From: Mike Riley
To: ACT-WCM
Subject: Alabama-Coosa-Tallapoosa River Basin Water Control Manual Draft Environmental Impact Statement
Date: Saturday, March 30, 2013 7:46:59 AM
Attachments: image003.jpg
Ltr to Corp of Engineers Supporting APCO Extension of 60 days.pdf

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LMLPA respectfully submits the attached document for a 60 day extension.

Mike Riley
LMLPA Graphic (Small)

QUANTITY QUALITY SAFETY
LMLPA
LOGAN MARTIN LAKE PROTECTION ASSOCIATION
P.O. Box 2002
Pell City, AL 35125

March 30, 2013

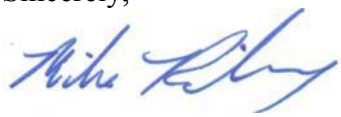
Colonel Steven J. Roemhildt
Commander, Mobile District
U.S. Army Corps of Engineers
ATTN: PD-EI (ACT-DEIS)
Post Office Box 2288
Mobile, Alabama 36628

Subject: Draft Environment Impact Statement
Update of Water Control Manual for Alabama-Coosa-Tallapoosa Basin

Dear Colonel Roemhildt:

Logan Martin Lake Protection Association (LMLPA) wants to emphasize our support of Alabama Power Company's request of a 60-day extension to July 1, 2013 for parties to submit comments on the above referenced documents. Also, we would like to request an extension of the due date for comments on the documents. The complexity of the issues and the limited time period we believe a 60-day extension should not be a problem.

Sincerely,



Mike Riley
President

From:	Judy L. Worley
To:	ACT-WCM
Cc:	Herb R. Nadler; Leon Jourolmon
Subject:	Southeastern Power DEIS Comments
Date:	Wednesday, May 29, 2013 2:22:14 PM
Attachments:	Mobile DEIS 2013.pdf

Attached are Southeastern Power Administration's comments on the Mobile District's Draft Environmental Impact Statement regarding the update to the Master Water Control Manual for the Alabama-Coosa-Tallapoosa River Basin.

The comments are also being mailed out today. If you have any questions, please contact Herbert Nadler at 706-213-3853 or at: herb.nadler@sepa.doe.gov.

Judith L. Worley
Southeastern Power Administration
1166 Athens Tech Road
Elberton, GA 30635-6711
Phone: 706-213-3836
FAX: 706-213-3884
judyw@sepa.doe.gov

Department of Energy
Southeastern Power Administration
Elberton, Georgia 30635-6711

May 29, 2013

VIA E-Mail

Colonel Steven J. Roemhildt
District Commander
Mobile District, USACE
Attn: PD-EI (ACT-DEIS)
P. O. Box 2288
Mobile, AL 36628-0001

Dear Colonel Roemhildt:

Southeastern Power Administration (Southeastern) is pleased to have an opportunity to provide comments on the Mobile District's Draft Environmental Impact Statement (DEIS) regarding the update to the Master Water Control Manual for the Alabama-Coosa-Tallapoosa (ACT) River Basin. As the Federal agency with responsibility for marketing power from the District's hydroelectric projects, we are very interested in any actions that will be taken which will affect the projects in terms of capacity reductions, energy reductions, seasonal redistributions of power, operational constraints, or restrictions to the daily timing of peaking generation. As such, Southeastern has significant concerns with the proposed change to basin operation and the adequacy of the DEIS analysis utilized to ultimately determine impacts to the hydropower purpose.

Of major concern to Southeastern is the proposed alteration to the conservation pool at the Allatoona project. The four proposed zones of operation clearly represent a reduction in hours use for hydropower when compared to the current plan, particularly the largest zone (ZONE 4), which provides for no hydropower generation despite the fact that the majority of the original congressionally-authorized conservation pool remains. Southeastern strongly contends that this proposed change is a significant impact to the hydropower purpose; and, as plainly described on page ES-1, line 38 of the DEIS, requires a feasibility study and Congressional Authorization. Original project documentation indicates that well in excess of 220,000 acre-feet of project storage capacity would be available for power production and the proposed new zones of operation would have a significant impact to that availability. This clearly constitutes a considerable affect on a project purpose, and as such, is outside the scope of a Water Control Manual update.

Another concern to Southeastern is the selection of an inappropriate baseline for comparison to the proposed action alternative (Plan G). The selection of current condition as the baseline arbitrarily dismisses all cumulative impacts that have occurred to the detriment of the hydropower purpose for the last several decades. Rather than simply establishing a new benchmark forward, the DEIS analysis should have identified these previous impacts so that they could have been included in the impact summary. During the multi-state compact negotiations, a 1970s timeframe analysis was going to be conducted in order to identify harm and impacts to parties which had already occurred and been incorporated into what was considered "normal" operations. The same approach should be followed in this instance. Southeastern also disagrees with the concept the DEIS utilizes in determining "system impacts" to hydropower in the river basin. This approach masks project-specific impacts and obscures the individual parties that are potentially harmed by the proposed revision. Southeastern firmly believes that the DEIS should contain a site-specific analysis for each individual hydropower project which identifies benefits or impacts. The analysis that has been conducted is inadequate, as it only looks forward and socializes the impacts on a river system basis, when in reality, very specific parties will be harmed if the plan is implemented.

Southeastern also questions the HEC-ResSim modeling which is being utilized in the analysis. Baseline modeling output that supposedly depicts the current operation is so significantly different than corresponding project actual information, we question if it really is a simulation of current operations. The comparison that has been made between the proposed alternative Plan G and the Baseline do not appear to produce a realistic estimation of impacts to hydropower. In almost all instances, the differences between the model results of the Baseline and Plan G are a small fraction of a percent; however, when compared to project actual operations, the differences for both are significant.

Among our other areas of concerns are the reductions and seasonal redistribution of hydropower generation, particularly at Allatoona with the re-defining of the project guide curve/flood control pool during the fall and early winter months. This proposed altered operation would shift generation from the critical demand months of June through September into the fall and winter months, which does not reflect the most valuable use of hydropower, and again represents a loss in benefits to our purpose.

We are also concerned with the proposed introduction of zones of operation at the Carters project. Ultimately the increased level of releases could result in lower overall project elevations, which may impact project capacity. The importance of the capacity component cannot be overlooked or eliminated from an analysis. A significant portion of Southeastern revenue is based on the generating capacity of the projects. Any change in operation which may result in a drawdown of a project could impact our ability to satisfy capacity obligations and impact revenue.

In addition, the model completely misrepresents the operations at the Carters project. At Carters, we pump and generate only the quantity of energy that is required to support the capacity at the project. Any generation in excess of this quantity is an unnecessary additional cost for pumping energy to the Government. Artificially setting Carters generation to such large quantities introduces additional generation into the system energy totals which tends to obscure impacts

that would occur during actual operations. In every instance for the 70-year modeled period, both the Baseline and Plan G model generate well in excess of 600,000 MWH annually, when in reality there have only been three times in the project's 37-year history that this has occurred. The generation and pump cycles required to meet this quantity of energy production is significant; and with the physical limitations of the re-regulation pond, it is unrealistic for a model to accomplish this continually.

Southeastern appreciates the tremendous effort the Mobile District has put into the development of the draft Master Water Control Manual thus far and understands the many challenges ahead. We look forward to working with the District in refining this proposed document in a manner which enables Congressionally Authorized purposes to continue to meet obligations and allows the needs of the basin to be satisfied.

Sincerely,

Herbert Nadler

Herbert Nadler
Assistant Administrator
of Power Resources

May 31, 2013

BY ELECTRONIC MAIL AND U.S. MAIL
Colonel Steven J. Roemhildt, Commander
U.S. Army Corps of Engineers, Mobile District
Attn: PD-EI (ACT-DEIS)
P.O. Box 2288
Mobile, AL 36628

Subject: Metropolitan North Georgia Water Planning District Comments
Draft Master Water Control Manual Update and Environmental Impact Statement
for the Alabama - Coosa - Tallapoosa River Basin

Dear Colonel Roemhildt:

Please accept these comments on the Draft Water Control Manual (the "Manual") and Draft Environmental Impact Statement on behalf of the Metropolitan North Georgia Water Planning District (the "Metro Water District"). The Metro Water District is concerned that the draft documents do not address the current or future water supply needs of the region. Because these needs already exist and are projected to increase over the life of the Water Control Manual, some action must be taken to address them. I have attached a copy of our latest Water Supply and Water Conservation Management Plan to help document these requirements.

It also should be noted that the Metro Water District has helped implement an aggressive water conservation program across the region, including areas served by Allatoona Lake. The region has achieved water conservation savings greater than 20% and is committed to the wise use of our resources. The Metro Water District's water conservation program is also outlined within the Water Supply and Conservation Plan.

Please do not hesitate to call if I can provide you with additional information or assist you in any other way.

Sincerely,

Katherine Zitsch, PE, BCEE
Manager

Attachment: 2009 Metro Water District Water Supply and Water Conservation Management Plan

40 Courtland St., NE ♦ Atlanta, Georgia 30303-2538
Telephone: (404) 463-3256 ♦ Facsimile (404) 463-3254

Water Supply and Water Conservation Management Plan

May 2009

Prepared By:
AECOM

Metropolitan North Georgia
Water Planning District

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Water Supply and Water Conservation Management Plan

Prepared for:
Metropolitan North Georgia Water Planning District
40 Courtland Street, NE Atlanta, GA 30303
www.northgeorgiawater.org

Prepared by:
AECOM,
Maddaus Water Management,
and R2T, Inc.

May 2009

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EXECUTIVE SUMMARY

The Metropolitan North Georgia Water Planning District (Metro Water District) was created by the Georgia General Assembly in 2001 (O.C.G.A. §12-5-572) to serve as the water planning organization for the greater metropolitan Atlanta area. The Metro Water District's purpose is to establish policy, create plans and promote intergovernmental coordination of water issues in the District from a regional perspective.

The Metro Water District includes 15 counties (Bartow, Cherokee, Clayton, Cobb, Coweta, DeKalb, Douglas, Fayette, Fulton, Forsyth, Gwinnett, Hall, Henry, Paulding, and Rockdale counties) as well as 91 municipalities partially or fully within these counties. The Metro Water District also has seven authorities which provide water, sewer and/or stormwater services. The Metro Water District's plans and policies work to protect water resources in the Chattahoochee, Coosa, Flint, Ocmulgee, Oconee and Tallapoosa River Basins.

With the adoption of the Georgia State-wide Water Management Plan by the Georgia General Assembly in 2008, the Metro Water District is now one of eleven regional water planning councils in the state, and will continue to work within the integrated framework of state water resources planning.

The Metro Water District enabling legislation mandated the development of three long-term regional plans to address the water resources challenges:

- Water Supply and Water Conservation Management Plan
- Wastewater Management Plan
- Watershed Management Plan.

The first plans were completed and adopted in 2003 and have been actively implemented by local jurisdictions in the Metro Water District. This document serves as the first update to the original Water Supply and Water Conservation Management Plan and details strategies and recommendations for both effective water supply and water conservation. It includes specific tasks and milestones for implementing these recommendations for local governments as well as regional and state agencies.

THE PLAN UPDATE PROCESS

The Metro Water District utilized an integrated planning effort similar to that used to develop the original plans in order to build consensus for long-term regional water resources management solutions. The Metro Water District water resources plans are the result of a collaborative effort between the Metro Water District's local jurisdictions, the Georgia Environmental Protection Division (Georgia EPD), and numerous stakeholders.

As envisioned by the Metro Water District's enabling legislation, the planning process includes the Metro Water District Governing Board, a Technical Coordinating Committee (TCC), six Basin Advisory Councils (BAC), Georgia EPD, planning staff from the Atlanta Regional Commission and technical consulting firms.

INTEGRATION OF PLANNING EFFORTS

The Metro Water District also prepared two other plans which together with the Water Supply and Water Conservation Management Plan represent an integrated and holistic approach to water resources planning and management. The **Watershed Management Plan** details strategies and recommendations for both effective watershed and stormwater management and water quality protection. It includes specific tasks and milestones for implementing these recommendations for local governments as well as regional and state agencies. The **Wastewater Management Plan** sets forth strategies for comprehensive wastewater management efforts to meet future needs across the Metro Water District. The plan outlines a long-term implementation schedule for public wastewater treatment. It also provides for comprehensive wastewater planning to establish future sewer service areas and calls for more intensive management of privately owned septic systems.

KEY CHANGES TO THE PLAN

In this plan update, there are a number of changes from the 2003 Water Supply and Water Conservation Management Plan, as amended, including a reorganization of the document. The most notable organizational change involved providing simple implementation summaries for each measure that have more background and implementation guidance than were included in the 2003 document.

Additionally, key elements of updating the 2003 Water Supply and Water Conservation Management Plan include a review and update of water conservation measures, water demand forecasts, existing and potential water sources, extension of the planning horizon to 2035 and ensuring compatibility with the State-wide Water Management Plan. As a result of the review of water conservation measures, three of the measures from the 2003 Water Supply and Water Conservation Management Plan, as amended have been enhanced and two new measures have been added to the Water Conservation Program and are described in Section 5.

EXISTING WATER SUPPLY AND TREATMENT FACILITIES

Water supply service and management throughout the Metro Water District is provided by over 50 individual water providers. Water management includes supply, treatment, distribution, interconnections, and the interaction of these infrastructure systems with the natural systems.

EXISTING WATER SUPPLIES

The Metro Water District relies primarily on surface water from rivers and storage reservoirs as its main source of water supply. In fact, surface water provides over 99 percent of the water supply in the District. Within the Metro Water District, almost 888 AAD-MGD (average annual day-million gallons per day) of permitted water supply (surface and groundwater) is available. The Chattahoochee basin accounts for approximately 73 percent of the permitted available water supply in the Metro Water District. A summary of existing permitted monthly average available water supply by basin is presented in Table ES-1.

TABLE ES-1
Metro Water District Percent Permitted Monthly Average Available Water Supply by Basin

Source Basin	Percent Permitted Monthly Average Available Water Supply
Chattahoochee	72.6 %
Coosa	14.0 %
Flint	5.0 %
Ocmulgee	8.1 %
Oconee	0.2 %
Tallapoosa	0.1 %

EXISTING WATER TREATMENT FACILITIES

The Metro Water District currently has 38 existing publicly-owned surface water treatment plants, ranging in permitted capacity of less than 1 MGD to 150 PD-MGD (peak day - million gallons per day), providing a combined permitted treatment capacity of 1,135 PD-MGD. The permitted treatment capacity of 1,135 PD-MGD or 710 AAD-MGD treats water from the 882 AAD-MGD of permitted supply.

EXISTING WATER SUPPLY INTERCONNECTIONS

All of the counties within the Metro Water District maintain interconnections with at least one other county for either routine or emergency water sale. Some of these interconnections originally served as a primary water supply source before the water system in the receiving county was adequately developed. These connections are now kept for emergency uses. Interconnections with other water systems provide a valuable means of increasing water system reliability.

EXISTING INTERBASIN TRANSFERS

Interbasin transfers of water and wastewater occur among municipalities, counties, and basins. Transfers among basins are particularly common within counties that straddle the ridges between two or more basins. Interbasin transfers are a key and necessary element in supplying water throughout the Metro Water District; there are water supply and wastewater transfers into and out of every basin. Table ES-2 summarizes the existing water and wastewater interbasin transfers in the Metro Water District.

TABLE ES-2
Summary of Existing Net Interbasin Transfers

Source Basin	Receiving Basin	Net Transfer (AAD-MGD)
Chattahoochee	Ocmulgee	100
Chattahoochee	Oconee	7
Coosa	Chattahoochee	14
Flint	Chattahoochee	2
Flint	Ocmulgee	5

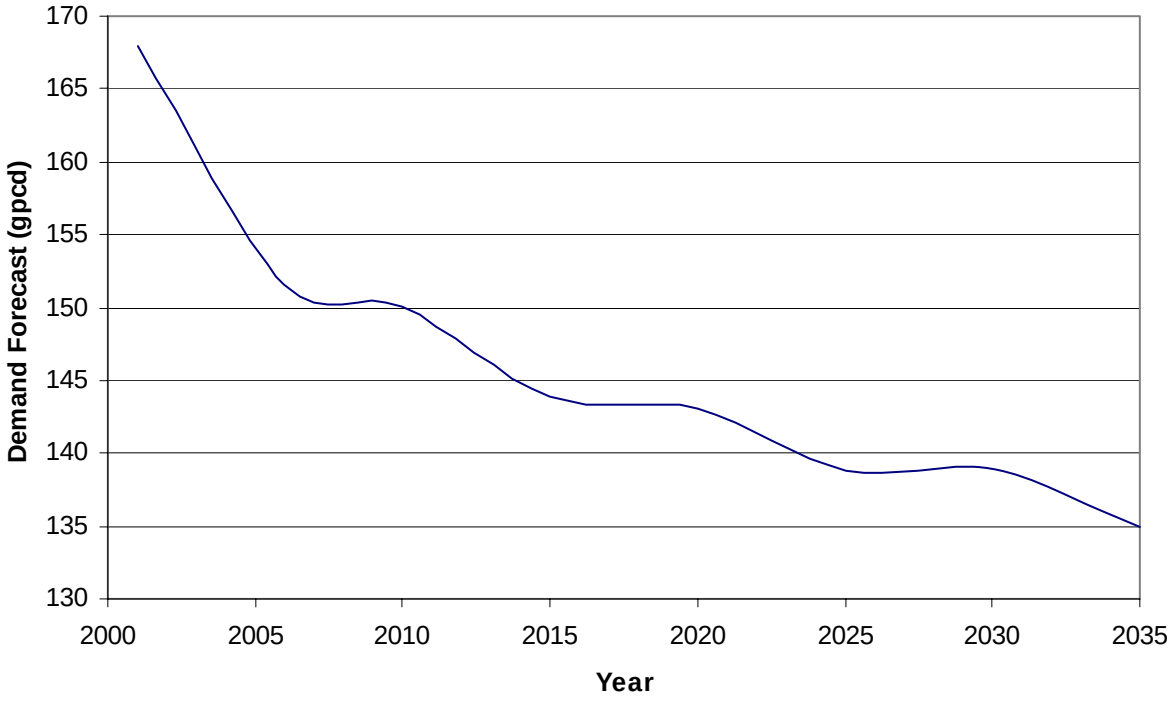
Note: Transfers estimated based on 2006 actual withdrawals and discharges.

WATER DEMAND FORECASTS

The "Demand Side Management Least Cost Planning Decision Support System" (DSS) computer model developed by Maddaus Water Management, which was used for the 2003 Plan, was updated and used to forecast water demands and assess water conservation measures. The model uses current water production and billing data provided by most local water providers, along with population and employment forecasts, to estimate water demands through 2035. The model provides water use for each county by water use sector (single-family, multi-family, commercial, industrial, institutional), splits usage into indoor and outdoor components and further subdivides indoor use into major end uses (toilets, faucets, etc.). The level of detail increases the accuracy of both the forecasts as well as the anticipated benefits of the water conservation program, because the demand and savings are based on the specific aspects of water use within that county. For example, the replacement of old toilets will conserve more water in a county with older housing stock than in a county with newer housing stock.

With implementation of the enhanced water conservation program, the projected water demand is estimated to be 1,011 MGD on an average annual daily demand basis. Figure ES-1 shows that this Plan update provides a 20% reduction in per capita demand from 2001 to 2035. The starting point of 168 gallons per capita per day (gpcd) reflects billing data for 2001 collected for the 2003 Plan. The 2006 data shows a 151 gpcd, used in the Plan update. The end point reflects the benefit of the conservation program in the Plan update.

FIGURE ES-1
Metro Water District Overall Per Capita* Water Use Trends (2001 – 2035)



* Overall per capita = total water demand supplied by public water systems in the Metro Water District divided by the Metro Water District's population.

WATER CONSERVATION ANALYSIS

Water conservation was considered first in the planning process, prior to looking at new or expanded sources. The water conservation analysis used the DSS computer model to maximize the cost-benefit of the updated water conservation program. The updated water conservation program expands the existing Metro Water District program to further enhance water conservation into the future. The program resulted from an extensive analysis of the current program, evaluation of new methods and measures, and stakeholder involvement.

An important step in updating the water conservation program was the review and screening of additional potential water conservation measures. A list of 45 potential water conservation measures were identified and evaluated. Each potential conservation measure was ranked against three qualitative criteria: technology / market maturity, service area match, and customer acceptance / equity. The screening process resulted in a short-list of new potential water conservation measures. The selected measures that could be evaluated quantitatively for water savings were modeled and ranked based on the cost of the water saved (cost / million gallons saved).

Combinations of the best individual water conservation measures were then placed in several different "Option Packages" or programs. Three water conservation packages were identified for the Metro Water District, each with varying degrees of water savings and costs. The existing adopted water conservation measures provided the backbone for each of these packages. Package A was composed of the 10 existing water conservation measures to provide a benchmark for the analyses. Package B was composed of Package A plus 2 new water conservation measures and 3 revised existing measures. Package C is comprised of all evaluated water conservation measures.

Water Conservation Program B was selected as the recommended program. This aggressive water conservation program will achieve significant savings (88 MGD) in addition to the savings (60 MGD) that will occur through the natural replacement of less efficient plumbing fixtures. Implementation of Program B realizes the majority of the water savings available while Program C requires spending 5% more (or $19M) to gain just 4 MGD of additional water savings. Implementing the measures in Program B provides additional water conservation benefits on the foundation provided by the existing measures without exceeding the number of measures that a local water provider can realistically implement.

WATER CONSERVATION PROGRAM

Water conservation is a critical element in meeting the water supply needs within the Metro Water District. When fully implemented, these water conservation measures will reduce the Metro Water District's water demand by the end of the planning period. Much progress related to water conservation has been achieved since the adoption of the 2003 Water Supply and Water Conservation Management Plan. The Metro Water District's plan has been instrumental in making water conservation a priority in north Georgia. The Metro Water District is the only major metropolitan area in the country with more than 100 jurisdictions that is implementing such a comprehensive long-term water conservation program that is required and enforced. Tiered water conservation rates have been put in place throughout the Metro Water District. All of the largest water systems have implemented programs to reduce system water loss. Toilet rebate programs are in place and ahead of schedule. The water conservation

measures in this Plan update include and go beyond the measures in the 2003 Plan. This update includes:

- The 10 water conservation measures from the 2003 plan
  - Conservation pricing
  - Replace older, inefficient plumbing fixtures
  - Pre-rinse spray valve retrofit education program
  - Rain sensor shut-off switches on new irrigation systems
  - Sub-meters in new multi-family buildings
  - Assess and reduce water system leakage
  - Conduct residential water audits
  - Distribute low-flow retrofit kits to residential users
  - Conduct commercial water audits
  - Implement education and public awareness plan
- 3 of those 10 water conservation measures are strengthened
  - Irrigation meter pricing at 200 percent of the first tier rate
  - 1.28 gpf toilet rebate program only by 2014
  - Minimum local education requirements and optional toolbox of examples is provided.
- 2 new water conservation measures are added
  - Install 1.28 gpf toilets and low flow urinals in government buildings
  - Require new car washes to recycle water.

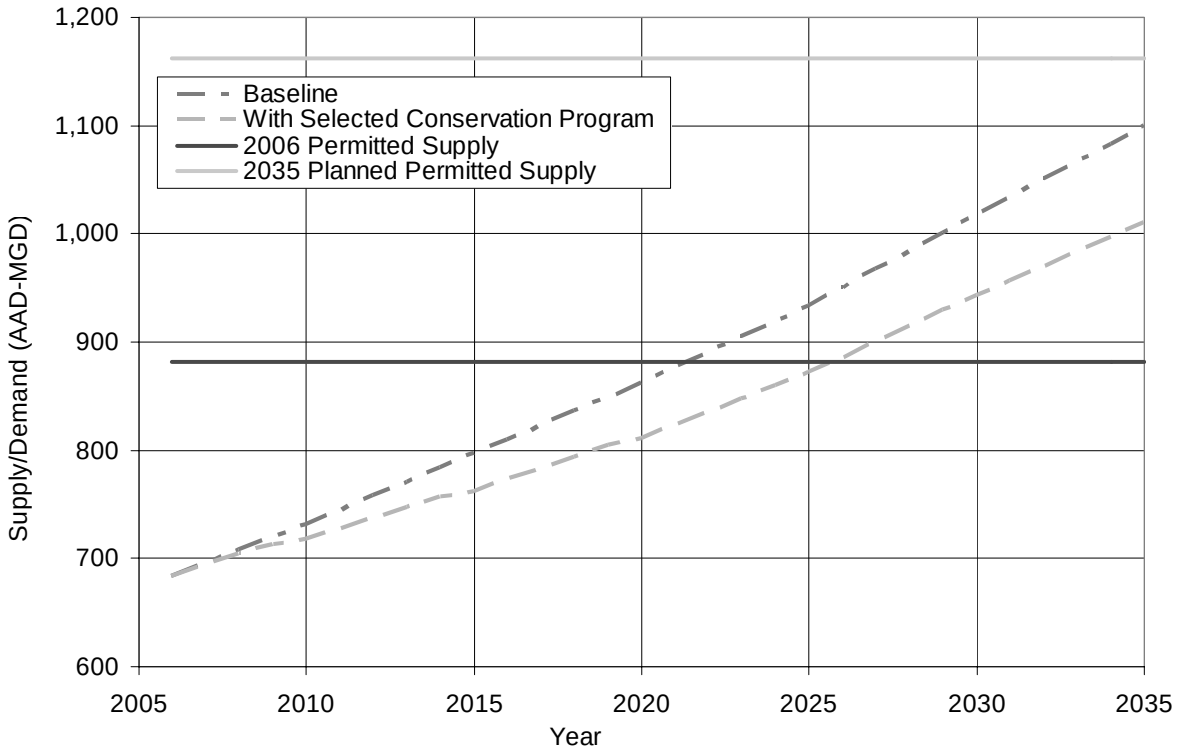
WATER SUPPLY SOURCES

By 2035, the Metro Water District's water demands with the aggressive water conservation program will approach 1,011 AAD-MGD. The current permitted surface water supply is 882 AAD-MGD; therefore, to meet the projected future water supply needs in the Metro Water District through 2035 additional water supply sources will be needed. The future water supply alternatives to meet 2035 demands include existing water supply sources and reservoirs, expansions of existing sources, and potential new water supply sources. It is important to note that the benefits of the water conservation program were considered prior to consideration of additional water supply sources.

On an average annual basis, the anticipated 2035 permitted surface water supply is 1,140 AAD-MGD. Figure ES-2 shows graphically that the water supplies identified will meet 2035 forecasted demands.

Groundwater use makes up less than 1% of the public water supplies for the Metro Water District, due to bedrock geology. Over the 2035 planning horizon, it is expected that the percentage of groundwater use will remain about constant. For planning purposes, groundwater supply sources have been factored into the water supply plan as a source for small towns and as a supplemental source.

FIGURE ES-2
Metro Water District Water Demand and Supply



WATER SUPPLY FACILITIES

In order to maintain reliable water supply within the Metro Water District, the following action items are needed to further maximize existing sources, secure additional water supply sources and build additional treatment capacity.

- Construct three water supply reservoirs that are in the planning stages plus continue to investigate three additional water supply reservoirs needed within the planning horizon.
- Construct two new storage facilities to drought proof and extend existing supply sources.
- Construct 6 new water treatment plants and expand 28 existing water treatment plants based on the phased approach provided in Appendix B.

In 2035, the planned treatment capacity in the Metro Water District is 1,726 PD-MGD or 1,079 AAD-MGD from a total of 44 publicly-owned surface water treatment plants.

Table ES-3 provides the future interbasin transfers, based on 2035 demand forecasts and the facilities planned to meet the forecasted demand. Future planned water supplies aim to minimize interbasin transfers. The net interbasin transfer shows the total interbasin transfer based on expected permitted withdrawals and discharges.

TABLE ES-3
Summary of 2035 Net Interbasin Transfers

Source Basin	Receiving Basin	Net Transfer (AAD-MGD)
Chattahoochee	Flint	7
Chattahoochee	Ocmulgee	97
Chattahoochee	Oconee	6
Coosa	Chattahoochee	32
Coosa	Tallapoosa	2
Flint	Ocmulgee	2

WATER REUSE

There are several types of reuse that may be used in the Metro Water District to extend supplies or replace potential new water sources with reuse water. The plan outlines the different types of water reuse as well a discussion of existing and future applications in the Metro Water District identified to meet the 10% reuse planning standard identified by Georgia EPD.

Non-potable and indirect potable reuse are both currently practiced in the Metro Water District and are expected to sustain water supplies into the future. Indirect potable reuse is highly encouraged, where appropriate. Non-potable reuse is acceptable depending on each local community's consumptive use challenges, when it offsets an existing potable water supply.

Long-term sustainability of the resource can be achieved through returning reclaimed water to Lake Lanier and Allatoona Lake. The cities and counties that withdraw water from Lake Lanier for drinking water supply should maximize the return of reclaimed water to the Lake. Summing both planned and incidental indirect potable reuse, communities currently plan to return over 100 AAD-MGD to Lake Lanier and approximately 36 AAD-MGD to Allatoona Lake as outlined in the Wastewater Management Plan within the 2035 planning horizon.

LOCAL PLANNING RECOMMENDATIONS

This Water Supply and Water Conservation Management Plan is regional in breadth, looking holistically at regional issues. The action items in this Plan are intended to be refined at the local level by the affected local water providers through local water master plans. Local water master plans, at a minimum, must conform to the goals of the Metro Water District's Water Supply and Water Conservation Management Plan to ensure that customer service goals are cost-effectively met with a long-term regional perspective.

Other local planning recommendations include developing local emergency water plans, taking necessary steps to protect source water supplies and developing a water system asset management program.

WATER SUPPLY ISSUES

Lake Lanier and Allatoona Lake have played a key role in assuring an adequate water supply for the Metro Water District since their construction by the U.S. Army Corps of Engineers (Corps) in the 1950s. These federal reservoirs are multi-purpose projects that store water for multiple purposes: hydropower production, flood control, navigation, water supply, water quality, recreation and navigation. Although the Corps controls the storage in these reservoirs, the water in the State of Georgia is allocated and managed among users by the State of Georgia.

This Plan assumes that the federal reservoirs will continue to operate to meet water supply needs within the Metro Water District consistent with the guidance about future yield expectations provided by Georgia EPD. After reviewing alternatives to the use of the federal reservoirs, *the Water District has concluded that there are no alternatives to the Chattahoochee River and the Etowah River as major water supply sources for north Georgia*.

It should be noted that expectations regarding water supply available from the operation of Lake Lanier and Allatoona Lake assume operation of these Corps reservoirs based on a balanced operation of the projects for all purposes. Recent changes in Corps operations of these Lakes beginning in 2006 represent a dramatic change and are of concern. In addition, the operation of the federal reservoirs is the subject of litigation of which the outcome is uncertain. Nonetheless, the Metro Water District trusts that the Corps will eventually develop Water Control Plans for the ACF and the ACT that provide a balanced approach for all the users of each system.

Other issues affecting the Metro Water District include: minimizing consumptive uses (water reuse, septic systems, land application systems, and interbasin transfers), reservoir storage reliability, regulation of small water withdrawals, instream flow protection policy, drought planning, impacts of climate change on water resources, surface water and groundwater treatment standards, chemicals of concern, and sedimentation of stream and river intakes.

STATE AND REGIONAL POLICY RECOMMENDATIONS

State and regional policy recommendations are provided to further implementation of water supply and water conservation management in the Metro Water District. These recommendations are intended for state and regional agencies, and require no action on the part of local governments. Policy recommendations include:

- Metro Water District should facilitate ongoing discussions on post-2035 water supply planning.
- Georgia EPD and the Georgia Environmental Facilities Authority (GEFA) should continue to financially support the construction of needed water supply sources through GEFA and other Federal and State funding sources.
- Georgia EPD should consolidate the permit cycles for water withdrawal permits and water treatment facility permits. Georgia EPD should also work to consolidate and standardize reporting to enable reports be simplified to meet multiple requirements.
- Through Georgia legislation, the State plumbing code should be adjusted to reflect market maturity for higher efficiency fixtures.
- Georgia EPD should study and make recommendations to the Georgia General Assembly on requiring all withdrawals in the Metro Water District to adhere to the same drought restrictions

as those on public water supplies and requiring permits for less than 100,000 gpd within the Metro Water District.

- Georgia Department of Community Affairs (Georgia DCA) should consider updating the new Comprehensive Land Use Plan review audit checklist as needed to encourage coordination between land use planning and water supply planning. Georgia DCA should also review and support source water supply watershed protection as outlined in the Part V Environmental Planning Criteria.
- The Metro Water District should continue working with the Technical Coordinating Committee (TCC) and if necessary a working sub-committee of the TCC to collect data and measure progress of the regional water conservation program.

EDUCATION AND PUBLIC AWARENESS

Education and public awareness is essential to effective water resources management. This Plan includes a detailed education and awareness program specifically designed to:

- Raise public awareness of water issues and needs to foster support for solutions;
- Educate the public and other identified target groups in order to increase awareness and encourage behavioral changes; and
- Coordinate with other public as well as private entities to maximize the visibility of the Metro Water District and its messages.

The Metro Water District education and public awareness program is comprised of two elements: a regional program managed by the Metro Water District staff; and education activities undertaken by local governments. The Metro Water District provides a regional education and public awareness program and develops mass media content and educational tools, including a comprehensive website, brochures and presentation materials. The local governments' role in education and public awareness is to reach out to specific groups in their community, provide educational materials and share knowledge of subject matters with the public by undertaking specific education and outreach activities.

PLAN IMPLEMENTATION

The Water Supply and Water Conservation Management Plan provides implementation guidance and schedules for the management measures and actions included in the Plan. Local water providers have a high level of accountability for implementing the Water Supply and Water Conservation Management Plan's measures through the Georgia EPD audit process. Georgia EPD auditors conduct a thorough review of the local programs and procedures to determine consistency with the Metro Water District Water Supply and Water Conservation Management Plan. Communities must substantially comply with the Metro Water District plan provisions in order to modify or obtain new water withdrawal permits, wasteload allocations, GEFA loan funding, or the renewal of MS4 stormwater permits. Overall, this system has worked well to ensure implementation of the provisions of all three Metro Water District water resources plans.

IMPLEMENTATION FUNDING

Successful implementation of the water supply and water conservation action items located in this plan requires adequate funding. Local governments should develop a stable funding mechanism that will

provide for complete implementation. There is only one appropriate primary funding method available to local governments, water rates. In addition, there are a number of secondary sources of funding, including the local government's general appropriations, loans, bonds, service fees, and grants. A blend of funding mechanisms is recommended for most local governments.

FUTURE PLAN EVALUATION

The Metro Water District enabling legislation identifies the need to periodically assess regional progress toward implementation of the specific actions identified in the Water Supply and Water Conservation Management Plan and toward meeting the long-term goal of comprehensive water resources management. The aggressive conservation program and action items provide the framework for evaluating implementation of this Plan. The future evaluation includes annual surveys completed by the Metro Water District that will track progress.

There are two types of plan reviews and updates: annual reviews and plan updates that occur every five years. The reviews and updates are an important component of an adaptive management approach for all three of the Metro Water District's long-term management Plans (water supply and conservation, wastewater, and watershed).

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Section 1: INTRODUCTION

The Water Supply and Water Conservation Management Plan provides regional water demand forecasts that include the effects of water conservation and identifies adequate future water supplies in the 15-county Metropolitan North Georgia Water Planning District. The Water Supply and Water Conservation Management Plan prescribes strategies and recommendations for effective water supply management. The Plan builds upon existing efforts to meet the overall goal of protecting water supply in and downstream of the region.

THE METRO WATER DISTRICT

The Metropolitan North Georgia Water Planning District (Metro Water District) was created by the Georgia General Assembly in 2001 (O.C.G.A. §12-5-572) to serve as the water planning organization for the greater metropolitan Atlanta area. The Metro Water District's purpose is to establish policy, create plans and promote intergovernmental coordination of water issues in the District from a regional perspective.

The Metro Water District includes 15 counties (Bartow, Cherokee, Clayton, Cobb, Coweta, DeKalb, Douglas, Fayette, Fulton, Forsyth, Gwinnett, Hall, Henry, Paulding, and Rockdale counties) as well as 91 municipalities partially or fully within these counties (Figure 1-1). The Metro Water District also has seven authorities which provide water, sewer and/or stormwater services. Table 1-1 provides a list of the local jurisdictions that make up the Metro Water District. The Metro Water District's plans and policies work to protect water resources in the Chattahoochee, Coosa, Flint, Ocmulgee, Oconee and Tallapoosa River Basins (Figure 1-2).

With the adoption of the Georgia State-wide Water Management Plan by the Georgia General Assembly in 2008, the Metro Water District is now one of eleven regional water planning councils in the state, and will continue to work within the integrated framework of state water resources planning.

REGIONAL WATER RESOURCES PLANS

The Metro Water District enabling legislation mandated the development of three long-term regional plans to address the water resources challenges: water supply and water conservation, wastewater management and watershed protection and management. The first plans were completed and adopted in 2003 and have been actively implemented by local jurisdictions in the Metro Water District over the last five years.

This document, the Metro Water District's **Water Supply and Water Conservation Management Plan**, details strategies and recommendations for effective water supply management and conservation. It includes the specific tasks and milestones for implementing these recommendations for both local governments as well as state and regional agencies.

FIGURE 1-1
Metro Water District Area

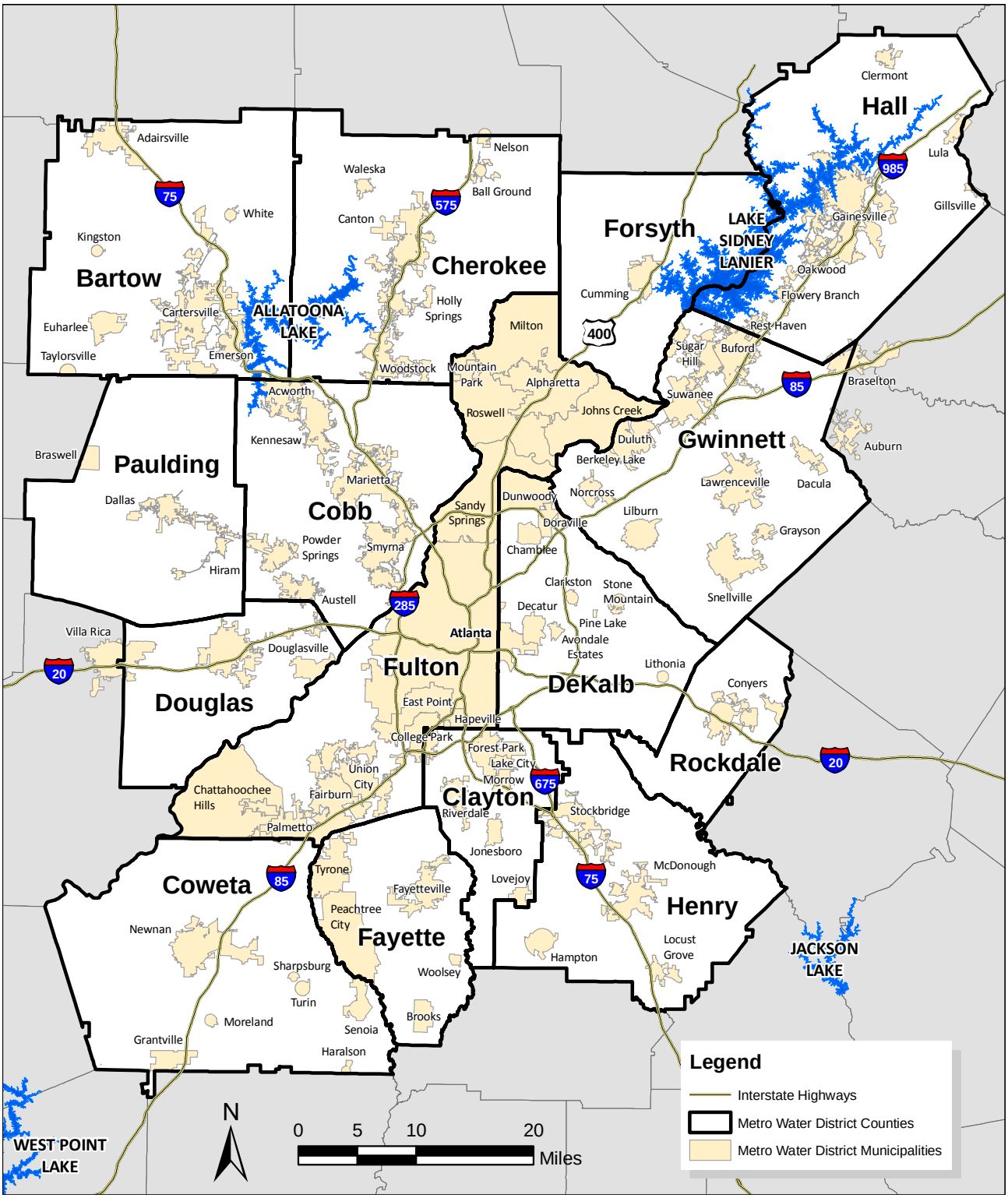


TABLE 1-1
Metro Water District Local Jurisdictions

Counties

Bartow County	Coweta County	Forsyth County	Henry County
Cherokee County	DeKalb County	Fulton County	Paulding County
Clayton County	Douglas County	Gwinnett County	Rockdale County
Cobb County	Fayette County	Hall County	

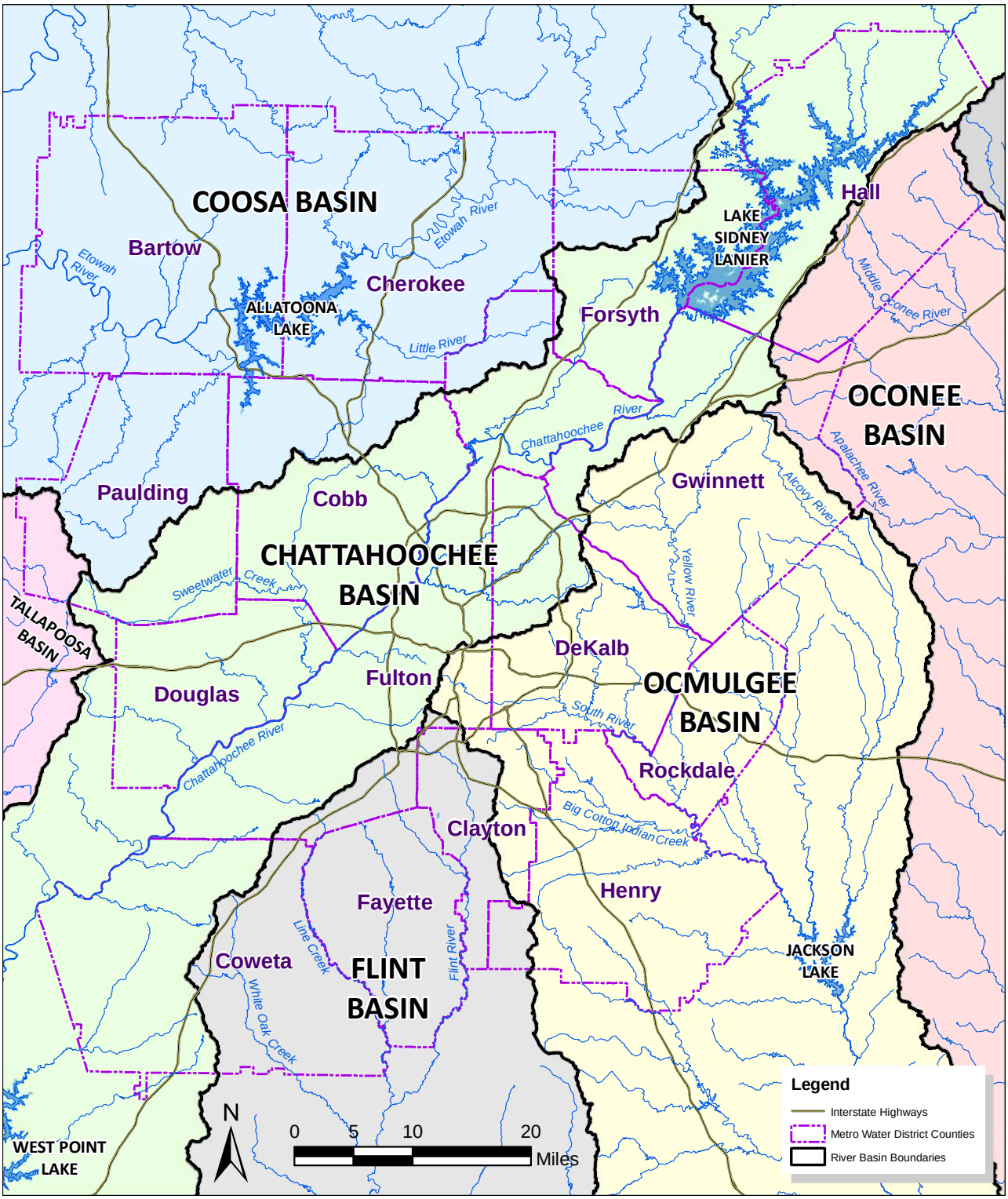
Municipalities

Acworth	Clermont	Gillsville	Marietta	Sharpsburg
Adairsville	College Park	Grantville	McDonough	Smyrna
Alpharetta	Conyers	Grayson	Milton	Snellville
Atlanta	Cumming	Hampton	Moreland	Stockbridge
Auburn	Dacula	Hapeville	Morrow	Stone Mountain
Austell	Dallas	Haralson	Mountain Park	Sugar Hill
Avondale Estates	Decatur	Hiram	Nelson	Suwanee
Ball Ground	Doraville	Holly Springs	Newnan	Taylorsville
Berkeley Lake	Douglasville	Johns Creek	Norcross	Turin
Braselton	Duluth	Jonesboro	Oakwood	Tyrone
Braswell	Dunwoody	Kennesaw	Palmetto	Union City
Brooks	East Point	Kingston	Peachtree City	Villa Rica
Buford	Emerson	Lake City	Pine Lake	Waleska
Canton	Euharlee	Lawrenceville	Powder Springs	White
Cartersville	Fairburn	Lilburn	Rest Haven	Woodstock
Chamblee	Fayetteville	Lithonia	Riverdale	Woolsey
Chattahoochee Hills	Flowery Branch	Locust Grove	Roswell	
Clarkston	Forest Park	Lovejoy	Sandy Springs	
	Gainesville	Lula	Senoia	

Authorities

Cherokee County Water and Sewerage Authority	Douglasville-Douglas County Water and Sewer Authority
Clayton County Water Authority	Henry County Water and Sewerage Authority
Cobb County-Marietta Water Authority	Peachtree City Water and Sewerage Authority
Coweta County Water and Sewerage Authority	

FIGURE 1-2
Metro Water District Major River Basins



The 2003 Water Supply and Water Conservation Management Plan planning process evaluated a wide spectrum of water conservation measures to develop a comprehensive regional water conservation program. The selected measures established a program that calls for intensive water demand management and aggressive water conservation. The plan includes recommended supply sources and facilities for the Metro Water District, as well as the sizing of water treatment plants required to meet local demands. The communities within the Metro Water District have worked aggressively over the past five years towards implementation of these management measures.

The Metro Water District also prepared two other plans which together with the Water Supply and Water Conservation Management Plan represent an integrated and holistic approach to water resources planning and management. The **Watershed Management Plan** details strategies and recommendations for both effective watershed and stormwater management and water quality protection. It includes specific tasks and milestones for implementing these recommendations for local governments as well as regional and state agencies. The **Wastewater Management Plan** sets forth strategies for comprehensive wastewater management efforts to meet future needs across the Metro Water District. The plan outlines a long-term implementation schedule for public wastewater treatment. It also provides for comprehensive wastewater planning to establish future sewer service areas and calls for more intensive management of privately owned septic systems.

PLAN IMPLEMENTATION

The Metro Water District, Georgia EPD and local governments all play important roles in implementing the District's water resources plans as illustrated in Figure 1-3 below. The Metro Water District develops the plans which are implemented by local jurisdictions. The Georgia Environmental Protection Division (Georgia EPD) enforces the plans' provisions through its permitting process. All local jurisdictions within the Metro Water District are required to substantially comply with the plans in order to obtain new or expanded water withdrawals or wastewater discharges, renewal of their NPDES municipal stormwater permits, or any Georgia Environmental Facilities Authority (GEFA) grant or loan funding.

FIGURE 1-3
Metro Water District Plan Development and Implementation

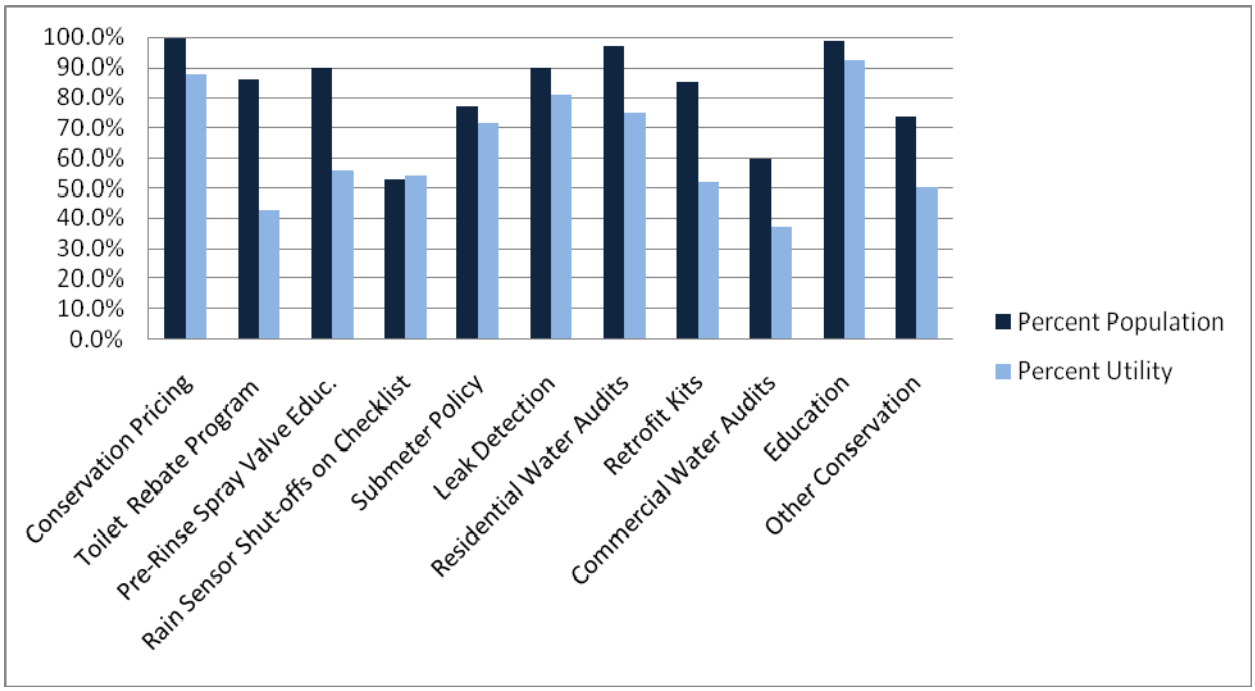
IMPLEMENTATION PROGRESS

Water Conservation Program

An aggressive water conservation program was developed for the 2003 Water Supply and Water Conservation Management Plan. The Metro Water District is the only major metropolitan area in the country with more than 100 jurisdictions implementing a long-term comprehensive water conservation program that is required and enforced. The water conservation program is essential for meeting future water supply demands in the Metro Water District. Implementation of the ten measures adopted in 2003 has been very successful.

To gauge regional progress, the Metro Water District surveyed local water providers in the fall of 2008 on the status of implementation of key plan measures. Fifty-two water providers representing 96% of the Metro Water District's population responded to the survey. The survey responses regarding water conservation are summarized in Figure 1-4. Results are displayed as both the percent of population served by a water provider implementing each measure and by percent of water providers that are implementing each measure.

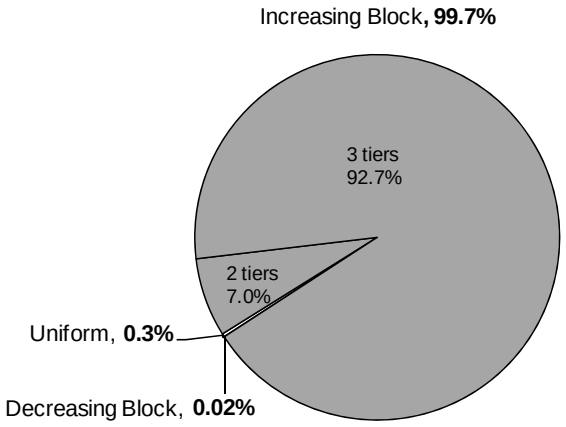
FIGURE 1-4
Water Conservation Measures Implementation – 2008



All Metro Water District water providers are required to adopt a multi-tiered conservation rate structure. In October 2008, the Metro Water District published the 2008 Water and Wastewater Rate Survey which was based on a detailed survey of local water and wastewater providers in the Metro Water District regarding water and wastewater rates. The survey received 100% participation from Metro Water District water and wastewater providers. The conservation pricing statistics in Figures 1-4 and 1-5 are based on the results of the 2008 Metro Water District Water and Wastewater Rate Survey. The water and wastewater rate survey results found that over 99% of the District's population is served by

increasing block or tiered water conservation rates, with 92.7% served by 3 or more tiers and 7% served by 2 tiers.

FIGURE 1-5
Water Rate Structures by Population Served



All Metro Water District water providers are required to adopt a program to replace older, inefficient toilets by 2009. Many water providers are ahead of the implementation schedule and are already implementing programs. In March 2008, the Metro Water District kicked-off its regional toilet rebate program to retrofit older, inefficient toilets. The program offers rebates to single-family residential customers of participating water providers that own or rent homes built before 1993. The Metro Water District provides administrative support services for the 13 participating water providers. In addition, eight other water providers had a local rebate program in 2008 to replace older, inefficient toilets. These programs rebated over 17,800 toilets in 2008, which will save over 300,000 gallons of water per day.

Water Supply Strategies

The Water Supply and Water Conservation Management Plan includes a framework for water supply facilities and strategies for resource management. Local water providers and Metro Water District have made significant progress in implementing specific water supply strategies, including:

- Intensification of water conservation efforts;
- Construction of four new reservoirs;
- Sharing of water resources through interconnections for reliability; and
- Reclamation of water by indirect potable reuse through Lake Lanier.

Local water management plans and emergency plans are needed to support the water supply strategies. The results of the 2008 implementation survey of local water providers show that 96% of the Metro Water District's population is served by local water providers with current long-range local water management plans and 79% of the Metro Water District's population is served by a local water provider that has a current emergency water plan.

Education and Public Awareness

Since the adoption of the 2003 Water Supply and Water Conservation Management Plan, the Metro Water District has provided many technical workshops. Some of the water conservation workshop topics have included water conservation pricing, residential water audits, finding and fixing leaks, commercial water audits, assessing and reducing water loss, water efficient landscaping, xeriscaping, rain gardens, rain barrels, Project WET conserve water educator training, water festivals and other educational topics. In addition, the Metro Water District provided the first training in the country on the American Water Works Association's Water Audit Software in September 2006 to local water providers in the Metro Water District.

The Metro Water District works with the Technical Coordinating Committees and Basin Advisory Councils to develop educational material for the local water systems' customers, such as the Do-It-Yourself Household Water Assessment, the Low-Flow Pre-Rinse Spray Valve brochure, the Landscape Irrigation Watering Guide and the Maintenance Guide for Landscape Irrigation Systems. Almost 99% of the Metro Water District's population is served by local water providers that provide education on conserving water.

Other education and public awareness activities include the annual essay contest and media campaign. The Metro Water District has reached out to school age kids through the annual essay contest. Over the last five years, the essay contest has received over a thousand essays from middle school students across the District. Also, the Metro Water District runs a media campaign every year. The Metro Water District partners with a local news station each year to produce and air water conservation public service announcements. In 2006, the Metro Water District and WSB-TV produced and aired a television special called "Our Water, Our Future."

PLAN DEVELOPMENT

PLANNING PROCESS

The Metro Water District enabling legislation requires that "the district shall prepare an updated water supply and water conservation management plan no less frequently than every five years after finalization of the initial plan." (O.C.G.A. §12-5-582(c)) The first 5-year update of the Water Supply and Water Conservation Management Plan has been completed in conjunction with updates to the Watershed Management Plan and Wastewater Management Plan.

The Metro Water District utilized an integrated planning effort similar to that used to develop the original plans in order to build consensus for long-term regional water resources management solutions. The Metro Water District water resources plans are the result of a collaborative effort between the Metro Water District's local jurisdictions, the Georgia EPD, and numerous stakeholders.

PLANNING PARTICIPANTS

As envisioned by the Metro Water District's enabling legislation, the planning process includes the Metro Water District Governing Board, a Technical Coordinating Committee (TCC), six Basin Advisory Councils (BAC), Georgia EPD, planning staff from the Atlanta Regional Commission and technical consulting firms.

Metro Water District Board: The 26-member Metro Water District Governing Board is the decision-making body for the Metro Water District which includes local representatives from the Metro Water District communities as well as citizen members.

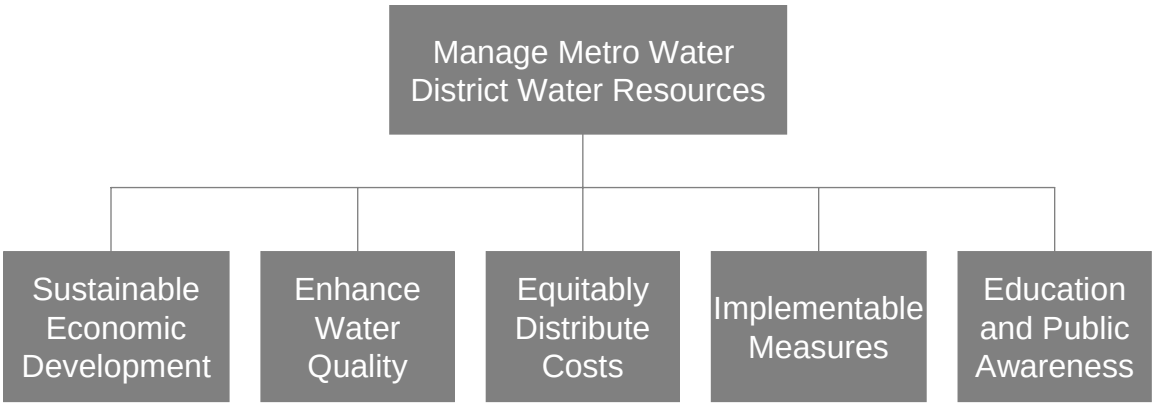
Technical Coordinating Committee (TCC): The TCC is comprised primarily of local government officials and staff from counties, cities, and authorities in the Metro Water District, and provides planning and policy support in the areas of water supply and conservation, wastewater management, stormwater and watershed management, septic systems, and education and public awareness.

Basin Advisory Council (BAC): The BACs are comprised of basin stakeholders including water professionals, business leaders, environmental advocates and other interested individuals and groups. Six BACs represent the Chattahoochee, Etowah, Flint, Oconee, Ocmulgee river basins and the Lake Lanier basin. The BACs advise in the development and implementation of policy related to basin-specific issues and provide input on plan content to the Governing Board, TCC and Metro Water District staff.

POLICY GOALS

The Metro Water District planning process was driven by policy goals agreed upon by all planning participants and adopted by the Board in 2002. These policy goals (shown in Figure 1-6) served as guideposts and helped ensure consistency of purpose for the watershed, wastewater, and water supply plans.

FIGURE 1-6
Metro Water District Policy Goals



PLAN UPDATE FOCUS

Since their adoption in 2003, the Metro Water District plans have become valuable tools for protecting and preserving water resources. For the plan update process, there were a number of objectives developed in conjunction between Metro Water District staff, TCC and BAC's. For the Water Supply and Water Conservation Management Plan these included:

- Revisit and update key assumptions, forecasts, analytical tools and techniques and integrate with updated policies and regulatory changes.

- Reassess water demand forecasts, taking into account watering restrictions, abnormal weather patterns, and most recent regional population projections.
- Enhance focus on efficiency. Revisit and revise water conservation program as part of the forecasts and then identify sources and facilities to meet needs.
- Provide more flexibility in plan implementation dates and capacities in Appendix B to eliminate the need for minor plan amendments.
- Enhanced focus on water reuse to sustain water supply.

INTEGRATION WITH STATE WATER PLAN

In 2004, the Georgia General Assembly passed the Comprehensive State-wide Water Management Planning Act to establish a set of policies to govern water management decisions. Following two years of development and public comment, the Comprehensive State-wide Water Management Plan (State Water Plan) was adopted by the Georgia General Assembly on January 18, 2008. The overall goal of the plan is to manage "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".

Key themes repeated throughout the State Water Plan include: management of consumptive use to ensure present and future opportunities for use of the resource, importance of water conservation, and identification of future water supplies including reservoirs. Several meetings were held with Georgia EPD throughout the planning process to provide consistency with the State Water Plan. Future action items that may affect the Water Supply and Water Conservation Management Plan include creation of rules related to the Water Conservation Implementation Plan (WCIP).

Georgia EPD will establish guidelines and criteria for local plans to be implemented by the Metro Water District and the other planning districts statewide. As the state water planning process progresses, the Metro Water District will evaluate and update its water resources plans and programs as needed to stay in compliance with the State Water Plan guidelines and criteria.

KEY CHANGES TO THE PLAN

In this plan update, there are a number of changes from the 2003 Water Supply and Water Conservation Management Plan, as amended, including a reorganization of the document. The most notable organizational change involved providing simple implementation summaries for each measure that have more background and implementation guidance than were included in the 2003 document.

Additionally, key elements of updating the 2003 Water Supply and Water Conservation Management Plan include the following:

- Review and update water conservation measures
- Update water demand forecasts
- Update existing and potential water sources
- Extend the planning horizon to 2035
- Ensure compatibility with the State-wide Water Management Plan

As a result of the review of water conservation measures, three of the measures from the 2003 Water Supply and Water Conservation Management Plan, as amended, have been enhanced and two new measures have been added to the Water Conservation Program and are described in Section 5.

PLAN OVERVIEW

ORGANIZATION OF THE WATER SUPPLY AND WATER CONSERVATION MANAGEMENT PLAN

The Water Supply and Water Conservation Management Plan is organized in the following sections:

Section 1: Introduction – Provides an overview of the Metro Water District, water supply and water conservation management planning process, a summary of the successes of the 2003 Plan, and organization of this Plan.

Section 2: Existing Water Supply and Treatment Conditions – Summarizes the current conditions in the Metro Water District, including existing water supplies and water treatment facilities.

Section 3: Water Demand Forecasts – Provides the methodology and results for water demand forecasts based on population and employment projections for the Metro Water District.

Section 4: Water Conservation Analysis – Summarizes the development and evaluation of water conservation options for the Metro Water District.

Section 5: Water Conservation Program – Outlines the water conservation program measures that all Metro Water District communities are required to implement.

Section 6: Water Supply Sources – Identifies surface water supply sources for the Metro Water District to meet future water demands and additional water sources that may be needed beyond 2035.

Section 7: Reuse – Provides an overview of reuse alternatives, opportunities and challenges in the Metro Water District.

Section 8: Planned Water Supply Facilities – Provides an overview of the recommended infrastructure improvements and water system interconnections in the Metro Water District.

Section 9: Local Water Planning – Describes the roles and requirements for local water master plans.

Section 10: Issues – Summarizes the water supply issues and limitations considered in development of the Water Supply and Water Conservation Management Plan.

Section 11: State and Regional Policy Recommendations – Summarizes recommendations for various state and regional agencies to help advance watershed protection in the Metro Water District.

Section 12: Education and Public Awareness – Outlines public education and outreach efforts at the regional and local levels.

Section 13: Implementation Plan – Includes the specific tasks, milestones, and responsibilities for implementation of the recommended Water Supply and Water Conservation Management Plan. In addition, funding mechanisms for local water providers are provided.

Section 14: Future Plan Evaluation – Summarizes metrics for future evaluation of the Water Supply and Water Conservation Management Plan.

Appendices

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Section 2: EXISTING WATER SUPPLY AND TREATMENT CONDITIONS

The Metropolitan North Georgia region developed in the headwaters of six river basins. The Metro Water District withdraws drinking water from the Chattahoochee, Coosa, Flint, Ocmulgee, Oconee and Tallapoosa river basins. The vast majority of the water supply for the Metro Water District, over 99 percent, is from these surface water sources.

Approximately 600 AAD-MGD (average annual day-million gallons per day) of potable water is currently withdrawn and provided to customers within the Metro Water District by publicly-owned water providers through a series of raw water supplies and treatment facilities. The current water withdrawals are based on 2006 local water provider data and reflect the ongoing drought conditions and emergency drought management measures in place in 2006. Currently, interbasin transfers are used in supplying water throughout the Metro Water District; there are water supply and wastewater transfers into and out of every basin in the Metro Water District. Inter-jurisdictional water connections serve as a valuable means of providing emergency and routine water supplies to many water systems in the Metro Water District.

EXISTING WATER SUPPLIES

Existing water supply sources in the Metro Water District were identified through existing permits issued by Georgia EPD, interviews with local water providers, and a literature review of available state, regional and local studies. Within the Metro Water District, including both surface and groundwater, almost 888 AAD-MGD of permitted water supply is available. The Metro Water District relies primarily on surface water from rivers and storage reservoirs as its main source for this water supply. The most significant water supply source for the region is the Chattahoochee River system, which includes Lake Lanier; the Chattahoochee basin accounts for approximately 73 percent of the permitted available water supply in the Metro Water District. Table 2-1 summarizes the surface water supply sources permitted within the Metro Water District.

TABLE 2-1
Existing Municipal Permitted Surface Water Supplies (2006)

Water Supply Source	Owner/Operator Utilizing Source	Permitted Monthly Average Withdrawal (MGD)	
		Supplemental Source	Source at Intake
Chattahoochee River Basin			
Chattahoochee River	Cobb County-Marietta Water Authority		87
	DeKalb County Water System		140
	City of Atlanta Watershed Management		180
	Atlanta - Fulton County Water Resources		90
Lake Lanier	City of Cumming		18
	Forsyth County Water Resources		14
	Gwinnett County Public Utilities		150
	City of Buford		2
	City of Gainesville Public Utilities		30
Bear Creek Reservoir (Note 1)	Douglasville-Douglas County Water and Sewer Authority	6	
Dog River Reservoir	Douglasville-Douglas County Water and Sewer Authority		23
Big Creek	City of Roswell		1.2
Sweetwater Creek (fills Ben Hill Reservoir)	City of East Point		11.5
Cedar Creek Reservoirs	City of Palmetto		0.45
Cedar Creek (B.T. Brown) Reservoir	Coweta County Water and Sewerage Authority		6.7
J.T. Haynes Reservoir	Newnan Utilities (filled by 3 sources)		14
Sandy Brown Creek	Newnan Utilities (fills J.T. Haynes Reservoir only)	8	
Permitted Monthly Average Withdrawal in Chattahoochee River Basin			767.85
Coosa River Basin			
Etowah River	City of Canton		5.45
	City of Cartersville (Note 8)		5
Hollis Q. Lathem (Yellow Creek) Reservoir/Etowah River	Cherokee County Water and Sewerage Authority		36
Allatoona Lake	City of Cartersville (Note 8)		18
	Cobb County-Marietta Water Authority		78
Lewis Spring	City of Adairsville		4.1
Bolivar Springs	Bartow County Water System		0.8
Moss Springs	City of Emerson		0.5
Hickory Log Creek Reservoir (Note 2)	City of Canton		-
	Cobb County-Marietta Water Authority		
Permitted Monthly Average Withdrawal in Coosa River Basin			147.85
Flint River Basin			
Flint River (Note 3)	Clayton County Water Authority (fills J.W. Smith and Shoal Creek Reservoirs)	40	
	Fayette County Water System (fills Lake Horton only)	16	
J.W. Smith and Shoal Creek Reservoirs (Note 4)	Clayton County Water Authority		17
White Oak Creek	Newnan Utilities (fills J.T. Haynes Reservoir only)	7	
Line Creek	Newnan Utilities (fills J.T. Haynes Reservoir only)	12	

Water Supply Source	Owner/Operator Utilizing Source	Permitted Monthly Average Withdrawal (MGD)	
		Supplemental Source	Source at Intake
Hutchins' Lake	City of Senoia		0.3
Whitewater Creek	City of Fayetteville		3
Lake Kedron (Note 4)	Fayette County Water System		4.5
Lake Peachtree (Flat Creek) (Note 4)			
Lake Horton	Fayette County Water System		14
Whitewater Creek	Fayette County Water System (fills Lake Horton only)	2	
Lake McIntosh	Fayette County Water System		12.5
Still Branch Creek Reservoir (Note 5)	City of Griffin (will provide water to Pike, Spalding and Coweta Counties)		1.68
Permitted Monthly Average Withdrawal in Flint River Basin			52.98
Ocmulgee River Basin			
W.J. Hooper Reservoir (Little Cotton Indian Creek)	Clayton County Water Authority		20
Blalock Reservoir/Pates Creek	Clayton County Water Authority		10
John Fargason (Walnut Creek) Reservoir	City of McDonough		2.4
S. Howell Gardner (Indian Creek) Reservoir	Henry County Water and Sewerage Authority		8
Rowland (Long Branch) Reservoir	Henry County Water and Sewerage Authority		10
Towaliga River Reservoirs (Strickland and Cole) (Note 1)	Henry County Water and Sewerage Authority	11	
Tussahaw Creek Reservoir	Henry County Water and Sewerage Authority		13
Big Haynes Creek (Randy Poynter Lake)	Rockdale County		22.1
Brown Branch	City of Locust Grove		0.3
Permitted Monthly Average Withdrawal in Ocmulgee River Basin			85.8
Oconee River Basin			
Cedar Creek Reservoir (Note 6)	City of Gainesville		2
North Oconee River (fills Cedar Creek Reservoir only)	City of Gainesville	20	
Permitted Monthly Average Withdrawal in Oconee River Basin			2
Tallapoosa River Basin			
Lake Fashion	City of Villa Rica		1.5
Cowan Lake			
Total Permitted Monthly Average Withdrawal in Tallapoosa River Basin			1.5
Total Permitted Withdrawal in Metro Water District (Note 7)	Monthly average basis		1057.98
	Annual average basis		881.65

Notes:
1. Staggered withdrawal permit to maintain in-stream flows; maintained for emergency use only.
2. Hickory Log Creek construction is complete; reservoir is off-stream storage filled with water pumped from the Etowah River. Water will not be withdrawn from the reservoir but instead from intake facilities downstream.
3. Clayton County Water Authority has a tiered withdrawal permit to maintain in-stream flows.
4. Combined permit limit.
5. Maximum monthly yield is 42 MGD for the entire reservoir. This reservoir is located outside of the District and is owned by the City of Griffin. Reservoir serves Pike and Spalding Counties as well Coweta County. Coweta County currently has a purchase contract for 1.68 MGD of finished water from the City of Griffin which escalates at 0.36 MGD/year for an ultimate 7.5 MGD.
6. Previously known as North Oconee Reservoir. Will be used as a future water supply source.
7. Annual average day equals monthly average day divided by 1.2.
8. The City of Cartersville has two intakes covered under one permit, with a permitted monthly average withdrawal of 23 MGD. Of that permitted amount, up to 18 MGD may be withdrawn from Allatoona Lake on a monthly average basis.

PLANNED RESERVOIRS

In addition to the existing reservoirs presented previously in Table 2-1, there are three reservoirs planned for the Metro Water District in the near future that require 404 permits. These planned reservoirs are far enough along in the permitting process, as State and Federal permits are being sought for these projects. Three additional reservoirs are in early planning stages but anticipated to be constructed by the end of the planning period. It is important to note that although these reservoirs are planned to meet future demands, they will need to secure all necessary state and federal permits prior to operation. Table 2-2 summarizes the planned reservoirs. Yield and size information included in Table 2-2 is based on best available data. Safe yield studies may be needed to confirm the permissible yield.

TABLE 2-2
Planned Reservoirs

Reservoir (Note 1)	Owner/Operator Utilizing Resource	Basin	Estimated Size and Yield
Glades Reservoir	Hall County	Chattahoochee	The 733-acre reservoir with an estimated yield of 6.4 MGD will release water to Lake Lanier. Currently in the permitting process.
Bear Creek Reservoir	Proposed South Fulton Water Authority (Note 2)	Chattahoochee	Impoundment on Bear Creek, a tributary of the Chattahoochee River. The permitting process has been initiated with an estimated yield of 15 MGD.
Richland Creek Reservoir	Paulding County	Coosa	A 305-acre reservoir with an estimated yield of 35 MGD is in the permitting process on Richland Creek.
Etowah Reservoir	Fulton County	Coosa	A reservoir is being considered by Fulton County with a proposed 30 MGD yield.
Ocmulgee Reservoir	Henry County Water and Sewer Authority	Ocmulgee	A new reservoir is being considered in the Ocmulgee basin with a proposed 13 MGD yield.
Cedar Creek Reservoir	Gainesville-Hall County	Oconee	The Cedar Creek reservoir is expected to have a yield of 9 MGD and be supplemented with water from the North Oconee River.

Notes:
1. Reservoirs that do not require 404 permits, off-line reservoirs, and reservoirs whose primary purpose is to facilitate water treatment plant operations are not included herein.
2. The service provider for the Bear Creek Reservoir should be resolved through negotiation process or other means before a permit is issued to resolve conflicts with existing service areas.

PLANNED STORAGE

In addition to the reservoirs listed above in Table 2-2, there are two projects planned in the Metro Water District that will provide additional storage, but do not provide additional yield. These storage facilities will help drought-proof and extend existing sources and are listed in Table 2-3.

TABLE 2-3
Planned Storage

Storage	Owner/Operator	Basin	Estimated Size
Coweta County Sandy Creek Reservoir	Coweta County	Chattahoochee	2.7 Billion Gallons
Bellwood Quarry Reservoir	City of Atlanta	Chattahoochee	2.5 Billion Gallons

GROUNDWATER SOURCES

Groundwater sources make up less than one percent of the total available water supply in the Metro Water District due to bedrock geology. Groundwater supplies several small towns and is used as a supplemental source. The development of new groundwater sources will generally be of the type found in Clayton County, where wells supplement the existing surface water supplies rather than being the primary source. Table 2-4 summarizes the groundwater sources utilized for water supply within the Metro Water District.

TABLE 2-4
Existing Permitted Groundwater Supplies

Owner/Operator Utilizing Resource	County	Monthly Average Permitted Withdrawals in MGD (2006)
City of White	Bartow	0.2
City of Ball Ground	Cherokee	0.2
Clayton County Water Authority	Clayton	0.73
City of Senoia	Coweta	-
Coweta County Water & Sewer Department	Coweta	0.5
City of Villa Rica	Douglas	0.125
City of Fayetteville	Fayette	0.94
Fayette County Water System	Fayette	0.83
City of Lawrenceville	Gwinnett	2
City of Flowery Branch	Hall	0.37
City of Hampton	Henry	0.14
City of Locust Grove	Henry	1
City of McDonough	Henry	0.15
City of Stockbridge	Henry	0.52
Total Groundwater Supply (monthly average basis)		**7.7**
Total Groundwater Supply (AAD-MGD) (Note 1)		**6.4**

Notes:
1. Annual average day equals monthly average day divided by 1.2.

INTERBASIN TRANSFERS

The water and wastewater systems of the Metro Water District operate as an interdependent service network. Generally speaking, water is moved from areas where it is available to areas where it is needed; likewise, wastewater is moved from water use points to available wastewater treatment facilities. Transfers of water and wastewater occur among municipalities, counties, and basins. Transfers among basins are particularly common within counties that straddle the ridges between two or more basins. This situation applies to 11 of the Metro Water District's 15 counties.

Currently, interbasin transfers are a key element in supplying water throughout the Metro Water District; there are water supply and wastewater transfers into and out of every basin in the Metro Water District. The majority of water interbasin transfers are from the Chattahoochee River Basin. Residents in the Ocmulgee River Basin currently rely heavily on the Chattahoochee River Basin for water supply. For example, raw water is withdrawn from the Chattahoochee River Basin and is treated by DeKalb and Gwinnett Counties for distribution to areas both inside and outside of the Chattahoochee Basin. Smaller quantities are also exported from the Chattahoochee River Basin to the Flint, Coosa, and Oconee River Basins. Water is also transferred from Allatoona Lake (Coosa River Basin) to the Chattahoochee River Basin. Table 2-5 summarizes the existing water and wastewater interbasin transfers in the Metro Water District.

TABLE 2-5
Summary of Existing Interbasin Transfers

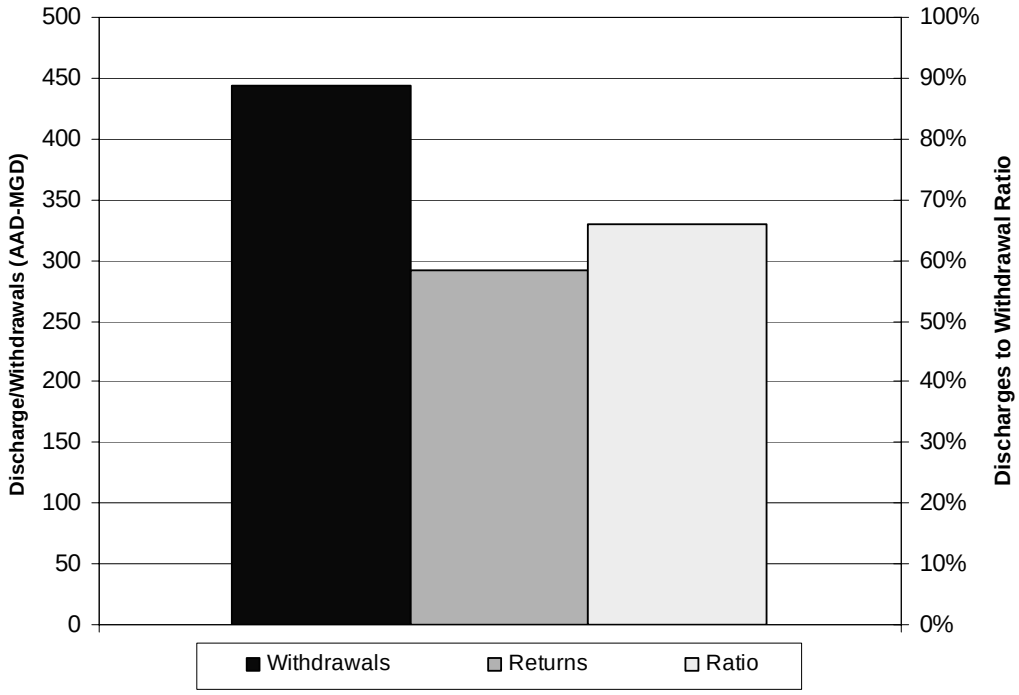
Water Supply		
Water Supply Basin	**Receiving Basin**	**Transfer (AAD-MGD)**
Chattahoochee	Flint	9
Chattahoochee	Ocmulgee	127
Chattahoochee	Oconee	11
Coosa	Chattahoochee	13
Ocmulgee	Flint	5
Wastewater Returns		
Basin Generated	**Basin Discharge**	**Transfer (AAD-MGD)**
Coosa	Chattahoochee	1
Flint	Chattahoochee	11
Flint	Ocmulgee	10
Ocmulgee	Chattahoochee	27
Oconee	Chattahoochee	3
Net Interbasin Transfer		
Source Basin	**Receiving Basin**	**Net Transfer (AAD-MGD)**
Chattahoochee	Ocmulgee	100
Chattahoochee	Oconee	7
Coosa	Chattahoochee	14
Flint	Chattahoochee	2
Flint	Ocmulgee	5

Note: Transfers estimated based on 2006 actual withdrawals and discharges.

EXISTING CHATTAHOOCHEE BASIN RETURN FLOWS

As the Chattahoochee River and Lake Lanier account for approximately 73 percent of the permitted available water supply in the Metro Water District, returning flow to this basin is an important element of this Water Supply and Water Conservation Management Plan. Currently, approximately 66% of the water withdrawn from the Chattahoochee basin is returned to the basin.

FIGURE 2-1
Chattahoochee Basin Withdrawals and Discharges for 2006



EXISTING WATER TREATMENT FACILITIES

Water supply and treatment is provided for the Metro Water District by various public local water providers. The structure of these local water providers differs across the Metro Water District; however, the majority are city or county-operated water and/or wastewater providers. A few third-party providers exist that provide water for a conglomerate of entities. An example of this is the Cobb County-Marietta Water Authority, which was created by the Georgia legislature to serve as a regional wholesaler of water. This Authority treats and distributes potable water for wholesale purchase by municipalities within Cobb County, as well as in neighboring cities and counties.

The Metro Water District currently has 38 existing publicly-owned surface water treatment plants, ranging in permitted capacity of less than 1 MGD to 150 PD-MGD (peak day - million gallons per day), providing a combined permitted treatment capacity of 1,135 PD-MGD. The permitted treatment capacity of 1,135 PD-MGD or 710 AAD-MGD treats water from the 882 AAD-MGD of permitted surface supply.

The Metro Water District's 38 surface water treatment plants range in age and condition. Additionally, the source water quality for these treatment plants varies widely. The vast majority of the water treatment plants utilize conventional treatment with chemical coagulation, flocculation, sedimentation, filtration, and disinfection. Some water treatment plants in the Metro Water District currently utilize or are investigating advanced treatment technologies such as ozonation, ultraviolet (UV) disinfection, and membrane filtration. Regulatory treatment standards continue to become more stringent, requiring treatment plants to continually assess and optimize treatment for continued compliance.

Groundwater accounts for less than 1 percent of the water supply within the Metro Water District, and typically only requires disinfection prior to distribution to customers. The City of Lawrenceville owns and operates the only groundwater treatment plant in the Metro Water District that applies additional treatment for removal of radon, iron and manganese to a groundwater-only source.

Table 2-6 summarizes the existing surface water treatment plants in the Metro Water District, including capacities.

TABLE 2-6
Existing Surface Water Treatment Plants

County	WTP	Entity	Source Stream/ Reservoir	2006 WTP Permitted Capacity (PD-MGD) (Note 1)
Bartow	Lewis Spring WTP	City of Adairsville	Lewis Spring (Note 2)	4
	Clarence B. Walker WTP	City of Cartersville	Allatoona Lake	27
	Emerson WTP	City of Emerson	Moss Spring (Note 2)	0.5
	Bartow County WTP	Bartow County	Bolivar Springs	0.8
Cherokee	Canton WTP	City of Canton	Etowah River	5.45
	Etowah River WTP	Cherokee County Water and Sewerage Authority	Yellow Creek Reservoir and Etowah River	38
Clayton	Terry R. Hicks WTP	Clayton County Water Authority	Blalock Reservoir	10
	W.J. Hooper WTP		W.J. Hooper Reservoir	20
	J.W. Smith WTP		J.W. Smith Reservoir	12
Cobb	James E. Quarles WTP	Cobb County-Marietta Water Authority	Chattahoochee River	86
	Hugh A. Wyckoff WTP		Allatoona Lake	72
Coweta	B.T. Brown WTP	Coweta County	Cedar Creek (B.T. Brown) Reservoir	7.7
	Hershall Norred WTP	City of Newnan	J.T. Haynes Reservoir	14
	Senoia WTP	City of Senoia	Hutchins' Lake	0.45
DeKalb	Scott Candler WTP	DeKalb County	Chattahoochee River	128

County	WTP	Entity	Source Stream/ Reservoir	2006 WTP Permitted Capacity (PD-MGD) (Note 1)
Douglas	Bear Creek WTP	Douglasville-Douglas County Water and Sewer Authority	Bear Creek Reservoir	16.36
			Dog River Reservoir	
	Franklin Smith WTP	City of Villa Rica	Lake Fashion, Cowan Lake	1.5
Fayette	Crosstown WTP	Fayette County	Lake Horton, Lake Kedron, Lake Peachtree, groundwater	13.5
	South Fayette WTP			6.2
	Fayetteville WTP	City of Fayetteville	Whitewater Creek	3
Forsyth	Cumming WTP	City of Cumming	Lake Lanier	24
	Forsyth County WTP	Forsyth County	Lake Lanier	13.9
Fulton	Atlanta-Fulton County WTP	Atlanta-Fulton County Water Resources Comm.	Chattahoochee River	90
	Hemphill WTP	City of Atlanta	Chattahoochee River	136.5
	Chattahoochee WTP			64.9
	Roswell Cecil Wood WTP	City of Roswell	Big Creek	1.2
	East Point WTP	City of East Point	Sweetwater Creek	13.9
	Palmetto WTP	City of Palmetto	Cedar Creek	0.6
Gwinnett	Lake Lanier WTP	Gwinnett County Public Utilities	Lake Lanier	150
	Shoal Creek WTP			75
	Buford WTP	City of Buford	Lake Lanier	2
Hall	Lakeside WTP	City of Gainesville	Lake Lanier	10
	Riverside WTP			25
Henry	Towaliga River WTP	Henry County Water and Sewerage Authority	S. Howell Gardner (Indian Creek) and Rowland Reservoirs	24
	Tussahaw WTP		Tussahaw Creek Reservoir	13
	McDonough WTP	City of McDonough	John Fargason (Walnut Creek) Reservoir	2.28
	Locust Grove WTP	City of Locust Grove	Brown Branch	0.45
Rockdale	Big Haynes Creek WTP	Rockdale County	Big Haynes Creek (Randy Poynter Lake)	22.1
Total Metro Water District Treatment Capacity (PD-MGD)				**1135.29**
Total Metro Water District Treatment Capacity (AAD-MGD)				**709.56**

Notes:
1. WTP capacity is on a permitted peak day basis.
2. Lewis and Moss Springs are groundwater under the influence of surface water and therefore classified as a surface water WTP.
3. Annual average day equals monthly average day divided by 1.6.

EXISTING INTERCONNECTIONS

All of the counties within the Metro Water District maintain interconnections with at least one other county for either routine or emergency water sale. Some of these interconnections originally served as a primary water supply source before the water system in the receiving county was adequately developed. These connections are now kept for emergency uses.

Interconnections with other water systems provide a valuable means of increasing water system reliability. If water systems are interconnected, finished water supply can readily be available in the event of a major water system failure. These connections can function on an emergency-only basis, as a peaking supply, or they can provide major or sole sources of water supply for some water systems.

NON-MUNICIPAL PERMITTED WITHDRAWALS

This regional plan focuses on municipal water supply, however, given the limitations of water supply it is important recognize other water users in the region. Non-municipal permitted withdrawals sum to 1,859.34 PD-MGD and 1,399.47 MGD on a monthly average basis. Table 2-7 provides a list of non-municipal permitted withdrawals by basin. Non-municipal permitted water withdrawals are approximately double the municipal permitted water supply. The largest non-municipal permitted withdrawals are associated with power generation in the Chattahoochee basin. Non-municipal water permittees will have water conservation programs under the Comprehensive State-wide Water Management Plan and be responsible for submitting progress reports over the next planning period.

TABLE 2-7
Non-municipal Permitted Withdrawals

Basin	Peak Day Permitted Withdrawal (MGD)		Monthly Average Permitted Withdrawal (MGD)	
	Power Generation	Other *	Power Generation	Other*
Chattahoochee	1,114	9.58	1,094	6.65
Coosa	520	21.4	85	19.5
Flint	-	-	-	-
Ocmulgee	194	-	194	-
Oconee	-	0.36	-	0.32
Tallapoosa	-	-	-	-
Total	1,828	31.34	1,373	26.47

* Other uses include industrial demand and golf course irrigation.

Section 3: WATER DEMAND FORECASTS

INTRODUCTION

This Section documents the methodology used to develop water demand forecasts. The "Demand Side Management Least Cost Planning Decision Support System" (DSS) computer model developed by Maddaus Water Management was updated and used to forecast water demands and assess water conservation measures. The model uses current water production and billing data provided by most local water providers, along with population and employment forecasts, to estimate water demands through 2035.

Using two distinct approaches, "top-down" and "bottom-up", the model calculates indoor and outdoor anticipated demands for each of the customer categories: single-family residential, multi-family residential, commercial, industrial, institutional and other categories as established by the local water provider. The "top-down" approach breaks overall water usage by total consumed/billed, by customer category, and by indoor and outdoor usage. The "bottom-up" approach examines the frequency of use for a particular end use (such as toilets, showers, faucets, etc.) and aggregates them to total water usage for each customer category. To calibrate the model, the two approaches are adjusted and reconciled as needed. Each county's specific conditions were calibrated using this approach, and then the model was used to forecast future water demands and to assess the water conservation measures.

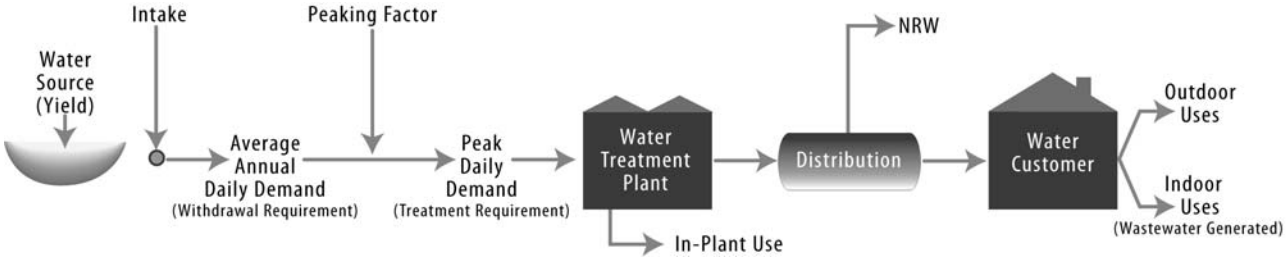
DATA COLLECTED

Water demand forecasts for the Metro Water District were based on three main data inputs: 1) billing and production data, 2) population and employment forecasts, and 3) estimates of the current stock of plumbing fixtures and appliances for each county. The first input enables the model to build a water use profile by customer category for existing conditions. The second input is used to project current unit-based demands forward through the planning horizon. The third input is used to quantify the expected reduction in current water use trends based on natural conversion of inefficient plumbing fixtures resulting from the existing State plumbing code. Other demographic data used in the model was obtained from the 2000 and 2006 US Census.

WATER BILLING AND PRODUCTION DATA

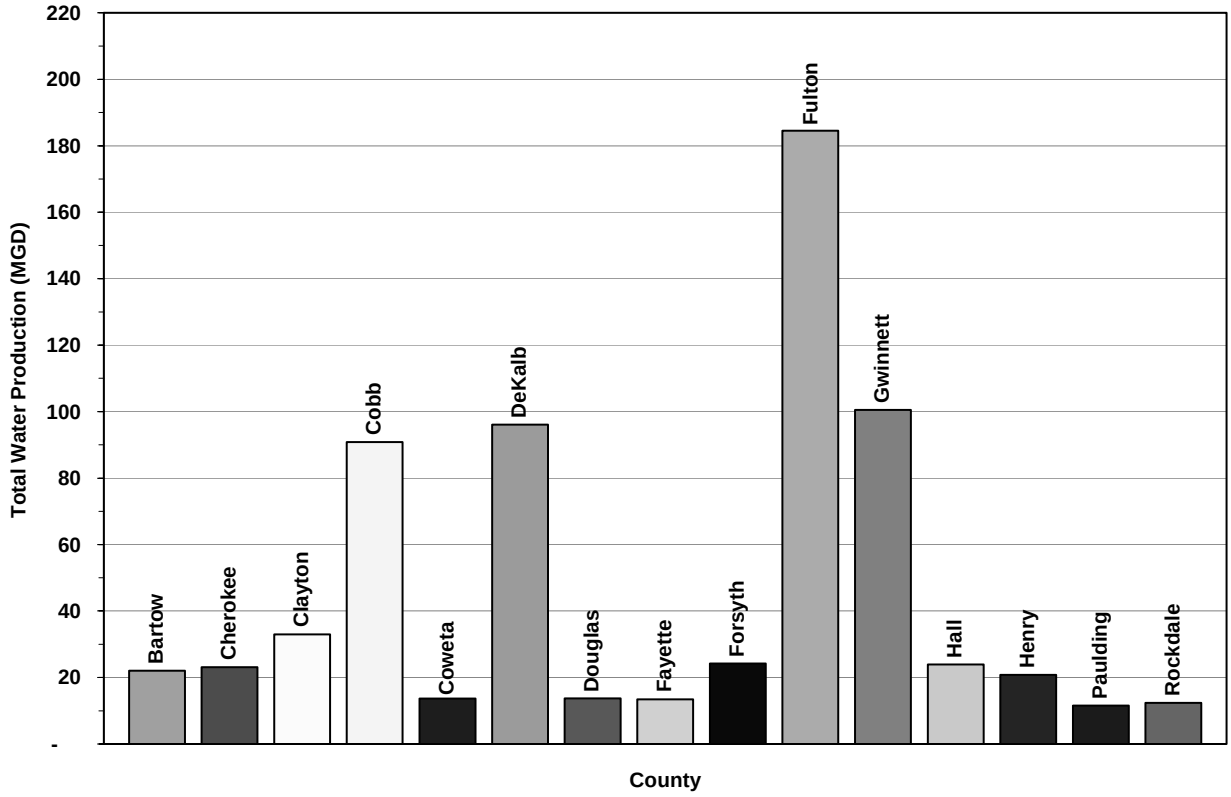
Water usage data was solicited from the local water providers in the Metro Water District. This data included water withdrawal and production data, as well as customer billing data (water use data) by category. Figure 3-1 shows the process by which water is conveyed from the source to the end use, and how the provided billing data was separated into its various components for further analysis.

FIGURE 3-1
Water System Diagram



The current water use data for each county in the Metro Water District is shown in Figure 3-2 in million gallons per day on an annual average day demand (AAD-MGD). For the purposes of forecasting future water demands, the 2006 actual water use data was adjusted as discussed later in this Section to reflect the ongoing drought conditions and suppressed usage due to emergency drought measures in 2006. If water use data was not available, water production data was adjusted to reflect expected water use.

FIGURE 3-2
2006 Adjusted Municipal Water Use by County (AAD-MGD)

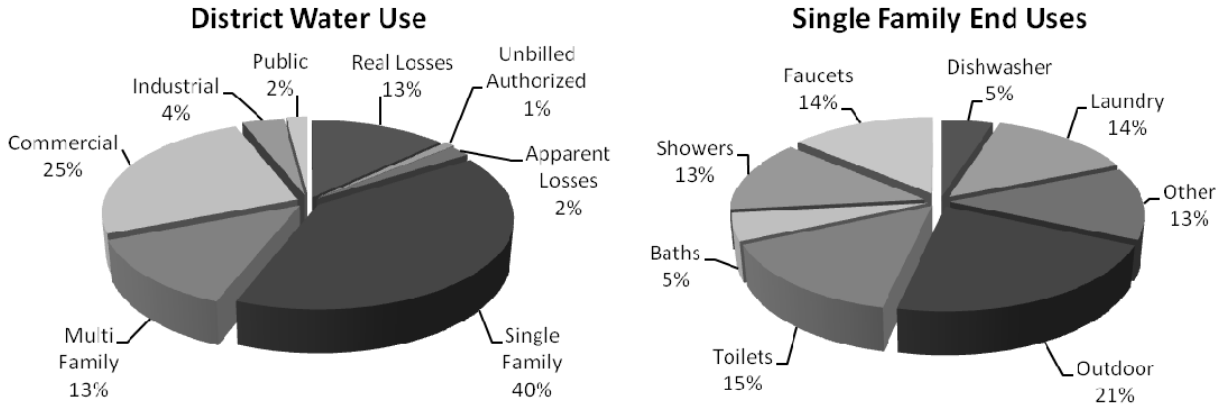


Non-revenue water (NRW) and water loss are indicators of the efficiency of the region's water distribution systems. NRW is identified by the International Water Association/American Water Works Association (IWA/AWWA) as the total water in the system (including water produced and imported) minus the total billed consumption, or as water that does not provide revenue to the local water provider. Water loss can be subdivided into a number of categories; unbilled authorized, apparent losses, and real losses. Unbilled authorized uses include fire fighting, hydrant flushing, street cleaning and public fountains. Apparent losses include meter inaccuracies, data errors and unauthorized consumption (theft or illegal connections). Real losses include physical losses from any type of leakage, break, or overflow. NRW and water loss were estimated based on the national information and limited local information, as available. The IWA/AWWA methodology that defines NRW and water loss is a new national standard and as it becomes more widely understood and used by water systems more complete data should be available.

The local water provider production data was broken out by customer category (such as single family residential, commercial, industrial, etc.) and was used along with NRW and water loss data to create the Metro Water District water use profile. The calibration of the top down and bottom up analyses in the model generated the typical single family residential end uses.

Figure 3-3 shows the water use profile for the Metro Water District. Residential water use, including single and multi-family use, accounts for 53 percent of the Metro Water District's total water use.

FIGURE 3-3
Metro Water District Water Use Profile (AAD-MGD)



POPULATION FORECASTS

Population and employment data for each of the 15 counties were obtained from each county's local Regional Development Center (RDC). Where data was not available from the local RDC, data from the Atlanta Regional Commission was used, with the exception of Hall County where the Gainesville-Hall Metropolitan Planning Organization (MPO) data was used. Table 3-1 shows the population forecasts by county.

TABLE 3-1
Population and Employment Forecasts by County

County	Population Forecasts (# of people)		
	2015	2025	2035
Bartow[1]	139,600	210,800	304,900
Cherokee	229,900	303,000	410,700
Clayton	288,600	294,000	307,300
Cobb	694,200	737,400	796,900
Coweta[2]	124,900	162,500	253,400
DeKalb	747,100	789,800	856,400
Douglas	138,000	182,000	257,000
Fayette	114,700	142,200	181,200
Forsyth[1]	256,700	342,100	412,800
Fulton	943,900	1,065,500	1,233,800
Gwinnett	843,900	945,900	1,044,300
Hall[3]	245,300	325,200	405,200
Henry	222,600	309,700	424,100
Paulding[1]	215,700	353,000	445,600
Rockdale	88,600	117,100	159,200
District Total	**5,293,700**	**6,280,200**	**7,492,800**
County	**Employment Forecasts (# of employees)**		
	2015	2025	2035
Bartow[1]	44,900	56,300	67,900
Cherokee	66,700	99,800	141,500
Clayton	138,900	155,700	181,600
Cobb	361,600	415,200	480,700
Coweta[2]	43,300	59,600	82,900
DeKalb	343,600	397,100	459,200
Douglas	53,600	72,900	92,400
Fayette	56,800	76,900	99,100
Forsyth[1]	89,800	120,700	146,600
Fulton	845,600	978,300	1,103,600
Gwinnett	396,100	477,200	546,100
Hall[3]	134,300	230,700	327,200
Henry	70,100	103,800	140,900
Paulding[1]	27,000	33,900	40,800
Rockdale	42,200	52,900	65,200
District Total	**2,714,500**	**3,331,000**	**3,975,700**

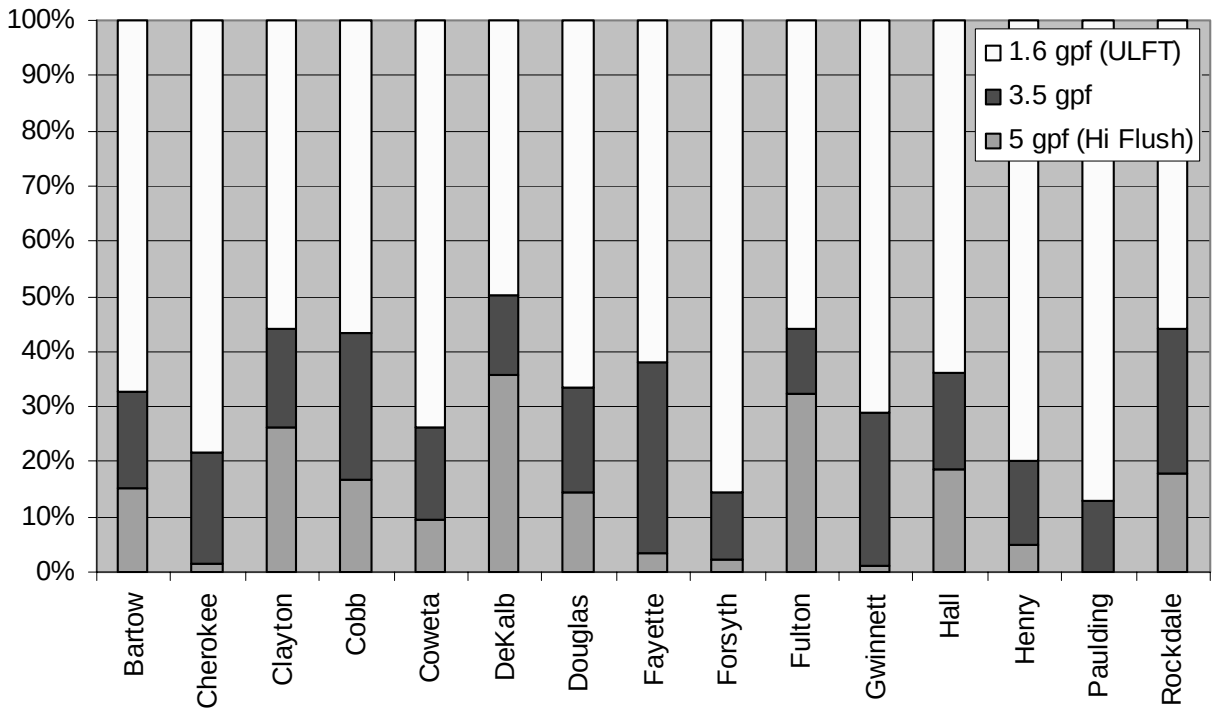
Source: ARC Population and Employment Forecasts were used for all counties within the ARC Region; sources for counties outside the ARC Region are as follows:
1. RDC Population and Employment Forecasts (Bartow, Forsyth and Paulding)
2. ARC Population and Employment Forecasts (Coweta)
3. Gainesville-Hall County 2030 MPO Population and Employment Forecasts (Hall)

PLUMBING FIXTURE STOCK

Plumbing fixture stock was inferred from housing data provided by the Metro Water District and the 2000 US Census. The Metro Water District provided estimates of housing age from the 2000 Census and the 2006 American Community Survey that were adjusted based on a projected replacement rate to more efficient fixtures.

The types of plumbing fixtures installed in houses and other buildings play a large role in current internal use as well as forecasted use in the future. Counties with recent development, such as Forsyth and Paulding have very low estimates of inefficient toilets. Alternatively, counties which developed more heavily in past decades, such as Fulton and DeKalb, have a higher percentage of inefficient toilets. Toilets are the largest water users inside the home; therefore, counties with large percentages of high flush toilets have a higher water savings potential in the future from the natural replacement of fixtures due to plumbing code. Estimates for existing types of toilet fixtures by county are provided in Figure 3-4.

FIGURE 3-4
Toilet Fixture Estimates by County, Year 2006



ASSUMPTIONS

Certain assumptions and adjustments were made to the billing data collected from local water providers in order to account for non-typical weather patterns and for certain data that was not available. General assumptions in the model include the following:

- The base year for the water use forecasts is 2006. However, drought management restrictions in effect during 2006 depressed the normal water use rates. In order to create a representative base year for water demands forecasts, 2006 demands were adjusted to take into account drought management restrictions. The adjustment was based on the last 10 years of weather data looking at water use during both wet and dry years of record, long-term permanent changes in water use behavior as the result of drought, and the benefits of natural conservation and the Metro Water District's aggressive water conservation program in reducing historical demand. The difference in per capita demand between the 2006 actual and the 2006 adjusted demand essentially reflects demand suppression resulting from emergency drought response actions, including outdoor watering restrictions, which are not reflective of normal water use patterns.
- Once the per-account unit-based demands for each customer category were established, the number of accounts was used to estimate the total demand for each county. In cases where complete billing data was available, the numbers of accounts were taken directly from the data.
- In cases where part or all of the billing data was not available, accounts were either increased from the 2003 Plan model relative to either the increase in population and employment, or the increase in housing units over the 5-year period.
- When both production and billing data were available, non-revenue water was estimated as a percentage of production. When this value was not available, non-revenue water was based on percentages in the 2003 Plan.

Table 3-2 shows the resulting adjusted base year per capita and per employee uses for residential single- and multi-family, as well as other non-residential uses, including indoor and outdoor use.

ADJUSTED BASE YEAR PROFILE

As 2006 water use was unnaturally depressed as a result of the ongoing drought, the water use data was adjusted to create an adjusted base year profile that would reflect normal water use conditions. For long-term regional planning, normal water conditions provide a more reasonable estimate of future needs than the drought-impacted actual water usage. The 2006 data shown in Figure 3-2 was adjusted to develop the 2006 adjusted base year profile, which represents water use under normal conditions. Following the adjustment, the total system per capita use adjusted is approximately 10% lower than the 2003 Plan despite regional growth as residual demand suppression from drought restrictions will remain. Table 3-2 shows the adjusted base year per capita and per employee uses for residential single and multi family, as well as all other non-residential uses, including indoor and outdoor use.

TABLE 3-2
Adjusted Base Year Water Use Profile by County

County	Total System Use (Note 1)	Overall (gpcd) (Note 2)				Single Family Residential (gpcd) (Note 3)				Multi Family Residential (gpcd) (Note 3)				Non-Residential (gpd/employee) (Note 3)			
		Total Consumption	Indoor	Outdoor (Note 5)	% Outdoor	Total	Indoor	Outdoor (Note 5)	% Outdoor	Total	Indoor	Outdoor (Note 5)	% Outdoor	Total	Indoor	Outdoor (Note 5)	% Outdoor
Bartow	241	186	152	34	18%	88	68	20	23%	75	66	9	12%	266	225	41	15%
Cherokee	126	106	84	22	21%	79	61	18	23%	69	59	10	15%	117	94	22	19%
Clayton	124	108	91	17	16%	81	68	14	17%	78	66	12	15%	61	52	9	15%
Cobb	140	127	100	27	22%	82	63	19	23%	67	60	7	10%	98	73	25	25%
Coweta	127	101	84	17	17%	83	66	17	20%	67	60	7	10%	78	70	8	10%
DeKalb	143	120	98	22	18%	85	68	17	20%	69	61	8	12%	89	76	13	15%
Douglas	115	88	73	15	18%	78	65	13	17%	60	57	3	5%	62	47	16	25%
Fayette	130	116	92	23	20%	87	69	18	21%	63	57	6	10%	85	70	15	18%
Forsyth (Note 4)	160	130	88	42	32%	99	70	30	30%	N/A	N/A	N/A	N/A	83	50	32	39%
Fulton	202	168	135	33	19%	106	79	28	26%	83	73	10	12%	94	77	17	18%
Gwinnett	142	116	90	27	23%	91	71	20	22%	67	60	7	10%	58	38	20	34%
Hall	138	123	97	26	21%	79	63	16	20%	61	55	6	10%	132	102	30	23%
Henry	121	102	77	24	24%	78	63	16	20%	69	59	10	15%	103	65	39	37%
Paulding	95	85	71	14	17%	80	66	14	17%	72	64	7	10%	44	37	7	15%
Rockdale	154	105	84	21	20%	83	68	15	18%	71	64	7	10%	53	39	15	27%
Weighted Average (Note 6)	**151**	**127**	**101**	**26**	**20%**	**89**	**69**	**20**	**22%**	**69**	**61**	**8**	**11%**	**89**	**70**	**19**	**22%**

Notes:
1. Total adjusted per capita use (total adjusted demand including non-revenue water divided by total population) includes self-supplied water demands, shown in gpcd
2. Includes self-supplied, does not include non-revenue water
3. Publicly supplied water and population only
4. Billing data includes multi-family in single family category
5. Outdoor use is defined as all use above the winter minimum level
6. Weighted average based on population

gpcd = gallons per capita (person) per day
gpd = gallons per day

METHODOLOGY

TOP-DOWN ANALYSIS

The total adjusted demand for each county was estimated based on the per-account unit-based demands for each customer category and the number of customer accounts. In cases where complete billing data was available, the numbers of accounts were taken directly from the data. In cases where part or all of the billing data was not available, accounts were either increased from the 2003 Plan model relative to either the increase in population and employment, or the increase in housing units over the 5-year period. Since there is not a standard billing category system in place in the Metro Water District, common categories were used across the Metro Water District for comparative purposes. The main categories were as follows:

- Single Family Residential
- Multi Family Residential
- Commercial
- Industrial
- Institutional

Other categories vary as defined based on the billing data submitted by the utilities. These include separate irrigation metering, wholesale customers, individual industries (i.e., food processing), etc. A "self-supplied" category was added to counties with a significant population on private wells. Based on these account categories and data supplied by water providers, the number of accounts per customer category was determined.

The top-down analysis also looked at housing stock information to estimate the percentage of water use by plumbing fixtures. The makeup of plumbing fixtures in the Metro Water District was based on housing age (derived from the 2000 census and 2006 American Community Survey) and adjusted with a modest natural replacement rate, shown in Table 3-4.

The natural replacement converts existing less efficient plumbing fixtures with more efficient fixtures as they are damaged or due to changes in style. The Georgia plumbing standards ensure that older fixtures are replaced with more efficient fixtures. Over time, the plumbing code will gradually reduce indoor per capita demands, as the percentage of efficient fixtures in homes and buildings increases. This demand, which includes water savings due to efficient fixtures, is referred to as the 'baseline' demand.

BOTTOM-UP ANALYSIS

The American Water Works Association Research Foundation (AWWARF) study, "Residential End Uses of Water" provided the initial bottom-up estimates for fixture use frequencies and quantities. Table 3-3 shows the average water end uses and frequency of use factors for a single-family account, based on the AWWARF study. These initial end use estimates were compared in each model to the existing stock of plumbing fixtures in each of the counties, based on the top-down analysis. For instance, counties with a larger percentage of older homes have a larger portion of indoor use attributed to toilet flushing than counties with a higher percentage of new

development. The top-down and bottom-up were adjusted until they matched to assure calibration of the model, with preference provided to the more accurate top-down generated numbers.

TABLE 3-3
Single Family Water End Uses (AWWARF)

End Use	Share	Gallons Per Person Per Day	Average Uses per Person Per Day
Toilets	26.7%	18.5	5.05 flushes
Clothes Washers	21.7%	15.0	0.37 loads
Shower	16.8%	11.6	0.75 showers and baths
Faucet	15.7%	10.9	8.1 minutes
Leaks	13.7%	9.5	
Other Domestic	2.2%	1.5	
Bath	1.7%	1.2	
Dishwasher	1.4%	1.0	0.1 loads
Indoor Total	100%	69.3	

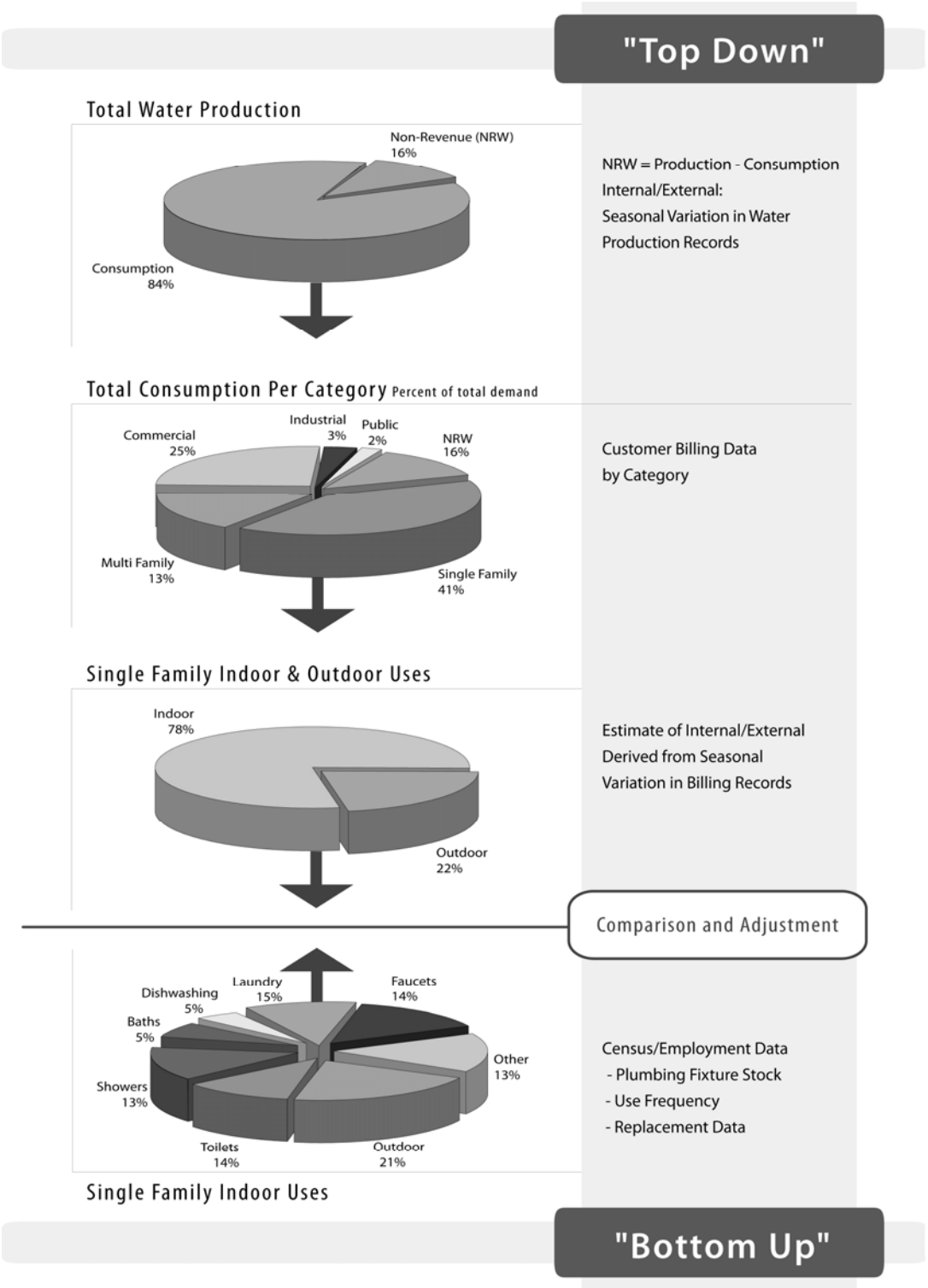
Source: "Residential End Uses of Water," Mayer, AWWARF, 1999.

TABLE 3-4
Natural Plumbing Fixture Conversion

End Use	Current Plumbing Code	Natural Replacement Rate
Toilets	1.6 gallons/flush	2% per year
Urinals	1.0 gallons/flush	2% per year
Showerheads	2.5 gallons/minute	4% per year
Washing Machine	19 gallons/load or less	6.7% per year Up to 2007, 30% will be efficient From 2007 to 2010, 50% will be efficient Beyond 2010, all replacements will be efficient

Specific water savings resulting from the plumbing code vary by county depending upon the demographics of each county and its current share of low, medium, and high flow fixtures in existing dwellings and businesses.

FIGURE 3-5
Water Use Model Methodology



BASELINE WATER DEMAND FORECASTS

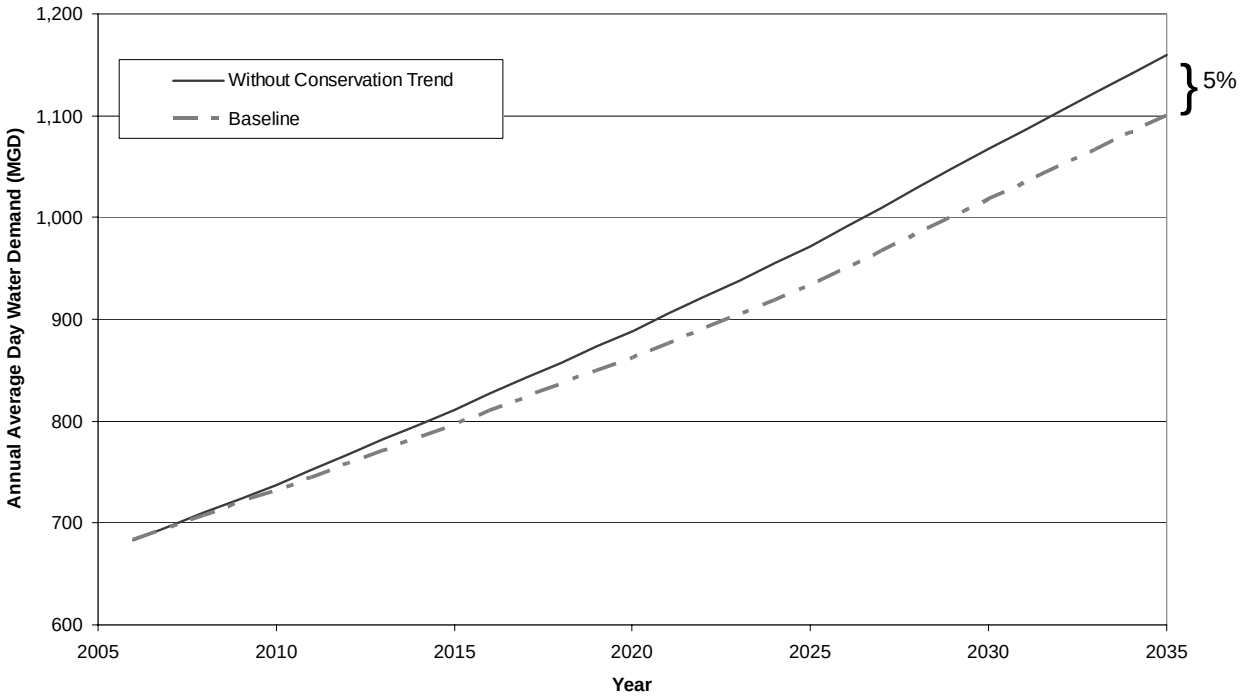
The without conservation trend forecasts water demands without water savings due to the existing plumbing code; while the baseline water demand forecast incorporates future reductions in indoor use as a result of the continued implementation of the existing plumbing code. The natural replacement of less efficient plumbing fixtures is expected to reduce future water demand by 5% in 2035. Figure 3-6 provides a comparison of the demands considered "baseline" and those demands based on trends without conservation.

The baseline savings in the 2003 Water Supply and Water Conservation Management Plan was estimated to be 9%. While a reduced savings is anticipated from progress since 2004 in implementing the conservation plan and plumbing code, the difference between 9% and 5% is worth noting.

The 2003 Water Supply and Water Conservation Management Plan used a base year of 2001 for the water supply and water conservation models. The models used the best available information at that time, and relied heavily on the typical residential water use, as published in the AWWA Research Foundation (AWWARF) Residential End Uses report that shows average residential water uses from 12 American cities in the mid 1990s.

For this Plan update, the Metro Water District relied more heavily on fixture stock (inferred from housing age) than the outdated residential end uses presented in the AWWARF Residential End Uses report due to the availability of more accurate local data on housing age and toilet replacement rates. The typical end uses in this report no longer reflect conditions in the Metro Water District; including the relatively new housing stock compared to other cities, the high level of bathroom remodels in the past decade, and the impact of the federal and state plumbing code requirements. For the Plan update, housing stock information provided by the Metro Water District was not adjusted to match the AWWARF study. The makeup of residential toilets in the Metro Water District was based on housing age (derived from the 2000 census and 2006 American Community Survey) and adjusted with a modest natural replacement rate of 1% to 1.5% per year. The current residential water usage profile for the Metro Water District, shown on page 3-3, does not match the AWWARF Report for 12 cities from the mid 1990s. The Plan update water use profile is more reflective of existing conditions in the Metro Water District.

FIGURE 3-6
Forecast of Baseline and Without Conservation Demands



FINAL WATER DEMAND FORECASTS WITH METRO WATER DISTRICT CONSERVATION PROGRAM

The baseline water demands were reduced though the application of the chosen Metro Water District Water Conservation Program. The analysis and selection of the recommended water conservation program is further described in Section 4. The recommended water conservation program, discussed in Section 4, is projected to reduce the baseline water demands by 8 percent from a baseline demand of 1,099 AAD-MGD to 1,011 AAD-MGD. Table 3-5 shows the baseline and projected water demands with the conservation program by county.

TABLE 3-5
2035 Water Demand Forecasts by County

County	2035 Forecasts		
	Without Conservation AAD-MGD	Baseline AAD-MGD	Recommended Conservation Program AAD-MGD
Bartow	55.4	52.8	46.4
Cherokee	50.5	47.8	44.6
Clayton	45.0	42.7	40.0
Cobb	121.0	115.3	108.7
Coweta	33.5	31.9	29.3
DeKalb	123.4	116.0	106.4
Douglas	29.7	27.5	24.5
Fayette	26.0	24.3	23.1
Forsyth	69.5	66.9	59.7
Fulton	263.2	250.0	228.2
Gwinnett	161.5	153.6	140.4
Hall	57.3	54.3	52.0
Henry	49.2	46.9	43.4
Paulding	52.0	49.2	47.2
Rockdale	22.0	20.2	16.9
District Total	**1,159.2**	**1,099.4**	**1,010.8**

Comparing the water demand forecasts by county to the 2003 Water Supply and Water Conservation Management Plan, the increase in demands correlate to the population and employment forecasts. These forecasts are also impacted by the current water use patterns for each county as well as the potential for water conservation associated with the housing stock and the blend of water users specific to each county.

BEYOND 2035

The 2050 demand forecasts are provided to initiate consideration of supplies needed outside of the planning horizon. With the cost and time needed to develop new water sources, communities may wish to consider demand beyond the 2035 planning horizon. Population information for 2050 was obtained, where available, from long range planning by the local Regional Development Centers (RDC), Counties, and the City of Atlanta. Where this information was not available, the 2035 population forecasts were linearly projected out to 2050. Water demands for 2050 were estimated by multiplying the 2050 population by each county's future gallons per capita daily estimates with conservation. The results of the forecasts are shown in Table 3-6. As population and employment forecasts for 2050 are not available in any degree of precision, the forecasts of demands followed the same straight line analysis. The population and employment forecasts for 2050 as part of the Comprehensive State-wide Water Management Plan will be used, when available, for the next Plan update.

TABLE 3-6
2050 Population and Demand Forecasts

County	2050 Population	2050 Demand (AAD-MGD)
Bartow (Note 1)	486,254	74
Cherokee	499,639	54
Clayton	388,064	44
Cobb	869,974	119
Coweta	287,444	33
DeKalb	923,885	120
Douglas (Note 2)	310,000	31
Fayette	208,278	27
Forsyth (Note 2)	538,606	78
Fulton (Note 3)	1,692,114	284
Gwinnett (Note 2)	1,158,000	156
Hall (Note 1)	442,800	57
Henry	531,098	54
Paulding (Note 1)	479,393	51
Rockdale	185,543	20
District Total	**9,001,092**	**1,202**

Notes:
1. Population projection provided by local RDC.
2. Population projection provided by county water system.
3. Population projection provided by county water system and City of Atlanta.

Section 4: WATER CONSERVATION ANALYSIS

This Section presents the water conservation measures evaluated and selected for the 2008 Water Supply and Water Conservation Management Plan. The updated water conservation program expands the existing Metro Water District program to further enhance water conservation into the future. The program resulted from an extensive analysis of the current program, evaluation of new methods and measures, and stakeholder involvement. The process yielded a program of water conservation measures that has the potential to reduce Metro Water District water demand up to 13 percent beyond trends without conservation by the end of the planning period.

Water conservation was considered first in the planning process, prior to looking at new or expanded sources. This Section discusses the process for evaluation and selection of the water conservation measures that build on progress from the 2003 Plan. In general, the water conservation program includes the measures that were most cost-beneficial across the Metro Water District. After identifying the water savings resulting from the water conservation program, additional sources and reservoirs were considered as discussed in Section 6 to meet outstanding demand.

EXISTING WATER CONSERVATION PROGRAM

Water conservation is an essential element of water resources management within the Metro Water District. With the adoption of the 2003 Water Supply and Water Conservation Management Plan, the Metro Water District and its member water providers immediately began implementing the recommended water conservation measures. Table 4-1 lists the water conservation measures in the existing program. Much progress has been achieved through this program. For example, the majority of local water providers have adopted tiered water rates; the Metro Water District has also begun a toilet rebate program; and many local water providers have begun aggressive leak detection and repair programs. More detail on progress of implementation items is provided on an annual basis by the Metro Water District in the Activities and Progress Reports. Through the plan update process, the goal is to build on this successful water conservation foundation.

TABLE 4-1
Existing Water Conservation Measures in Metro Water District in 2003 Plan, as amended

Number	Measure Description
1.	Establish conservation pricing by all local water providers.
2.	Replace older, inefficient plumbing fixtures.
3.	Require pre-rinse spray valve retrofit education program.
4.	Enact legislation to require rain sensor shut-off switches on new irrigation

Number	Measure Description
5.	Require sub-unit meters in new multi-family buildings.
6.	Assess and reduce water system leakage.
7.	Conduct residential water audits.
8.	Distribute low-flow retrofit kits to residential users.
9.	Conduct commercial water audits.
10.	Implement education and public awareness plan.

EVALUATION OF ADDITIONAL POTENTIAL WATER CONSERVATION MEASURES

An important step in updating the water conservation program was the review and screening of additional potential water conservation measures. The process included a review of the current water conservation measures required by the 2003 Plan, identification of additional water conservation measures that may be appropriate for the region, and the screening of these water conservation measures to a short-list for detailed evaluation (benefit-cost analysis). To accomplish this process, a list of 45 potential water conservation measures were identified and evaluated.

Each potential conservation measure was ranked against three qualitative criteria, listed below. Scores for each criterion were based on a scale of 1 to 5, with 5 being the most acceptable. Measures with low scores were eliminated from further consideration, while those with high scores were passed into the next evaluation phase (cost-effectiveness analysis). The three qualitative criteria are:

- Technology/Market Maturity: Is required technology available commercially and supported by the local service industry? For example, a water-saving device would score very low if it is not yet commercially available in this area.
- Service Area Match: Is the technology appropriate for the area's climate, building stock, or lifestyle? For example, promoting xeriscape gardens for multifamily or commercial sites may not be appropriate where water use analysis indicates relatively little outdoor irrigation.
- Customer Acceptance/Equity: Are customers willing to implement measures? If not, the water savings would be too low to be significant. Measures should also be equitable to ensure that one category of customers does not benefit while another pays the costs without receiving benefits. Customer acceptance may be based on convenience, economics, perceived fairness, or aesthetics.

The screening process resulted in a short-list of 16 new potential water conservation measures (beyond those currently adopted by the Metro Water District) for consideration. These water conservation measures were placed into two categories: those that were assessed quantitatively using a cost-benefit model and those that were assessed on a qualitative basis. The qualitative measures provide opportunities for water savings and good stewardship of water resources but are better suited to qualitative analyses as precise water savings attributable to these measures are not available. Estimates of implementation costs for both the quantitative and qualitative measures were taken into consideration.

COST-EFFECTIVENESS ANALYSIS

The Least Cost Decision Support System (DSS) model, as described in Section 3, was used to evaluate the quantitative water conservation measures (measures 1 through 16 in Table 4-2). Because of interactions between measures when assembled into a conservation program, each existing as well as potential new measure was modeled individually as well as in packages to assess the overall water savings.

An economic screening analysis was performed, as illustrated in Figure 4-1. First, the DSS model evaluated each of these 16 water conservation measures individually, simulating them as if they were implemented alone. The DSS model evaluated potential water savings based on conditions specific to each county. Information specific to each county and each water use sector was used to evaluate potential savings for each conservation measure. For instance, the DSS model calculated the savings for pre-rinse spray valve retrofits based on the number and age of restaurants specific to each county as well as the percent of total restaurant use for those devices. Similarly, the DSS model calculated the water savings for toilet retrofits by county based on the number and age of the single-family housing stock as well as the percentage of single-family use of water for toilet flushing. Based on existing information, and forecasted demands, potential savings for each measure were quantified. Next, the individual water conservation measures were ranked based on the cost of the water saved (cost / million gallons saved) and the best water conservation measures were selected. Combinations of the best individual water conservation measures were then placed in several different "Option Packages" or programs.

Three water conservation packages were identified for the Metro Water District, each with varying degrees of water savings and costs. The existing adopted water conservation measures provided the backbone for each of these packages. Package A was composed of the 10 existing water conservation measures to provide a benchmark for the analyses. Package B was composed of Package A plus four new water conservation measures. Package C is comprised of all 16 evaluated water conservation measures.

Finally, the option packages were evaluated to determine how much water savings could be obtained when these water conservation measures were combined (this accounts for overlapping measures and interaction). Feedback from the Technical Coordinating Committee and Basin Advisory Councils was used in conjunction with input from the Metro Water District to create the most appropriate overall option package.

FIGURE 4-1
Evaluation Process of Water Conservation Measures

The time value of money was explicitly considered. The value of all future costs and benefits was discounted to 2006 (the base year) at the real interest rate of 3.0%. The DSS model calculates this real interest rate, adjusting the current nominal interest rate (assumed to be approximately 6.1%) by the assumed rate of inflation (3%). Cash flows discounted in this manner are referred to as

"Present Value" sums herein, and are used in order to properly make comparisons of water conservation measures.

Benefit-cost analyses can be performed from several different perspectives, based on who is affected. For planning water conservation programs for local water providers, the perspectives most commonly used for benefit-cost analyses include the local water provider and the community. The local water provider or "utility" benefit-costs are based on the benefits and costs to the local water provider. The "community" benefit-costs includes the local water provider benefit and costs together with account owner/customer benefits and costs. These include customer energy benefits and costs of implementing the water conservation measure, beyond what the local water provider pays.

The local water provider perspective offers two advantages for this analysis. First, it considers only the program costs that will be directly borne by the local water provider. This enables the local water provider to fairly compare potential investments for conserving and supplying water. Second, because revenue shifts are treated as transfer payments, the analysis is not complicated with uncertainties associated with long-term rate projections and rate design assumptions. Because of the local water provider's paramount role in the Metro Water District's water conservation program, the local water provider or utility perspective was primarily used to evaluate elements of the water conservation measures.

COMPARISON OF MEASURES

Table 4-2 shows the evaluation of water conservation measures for the Metro Water District, which is a sum of the individual results for each county. This table presents the estimated water savings for each conservation measure, how much each would cost and the benefit-cost ratios for each of the measures considered on a stand-alone basis, i.e. without interaction or overlap from other measures that might affect the same end use(s). Note that water conservation measures with benefit-cost ratios less than 1.0 have a negative Net Utility Benefit. Water savings shown are averaged over the 29-year analysis period. Other key statistics include the cost of water saved in dollars per million gallons ($/MG), and the benefit-cost ratios. Benefits and costs are defined below:

- *Utility benefits and costs*: Those benefits and costs that the utility would receive or spend.
- *Community benefits and costs*: Community benefits equal utility benefits plus customer energy (cost to heat water) benefits. Community costs include utility and customer costs.
- *Water benefits*: Based on assigning a typical unit value for avoided treated and distributed surface water at a cost of $3,000/MG. The $3,000/MG is based on national surveys that indicate the typical cost for surface water treatment plant capital as well as operations and maintenance costs per million gallons treated.
- *Costs for the utility*: Includes measure set-up, annual administration, and payment of rebates or purchase of devices or services as specified in the measure design.
- *Customer costs*: Includes costs of implementing the measure and maintaining its effectiveness over the life of the measure.

TABLE 4-2
District-Wide Results of Conservation Measures Evaluation

	Conservation Measure	Present Value of Water Utility Benefits (million $) (Note 1)	Present Value of Total Community Benefits (million $) (Note 1)	Present Value of Water Utility Costs (million $) (Note 1)	Present Value of Total Community Costs (million $) (Note 1)	Water Utility Benefit-Cost Ratio	Total Community Benefit-Cost Ratio	Average Water Savings (MGD) (Note 2)	Cost of Savings per Unit Volume ($/MG)	Net Utility Benefit (million $)	2035 Water Savings (MGD) (Note 3)
1	Conservation Pricing	$231.5	$293.5	$13.6	$13.6	17.03	21.59	11.85	$104.74	$217.9	19.8
2	Replace Older Inefficient Plumbing Fixtures	$55.5	$55.5	$22.3	$47.0	2.48	1.18	2.43	$840.48	$33.1	2.4
3	Rain Sensor Regulations	$23.4	$23.4	$5.7	$21.7	4.07	1.08	1.23	$424.72	$17.7	2.5
4	Multi-Family Submetering	$44.8	$102.9	$1.2	$102.5	36.91	1.00	2.19	$50.47	$43.6	4.6
5	Water Loss Reduction (Audits & Leak Detection/Repair)	$431.6	$431.6	$161.8	$161.8	2.67	2.67	14.65	$1008.44	$269.8	35.5
6	Residential Water Audits	$2.9	$5.2	$0.4	$4.2	7.47	1.26	0.14	$258.33	$2.5	0.2
7	Low flow showerhead & aerator distribution	$35.1	$118.8	$16.2	$19.5	2.16	6.10	1.60	$924.35	$18.8	1.9
8	Commercial Water Audits	$80.6	$128.5	$30.3	$39.6	2.66	3.24	4.04	$684.09	$50.3	8.5
9	Public Information	$34.6	$70.0	$36.2	$36.2	0.96	1.93	1.52	$2,177.87	-$1.6	1.2
10	High Efficiency Toilets Rebate	$125.9	$125.9	$44.4	$84.6	2.84	1.49	5.65	$717.12	$80.5	6.7
11	Install High Efficiency Toilets and Urinals in Gov Buildings	$14.7	$14.7	$7.9	$16.6	1.88	0.89	0.68	$1,055.61	$6.9	0.9
12	Hotel & Motel Water Audits	$9.5	$9.5	$1.2	$3.2	7.84	2.99	0.44	$252.33	$8.3	0.6
13	Commercial Kitchen Spray Wash	$9.6	$26.2	$1.7	$1.7	5.57	15.11	0.44	$355.28	$7.9	0.6
14	Irrigation Meter Pricing	$44.0	$44.0	$4.6	$35.0	9.65	1.26	2.25	$185.21	$42.5	3.8
15	Washer Rebate	$24.4	$74.1	$12.4	$37.2	1.97	1.99	1.12	$1,011.97	$12.0	1.4
16	Car Wash Recycling	$8.6	$8.6	$0.1	$3.3	87.77	2.60	0.40	$22.19	$8.5	0.6

Notes:
1. Present Value calculated using 3% interest rate
2. Annual water savings averaged over the 29-year planning period
3. 2035 water savings represent water savings realized in the year 2035

BEST OPTION PACKAGES

Table 4-3 provides a short description of the 26 water conservation measures and the option packages in which they were placed. Three option packages were designed to accomplish an increasing level of water savings. The DSS model was used to quantify the interaction between measures in terms of water savings and benefits to estimate the combined savings and benefits from the three best option packages. This analysis was performed at the county level and then aggregated to the Metro Water District level.

TABLE 4-3
Descriptions of the Conservation Measures Evaluated Quantitatively and Qualitatively

Conservation Measure		Applicable Category	Distribution Method and Incentive	Description	Package
1	Establish Conservation Rates	Water Provider	Water Provider	Implement or modify rate structures to provide inclining block rates that charge customers more per unit for higher use.	A, B, C
2	Replace older, inefficient plumbing fixtures	Existing Indoor - Residential	Water Provider	To speed the conversion of older, inefficient plumbing fixtures towards current lower flow models, local water providers will be required to implement a program targeting the replacement of older plumbing fixtures. Low flow fixtures are defined according to current code standards.	A, B, C
3	Rain-sensor shut off device on irrigation controllers	New Development - SF & MF & CII	Statewide Requirement	To reduce wasted irrigation water, establish regulations requiring rain sensor irrigation shut-off switches on all new irrigation systems - both residential and non-residential. A new State law was established to implement this requirement across the Metro Water District.	A, B, C
4	Multi-family Sub metering requirement	New Development - MF	City/County or Water Provider Requirement	A water provider policy or local ordinances should be adopted to require that all new multi-family buildings (i.e. apartments, town homes, condominiums) be built with sub-meters that bill for water service, based on volume of use.	A, B, C
5	Water loss reduction	Water Provider	Water Provider	Water providers must identify methods to reduce leakage in their systems, and to reduce unbilled water. Each water provider should perform a distribution system water audit based on the International Water Association (IWA) methodology, in order to maintain uniform assessments of leakage and set targets at the economic level of leakage.	A, B, C
6	Residential water audits	Existing Indoor & Outdoor - SF & MF	Water Provider	Water providers will provide water audits (indoor and outdoor use) to residential customers. The largest 25 percent of water users should be targeted to evaluate water saving measures, and audits should be made available to customers who complain about high water bills.	A, B, C

Conservation Measure		Applicable Category	Distribution Method and Incentive	Description	Package
7	Low flow showerhead & aerator distribution	Existing Indoor - SF	Water Provider	Water providers will distribute low-flow retrofit kits to customers. These kits could include low-flow showerheads, faucet aerators, and other applicable retrofit items. The kits would be distributed to the portion of the service areas that have pre-1992 homes.	A, B, C
8	Commercial water audits	Existing Indoor - CII	Water Provider	Water providers will provide water audits (indoor and outdoor use) to commercial customers. This audit will include a feasibility report that outlines changes to process and operations to reduce water usage. The Pollution Prevention Assistance Division (P2AD) of the DNR can be used to train auditors in performing the water audits.	A, B, C
9	Expand public education program	Water Provider	Metro Water District and Water Provider	Public education would be used to raise awareness of other conservation measures available to customers. Programs could include emphasis on school programs but also include landscape classes for homeowners, poster contests, speakers to community groups, radio and television time, and printed educational material such as bill inserts, etc. Program would continue indefinitely.	A, B, C
10	High Efficiency Toilet (HET) Rebates (possible refinement to Plan Action No. 2)	Existing Indoor - Residential	Water Provider	Provide a rebate for the installation of a high efficiency toilet (HET). HET's are defined as any toilet that is 1.28 gallons per flush or less.	B, C
11	Installation of HETs and high efficiency urinals in government buildings	Indoor - Government	Local Government and Water Provider	Install high efficiency toilets and high efficiency urinals in government facilities. Replacements would include urinals flushing with 0.5 gpf or less and toilets that flush 1.28 gpf or less.	B,C
12	Focused water audits for hotels/motels	Existing Indoor - CII	Water Provider	Provide water audits to hotels and motels. Standardize the types of services offered to reduce costs. Included would be bathrooms, kitchens, ice machines, cooling towers, landscaping, and irrigation systems and schedules.	C
13	Restaurant low flow spray rinse nozzles (possible refinement to Plan Action No. 3)	Existing Indoor - CII	Water Provider	Provide installation of 1.6 gpm spray nozzles for the rinse and clean operation in restaurants and other commercial kitchens.	C
14	Irrigation meters pricing (possible refinement to Plan Action No. 1)	New and Existing Development – MF & CII	Water Provider	If allowed, these meters will be charged on a separate rate schedule that recognizes the high peak demand placed on the system by irrigators - at a rate much higher than base rate.	B, C

Conservation Measure		Applicable Category	Distribution Method and Incentive	Description	Package
15	Clothes washer rebates	Existing Indoor - SF & MF & CII	Water Provider	Water provider would offer a rebate for the purchase of an efficient clothes washer until such time as they are required to be sold in stores.	C
16	Require car washes to recycle water	New Outdoor - CII	City/County Requirement	Pass a regulation that required all new drive-through car washes to recycle water, in order to get a water meter.	B, C
Qualitative Measures					
17	Water waste ordinance	All Categories	Metro Water District to Develop Model Ordinance	Model ordinance would provide a general policy statement for local governments that would prohibit water waste such as runoff from over-watering landscaping, irrigation during rainfall events, not repairing leaks, and other wasteful activities.	Optional Education Toolbox
18	Prohibit HOA or CC&R conditions that mandate irrigation	SF & MF	Metro Water District to Determine Approach	Homeowners Associations would not be allowed to require automatic irrigation systems nor specify the amount of watering per week. Metro Water District will research the feasibility.	Optional Education Toolbox
19	Cooling Tower Education	CII	Metro Water District	Provide education to industry about efficient use of cooling towers.	Optional Education Toolbox
20	Promote water efficiency aspects of green buildings	New Development - All Categories	Metro Water District	Metro Water District staff to work with local green building associations, developers, designers, vendors to promote incorporating water efficiency into building design.	Optional Education Toolbox
21	New home efficiency award program promotion (WaterSense)	New Outdoor - SF & MF	Metro Water District	Co-sponsor award program to developers that are “green builders” and offer homes for sale that meet certain criteria such as EPA's new Water Sense program for new homes. This could be combined with energy efficient homes.	Optional Education Toolbox
22	Award program for water savings by businesses	Existing Indoor - CII	Metro Water District Sponsor	Metro Water District would sponsor an annual awards program for businesses that significantly reduce water use.	Optional Education Toolbox
23	Offer landscape training classes to homeowners	Existing Outdoor -SF	Water Provider with Cooperative Extension Service	Conduct a landscape water efficiency training program for homeowners in the spring of each year.	Optional Education Toolbox
24	Xeriscape demonstration gardens	Water Provider Property or Other Public Property	Water Provider	Donate or acquire a portion of public or private land to create a demonstration garden displaying living examples of low water-using gardens and landscaping. The Water provider would provide signs and brochures to educate those people visiting the garden.	Optional Education Toolbox
25	School education	Water Provider	Water Provider	The Water provider would sponsor school conservation by providing presentations, opportunities for field trips, and/or coloring books, etc. to teach students the importance of conserving water.	Optional Education Toolbox

Conservation Measure		Applicable Category	Distribution Method and Incentive	Description	Package
26	Provide historical water use on water bills	All Categories	Water Provider	Provide detailed information on customer's historical water use, including typical usage and trends.	Optional Education Toolbox

Notes:
gpm = gallons per minute
gpf = gallons per flush
SF = single family
MF = multi-family
CII = commercial, industrial, institutional

Selection criteria for the water conservation measures in each option package included the following, by program:

- Program A includes the existing measures from the 2003 Plan, as amended.
- Program B includes Program A measures plus two new additional measures and three revised existing measures. Program B is designed to be the midpoint program and includes cost-effective measures that are able to conserve significant amounts of water.
- Program C includes all the quantitative measures presented in Table 4-3.
- An optional education toolbox category was developed to provide guidance on optional measures for utilities. All of the qualitative measures were assigned to this category, which can be used to enhance the education and public awareness program measure.

DISTRICT-WIDE RESULTS OF OPTION PACKAGES EVALUATION

Table 4-4 presents key evaluation statistics compiled from the individual county DSS models. Assuming all measures are successfully implemented, projected water savings in MGD are shown for 2035, as are the costs to achieve this water demand reduction. The costs are expressed in two ways: total present value over the 30-year period and the cost for each million gallons of water saved.

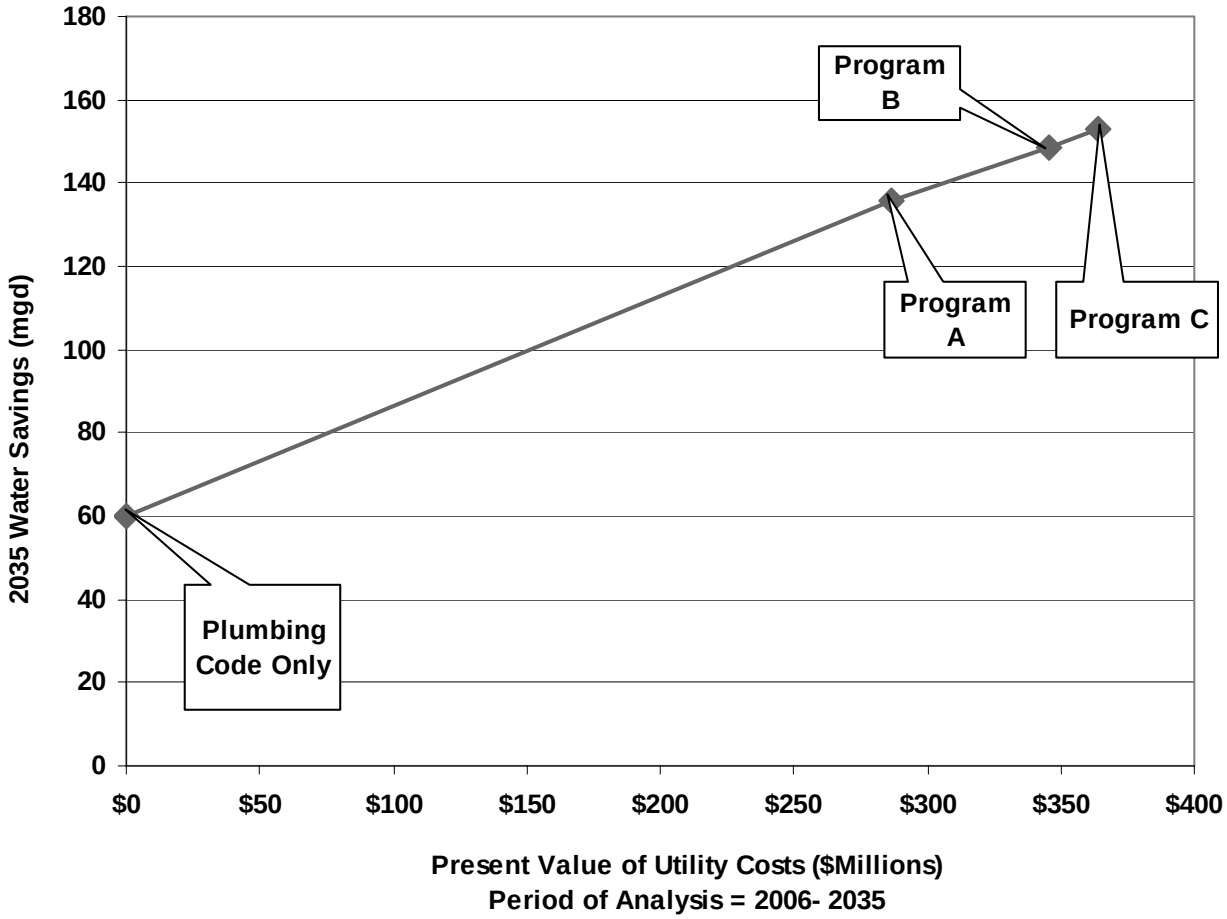
TABLE 4-4
District-wide Results of Option Packages Evaluation

Conservation Option Package (includes plumbing code)	Water Utility Benefit-Cost Ratio	2035 Water Savings (MGD)	2035 Indoor Water Savings (MGD)[1]	2035 Outdoor Water Savings (MGD)	Water Savings as a percent of 2035 Without Conservation Trend	Present Value of Water Utility Costs (million $)	Cost of Water Saved ($/MG)
A	2.5	136.0	117.3	18.7	12%	$286.9	$675
B	2.6	148.4	125.4	23.0	13%	$345.7	$654
C	2.6	153.1	130.1	23.0	13%	$364	$650

Notes:
Present Value is determined using an interest rate of 3%
Programs A, B and C include plumbing code savings
Cost of water saved is present value of water utility cost divided by total 30-year water savings.
1. Includes non-revenue water reduction savings.

The 13 percent water savings in Table 4-4 reflects only conservation beyond 2006 and does not incorporate total savings since 2001, when the Metro Water District began comprehensive regional water conservation planning. It is anticipated that there will be a 20 percent reduction in per capita use from 2001 to 2035. See the 'Comparison with 2003 Plan" discussion at the end of this Section for an explanation of how this compares to water saving estimates in the 2003 Plan. Figure 4-2 shows the cost of the three option packages for the local water provider versus the amount of water saved for each water conservation program.

FIGURE 4-2
Present Value of the Three Water Conservation Option Packages



COUNTY RESULTS OF OPTION PACKAGES EVALUATION

Table 4-5 presents selected evaluation statistics for the three option packages for each of the Metro Water District's 15 counties. Water savings tend to vary based on the size of the county, the age of the housing stock and plumbing fixtures, the amount of commercial and outdoor water use, and the age and condition of the distribution system as indicated by the amount of non-revenue water.

TABLE 4-5
County Results of Option Packages Evaluation

County	Water Utility Benefit-Cost Ratio			2035 Water Savings (MGD)			2035 Water Savings (% of 2035 Without Conservation Trend)			Present Value of Water Utility Costs ($M)		
	A	B	C	A	B	C	A	B	C	A	B	C
Bartow	4.5	4.4	4.4	8.8	9.0	9.0	16%	16%	16%	$ 11.1	$ 11.9	$ 12.3
Cherokee	2.1	2.2	2.2	5.8	5.9	6.0	11%	12%	12%	$ 13.7	$ 14.6	$ 15.2
Clayton	1.3	1.6	1.7	4.2	5.0	5.1	9%	11%	11%	$ 19.5	$ 23.3	$ 24.0
Cobb	3.3	3.5	3.5	10.4	12.3	13.0	9%	10%	11%	$ 18.1	$ 26.7	$ 29.4
Coweta	1.8	1.9	2.0	3.9	4.2	4.3	12%	13%	13%	$ 10.3	$ 11.0	$ 11.3
DeKalb	2.7	2.7	2.7	15.4	17.0	17.4	13%	14%	14%	$ 32.6	$ 43.7	$ 45.6
Douglas	2.1	2.1	2.1	5.0	5.2	5.2	17%	17%	17%	$ 11.3	$ 12.5	$ 12.8
Fayette	1.5	1.5	1.6	2.8	2.9	2.9	11%	11%	11%	$ 8.1	$ 9.2	$ 9.5
Forsyth	3.4	3.7	4.0	7.9	9.8	11.8	11%	14%	17%	$ 14.7	$ 17.7	$ 21.6
Fulton	4.1	3.9	3.9	32.4	35.0	35.7	12%	13%	14%	$ 45.0	$ 60.3	$ 63.4
Gwinnett	2.5	2.7	2.7	19.3	21.1	21.4	12%	13%	13%	$ 47.9	$ 55.3	$ 57.6
Hall	1.3	1.5	1.6	5.0	5.3	5.4	9%	9%	9%	$ 16.6	$ 18.4	$ 18.9
Henry	1.6	1.7	1.7	5.5	5.8	5.9	11%	12%	12%	$ 16.9	$ 18.6	$ 19.1
Paulding	1.4	1.5	1.5	4.7	4.8	4.9	9%	9%	9%	$ 14.3	$ 14.7	$ 15.3
Rockdale	3.6	3.5	3.5	4.9	5.1	5.1	22%	23%	23%	$ 6.8	$ 7.8	$ 8.0
Total	**2.5**	**2.6**	**2.6**	**136.0**	**148.4**	**153.1**	**12%**	**13%**	**13%**	**$ 286.9**	**$ 345.7**	**$ 364**

Notes:
Present Value is determined using an interest rate of 3%
Variations in forecasted water savings amongst counties depends on the existing plumbing stock, age of infrastructure, and demographics.

RECOMMENDED WATER CONSERVATION PROGRAM (B)

Water Conservation Program B was selected as the recommended program. Although all three water conservation programs were evaluated as cost effective for the local water provider, Program B represented an approach that would be widely accepted. This aggressive water conservation program will achieve significant savings and maximize returns on investments in the program. Implementation of Program B realizes the majority of the water savings available while Program C requires spending 5% more (or $19M) to gain less than 5 MGD of additional water savings. Implementing the measures in Program B provides additional water conservation benefits on the foundation provided by the existing measures without exceeding the number of measures that a local water provider can realistically implement. However, the additional measures in Program C may be held in reserve for implementation as substitution measures if one or more of the measures in Program B is determined to either be too difficult to implement, or if expected water savings do not materialize.

FUTURE WATER DEMAND WITH OPTION PACKAGES

Figure 4-3 is a graphical representation of how the three option packages would reduce overall water demands in the Metro Water District below the baseline level (which includes natural conservation related to current plumbing codes). By 2035, the average water savings across the Metro Water District would be as follows:

Program A – 7% (76 AAD-MGD)

Program B – 8% (88 AAD-MGD)

Program C – 8% (93 AAD-MGD)

The savings listed above are beyond the 5 percent (60 AAD-MGD) Metro Water District benefits achieved by 2035 through natural replacement associated with the plumbing code.

Beyond 2006, a total conservation benefit of 13 percent over current water use trends is expected from conservation program B in combination with natural replacement benefits. The Metro Water District currently uses water efficiently with a relatively low adjusted per capita water use; therefore the 13% reduction is aggressive. This reduction is also significant given the age of the housing stock and extent of the distribution systems in the Metro Water District. Comparisons of per capita demands and percent savings through conservation can often be misleading. Communities using water very efficiently will not be able to achieve the same large percent reductions as communities who are not as efficient with their current water use. Newer urban areas have more efficient housing stock and therefore may have lower per capita demands than older communities.

The 13 percent water savings reflects only conservation beyond 2006 and does not incorporate total savings anticipated since 2001, when the Metro Water District began comprehensive regional water conservation planning. It is anticipated that there will be a 20 percent reduction in per capita use from 2001 to 2035. See the ‘Comparison with 2003 Plan” discussion at the end of this Section for an explanation of how this compares to water saving estimates in the 2003 plan.

FIGURE 4-3
Metro Water District Annual Average Day Water Demand Forecasts (2006-2035)

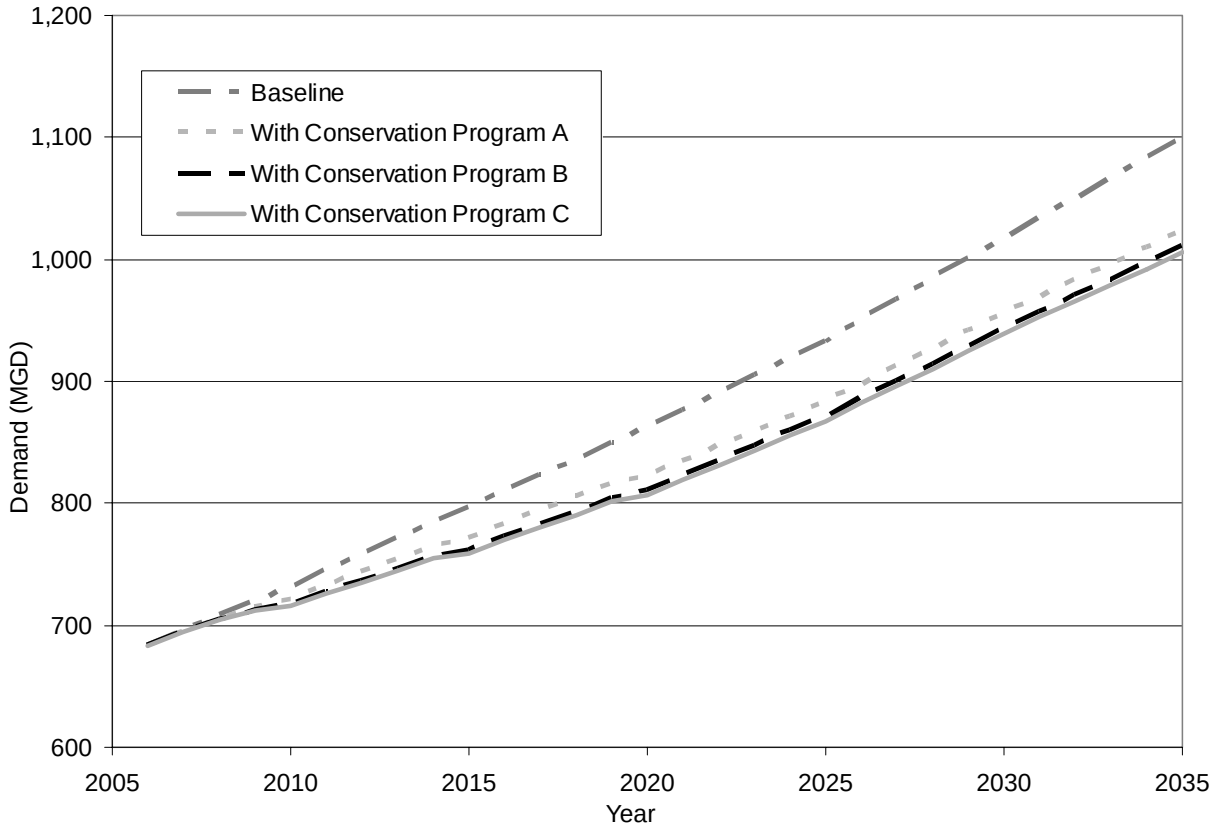


Table 4-6 provides the 2035 average annual day water use forecasts for each county in the Metro Water District after the savings from the recommended water conservation program have been applied. The water demand forecasts that include the savings from water conservation will be used in the remainder of the Water Supply and Water Conservation Management Plan to determine water supply and facility needs.

TABLE 4-6
Metro Water District 2035 Water Use Forecasts by County

County	2035 Forecasts		
	Without Conservation AAD-MGD	Baseline AAD-MGD	Recommended Conservation Program AAD-MGD
Bartow	55.4	52.8	46.4
Cherokee	50.5	47.8	44.6
Clayton	45.0	42.7	40.0
Cobb	121.0	115.3	108.7
Coweta	33.5	31.9	29.3
DeKalb	123.4	116.0	106.4
Douglas	29.7	27.5	24.5
Fayette	26.0	24.3	23.1
Forsyth	69.5	66.9	59.7
Fulton	263.2	250.0	228.2
Gwinnett	161.5	153.6	140.4
Hall	57.3	54.3	52.0
Henry	49.2	46.9	43.4
Paulding	52.0	49.2	47.2
Rockdale	22.0	20.2	16.9
District Total	**1,159.2**	**1,099.4**	**1,010.8**

Water conservation is essential to meeting projected Metro Water District water demands. By the year 2035, the planned level of water conservation could reduce water demands by approximately 88 AAD-MGD, or 8 percent District-wide (beyond the savings achieved through the plumbing code). This can be achieved through more efficient indoor and outdoor water use and reduction of water losses by local water providers through system leakage detection and elimination programs. Each of these water conservation measures are described in greater detail in Section 5, Water Conservation Program.

COMPARISON WITH 2003 PLAN

The DSS model used for the water conservation analysis for the 2003 Plan as well as for the 2008 Plan Update looks at existing water use and forecasts forward. Many changes have occurred since 2003 in population, water use, drought restrictions, natural conservation due to plumbing code changes, and the Metro Water District's aggressive water conservation program.

The Metro Water District's first Water Supply and Water Conservation Plan was adopted at the end of 2003. In four short years, the local governments and water providers in the Metro Water District made great progress in implementing the Plan's conservation requirements. This update continues and improves upon the Metro Water District's commitment to water conservation.

This Plan update shows the Metro Water District will use less water and be more efficient in 2035 compared to the 2003 Plan estimates for 2030. With an additional 5 years of growth and

development, Table 4-7 shows that both the total consumption and the total per person forecasts are lower as compared with the 2003 Plan.

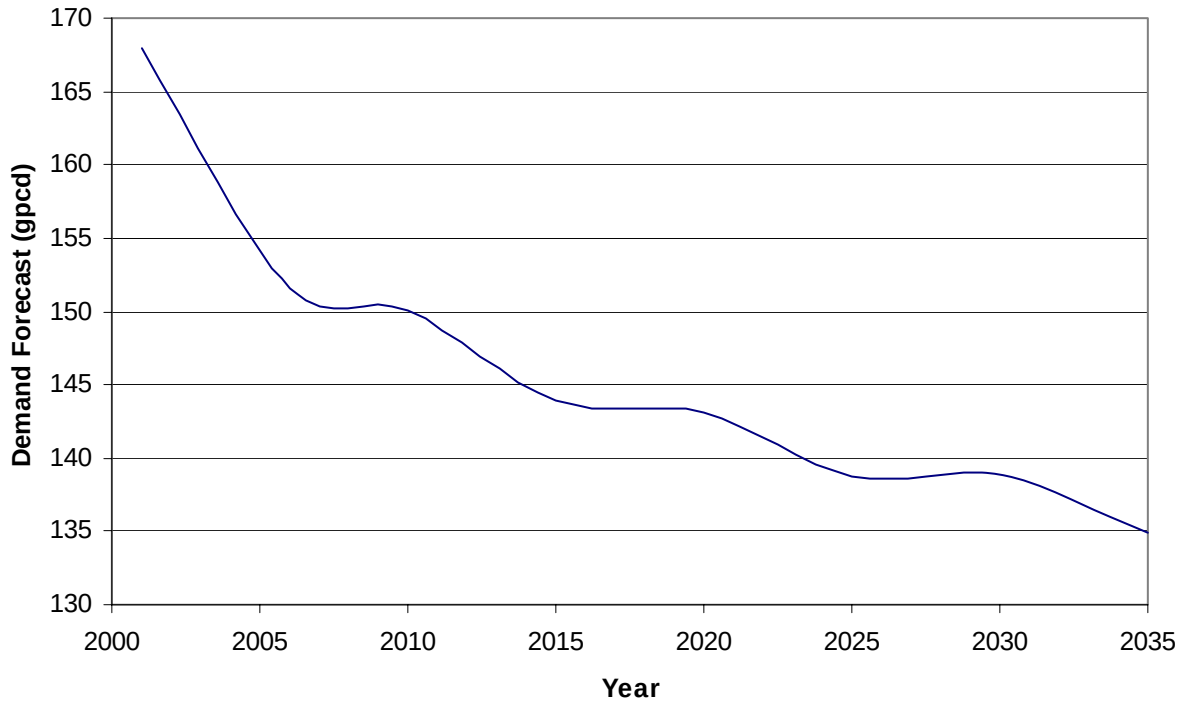
TABLE 4-7
Comparison of 2003 Plan and this Plan Update

Comparison	2003 Plan (2030 forecasts)	Draft Update (2035 forecasts)
Planned Future Water Demand with Recommended Conservation Program	1,081 AAD-MGD	1,011 AAD-MGD
Future Per-Capita Demand Under District Plan	138 gpcd*	135 gpcd*

* Total gallons per capita per day – this number reflects all the water used in the Metro Water District divided by the population within the Metro Water District.

Figure 4-4 shows a 20% reduction in per capita demand from 2001 to 2035 based on implementation of the Plan update. The starting point of 168 gallons per capita per day (gpcd) reflects billing data for 2001 collected for the 2003 Plan. The 2006 data shows a 151 gpcd, used in this Plan update. The end point reflects the benefit of the conservation program in this Plan update.

FIGURE 4-4
Metro Water District Overall Per Capita* Water Use Trends (2001 – 2035)



* Overall per capita = total water demand supplied by public water systems in the District divided by the District's population.

The water conservation measures in this Plan update go beyond the measures in the 2003 Plan. This update includes:

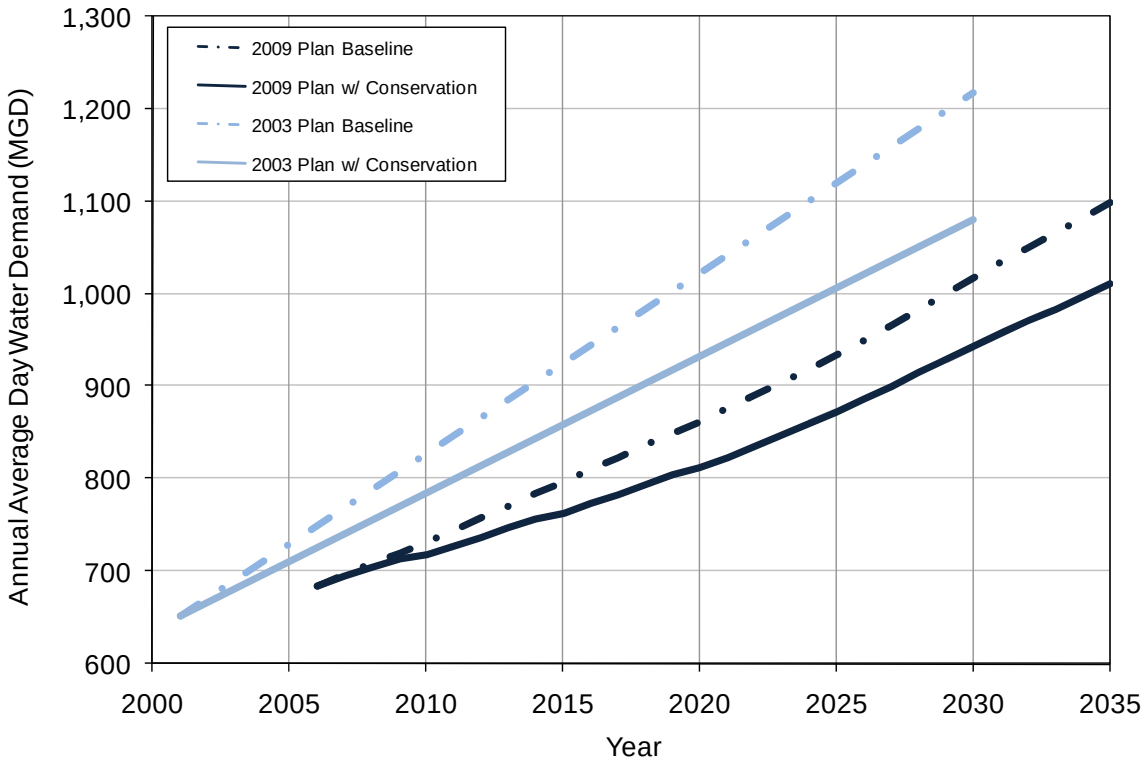
- The 10 water conservation measures from the 2003 plan
    - Conservation pricing
    - Replace older, inefficient plumbing fixtures
    - Pre-rinse spray valve retrofit education program
    - Rain sensor shut-off switches on new irrigation systems
    - Sub-meters in new multi-family buildings
    - Assess and reduce water system leakage
    - Conduct residential water audits
    - Distribute low-flow retrofit kits to residential users
    - Conduct commercial water audits
    - Implement education and public awareness plan
- 3 of those 10 water conservation measures are strengthened
    - Irrigation meter pricing at 200 percent of the first tier rate
    - 1.28 gpf toilet rebate program only by 2014
    - Minimum local education requirements
- 2 new water conservation measures are added
    - Install 1.28 gpf toilets & low flow urinals in government buildings
    - Require new car washes to recycle water

This Plan update identifies future water conservation opportunities based on current water use patterns. This Plan's updated conservation forecasts are based on more accurate data:

- Updated population and employment forecasts
- Housing stock age data reflects increased emphasis on local census data and the 2006 American Community Survey which shows our housing stock is younger and more water- efficient.
- Base year water use data from 2006 provides a lower starting point of 151 gpcd for forecasts versus 2001 data of 168 gpcd used in the 2003 Plan; reducing future water demand forecasts.

The availability of better data for the Plan update produces a more robust plan while maintaining the same commitment to water conservation. In fact, comparing the per capita demand from the beginning of the regional water conservation program to the 2035 per capita demand, the Plan update demonstrates a 20% reduction in demand.

FIGURE 4-5
Comparison of Baseline and Plan with Conservation between 2003 and 2009 Plans



Section 5: WATER CONSERVATION PROGRAM

Water conservation is a critical element in meeting the water supply needs within the Metro Water District. This Section presents the water conservation measures selected for the 2008 Water Supply and Water Conservation Management Plan. When fully implemented, these water conservation measures have the potential to reduce the Metro Water District's water demand up to 13 percent beyond the trend without conservation by the end of the planning period.

Much progress related to water conservation has been achieved since the adoption of the 2003 Water Supply and Water Conservation Management Plan. The Metro Water District's plan has been instrumental in making water conservation a priority in north Georgia. The Metro Water District is the only major metropolitan area in the country with more than 100 jurisdictions that is implementing such a comprehensive long-term water conservation program that is required and enforced. Tiered water conservation rates have been put in place throughout the Metro Water District. All the largest water systems have implemented programs to reduce system water loss. Toilet rebate programs are in place and ahead of schedule.

The updated plan builds upon 10 measures in the 2003 Plan and advances the Metro Water District's conservation efforts even further. The 10 measures from the 2003 Plan, as amended, will continue to be implemented with revisions to 3 of those measures. The revisions include the following:

- Measure 5.1 – Conservation Pricing: If local water providers allow irrigation meters, at a minimum, the rate for irrigation use should be equal to or greater than 200 percent of the first tier rate.
- Measure 5.2 – Replace Older, Inefficient Plumbing Fixtures: By 2014, local water provider's toilet replacement programs will only include high efficiency toilets (HET).
- Measure 5.10 – Implement Education and Public Awareness Plan: Minimum annual requirements are identified for education and outreach activities and public participation and involvement activities. An optional toolbox is provided as examples of how to meet the annual requirements.

In addition, two new required measures have been added including the following:

- Measure 5.11 – Installing HET and High Efficiency Urinals in Government Buildings
- Measure 5.12 – Require New Car Washes to Recycle Water

All measures are currently required unless provided for otherwise. The implementation schedule for these water conservation measures is presented in Section 13, Implementation Plan.

ACTION ITEM 5.1 – CONSERVATION PRICING

Responsible Party

☑ Local Water Provider
☐ Local Government
☐ Other: _____

In Coordination With

☐ Local Water Providers
☐ Local Wastewater Provider
☑ Local Government
☐ Other: _____

ACTION ITEM

Implement water conservation pricing.

OBJECTIVE

The objective of this measure is to reduce excessive discretionary water use, especially outdoor irrigation, by increasing the cost of water as the volume of use increases.

DESCRIPTION OF MEASURE

Single Family Residential

In general, tiered rate structures encourage water conservation by charging higher rates for customers with higher water use. Local water providers should perform a rate and revenue analysis to determine what percent of customers will typically fall into each tier to produce an estimated revenue stream over time. The rate and revenue analysis is needed for the following reasons:

- To determine the rates to assign each tier;
- To determine the effect on the revenue stream; and
- To maintain fair and equitable billing rates.

All Metro Water District water providers should be implementing at least a 3 tiered rate structure. It is important to note that local water providers may elect to create more than three tiers to further enhance water conservation and revenue needs. Table 5-1 provides a guideline for setting effective conservation rates. However, each local water provider should establish rate structures based on a local rate study and an understanding of the local customer base. While rate structures may vary by customer category, decreasing block rate structures are not allowed within the Metro Water District.

TABLE 5-1
Water Conservation Tiered Rate Structure (Example)

Tier	Water Use	Rate
First Tier (Conservation Tier)	125% of the average winter use for the customer type/ meter type	Base rate
Second Tier (Middle Tier)	Bound by the first tier and the third tier	At least 25% above base rate
Third Tier (High Use Tier)	Highest 5-10% of customers or the customers who use 10-20% of the total water volume	At least 200% above base rate

The average winter use, which is the basis of the conservation tier, is calculated by the billing system for the residential customer category. Outdoor water is typically not used during the winter months so the average winter use reflects baseline indoor water use. The lowest tier should be calibrated against average winter single-family residential water use numbers. The AWWA Research Foundation estimated a typical single-family winter use of 69.3 gallons per capita per day or 6,000 gallons per single-family account per month, nationally, is common for conservation use estimates[1]. Once the winter use baseline is determined for the residential customer category, the first tier rates can be established.

As conservation rates achieve success, use in the top tier should reduce; therefore, conservation rates should be re-analyzed periodically. Periodic rate adjustments may be needed to ensure that the funds needed for regular operations are not jeopardized.

Commercial

Commercial, multi-family, institutional and industrial categories should be analyzed to determine the best approach to encourage conservation. Office, institutional and multi-family categories that use outdoor irrigation and have similar use patterns to single-family may benefit from tiered rates set with appropriate bases for those categories. However, many commercial customers have water use patterns that are appropriate for uniform rates. The type of conservation rate for commercial accounts is left to the discretion of the local water provider. At a minimum, a uniform rate structure should apply.

Irrigation Meters

If local water providers allow the use of irrigation meters, the irrigation rate should be significantly higher than the rate for indoor use. The true cost of peak demand as a result of irrigation can be calculated through a rate study. At a minimum, the rate for irrigation use should be equal to or greater than 200 percent of the first tier rate. Discouraging irrigation meters through high fees for irrigation meters purchase and/or installation is also encouraged.

Water customers have traditionally requested irrigation meters to avoid sewer charges that accompany water rates. Water rates typically are equal to or less than rates for indoor use. However, irrigation often poses an added burden to the local water provider by creating very large peaks in water demand. Rate schedules for irrigation meters should recognize the impact that the high peak demand of irrigation places on the local water system and encourage conservation of our region's limited water supplies.

It is important to note that this measure does not require the use of irrigation meters. If a local water provider does not have any active irrigation meters, no action is required for that local water provider with respect to this conservation measure. Local water providers that currently offer and/or have active irrigation meters must establish an irrigation rate structure that reflects the impact on the local water system.

Billing System Functionality

New billing systems could potentially represent a multi-million dollar investment and two-year implementation time-frame for most local water providers. While local water providers in the

[1] American Water Works Association Research Foundation "Residential End Uses of Water, " Mayer, 1999.

Metro Water District are not required to update existing billing software, as existing billing software is replaced it should include certain functionality to facilitate conservation. Functionality that should be available in new billing system packages in the Metro Water District include:

- Ability to sub-divide customers into the following customer categories; single-family residential, multi-family residential, commercial, industrial and institutional.
- Include both current and historical water use information on bills.
- Include an explanation of the conservation pricing. This information will allow the customer to set goals for water use to avoid the top pricing tier.
- Clearly identify the billing units, with preference given towards gallon-based units. Most customers are familiar with gallons as a unit of measure and less familiar with other units.

The increased billing functionality over time will provide water customers in the Metro Water District with more information to make water use choices. Additionally, the proper classification of customer categories will assist with future forecast updates as well as the future evaluation of the benefit of the regional conservation program.

SPECIFIC SUB-TASKS

Sub-Task	Description
Perform a rate and revenue analysis	Perform a rate analysis to develop a minimum 3-tiered water conservation pricing schedule.
Commercial rates	Determine appropriate commercial rates for the service area.
Irrigation meter pricing	If irrigation meters are allowed, develop an irrigation meter pricing schedule that recognizes the impact on peak demand from irrigation.
Billing system functionality	As local water providers replace existing billing systems, they will assess the functionality of new software to facilitate conservation.
Review and update pricing	Periodically review and adjust conservation pricing to respond to changes in demand and ensure sufficient operation and maintenance funds are available. At least every 5 years, review rates specifically for effectiveness of conservation pricing.

ACTION ITEM 5.2 – REPLACE OLDER, INEFFICIENT PLUMBING FIXTURES

Responsible Party

☑ Local Water Provider
☐ Local Government
☐ Other: _____

In Coordination With

☐ Local Water Providers
☐ Local Wastewater Provider
☑ Local Government
☐ Other: _____

ACTION ITEM

Implement a program to convert older, inefficient toilets to low flow toilets.

OBJECTIVE

The objective of this measure is to reduce indoor water use and speed the conversion of older, inefficient toilets towards lower flow models. Toilets are one of the highest water users and replacement of older, inefficient models will reduce water use.

DESCRIPTION OF MEASURE

Homes built in or prior to 1993 may contain inefficient toilets. Before the 1950s, toilets typically used 7 gallons or more for each flush. By the end of the 1960s, toilets were designed to flush with 5.5 gallons, and in the 1980s the new toilets being installed were using only 3.5 gallons. Today, a new toilet uses no more than 1.6 gallons of water and high efficiency toilets (HETs) use no more than 1.28 gallons of water per flush. Replacing an inefficient toilet with a low flow model will conserve water.

Each local water provider should offer a program to convert older, inefficient toilets to 1.6 gallons per flush (gpf) models and / or 1.28 gpf models within their community. Local water providers should implement a strategy to distribute, install, or provide incentive to replace higher flow fixtures on accounts owning pre-1993 built homes. The program must specifically address toilet replacement rather than provide toilet retrofit devices and implementation should begin no later than 2009. Examples of such programs include:

1. Rebate incentive program – Customer receives a credit to water bill, cash, or voucher offsetting the cost for a new low-flow toilet.
2. Direct install program – Customer exchanges older toilet for a low-flow toilet with discounted installation through the local water provider.
3. Other – Any program that provides at least the same rate of replacement as the above examples. The local water provider must estimate exchange rate.

The Metro Water District currently administers a toilet rebate program for single family residences that replace older toilets with either 1.6 gpf or 1.28 gpf toilets as a service for water providers in the Metro Water District that choose to participate. Local water providers not currently participating in the Metro Water District's toilet rebate program should adopt a program, either independently or through the Metro Water District, to replace 3.5 gpf or higher toilets.

The Metro Water District website includes a summary by county of older plumbing fixtures that includes the number of housing units built by decade and maps showing the density of homes

constructed prior to 1993. These summaries include estimates by county and calculate the number of homes that are anticipated to need retrofits based on natural conversion of older plumbing fixtures. These summaries are helpful to local water providers in developing their local program.

This water conservation measure will be enhanced in the future, as the HET technology matures. HETs are a relatively new technology and are not as widely available as 1.6 gpf toilets. By 2014, the technology is expected to be widely available to the Metro Water District and local water providers will be required to provide only 1.28 toilet rebates, either through the Metro Water District rebate program or their own local program.

SPECIFIC SUB-TASKS

Sub-Task	Description
Establish a replacement strategy (through the Metro Water District program or local program)	Participate in the regional program or implement a local rebate or other incentive program for the replacement of pre-1993 toilets.
Enhance replacement program	As HET technology matures, encourage the replacement of older toilets to HET toilets.

ACTION ITEM 5.3 – REQUIRE PRE-RINSE SPRAY VALVE RETROFIT EDUCATION PROGRAM

Responsible Party

☑ Local Water Provider
☐ Local Government
☐ Other: _____

In Coordination With

☐ Local Water Providers
☑ Local Wastewater Provider
☑ Local Government
☐ Other: _____

ACTION ITEM

Develop an education program targeting food service establishments on retrofitting with low-flow pre-rinse spray valves.

OBJECTIVE

The objective of this measure is to speed the installation of low-flow pre-rinse spray valves in food preparation establishments to reduce water demand.

DESCRIPTION OF MEASURE

A pre-rinse spray valve is a handheld device that uses a spray of water to remove food and grease from dishware, utensils and pans before placing them in the dishwasher. A low-flow pre-rinse spray valve uses only 1.6 gallons per minute (gpm) or less. A typical pre-rinse spray valve uses 3 gpm and older spray valves use up to 7 gpm.

The dishwashing operations in a typical restaurant consume over two-thirds of all the water used. In some cases, nearly one-half of the water used in dishwashing is consumed by the pre-rinse spray valve. A low-flow pre-rinse spray valve is one the easiest and most cost effective water saving devices available to the food service operator. New efficient low-flow valves can reduce rinse water usage by 30 to 70 percent compared to older spray valves.

Each local water provider must develop an education program that targets food service establishments such as grocery stores, restaurants, cafeterias, and institutional housing facilities. This program is to begin no later than January 2009. The Energy Policy Act of 2005 sets the maximum flow rate of pre-rinse spray valves at 1.6 gpm. Pre-rinse spray valve education programs will not be required after 2013 since the market will be saturated with low-flow spray valves.

The Metro Water District has created a pre-rinse spray valve brochure, available on the website, that local water providers may distribute to meet the requirements of this measure. The Metro Water District website also includes a summary of the number of food service establishments, both full service restaurants and limited service eating places, by county that can assist in the development of the program and the level of effort in each area.

Other optional program suggestions are to distribute brochures during grease trap inspections of food service establishment, other site visits, direct mailings or rebate or direct installation programs.

SPECIFIC SUB-TASKS

Sub-Task	Description
Develop a pre-rinse spray valve retrofit educational program	Using the Metro Water District brochure or other media, develop a program targeting food service operators.

ACTION ITEM 5.4 – RAIN SENSOR SHUT-OFF SWITCHES ON NEW IRRIGATION SYSTEMS

ACTION ITEM

Implement state law requiring the installation of rain sensor irrigation shut-off switches for all new properties.

Responsible Party

☐ Local Water Provider
☐ Local Government
☑ Other: State Legislation

In Coordination With

☑ Local Water Providers
☐ Local Wastewater Provider
☑ Local Government
☐ Other: _____

OBJECTIVE

The objective of this measure is to reduce water wasting by requiring rain sensor shut-off switches on irrigation systems, so they do not operate during or immediately following a rain event.

DESCRIPTION OF MEASURE

In 2004, the Georgia General Assembly passed a law (Georgia Code Section 12-5-6), which requires rain sensor shut-off switches on new landscape irrigation systems for both residential and nonresidential properties within the Metro Water District. The law took effect on January 1, 2005; therefore, all new in-ground residential and commercial landscape irrigation systems in the Metro Water District will have rain sensor shut-off switches. At the local level, building inspection checklists should be updated to reflect rain sensor requirements for new construction with irrigation systems.

A rain sensor shut-off switch is an electric device that detects and measures rainfall and turns off the irrigation system when a predetermined amount of rain has fallen. This prevents the irrigation system from watering when the landscape has already receiving enough water from the rainfall. Rain sensors reduce unnecessary watering during rainfall events.

There are over 1,500 outdoor service companies within the 15-county Atlanta region that employ approximately 13,000 people according to the 2006 Census County Business Patterns. These companies account for 60 percent of the outdoor service companies across the entire state of Georgia. Over 400 companies in the Atlanta region deal directly with installing irrigation systems.

In April 2006, the Metro Water District sent letters to all of the irrigation companies in the 15-county Atlanta region in an effort to reach out to these companies and ask for help implementing this water conservation measure. This letter was sent with the support of the Metro Atlanta Landscape and Turf Association (MALTA) and the Georgia Green Industry Association.

SPECIFIC SUB-TASKS

Sub-Task	Description
Enact rain sensor shut-off legislation	Require all new irrigation systems to include rain sensor shutoff switches.
Update building inspection checklists	Update checklists to inspect irrigation systems for shutoff switches.

ACTION ITEM 5.5 – REQUIRE SUB-METERS IN NEW MULTI-FAMILY BUILDINGS

ACTION ITEM

Adopt local ordinances or water provider policy that requires all new multi-family buildings (e.g. apartments, townhomes, and condominiums) be individually metered or sub-metered.

Responsible Party

☑ Local Water Provider
☐ Local Government
☐ Other: _____

In Coordination With

☐ Local Water Providers
☐ Local Wastewater Provider
☑ Local Government
☐ Other: _____

OBJECTIVE

The objective of this measure is to reduce water use in multi-family properties by allowing each unit to be billed based on volume of use.

DESCRIPTION OF MEASURE

Local water providers must adopt an ordinance or local policy to require sub-metering of multi-family buildings. The adoption of a local sub-metering ordinance is authorized by O.C.G.A. § 12-5-180.1. A local policy may be used in lieu of an ordinance. The Metro Water District website includes example language to assist in creating a local ordinance or policy.

The National Multiple Family Submetering and Allocation Billing Program Study shows that sub-metering reduced water use by 15.3% compared with traditional in-rent multi-family properties, providing a substantial savings. To accomplish sub-metering, local water providers may either install individual meters that will be billed by the local water provider on each unit or require the property owner to install sub-unit meters owned and managed by the property owner with a utility owned master meter. If sub-meters are installed, local water providers are not responsible for billing sub-metered units. Typically, multi-family properties will use a third party meter reading and billing service.

High water use detected by a sub-meter can also assist with leak detection efforts beyond the master meter. This is beneficial for the multi-family property management for several reasons: 1) the location of the leak can be more easily identified; and 2) since a leak will cause a resident's water bill to be high they will be more likely to report leaks before they become a bigger problem.

SPECIFIC SUB-TASKS

Sub-Task	Description
Adopt a local sub-meter ordinance or policy	Adopt a local ordinance or require sub-meters as a condition of purchasing a master meter for multi-family properties.

ACTION ITEM 5.6 – ASSESS AND REDUCE WATER SYSTEM LEAKAGE

ACTION ITEM

Assess local water losses annually using the IWA/ AWWA water audit methodology.

Develop a program for identifying and reducing local water system loss.

Responsible Party

☑ Local Water Provider
☐ Local Government
☐ Other: _____

In Coordination With

☐ Local Water Providers
☐ Local Wastewater Provider
☑ Local Government
☑ Other: Fire & Police Departments

OBJECTIVE

The objective of this measure is to reduce water losses within the water distribution system and water treatment facilities.

DESCRIPTION OF MEASURE

Water providers must identify methods to reduce leakage in their systems, and to reduce unbilled water. The first step is to determine the extent of water losses in the distribution system using the International Water Association (IWA) and American Water Works Association (AWWA) methodology, herein referred to as the IWA / AWWA method.

The IWA / AWWA methodology is recommended to quantify and classify non-revenue water because it addresses some of the major problems in estimating system water loss. The commonly used percentage of "unaccounted-for-water" method of determining system water loss does not provide a standard for measurement of water use and water loss. The IWA / AWWA methodology defines all uses and losses and is designed to function with different units and measures using a water balance format.

The methodology uses an Excel spreadsheet and is more comprehensive and accurate than previously available tools for water loss calculations. Within IWA/AWWA methodology, no water is considered "unaccounted for", as it is allocated as either a consumption or loss. Water loss programs can then target the most significant categories of losses, which will vary for every local water provider. The spreadsheet provides benchmark information and allows utilities to easily set performance targets.

Local water providers must establish a goal for reducing the "real" water losses, or those associated with loss through all types of leaks, breaks and overflows on mains, service reservoirs and service connections, up to the point of customer metering. The goal for reducing the real component of water loss will be based on existing water loss, the specifics for the distribution system and the water loss program. The goal for real water loss established by each local water provider will be achieved over the next five years.

The IWA/AWWA identifies the areas of biggest water losses as well as their financial impact. Based on water loss data, each local water provider can develop a water loss program that will be

beneficial to their particular water system. Optional example programs to reduce water losses include the following list. All options will not be appropriate for all water systems.

- Conduct an on-going meter calibration and/or replacement program. Older meters should routinely be checked for accuracy. Faulty meters almost always underestimate the amount of water used, resulting in significant amounts of non-billed water.
- Use leak detection equipment (sonar) and software to identify leaks. There are several different types of leak detection equipment on the market, ranging from hand- held listening devices to permanent and semi-permanent devices that are placed within the system to record leaks at low demand times (such as early morning hours, 3 am). Proactive leak detection programs have been successful in the Metro Water District in finding minor leaks that are not usually found, and can result in significant water losses over time.
- Maintain an understanding of the system through a current water distribution model. Optimization of the system and understanding of system challenges will allow for quicker identification of leaks and other losses.
- Establish DMAs (district metered areas) within the system to identify real losses. A DMA is a distribution system zone monitored routinely to produce a pattern for night flows. DMAs enable the identification and location of unreported breaks and leakage, or real losses.
- Actively manage system pressure by establishing different pressure zones for the system or by reducing pressures across the system. Care must be taken when lowering system pressure to adhere to minimum required pressures for daily operation and fire protection. Benefits of pressure management include: reduction in leakage volumes, reduction in new break frequencies, reduced hydraulic impact, and extension of the existing infrastructure.
- Work with intergovernmental departments (fire and police staff) to routinely inform the utility of standing water areas and potential leaks.
- Establish a strategy for prioritizing leak repairs. Although main breaks require swift response time, losses on smaller lines deserve as much or more attention, as small losses over long periods of time may result in significant losses.
- Address leaks or inefficiencies in the water treatment plant.
- Maintain an asset management program to track aging pipes and meters with a schedule for planned replacement.
- Maintain accurate billing system records through communication between meter reading, distribution maintenance and customer service staff. Lack of communication can sometimes result in customer service staff entering erroneous information into the system (wrong multiplier, active vs. inactive accounts, etc.). Periodic field checks of billing system data may help identify and correct these errors.

A leak detection and repair program to recover lost water may benefit the water provider in many ways because recovered lost water:

- delays the need for developing new water sources and infrastructure;
- is treated and ready for use by the customer;
- is pressurized to reach the customer;

- generates additional revenue; and
- conserves energy.

SPECIFIC SUB-TASKS

Sub-Task	Description
Assess local water losses annually	Use the IWA/AWWA methodology annually to calculate the system water loss and causes of greatest water loss.
Develop a program for identifying and reducing local water system loss	Based on the water loss assessment and local knowledge, develop steps for reducing apparent and real losses as used in the AWWA Water Audits. These steps should be based on local conditions, such as the age and condition of the system and past efforts at reducing water losses.
Set a goal for real water losses	Each water system must set a goal for real water losses that will be achieved and/or maintained over the next five years.

ACTION ITEM 5.7 – CONDUCT RESIDENTIAL WATER AUDITS

ACTION ITEM

Provide residential water audit information to residential water customers.

Responsible Party

☑ Local Water Provider
☐ Local Government
☐ Other: _____

In Coordination With

☐ Local Water Providers
☐ Local Wastewater Provider
☐ Local Government
☐ Other

OBJECTIVE

The objective of this measure is to reduce residential water use by educating residents on how they use water and how use can be reduced.

DESCRIPTION OF MEASURE

Residential water audits should be made available to the top 25% of water users. In addition, audits can be made available to customers who complain about high water bills. This guidance may be made available either through mailings, provided at the local water provider office or hosted on the website.

The Metro Water District has developed a "Do It Yourself Household Water Assessment" to assist water providers with residential water audits. The assessment process includes:

- Analyzing how much water you use;
- Detecting leaks (pipes, toilets, faucets);
- Checking for and using water-efficient appliances;
- Assessing outdoor water use; and
- Changing water use habits.

Copies of the assessment tool will be made available for display in local water provider billing offices. In addition, the local water provider may choose to mail the brochure with a bill and/or place on website. This measure may be conducted jointly with conservation measure #8 (distribute low-flow retrofit kits to residential users).

SPECIFIC SUB-TASKS

Sub-Task	Description
Develop a water audit program	Utilize the "Do It Yourself Household Water Assessment" or other materials to educate customers on their water use through a self-water audit.
Distribute water audits	Distribute the "Do It Yourself Household Water Assessment" or other materials to target audience.

ACTION ITEM 5.8 – DISTRIBUTE LOW-FLOW RETROFIT KITS TO RESIDENTIAL USERS

Responsible Party

☑ Local Water Provider
☐ Local Government
☐ Other: _____

In Coordination With

☐ Local Water Providers
☐ Local Wastewater Provider
☐ Local Government
☐ Other: _____

ACTION ITEM

Distribute low-flow retrofit kits to customers.

OBJECTIVE

The objective of this measure is to reduce residential indoor water use by retrofitting faucets, showerheads and other water-saving devices.

DESCRIPTION OF MEASURE

Retrofit kits are intended to target portions of the service area with homes built before 1993. Local water providers may advertise the availability of retrofit kits, direct mail, distribute at festivals, or other forms of distribution.

A low-flow retrofit kit is a package of water saving devices that can assist residents to save water at home and typically includes low-flow showerheads, faucet aerators, and other applicable retrofit items. It is important to promote water conservation in the home due to the fact that 54 percent of water used in the Atlanta region occurs in the home. The distribution of low-flow retrofit kits can accelerate the natural conversion of less efficient plumbing fixtures.

The recommended water conservation retrofit kit currently contains 5 products including a low-flow showerhead, a kitchen aerator, a low-flow faucet aerator, leak detection dye tablets and a flow meter bag. Each local water provider should tailor their kits toward their customer base. Detailed product descriptions are provided below.

Low-Flow Showerhead: A highly efficient showerhead uses 2.0 gallons/min. The showerhead uses air pressure instead of extra water to provide water at a comfortable rate. Low flow showerheads provide an even spray pattern and may also offer a variety of spray patterns.

Kitchen Faucet Aerator: A highly efficient kitchen aerator provides an even spray pattern at 2.0 gallons/ minute.

Low-Flow Lavatory Faucet Aerator: A highly efficient faucet aerator provides an even spray pattern at 1.0 gallons/min.

Leak Detection Dye Tablets: The leak detection dye tablets provide a way to check for leaks in toilets.

Flow Meter Bag: The flow meter bag helps with measuring the flow from a showerhead or faucet.

The Metro Water District provides a list of retrofit kit providers on their website. Local water providers with high outdoor use consumption may choose to include outdoor water saving devices in retrofit kits.

SPECIFIC SUB-TASKS

Sub-Task	Description
Purchase low flow retrofit kits	Identify and purchase low flow retrofit kits appropriate for the local water service area.
Distribute low flow retrofit kits	Target the distribution of retrofit kits to customers in pre-1993 properties.

ACTION ITEM 5.9 – CONDUCT COMMERCIAL WATER AUDITS

ACTION ITEM

Develop a commercial water audit program that targets high water users.

Responsible Party

☑ Local Water Provider
☐ Local Government
☐ Other: _____

In Coordination With

☐ Local Water Providers
☐ Local Wastewater Provider
☐ Local Government
☑ Other: P2AD

OBJECTIVE

The objective of this measure is to reduce water consumption from commercial and industrial water users, by site specific assessments of use and potential for improved efficiency.

DESCRIPTION OF MEASURE

A commercial water audit program includes on-site water audits at commercial, industrial and institutional facilities. Water providers should inform customers of the program and offer the on-site water assessment. Interested customers will typically provide basic water use information about the facility prior to an on-site assessment. Local water providers may want to ask commercial and industrial facilities to make an early commitment to reduce water consumption.

Once an on-site assessment is performed, the water provider should provide the customer with recommended measures based on payback period. The Pollution Prevention Assistance Division (P2AD) has developed a spreadsheet for assessing water conservation opportunities based on the payback period for capital improvements. Following the audit, local water providers could periodically check in with facilities to encourage implementation.

Commercial, Industrial and Institutional (CII) uses are variable and complex. Examples of types of facilities may include, but are not limited to, commercial and retail centers, office buildings, hotels and motels, coin and card operated laundries, auto service and repair shops, restaurants and fast food, bakery and pastry shops, beverage manufacturers, commercial printers, fuel service stations and convenience stores, vehicle washes, schools, grocers, hospitals, industrial bakers, industrial laundries and dry cleaners, laboratories, metal finishers, paper manufacturers, water features and pools and landscapes. A facility's water use can be related to those they serve, such as industrial processes, number of hotel customers, students at a school or patients at a hospital. Different types of facilities will have different water use characteristics and potential efficiencies; however, this may also vary within the same type of facility. Therefore, an on-site water audit of a facility provides a more accurate assessment than estimating efficiencies of certain types of facilities. Commercial water audits include a site visit, characterization of existing water uses, and recommended changes to process and operations to reduce water usage.

SPECIFIC SUB-TASKS

Sub-Task	Description
Train personnel	Train personnel to conduct commercial water audits using the P2AD water audit spreadsheet or other method of assessing water conservation potential.
Advertise water audit program	Contact highest commercial water users or otherwise advertise the audit program.
Conduct audits with interested commercial partners	Perform water audits with interested commercial partners based on the local program.
Report results to commercial partners	Provide recommendations of cost-beneficial water conservation measures based on the site audit.

ACTION ITEM 5.10 – IMPLEMENT EDUCATION AND PUBLIC AWARENESS PLAN

ACTION ITEM

Develop a local public education program with both education and outreach activities.

Responsible Party

- ☑ Local Water Provider
- ☐ Local Government
- ☐ Other: _____

In Coordination With

- ☐ Local Water Providers
- ☑ Local Wastewater Provider
- ☑ Local Government
- ☑ Other: Keep America Beautiful Affiliate, Environmental Education

OBJECTIVE

The objective of this measure is to enhance public cooperation and support for water conservation by conducting information and outreach programs.

DESCRIPTION OF MEASURE

There are a number of regional education programs outlined in Section 12, Public Education and Awareness. Based on the regional program, local water providers must implement a local water conservation education and outreach program. Local water providers must implement a minimum number of education and outreach activities based on Table 5-2. The optional education toolbox is provided in Table 5-3 to provide ideas for enhancing existing local public education programs.

TABLE 5-2
Minimum Local Education and Public Awareness Program Annual Requirements

Population	Education and Outreach Activities	Public Participation and Involvement Activities
<50,000	2	2
>50,000	3	3

TABLE 5-3
Optional Education Toolbox

Education and Outreach Activities	Public Participation and Involvement Activities
Bill stuffers or newsletters	Water treatment facility tours
Brochures at municipal facilities	Citizen advisory group
Website with water conservation information	Water festivals
Local Cable or Government TV station programming	School classroom education
Speakers bureau presentations	Technical training to target audiences
Press releases	Retrofit kit distribution

Education and Outreach Activities	Public Participation and Involvement Activities
Provide historical water use on water bills	Essay contests
Adopt a water waste ordinance	Coloring book contest
Xeriscape demonstration garden	Community workshops
Promote toilet rebate program	Interactive kiosks / exhibits
Other innovative education and outreach activities	Other innovative public participation and involvement activities

Local water providers are encouraged to work with the local wastewater providers, local government staff, extension service agent, and Keep America Beautiful affiliates to include water conservation in existing programs and events.

In addition to the regional education and public awareness program, as described in Section 12, the Metro Water District may consider the following:

- Research Homeowner Association conditions that mandate irrigation and determine approach to prohibit mandatory irrigation.
- Develop a model "water waste" ordinance.
- Promote water efficiency aspects of green building.
- Assist with development of a new home efficiency award program.
- Sponsor an annual awards program for water saving businesses.
- Offer cooling tower education and training.
- Add additional emphasis to outdoor watering education including developing educational materials on rainwater harvesting and efficient water use for pools, spas, pressure washing and non-commercial car washing.
- Provide education on energy and water savings possible through implementing water conservation practices.

SPECIFIC SUB-TASKS

Sub-Task	Description
Develop a local public education program	In conjunction with the regional educational efforts, each local water provider will implement a local education program.
Perform public education and outreach activities	Perform activities to educate the public either individually, or in combination with other agencies/partners.
Perform public participation and involvement activities	Perform activities to engage the public either individually, or in combination with other agencies/partners.

ACTION ITEM 5.11 – INSTALL HIGH EFFICIENCY TOILETS AND HIGH EFFICIENCY URINALS IN GOVERNMENT BUILDINGS

ACTION ITEM

Develop a program and schedule for the replacement of inefficient toilets and urinals within government buildings with high efficiency toilets and high efficiency urinals.

Responsible Party

☑ Local Water Provider
☑ Local Government
☐ Other: _____

In Coordination With

☐ Local Water Providers
☐ Local Wastewater Provider
☐ Local Government
☐ Other: _____

OBJECTIVE

The objective of this measure is to demonstrate leadership in water conservation and reduce water use by replacing older plumbing fixtures with high efficiency toilets and high efficiency urinals within government buildings.

DESCRIPTION OF MEASURE

Local governments and local water providers should demonstrate leadership in practicing water conservation. Replacing inefficient fixtures with high efficiency fixtures in government buildings not only conserves water for the local government, it provides an opportunity for public awareness and education. High efficiency replacement fixtures include HET toilets, 1.28 gpf or less, and high-efficiency urinals, 0.5 gpf or less.

This measure focuses on government buildings and includes public administration buildings, local water provider administration buildings, public libraries, and court buildings. This action item only requires the retrofit of 3.5 gpf or higher toilets and urinals greater than 1.0 gpf.

Funding for this measure can come from a variety of sources including local water provider budgets, City or County general funds or building renovation funds. Options for implementation of this action item include; direct replacement programs, establishing a new toilet replacement line item in department budgets to cover replacement costs, or providing rebates for government buildings.

HETs are a relatively new technology that is not available at all retail locations within the Metro Water District. This measure will not be required until the technology is widely available, with replacement programs initiated by 2014 and all of the listed buildings retrofitted by 2020.

SPECIFIC SUB-TASKS

Sub-Task	Description
Develop a list of eligible government buildings	Develop a list of all public administration buildings, local water provider administration buildings, public libraries, and court buildings with the approximate number of fixtures to retrofit.
Develop a retrofit schedule and program	Determine the schedule and funding mechanism for retrofitting the less efficient fixtures. Programs should begin by year 2014.
Retrofit fixtures	Replace all toilets greater than 3.5 gpf with HET toilets and all urinals greater than 1.0 gpf by 2020.

ACTION ITEM 5.12 – REQUIRE NEW CAR WASHES TO RECYCLE WATER

Responsible Party

☐Local Water Provider
☑ Local Government
☐ Other: _____

In Coordination With

☑ Local Water Providers
☐ Local Wastewater Provider
☐ Local Government
☐ Other: _____

ACTION ITEM

Adopt an ordinance that requires all new drive-through car washes to recycle water.

OBJECTIVE

The objective of this measure is to reduce water consumption from drive-through car wash facilities by requiring them to recycle water.

DESCRIPTION OF MEASURE

This measure requires local governments to pass ordinances or regulations requiring all new drive-through car washes, including in-bay and conveyor washes, to recycle water. In lieu of an ordinance, local water providers may require car washes to recycle water in order to get a water meter or local governments may incorporate the requirement in local development guidance. A local policy may be used in lieu of an ordinance.

Car washes are estimated to use an estimated 1.7 MGD in the State of Georgia, according to the Southeastern Car Wash Association. The number of carwashes in the Metro Water District is estimated at 200. Recycling water at car washes is estimated to potentially reduce car wash water usage by 35%.

There are three main types of car washes: self-service, in-bay, and conveyor. The self-service car washes are typically coin-operated with spray wands and brushes operated by the customer. In-bay automatic car washes are characterized by a wash bay in which the customer stays in their car as the carwash equipment uses either spray nozzles or brushes, or a combination of both to process the individual cycles. The conveyor car wash is usually installed in a tunnel, and includes a series of cloth brushes or curtains and arches from which water is sprayed while the car is pulled through the tunnel on a conveyor chain. The self-service car wash typically uses 15 gallons per wash, while the in-bay and conveyor washes typically use 50 and 35 gallons per wash, respectively. Because the self-service washes use less water, these facilities do not generally recycle water. However, the in-bay and conveyor washes will be subject to recycle requirements.

The Metro Water District should develop guidance for an ordinance to require recycling of water at drive-through car washes.

SPECIFIC SUB-TASKS

Sub-Task	Description
Adopt a local ordinance or regulation	Require all new drive-through car washes to recycle water by 2010.
Update plan review procedures	Update plan review procedures, as needed, to ensure new drive-through car washes recycle water.

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Section 6: WATER SUPPLY SOURCES

This Section identifies surface water supply sources for the Metro Water District to meet future water demands. The first part of this Section discusses the water supply sources intended to meet water needs through the 2035 planning horizon. The rest of this Section discusses alternate potential water supply sources or those for post-2035 consideration.

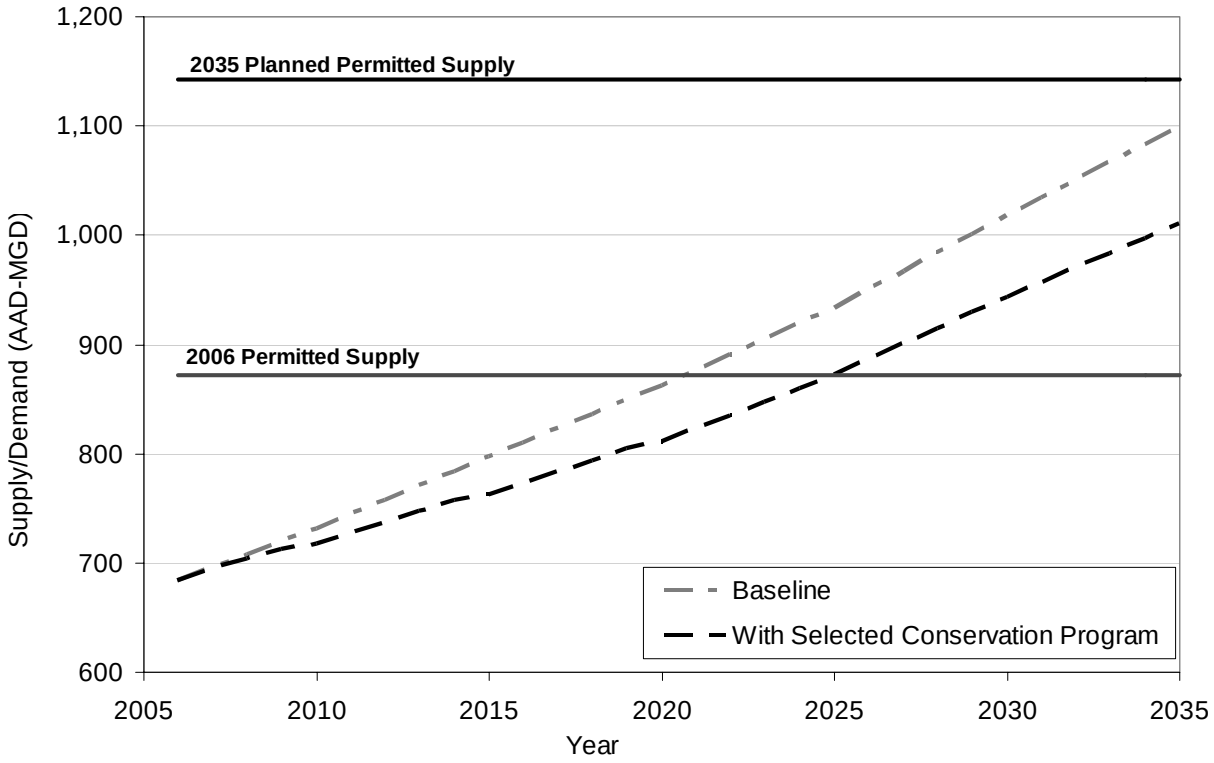
MEETING 2035 DEMAND

By 2035, the Metro Water District's water demands will be approaching 1,011 AAD-MGD as shown in Table 3-5 with the aggressive water conservation program discussed in Section 5. The current permitted surface water supply is 882 AAD-MGD, therefore to meet the projected future water supply needs in the Metro Water District through 2035, additional water supply sources will be needed. It is important to note that the savings from the Metro Water District water conservation program were considered first, prior to looking at additional water supply sources. The water supply evaluation performed for the 2003 plan served as a starting point for identifying new sources, supplemented by additional water supply sources identified through discussions with local water providers and previous water supply evaluations performed by local and regional agencies. These future water supply alternatives to meet 2035 demands included:

- Existing water supply sources and reservoirs
- Expansions of existing sources
- Potential new water supply sources

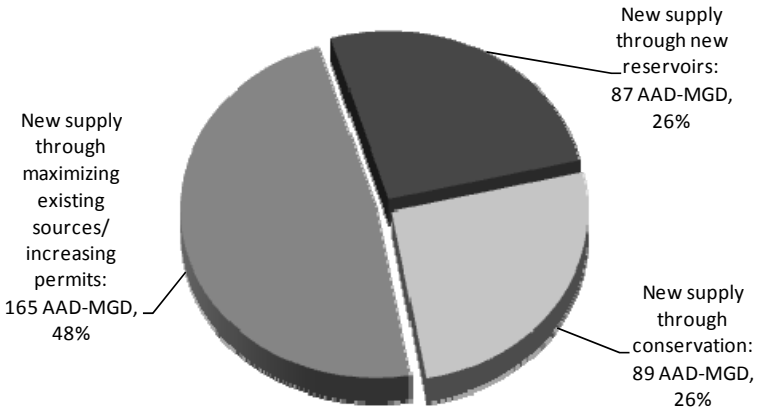
Each of these sources was evaluated and considered in conjunction with local plans, priorities and preferences. On an average annual basis, the anticipated year 2035 permitted surface water supply is 1,140 AAD-MGD. Figure 6-1 shows graphically that the water supplies identified will meet 2035 forecasted demands.

FIGURE 6-1
Metro Water District Water Demand and Supply Forecasts



To meet the 2035 water demands, this Water Supply and Water Conservation Management Plan relies on (1) an aggressive water conservation program, (2) maximizing existing supply sources, and (3) new supply sources through new reservoirs. Figure 6-2 shows that the majority of planned future supplies over currently permitted supplies are the result of maximizing existing water supply sources while conservation provides slightly more water than new reservoir sources.

FIGURE 6-2
Comparison of Future Water Supplies to Meet Demands



WATER SUPPLY EVALUATION CRITERIA

The evaluation criteria used to develop the recommended water supply sources was based on the alternatives evaluation in the 2003 Water Supply and Water Conservation Management Plan with some adjustments as outlined below.

Maximize the use of existing sources and facilities. Water supply sources and treatment facilities are a major investment for local water providers; therefore maximizing existing water supply sources is cost-effective and generally involves the lowest environmental impact.

Minimize interbasin transfers and maximize basin self-sufficiency. Maximizing basin self-sufficiency includes both minimizing interbasin transfers and careful use of the allocations from Lake Lanier and Allatoona Lake. The Metro Water District has always supported the minimization of interbasin transfers.

Maximize reuse opportunities. With limited drinking water supplies in the Metro Water District, indirect potable reuse is viewed as an amenity to replenish drinking water supplies. Indirect potable reuse is critical to meeting future water supply needs in Lake Lanier and Allatoona Lake. Non-potable reuse replaces demands for potable water supply, thereby extending limited available water supply sources.

Continue to protect water quality. Protecting existing and future drinking water supplies is a strong priority of the Wastewater Management Plan and the Watershed Management Plan. The location of new drinking water supply sources must consider water quality as well as instream water needs.

Advanced treatment technologies. As the use of indirect potable reuse to augment water supplies increases, it will likely be accompanied by upgrades to treatment technologies in drinking water treatment plants. Technologies such as UV disinfection may provide added barriers and ensure continued delivery of high quality potable water.

2035 WATER SUPPLY SOURCES

The following discussion presents the preferred water supply sources to meet 2035 water demands consistent with the County Level Summaries in Appendix B. The sources identified to meet 2035 water demands are shown on Figure 6-3 and in Table 6-1.

As discussed in Section 2, groundwater use makes up less than 1% of the public water supplies for the Metro Water District due to bedrock geology. Over the 2035 planning horizon, it is expected that the percentage of groundwater use will remain about constant. For planning purposes, groundwater supply sources have been factored into the water supply as a source for small towns and as a supplemental source.

While water reuse is an important component of this Water Supply and Water Conservation Management Plan, it is considered a mechanism for increasing reliability and extending supplies. Reuse is covered in detail in Section 7.

FIGURE 6-3
Surface Water Supply Sources Identified to Meet 2035 Demands

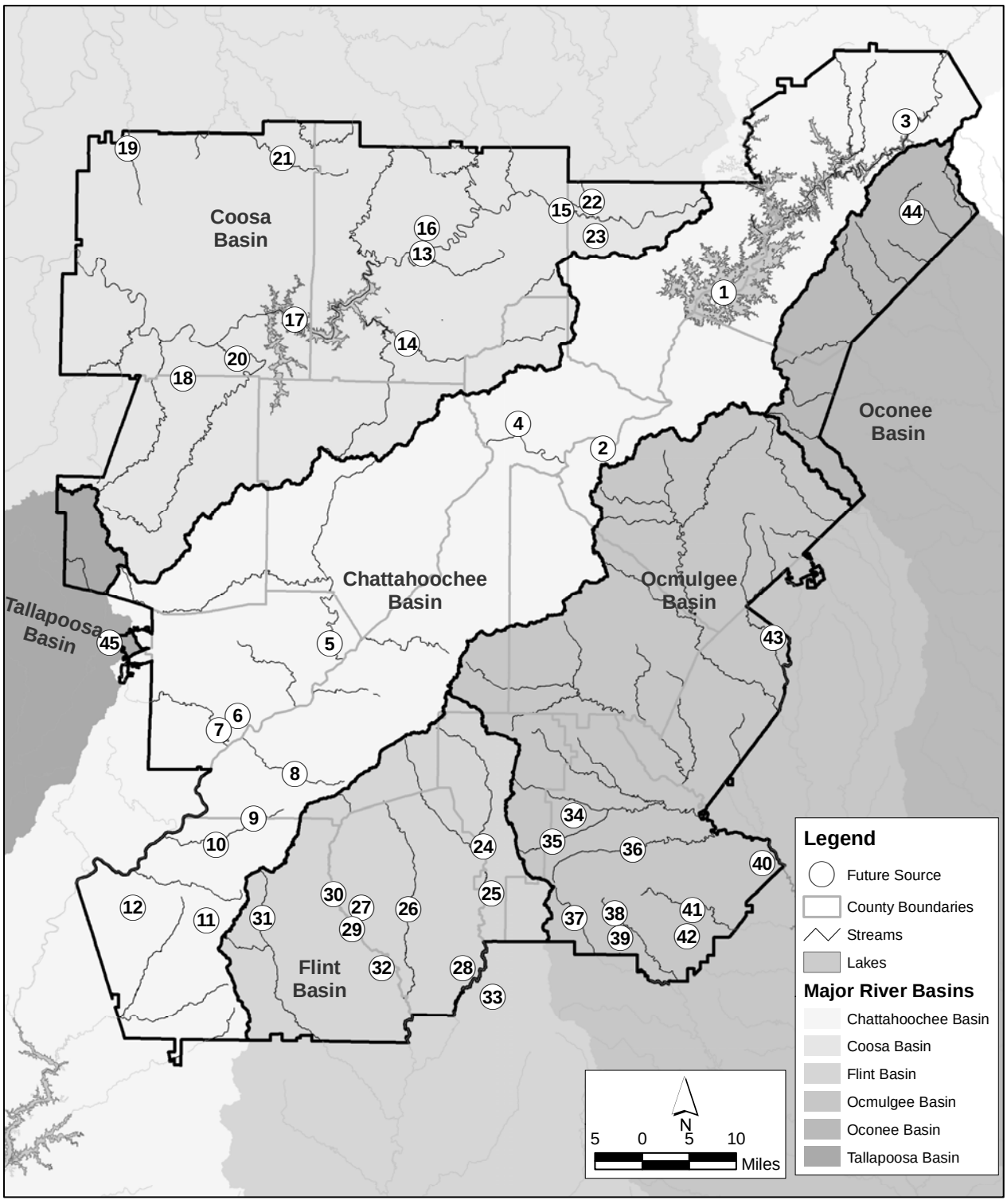


TABLE 6-1
Surface Water Supply Sources Through 2035

Water Supply Source	Owner/Operator Utilizing Source	2035 Planned Permitted Monthly Average Withdrawal (MGD) (Note 10)
Chattahoochee River Basin		
1 Lake Lanier	City of Cumming	27
	Forsyth County Water Resources	51
	Gwinnett County DWR	169
	City of Buford	3.22
	City of Gainesville Public Utilities	53
2 Chattahoochee River	Cobb County-Marietta Water Authority	87
	DeKalb County Watershed Management	140
	City of Atlanta Watershed Management	180
	Atlanta - Fulton County Water Resources	116
	Forsyth County / City of Cumming	(Note 1)
3 Glades Reservoir (Flat Creek)	Hall County	TBD
4 Big Creek	City of Roswell	3.75
5 Sweetwater Creek	City of East Point	11.5
6 Bear Creek (Douglas County)	Douglasville-Douglas County Water and Sewer Authority	(Note 2)
7 Dog River	Douglasville-Douglas County Water and Sewer Authority	23
8 Bear Creek (Fulton County)	TBD	11
9 Cedar Creek (Fulton County)	City of Palmetto	0.45
10 Cedar Creek (BT Brown) Reservoir (Coweta County)	Coweta County Water and Sewerage Authority	7.5
11 Sandy Brown Creek and J.T. Haynes Reservoir	Newnan Utilities	15.8
12 Chattahoochee Basin Options	Coweta County	8
Chattahoochee River Basin Total		**907.22**
Coosa River Basin		
13 Etowah River	City of Canton	13.5
	City of Cartersville	(Note 3)

Water Supply Source	Owner/Operator Utilizing Source	2035 Planned Permitted Monthly Average Withdrawal (MGD) (Note 10)
14 Etowah Watershed Reservoir (Note 4)	Fulton County	15
15 Etowah River / Yellow Creek (Lathem Reservoir)	Cherokee County Water and Sewerage Authority	39.8
16 Etowah River / Hickory Log Creek	Cobb County-Marietta Water Authority	(Note 5)
	City of Canton	
17 Allatoona Lake	Cobb County-Marietta Water Authority	106.5
	City of Cartersville	52.5
18 Etowah River / Richland Creek	Paulding County	30
19 Lewis Spring	City of Adairsville	4.5
20 Moss Springs	City of Emerson	0.5
21 Bolivar Springs	Bartow County	0.8
22 Bannister Creek	Forsyth County	TBD (Note 1)
23 Etowah Watershed Reservoir	Forsyth County	
Coosa River Basin Total		**263.1**
Flint River Basin		
24 Flint River	Clayton County Water Authority	(Note 6)
	Fayette County Water System	(Note 7)
25 J.W. Smith and Shoal Creek Reservoirs	Clayton County Water Authority	19.8 (Note 8)
26 Whitewater Creek	City of Fayetteville	3
	Fayette County Water System (Note 6)	31
27 Lake Kedron / Lake Peachtree (Flat Creek)	Fayette County Water System	
28 Lake Horton (Horton Creek)	Fayette County Water System	
29 Lake McIntosh (Line Creek)	Fayette County Water System	
30 Line Creek	Newnan Utilities	(Note 9)
31 White Oak Creek	Newnan Utilities	
32 Hutchins' Lake (Keg Creek)	City of Senoia	0.45
33 Still Branch Creek	City of Griffin (to Coweta County)	7.5
Flint River Basin Total		**61.75**

Water Supply Source	Owner/Operator Utilizing Source	2035 Planned Permitted Monthly Average Withdrawal (MGD) (Note 10)
Ocmulgee River Basin		
34 W.J. Hooper Reservoir (Little Cotton Indian Creek)	Clayton County Water Authority	39.5 (Note 8)
35 Blalock Reservoir (Pates Creek)	Clayton County Water Authority	
36 Fargason (Walnut Creek) Reservoir	City of McDonough	2.4
37 Towaliga River Reservoirs (Strickland and Cole)	Henry County Water and Sewerage Authority	21.75
38 Gardner (Indian Creek) Reservoir	Henry County Water and Sewerage Authority	
39 Rowland (Long Branch) Reservoir	Henry County Water and Sewerage Authority	
40 Ocmulgee Reservoir	Henry County Water and Sewerage Authority	39
41 Tussahaw Creek Reservoir	Henry County Water and Sewerage Authority	
42 Brown Branch	City of Locust Grove	0.34
43 Big Haynes Creek	Rockdale County	22.1
Ocmulgee River Basin Total		**125.09**
Oconee River Basin		
44 North Oconee River / Cedar Creek	City of Gainesville Public Utilities	9
Tallapoosa River Basin		
45 Little Tallapoosa River (Lake Fashion / Cowan Lake)	City of Villa Rica	2.25
Totals		
Metro Water District Total	Monthly Average	1,368.41
	Annual Average	1,140.34

Notes:
1. Alternate intake if additional supplies are unavailable from Lake Lanier
2. The Bear Creek Reservoir serves as a supplemental supply to the Dog River Reservoir.
3. Cartersville's permit for Etowah River is included within it's Allatoona Lake permit.
4. The specific location of the reservoir has not been identified, but is likely to be near the Fulton County service area.
5. Water released to Etowah River—included in Canton / Cobb County Marietta Water Authority withdrawals
6. Water pumped to fill Shoal Creek reservoir
7. Water pumped to fill Lake Horton reservoir
8. Clayton County Water Authority will increase capacity at one of its three facilities to 79 PD-MGD (59.3 MGD on a monthly average basis) by 2035. This table shows capacities evenly split.
9. White Oak Creek and Line Creek withdrawals fill JT Haynes Reservoir.
10. Annual average day equals monthly average divided by 1.2.

CHATTAHOOCHEE RIVER BASIN

The Chattahoochee River, along with Lake Lanier and several tributaries will continue to be the largest water supply source in the Metro Water District through 2035 and beyond. The major supply sources through the planning horizon are described below.

Lake Lanier: Lake Sidney Lanier is the largest reservoir on the Chattahoochee River and extends 44 miles up the Chattahoochee from Buford Dam. Gwinnett County, City of Buford, City of Cumming/Forsyth County and City of Gainesville have water supply intakes on Lake Lanier. All five local water providers are expected to increase their withdrawals through 2035 to meet demands.

Chattahoochee River: The main stem of the Chattahoochee River in the Metro Water District for water supply includes the reach from Buford Dam to Peachtree Creek. The City of Atlanta, Atlanta-Fulton County Water Resources Commission, Cobb County-Marietta Water Authority, and DeKalb County all have major water supply intakes on this reach. Through 2035, it is anticipated that Atlanta-Fulton County Water Resources Commission will increase its permitted withdrawal from the Chattahoochee River. Forsyth County/City of Cumming may develop an intake on the Chattahoochee River during the planning horizon if additional supplies from Lake Lanier are not obtained.

Flat Creek (Glades Reservoir): A land owner in Hall County is currently in the permitting process for a new 733-acre reservoir on Flat Creek that will release water into Lake Lanier in Hall County. Expected year 2035 monthly withdrawal from this source is yet to be determined.

Big Creek: Big Creek in north Fulton County is a water supply source for the City of Roswell with a permitted monthly average withdrawal of 1.2 MGD. A safe yield analysis of Big Creek and additional supplemental sources are currently under investigation. Roswell plans to continue using this supply with a total monthly average withdrawal of 3.75 MGD by 2035 from a combination of groundwater and surface water sources.

Sweetwater Creek: The City of East Point has a water withdrawal intake on Sweetwater Creek in Douglas County. The Ben Hill reservoir provides storage and serves as a management tool to ensure the minimum required flow from Sweetwater Creek to the Chattahoochee River and to ensure adequate flows in Sweetwater Creek during droughts. Through 2035, no expansion or changes in the permitted monthly average withdrawal of 11.5 MGD are being considered.

Bear Creek (Douglas County): The Douglasville-Douglas County Water and Sewer Authority operates a reservoir on Bear Creek in Douglas County. The Bear Creek Reservoir serves as a supplemental supply to the Dog River Reservoir.

Dog River: The Dog River Reservoir in Douglas County is operated by the Douglasville-Douglas County Water and Sewer Authority. A project currently underway to increase the dam height will allow for an increase of permitted monthly withdrawal to 23 AAD-MGD.

Bear Creek (Fulton County): A new impoundment is proposed on Bear Creek in south Fulton County. This project would have an expected permitted monthly withdrawal of 11 MGD in year 2035.

Cedar Creek (Fulton County): The City of Palmetto has a water withdrawal intake and chain of reservoirs on Cedar Creek in south Fulton County. This facility has a maximum yield of 1.0 AAD-MGD. Palmetto plans to continue utilizing this source through 2035.

Cedar Creek (Coweta County): The B.T. Brown Reservoir on Cedar Creek in Coweta County is operated by the Coweta County Water and Sewerage Authority. The Authority proposes increasing the yield of this reservoir to allow for 10 PD-MGD capacity at the treatment plant by reducing the 12-foot freeboard between the top of the dam and normal pool without any additional structural changes.

Sandy Brown Creek and JT Haynes Reservoir: The City of Newnan uses Sandy Brown Creek as a water supply source for the off-stream J.T. Haynes Reservoir. The J.T. Haynes Reservoir is also supplemented with flows from White Oak Creek and Line Creek. Withdrawals from the J.T. Haynes Reservoir are expected to increase to a permitted monthly average withdrawal of 16 MGD by 2035.

Chattahoochee Basin Options: Coweta County will explore either purchasing water from the City of Atlanta or developing an intake on the Chattahoochee River for meeting future demands in Coweta County.

Chattahoochee Basin Limitations

Georgia EPD has determined a withdrawal limit from Lake Lanier and the Chattahoochee River above Peachtree Creek for the Metro Water District of 664 AAD-MGD. However, additional withdrawals are allowed if returns are equal to 100% of the withdrawal increment over the 664 AAD-MGD limit. Georgia EPD has also provided guidance on the rate of return for withdrawals in the Chattahoochee River Basin above Whitesburg for the Metro Water District. This Chattahoochee River Basin average annual return rate is 58% of withdrawals.

This plan complies with both requirements. The return rate in the Chattahoochee River Basin for this plan is 78% of the annual average withdrawals in 2035. This plan also complies with the withdrawal limit based on returns. The plan includes a total withdrawal of 688 AAD-MGD from the Chattahoochee River and Lake Lanier by meeting the 100% return rate of the 24 AAD-MGD beyond the 664 AAD-MGD.

COOSA RIVER BASIN

The Coosa River in the Metro Water District, which includes the Etowah River and Allatoona Lake, will continue to be the second largest water supply source for the Metro Water District through 2035. The water supply sources through the planning horizon are described below.

Etowah River: The main stem of the Etowah River provides water supplies for the City of Canton, the City of Cartersville and the Cherokee County Water and Sewerage Authority. The Cherokee County Water and Sewer Authority utilizes the Hollis Q. Lathem Reservoir as an in-stream drought contingency facility on Yellow Creek. Water is released from this reservoir during periods of critical flow in the Etowah River. Both Canton and the Cherokee County Water and Sewer Authority plan to increase withdrawals from the Etowah to meet demands through 2035. The Etowah River is also the primary source of water for the Hickory Log Creek Reservoir. The City of Cartersville in conjunction with Bartow County is considering an intake

on the Etowah River downstream of Allatoona Lake. Forsyth County is also considering adding a withdrawal from an Etowah River source. A new reservoir is under consideration by Fulton County to meet demands in North Fulton. The specific location of the reservoir within the Etowah basin has not been identified, but is likely to be near the Fulton County service area.

Allatoona Lake: Allatoona Lake is an impoundment of the Etowah River which is operated by the U.S. Army Corps of Engineers (Corps). Both the Cobb-County Marietta Water Authority and the City of Cartersville have water supply intakes on the Lake. Both local water providers plan to increase their withdrawals through 2035.

Richland Creek: Paulding County is currently in the permitting stages of a new reservoir on Richland Creek; expected permitted monthly withdrawal is 30 MGD.

Lewis Spring: The City of Adairsville utilizes Lewis Spring which is a groundwater spring, considered a surface water source. Adairsville plans to increase its use of this source slightly through 2035.

Moss Springs: The City of Emerson utilizes Moss Springs, which is a groundwater spring, considered a surface water source.

Bolivar Springs: Bartow County utilizes Bolivar Springs, which is a groundwater spring, considered a surface water source.

Bannister Creek: Forsyth County is exploring a supplemental water source to an off-stream reservoir by pumping water from Bannister Creek to the Etowah River, just upstream of its confluence with the Etowah River.

Hickory Log Creek Reservoir: Hickory Log Creek Reservoir is off-stream storage filled with water pumped from the Etowah River. Water is not withdrawn from the reservoir but instead from intake facilities downstream.

Coosa Basin Limitations

Georgia EPD has set a withdrawal limit from Allatoona Lake of 200 AAD-MGD. For other new or expanded withdrawals in the Coosa Basin, an instream protection flow of monthly 7Q10 is required. A third restriction is that interbasin transfers from the Coosa River Basin are limited to a maximum of 100 AAD-MGD.

This plan complies with those requirements. The total withdrawal from Allatoona Lake in the plan is 133 AAD-MGD. The net withdrawal for the entire Coosa Basin within the Metro Water District is 219 AAD-MGD. The interbasin transfer amount is 34 AAD-MGD.

FLINT RIVER BASIN

The Flint River basin will continue to be an important water supply source for southern Metro Water District communities through 2035. The water supply sources through the planning horizon are described below.

Flint River: The Flint River is utilized as a water supply source by both the Clayton County Water Authority and the Fayette County Water System. Clayton County Water Authority pumps

from the Flint River to fill two reservoirs located on Shoal Creek. Fayette County pumps from the Flint River to Lake Horton. Fayette County plans to increase withdrawals from the Flint River by 2035. Clayton County may also increase withdrawals from the Flint River by 2035.

J.W. Smith and Shoal Creek Reservoirs: Clayton County Water Authority has two reservoirs on Shoal Creek: the J.W. Smith Reservoir and Shoal Creek Reservoir. Both facilities are filled primarily with off-stream pumping from the Flint River.

Whitewater Creek: The City of Fayetteville and Fayette County both have intakes on Whitewater Creek. Fayette County pumps water from Whitewater Creek to either the Crosstown Water Treatment Plant or to the Lake Horton reservoir. The City of Fayetteville is considering an off-stream reservoir by 2015 for additional drought protection.

Flat Creek Reservoirs (Lake Kedron/Lake Peachtree): Lake Kedron and Lake Peachtree are two impoundments of Flat Creek which are used as a water supply source by Fayette County. No increased withdrawals from the Flat Creek reservoirs are anticipated through 2035.

Horton Creek (Lake Horton): Lake Horton is a water supply reservoir on Horton Creek in Fayette County. Water is pumped from the Flint River and Whitewater Creek to the Lake. The Fayette County Water System plans to expand withdrawals from Lake Horton through 2035.

Line Creek: Fayette County has an impoundment on Line Creek, Lake McIntosh, which provides a yield of 12.5 AAD-MGD. Newnan Utilities has an intake on Line Creek which is used as a supplemental water supply source for the off-stream J.T. Haynes Reservoir. Both Fayette County and Newnan Utilities plan to utilize additional withdrawals from Line Creek by 2035.

White Oak Creek: White Oak Creek is used by Newnan Utilities as a water supply source for the off-stream J.T. Haynes Reservoir. No additional withdrawals are expected from this source through 2035.

Hutchins' Lake: The City of Senoia located on Keg Creek just upstream of the confluence with Line Creek. This is a small drinking water supply reservoir that serves the needs of the City of Senoia. Senoia plans to expand their permitted withdrawal by year 2015.

Still Branch Creek: Coweta County has an existing contractual agreement with the City of Griffin to purchase water from Still Branch Creek. The impoundment is located east of the Flint River in Pike County. The maximum 24 hour withdrawal is 48 MGD and the not to exceed monthly average is 42 MGD. Still Branch Creek serves the City of Griffin as well as seven wholesale customers.

OCMULGEE RIVER BASIN

The Ocmulgee River Basin includes a number of important water supply sources for the southwest communities in the Metro Water District, including Clayton, Henry and Rockdale Counties. The water supply sources through the planning horizon are described below.

W.J. Hooper Reservoir (Little Cotton Indian Creek): The Clayton County Water Authority has the William J. Hooper Reservoir on Little Cotton Indian Creek in Henry County near Stockbridge. The reservoir is supplemented with flows from the upstream Blalock Reservoir. Clayton County Water Authority has a permit to pump supplemental water from Big Cotton Indian Creek, but is not currently using this source. It is expected that some increases in withdrawals from the reservoirs on Little Cotton Indian Creek will occur by 2035.

Blalock Reservoir (Pates Creek): The Edgar Blalock Reservoir is another Clayton County Water Authority reservoir on Pates Creek fives miles upstream on its confluence with Little Cotton Indian Creek. The Blalock Reservoir can release up to 20 AAD-MGD downstream to the Hooper Reservoir. No expansions of this facility are planned through 2035.

John Fargason (Walnut Creek) Reservoir: The City of McDonough uses Walnut Creek as a water supply source and owns and operates the in-stream John Fargason reservoir. The City of McDonough plans to expand this supply source before 2010.

Towaliga River (Strickland and Cole) Reservoirs: The Henry County Water and Sewerage Authority has two reservoirs on the Towaliga River; The Edward Cole (Upper Towaliga) Reservoir and the Strickland (Lower Towaliga) Reservoir. The Towaliga Reservoirs feed the S. Howell Gardner (Indian Creek) and Rowland (Long Branch) Reservoirs. The Authority plans to expand withdrawals from the Towaliga watershed to allow for an additional 5 PD-MGD by 2025 at the Towaliga Water Treatment Plant. The additional needed capacity will be obtained through a permit increase at the Towaliga, Gardner, and/or the Rowland Reservoirs.

S. Howell Gardner (Indian Creek) Reservoir: The S. Howell Gardner Reservoir is an impoundment of Indian Creek used as a water source by the Henry County Water and Sewerage Authority at the Towaliga Water Treatment Plant. The Authority is planning for an additional 5 PD-MGD by 2025 at the Towaliga Water Treatment Plant. The additional needed capacity will be obtained through a permit increase at the Towaliga, Gardner, and/or the Rowland Reservoirs.

Rowland (Long Branch) Reservoir: The Rowland Reservoir is an impoundment of Long Branch used as a water source by the Henry County Water and Sewerage Authority at the Towaliga Water Treatment Plant. The Authority is planning for an additional 5 PD-MGD by 2025 at the Towaliga Water Treatment Plant. The additional needed capacity will be obtained through a permit increase at the Gardner Reservoir and/or the Rowland Reservoir.

Tussahaw Creek: The Tussahaw Creek Reservoir, a 1,500-acre impoundment on Tussahaw Creek, provides water supply for the Henry County Water and Sewerage Authority. The Henry County Water and Sewerage Authority plans to expand withdrawals to a maximum of 52 MGD by 2035.

Ocmulgee Reservoir: The Henry County Water and Sewerage Authority is considering a new reservoir on the Ocmulgee River. The specific location of the reservoir has not been identified.

Withdrawals from the proposed Reservoir would likely be routed to the Tussahaw Water Treatment Facility.

Brown Branch: The City of Locust Grove treats spring water from Brown Branch, which forms the headwaters to Wolf Creek. The spring water is blended with well water.

Big Haynes Creek: Big Haynes Creek is the major water supply source for Rockdale County, which withdraws from Randy Pointer Lake, an instream water supply reservoir. Rockdale County plans to increase withdrawals from this source by 2025.

OCONEE RIVER BASIN

The Oconee River Basin in the Metro Water District is composed mostly of smaller headwater streams; therefore there is only one water supply source below that is being considered for meeting 2035 demands.

North Oconee River / Cedar Creek: The City of Gainesville plans to use the North Oconee Reservoir on Cedar Creek for water supply purposes and pump from the North Oconee River as a supplemental source. This reservoir will have an expected permitted monthly withdrawal of 9 MGD.

TALLAPOOSA RIVER BASIN

The Tallapoosa River Basin accounts for less than 2% of the land area in the Metro Water District with primarily small headwater streams. There is only one water supply source that is planned for meeting 2035 demands.

Lake Fashion/ Cowan Lake: The City of Villa Rica withdraws water from the main reservoir Lake Fashion and the backup reservoir Cowan Lake. Both reservoirs are located in the Upper Little Tallapoosa River; Cowan Lake is fed by Astin Creek and Lake Fashion is fed by the Little Tallapoosa River. The City of Villa Rica plans to expand this supply source before 2015.

FUTURE INTERBASIN TRANSFERS

Table 6-2 provides the future interbasin transfers, based on 2035 demand forecasts and the facilities planned to meet the forecasted demand. Future planned water supplies aimed to minimize interbasin transfers are discussed in the evaluation criteria discussion.

In Table 6-2, the water supply interbasin transfer shows the difference between withdrawal and consumption and the wastewater shows the difference between consumption and discharge. The net interbasin transfer shows the total interbasin transfer based on expected permitted withdrawals and discharges.

TABLE 6-2
Summary of 2035 Interbasin Transfers

Water Supply		
Water Supply Basin	**Receiving Basin**	**Transfer (AAD-MGD)**
Chattahoochee	Flint	19
Chattahoochee	Ocmulgee	179
Chattahoochee	Oconee	15
Coosa	Chattahoochee	36
Coosa	Tallapoosa	2
Ocmulgee	Flint	15
Wastewater Returns		
Basin Generated	**Basin Discharge**	**Transfer (AAD-MGD)**
Chattahoochee	Coosa	4
Flint	Chattahoochee	12
Flint	Ocmulgee	17
Ocmulgee	Chattahoochee	82
Oconee	Chattahoochee	9
Net Interbasin Transfer		
Source Basin	**Receiving Basin**	**Net Transfer (AAD-MGD)**
Chattahoochee	Flint	7
Chattahoochee	Ocmulgee	97
Chattahoochee	Oconee	6
Coosa	Chattahoochee	32
Coosa	Tallapoosa	2
Flint	Ocmulgee	2

POST-2035 WATER SUPPLY OPTIONS

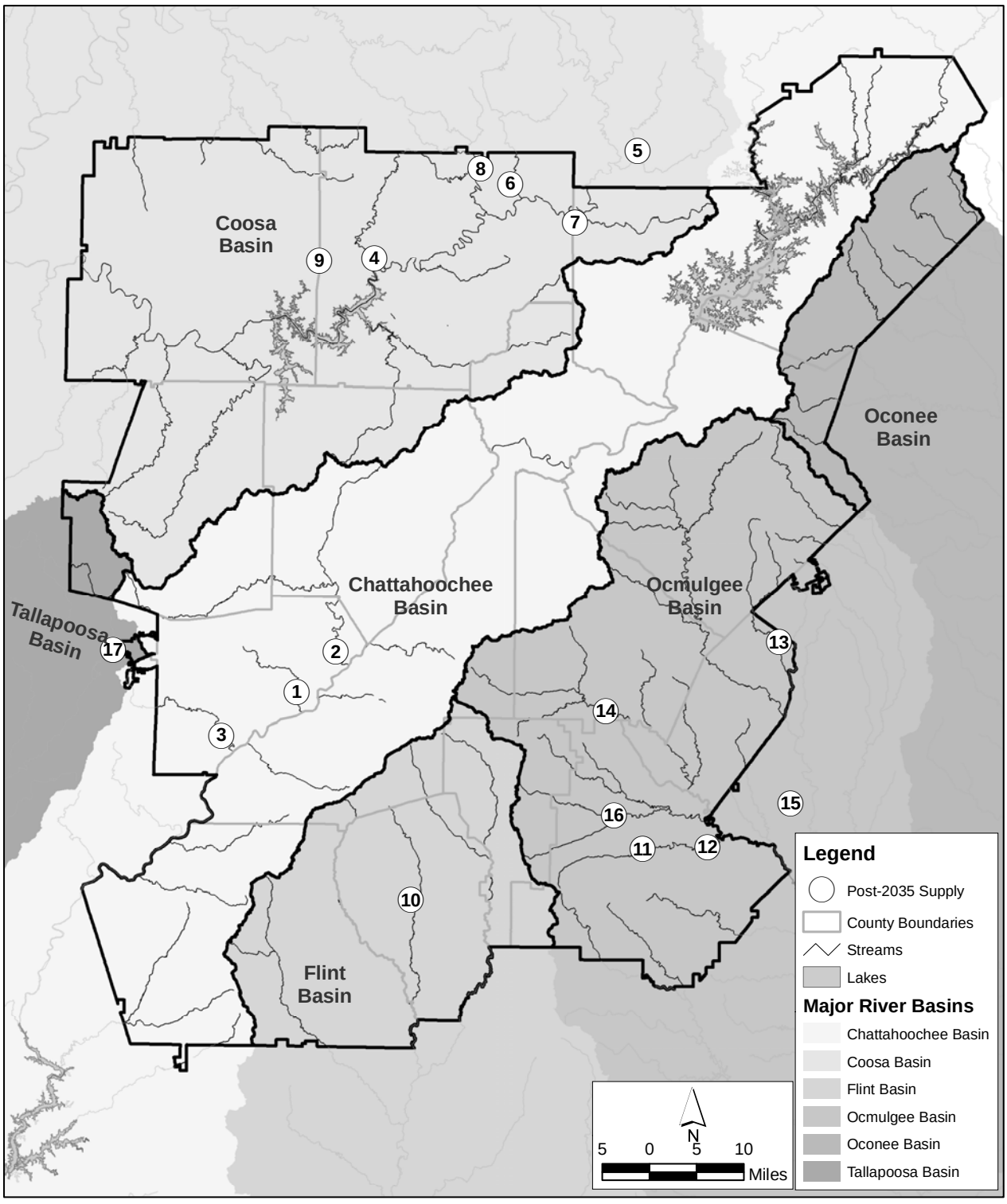
The following potential new water supply sources are not required to meet the expected future demands of the Metro Water District through 2035. However, they may be considered as water supply alternatives if any of the planned water supply sources are not realized and for future water supply demands beyond 2035. While not all of these water supply sources may be needed to meet demands beyond 2035, a wider range of potential alternatives will provide for better future planning.

The information on yield for the water supply sources are for future planning purposes and based on data collected for the 2003 Water Supply and Water Conservation Management Plan with supplemental information provided by the local water providers. Safe yield analysis would be required to confirm the ability of these potential sources to meet future demands.

A number of the post-2035 water supply options include regional reservoirs. The development and use of water supply sources outside the Metro Water District will be determined in accordance with the regional planning process under the Comprehensive State-wide Water Management Plan adopted by the 2008 General Assembly. Georgia EPD certification of this Plan does not constitute an endorsement of the development of the post-2035 potential water supply sources listed in the remainder of this Section.

Realizing future water supply sources can require decades of planning and significant capital expenditure. Knowing these time and financial investments, planning ahead for needs beyond the 2035 planning horizon within the bounds of the 2035 planning horizon is critical. Further evaluation and vetting of these post-2035 potential water supply sources beyond this Plan by the TCC is recommended in Section 11. Figure 6-4 shows the location of these potential water supply options that are further summarized by basin.

FIGURE 6-4
Additional Potential New Surface Water Supply Sources for the Metro Water District (Post-2035)



CHATTAHOOCHEE RIVER BASIN

Anneewakee Creek: A new reservoir on Anneewakee Creek near the confluence with Chattahoochee River.

Sweetwater Creek: A new dam and reservoir on Sweetwater Creek near the confluence with Chattahoochee River.

Dog River Reservoir: The Dog River Reservoir could be expanded as a water supply source by raising the dam and expanding storage volume from its current 1.9 BG to 5.44 BG.

TABLE 6-3
Chattahoochee River Basin – Other Potential Surface Water Supply Sources (Post-2035)

Water Supply Source	Description
1 Anneewakee Creek	Reservoir on Anneewakee Creek near confluence with Chattahoochee River
2 Sweetwater Creek	New dam and reservoir on Sweetwater Creek near confluence with Chattahoochee River
3 Dog River Reservoir	Increase dam height on Dog River Reservoir

COOSA RIVER BASIN

Shoal Creek (Options 1 and 2): Pump water from Shoal Creek about 5 miles upstream of its confluence from the Etowah River to an off-stream storage reservoir to supplement flows in the Etowah River. A second option would be a reservoir site in southwest Dawson County filled by Shoal Creek only or with water pumped from the Etowah River.

Long Swamp Creek (Options 1 and 2): Construct a low dam and river intake on Long Swamp Creek and store water during wet weather conditions in quarries near Tate, Georgia to augment flows to Allatoona Lake. Another option would involve constructing off-stream storage reservoir on Long Creek, two miles upstream of its confluence with the Etowah River.

Settingdown Creek: Off-stream reservoir on Settingdown Creek at its confluence with the Etowah River, with regulated releases to the Etowah River.

Sharp Mountain Creek: New dam and reservoir located on Sharp Mountain Creek, 1,000 feet upstream of Spence Road. The Cobb County-Marietta Water Authority has purchased most of the land required for the reservoir.

Boston Creek: A new 249-acre reservoir on Boston Creek with estimated usable volume of 1,950 MG at normal pool.

TABLE 6-4
Coosa River Basin – Other Potential Surface Water Supply Sources (Post-2035)

Water Supply Source		Description
4 Shoal Creek (Option 1)		Pump water from Shoal Creek to an off-stream storage reservoir to supplement flows in Etowah River.
5 Shoal Creek (Option 2)		Reservior site in Dawson County filled by Shoal Creek only or water pumped from the Etowah River.
6 Long Swamp Creek	Option 1	Construct a low dam and river intake on Long Swamp Creek and store water in quarries to augment flows to Allatoona Lake.
	Option 2	A potential off-stream storage reservoir on Long Swamp Creek, two miles upstream of its confluence with the Etowah River.
7 Settingdown Creek		Off-stream reservoir on Settingdown Creek at its confluence with the Etowah River, with regulated releases to the Etowah River.
8 Sharp Mountain Creek		New dam and reservoir located on Sharp Mountain Creek.
9 Boston Creek		A new 249-acre reservoir on Boston Creek for withdrawal credits from Allatoona Lake.

FLINT RIVER BASIN

Whitewater Creek: New reservoir on Pelham Creek near Davis Road supplied by Whitewater Creek. The land for this facility has been purchased by Fayetteville, but permitting has not been started.

TABLE 6-5
Flint River Basin – Other Potential Surface Water Supply Sources (Post-2035)

Water Supply Source	Description
10 Whitewater Creek	New reservoir on Pelham Creek near Davis Road.

OCMULGEE RIVER BASIN

Walnut Creek (Options 1 and 2): One option for additional water supplies from Walnut Creek would involve raising the dam elevation of the McDonough John Fargason Reservoir from 735 feet to 755 feet mean sea level. A second option would be a new 60-foot dam and reservoir on Walnut Creek at Turner Drive which would create 3,070 MG of usable storage.

Big Haynes Creek: The Randy Poynter Reservoir on Big Haynes Creek could be expanded as a water supply source by raising the dam by one foot.

South River: DeKalb County is investigating the possibility of a surface water intake or off-stream reservoir on the South River within the County. If feasible, this source will include indirect potable reuse to augment existing supplies.

Ocmulgee Reservoir: Additional development of water sources in the Ocmulgee Basin are being considered to meet future demands.

Big Cotton Indian Creek: Flows into the Clayton County Water Authority Hooper Reservoir have occasionally been supplemented in the past by pumping water from the Big Cotton Indian Creek at an old low-head dam site located approximately 6 miles downstream.

TABLE 6-6
Ocmulgee River Basin – Other Potential Surface Water Supply Sources (Post-2035)

Water Supply Source	Description
11 Walnut Creek (Option 1)	Raise the dam elevation from 735 feet mean sea level (MSL) to 755 feet MSL to increase yield.
12 Walnut Creek (Option 2)	New 60-foot dam and reservoir on Walnut Creek at Turner Drive.
13 Big Haynes Creek	Raise the dam by one foot to increase the safe yield.
14 South River	New intake or off-stream reservoir on South River with flows augmented by indirect potable reuse.
15 Ocmulgee Basin Source	Source in the Ocmulgee basin.
16 Big Cotton Indian Creek	Clayton County Water Authority has an inactive intake on this source. If they reactivated the withdrawal, it would be used to supplement the W.J. Hooper Reservoir.

*indicated increase in yield

OCONEE RIVER BASIN

No post-2035 sources are being considered in the Oconee River basin.

TALLAPOOSA RIVER BASIN

West Georgia Reservoir: There has been regional interest in creating a West Georgia Reservoir as a water supply source for communities both inside and outside of the Metro Water District.

TABLE 6-7
Tallapoosa River Basin – Other Potential Surface Water Supply Sources (Post-2035)

Water Supply Source	Description
17 West Georgia Reservoir	A dam and reservoir on the Tallapoosa River mainstem or a major tributary have been discussed by several west Georgia communities in Carroll or Haralson counties.

Section 7: REUSE

With the challenges associated with permitting surface water and the limited availability of groundwater, water reuse may be a viable option to extend limited, local water supply sources. Water reuse is the use of reclaimed water as a substitute for another generally higher quality water source. There are several types of reuse that may be used in the Metro Water District to extend supplies or replace potential new water sources with reuse water. Georgia EPD provided the Metro Water District with a goal to reuse 10% of the water withdrawn. This Section outlines the different types of water reuse as well as a discussion of existing and future applications in the Metro Water District identified to meet the 10% reuse goal.

TYPES OF WATER REUSE

There are several types of water reuse that may be considered now or in the future by local water providers in the Metro Water District. To provide a common starting point for a discussion of reuse, Table 7-1 defines several common water reuse terms.

TABLE 7-1
Water Reuse Terminology

Term	Definition
Reclaimed Water[1]	Wastewater that has received treatment to urban water reuse standards, meets the treatment criteria specified in Georgia EPD's reuse guidelines, and is utilized at a reuse area or is sent to a designated user for reuse. Reclaimed water can include municipal wastewater, industrial wastewater, or treated effluent.
Water Reuse or Non-potable Reuse[1]	Use of reclaimed wastewater as a substitute for another generally higher quality water source. Reclaimed water can be reused for beneficial irrigation of areas that may be accessible to the public (such as golf courses, residential and commercial landscaping parks, athletic fields, roadway medians, and landscapes) and for other beneficial uses such as cooling towers, concrete mixing, car washes, etc.
Direct Potable Reuse[2]	The introduction of highly treated reclaimed water either directly into the potable water supply distribution system downstream of a water treatment plant, or into the raw water supply immediately upstream of a water treatment plant. This method of reuse incorporates no dilution or blending with other water sources.
Indirect Potable Reuse[2]	The planned incorporation of reclaimed water into a raw water supply such as in water storage reservoirs or a groundwater aquifer, resulting in mixing and assimilation, thus providing an environmental buffer.
Grey water	"Grey water" is defined as the wastewater produced from lavatories, bathtubs, showers, clothes washers and laundry trays. It does not include wastewater from water closets, kitchen sinks, photo lab sinks, dishwashers, or any other water deemed not appropriate for grey water systems.

Notes:
1. Georgia Comprehensive State-wide Water Management Plan, January 2008.
2. Water Reuse – Issues, Technologies, and Applications, Metcalf & Eddy, Inc., 2007

METRO WATER DISTRICT WATER REUSE ALTERNATIVES

Of the water reuse categories listed in Table 7-1, only non-potable reuse and indirect potable reuse are recommended for the Metro Water District at this time. Direct potable reuse is not currently practiced in the United States, due to a lack of regulatory acceptance, public confidence with its safety and costs associated with implementing this type of reuse. Therefore, direct potable reuse is not being actively pursued for the Metro Water District at this time. Beyond 2035, both direct potable reuse and grey water may be considerations.

Water reuse in the Metro Water District offers a consistently available water supply to sustain existing sources. Treated municipal wastewater is a more reliable supply source than stormwater runoff or industrial discharges, because rain is intermittent and the treatment is not as significant. Despite these benefits, water reuse must consider public health, treatment process reliability, and carefully plan future infrastructure.

Non-potable and indirect potable reuse are both currently practiced in the Metro Water District and are expected to sustain water supplies into the future. Indirect potable reuse is highly encouraged, where appropriate. Non-potable reuse is acceptable depending on each local community's consumptive use challenges, when it offsets an existing potable water supply. The available applications and challenges of both non-potable reuse and indirect potable reuse are outlined below.

NON-POTABLE REUSE

Non-potable reuse is currently practiced in the Metro Water District in the form of golf course irrigation, industrial process water, and other urban irrigation. Several local water providers in the Metro Water District with high irrigation demands have found that non-potable reuse can offset peak potable water demands.

Existing non-potable reuse applications in the Metro Water District generally belong to one of the following categories:

- Irrigation with secondary-treated effluent in restricted areas or land treatment of wastewater
- Irrigation with high quality treated effluent in unrestricted areas such as golf courses and parks

Although most of these non-potable reuse projects were developed to eliminate or reduce wastewater discharges, the reclaimed water from at least one treatment system recharges the potable water supply via soil percolation and constructed treatment wetlands. Non-potable reuse and land application of wastewater contribute to consumptive use of water as they have varying rates of returning water to the surface water source. Non-potable reuse that replaces surface water withdrawals is one way that this practice can be considered beneficial. Below is a listing of important factors for communities to consider related to non-potable reuse.

Matching Supply and Demand

Successful programs require thorough planning to identify sufficient end-users of non-potable reuse water. Most of the irrigation users do not require water year-round, therefore storage or other uses of the water must be identified. Before initiating a non-potable reuse program, communities should develop a demand profile to assess the diurnal and seasonal variations in demand which may affect the infrastructure and storage size and location.

Providing irrigation water to golf courses can offset potable water usage and/or withdrawals from streams and groundwater, which is beneficial to the Metro Water District. Golf courses requesting increases in a water withdrawal permit or a new well permit should consider the use of reclaimed water for irrigation, when available from local wastewater providers.

Infrastructure Requirements

Infrastructure needs for pipelines, pumping stations, and storage have a significant impact on the financial viability of reuse. Early adopters of non-potable reuse typically resulted from proximity to the water reclamation facility. Proximity of industrial users to the water reuse facility can also be a challenge for some communities as dedicated reuse pipelines may be prohibitively expensive.

Economic Considerations

In addition to the infrastructure financial requirements, communities must consider the annual operations and maintenance costs of the additional treatment processes, distribution system, administration and other infrastructure. Non-potable reuse water rates should be structured so that they effectively support the capital investment in infrastructure as well as encourage conservation.

Environmental Considerations

As irrigation water is not immediately returned to surface waters for use by the downstream contemporary user, the practice of non-potable reuse for irrigation must align with any established consumptive use targets. Non-potable water reuse must consider the need for instream flows during drought to protect instream habitat.

Regulatory Considerations

Georgia EPD has established guidelines for non-potable reuse in the document: Water Reclamation and Urban Water Reuse, published in 2002. In addition to establishing water quality standards, requirements are placed on the reliability and redundancy for the reuse water treatment processes.

A summary of a few selected existing water reuse applications in the Metro Water District are presented below:

- The Cherokee Rose Creek Water Pollution Control Plant (WPCP), owned by the Cherokee County Water and Sewerage Authority (CCWSA), is permitted to discharge 2.5 MGD to either the Towne Lake Golf Course or Allatoona Lake.
- The Cauley Creek Water Reclamation Facility (WRF), located in North Fulton County, is privately owned by Cauley Creek Water Reclamation, LLC in a trust indenture relationship with

Fulton County. The current capacity of the WRF is 5 MGD. The water is distributed under pressure via two separate transmission pipelines that serve the Shakerag area of North Fulton County. The primary pipeline serves the 18-hole St. Ives and the 36-hole Atlanta Athletic Club golf courses. It could also be used to serve the Quail Hollow, Montclair, and St. Ives communities, due to the proximity of the pipeline to these developments. The pipeline is also serving the 18-hole Country Club of the South golf course, the 27-hole River Pines golf course, as well as the Standard Club. The second transmission pipeline, which is under construction, will extend northward along Bell Road and will provide reclaimed water to the Homestead and Shakerag communities as well as Technology Park, for landscape irrigation.

- The Johns Creek Environmental Campus, owned by Fulton County Department of Public Works is situated on 43 acres off Holcomb Bridge Road in the City of Roswell adjacent to the Chattahoochee River. Construction began in late 2006 and is anticipated to last approximately 40 months. The facility will replace the existing Johns Creek WRF and will have a total capacity of 15 MGD with an outfall to the adjacent Chattahoochee River as well as the capability to provide adjacent areas with non-potable reuse water.
- The Fowler WRF was commissioned as a design-build-operate facility by The Forsyth County Water and Sewer Department. Its current capacity is 2.5 MGD, with expansion capability to 7.5 MGD. It serves new communities in the Big Creek area north of Atlanta Road in Cumming. It will eventually receive flow from areas of South Forsyth County between Shiloh Road and McGinnis Ferry Road which is currently being treated by Fulton County. The treatment plant provides full urban water reuse quality water for irrigation, and has a 180-acre drip irrigation system at McGinnis Ferry Road for disposal of excess water. Through a 12-mile reuse pipeline (20-inch diameter), the WRF currently provides reuse water to a high school on Majors Road, Sharon Springs Park and St. Marlo's Country Club.

INDIRECT POTABLE REUSE

For indirect potable reuse, discharge of reclaimed water to a lake or reservoir may be preferable to the discharge of water to a river or stream. Lake Lanier and Allatoona Lake are two likely choices for indirect potable reuse; Lake Lanier currently receives reclaimed water from several sources, including the City of Gainesville and Flowery Branch. Gwinnett County is also permitted to discharge to Lake Lanier but has not begun to return water to the Lake under this permit. Cobb and Cherokee Counties return reclaimed water to Allatoona Lake. Returning reclaimed water to these sources is an important means of sustaining water supplies for the Metro Water District and is an essential strategy for meeting water supply needs within the Metro Water District.

Planned indirect potable reuse to local supply sources within a community is encouraged throughout the Metro Water District as a means of sustaining water supplies. Returning reclaimed water to a local source can be more economical. Indirect potable reuse within a community provides necessary oversight of local water and wastewater treatment systems to assure high water quality. The Clayton County Water Authority is an example of a planned indirect potable reuse system that augments local water supplies. In cases where the return is made to one of the federal reservoirs, questions have arisen regarding how return flows should be credited. Georgia EPD has a number of permit requests in progress form Metro Water District water providers to institute planned indirect potable reuse. It is the position of the Metro Water District that such return flow should be fully credited to the entities making the returns.

Water Quality Considerations

The viability of planned indirect potable reuse depends in part on the quality of the wastewater to be treated. Chemical and microbiological constituents that may be present in industrial wastewater may present challenges or adversely affect treatment processes. While industrial wastewater in the Metro Water District is not expected to limit indirect potable reuse, each community should analyze the potential impact.

Regulatory Considerations

Georgia EPD is developing guidelines for planned indirect potable reuse that will address technology, and regulatory requirements that will have to be met in order for a community to develop a planned indirect potable reuse system.

Public Acceptance Considerations

Educating the public on the benefits of indirect potable reuse and the multiple barrier approaches used to protect public health is an important regional challenge. The educational messages related to indirect potable reuse are a recommended element of the regional education and public awareness program, outlined in Section 12. The planned indirect potable reuse guidelines that Georgia EPD is developing will include public participation requirements.

Indirect potable reuse is already practiced in the Metro Water District, both in planned and incidental forms. Several major water supply intakes on the Chattahoochee River are currently located downstream of discharges from treatment facilities in Fulton and Gwinnett Counties. Examples of planned indirect potable reuse are found in Gwinnett, Cobb and Clayton Counties.

- Gwinnett County has constructed the 60-MGD Gwinnett F. Wayne Hill Water Resources Center, an indirect potable reuse facility. The facility treats wastewater to extremely stringent levels and returns it to the Chattahoochee River (20-MGD), where many downstream drinking water intakes exist. The treated effluent is transported 20 miles south, to a common outfall at the existing discharge location of the Gwinnett Crooked Creek WRF. This pipeline provides an opportunity for major water users (such as the Mall of Georgia) along the pipeline route to use the highly treated effluent for irrigation. Ultimately, Gwinnett will also return water to Lake Lanier (40-MGD), a primary source of drinking water for the Metro Water District.
- The Cobb Northwest Cobb WRF near Kennesaw is permitted to discharge 8 MGD to Allatoona Lake and 2 MGD to Cobblestone Golf Course for irrigation purposes. The treatment plant provides advanced nitrogen and phosphorus removal, filtration and ultraviolet disinfection ahead of its discharge to Allatoona Lake, the major water supply for West Cobb, Bartow, Paulding and Cherokee Counties.
- Noonday Creek WRF, also in northwest Cobb County, has a capacity of 12 MGD and has biological phosphorus removal, filtration and ultraviolet disinfection. The plant discharges to Noonday Creek, which is a tributary of Allatoona Lake.
- Clayton County Water Authority (CCWA) currently practices indirect potable reuse at two water reclamation facilities, W.B. Casey and Shoal Creek, which discharge high quality effluent into constructed treatment wetlands for natural treatment prior to discharge into CCWA drinking water supply watersheds. The CCWA indirect potable reuse system utilizes the multiple barrier approach seen in most other systems, but also provides two extra barriers through the

constructed treatment wetlands and UV disinfection of potable water. During the 2007 drought, these two systems contributed to CCWA water reserves, which where maintained at or above 77% of full capacity. The W.B. Casey WRF facility provides advanced secondary level treatment for 24 MGD, of which 9.3 MGD of this treated effluent is currently pumped to the E.L. Huie Jr. constructed treatment wetlands. The Huie wetland discharges to the Pates Creek watershed containing both the Shamrock and the Blalock reservoirs. Construction of an additional 8.2 MGD of wetland cells will bring the total treatment capacity to 17.5 MGD in 2009. The Shoal Creek WRF provides advanced secondary treatment with UV disinfection to 4.4 MGD with an average of 1.4 MGD of treated effluent being pumped to the Panhandle constructed treatment wetlands. The Panhandle wetland discharges to the Shoal Creek watershed containing both the Shoal Creek and the J.W. Smith reservoirs.

- The City of Gainesville supplies drinking water to the City and Hall County with water withdrawn from Lake Lanier and treated at the City's Lakeside and Riverside Water Treatment Plants. Wastewater is treated to advanced levels and discharged back to Lake Lanier, in support of regional and state objectives for water reclamation and reuse. Two Water Reclamation Facilities, Flat Creek WRF and Linwood WRF, perform advanced treatment and disinfection using ultraviolet radiation to protect Lake Lanier water quality. The newly rebuilt Linwood WRF was dedicated in 2008, and uses membrane technology to enhance nutrient removal and indirect potable reuse of the reclaimed water.

REUSE DEMAND ESTIMATES

The Metro Water District reuse demands were estimated using the Least Cost Planning Decision Support System (DSS) Model and methodologies discussed in Sections 3 and 4 of this report. These planning level estimates provide an estimate of the possibilities for reuse in the Metro Water District. The Wastewater Plan shows in Section 2 that 16% of the wastewater treated in the Metro Water District is reuse water, either non-potable or planned or incidental indirect potable reuse. Within the planning horizon, that percentage is expected to increase to 26% of wastewater treated in the Metro Water District. This Section includes an estimate based on the DSS model of potential for reuse but is not intended to guarantee that level of reuse. Based on the planning considerations, local water and wastewater providers should analyze the potential based on local master plans for implementing reuse.

NON-POTABLE REUSE DEMAND ESTIMATES

Urban irrigation demand, also known as non-residential irrigation demand, was estimated for the Metro Water District. Not all of the urban irrigation demand can be met through non-potable reuse due to a number of factors, including proximity to a reuse corridor, the use of private irrigation facilities (such as small lakes or groundwater wells), or the small size of some parks or open spaces that can make the cost of infrastructure prohibitive. The 2035 urban irrigation demand that could potentially be supplied by non-potable reuse was estimated to be 50 AAD-MGD.

Most parks and golf courses are only irrigated in the spring and summer months, as the irrigation demand is usually very low during winter months. Replacing potable water with reclaimed water for urban irrigation would have a small, but positive impact on demand reduction, especially during peak demand months. Because of the generally abundant rainfall in the region, demand reduction through urban irrigation is best treated as a way to lower potable water use during peak

demand months, thereby conserving potable water for other types of consumption. In some instances, surface water discharge permits during off peak months may be combined with reuse where sufficient storage is not viable during times when reuse water demand is low.

For non-potable reuse to be beneficial it needs to replace (i.e., conserve) potable water use and work within the framework of local consumptive use targets. If additional irrigation water demand is created by the presence of an inexpensive non-potable reuse water supply, then not all reuse water will be replacing potable water demand. It should also be noted that during drought periods, irrigation bans are the first water conservation measure to be undertaken by many Metro Water District municipalities. This means that reuse for irrigation in such a period would not be replacing potable water use.

Industrial demand for reclaimed water was also estimated. Industrial demands include potable water use, as well as process water use at industrial customer locations. In order to estimate the portion of the total industrial water demand that could be met through reclaimed water, data from the 2003 Water Supply and Water Conservation Management Plan was used. The industries assessed represented a wide variety of process types. Based on this information, the 2035 industrial potential for reclaimed water was estimated to be 10 AAD-MGD. This reuse potential may not be achieved due to siting and water quality constraints at many industrial facilities.

INDIRECT POTABLE REUSE ESTIMATES

Potential indirect potable reuse quantities were estimated by considering the amount of wastewater discharged, required minimum instream flow requirements, and downstream water withdrawals. Based on preliminary calculations, the amount of reclaimed water available for planned indirect potable reuse could range from 40 AAD-MGD to 125 AAD-MGD, or 4 to 12 percent of the projected 2035 demand for the Metro Water District. The Georgia EPD has imposed limits on the amount of indirect potable reuse that Lake Lanier can accept. The current limit is 92 MGD on a maximum monthly basis, with a phosphorus level of 0.13 milligrams per liter (mg/L). If the quantity of indirect potable reuse to Lake Lanier exceeds 120 MGD, the cost of treating to the necessary nutrient limit may become prohibitively expensive.

Returning reclaimed water to local water supply sources was estimated for 2035 based on information from local water providers. The potential exists for up to 100 AAD-MGD of planned indirect potable reuse to occur at local water supply sources. The feasibility and cost of implementing indirect potable reuse will be dependent on phosphorus and regulatory limits as well as raw water quality in the reservoirs or receiving streams.

ACTION ITEM 7.1 – RETURN RECLAIMED WATER TO LAKE LANIER AND ALLATOONA LAKE FOR FUTURE INDIRECT POTABLE REUSE

Responsible Party

☑ Local Water Provider
☐ Other: _____

In Coordination With

☐ Site Plan Review Staff
☑ Community Development/ Zoning
☑ Neighboring Local Water Providers (where appropriate)
☐ Georgia EPD
☑ Other: Metro Water District, USACE

ACTION ITEM

Return reclaimed water to Lake Lanier and Allatoona Lake for future indirect potable reuse.

OBJECTIVE

The objective of this measure is to sustain water supplies in Lake Lanier and Allatoona Lake through the implementation of indirect potable reuse.

DESCRIPTION OF MEASURE

Long-term sustainability of the resource can be achieved through returning reclaimed water to Lakes Lanier and Allatoona. The Metro Water District should negotiate with the Corps to provide a storage credit to permitted withdrawers for returning the reclaimed indirect potable reuse water to the Lakes.

The cities and counties that withdraw water from Lake Lanier for drinking water supply should maximize the return of reclaimed water to the Lake. Gwinnett and Hall Counties have the treatment infrastructure in place to return highly treated wastewater to Lake Lanier. Gwinnett County has a discharge permit to Lake Lanier and estimates returning reclaimed water to Lake Lanier by the end of 2009. At this time, Gainesville and Flowery Branch are currently returning reclaimed water to the Lake via discharges to tributaries. Forsyth County and the City of Cumming have plans to build water reclamation facilities to return flow to Lake Lanier by 2015.

The cities and counties that withdraw water from Allatoona Lake for drinking water supply should maximize the return of reclaimed water to the Lake. Cherokee and Cobb Counties return reclaimed water to Allatoona Lake directly and via tributary streams of the Lake. Cartersville in Bartow County also returns reclaimed water to Allatoona Lake via tributary streams.

Summing both planned and incidental indirect potable reuse, communities currently plan to return over 100 AAD-MGD to Lake Lanier and approximately 36 AAD-MGD to Allatoona Lake as outlined in the Wastewater Management Plan within the 2035 planning horizon.

CONCLUSIONS

Water reuse is an important component of the overall water supply strategy to sustain water resources. Non-potable reuse is acceptable depending on local consumptive use challenges when it offsets existing potable demands. Reuse potential in the Metro Water District has the potential to play a significant role within the 2035 planning horizon, with estimates of providing 8 to 20% of the total water supply. Beyond the 2035 planning horizon, it is anticipated that to sustain water supplies within the Metro Water District, reuse and more specifically indirect potable reuse in conjunction with the aggressive water conservation program will be needed to meet water demands.

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Section 8: PLANNED WATER SUPPLY FACILITIES

In order to maintain reliable water supply within the Metro Water District, the following action items are needed to further maximize existing sources, secure additional water supply sources and build additional treatment capacity. The facilities included in this Section were selected to utilize the sources identified in Section 6, which are based on the water supply evaluation criteria outlined on pages 6-2 and 6-3.

- Construct three water supply reservoirs that are in the planning stages plus continue to investigate three additional water supply reservoirs needed within the planning horizon.
- Support permitting and construction of local water supply reservoirs to supplement major water supply sources.
- Expand treatment capacity based on the phased approach provided in Appendix B.

Appendix B: County Level Summaries, presents a more detailed phasing plan for water supply and treatment capital improvement projects, many of which are associated with action items in this Section. It is important to note that treatment capacity may not be expanded without the issuance of a new or amended water withdrawal permit from Georgia EPD if the proposed expansion will expand the treatment capacity beyond the currently permitted water withdrawal limits.

ACTION ITEM 8.1 – SUPPORT CONSTRUCTION OF 6 PLANNED WATER SUPPLY RESERVOIRS

The Water Supply and Water Conservation Management Plan includes three new water supply reservoirs that are planned and in various stages of the permitting process, presented in Table 8-1. Three additional reservoirs included in Table 8-1 have not initiated the permitting process, but are needed within the planning horizon. Since reservoir planning, permitting and development can take 5 years or more, initial planning for the three reservoirs that are not in the permitting process should begin soon. The Metro Water District supports the permitting and timely construction of these projects, as these reservoirs are of critical importance to the jurisdictions that will benefit directly from these new sources.

Other new reservoirs, if proven locally feasible, will be supported if they are consistent with the Water Supply and Water Conservation Management Plan. Potential reservoir projects, beyond the six included, may be investigated, and if possible constructed.

TABLE 8-1
Planned Water Supply Reservoirs in the Metro Water District

Reservoir	Owner/Operator Utilizing Resource	Basin	Estimated Size and Yield
Glades Reservoir	Hall County	Chattahoochee	The 733-acre reservoir with an estimated yield of 6.4 MGD will release water to Lake Lanier. Currently in the permitting process.
Bear Creek Reservoir	Proposed South Fulton Water Authority	Chattahoochee	Impoundment on Bear Creek, a tributary of the Chattahoochee River. Estimated yield is 15 MGD.
Richland Creek Reservoir	Paulding County	Coosa	A 305-acre reservoir with an estimated yield of 35 MGD is in the permitting process on Richland Creek.
Etowah Reservoir	Fulton County	Coosa	A reservoir is being considered by Fulton County with a proposed 30 MGD yield.
Ocmulgee Reservoir	Henry County Water and Sewer Authority	Ocmulgee	A new reservoir is being considered in the Ocmulgee basin with a proposed 13 MGD yield.
Cedar Creek Reservoir	Gainesville-Hall County	Oconee	The Cedar Creek reservoir is expected to have a yield of 9 MGD and be supplemented with water from the North Oconee River.

Note: Reservoirs that do not require 404 permits, off-line reservoirs, and reservoirs whose primary purpose is to facilitate water treatment plant operations are not included herein.

ACTION ITEM 8.2 – CONSTRUCT 6 NEW WATER TREATMENT PLANTS

Six new water treatment plants are proposed to treat water from planned and existing reservoirs; Table 8-2 provides a summary of the proposed facilities. The capital improvements phasing plan associated with this action is presented in Appendix B, County Level Summaries.

TABLE 8-2
Planned New Water Treatment Plants in the Metro Water District

Planned Water Treatment Plants	Source
Bartow North End WTP (Note 1)	Allatoona Lake
Bartow South End WTP (Note 1)	Allatoona Lake
Fulton County Etowah WTP	Reservoir on Etowah River
Bear Creek WTP (in South Fulton)	Bear Creek Reservoir
Gainesville-Hall County Cedar Creek WTP	Cedar Creek Reservoir
Paulding County WTP	Richland Creek Reservoir

Notes:
1. Represents Option 2 of Bartow County's Phasing Plan, described in Appendix B of this Plan. If these plants are not built, the County will continue to meet water needs exclusively through Adairsville and Cartersville WTPs.

ACTION ITEM 8.3 – EXPAND 28 EXISTING WATER TREATMENT PLANTS

Many existing water treatment facilities will require capacity expansions and upgrades before 2035; the capital improvements phasing plan for expansions are presented in Appendix B. The 28 water treatment plants identified for expansion are listed in Table 8-3. Because treatment process upgrades may be triggered by future regulatory requirements, the date and scope of process upgrades are not provided in Appendix B. The non-capital tasks associated with water treatment plant expansions include financing, inter-jurisdictional agreements and State permitting.

TABLE 8-3
Water Treatment Plants Planned to be Expanded before 2035

Location by County	Water Treatment Plant
Bartow	Adairsville WTP
	Cartersville WTP
Cherokee	Canton WTP
	Cherokee Etowah River WTP
Clayton (Note 1)	Clayton Hicks WTP
	Clayton Hooper WTP
	Clayton Smith WTP
Cobb	CCMWA Quarles WTP
	CCMWA Wyckoff WTP
Coweta	Coweta BT Brown WTP
	Newnan Hershall Norred WTP
	Senoia WTP
DeKalb	DeKalb Scott Candler WTP
Douglas	DDCWSA Bear Creek WTP
	Villa Rica Franklin Smith WTP (Note 2)
Fayette	Fayette Crosstown WTP
	South Fayette WTP
	Fayetteville WTP
Forsyth	Cumming WTP
	Forsyth WTP
Fulton	Atlanta-Fulton County WTP
	Roswell WTP
Gwinnett	Buford WTP
Hall	Gainesville Lakeside WTP
Henry	Henry Towaliga River WTP
	Henry Tussahaw WTP
	McDonough WTP
Rockdale	Rockdale Big Haynes Creek WTP

Notes:
1. One or more of Clayton County Water Authority's WTPs to be expanded.
2. Located in Carroll County

2035 PROPOSED METRO WATER DISTRICT TREATMENT FACILITIES AND CAPACITIES

Table 8-4 summarizes the proposed surface water treatment plants in the Metro Water District, including capacities based upon the County Level Summaries in Appendix B. Treatment facilities are permitted based on a peak day basis (PD-MGD).

TABLE 8-4
Proposed Surface Water Treatment Plants

County	WTP	Entity	Source Stream / Reservoir	2035 WTP Planned Capacity (PD-MGD)
Bartow (Note 2)	Lewis Spring WTP	City of Adairsville	Lewis Spring (Note 3)	6
	Clarence B. Walker WTP	City of Cartersville	Allatoona Lake	40
	Bartow North End (Note 1)	Bartow County	Etowah River	30
	Bartow South End (Note 1)	Bartow County	Etowah River	
	Emerson WTP	Bartow County	Moss Springs	0.5
	Bartow County WTP	Bartow County	Bolivar Springs	0.8
Cherokee	Canton WTP	City of Canton	Etowah River	18
	Etowah River WTP	Cherokee County Water and Sewerage Authority	Yellow Creek Reservoir and Etowah River	53
Clayton	Terry R. Hicks WTP	Clayton County Water Authority	Blalock Reservoir (Note 3)	79
	W.J. Hooper WTP		W.J. Hooper Reservoir (Note 3)	
	J.W. Smith WTP		J.W. Smith Reservoir (Note 3)	
Cobb	James E. Quarles WTP	Cobb County-Marietta Water Authority	Chattahoochee River	106
	Hugh A. Wyckoff WTP		Allatoona Lake	142
Coweta (Note 4)	B.T. Brown WTP	Coweta County	Cedar Creek (B.T. Brown) Reservoir	10
	Hershall Norred WTP	City of Newnan	J.T. Haynes Reservoir	21
	Senoia WTP	City of Senoia	Hutchins' Lake	0.6
DeKalb	Scott Candler WTP	DeKalb County	Chattahoochee River	175
Douglas	Bear Creek WTP	Douglasville-Douglas County Water and Sewer Authority	Bear Creek Reservoir	23
			Dog River Reservoirs	
	Franklin Smith WTP	City of Villa Rica	Lake Fashion, Cowan Lake	3
Fayette	Crosstown WTP	Fayette County (Note 3)	Lake Horton, Lake Kedron, Lake Peachtree, groundwater	35
	South Fayette WTP			
	Fayetteville WTP	City of Fayetteville	Whitewater Creek	4
Forsyth	Cumming WTP	City of Cumming	Lake Lanier	36
	Forsyth County WTP	Forsyth County	Lake Lanier	68

County	WTP	Entity	Source Stream / Reservoir	2035 WTP Planned Capacity (PD-MGD)
Fulton	Atlanta-Fulton County WTP	Atlanta-Fulton County Water Resources Commission	Chattahoochee River	155
	Fulton Etowah WTP (Note 1)	Fulton County	Etowah River	20
	Hemphill WTP	City of Atlanta	Chattahoochee River	136.5
	Chattahoochee WTP			64.9
	Roswell Cecil Wood WTP	City of Roswell	Big Creek	5
	East Point WTP	City of East Point	Sweetwater Creek	13.9
	Bear Creek WTP (Note 1)	(Note 5)	Bear Creek Reservoir	15
	Palmetto WTP	City of Palmetto	Cedar Creek	0.6
Gwinnett	Lake Lanier WTP	Gwinnett County Public Utilities	Lake Lanier	150
	Shoal Creek WTP			75
	Buford WTP	City of Buford	Lake Lanier	4.83
Hall	Lakeside WTP	City of Gainesville	Lake Lanier	46
	Riverside WTP	City of Gainesville		25
	Cedar Creek WTP (Note 1)	Gainesville-Hall County	Cedar Creek Reservoir / North Oconee River	12
Henry	Towaliga River WTP	Henry County Water and Sewerage Authority	S. Howell Gardner (Indian Creek) and Rowland Reservoirs (Long Branch), Strickland and Cole Reservoirs	29
	Tussahaw WTP		Tussahaw Creek Reservoir	52
	McDonough WTP	City of McDonough	John Fargason (Walnut Creek) Reservoir	3.1
	Locust Grove WTP	City of Locust Grove	Brown Branch	0.45
Paulding	Paulding County WTP (Note 1)	Paulding County	Etowah River / Richland Creek Reservoir	40
Rockdale	Big Haynes Creek WTP	Rockdale County	Big Haynes Creek (Randy Poynter Lake)	27.1
Metro Water District Total (PD-MGD)				**1,726**
Metro Water District Total (AAD-MGD) (Note 6)				**1,079**

Notes:
1. New facility to be built by 2035.
2. Facilities reflect Option 2 for Bartow County.
3. Local water provider should expand its WTPs according to a local plan.
4. This represents Option 1 for Coweta County.
5. The service provider for Bear Creek WTP will be determined through the Fulton County HB489 renegotiation process.
6. Annual average day equals peak day divided by 1.6.

Section 9: LOCAL WATER PLANNING

This Water Supply and Water Conservation Management Plan is regional in breadth, looking holistically at regional issues. The action items in this Section are intended to be refined at the local level by the affected local water providers through local water master plans. A local water master plan typically evaluates local system current and future demands, as well as resources and facilities. They also typically recommend solutions to address the development of sources and the design, construction, and financing of facilities in order to meet anticipated regulatory requirements, residential and commercial growth and system reliability needs. Local water master plans are important for providing a dependable water service to existing and future customers.

Local water master plans, at a minimum, must conform to the goals of the Metro Water District's Water Supply and Water Conservation Management Plan to ensure that customer service goals are cost effectively met with a long-term regional perspective. The following Section discusses the actions required that are associated with local water master plans.

ACTION ITEM 9.1 – DEVELOP LOCAL WATER MASTER PLANS

ACTION ITEM

Develop a local water master plan that reflects available water sources, water source development, water treatment facility and/or water distribution system improvement needs based on future water demands.

Responsible Party

☑ Local Water Provider
☐ Other: _____

In Coordination With

☑ Neighboring water providers (where appropriate)
☑ Local Wastewater Providers
☑ Local Stormwater Program
☐ Georgia EPD
☑ Community Development/ Zoning
☐ Other: _____

OBJECTIVE

The objective of this measure is plan for future water supply, treatment and distribution needs in a manner consistent with this regional Water Supply and Water Conservation Management Plan.

DESCRIPTION OF MEASURE

The local water master plan (also called water management plan) will identify future demands, supply sources, water service areas, treatment facility needs and distribution system extensions and expansions to support proposed infrastructure improvements to the local water system. As part of the next regularly scheduled local plan update to existing water master plans, in some cases, revisions may be necessary to be consistent with Metro Water District Plans.

The master plans should have a minimum planning horizon of 30 years. To remain current and relevant, water master plans should be updated every 5 years, at a minimum. Recognizing that water master plans are "living documents," local water providers should consult master plans when making critical infrastructure decisions and update these plans as necessary to address changing local conditions.

At times, water master plans will need to be amended to address proposed inter-jurisdictional projects. These master plan amendments should be developed in cooperation with all affected jurisdictions. These jurisdictions include the county, cities within the county, neighboring counties and local water providers. All inter-jurisdictional projects should be in compliance with O.C.G.A § 36-70-20, the Service Delivery Act.

Local water providers have flexibility in the development of their local water master plan, as a large system will likely have a more detailed master plan than a smaller system. Typically, water master plans include the following elements:

- **Introduction** – describes the planning period, program objectives, regulatory framework and key stakeholders involved in the planning process.
- **City/County Characteristics & Demographics** – describes the population, land use, physical and biological characteristics of the area including water quality, topography, wetlands, water resources and protected species.
- **Inventory & Evaluation of Existing Water System** – identifies the existing water sources and service areas and analyzes the local water distribution system, including hydraulic capacity, as well as water treatment capabilities, including optional analyses of water treatment processes and the identification of problems with treatment processes.

- **Future Water Demand Projections** – projects future water demands based on demographic projections, conservation, anticipated reuse, future land use, and the projected water service area boundary. Future demands should consider emergency supply needs and any additional interconnections with other local water providers.
- **Future Water Source, Distribution & Treatment Alternatives** – create water system alternatives for future extensions and demands with a recommended solution for new or expanded supply sources, treatment alternatives, system interconnections, and distribution system maintenance or capital needs.
- **Implementation of Recommended Alternative** – describes the recommended alternative, including a high level overview of the potential environmental impacts, required permits, institutional impacts, estimated costs and a capital improvements phasing plan associated with the recommended alternative.

OTHER CONSIDERATIONS

Additional elements that must be considered during the development of local water master plans include:

- Source water supply watershed or wellhead protection areas
- Water reuse management
- Consumptive use targets
- Interbasin transfers
- Interconnections facilities
- Cross-connection program
- Drought and emergency plans

The local master plans will refine the water treatment plant expansion details outlined in Section 8 and Appendix B of this Water Supply and Water Conservation Management Plan. Local water providers will develop water treatment expansion master plans that define the number, location, and capacities of water treatment facilities, and their implementation schedule. A life cycle cost analysis can be used to compare different expansion scenarios. Water treatment technologies, residuals handling, and management issues also will be included as part of this master planning.

Local water master plans must also be consistent with the Comprehensive State-wide Water Management Plan, which encourages integrated and sustainable water resources management. Local water master plans may be coordinated with local wastewater master plans and the Metro Water District's Wastewater Management Plan, as well as local watershed studies and plans, such as watershed assessments, watershed protection plans and the Metro Water District's Watershed Management Plan. Coordination on source water protection issues is required in the Metro Water District's Watershed Management Plan. Additionally, water master plans may coordinate ongoing monitoring requirements with the requirements of other local plans to maximize the benefit for the local investment.

SPECIFIC SUB-TASKS

Sub-Task	Description
Create and utilize a local water master plan with a 30 year planning horizon	Create and consult local water master plan when making critical infrastructure decisions. The master plan should outline future system expansions and capital projects.
Update local water master plan	Update local water master plans every five years, remaining consistent with regional and state requirements. The water master plan should include additional implementation details beyond the breadth included in this Plan.

ACTION ITEM 9.2 – DEVELOP OR UPDATE LOCAL EMERGENCY WATER PLANS

ACTION ITEM

Each water system must develop or update their written emergency water supply plan to include sufficient emergency water supply sources and detailed steps required to modify system operations in order to accept or share water with adjacent water providers.

Review interconnection reliability targets to estimate minimum water supplies for reliability, efficiency and emergencies.

Responsible Party

☑ Local Water Provider
☐ Other: _____

In Coordination With

☑ Neighboring water providers (where appropriate)
☐ Local Wastewater Providers
☐ Local Stormwater Program
☑ Georgia EPD
☐ Community Development/ Zoning
☐ Other: _____

OBJECTIVE

The objective of this measure is to ensure all local water providers in the Metro Water District are prepared for potential water emergencies by having an up-to-date emergency water supply plan.

DESCRIPTION OF MEASURE

Having a detailed emergency water supply plan in place is an essential component of compliance with the Public Health Security and Bioterrorism Preparedness and Response Act of 2002. Having an emergency plan in place is also crucial during droughts when systems may be forced to rely on neighboring local water providers for additional water supply.

When sufficient storage is not available for purposes of reliability, the local water provider should establish interconnections with neighboring communities. A District-wide Interconnection Reliability Target (IRT) is a goal for emergency needs. Depending on the water supply source, the IRT for each water system should be defined as in Table 9-1. Approximately 35 percent of the annual average daily demand (AAD) is estimated for meeting "emergency water needs", including eating, drinking, toilet flushing, fire fighting and hospital use. Communities served by smaller water sources must identify connections to achieve either 35 percent of AAD demand in interconnections or another local target as appropriate for the system. Communities served by major water supply sources (Lake Lanier, Allatoona Lake, Chattahoochee River, and Etowah River), typically have more than one treatment facility and therefore do not need to provide connections for 35 percent of the total AAD demand, as shown in Table 9-1.

TABLE 9-1
Recommended Formula for Calculating Water System Interconnection Reliability Target (IRT)

Water Supply Source	Interconnection Reliability Target Formula
Lake Lanier Allatoona Lake Chattahoochee River Etowah River	(35% x AAD) – (Total WTP capacity – Largest WTP capacity)
Other smaller water supply sources	35% x [AAD]

AAD = Average Annual Day

Each water system will need to define its own IRT and evaluate other factors affecting water system reliability, including raw and finished water storage, infrastructure conditions, equipment redundancy, and existing interconnection capability. Detailed hydraulic studies should be conducted for each county and each water system to determine the overall distribution system improvements that are required to meet projected 2035 demands. The pipe sizes, approximate locations and lengths for potential interconnections should be refined by the hydraulic evaluations. The actual location, pipe size, length and alignment of the future interconnections, pumping or pressure reducing arrangements at the desired location should be determined as part of detailed design. Each water system should evaluate the feasibility and cost-effectiveness of providing multi-directional flows at existing and future interconnections with a pipe diameter greater than or equal to 12 inches. Each water system should improve and continuously update its inventory of distribution system components, including location and size of pipes, valves, and storage facilities. An updated inventory, including good system maps, will be beneficial in locating future interconnection locations and addressing other system maintenance problems such as pipe breaks and leaks. The distribution system maps can be incorporated into a Geographical Information System format currently used by many water systems in the Metro Water District.

Local Considerations

The local emergency water plan should include what steps must be taken to receive water from an adjacent utility or to provide water to another utility. Existing drought contingency plans should be revised to coordinate water conservation measures with emergency water plans.

For the receiving local water provider, these steps may include defining: 1) sub-areas within water systems that can be served by other utilities; 2) valving, piping, and pumping changes for flow reversal in the sub-area during the water sharing period; and 3) public notice/media announcement requirements for additional water conservation and potential water quality changes.

For the supplying local water provider, these steps may include: 1) pumping and piping changes to supply the local water provider in need; and 2) public notice/media announcement requirements for additional water conservation.

Additional factors to take into consideration when establishing new interconnections between water systems or increasing flows through existing connections include the following:

Chemical Compatibility: In general, the critical chemical properties for the 38 publicly-owned WTPs in the Metro Water District are compatible with two exceptions. Both the DeKalb County Water System and the Cobb County-Marietta Water Authority maintain their finished water pH above 8.0 for corrosion control purposes. Systems connecting to either the DeKalb or Cobb systems for routine water sales will need to make significant adjustments to their treatment or operational practices as well as anticipate and have mitigation plans in place for exceeding the lead standard for drinking water. For emergency situations, these water quality differences are insignificant.

Treatment Requirements: A few water systems have large industrial water customers that require the hardness, iron, and manganese levels in treated water be below typical levels. These water systems may find it more cost-effective to invest in equipment redundancy and finished water storage facilities for day-to-day operational flexibility and reliability. Assuming industrial operations are halted during extreme emergencies, interconnections with utilities providing different finished water quality can still be used to meet the emergency needs.

Water Quality: Transferring water between local water providers will cause reversal of flow in some areas. These areas will likely experience short-term changes in the aesthetic qualities of the water caused by disturbance of sediment in the distribution pipes. This problem is primarily a nuisance; no health concerns are anticipated as long as the required disinfectant residual in the distribution system is maintained. A systematic flushing program can alleviate these short-term changes in water quality.

Operating Pressure: Systems with different operating pressures are not readily able to transfer water without modifications. For many of the existing interconnections, pumping stations or pressure reducing valves are required to adjust the pressure at the connection point. Water systems will need to evaluate the available water pressure at any potential connection point, to determine the specific requirements for transferring water from one system to another.

Impact on Water Withdrawal Permits: When a municipal water system applies for a water withdrawal permit from the Georgia EPD, the amount of water permitted is based on water supply needs and projected population growth for the water system's service area. If one system is providing water to another system on a routine basis, the Georgia EPD often includes Special Conditions to the permit, which may include the following:

- A certain agreed-upon amount of water between the two systems to be reserved as pass-through water from the supplying system to the receiving system is specified.
- Water withdrawal permit for the water provider acknowledges that it includes the receiving system's water supply allocation.
- Indication of whether or not this is a temporary transfer of the water supply allocation and the length of the agreement between the two systems is stated.
- If both water systems have existing water withdrawal permits, then modification of the permits for both systems is necessary to reflect an additional amount to the supplying system, assuming it has adequate treatment capacity. The receiving system's permit is reduced by the amount that is obtained from the supplying system.
- During emergency situations, Georgia EPD may allow permits to be amended to accommodate special needs.

SPECIFIC SUB-TASKS

Sub-Task	Description
Adopt a written emergency water supply plan	Develop, adopt and use a written plan that defines specific steps required to accept or share water in an emergency.
Assess the need for establishment and maintenance of service connections	Share existing regional water supplies where practicable.
If interconnections are needed, meet interconnection reliability targets	Ensure interconnections provided needed reliability, efficiency and emergency water supplies.
Update the emergency water supply plan	Update the plan as needed to remain viable during an emergency and remain consistent with this Plan.

ACTION ITEM 9.3 – SOURCE WATER SUPPLY WATERSHED PROTECTION

ACTION ITEM

Coordination between local governments and water providers on issues related to source water supply protection.

Adopt drinking water supply watershed buffers as required by Part V Environmental Planning Criteria.

Develop and implement inter-jurisdictional agreements as necessary.

Responsible Party

☑ Local Water Provider
☐ Other: _____

In Coordination With

☐ Neighboring water providers (where appropriate)
☐ Local Wastewater Providers
☑ Local Stormwater Program
☐ Georgia EPD
☑ Community Development/ Zoning
☐ Other: _____

OBJECTIVE

The objective of this measure is to protect the water quality and viability of drinking water supplies from nonpoint source pollution and spills of hazardous materials that could compromise drinking water quality.

DESCRIPTION OF MEASURE

Water supply watershed protection programs serve to protect water resources from contaminants, thereby effectively preserving the amount of water supply available. By limiting the amount of pollution that enters the water supply, local water providers can reduce the costs of treatment and help guarantee public health. The Metro Water District's Watershed Management Plan outlines requirements for the protection of source water supply watersheds and establishes a coordination element between local water providers on water quality challenges in drinking water supply watersheds. Local water providers and local governments with source water supply watersheds within their jurisdictions are required to undertake these action items in order to protect these source water supplies.

SPECIFIC SUB-TASKS

Sub-Task	Description
Identify water supply watersheds	Identify water supply watersheds within the jurisdiction as well as priority issues and areas for watershed protection actions.
Adopt Environmental Planning Criteria	Local governments must adopt the Environmental Planning Criteria including adoption of drinking water supply watershed buffers in local ordinances.
Coordination on watershed protection	Water supply providers must coordinate at least annually with local governments to discuss local issues and priorities for water supply watershed protection as well as other challenges.

Part V Environmental Planning Criteria were developed by Georgia DNR and are enforced by the Georgia Department of Community Affairs (Georgia DCA) through the review of Comprehensive Land Use Plans. Related to drinking water protection, local governments are required to protect water supply watersheds and groundwater recharge areas within their jurisdictions. The planning criteria include buffer and lake management requirements intended to protect drinking water supplies. Local governments must adopt the stream buffers and other measures in compliance with the environmental planning criteria. The rules for source water supply watershed protection have recently changed, providing additional flexibility in the buffer requirements for small drinking water supply watersheds when communities adopt other measures to protect drinking water supplies.

Communities which are in compliance with the Georgia DCA's environmental planning criteria are in compliance with this requirement. New water supply sources planned or recommended in the Water Supply and Water Conservation Management Plan must be protected as they are formalized.

Source Water Assessment Plans (SWAPs): SWAPs were completed for public water systems as required by the Safe Drinking Water Act. The SWAPs include an assessment of the susceptibility of each drinking water supply watershed to sources of potential contamination and provide each supply watershed with a risk-based score. The SWAP plans may be a starting point for identification of potential parameters of concern.

Emergency Response Maps: Communities with source water supply watersheds and major transportation corridors may choose to provide emergency response personnel with maps outlining the source water supply watersheds. First responders to accidents, especially those with spills of hazardous materials, would be able to alert the appropriate water plant(s) of spills that the intake(s) can be shut down until the threat of pollution had passed. This measure should be coordinated with the Watershed Management Plan and the local water providers. It is recommended that maps show the emergency contact information for the water plant(s) associated with each source water supply watershed and that maps be laminated for field use by emergency responders.

Wellhead protection requirements are required under the SDWA based on 1986 amendments. Georgia EPD has established protection areas around drinking water supply wells that vary based on the local geology, well depth, and pumping rate. These wellhead protection areas are intended to help protect wells and springs used as sources of water supply for community public water systems from nearby pollution sources.

Coordination: Water suppliers must coordinate annually with all local governments with jurisdiction in the source water supply watershed to discuss any challenges or opportunities related to source water supply protection. Source water supply watershed challenges vary throughout the Metro Water District, therefore a one size-fits all solution is not advisable. Annual coordination meetings may include discussion of possible local actions based on the challenges and parameters of concern for the community.

ACTION ITEM 9.4 – WATER SYSTEM ASSET MANAGEMENT

ACTION ITEM

Develop an asset management program that ensures proper management of the water system.

Responsible Party

☑ Local Water Provider
☐ Other: _____

In Coordination With

☐ Neighboring water providers (where appropriate)
☐ Local Wastewater Providers
☐ Local Stormwater Program
☐ Georgia EPD
☑ Community Development/ Zoning
☐ Other: _____

OBJECTIVE

The objective of establishing a water system management program is to facilitate effective operation and maintenance of the system to ensure its proper functioning and to minimize the occurrence of water system leakage.

DESCRIPTION OF MEASURE

The condition of water infrastructure within the Metro Water District varies greatly from new systems in outlying counties to facilities over 100 years old in some of the most populous cities and counties. Aging water system infrastructure affects the safety, efficiency and reliability of the water system. Aging infrastructure can also cause financial challenges as operational funds are at risk, being diverted to cover emergency repair costs.

Asset management approaches to the maintenance of water infrastructure include managing and maintaining the system in a way that minimizes the lifecycle costs. Asset management for local water providers includes the regular inspections and maintenance from the source to the treatment facility through the distribution system up to the customer meters. Regular maintenance can extend the lifespan of the water system assets as well as prevent customer service interruptions.

SPECIFIC SUB-TASKS

Sub-Task	Description
Map water system assets	Develop a map of the distribution system and assets, either on paper or in a Geographic Information System (GIS) platform.
Develop a water system asset management program	Develop a written asset management program to inspect, maintain, and rehabilitate the local water system.
Coordinate asset management and leak detection programs	Coordinate the asset management program with the leak detection program discussed in Action Item 5.6.

Local water providers with smaller service areas may elect to compile asset information in paper maps. Most local water providers however will create a map of the system assets using GIS. The maps must at minimum include the location of water tanks, main distribution lines, water treatment facilities and fire hydrants. More detailed maps may include assets such as all water lines, meters, and valves. Regular maintenance of water system assets is recommended. Common elements of a water distribution system asset management program are outlined below.

Cross connection control and backflow prevention – Backflow prevention devices are required to prevent water from a home or business from entering the public water supply through a reverse in flow caused by a pressure drop in the distribution system. Pressure drops that cause backflows could include water main breaks or fire fighting activities. Routine inspection of backflow devices, especially those that could lead to a cross-connection or hazardous materials entering the public water supply are common elements of an asset management program.

Water main and line repair/replacement – Waterlines have a finite lifespan therefore most asset management programs include a replacement schedule for pipelines based on age, material type, maintenance history, and criticality.

Storage tank maintenance – Most water tanks are made of steel and must be periodically painted to prevent corrosion. Other maintenance activities for water tanks may include replacing screens over vents and other points of access to insects, birds and rodents. Cell towers are often co-located with elevated water tanks and any structure adjacent to or attached to water tanks should be regularly inspected.

Pump maintenance – Maintenance of booster and other system pumps involves checking the pumps regularly for excessive vibration or noise, providing grease and lubrication regularly and checking the pumps bearings and packing glands.

Hydrant flushing – Water line flushing is performed to remove any accumulated sediments or other impurities which have been deposited in the pipe and improve the flow of water through the distribution system. Flushing is performed in conjunction with fire hydrant testing to reduce water wasting. Water mains may also be mechanically cleaned through the use of swabs or "pigs" which are devices that are pulled through a section of line that scrape the accumulated debris off the inside of the pipe. Dead end pipelines and those with low water pressure may need to be flushed more frequently for water quality purposes.

Valve maintenance – Water distribution system valves allow for the isolation of portions of the distribution system. Valves are critical if a water main breaks, as it allows the isolation of the break during the repair. Exercising the valves in the water distribution system can ensure their smooth operation if system isolation is needed for emergency purposes.

Section 10:
WATER RESOURCES ISSUES

As water systems in the Metro Water District continue to collaborate on regional water resources planning, water resources issues are identified. This Section outlines the regional water resource issues in the Metro Water District. Issues are identified and described within the subdivisions of federal operation of Lake Lanier and Allatoona Lake, water quantity and water quality issues.

FEDERAL OPERATION OF LAKE LANIER AND ALLATOONA LAKE

Lake Lanier and Allatoona Lake have played a key role in assuring an adequate water supply for the Metro Water District since their construction by the U.S. Army Corps of Engineers (Corps) in the 1950s. These federal reservoirs are multi-purpose projects that store water for multiple purposes: hydropower production, flood control, navigation, water supply, water quality, recreation, and navigation. Although, the Corps controls the storage in these reservoirs, the water in the State of Georgia is allocated and managed among users by the State of Georgia.

This Plan assumes that the federal reservoirs will continue to operate to meet water supply needs within the Metro Water District consistent with the guidance about future yield expectations provided by Georgia Environmental Protection Division (Georgia EPD). These assumptions are reasonable because Georgia EPD is the entity responsible for managing and permitting water withdrawals within the State. Furthermore, the Metro Water District believes that water use within the Metro Water District is reasonable, constituting only 1 to 2% of the total volume of water passing from Georgia to Florida in the Apalachicola-Chattahoochee-Flint (ACF) basin, and a similar fraction in the Alabama-Coosa-Tallapoosa (ACT) basin. In addition, after reviewing alternatives to the use of the federal reservoirs, *the Metro Water District has concluded that there are no alternatives to the Chattahoochee River and the Etowah River as major water supply sources for north Georgia*.

Finally, it should be noted that expectations regarding water supply available from the operation of Lake Lanier and Allatoona Lake assume operation of these Corps reservoirs based on a balanced operation of the projects for all purposes. Recent changes in Corps operations of these Lakes beginning in 2006 represent a dramatic change and are of concern. In addition, the operation of the federal reservoirs is the subject of litigation of which the outcome is uncertain. Nonetheless, the Metro Water District trusts that Corps will eventually develop Water Control Plans for the ACF and the ACT that provide a balanced approach for all the users of each system.

WATER QUANTITY ISSUES

Water resources issues provide a contextual framework for the limitations on water quantities available for use within the Metro Water District. Multiple uses for water supply must be considered and balanced with the needs of instream and downstream users. The issues presented below include consumptive use, regulation of small water withdrawals, instream flow protection

policy, and downstream use concerns. Elements of these issues overlap with some of the concerns noted in the discussion of water supply.

CONSUMPTIVE USE

An important consideration for the Metro Water District is the effect of consumptive use. Consumptive use, as defined in the Georgia Comprehensive State-wide Water Management Plan, is the difference between the total amount of water withdrawn from a defined hydrologic system of surface water or groundwater and the total amount of the withdrawn water that is returned to that same hydrologic system over a specified period of time. Water use is consumptive when water is removed from a specified hydrologic system of surface water or groundwater and is not returned to that same system within a time frame that allows contemporary users and uses to avail themselves of the benefits of that quantity of water. The Georgia Comprehensive State-wide Water Management Plan specifically identifies the following as water uses that contribute to consumptive use:

- **Water Reuse**: is the use of reclaimed water as a substitute for another generally higher quality water source. Reclaimed water can be reused for the beneficial irrigation of areas that may be accessible to the public (such as golf courses, residential and commercial landscaping, parks, athletic fields, roadway medians, and landscapes) and for other beneficial uses such as human uses, cooling towers, concrete mixing, and car washes.
- **On-Site Sewage Management Systems**: is a sewage management system other than a public or community sewage treatment system that serves one or more buildings, mobile homes, recreational vehicles, residences, or other facilities designed or used for human occupancy or congregation, and which is permitted by a local county board of health under rules promulgated by the Department of Human Resources. Such term shall include, without limitation, conventional and chamber systems, privies, and experimental and alternative on-site sewage management systems that are designed to be physically incapable of a surface discharge of effluent that may be approved by the Department of Human Resources.
- **Land Application Systems**: Any method of disposing of pollutants in which the pollutants are applied to the surface or beneath the surface of a parcel of land and which results in the pollutants percolating, infiltrating, or being absorbed into the soil and then into the waters of the state. (Note: source for this definition is the Georgia Department of Natural Resources General Land Application System Permit for Large Communities)
- **Interbasin Transfers**: is a withdrawal or diversion of water from one river basin, followed by use and/or return of some or all of that water to a second river basin. The river basin from which the withdrawal or diversion occurs is termed the ‘donor’ basin, and the river basin to which all or a portion of the water is diverted and returned is termed the ‘receiving’ basin.

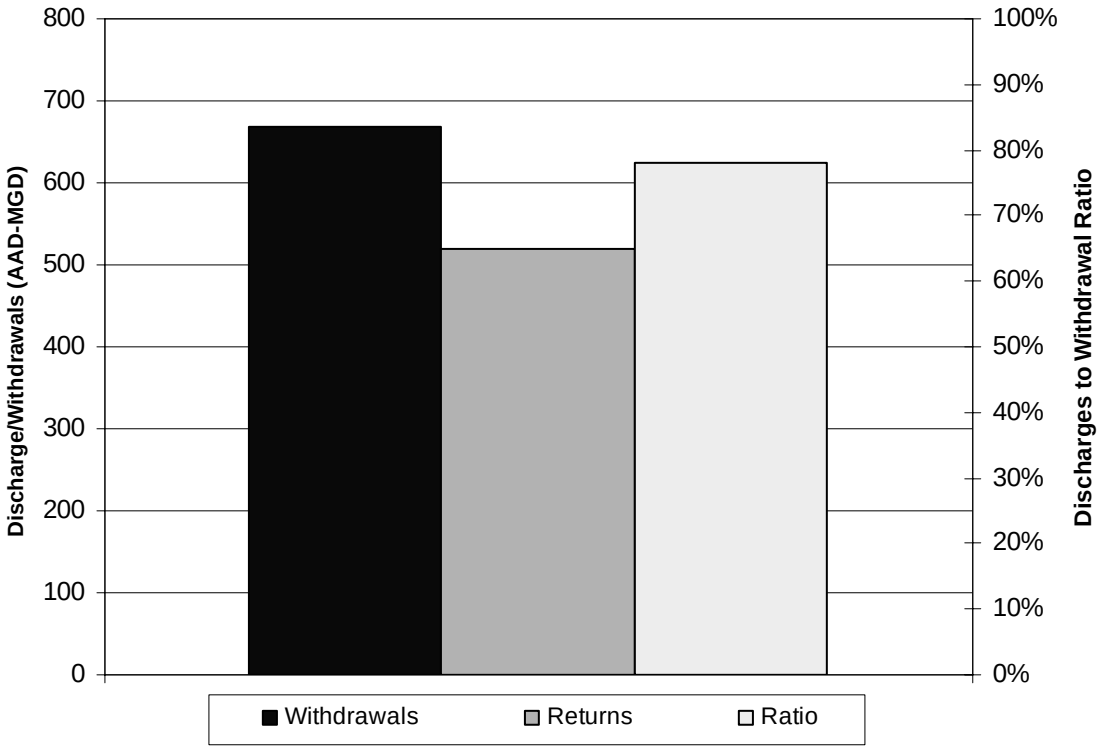
The Georgia Comprehensive State-wide Water Management Plan recognizes that each of the above water management practices can be appropriate, viable measures; however, managing the consumptive uses of water is necessary to meet water demands in a sustainable manner. This Plan states that managing consumptive use of a water source involves the integrated management of

demands from that source, returns to that source, and actions taken to supplement the supply that source provides.

Consumptive use is an important consideration for the Metro Water District for maintaining local stream flows and water supplies. A goal of the Metro Water District's plans is to minimize consumptive uses to the extent possible, while also balancing other goals and considerations. In terms of this Water Supply and Water Conservation Management Plan, consumptive use is a demand management strategy. The Wastewater Management Plan focuses on the consumptive losses from onsite-sewage management systems and land application systems with a long-term goal of returning water so that it is available for instream and offstream uses and users.

The Metro Water District was provided planning guidance by Georgia EPD to return 58% (annual average) of the water withdrawn from the Chattahoochee River basin. Figure 10-1 shows that the Metro Water District will meet the return target for the Chattahoochee basin in 2035. In the future Georgia EPD may modify the existing planning guidance for the Chattahoochee basin and/or identify return targets for others basins through the Comprehensive State-wide Water Management Plan. In order to manage consumptive use, local governments should consider the implications of local land use planning, specifically the role of septic systems in future growth. If a local government chooses to develop on septic systems they might have to consider other ways to reduce water demands and consumptive uses such as more intensive water supply system leak detection, low flow plumbing retrofit programs or banning outdoor irrigation.

FIGURE 10-1
Chattahoochee Basin Withdrawals and Discharges for 2035



RESERVOIR STORAGE RELIABILITY

During the current drought, several communities have suffered from dangerously low reservoir levels. Weather conditions over the past few years present the possibility for a new drought of record. These more extreme conditions will require more conservative sizing of reservoirs in the future. Communities with offstream supplies or small drinking water supply watersheds face the largest challenges during drought conditions. Reliability of existing and future reservoirs is a long-term challenge for the Metro Water District. Reservoir sizing should account for future demands, drought conditions, the impact of global climate change, loss of storage volume over time due to sedimentation, impacts of urbanization on base stream flows, and consideration of additional storage contingency.

REGULATION OF SMALL WATER WITHDRAWALS

Under current Georgia EPD guidelines, a private entity can withdraw from a groundwater or surface water source up to 100,000 gpd without a withdrawal permit. During the recent drought conditions, small surface water withdrawals and wells have become more common to provide irrigation water to avoid drought irrigation restrictions. Individuals have been able to withdraw water for irrigation purposes when downstream users were lacking abundant water supply. Since the quantity of water withdrawn under 100,000 gpd is not required to be reported, it is difficult to quantify the impact on instream and downstream water users. This issue is discussed further in Section 11.

INSTREAM FLOW PROTECTION POLICY

Water withdrawals affect downstream flows. Without limitations on withdrawal quantities, detrimental impacts to natural habitats and downstream users can occur. Georgia protects its water systems by mandating a minimum instream flow. Georgia's minimum instream flow policy historically was based on the 7Q10, which is the statistical figure that reflects the lowest 7-day running average of a stream's flow with a recurrence frequency of once in ten years. In order to better protect the health of aquatic ecosystems and to protect downstream users, Georgia EPD established a new minimum instream flow policy, effective April 1, 2001. All new applications for new or expanded surface water withdrawals are required to meet the 2001 minimum flow protection requirements. Applicants are required to select from one of the following three options for the 2001 minimum instream flow requirements:

- Option 1 – Monthly 7Q10 Minimum Flow
- Option 2 – Site-Specific Flow Study from which seasonal instream flows would be derived
- Option 3 – Mean Annual Flow: specific percentages of mean annual flow for regulated and unregulated streams, with seasonal adjustments

This policy is not applicable to those streams whose flows are determined by the operation of a Federal reservoir, such as the Chattahoochee River below Buford Dam and the Etowah River below Allatoona Lake.

Existing withdrawal permits will be revised to take into account the 2001 minimum instream flow requirements when permit holders request additional withdrawals from the source. The 2001 minimum instream flow policy is identified in the Georgia Comprehensive State-wide Water

Management Plan as being consistent with protection of natural systems and biological integrity of the water resources to which the permits apply.

EMERGENCY AND DROUGHT PLANNING ISSUES

Sound planning can reduce the vulnerability of local water systems to unplanned events. Emergency response plans that provide an action plan should unforeseen incidences occur can reduce critical reaction time. Drought management planning at the State and local level ensures contingency plans are in place to meet critical water needs.

Vulnerability assessments are required under the EPA's Public Health Security and Bioterrorism Preparedness and Response Act of 2002. Community water systems (CWS) that serve more than 3,300 persons were required to complete a vulnerability assessment on all components of the system (wellhead or surface water intake treatment plant, storage tank(s), pumps, distribution system and other important components of the system). Based on the vulnerability assessment, local water providers were required to complete or update an emergency response plan (ERP) that outlined response measures in the case of an incident. Several communities in the Metro Water District are implementing policies and procedures to increase water system security.

This Metro Water District plan calls for long term water efficiency which lowers water use over time while not negatively impacting the citizen's quality of life. Drought planning differs significantly from long term efficiency planning due to the necessity for implementation of emergency measures that can have significant economic and quality of life impacts on the citizens. This Plan calls for year-round water conservation practices, even during non-drought periods and established triggers to determine the severity or level of necessary drought restrictions required during drought conditions. The drought level increases with the severity of the drought as do the water use restrictions.

One of the permanent, non-drought water conservation practices is an outdoor watering schedule. This schedule is based on an odd-even outdoor water use schedule, in which odd numbered addresses may water on Tuesdays, Thursdays, and Sundays, and even numbered addresses may water on Mondays, Wednesdays, and Saturdays. Exceptions and specific schedules for commercial and other non-residential water uses are specifically stated in the Georgia Drought Management Plan.

Georgia EPD may request or order permit holders of both water treatment plants and water withdrawals to restrict water usage when the Director of Georgia EPD determines that such measures are necessary to protect and preserve public health and welfare, and/or aquatic communities. For example, if a water distribution system's pressure drops below 20 pounds per square inch, the Director may determine that public health is at risk, and may require water use restrictions. Georgia EPD may also restrict businesses that use large volumes of water, such as car wash facilities and garden centers, during drought periods. These measures are short-term to mitigate water shortages and prioritize water usage.

CLIMATE CHANGE IMPACTS

The recent Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report: Climate Change 2007 determined more conclusively than ever before that global climate is warming at an accelerated rate and is likely due to man-made greenhouse gases. General changes

in weather that are predicted to accompany this warming in the southeast are that dry and wet weather events will become more intense than in recent decades. Although more study is needed to determine precisely how climate will change in the Metro Water District area, the following general impacts are likely:

- More frequent heat waves
- Increases in evaporation
- A decrease in annual precipitation
- Increased variability of precipitation including:
  - More severe and extended drought
  - Increased frequency and intensity of rain events

Climate change introduces an additional element of uncertainty for managing water resources. The probable impacts on water supplies that should be considered are increased water use due to increased temperatures and reduced reservoir yields due to evaporation and extended drought. The potential impacts on water quality that may accompany climate change include more erosion and turbidity due to more frequent and intense rain events. Warmer water may also impact the water quality of supplies. Increased flooding may also damage public water supply facilities that are located in or near flood prone areas.

If climate change increases water demand by 10% this would increase the average annual demand in the Metro Water District to 1,112 AAD-MGD in the year 2035. The Metro Water District should monitor information regarding climate change and as more specific data is available for the region take this into account in future plan updates.

There are actions that are already part of the water supply planning process that will help to mitigate the impacts of global warming in the Metro Water District. The water conservation program in this plan will reduce water use and use the limited water supply more efficiently. Returning reclaimed wastewater to reservoirs such as Lanier and Allatoona will also serve to make water supplies more reliable in extended drought.

Additional measures that should also be considered in future planning include:

- Review yield of existing reservoir storage in light of changing conditions;
- Increase off-stream storage to mitigate impacts of reduced yield; and
- Develop multiple and diversified sources, where possible, to increase reliability.

WATER QUALITY ISSUES

Water quality is where the linkage amongst the three Metro Water District plans is the clearest; protecting water quality is one of the primary objectives of the planning efforts. Water quality is not only important to ecological habitats but also to sustain water supplies for potable uses. Issues related to water supply and quality include water treatment requirements, EPA Groundwater Rule, chemicals of concern and sedimentation of stream and river intakes.

WATER TREATMENT STANDARDS

Water treatment standards are expected to become more stringent over the next 30 years as the expectations for higher quality drinking water continue coupled with more reliance on reclaimed water to augment water supply sources. To date, EPA has developed the majority of the regulations that were required to be promulgated by the 1996 Safe Drinking Water Act Amendments. Two key rules have taken effect since the 2003 Water Supply and Water Conservation Plan: The Long-Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR), which focuses on treatment and control of the microorganism Cryptosporidium; and the Stage 2 Disinfectants/Disinfection Byproducts Rule (D/DBPR), which focuses on the long-term health effects of exposure to compounds produced by chlorine disinfection practices, used by most local water providers within the Metro Water District.

For LT2ESWTR, monitoring starting dates are staggered by system size. The largest systems (serving at least 100,000 people) began monitoring in October 2006 and the smallest systems (serving fewer than 10,000 people) began monitoring in October 2008. After completing monitoring and determining their treatment needs, systems will generally have three years to comply with any additional treatment requirements. Systems must conduct a second round of monitoring six years after completing the initial round to determine if source water conditions have changed significantly.

The Stage 2 D/DBPR rule builds incrementally on existing D/DBPR rules. The first step is a multi-year process to determine the areas of the distribution system with the highest risk. If disinfectant or disinfection byproduct levels are too high, local water providers will have to implement operational or treatment changes. The time to complete system modifications will depend on the system size. Most water systems in the Metro Water District initiated monitoring in Fall 2007 under the Stage 1 D/DBPR rule. By April 1, 2012, most local water providers in the Metro Water District must submit a monitoring plan and begin compliance with Stage 2 D/DBPR. All local water providers should be in compliance with Stage 2 by 2016.

These two rules may require changes in the treatment practices of many water utilities during the next 30 years. Some of the technologies that may be required for compliance with these new rules include optimization of existing chlorination practices; use of alternative oxidants and disinfectants (such as ozonation and ultraviolet (UV) disinfection); optimization of coagulation, and/or higher levels of organic precursor removals, including membranes, advanced oxidation processes or granular activated carbon (GAC) treatment.

EPA is continually evaluating potentially harmful compounds in drinking water that may be regulated in the future. Based on past experience, the time it takes for a contaminant to go from being listed on the Contaminant Candidate List (CCL) to being regulated is 10 to 20 years. Because of this continually-updated process, additional drinking water contaminants will be regulated during the 30-year study period. It is difficult to predict the specific compounds to be regulated and the treatment technologies that may be needed to treat them. However, it is likely that water treatment plants will be required to continually evaluate their performance and optimize existing treatment or add new technologies. These changes in treatment standards will need to be addressed in future updates to the Water Supply and Water Conservation Management Plan.

GROUNDWATER TREATMENT RULE

EPA published the Groundwater Rule (GWR) in the Federal Register on November 8, 2006 in response to requirements in the 1996 Amendments to the Safe Drinking Water Act. The purpose of the rule is to provide for increased protection against microbial pathogens in public water systems that use groundwater sources. The GWR applies to public water systems that rely on groundwater or to any system that mixes surface and groundwater if the groundwater is added directly to the distribution system and provided to consumers without treatment. Currently, less than one percent of the Metro Water District's water supply is obtained from groundwater sources. However, the increase in operating costs, due to additional monitoring and disinfection requirements may make some of the existing and future groundwater sources less viable, further increasing the Metro Water District's reliance on surface water.

CHEMICALS OF CONCERN

Chemicals of concern is a term used to describe a wide array of chemicals and microorganisms that are suspected of posing a risk to public health through drinking water, that include pharmaceuticals and personal care products (PPCP's) and endocrine disrupting compounds (EDCs). Chemicals of concern are not presently regulated, partly because of difficulty with analytical techniques, detection limits levels and lack of baseline information on ambient concentrations. The EPA tracks chemicals of concern through the CCL.

In the future, if removal of these chemicals of concern becomes regulated, advanced treatment techniques, such as UV disinfection, nanofiltration (NF) or reverse osmosis (RO) membranes will become common in the Metro Water District. Treatment for chemicals of concern is also covered in the Wastewater Management Plan. Educating the public on proper disposal of pharmaceuticals and household chemicals will help reduce the contribution to the sanitary sewer waste stream and ultimately in source water supplies.

SEDIMENTATION OF STREAM AND RIVER INTAKES

Excessive sedimentation at water intakes can cause interruption in water supply and serious abrasion of pumps with consequent higher operating costs. Sediment entrainment at pump intakes is causes by erosion and high sediment loads within the contributing watershed. Smaller intakes on smaller streams and rivers are more prone to sedimentation. In addition, high turbidity increases treatment costs and issues for local water providers. Communities in the Metro Water District will need to enforce existing erosion and sedimentation control regulations, as discussed in the Watershed Management Plan, to help prevent sediment from reaching receiving waters.

Section 11: STATE AND REGIONAL POLICY RECOMMENDATIONS

This Section focuses on State and regional policy recommendations to further implementation of water supply development and water conservation practices in the Metro Water District. These recommendations are intended for State agencies, and require no action on the part of local governments or local water providers. Implementation of these policy recommendations is intended to advance the progress towards addressing integrated water resources protection within the Metro Water District. The recommendations identify actions to be taken, the agency to lead the action, and the year for the action to begin is shown in parentheses.

POST-2035 WATER SUPPLY SOURCE PLANNING

Although this Water Supply and Water Conservation Management Plan provides for supply sources and facilities to meet the 2035 forecasted demands, planning for supply sources beyond 2035 will need to continue within the planning horizon. The Metro Water District should continue to facilitate regional water supply source planning through the existing Technical Coordinating Committee or through a sub-committee of that group. The TCC or sub-committee will be charged with identifying and advocating future water supply sources in the Metro Water District.

- Metro Water District staff should facilitate ongoing discussions on post-2035 water supply planning. (ongoing)

FACILITATE NEW WATER SUPPLY SOURCES

This Water Supply and Water Conservation Management Plan outlines several planned and potential water supply sources critical to meeting future water demands and providing needed water supply reliability within the Metro Water District. The State has recently recognized the importance of reservoir and water supply projects with the Water Conservation and Drought Relief Act, signed into law in May 2008. The law facilitates new water supplies by bringing State agencies together and providing State funding assistance for projects. The law tasks Georgia EPD with expediting permitting related to new reservoir applications and tasks the Georgia Environmental Facilities Authority (GEFA) with providing financial assistance for reservoir and water supply projects. The following recommendations should be considered by GEFA and Georgia EPD related to facilitating new water supply sources for the Metro Water District:

- Continue to financially support the construction of needed water supply sources through GEFA and other Federal and State funding sources. (ongoing)

FACILITATE WATER PERMITTING

The law creating the Metro Water District (O.C.G.A. §12-5-571) grants the Georgia EPD broad powers for issuing water withdrawal permits to water providers in the Metro Water District in accordance with the Water Supply and Water Conservation Management Plan. Regulatory permitting of water withdrawals as well as water treatment facility expansion is crucial to the implementation of the Plan.

Currently, water withdrawal permits are handled by the Water Withdrawal Permitting Program of the Georgia EPD's Watershed Protection Branch. The Drinking Water Permitting and Engineering Program is under the same branch and issues permits for public water systems, including permits for the expansion or modification of existing public water treatment plants. In addition, several programs within the Watershed Protection Branch regulate wastewater systems. While consolidation of these permits may not be practical, Georgia EPD should continue its current efforts to improve coordination and communication among the groups handling the permits in order to expedite projects included in the Water Supply and Water Conservation Management Plan. In accordance with HB342, a multi-agency Water Supply Technical Assistance Program has been established to assist communities in developing water supply projects. Recommendations for coordination and communication include the following:

- Consolidate permit cycle. The water withdrawal permit is typically issued for a ten-year period; the permit to operate treatment facilities is also typically issued for a ten-year period. It is recommended that the permit cycles for both withdrawal and treatment/operation/plant expansion be consolidated into the same cycle on the basis of river basin (same as the wastewater permits), in order to revise and refine these permits based on the updated needs in the particular basin. (2009 – 2011)
- Consolidate and standardize reporting. Reporting is required for several regulatory programs, such as the water conservation progress report. These reports can be simplified to meet multiple requirements. Revisions to permit reporting could include web-based reporting or other recommendations resulting from the Georgia Association of Water Professionals (GAWP) Watershed Streamlining Task Force. (2009 – 2010)

ENCOURAGE CONSERVATION THROUGH STATE LEGISLATION

The following State legislation should be considered to support local water conservation programs:

- Adjust the State plumbing code to reflect market maturity for higher efficiency fixtures, such as 1.28 gallon per flush HET toilets and 0.5 gallon per flush high-efficiency urinals for all new development and redevelopment projects. (2015 – 2035)
- Return local home rule to local water providers for establishing drought restrictions based on their local conditions and understanding of their water systems.
- Offer state tax credits for commercial and industrial retrofit of toilets and urinals, coin operated washers, front loading washing machines, water efficient dishwashers, instant hot water heaters, drip irrigation and advanced irrigation controllers.
- Prohibit homeowners associations (HOAs) from requiring water intensive landscaping or irrigation.

SMALL WATER WITHDRAWALS

During the recent drought conditions, small surface water withdrawals and wells have become more common to provide irrigation water to avoid drought irrigation restrictions. The cumulative impact of small surface water withdrawals and groundwater withdrawals has the potential to deplete municipal water resources. In the Metro Water District, there is a strong correlation between groundwater and surface water flows, therefore groundwater use depletes base flows in streams. Since the quantity of water withdrawn under 100,000 gpd is not required to be reported, it is difficult to quantify the impact on instream and downstream water users. The Georgia EPD should study the following policy changes and make the appropriate recommendations to the Georgia General Assembly:

- Require all withdrawals in the Metro Water District to adhere to the same drought restrictions as those on public water supplies.
- Consider requiring permits for withdrawals less than 100,000 gpd within the Metro Water District.

COMPREHENSIVE LAND USE PLAN COORDINATION

Georgia Department of Community Affairs (Georgia DCA) is responsible for overseeing required Comprehensive Land Use Plans and implementation of Part V Environmental Planning Criteria under the Georgia Planning Act.

Georgia DCA currently reviews Comprehensive Land Use Plans (CLUPs) for compliance with the Metro Water District Water Supply and Water Conservation Management Plan. The local CLUPs direct where growth will occur locally and should be coordinated with local water providers. Additionally, Georgia DCA through the CLUP review process should support protection of source water supply watersheds.

The Part V Environmental Planning Criteria include important protections for source water supply watersheds. These criteria were recently updated by Georgia DCA and Georgia EPD. Reviews of the Part V Environmental Planning Criteria will need to be more thorough as local governments have several options available for compliance with the updated criteria.

The following recommendations should be considered by Georgia DCA related to required Comprehensive Land Use Plan reviews:

- The new Comprehensive Land Use Plan review audit checklist should be updated as needed to encourage coordination between land use planning and water supply planning in accordance with this Water Supply and Water Conservation Management Plan. (2009 - 2010)
- Review and support source water supply watershed protection as outlined in Part V Environmental Planning Criteria. (2009 and ongoing)

WATER CONSERVATION PROGRAM EVALUATION

The water conservation program is a critical element of this regional Water Supply and Water Conservation Management Plan. Future water supplies and treatment capacities contained within this Water Supply and Water Conservation Management Plan are based on attaining the

forecasted benefits of this conservation program on a regional scale. Currently there are several practical limitations to measuring progress such as inconsistent terminology, lack of available data and the need to identify practical ways of collecting data. Periodically, it will be important to assess the progress and benefit of the water conservation program. Recommendations throughout this Plan are intended to address the existing limitations to the degree practicable to develop a sound method of measuring regional progress. Examples include the use of the IWA/AWWA software in Action Item 5.6 to assess water loss following a standardized methodology.

The Metro Water District should work through the Technical Coordinating Committee and, if necessary, a sub-committee of the TCC to discuss options for collecting data and measuring progress. The Metro Water District should consider the following:

- Metro Water District staff should facilitate discussions to establish terminology and methodology for measuring progress of the water conservation program. (2009 - 2011)

Section 12:
EDUCATION AND PUBLIC AWARENESS

INTRODUCTION

Education and public awareness is essential to effective water resources management. The 2003 Water Supply and Water Conservation Management Plan developed an education and public awareness program that has made significant progress in reaching the Metro Water District population with its messages on water supply and water conservation over the last five years.

The Metro Water District education and awareness program is specifically designed to:

- Raise public awareness of water issues and needs to foster support for solutions;
- Educate the public and other identified target groups in order to increase awareness and encourage behavioral changes; and
- Coordinate with other public as well as private entities to maximize the visibility of the Metro Water District and its messages.

The Metro Water District education and public awareness program is comprised of two elements: a regional program managed by the Metro Water District staff; and education activities undertaken by local governments. The Metro Water District provides a regional education and public awareness program that works through the Water Supply and Water Conservation Technical Coordinating Committee (TCC) to expand upon the key water supply and conservation themes identified in this plan and develop mass media content and educational tools, including a comprehensive website, brochures and presentation materials. The local governments' role in education and public awareness is to reach out to specific groups in their community, provide educational materials and share knowledge of subject matters with the public by undertaking specific education and outreach activities. Without local implementation of the education program the full potential of this plan cannot be realized.

The following pages outline the key messages, the identified targeted audiences and various delivery techniques. This is followed by an overview of the Metro Water District's regional education and public awareness program and activities. The final part of this section includes the local education and public awareness requirements.

EDUCATION AND PUBLIC AWARENESS APPROACH

WATER SUPPLY AND WATER CONSERVATION MESSAGES

The Metro Water District along with the Water Supply and Water Conservation TCC has created central messages, identified below, for both the regional and local water supply and water conservation education and public awareness program.

- With limited water supplies in the Metro Water District, outdoor water use is considered consumptive and should be minimized. Tools and techniques such as native, drought tolerant landscaping, better irrigation controls, use of recycled water for car washing and other outdoor water use education will help minimize these consumptive uses.
- Water is a precious resource and "water wasting" should be avoided. Water wasting includes activities such as runoff from over-watering landscaping, irrigation during rainfall events, not repairing leaks, and other wasteful activities.
- As the Atlanta region develops, water efficient new homes and green buildings should be promoted. There is a great deal of interest from the public as well as builders on creating more water efficient new homes and buildings.
- Increased understanding of "typical" usage and a customer's own historical usage will provide water users with basic information they need to reduce water demands.
- Indirect potable reuse, which consists of returning highly treated reclaimed water to the natural environment (reservoir, storage reservoir, or stream) where it mixes with receiving waters and is eventually reused, and is a valuable means of sustaining the Metro Water District's water supply.

TARGET AUDIENCES

Identifying stakeholders helps in tailoring messages and education materials. While regional water conservation messages will be consistent, specific information may be more applicable to certain audiences. The Metro Water District has identified the appropriate target audiences for the Water Supply and Water Conservation Management Plan in Table 12-1.

TABLE 12-1
Education Focus for Target Audiences

Target Audience	Education Focus
General Public	Basic concepts of water efficiency and conservation including how individual actions can make an impact.
Residents	Residents must be educated about how to conserve water at home and understand water conservation pricing structures for water supply. Understanding their water use and the importance of not wasting water is key information for residents to start making small behavioral changes that will conserve water.
Students / Schools	Instilling water conservation messaging in students is important to developing conservation-minded habits and behaviors at a young age. The education and support of the teachers and schools is vital to getting the messages to students.
Home Gardeners	Proper knowledge on water-wise landscaping, irrigation system operation and maintenance and appropriate levels of outdoor watering is important for this audience.

Target Audience	Education Focus
Urban Agriculture (landscapers, irrigators etc.)	This audience should to be educated on the need to incorporate water conservation measures into the daily lives of their customers.
Golf Courses	Golf course owners and staff should be educated on implementing water conservation and water reuse best management practices.
Plumbers	This audience should to be educated on the need to incorporate water conservation measures into the daily lives of their customers.
Builders/ Developers/ Designer Professionals	This audience should be educated on the importance of installing water efficient appliances and fixtures in new homes and buildings.
Real Estate Professionals	Real estate professionals should have a general understanding of the limited water resources in the region and the importance of installing water efficient fixtures and appliances in both new and older homes.
Offices/ Retail	This audience needs to be educated on how to save water in an office environment, this includes making sure the building, business operations, cooling towers and employees are all water efficient.
Restaurant / Food Service	Restaurant owners and manager should be educated on water conserving commercial kitchen appliances and fixtures and on ways to conserve water in restrooms. Staff should understand how to appropriately use appliances and fixtures and be knowledgeable about other ways to conserve water in their day to day activities in the kitchen.
Laundry Facilities and Linen Suppliers	This audience should be educated on water efficient processes, commercial appliances and fixtures that can be used to improve their water efficiency while continuing to abide by all applicable health regulations.
Hotels	Hotels have more plumbing and water using fixtures than most standard commercial operations. Hotels should understand the importance of finding and fixing leaks, the water savings that can be generated by installing water efficient fixtures as well as the understand the messaging for restaurants and laundry facilities.
Health Care Facilities	Health care facilities may operate equipment such as x-ray machines, sanitizers and sterilizers that use water and should be encouraged to use them in a manner that conserves water while continuing to abide by all applicable health and safety standards. These facilities typically have many bathrooms and sinks and water efficiency should be promoted in these areas.
Heavy / Light Industrial	Industries should understand their water use, conserve water at their facilities and educate employees on how to conserve water.
Car Washes	Car washes should be encouraged to conserve water by retrofitting existing facilities and/or maintaining water recycling systems.

Target Audience	Education Focus
Water Systems	Water professionals need to be informed on the process and solutions within the Water Supply and Water Conservation Management Plan for their understanding, and to ensure that there is a coordinated approach that supports the goals of the Metro Water District. Utility employees need to be educated on water conservation methods to be able to inform their customers on how to save water.
Local Elected Officials / Governing Boards	Importance of promoting and sufficiently funding the implementation of the Metro Water District's conservation measures.

DELIVERY TECHNIQUES

There are a number of ways to reach target audiences in a public education effort both at a local and regional level. Some examples of these delivery methods are outlined below.

Internet

- **Website** – An internet site or page can provide an inexpensive way to foster awareness and education of water supply and water conservation issues at the community or regional level. A website can also serve as an information clearinghouse for other educational materials, and provide resources and additional links for target groups such as the general public, the development communities, and various industries.
- **Email** – Email newsletters can provide information of upcoming outreach events as well as tips on water supply management and conservation for targeted audiences and the general public. Email is often the least expensive way to reach a larger number of individuals and entities.
- **Streaming media** – Tools such as streaming audio and video, webcasts, online training workshops, and other interactive electronic media tools provide additional opportunities for reaching target audiences.

Printed Materials

- **Brochures & Fact Sheets** – Brochures, fact sheets and other literature can be for general information or provide messages and tips specific to a particular topic or target group. Printed materials often complement other education and public awareness activities such as public outreach events, workshops, and on-site inspections of businesses.
- **Bill Inserts** – Printed materials can be designed to accompany utility bills or other correspondence to local citizens and businesses. Inserts can include brochures, newsletters tips on best management practices and events notices. Bill inserts are an excellent way to distribute educational materials without additional postage expenses.
- **CD / DVDs and DVD-ROMs** are mediums for providing interactive educational material and are especially well-suited for youth and classroom education. In addition, video DVDs can be used to distribute content such as public service announcements (PSAs), video programs, and instructional/training videos.

- **Posters** – Wall posters provide a great deal of information quickly to the target audience at a stationary location and can be displayed at locations such as libraries, schools, and other public locations.

Mass Media

- **Press Relations** – Both local communities and the Metro Water District can work with the media to ensure coverage of water supply and water conservation issues and activities. This can include both articles and events listings in general circulation newspapers, specialty papers, and regional magazines; radio and television interviews; features on radio and television news and public affairs programming; and coverage of events such as water conservation fairs and community events.
- **Television Public Service Announcements** – Television advertising using PSAs provide an immediate impact with a visual message. Broadcast channels reach a wide audience but are high-priced. Cable television offers local communities the ability to target their citizens and even tailor advertising to specific channels and audiences.
- **Radio Public Service Announcements** – Radio PSAs are an alternative to television and provide a less expensive way to reach a large number of individuals with water conservation messages and tips.
- **Outdoor Advertising** – Billboards and other outdoor advertising such as bus shelter ads can be a way to reach audiences through a different medium. These outdoors ads are well suited to short theme messages and specific tips on water conservation.
- **Other Advertising** – Other advertising methods that may be considered include movie theater PSAs, paid ads in newspapers and print magazines, and sponsorship of traffic and/or weather spots on radio.

Outreach and Involvement

- **Workshops** – Workshops and seminars opportunities to provide more detailed information and training to citizens, businesses and industry groups.
- **Speakers Bureau** – A speaker's bureau provides an opportunity for government staff and other professionals to address community organizations, business groups, homeowners' associations, church groups and educational institutions on issues related to water supply and water conservation management.
- **Events –** Hosting or participation in community events provides an opportunity for the distribution of information and resources directly to target communities. In addition, topic-specific events such as water conservation fairs, Earth Day events, school fairs, etc. are an important way to involve citizens directly in water supply and water conservation management efforts.
- **Kiosks / Exhibits –** A kiosk or exhibit provides a way to present information and educational messages at workshops and other events. Exhibits may be permanent or portable and can have static displays, videos, or interactive features. Portable display boards are often effective for use at events or workshops.

- **Promotional Items** – Promotional giveaways such as magnets, pencils and bumper stickers, can be imprinted with water conservation messages and tips and distributed at community events, schools and workshops.

REGIONAL EDUCATION PROGRAM

Over the years, the Metro Water District has developed a comprehensive education and public awareness program that includes all the elements outlined in this section. A regional education and public awareness plan has many benefits including reducing duplication of efforts, improving cost effectiveness among groups by sharing costs, and expanding the size and scale of education efforts to include mass media such as television and radio advertising.

The Metro Water District developed a regional water conservation education and public awareness program to help local governments educate their communities about the importance of conserving water. The regional water conservation campaign includes brochures, videos, how-to-manual and promotional items. The Metro Water District adopted Water Use It Wisely, a nationally known water conservation public education campaign recognized for their indoor and outdoor water conservation tips.

Shortly after adopting Water Use It Wisely, the Metro Water District began its water conservation media campaign. The media campaign included television, radio, outdoor and movie theatre advertising. Water Use It Wisely messages were placed on local television and radio stations, billboard, bus stations and in movie theatres throughout the Metro Water District. The Metro Water District has partnered with local television stations to air Water Use It Wisely and partnering station public service announcements (PSAs). The radio water conservation PSAs were aired on radio stations across the region during peak times such as morning and evening rush hours.

As part of the regional education campaign, the Metro Water District provides an essay contest for middle school students throughout the Metro Water District. The essay contest encourages middle school students within the district, to write essays on water quality and water conservation. The Metro Water District recognizes one winner from each county and one overall winner. This regional essay contest helps local governments reach out to students and teachers who would normally not be able to because of budget and staff constraints.

Moving forward to the next five years, the Water Supply and Water Conservation Management Plan will continue to promote water conservation messages. New messages have been identified that the Metro Water District can promote including helping the community understand typical water use, outdoor water use is consumptive and should be minimized, “water wasting” should be avoided and new homes and green buildings should be water efficient. In support of these messages and to enhance current efforts, the Metro Water District should consider the following:

- Research Homeowner Association watering and irrigation requirements and, if feasible, develop a strategy to address required irrigation system and watering.
- Develop a model “water waste” ordinance.
- Promote water efficiency aspects of green building.
- Assist with development of a new home efficiency award program.
- Sponsor an annual awards program for water saving businesses.

- Offer cooling tower education and training.
- Add additional emphasis to outdoor watering education including developing educational materials on rainwater harvesting and efficient water use for pools, spas, pressure washing and non-commercial car washing.
- Provide education on energy and water savings possible through implementing water conservation practices.

The Metro Water District provides a number of educational resources for local governments to use in order to facilitate and manage their local education campaign. Table 12-2 is a list of educational resources provided by the Metro Water District. Each item gives a brief description on how local governments can use these tools to meet education requirements.

TABLE 12-2

Educational Materials Available to Local Governments by the Metro Water District

Educational Tools	Description
Brochures	The Metro Water District provides camera ready brochures for local governments to personalize with their own logo and contact information. A list of the available brochures and educational items can be found in the appendix of this plan.
CD/DVD	The Metro Water District provides a number of educational materials such as PowerPoint presentations, videos and public service announcements.
Presentations	The Metro Water District provides pre-packaged presentations with speaker's notes on a variety of topics such as household water audits, checking for leaks and building rain gardens.
Metro Water District Website	The Metro Water District website provides downloadable resources such as brochures, how-to-booklets, news articles and water conservation related reports and documents.
Exhibits	The Metro Water District has a mobile exhibit board and "water drop" costume available to loan to local governments for community events. The mobile exhibit board has facts and tips on water pollution prevention. Local governments can also customize the exhibit board with local information.
Press Materials	The Metro Water District provides templates for press releases, news articles, flyers and newsletter inserts to distribute to local and regional media outlets.

All components of the education and public awareness program are important for an effective education and public awareness program. The Metro Water District will continue to provide support to local government through its regional education and public awareness program.

LOCAL EDUCATION PROGRAM

The goal of local education programs is to achieve awareness of water supply and conservation issues with the goal of building public support for local actions and activities as well as changing behaviors that leads to the long-term protection of our water resources. Involving the public in local water supply and water conservation efforts is crucial because it promotes broader public support, helps create an ethic of stewardship and community service, and enables the public to make informed choices about water resources management. Changes in basic behavior and practices are necessary to achieve maximum, long-term improvements in water efficiency.

On a local level, Metro Water District communities are responsible for developing their own local education and public awareness programs that help both individual citizens as well as business and organizations to become aware of their role in water efficiency. This includes general information on water supply and water conservation management and issues.

LOCAL EDUCATION PROGRAM REQUIREMENTS

When developing a local education and public awareness program, communities are required to include both public education and outreach, as well as public involvement and participation activities:

- **Education and outreach program activities** are designed to distribute education materials and messages, and perform outreach to inform citizens and target audiences.
- **Public participation and involvement activities** provide opportunities for citizens to participate in programs and active implementation of water supply and water conservation programs, such as water festivals and community workshops.

Water providers in the Metro Water District are required to annually implement a minimum number of education and outreach, and public participation and involvement activities annually as part of their local education program as shown in Table 12-3. Table 12-4 provides some examples of activities that could be considered as public education and outreach versus public participation and involvement. These minimum education and outreach programs may be in coordination with other Metro Water District communities, local water/wastewater providers, or other public or private entities such as Keep Georgia Beautiful affiliates.

TABLE 12-3
Minimum Local Education and Public Awareness Program Annual Requirements

Population Served	Education and Outreach Activities	Public Participation and Involvement Activities
<50,000	2	2
>50,000	3	3

TABLE 12-4
Example Water Supply and Water Conservation Education / Outreach and Public Participation / Involvement Activities

Education and Outreach Activities	Public Participation and Involvement Activities
Bill stuffers or newsletters	Water treatment facility tours
Brochures at municipal facilities	Citizen advisory group
Website with water conservation information	Water festivals
Local Cable or Government TV station programming	School classroom education
Speakers bureau presentations	Technical training to target audiences
Press releases	Retrofit kit distribution
Provide historical water use on water bills	Essay contests
Adopt a water waste ordinance and enforcement	Coloring book contest
Xeriscape demonstration garden	Community workshops
Promote toilet rebate program	Interactive kiosks / exhibits
Other innovative education and outreach activities	Other innovative public participation and involvement activities

EXAMPLE DESCRIPTIONS OF ACTIVITIES

Example Education and Outreach Activities:

- **Provide historical water use on water bills**. Historical use on water bills provides a great opportunity to educate all water system customers. A water system could provide detailed information on customer's historical water use, including typical usage and trends.
- **Water waste ordinance**. An ordinance would provide a general policy statement for a local government that would prohibit water waste while also educating all water users on water wasting. Water wasting includes runoff from over-watering landscaping, irrigation during rainfall events, not repairing leaks, and other wasteful activities.
- **Xeriscape demonstration gardens**. A water system may donate or acquire a portion of public or private land to create a demonstration garden displaying living examples of low water-using gardens and landscaping. The water system would provide signs and brochures to educate those people visiting the garden.

Example Public Participation and Involvement Activities:

- **Facility tours at treatment plant**. Some local water service providers have tours available at their facilities. Tours can be arranged for school trips or other audiences. Informational materials such as brochures and fact sheets can be available for distribution at participating facilities.

- **School education**. School education can be an opportunity to educate students, teachers and/ or parents on water efficiency and may include a wide variety of outreach activities. The water system could sponsor school conservation by providing presentations, opportunities for field trips, and/or coloring books, etc. to teach students the importance of conserving water.

- **Community workshops**. Local water systems can offer training classes to homeowners on a variety of water efficiency topics. For instance, a water system may coordinate with the Cooperative Extension Service to conduct a landscape water efficiency training program for homeowners in the spring of each year. Topics for water efficiency workshops may include how to be a water wise household, finding and fixing leaks, making a rain barrel, Xeriscaping and proper irrigation watering and maintenance. Workshops may be held for interested existing groups and organizations during their regularly scheduled meetings.

TABLE 12-5
Water Supply and Water Conservation Education and Public Awareness Resources

Public Outreach Toolbox	
Program	**Program Description/Resource Location**
Metro Water District Programs	
Regional Outreach Tools	Various water conservation resources for outreach and events. http://www.northgeorgiawater.com
Conservation Support	Various websites to assist with water conservation program. http://www.northgeorgiawater.com
Water Use it Wisely	Various resources for outreach. http://www.wateruseitwisely.com
Georgia EPD Programs	
Conserve Water Georgia	Water Conservation and Watering Restrictions http://www.conservewatergeorgia.net
Georgia Project Wet	Water Education Resources for Teachers http://gaprojectwet.org
Adopt-a-Stream	Volunteer Water Sampling and Monitoring Program http://www.georgiaadoptastream.org
River of Words	Poetry, Writing and Art program for K-12 http://gaprojectwet.org/
Rivers Alive	Annual Volunteer Waterway Cleanup http://www.riversalive.com/
Other Public Education Resources	
EPA Water Sense	Various resources for outreach. http://www.epa.gov/watersense
Georgia DCA	"Winning Water" Water Festival http://www.winningwater.org

Section 13: IMPLEMENTATION PLAN

INTRODUCTION

The implementation actions for the Water Supply and Conservation Management Plan are a blueprint for State, regional and local water providers in the 15-county Metro Water District to follow. Performing these actions will lead towards achieving the goals established for the Water Supply and Water Conservation Management Plan.

ROLES

The Water Supply and Water Conservation Management Plan involves participation by citizens and many levels of government for implementation. The broad roles for these are summarized below:

Local Jurisdictions

- Own and operate local water systems that manage water supply, treatment, distribution and water conservation programs;
- Plan and construct water supply infrastructure for water supply (Note: projects required pursuant to a federal or State court order will take precedence over the recommendations contained in this plan);
- Participate in the Metro Water District including coordination with the Wastewater Management Plan and Watershed Management Plan;
- Implement programs to improve water system interconnections; and
- Participate in regional efforts for water resources management related to implementation of this Plan.

Metro Water District

- Promote inter-jurisdictional collaboration for water resources management;
- Serve as a forum and clearinghouse for regional issues, such as water conservation;
- Present a regional voice for water resources management;
- Provide local jurisdictions with support and guidance for implementing this Water Supply and Water Conservation Management Plan; and
- Monitor development of the Comprehensive Statewide Water Management Plan and its impact on the Metro Water District members.

Georgia Environmental Protection Division

- Issue water withdrawal permits in accordance with this Water Supply and Water Conservation Management Plan;
- Continue regulatory functions over water supply; and
- Support regional planning.

Georgia Environmental Facilities Authority

- Support the Water Supply and Water Conservation Management Plan through increased funding participation.

IMPLEMENTATION SCHEDULES

Three separate implementation schedules are included in this Section, one for local water providers, one for the Metro Water District, and one for State agencies. It should be noted that local water providers are only responsible for implementing management measures identified on the local implementation schedule and are not responsible for Metro Water District or State-level tasks. Local water providers should use this implementation schedule in combination with Appendix B, County-Level Summaries, which provides greater detail on new water supply development and new facility construction or expansion projects. The implementation schedules in this Section outline the programmatic requirements of this Water Supply and Water Conservation Management Plan.

The reference page numbers provide the location of the full description of each measure in the Water Supply and Water Conservation Management Plan where additional implementation guidance may be found. New program implementation or creation of a program is indicated differently than ongoing implementation in the implementation schedule. The distinction provides a quick snapshot for the level of intensity of implementation on an annual basis.

Tasks in the implementation schedule are outlined individually for the first few years of the Water Supply and Water Conservation Management Plan, considered the short-term. The action items for implementation in the calendar years 2012 to 2015 are considered medium-term and the action items for the 2015 to 2035 time-frame are considered long-term recommendations. The schedule for medium-term and long-term tasks may be adjusted during updates every 5 years, following an adaptive management approach.

TABLE 13-1
Local Water Provider Implementation Schedule

Category	#	Implementation Action Item	2009	2010	2011	2012 - 2015	2015 - 2035	Ref. Pages
Water Conservation Program	**5.1**	Conservation pricing (Irrigation meter pricing established by 2010)	·····	■	·····	·····	·····	5-2 to 5-4
	5.2	Replace older, inefficient plumbing fixtures	■	·····	·····	■	·····	5-5 to 5-6
	5.3	Pre-rinse spray valve retrofit education program	·····	·····	·····	·····	·····	5-7 to 5-8
	5.4	Rain sensor shut-off switches on irrigation systems	·····	·····	·····	·····	·····	5-9
	5.5	Require sub-unit meters in new multi-family buildings	·····	·····	·····	·····	·····	5-10
	5.6	Assess and reduce water system leakage	·····	·····	·····	·····	·····	5-11 to 5-13
	5.7	Conduct residential water audits	·····	·····	·····	·····	·····	5-14
	5.8	Distribute low-flow retrofit kits to residential users	·····	·····	·····	·····	·····	5-15 to 5-16
	5.9	Conduct commercial water audits	·····	·····	·····	·····	·····	5-17 to 5-18
	5.10	Implement education and public awareness plan (component of action item 12.1)	·····	·····	·····	·····	·····	5-19 to 5-20
	5.11	Install HETs and high efficiency urinals in government buildings	·····	·····	·····	·····	■	5-21
	5.12	Require car washes to recycle water	·····	■	■	■	·····	5-22
Reuse	**7.1**	Return reclaimed water to Lakes Lanier and Allatoona for future indirect potable reuse	■	■	■	■	■	7-8
Planned Water Supply Facilities	**8.1**	Construction of 6 new water supply reservoirs	■	■	■	■	■	8-2
	8.2	Construct 6 new water treatment plants	■	■	■	■	■	8-3
	8.3	Expand 28 existing water treatment plants	■	■	■	■	■	8-3 to 8-4
Local Planning Recommendations	**9.1**	Develop local water master plans, update every 5 years	·····	·····	·····	·····	·····	9-2 to 9-4
	9.2	Develop or update local emergency water plans	·····	·····	·····	·····	·····	9-5 to 9-8
	9.3	Source water supply watershed protection	■	·····	·····	·····	·····	9-9 to 9-10
	9.4	Water system asset management	■	■	■	·····	·····	9-11 to 9-12
Education and Public Awareness	**12.1**	Develop and implement a local education and public awareness program (action item 5.10 is a component of this action item)	·····	·····	·····	·····	·····	12-8 to 12-10

■ Active Implementation ····· Ongoing Implementation/ Program Maintenance

Note: Additional implementation items related to each county are included in Appendix B, County Level Summaries.

TABLE 13-2
Regional Agency Implementation Schedule

Category	Implementation Action Item	2009	2010	2011	2012 - 2015	2015 - 2035	Ref. Pages
Post-2035 Water Supply Planning	Facilitate post-2035 water supply planning with the TCC	.....	.....	.....	.....	.....	11-1
Water Conservation Program Evaluation	Continue discussions on evaluating a method for evaluating the water conservation program	.....	.....	.....	.....	.....	11-4
Program Assistance	Assist with program design, coordinate implementation as needed, monitor and report compliance and revise program as needed.	.....	.....	.....	.....	.....	
Education and Public Awareness	Continue to support education efforts with regional education programs	.....	.....	.....	.....	.....	12-6 to 12-8
	Investigate enhancing existing water conservation messages with new recommended topics	.....	■■■■	■■■■	■■■■	.....	12-6 to 12-7
■■■■ Active Implementation ..... Ongoing Implementation/ Program Maintenance							

TABLE 13-3
State Agency Implementation Schedule

Category	Implementation Action Item	2009	2010	2011	2012 - 2015	2015 - 2035	Ref. Pages
State of Georgia							
Facilitate New Water Supply Sources	Financially support the construction of needed water supplies through GEFA and other State and Federal funding sources	.....	.....	.....	.....	.....	11-1
Encourage Conservation	Adjust the State plumbing code to reflect market maturity for higher efficiency fixtures, such as 1.28 gallon per flush HET toilets and 0.5 gallon per flush high-efficiency urinals for all new development and redevelopment projects	.....	.....	.....	.....	■	11-2
	Return local home rule for drought water restrictions stricter than State drought response	.....	■	■	.....	.....	11-2
	Offer state tax credits for commercial and industrial retrofit with water-efficient fixtures	.....	■	■	.....	.....	11-2
	Prohibit HOAs from requiring water intensive landscaping or irrigation	.....	■	■	.....	.....	11-2
Georgia Environmental Protection Division (Georgia EPD)							
Facilitate Water Permitting	Consolidate permit cycles	■	■	■	.....	.....	11-2
	Consolidate and standardize reporting	■	■	.....	.....	.....	11-2
Small Water Withdrawals	Require all withdrawals in the Metro Water District to adhere to the same drought restrictions as those on public water supplies	■	■	.....	.....	.....	11-3
Georgia Department of Community Affairs (Georgia DCA)							
Comprehensive Land Use Coordination	Update the Comprehensive Land Use Plan audit checklist to be consistent with this plan	■	■	.....	.....	.....	11-3
	Review and support source water supply protection as outlined in the Part V Environmental Planning Criteria	■	.....	.....	.....	.....	11-3

■ Active Implementation ..... Ongoing Implementation/ Program Maintenance

IMPLEMENTATION COSTS

Cost estimates for the Water Supply and Water Conservation Management Plan are subdivided into three distinct categories: the water conservation measures, infrastructure costs, and programmatic expenses. These cost estimates are shown in Table 13-5.

The water conservation implementation costs are an output of the DSS model used to forecast the water savings, and subsequent monetary savings, of the selected water conservation program. These costs reflect the cost to the local water provider in establishing and managing these water conservation programs as well as the cost to the water customer of upgrading or installing technologies. As with estimated water savings, the conservation measure implementation costs will vary based on the specific conditions within each county.

Water infrastructure costs include water supply reservoirs, new water treatment plants and expansion of existing water treatment facilities.

The cost of reservoir storage is variable and site-specific, making it difficult to provide typical costs for reservoir projects. The costs can vary significantly depending on location, land and relocation costs, siting and permitting, engineering requirements, environmental impacts and mitigation, difficulty of construction, and the type of reservoir constructed (on-stream vs. pumped storage).

A recent report by GEFA "Georgia Inventory and Survey of Feasible Sites for Water Supply Reservoirs" dated October 31, 2008 estimated reservoir cost indicated costs ranging approximately 4 to 10 million dollars per MGD. Using this range, an estimated cost of the proposed reservoirs would be $824 million. A telephone survey in March 2009 by Metro Water District staff to local water systems to obtain costs for recently constructed reservoirs and proposed reservoirs in or near the Metro Water District showed a range from a low of 0.64 million dollars per MGD to a high of 7.5 million dollars per MGD, with an average cost per MGD of 2.42 million dollars. Using the actual estimates available from this survey and a unit cost of 4 million dollars per MGD where project estimates were not available, the total cost estimate of the proposed reservoirs would be $389 million dollars. This range is included in the Table 13-4 with the higher of the range included in the total.

National information was used for estimating the costs of treatment plant facilities, both for new construction and expansions of existing plants, which reflects the actual costs for dozens of facilities constructed throughout the U.S. Different unit costs were used for plants categorized as small or large. The basis for water treatment infrastructure costs is provided in Table 13-4.

TABLE 13-4
Unit Cost Estimates for Water Supply Treatment Facilities

Type of Project		Cost per MGD of Capacity (in Million $)
New Construction	Large	$4
	Small	$8
Expansions	Large	$4
	Small	$6

Infrastructure costs were calculated by multiplying the unit costs and the county-level facility plans outlined in Appendix B of the Water Supply and Water Conservation Management Plan.

Programmatic expenses such as local planning, state and regional policy, and educational program costs were developed based on cost data provided by communities within the Metro Water District and the Metro Water District. The programmatic costs also vary based on population, level of service, local challenges, and other parameters. As these costs are more region specific, local costs were used, as opposed to national costs.

TABLE 13-5
Estimated Annual Water Supply and Water Conservation Management Plan Implementation Cost by Program Category

Action Number	Description	Estimated Costs (Note 1)
5.0 Water Conservation Program (Note 2)		**Cost in million dollars**
5.1	Conservation pricing	$48.6
5.2	Replace older, inefficient plumbing fixtures	$131.6
5.3	Pre-rinse spray valve education program	$9.6
5.4	Rain sensor shut-off switches on new irrigation systems	$21.7
5.5	Require sub-meters in new multi-family buildings	$102.5
5.6	Assess and reduce water system leakage	$161.8
5.7	Conduct residential water audits	$4.2
5.8	Distribute low-flow retrofit kits to residential users	$19.5
5.9	Conduct commercial water audits	$39.6
5.10	Implement education and public awareness plan	$36.2
5.11	Install high efficiency toilets and urinals in government buildings	$16.6
5.12	Require car washes to recycle water	$3.3
	SUB-TOTAL	**$595.3**
8.0 Planned Water Supply Facilities (Note 3)		**Cost in million dollars**
8.1	Construct six new water supply reservoirs	$389 - $824
8.2	Construct six new water treatment plants	$308
8.3	Upgrade 28 existing water treatment plants	$2,272
	SUB-TOTAL	**$3,403**
9.0 Local Water Planning (Note 3)		**Cost in million dollars**
9.1	Develop local master plans	$2.25
9.2	Develop local emergency plans	$1.58
9.3	Source water supply watershed protection	$1.35
9.4	Water system asset management	$1,490
	SUB-TOTAL	**$1,495**
11.0 State and Regional Policy Recommendations (Note 3)		**Cost in million dollars**
11	State and Regional Policy	$0.20
12.0 Education and Public Awareness (Note 3)		**Cost in million dollars**
12.1	Local education program	$2.3
12.1	Regional education program	$1.2
	SUB-TOTAL	**$3.5**
Totals		
Local water providers and governments		$4,672
Metro Water District		$1.3
Georgia EPD		$0.1
TOTAL		$4,673.8

Notes:
1. Costs for planning period based on local and regional project cost data.
2. Water conservation costs based on the DSS model and includes both utility and community cost, presented in year 2008 dollars.
3. Based on year 2008 dollars.

IMPLEMENTATION FUNDING

Successful implementation of the Metro Water District Water Supply and Water Conservation Management Plan hinges on each local water provider's ability to fund the implementation actions. All local governments should develop a stable funding mechanism that will provide for complete implementation of the Water Supply and Water Conservation Management Plan. The funding methods outlined in this Section are divided into primary and secondary funding methods. The only primary funding method appropriate for funding implementation of the required action items is water rates. There are a number of secondary funding methods, however, that may help augment primary funding methods for specific projects or programs. A blend of funding methods is recommended to support implementation of the Metro Water District Water Supply and Water Conservation Management Plan.

WATER RATES

Like other public utilities, local water providers charge customers for services associated with water capacity, production, and distribution. Water rates provide a stable and dedicated revenue source for implementation of the Action Items in this Water Supply and Water Conservation Management Plan. Water rates should be based on a local rate study and designed to provide a sufficient revenue stream to support program costs and facility maintenance.

GENERAL APPROPRIATIONS (GENERAL FUND)

Revenues from local taxes typically comprise the "General Fund" which funds most activities performed by local governments. Annually, the local government divides the general fund based on local priorities into budgets for police, fire, transportation and other activities. The General Fund is an existing funding source that may be used to augment local water rates for special projects, such as development of a new water supply or construction of a treatment facility. The General Fund is not commonly used to fund water supply and water conservation programs in the Metro Water District.

LOANS/BONDS

Loans and bonds allow immediate expenditures on water supply and treatment projects beyond readily available local funds. Bonds are not a revenue source, but rather are a means of borrowing money for a specific purpose. Funds are typically paid over a 15-year to 20-year period with interest charges, similar to a home mortgage. Despite interest charges, loans and bonds are often a financially sound method for funding capital improvement projects. For some capital improvement projects, such as water treatment plant upgrades and water line rehabilitation, the upfront expenditure may be less than the long-term expense of damage or the cost of water loss due to procrastination.

Typically loans and bonds are used for capital improvement projects that cannot wait until local funds are available; loans and bonds are not recommended for routine operations. Repayment schedules for loans and bonds can be developed to smooth out peaks and valleys in revenue requirements and thus reduce the need for sporadic large rate increases.

General Obligation and Revenue Bonds – Debt financing of capital projects can be accomplished by issuing general obligation bonds, revenue bonds, or a combination of the two. General obligation bonds are issued based on the "taxing powers" of the local government therefore no assets are required as collateral. Revenue bonds are issued based on revenues generated by a specific revenue-generating entity such as special service fees, special assessments, or water rates. Because revenue bonds typically exclude property tax revenues, the interest rate on revenue bonds is typically higher.

Bonds require voter approval in a referendum and are subject to local administrative policy regarding debt ceilings. Most bonds are financed over a 15-year period with interest payments based on the community's bond rating.

Georgia Environmental Facilities Authority Loans – The Georgia Environmental Facilities Authority (GEFA) provides low-interest state loans to assist local governments across the state with a number of environmental-related efforts. Loan programs administered by GEFA cover water, wastewater, solid waste, and land conservation projects. Low interest loans are available for a maximum timeframe of 20 years with population-based limits on loan amounts. GEFA loans require that a community has a good payment history for previous GEFA loans, the project has identified and secured 100% of the total project funds, and the minimum debt service coverage is 105%. There are two GEFA loans capable of supporting implementation of this Water Supply and Water Conservation Management Plan; the Georgia Fund and the Drinking Water State Revolving Fund.

- The Georgia Fund is a state loan program administered through GEFA for water, wastewater and solid waste infrastructure projects. The Georgia Fund provides loans to local governments for projects such as water treatment plants, water and sewer lines, pumping stations, wells, water storage tanks and water meters.
- The Drinking Water State Revolving Fund (DWSRF) is a federal loan program administered by GEFA for drinking water infrastructure projects such as, the implementation of security measures, enhanced filtration/disinfection treatment, complying with standards and regulations, rehabilitating aging infrastructure and developing water supply sources.

Communities in the Metro Water District that apply for a GEFA loan must demonstrate through a Georgia EPD audit that they are in compliance with this Water Supply and Water Conservation Management Plan, as well as the Wastewater Management Plan and the Watershed Management Plan.

WaterFirst – Although typically considered a voluntary recognition program, communities designated by the Georgia DCA as "WaterFirst" communities receive discounts on GEFA loan interest rates. The WaterFirst Community Program is a voluntary partnership sponsored by the Georgia Department of Community Affairs (Georgia DCA) to increase the quality of life in communities through the wise management and protection of water resources. The award program recognizes local governments that make the connection between land use and water quality, and requires thinking beyond political boundaries to recognize the inextricable links created by shared water resources. Becoming a WaterFirst community demonstrates the desire to be responsible stewards of water resources for both environmental and economic benefits today and in the future.

SERVICE FEES

Local governments have the authority to establish special taxes or service fees to address specific local challenges. Service fees include SPLOST funds, impact fees, special assessments/tax districts, in-lieu of construction fees, and mitigation banks as outlined below.

SPLOST Funds – A Special Purpose Local Option Sales Tax (SPLOST) can be voted on and approved by communities for the purpose of funding the building and maintenance of public facilities. Cities and counties are allowed to add up to a 1% sales tax levied against the sale of goods and services with a SPLOST. A SPLOST is recommended by an elected body and voted upon by residents generally during a scheduled election. A SPLOST expires at the end of six years. If additional funds are still needed, they must be voted upon and approved again by the citizens of the community. Counties and school

systems are required to provide an independent accountants' report, examining the way the funds were allocated and verify that the system receiving the funds managed those funds appropriately. SPLOST revenues are generated from sales tax versus property tax, therefore are attractive in communities with significant commercial centers or high tourism rates. SPLOST funds are often helpful for large, community-supported capital projects such as the construction of a new drinking water supply reservoir and/or water treatment plant.

Development Impact Fees – Local governments may legally assess new development projects an impact fee within a proposed local water supply service area. The impact fee is calculated based on expenses incurred to provide the additional public capacity needed to serve the new growth and development and not based on the benefits received. Development impact fees to pay for water supply projects are not common in Georgia, because the burden of proof is on the local government to accurately demonstrate the cost of the impact.

Development impact fees related to local services, including tap fees and/or plan review fees, are common in the Metro Water District. These are generally one-time fees with revenues used specifically to fund salaries for personnel needed to perform the reviews and inspections required for the new development projects. These fees may be paid directly to the local water provider or to the local government depending on the plan review process for each community.

Community Improvement Districts (CIDs) – A unit of government with the power to provide governmental services and facilities. CIDs are similar to authorities that are often created by special tax districts. The benefit of the CID is that they may issue tax-exempt special assessment bonds to finance facilities that provide essential governmental functions, such as water supply- and water conservation-related projects. The debt is supported by the assessment power of the CID and not by the local government. CIDs are often used to support economic development activities.

In-Lieu Construction Fees – Local governments may elect to construct larger regional drinking water treatment facilities that provide benefit to new development areas as well as existing areas through a local Capital Improvement Plan. If regional drinking water treatment facilities are designed to handle supplies to new developments, local governments may charge developers an in-lieu fee for their portion of the drinking water treatment capacity. Alternatively, developers may pay a connection fee to cover the cost of extending drinking water supply infrastructure to the development. This strategy may support economic development, especially in redevelopment and infill development areas where drinking water supply requirements are hard to address on an individual lot basis.

GRANTS

A grant is a form of federal or state financial aid that does not need to be repaid and is typically based on demonstrated need. Grants typically require a local match but are a good way to leverage existing funds. While grants are helpful to extend locally-available funds, they typically are awarded on a competitive basis and involve a long lead time to secure funds. Most grants will not fund completed projects.

Georgia Water Supply Competitive Grant Program – GEFA will distribute $40 million in the State of Georgia as grant funds to support water supply and reservoir projects to make supplies more resistant to periods of drought. These funds are intended to augment the GEFA loan programs. Communities must be a "Qualified Local Government" with Georgia DCA, have a DCA-certified Service Delivery

Strategy, and within the Metro Water District demonstrate compliance with the Water Supply and Water Conservation Management Plan, Wastewater Management Plan, and Watershed Management Plan.

Community Development Block Grants (CDBG) – The CDBG grant program provides funding for projects that substantially benefit low and moderate income persons. Eligible water-related projects could include waterline replacement, additional water tank storage, water meter calibration and replacement, water conservation retrofit assistance, and other projects with a distinct benefit to low and moderate income persons. CDBG funds are distributed within the Metro Water District in two different manners depending on the county.

- **CDBG Entitlement Communities** receive their funds directly from the US Department of Housing and Urban Development (HUD). Jurisdictions in the Metro Water District that are currently entitlement communities include; Clayton, Cobb, DeKalb, Fulton, and Gwinnett Counties and the cities of Atlanta, Gainesville, Marietta, and Roswell. Entitlement communities develop their own programs and funding priorities. HUD determines the amount of each entitlement grant by a statutory dual formula which uses several objective measures of community needs, including the extent of poverty, population, housing overcrowding, age of housing and population growth lag in relationship to other metropolitan areas. There are a number of local requirements for communities to receive their annual funding allocations.
- **CDBG Non-Entitlement Communities** receive funds on a competitive grant basis from the Georgia Department of Community Affairs (Georgia DCA) with approximately $36 million available for the annual competition. Counties that participate in the state-wide competitive grant process in the Metro Water District include Bartow, Cherokee, Coweta, Douglas, Fayette, Forsyth, Hall, Henry, Paulding and Rockdale.

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Section 14: FUTURE PLAN EVALUATION

INTRODUCTION

The Water Supply and Water Conservation Management Plan was updated in compliance with the minimum planning elements identified in O.C.G.A. §12-5-584. The legislation identifies the need to periodically assess regional progress towards implementation of the specific actions identified in the Water Supply and Water Conservation Management Plan and towards meeting the long-term goal of comprehensive water resources management.

The O.C.G.A. specifically states the following Plan requirements:

> *"[E]stablishment of short-term and long-term goals to be accomplished by the plan and measures for the assessment of progress in accomplishing such goals and plan."*
>
> *"The District shall review …management plan(s) and (their) implementation annually to determine whether there is a need to update such plan(s) and shall report to the director the progress of implementation of its goals…"*
>
> *"…the District shall prepare updated …management plan(s) no less frequently than every five years…"*

The short and long-term water supply and water conservation management goals are summarized in Section 13 in the implementation schedule and the county level summaries in Appendix B. The water conservation measures provide the framework for evaluating implementation of this Water Supply and Water Conservation Management Plan. This section provides an overview of the required plan reviews and plan updates as well as provides a summary of regional progress to date.

PLAN REVIEWS AND UPDATES

There are two types of plan reviews and updates: annual reviews and plan updates that occur every five years. The reviews and updates are an important component of the adaptive management approach for all three of the Metro Water District's long-term management Plans (water supply and conservation, wastewater, and watershed).

> *Adaptive management is a type of natural resource management in which decisions are made as part of an ongoing science-based process. Adaptive management involves testing, monitoring, and evaluating applied strategies, and incorporating new knowledge into management approaches that are based on scientific findings and the needs of society. Results are used to modify management policy, strategies, and practices. (USGS)*

This adaptive management approach recognizes the limitations of current knowledge regarding future situations, and the inevitability of change. These Plans provide a big-picture context for specific actions

based on best available data, and will need to be adjusted as better information or new conditions arise. By design, the short-term management measures are outlined in greater detail than the long-term management measures. Recommendations for the first 5 years are reasonably firm, whereas those beyond 20 years are expected to be refined several times before they are implemented.

ANNUAL REVIEWS

The purpose of the annual plan review is to identify and discuss implementation challenges to determine if there is a need for plan amendments. The evaluation process provides stakeholders an opportunity to discuss concerns about a particular element of the Water Supply and Water Conservation Management Plan. The annual reviews are a reminder that the Plans are adaptable, dynamic, and flexible.

The Metro Water District annual surveys are one component of the annual review. The survey results are compiled into an annual activities and progress report by Metro Water District staff and are available on the Metro Water District website.

As the water conservation component of this Water Supply and Water Conservation Management Plan is critical to meeting future water demands, there is a need to track regional progress in more detail in the future. The Metro Water District will work with the TCC to establish additional methods to track water conservation progress in a consistent manner across the region, as recommended in Section 11.

PLAN UPDATES

Plan updates occur at least every 5 years and take a more holistic look at changed conditions and implementation actions since the last Plan Update. Evaluations of changed conditions for Plan Updates may include:

- Population forecasts and trends
- Water conservation program enhancements
- Identify additional supply sources needed to address demands
- County level summaries located in Appendix B

Undoubtedly, other issues will emerge that merit in-depth consideration in the future. As with existing efforts, future planning work should be open and inclusive, involving all Metro Water District members and stakeholders.

RECOMMENDED ANNUAL REVIEWS AND UPDATES

Table 14-1 displays key items for the Metro Water District to consider in its annual reviews and 5-year updates. It is essential that an updated Plan be prepared no less frequently than every 5 years in order to allow for appropriate adjustments.

TABLE 14-1
Summary of Plan Elements to Be Reviewed and Updated Regularly by the Metro Water District

Key to Actions: ● = Required ⊙ = Recommended ○ = Desirable ✱ = Automatic Plan Review Trigger

Plan Elements	Annual Reviews		Five-Year Update	
	Review	Update	Review	Update
Metro Water District Plan recommendations	●	○	●	⊙
Education & Public Awareness Programs	●	⊙	●	⊙
Watershed mandatory local management measures	●	⊙	●	⊙
Local conservation pricing	●		●	
Local water conservation programs	●	⊙	●	⊙
Recommended Metro Water District actions	●	⊙	●	⊙
Recommended actions for state agencies	○		●	
Related Metro Water District and State Plans (Water Supply/ Long-term Wastewater/ Watershed, etc)	○		●	⊙
Local septic system programs	○		●	●
Local sewer system operation and maintenance programs	○		●	
New population and demand forecasts			●	●
Funding trends	●		●	
Special Triggers for Plan Reviews *Note: Any of these actions should trigger an automatic review of their implications for Metro Water District Plans, and needed Plan modifications. Additionally, the status of any of these pending actions should be monitored routinely.*				
State-wide Comprehensive Water Management Plan resource assessments or guidance	✱	○	●	●
Georgia EPD policy or permit requirement changes	✱	○	●	●
Georgia EPD guidance on ACF and ACT basins modified	✱	○	●	●
Georgia EPD permit action on water withdrawal, reservoir or discharge (issued/denied/modified)	✱	○	●	●
Court rulings on general standards or district-specific cases (e.g. discharges to Lake Lanier)	✱	○	●	●
Legislative action relevant to Plans	✱	⊙	●	●
Major policy action by Metro Water District Board	✱	○	●	●
New reservoir permit actions	✱	○	●	●
Major change in Georgia DHR regulations on septic systems	✱	⊙	●	●
Major change in Georgia EPD policies or regulations	✱	⊙	●	●
Major change in GEFA or federal funding levels or policies	✱	○	●	●

PLAN ACCOUNTABILITY

Municipalities have a high level of accountability for implementing the Water Supply and Water Conservation Management Plan's mandatory management measures through the Georgia EPD audit process. Georgia EPD auditors conduct a thorough review of the local programs and procedures to determine consistency with the Metro Water District Water Supply and Water Conservation Management Plan. Communities must substantially comply with the Metro Water District plan provisions in order to modify or obtain new water withdrawal permits, wasteload allocations, GEFA loan funding, or the renewal of MS4 stormwater permits. Overall, this system has worked well to ensure implementation of the provisions of all three Metro Water District plans.

MEASURING PROGRESS

Over the past five years, the Metro Water District has tracked progress through surveys completed by local water providers summarized in the Annual Activities and Progress Report.

The Metro Water District Board indicated a need to establish and collect more detailed data on water use and conservation metrics to gage progress. The Chairman established a Board working group to initiate discussions on metrics and benchmarking for the water conservation program. The Board working group and the TCC developed metrics and benchmarks that water providers need to report annually to the Metro Water District. Metro Water District staff will develop a survey form for this purpose and collect overall water use metrics to report annually.

OVERALL WATER USE METRICS

Overall water use metrics to be tracked:

- Overall system water use for the Metro Water District overall and for each system.
    - Need a 10 year period and need to factor in weather
    - Withdrawals and returns
    - Water withdrawn/produced
    - Peaking factor and summer average and winter average
- Overall per capita use
- Single Family Overall Indoor Per-Account Use (winter average and total)
- Multi-Family Overall Indoor Per-Account Use, if possible

Overall water use and per capita use can be derived from water withdrawal and production data that Georgia EPD collects. The per account single-family and multi-family usage would depend on billing data available for systems. Multi-family accounts may not be available and special study would be required to determine multi-family per account estimate. Billing data would have to be collected, estimates of winter usage would have to be made and estimates would have to be determined. The methodology for collecting this information needs additional research.

MEASURING THE WATER CONSERVATION PROGRAM

All water conservation program measures are currently required unless provided for otherwise.

5.1 - Conservation Pricing:

Report/Measure:

- Collect data to determine how closely rate structures for each water system relate to recommended rate structure in the Metro Water District Plan. Data needed includes each water system's rate structure, residential winter average use and number of customers billed in each tier. Data may need to be collected bi-annually in concert with the rate survey. Coordinate with GEFA Rates Survey and based on GEFA's methodology report water systems that have an "effective" conservation pricing structure.
- Collect data on whether historical use information is reported on bills.

Benchmark:

- Minimally implement Metro Water District's recommended residential rate structure
- 100% of residents billed by conservation pricing rate structure
- 100% of residents with irrigation meters billed at 200% of the first tier rate or higher by 2010
- Minimally implement uniform rates for commercial
- Water providers should categorize customers by class including single-family residential, multi-family residential, commercial, industrial and institutional. If billing systems are not capable of this, water providers should make sure the next upgrade of their billing system is capable.
- Water providers should provide information on historical use on bills. If billing systems are not capable of this, water providers should make sure the next upgrade of their billing system is capable.

5.2 - Replace Older Inefficient Plumbing Fixtures:

Report/Measure:

- Report estimated number of homes with inefficient toilets, number of rebates/replacements per year, cost of rebated/replaced toilets to the water system and customers and Metro Water District staff will estimate water saved.

Benchmark:

- 100% of rebates/replacements are 1.28 gallons per flush toilets by 2014

5.3 - Pre-Rinse Spray Valve Education:

Report/Measure:

- Report on number of food service accounts. Document contact with each restaurant/food service provider and number of brochures distributed. Each water system should report number of food service accounts that have low flow 1.6 gpm pre-rinse spray valves. Develop methodology and Metro Water District could potentially estimate water savings.

Benchmark:

- Outreach to 100% of restaurants/food service providers

5.4 - Rain Sensor Shut-off Switches:

Report/Measure:

- Report on status of policy/checklist and number of new irrigation systems each year

Benchmark:

- Requirement in building code

5.5 - Sub-meters in New Multi-Family Buildings:

Report/Measure:

- Report on number of new multi-family buildings built and whether sub-meters were installed.

Benchmark:

- 100% of new multi-family buildings have sub-metering

5.6 - Assess and Reduce Water System Leakage:

Report/Measure:

- Fill out and turn in AWWA Water Audit Software every year and report ILI index, real losses, apparent losses, and authorized unbilled water use.
- Report goal and steps taken to reduce water loss and results such as number of leaks detected and repairs and water saved as a result.

Benchmark:

- Water providers are required to adopt the IWA water audit method and conduct the audit annually.
- Water providers are required to implement practices to reduce water loss.
- Water providers should set their own reduction targets and specifically identify how they will meet those targets.

5.7 - Conduct Residential Water Audits:

Report/Measure:

- Report number of residents that received audit and number of self-audit forms provided

Benchmark:

- Target 25% of highest water using residential accounts and target pre-1993 homes

5.8 - Distribute Low-Flow Retrofit Kits:

Report/Measure:

- Report number of kits distributed and contents of kits

Benchmark:

- Target highest water using residents and pre-1993 homes

5.9 - Conduct Commercial Water Audits:

Report/Measure:

- Report number of commercial water users, how many targeted, number of audits (including those performed by P2AD) and, where available, savings achieved from specific audits.

Benchmark:

- Target 25% of highest water using commercial accounts

5.10 - Implement Education and Public Awareness Plan:

Report/Measure:

- Report education/outreach and public participation/involvement activities

Benchmark:

- Water providers should have a water conservation education and outreach program.
- Water systems with population under 50,000 are required to implement 2 education/outreach activities and 2 public participation/involvement activities.
- Water systems with population over 50,000 are required to implement 3 education/outreach activities and 3 public participation/involvement activities.
- By 2015 and every five years thereafter, water providers and local government should assess and adjust their program(s) as needed.
- By 2010, the Metro Water District in coordination with the appropriate technical coordinating committees should develop and distribute educational materials related to efficient water use for pools, spas, pressure washing and non-commercial car washing.

5.11 - Install High Efficiency Toilets and Urinals in Government Buildings:

Report/Measure:

- Report how many government buildings, fixtures that have been retrofitted and resulting water saved.

Benchmark:

- 100% of local government buildings by 2020

5.12 – Require New Car Washes to Recycle:

Report/Measure:

- Report on new car washes and recycling systems

Benchmark:

- 100% of in-bay and conveyor car washes built in or after 2010 will recycle water

Other possible topics for water systems to report on include:

- Describe reuse projects
- Describe unique things they did that year regarding water conservation
- Data on school water use by school system and private schools. The data could be broken down by elementary, middle and high schools in each school system and the data collected could include number of students, number of faculty and staff, total water use per school system, per-capita student water use.

CONCLUSIONS

While the performance will be reported annually by the responsible entities, the final measure of implementation success will be the longer term, demonstrable trends of:

- Development of local water supply plans that are consistent with this Water Supply and Water Conservation Management Plan;
- Reallocation of Lake Lanier and Allatoona Lake, and permitting of new reservoirs currently in the permitting process;
- Implementation of the water conservation program;
- Planned indirect potable reuse of reclaimed water;
- Heightened public awareness and community support through an effective public education and awareness program;
- Availability of adequate funding of infrastructure intended to meet the growth needs of the Metro Water District; and
- Progress on improving surface water quality.

Appendix A:
PLAN ACCOUNTABILITY INDEX

The table below provides an index to the Sections that address the requirements for the Water Supply and Water Conservation Management Plan.

Requirement for Water Supply and Conservation Management Plan	Location in Report
Requirements in Senate Bill 130	
§ 12-5-584 (a) (1) Description of current water supply resources within the District and potential limitations on such resources	Section 2 – Existing Water Supply and Treatment Conditions Section 6 – Water Supply Sources
§ 12-5-584 (a) (2) Projected water supply requirements for the District	Section 3 – Water Demand Forecasts Section 4 – Water Conservation Analysis
§ 12-5-584 (a) (3) Identification of opportunities to expand water resources within the District	Section 6 – Water Supply Sources
§ 12-5-584 (a) (4) An accounting of existing interbasin transfers within the District	Section 2 – Existing Water Supply and Treatment Conditions
§ 12-5-584 (a) (5) A water conservation program including voluntary measures, best management practices, and measures enforceable through local ordinances	Section 5 – Water Conservation Program
§ 12-5-584 (a) (6) Education and public awareness measures regarding water conservation	Section 12 – Education and Public Awareness
§ 12-5-584 (a) (7) Establishment of short-term and long-term goals to be accomplished by the plan and measures for the assessment of progress in accomplishing such goals and plan	Sections 13 – Implementation Plan Section 14 – Future Plan Evaluation
Requirements in EPD's Water Planning Standards for Water Supply and Conservation Plan	
1. The plan shall include items 1-7 in OCGA 12-5-584.	See above
2. The plan shall, at a minimum, be consistent with all applicable federal and state laws and rules.	Section 10 – Water Resources Issues
3. The plan shall be consistent with agreements in the ACF/ACT compacts.	Section 6 – Water Supply Sources

Requirement for Water Supply and Conservation Management Plan	Location in Report
4. The plan shall propose allocations of the waters of the Chattahoochee River, Lake Lanier, Allatoona (and other lakes if appropriate) to water systems consistent with guidance to be provided by EPD.	Section 6 – Water Supply Sources Section 8 – Planned Water Supply Facilities Appendix B – County Level Summaries
5. The plan shall not prevent the appropriate and reasonable downstream water needs from being met, even during droughts. These needs include instream flow protection and water withdrawals both inside and downstream from the District.	Section 6 – Water Supply Sources
6. The plan shall optimize inter-jurisdictional water connections for efficiency and reliability.	Section 9 – Local Water Planning
7. The plan shall include a stakeholder process to (1) identify effective water conservation measures including water conservation pricing and low-flow toilet retrofit programs; (2) develop reasonable schedules for the implementation of each measure; (3) define a mechanism for determining resultant reductions in water use. All of these steps shall be included in the water conservation plan. The initiative formalized in the Memorandum of Understanding that created the California Urban Water Conservation Council is a good example of a stakeholder process.	Section 4 – Water Conservation Analysis Section 5 – Water Conservation Program
8. The plan shall provide that all local governments have water conservation pricing by January 1, 2004. The plan shall identify the details and extent of such pricing.	Section 5 – Water Conservation Program
9. The plan shall be consistent with the wastewater management plan and the watershed management plan.	Section 1 – Introduction
10. The plan shall identify various water supply alternatives. The plan shall determine the cost for the entire District of each alternative and the environmental/water supply benefits/amounts of each alternative.	Section 6 – Water Supply Sources Section 13 – Implementation Plan
11. The plan shall develop options to minimize future interbasin transfers.	Section 6 – Water Supply Sources
12. The plan shall identify the projected water consumption from each basin and analyze the impacts of this consumption.	Section 3 – Water Demand Forecasts Section 4 – Water Conservation Analysis

Appendix B: COUNTY LEVEL SUMMARIES

COUNTY-BY-COUNTY WATER FACILITY CAPACITY AND EXPANSION SCHEDULE

This Appendix outlines the schedule for expanding water facility treatment capacities in the Metro Water District. Appendix B details the capital projects and non-capital programs specific to each county in the Metro Water District. Capital projects include new water treatment facilities, as well as facility expansions. Non-capital programs include planning, intergovernmental agreements and other studies necessary to protect water resources and facilitate planned expansions.

The schedule shown is intended to be a general guideline to identify water supply and treatment needs through the planning horizon of 2035. In Appendix B, the expansion capacities are intended to be in operation before the end of the period shown, however planning, design and construction of expansions or new supplies may begin in the previous period. Actual timing of new or expanded facilities or supplies will occur when local growth and planning indicates the need for additional capacity.

Appendix B focuses on facility capacity and does not reflect upgrades to the level of treatment at existing water facilities. Facility capacities listed in Appendix B of the Water Supply and Water Conservation and Wastewater Management Plans for each planning period are considered as maximums and that local jurisdictions may plan within and up to that capacity. All new facilities and facility expansions identified in Appendix B are subject to permitting by Georgia EPD and must meet all state standards associated with the necessary permits. Inclusion within this plan does not guarantee a permit, however facilities must be reflected within Appendix B to initiate permitting discussions with Georgia EPD.

PLANT CAPACITIES

Plant capacities, listed in Appendix B, were determined to meet or exceed the projected 2035 peak day water demand. It is recognized that plant capacity is added in convenient increments and not to match a specific projected flow. At times, it may be desirable to construct somewhat more capacity than is shown in Appendix B to add a convenient increment of capacity. For example, if a WTP with 5 MGD capacity needs to handle a projected demand of 8 MGD, the most cost efficient plan may be to double the current capacity to 10 MGD. The convenient increments of plant capacity for expansion projects should be determined through local water master plans tailored both to the facility and the community.

The projections of plant capacity in Appendix B were based on a District-wide average peaking factor of 1.6 (peak day/average annual day). This peaking factor was calculated for the 2003 Water Supply and Water Conservation Management Plan and is considered appropriate for the 2008 Plan. In reality, due to variations in system storage and unaccounted-for-water, the peaking factors will vary for each local water provider. Each local water provider must determine an appropriate peaking value and the impacts of water conservation measures on future flows in the local water master plans.

Significant proposed changes in plant capacity will be evaluated against the essential elements of the Water Supply and Water Conservation Management Plan through the Plan Amendment process, outlined in Section 14. Minor changes in phasing of capacity are considered consistent with this Water Supply and Water Conservation Management Plan and do not require an amendment.

PHASING

The capital improvement project phasing shown in Appendix B was developed to provide adequate treatment capacity for the projected water demands in that phase, and to make steady progress toward implementing the essential elements of the Water Supply and Water Conservation Management Plan. Within this context, the timeframe for capital improvements in Appendix B is flexible. For example, delaying the date that a plant is decommissioned is generally acceptable. Expanding a plant in more or fewer projects is also generally acceptable. The local water master plans are expected to delve into the timeframes for capital improvements in greater detail than this regional Water Supply and Water Conservation Management Plan.

PERMITTING

In several instances, planning for future water supplies and shared water supply allocations are recommended for local water providers within the same county. Resolution of disputes between member jurisdictions over county-level water allocations contained in this Water Supply and Water Conservation Management Plan shall be made by the jurisdictions and local water providers prior to application for any permits by Georgia EPD. Treatment capacity may not be expanded without the issuance of a new or amended water withdrawal permit if the proposed expansion will expand the treatment capacity beyond the currently permitted water withdrawal limits.

Bartow County

Summary of Needs

Water Demands & Treatment Capacities	2035 Annual Average Day (AAD-MGD)	2035 Peak Day (PD-MGD)
Bartow County	46	74
Total Projected Demand	**46**	**74**
2006 Treatment Capacity	20	32
Additional Capacity Needed by 2035	26	42

Summary of Planned Sources

Source	Local Water Provider	Current Permitted Withdrawal (MGD) Monthly	Planned 2035 Withdrawal (MGD) Monthly	Planned 2035 Withdrawal (MGD) Peak Day
Lewis Spring	Adairsville	4.1	4.5	6.0
Moss Springs	Emerson	0.5	0.5	0.5
Bolivar Springs	Bartow Co.	0.8	0.8	0.8
Allatoona Lake	Cartersville/ Bartow County*	23		
Etowah River			52.5	70.0
Sum		28.4	58.3	77.3

* The current intake is only permitted to Cartersville. Future intakes on the Etowah may be a joint permit between Cartersville and Bartow County.

Capital Projects

- The Adairsville WTP is retained and expanded as necessary to serve its current service area.
- A local plan should be developed jointly by Bartow County and the City of Cartersville to decide between Option 1 and Option 2 before applying for permits from Georgia EPD.
- Option 1 - Expand Cartersville WTP from 27 mgd to 70 PD-MGD to meet growth in demand, with the exception of of Adairsville.
- Option 2 - Build two new WTPs to withdraw from either Lake Allatoona or the Etowah River, to be expanded together with the Cartersville WTP to meet the growth in demand, with the exception of Adairsville.

Option 1 Phasing Plan

Facilities (Note 1)	Sources	By 2010 Proposed Projects: Project Type	By 2010 Proposed Projects: Project Capacity (PD-MGD)	By 2010: Plant Capacity at End of Period (PD-MGD)	2011 to 2015 Proposed Projects: Project Type	2011 to 2015 Proposed Projects: Project Capacity (PD-MGD)	2011 to 2015: Plant Capacity at End of Period (PD-MGD)	2016 to 2025 Proposed Projects: Project Type	2016 to 2025 Proposed Projects: Project Capacity (PD-MGD)	2016 to 2025: Plant Capacity at End of Period (PD-MGD)	2026 to 2035 Proposed Projects: Project Type	2026 to 2035 Proposed Projects: Project Capacity (PD-MGD)	2026 to 2035: Plant Capacity at End of Period (PD-MGD)
Adairsville WTP	Lewis Spring	No expansions		4.0	Expand	2.0	6.0	No expansions		6.0	No expansions		6.0
Cartersville WTP	Lake Allatoona	No expansions		27.0	Expand	23.0	50.0	Expand	10.0	60.0	Expand	10.0	70.0
Emerson WTP	Moss Springs	No expansions		0.5	No expansions		0.5	No expansions		0.5	No expansions		0.5
Bartow County WTP	Bolivar Springs	No expansions		0.8	No expansions		0.8	No expansions		0.8	No expansions		0.8
Demand Projections & Total Capacity (PD-MGD)				**32.3**	**45 in Bartow**		**57.3**	**58 in Bartow**		**67.3**	**74 in Bartow**		**77.3**

Option 2 Phasing Plan

Facilities (Note 1)	Sources	By 2010 Proposed Projects: Project Type	By 2010 Proposed Projects: Project Capacity (PD-MGD)	By 2010: Plant Capacity at End of Period (PD-MGD)	2011 to 2015 Proposed Projects: Project Type	2011 to 2015 Proposed Projects: Project Capacity (PD-MGD)	2011 to 2015: Plant Capacity at End of Period (PD-MGD)	2016 to 2025 Proposed Projects: Project Type	2016 to 2025 Proposed Projects: Project Capacity (PD-MGD)	2016 to 2025: Plant Capacity at End of Period (PD-MGD)	2026 to 2035 Proposed Projects: Project Type	2026 to 2035 Proposed Projects: Project Capacity (PD-MGD)	2026 to 2035: Plant Capacity at End of Period (PD-MGD)
Adairsville WTP	Lewis Spring	No expansions		4.0	Expand	2.0	6.0	No expansions		6.0	No expansions		6.0
Cartersville WTP	Lake Allatoona	No expansions		27.0	Expand	5.0	32.0	Expand	4.0	36.0	Expand	4.0	40.0
Bartow North End WTP (Note 2)	Etowah River				New Construction		10.0	Expand	5.0	25.0	Expand	5.0	30.0
Bartow South End WTP (Note 2)	Etowah River				New Construction		10.0	Expand			Expand		
Emerson WTP	Moss Springs	No expansions		0.5	No expansions		0.5	No expansions		0.5	No expansions		0.5
Bartow County WTP	Bolivar Springs	No expansions		0.8	No expansions		0.8	No expansions		0.8	No expansions		0.8
Demand Projections & Total Capacity (PD-MGD)				**32.3**	**45 in Bartow**		**59.3**	**58 in Bartow**		**68.3**	**74 in Bartow**		**77.3**

Notes:

1) Plan schedule shown above is intended to be a general guideline to identify treatment capacity needs. Expansion capacities should be in operation before the end of the periods shown above, while planning, design and expansions may begin in the previous period. Exact timing of expansions is to be determined by local water master planning. Specific conditions for withdrawal/operating permits will be determined by Georgia EPD.
2) The planned facility expansion will happen at one of these facilities based on local growth patterns and local master plans.

Non-Capital Programs

The following non-capital programs are specific to Bartow County. These programs are in addition to those that apply to all counties within the Metro Water District.

- Maintain existing interconnections and water supply agreements with Cherokee and Polk Counties.
- Carry out joint planning studies between Bartow County and the City of Cartersville.

Cherokee County

Summary of Needs

Water Demands & Treatment Capacities	2035 Annual Average Day (AAD-MGD)	2035 Peak Day (PD-MGD)
Cherokee County	45	72
From CCMWA	1	2
Total Projected Demand	**44**	**70**
2006 Treatment Capacity	27	43.45
Additional Capacity Needed by 2035	17	27

Summary of Planned Sources

Source	Local Water Provider	Current Permitted Withdrawal (MGD) Monthly	Planned 2035 Withdrawal (MGD) Monthly	Planned 2035 Withdrawal (MGD) Peak Day
Lathem (Yellow Creek) Reservoir	CCWSA	36	39.8	53.0
Etowah River	Canton	5.45		
Hickory Log Reservoir (filled by Etowah River)	Canton/CCMWA	0	13.5	18.0
Sum		41.45	53.3	71.0

Capital Projects

- CCWSA should expand its Etowah River WTP from 38 to 53 PD-MGD. CCWSA has plans to sell water to utilities outside of the Metro Water District. These plans are not precluded by the Metro Water District Plan, but expansion will need to be permitted by Georgia EPD. Counties outside the Metro Water District have 20 MGD reserved from the ACT basin independent of supplies for the Metro Water District. Therefore, if these counties are served by Cherokee, it does not reduce water supplies from the Etowah sub-basin available to the Metro Water District.

Phasing Plan

Facilities (Note 1)	Sources	By 2010 Proposed Projects Project Type	By 2010 Proposed Projects Project Capacity (PD-MGD)	By 2010 Plant Capacity at End of Period (PD-MGD)	2011 to 2015 Proposed Projects Project Type	2011 to 2015 Proposed Projects Project Capacity (PD-MGD)	2011 to 2015 Plant Capacity at End of Period (PD-MGD)	2016 to 2025 Proposed Projects Project Type	2016 to 2025 Proposed Projects Project Capacity (PD-MGD)	2016 to 2025 Plant Capacity at End of Period (PD-MGD)	2026 to 2035 Proposed Projects Project Type	2026 to 2035 Proposed Projects Project Capacity (PD-MGD)	2026 to 2035 Plant Capacity at End of Period (PD-MGD)
Canton WTP	Hickory Log Reservoir (filled by Etowah River)	No expansions		5.45	Expand	12.55	18.0	No expansions		18.0	No expansions		18.0
CCWSA Etowah River WTP	Lathem (Yellow Creek) Reservoir	No expansions		38.0	No expansions		38.0	Expand	10.0	48.0	Expand	5.0	53.0
Demand Projections & Total Capacity (PD-MGD)		**39 in Cherokee -2 from CCMWA 37 Total**		**43.45**	**43 in Cherokee -2 from CCMWA 41 Total**		**56.0**	**54 in Cherokee -2 from CCMWA 52 Total**		**66.0**	**72 in Cherokee -2 from CCMWA 70 Total**		**71.0**

Notes:

1) Plan schedule shown above is intended to be a general guideline to identify treatment capacity needs. Expansion capacities should be in operation before the end of the periods shown above, while planning, design and expansions may begin in the previous period. Exact timing of expansions is to be determined by local water master planning. Specific conditions for withdrawal/operating permits will be determined by Georgia EPD.

Non-Capital Programs

The following non-capital programs are specific to Cherokee County. These programs are in addition to those that apply to all counties within the Metro Water District.

- Maintain existing interconnections and water supply agreements with Pickens, Forsyth, Cobb and Bartow Counties.

Clayton County

Summary of Needs

Water Demands & Treatment Capacities	2035 Annual Average Day (AAD-MGD)	2035 Peak Day (PD-MGD)
Clayton County	40	64
Total Projected Demand	**40**	**64**
2006 Treatment Capacity	26	42
Additional Capacity Needed by 2035	14	22

Summary of Planned Sources

Source	Local Water Provider	Current Permitted Withdrawal (MGD) Monthly	Planned 2035 Withdrawal (MGD) Monthly	Planned 2035 Withdrawal (MGD) Peak Day
Flint River	Clayton	fills Smith & Shoal Cr. Res.	59.3	79.0
Smith/Shoal Creek Reservoir	Clayton	17		
Hooper Res. (Little Cotton Indian Creek)	Clayton	20		
Blalock (Pates Creek) Reservoir	Clayton	10		
Sum		47	59.3	79.0

Capital Projects

- Projections indicate that water sources should be adequate through 2035. Clayton County should expand its three WTPs according to a local plan. Infrastructure should be kept in place to allow transfers from the City of Atlanta to fill peak demands on an emergency basis.

Phasing Plan

Facilities (Note 1)	Sources	By 2010 Proposed Projects: Project Type	By 2010 Proposed Projects: Project Capacity (PD-MGD)	By 2010: Plant Capacity at End of Period (PD-MGD)	2011 to 2015 Proposed Projects: Project Type	2011 to 2015 Proposed Projects: Project Capacity (PD-MGD)	2011 to 2015: Plant Capacity at End of Period (PD-MGD)	2016 to 2025 Proposed Projects: Project Type	2016 to 2025 Proposed Projects: Project Capacity (PD-MGD)	2016 to 2025: Plant Capacity at End of Period (PD-MGD)	2026 to 2035 Proposed Projects: Project Type	2026 to 2035 Proposed Projects: Project Capacity (PD-MGD)	2026 to 2035: Plant Capacity at End of Period (PD-MGD)
Clayton Hicks WTP	Blalock (Pates Creek) Reservoir	No expansions		10.0									
Clayton Hooper WTP	Hooper Reservoir (Little Cotton Indian Creek)	No expansions		20.0	Expansion of one facility	23.0	65.0	Expansion of one facility	8.0	73.0	Expansion of one facility	6.0	79.0
Clayton Smith WTP	Smith/Shoal Creek Reservoir (fed by Flint River)	No expansions		12.0									
Demand Projections & Total Capacity (PD-MGD)				**42**	**54**	**in Clayton**	**65**	**57**	**in Clayton**	**73**	**64**	**in Clayton**	**79**

Notes:

1) Plan schedule shown above is intended to be a general guideline to identify treatment capacity needs. Expansion capacities should be in operation before the end of the periods shown above, while planning, design and expansions may begin in the previous period. Exact timing of expansions is to be determined by local water master planning. Specific conditions for withdrawal/operating permits will be determined by Georgia EPD.

Non-Capital Programs

The following non-capital programs are specific to Clayton County. These programs are in addition to those that apply to all counties within the Metro Water District.

- Maintain existing interconnections and water supply agreements with Fayette, Henry and DeKalb Counties and the City of Atlanta.

Cobb County

Summary of Needs

Water Demands & Treatment Capacities	2035 Annual Average Day (AAD-MGD)	2035 Peak Day (PD-MGD)
Cobb County	109	174
To Paulding County	23	36
To Douglas County	10	16
To Cherokee County	1	2
Total Projected Demand	**143**	**228**
2006 Treatment Capacity	99	158
Additional Capacity Needed by 2035	44	70

Summary of Planned Sources

Source	Local Water Provider	Current Permitted Withdrawal (MGD) Monthly	Planned 2035 Withdrawal (MGD) Monthly	Planned 2035 Withdrawal (MGD) Peak Day
Allatoona Lake	CCMWA	78		
Hickory Log Creek Reservoir (filled by Etowah River)	Canton/CCMWA	0	106.5	142
Chattahoochee River	CCMWA	87	87	106
Sum		165	193.5	248

Capital Projects

- Cobb County-Marietta Water Authority (CCMWA), in conjunction with the City of Canton, have constructed the Hickory Log Creek Reservoir. The Wyckoff WTP may now expand to treat more water. It is recommended that the CCMWA Wyckoff WTP be expanded significantly over the next thirty years. It is also recommended that CCMWA continue to sell wholesale water to Paulding and DDCWSA in the future per intergovernmental agreements

Phasing Plan

Facilities (Note 1)	Sources	By 2010 Proposed Projects Project Type	By 2010 Proposed Projects Project Capacity (PD-MGD)	By 2010 Plant Capacity at End of Period (PD-MGD)	2011 to 2015 Proposed Projects Project Type	2011 to 2015 Proposed Projects Project Capacity (PD-MGD)	2011 to 2015 Plant Capacity at End of Period (PD-MGD)	2016 to 2025 Proposed Projects Project Type	2016 to 2025 Proposed Projects Project Capacity (PD-MGD)	2016 to 2025 Plant Capacity at End of Period (PD-MGD)	2026 to 2035 Proposed Projects Project Type	2026 to 2035 Proposed Projects Project Capacity (PD-MGD)	2026 to 2035 Plant Capacity at End of Period (PD-MGD)
CCMWA Quarles WTP	Chattahoochee River	No expansions		86.0	No expansions		86.0	No expansions		86.0	Expand	20.0	106.0
CCMWA Wyckoff WTP	Lake Allatoona	No expansions		72.0	Expand	36.0	108.0	Expand	12.0	120.0	Expand	22.0	142.0
	Hickory Log Reservoir (filled by Etowah River)	New reservoir											
Demand Projections & Total Capacity (PD-MGD)		**133 in Cobb 26 to Paulding 1 to DDCWSA 2 to Cherokee 162 Total**		**158**	**150 in Cobb 36 to Paulding 4 to DDCWSA 2 to Cherokee 192 Total**		**194**	**157 in Cobb 36 to Paulding 11 to DDCWSA 2 to Cherokee 206 Total**		**206**	**174 in Cobb 36 to Paulding 16 to DDCWSA 2 to Cherokee 228 Total**		**248**

Notes:

1) Plan schedule shown above is intended to be a general guideline to identify treatment capacity needs. Expansion capacities should be in operation before the end of the periods shown above, while planning, design and expansions may begin in the previous period. Exact timing of expansions is to be determined by local water master planning. Specific conditions for withdrawal/operating permits will be determined by Georgia EPD.

Non-Capital Programs

The following non-capital programs are specific to Cobb County. These programs are in addition to those that apply to all counties within the Metro Water District.

- Maintain interconnections and water supply agreements with Cherokee, DDCWSA and Paulding Counties.
- Evaluate the required improvements to accommodate peak sale of 16 PD-MGD to DDCWSA and 36 PD-MGD to Paulding County.

Coweta County

Summary of Needs

Water Demands & Treatment Capacities	2035 Annual Average Day (AAD-MGD)	2035 Peak Day (PD-MGD)
Coweta County	29	46
From City of Atlanta	-6	-10
From Still Branch Reservoir/Griffin	-5	-7.5
Projected Demand Needs	**18**	**29**
2006 Treatment Capacity	14	22.15
Additional Capacity Needed by 2035	4	7

Summary of Planned Sources

Source	Local Water Provider	Current Permitted Withdrawal (MGD) Monthly	Planned 2035 Withdrawal (MGD) Monthly	Planned 2035 Withdrawal (MGD) Peak Day
Still Branch Crk Res. (purchased)	Coweta	1.68	7.5	7.5
Cedar Creek (B.T. Brown Res.)	Coweta	6.7	7.5	10
J.T. Haynes Reservoir	Newnan	14		
Sandy Brown Creek	Newnan	Fills JT Haynes Reservoir		
White Oak Creek	Newnan			
Line Creek	Newnan		15.8	21
Hutchins' Lake (Keg Creek)	Senoia	0.3	0.45	0.6
Chattahoochee Options	Coweta	N/A	8	10
Sum		22.68	39.25	49.1

Capital Projects

- The BT Brown WTP should be expanded to 10 PD-MGD to fully utilize the yield of the Cedar Creek Reservoir. The Newnan WTP should be expanded to 21 PD-MGD. This capacity will fully utilize the current WTP site and approaches the yield of the existing water sources for the WTP. To meet water demands, a local plan should be developed by Coweta County to decide among:
- Option 1: Transfers (wholesale purchases) from the City of Atlanta (Recommended transfers outlined are presented in the phasing plan below).
- Option 2 (to be used alone or in combination with Option 1): Build a new WTP to withdraw from the Chattahoochee River with advanced treatment technologies. Project would be based on a joint plan develop by Coweta County and City of Atlanta.

Option 1 Phasing Plan

Facilities (Notes 1,2,3)	Sources	By 2010 Proposed Projects: Project Type	By 2010 Proposed Projects: Project Capacity (PD-MGD)	By 2010: Plant Capacity at End of Period (PD-MGD)	2011 to 2015 Proposed Projects: Project Type	2011 to 2015 Proposed Projects: Project Capacity (PD-MGD)	2011 to 2015: Plant Capacity at End of Period (PD-MGD)	2016 to 2025 Proposed Projects: Project Type	2016 to 2025 Proposed Projects: Project Capacity (PD-MGD)	2016 to 2025: Plant Capacity at End of Period (PD-MGD)	2026 to 2035 Proposed Projects: Project Type	2026 to 2035 Proposed Projects: Project Capacity (PD-MGD)	2026 to 2035: Plant Capacity at End of Period (PD-MGD)
Coweta - B.T. Brown WTP	Cedar Creek (BT Brown) Reservoir	No expansions		7.7	Expand	0.7	8.4	Expand	1.6	10.0	No expansions		10.0
Newnan - Hershall Norred WTP	JT Haynes Reservoir (filled by Sandy Brown Creek, White Oak Creek and Line Creek)	No expansions		14.0	Expand	2.0	16.0	Expand	1.0	17.0	Expand	4.0	21.0
Senoia WTP	Hutchins' Lake (Keg Creek)	No expansions		0.45	Expand	0.15	0.6	No expansions		0.6	No expansions		0.6
Distribution System Connection with City of Atlanta								Initial Construction		--	No expansions		--
Demand Projections & Total Capacity (PD-MGD)		**20.6 in Coweta -2.4 from Griffin -4 from Atlanta 14.2 Total**		**22.15**	**23.2 in Coweta -4.2 from Griffin -5 from Atlanta 14 Total**		**25.0**	**31.2 in Coweta -7.5 from Griffin -5 from Atlanta 18.7 Total**		**27.6**	**47 in Coweta -7.5 from Griffin - 10 from Atlanta 29.5 Total**		**31.6**

Option 2 Phasing Plan

Facilities (Notes 1,2,3)	Sources	By 2010 Proposed Projects: Project Type	By 2010 Proposed Projects: Project Capacity (PD-MGD)	By 2010: Plant Capacity at End of Period	2011 to 2015 Proposed Projects: Project Type	2011 to 2015 Proposed Projects: Project Capacity (PD-MGD)	2011 to 2015: Plant Capacity at End of Period	2016 to 2025 Proposed Projects: Project Type	2016 to 2025 Proposed Projects: Project Capacity (PD-MGD)	2016 to 2025: Plant Capacity at End of Period	2026 to 2035 Proposed Projects: Project Type	2026 to 2035 Proposed Projects: Project Capacity (PD-MGD)	2026 to 2035: Plant Capacity at End of Period
Coweta - B.T. Brown WTP	Cedar Creek (BT Brown) Reservoir	No expansions		7.7	Expand	0.7	8.4	Expand	1.6	10.0	No expansions		10.0
Newnan - Hershall Norred WTP	JT Haynes Reservoir (filled by Sandy Brown Creek, White Oak Creek and Line Creek)	No expansions		14.0	Expand	2.0	16.0	Expand	1.0	17.0	Expand	4.0	21.0
Senoia WTP	Hutchins' Lake (Keg Creek)	No expansions		0.45	Expand	0.15	0.6	No expansions		0.6	No expansions		0.6
New Chattahoochee WTP	Chattahoochee River							Initial Construction	10.0	10.0	No expansions		10.0
Demand Projections &		**20.6 in Coweta**		**22.15**	**23.2 in Coweta**		**25.0**	**31.2 in Coweta**		**37.6**	**47 in Coweta**		**41.6**

Notes:

1) Plan schedule shown above is intended to be a general guideline to identify treatment capacity needs. Expansion capacities should be in operation before the end of the periods shown above, while planning, design and expansions may begin in the previous period. Exact timing of expansions is to be determined by local water master planning. Specific conditions for withdrawal/operating permits will be determined by Georgia EPD.
2) Still Branch Creek reservoir is located outside of the District and is owned by the City of Griffin. Reservoir serves Pike and Spalding Counties as well as Coweta County. Coweta County has a purchase contract for 1.68 MGD of finished water (for 2008) from the City of Griffin which escalates at 0.36 MGD/year for an ultimate 7.5 MGD.
3) Coweta County should review development of smaller local resources within the County.

Non-Capital Programs

The following non-capital programs are specific to Coweta County. These programs are in addition to those that apply to all counties within the Metro Water District.

- Maintain interconnections and water supply agreements with the City of Atlanta and City of Griffin.
- Reassess the safe yield of the Cedar Creek Reservoir, Sandy Brown Creek, White Oak Creek and Line Creek reservoirs using procedures outlined in the forthcoming Statewide Water Plan.

DeKalb County

Summary of Needs

Water Demands & Treatment Capacities	2035 Annual Average Day (AAD-MGD)	2035 Peak Day (PD-MGD)
DeKalb County	106	170
Total Projected Demand	**106**	**170**
2006 Treatment Capacity	80	128
Additional Capacity Needed by 2035	26	42

Summary of Planned Sources

Source	Local Water Provider	Current Permitted Withdrawal (MGD) Monthly	Planned 2035 Withdrawal (MGD) Monthly	Planned 2035 Withdrawal (MGD) Peak Day
Chattahoochee River	DeKalb Co.	140	140	175
Sum		140	140	175

Capital Projects

Expand Scott Candler WTP to meet future demands.

Phasing Plan

Facilities (Notes 1, 2)	Source	By 2010 Proposed Projects: Project Type	By 2010 Proposed Projects: Project Capacity (PD-MGD)	By 2010: Plant Capacity at End of Period (PD-MGD)	2011 to 2015 Proposed Projects: Project Type	2011 to 2015 Proposed Projects: Project Capacity (PD-MGD)	2011 to 2015: Plant Capacity at End of Period (PD-MGD)	2016 to 2025 Proposed Projects: Project Type	2016 to 2025 Proposed Projects: Project Capacity (PD-MGD)	2016 to 2025: Plant Capacity at End of Period (PD-MGD)	2026 to 2035 Proposed Projects: Project Type	2026 to 2035 Proposed Projects: Project Capacity (PD-MGD)	2026 to 2035: Plant Capacity at End of Period (PD-MGD)
DeKalb Scott Candler WTP	Chattahoochee River	Expand	22.0	150.0	Expand	15.0	165.0	Expand	10.0	175.0	No expansions		175.0
Demand Projections & Total Capacity (PD-MGD)				**150**	**153 in DeKalb**		**165**	**158 in DeKalb**		**175**	**170 in DeKalb**		**175**

Notes:

1) Plan schedule shown above is intended to be a general guideline to identify treatment capacity needs. Expansion capacities should be in operation before the end of the periods shown above, while planning, design and expansions may begin in the previous period. Exact timing of expansions is to be determined by local water master planning. Specific conditions for withdrawal/operating permits will be determined by Georgia EPD.
2) The City of Atlanta portion of DeKalb County is being served by Atlanta-Fulton County Water Resources Commission.

Non-Capital Programs

The following non-capital programs are specific to DeKalb County. These programs are in addition to those that apply to all counties within the Metro Water District.

- Maintain interconnections and water supply agreements with Gwinnett, Rockdale, Henry and Clayton Counties and the City of Atlanta.

Douglas County

Summary of Needs

Water Demands & Treatment Capacities	2035 Annual Average Day (AAD-MGD)	2035 Peak Day (PD-MGD)
Douglas County	25	40
From CCMWA	-10	-16
Projected Demand Needs	**15**	**24**
2006 Treatment Capacity	11	17.9
Additional Capacity Needed by 2035	3	6.5

CCMWA = Cobb County-Marietta Water Authority

Summary of Planned Sources

Source	Local Water Provider	Current Permitted Withdrawal (MGD) Monthly	Planned 2035 Withdrawal (MGD) Monthly	Planned 2035 Withdrawal (MGD) Peak Day
Dog River Reservoir	DDCWSA	23	23	23
Bear Creek Reservoir	DDCWSA	To maintain in-stream flows		
Lake Fashion/ Cowan Lake	Villa Rica	1.5	2.25	3.0
Sum		24.5	25.25	26

Capital Projects

- The DDCWSA should proceed with plans to raise the dam at its Dog River Reservoir to increase the yield of this source (the increased withdrawal has been permitted). Infrastructure from Cobb County should be updated to allow larger transfers from CCMWA.
- The DDCWSA plans to design and construct a flow augmentation project to augment the 7Q10 release from the Dog River Reservoir.

Phasing Plan

		By 2010			2011 to 2015			2016 to 2025			2026 to 2035		
		Proposed Projects		Plant Capacity at End of Period (PD-MGD)	Proposed Projects		Plant Capacity at End of Period (PD-MGD)	Proposed Projects		Plant Capacity at End of Period (PD-MGD)	Proposed Projects		Plant Capacity at End of Period (PD-MGD)
Facilities (Note 1)	Sources	Project Type	Project Capacity (PD-MGD)		Project Type	Project Capacity (PD-MGD)		Project Type	Project Capacity (PD-MGD)		Project Type	Project Capacity (PD-MGD)	
DDCWSA Bear Creek WTP	Dog River Reservoir	Expand	6.64	23.0	No expansions		23.0	No expansions		23.0	No expansions		23.0
Villa Rica Franklin Smith WTP (Note 2)	Lake Fashion/ Cowan Lake	No expansions		1.5	Expand	1.5	3.0	No expansions		3.0	No expansions		3.0
Demand Projections & Total Capacity (PD-MGD)		**23 in Douglas -1 from CCMWA 22 in Douglas**		**24.5**	**24 in Douglas - 4 from CCMWA 20 in Douglas**		**26.0**	**30 in Douglas - 11 from CCMWA 19 in Douglas**		**26.0**	**40 in Douglas - 16 from CCMWA 24 in Douglas**		**26.0**

Notes:

1) Plan schedule shown above is intended to be a general guideline to identify treatment capacity needs. Expansion capacities should be in operation before the end of the periods shown above, while planning, design and expansions may begin in the previous period. Exact timing of expansions is to be determined by local water master planning. Specific conditions for withdrawal/operating permits will be determined by Georgia EPD.
2) The Villa Rica Franklin Smith WTP is located in Carroll County. This plant provides service to areas both inside and outside Douglas County. The full plant capacity is reflected in the table above.

Non-Capital Programs

The following non-capital programs are specific to Douglas County. These programs are in addition to those that apply to all counties within the Metro Water District.

- Maintain interconnections and water supply agreements with Cobb County.
- Determine required improvements to accommodate routine purchase of 16 PD-MGD from CCMWA.

Fayette County

Summary of Needs

Water Demands & Treatment Capacities	2035 Annual Average Day (AAD-MGD)	2035 Peak Day (PD-MGD)
Fayette County	23	37
Total Projected Demand	**23**	**37**
2006 Treatment Capacity	14	22.7
Additional Capacity Needed by 2035	9	14

Summary of Planned Sources

Source	Local Water Provider	Current Permitted Withdrawal (MGD) Monthly	Planned 2035 Withdrawal (MGD) Monthly	Planned 2035 Withdrawal (MGD) Peak Day
Flint River	Fayette Co.	Fills Lake Horton		
Whitewater Creek	Fayette Co.	Fills Lake Horton		
Flat Creek (Lake Kedron/Peachtree)	Fayette Co.	4.5		
Lake Horton (Horton Creek)	Fayette Co.	14		
Lake McIntosh (Line Creek)	Fayette Co.	12.5	31	35
Whitewater Creek	Fayetteville	3	3	4
Sum		34	34.0	39

Capital Projects

- The City of Fayetteville should build the new off-stream storage reservoir, Whitewater Creek, that is currently in early planning stages. This will give Fayetteville a reliable water source and allow their WTP to operate through droughts, which in past years would force a shut-down of the WTP. The Fayetteville WTP is currently rated to run at 4 PD-MGD, but is limited by the withdrawal permit of 3 PD-MGD.

Phasing Plan

Facilities (Note 1)	Sources	By 2010 Proposed Projects: Project Type	By 2010 Proposed Projects: Project Capacity (PD-MGD)	By 2010: Plant Capacity at End of Period (PD-MGD)	2011 to 2015 Proposed Projects: Project Type	2011 to 2015 Proposed Projects: Project Capacity (PD-MGD)	2011 to 2015: Plant Capacity at End of Period (PD-MGD)	2016 to 2025 Proposed Projects: Project Type	2016 to 2025 Proposed Projects: Project Capacity (PD-MGD)	2016 to 2025: Plant Capacity at End of Period (PD-MGD)	2026 to 2035 Proposed Projects: Project Type	2026 to 2035 Proposed Projects: Project Capacity (PD-MGD)	2026 to 2035: Plant Capacity at End of Period (PD-MGD)
Fayette Crosstown WTP	Flat Creek (Lake Kedron/Peachtree), Line Creek (Lake McIntosh), Lake Horton (Horton Creek) (fed by Flint River and Whitewater Creek)	No expansions		13.5	No expansions		13.5	Expand	6.0	19.5			
South Fayette WTP		Expand	3.0	9.2	No expansions		9.2	No expansions		9.2	Expansion of one facility	6.3	35
Fayetteville WTP	Whitewater Creek	No expansions		3.0	New off-stream storage	1.0	4.0	No expansions		4.0	No expansions		4.0
Demand Projections & Total Capacity (PD-MGD)				**25.7**	**22.8 in Fayette**		**26.7**	**28.9 in Fayette**		**32.7**	**37.0 in Fayette**		**39.0**

Notes:

1) Plan schedule shown above is intended to be a general guideline to identify treatment capacity needs. Expansion capacities should be in operation before the end of the periods shown above, while planning, design and expansions may begin in the previous period. Exact timing of expansions is to be determined by local water master planning. Specific conditions for withdrawal/operating permits will be determined by Georgia EPD.

Non-Capital Programs

The following non-capital programs are specific to Fayette County. These programs are in addition to those that apply to all counties within the Metro Water District.

- Maintain interconnections and water supply agreements with the City of Atlanta and Clayton County.

- Reassess the safe yield for the Lake McIntosh Reservoir, Horton Creek Reservoir, and the Lake Peachtree/Lake Kedron Reservoirs using procedures outlined in the forthcoming Statewide Water Plan.

Forsyth County

Summary of Needs

Water Demands & Treatment Capacities	2035 Annual Average Day (AAD-MGD)	2035 Peak Day (PD-MGD)
Forsyth County	60	96
Total Projected Demand	**60**	**96**
2006 Treatment Capacity	24	38
Additional Capacity Needed by 2035	36	56

Summary of Planned Sources

Source	Local Water Provider	Current Permitted Withdrawal (MGD) Monthly	Planned 2035 Withdrawal (MGD) Monthly	Planned 2035 Withdrawal (MGD) Peak Day
Lake Lanier	Forsyth Co.	14	51	68
Etowah Source		0	(Note 1)	
Bannister Creek		0		
Chattahoochee River		0		
Lake Lanier	Cumming	18	27	36
Sum		32	78	104

Capital Projects

- Lake Lanier may continue to be used as the water source for all of Forsyth County including the City of Cumming. Both the Cumming WTP and the Forsyth County WTP should be expanded. Apportionment of capacity between the Forsyth County and City of Cumming should be based on the needs and growth of their respective service areas. The City of Cumming's intake and raw water infrastructure is sized to accomodate all of the County's needs from Lake Lanier. If water storage is not granted by the US Army Corps of Engineers, Forsyth County may:
  - Apply for a water withdrawal from the Chattahoochee River which, if issued, may necessitate construction of a new WTP near the intake location; the existing WTP may be required to be taken off-line
  - Apply for a combination water withdrawal from the Chattahoochee River and Lake Lanier; a new WTP may be needed near the river intake location

Forsyth County may be partially served from Etowah sources. These sources are listed as Etowah off-stream reservoir and Bannister Creek in Section 6. Possible Etowah Basin contingency water supply options would be:

- The Cherokee County system could be extended to serve parts of western Forsyth County. To meet this new demand along with projected demands in Cherokee as well as possible future demands in Pickens and Dawson Counties, Cherokee may need to identify an additional source to supplement its current source, the Yellow Creek Reservoir.

- Cherokee, Forsyth, Dawson and Pickens Counties have considered constructing a new Upper Etowah Basin reservoir as a joint project (location to be determined). If this reservoir is constructed it could be an Etowah Basin source for Forsyth County.

- Forsyth County on its own or in coordination with other Metro Water District Counties (such as Fulton and/or Cherokee Counties) could develop an Etowah basin source (either inside or outside Forsyth County) to supply a portion of its water needs.

Phasing Plan

Facilities (Note 2)	Sources	By 2010 Proposed Projects Project Type	By 2010 Proposed Projects Project Capacity (PD-MGD)	By 2010 Plant Capacity at End of Period (PD-MGD)	2011 to 2015 Proposed Projects Project Type	2011 to 2015 Proposed Projects Project Capacity (PD-MGD)	2011 to 2015 Plant Capacity at End of Period (PD-MGD)	2016 to 2025 Proposed Projects Project Type	2016 to 2025 Proposed Projects Project Capacity (PD-MGD)	2016 to 2025 Plant Capacity at End of Period (PD-MGD)	2026 to 2035 Proposed Projects Project Type	2026 to 2035 Proposed Projects Project Capacity (PD-MGD)	2026 to 2035 Plant Capacity at End of Period (PD-MGD)
Cumming WTP	Lake Lanier	No expansions		24.0	No Expansions		24.0	Expansion	12.0	36.0	No Expansions		36.0
Forsyth WTP	Lake Lanier with possible Chattahoochee and/or Etowah Source	Expansion	16.83	30.73	Expansion	17.27	48.0	Expansion	12.0	60.0	Expansion	8.0	68.0
Demand Projections & Total Capacity (PD-MGD)				**54.73**		**63 in Forsyth**	**72**		**81 in Forsyth**	**96**		**96 in Forsyth**	**104**

Notes:
1) Chattahoochee River and Etowah Basin Options are options being considered if Forsyth County and/or the City of Cumming are unable to secure additional permitted withdrawal from Lake Lanier.
2) Plan schedule shown above is intended to be a general guideline to identify treatment capacity needs. Expansion capacities should be in operation before the end of the periods shown above, while planning, design and expansions may begin in the previous period. Exact timing of expansions is to be determined by local water master planning. Specific conditions for withdrawal/operating permits will be determined by Georgia EPD.

Non-Capital Programs

The following non-capital programs are specific to Forsyth County. These programs are in addition to those that apply to all counties within the Metro Water District.

- Maintain interconnections and water supply agreements with Cherokee, Fulton and Dawson Counties.

Fulton County

Summary of Needs

Water Demands & Treatment Capacities	2035 Annual Average Day (AAD-MGD)	2035 Peak Day (PD-MGD)
Fulton County	228	365
To Coweta County	6	10
Total Projected Demand	**234**	**375**
2006 Treatment Capacity	193	308.9
Additional Capacity Needed by 2035	41	66

Summary of Planned Sources

Source	Local Water Provider	Current Permitted Withdrawal (MGD) Monthly	Planned 2035 Withdrawal (MGD) Monthly	Planned 2035 Withdrawal (MGD) Peak Day
Chattahoochee River	Atlanta	180	180	201.4
Chattahoochee River	Atlanta/Fulton Co.	90	116	155
Etowah River Source	Fulton County	0	15	20
Big Creek	Roswell	1.2	3.75	5
Sweetwater Creek	East Point	11.5	11.5	13.9
Cedar Creek Reservoirs	Palmetto	0.45	0.45	0.6
Bear Creek Reservoir	TBD	0	11	15
Sum		283.15	337.70	410.9

Capital Projects

- Future expansion should be concentrated at the Atlanta-Fulton County WTP. This WTP draws from an upstream location and has an off-stream reservoir that improves its source reliability.
- The City of Atlanta should develop the 2.5-BG Bellwood Quarry Reservoir for storage and source reliability. Initial construction is anticipated for the 2011 to 2015 timeframe.
- The City of Atlanta should provide 10 PD-MGD of water to Coweta County.
- The infrastructure to provide water to Fayette and Clayton Counties on a peak emergency basis should aso be maintained and expanded as necessary.

- Fulton County should consider developing a new water source in the Etowah basin (location to be determined), with an accompanying WTP, either on its in own or in coordination with other Metro Water District Counties, such as Cherokee and/or Forsyth Counties.
- The Bear Creek Reservoir as currently planned and proposed has an estimated yield of 15 PD-MGD. A new WTP is proposed to be developed in conjunction with this reservoir.

Phasing Plan

Facilities (Note 1, Note 2)	Sources	By 2010 Proposed Projects: Project Type	By 2010 Proposed Projects: Project Capacity (PD-MGD)	By 2010: Plant Capacity at End of Period (PD-MGD)	2011 to 2015 Proposed Projects: Project Type	2011 to 2015 Proposed Projects: Project Capacity (PD-MGD)	2011 to 2015: Plant Capacity at End of Period (PD-MGD)	2016 to 2025 Proposed Projects: Project Type	2016 to 2025 Proposed Projects: Project Capacity (PD-MGD)	2016 to 2025: Plant Capacity at End of Period (PD-MGD)	2026 to 2035 Proposed Projects: Project Type	2026 to 2035 Proposed Projects: Project Capacity (PD-MGD)	2026 to 2035: Plant Capacity at End of Period (PD-MGD)
Atlanta-Fulton County WTP	Chattahoochee River	No expansions		90.0	Expand	45.0	135.0	No expansions		135.0	Expand	20.0	155.0
Fulton County Etowah WTP								Initial construction		10.0	Expand	10.0	20.0
	Fulton County Etowah Reservoir							Initial construction					
Atlanta Hemphill WTP	Chattahoochee River	No expansions		136.5	No expansions		136.5	No expansions		136.5	No expansions		136.5
Atlanta Chattahoochee WTP	Chattahoochee River	No expansions		64.9	No expansions		64.9	No expansions		64.9	No expansions		64.9
Roswell WTP (Note 3)	Big Creek	Expand	1.8	3.0	Expand	2.0	5.0	No expansions		5.0	No expansions		5.0
East Point WTP	Sweetwater Creek	No expansions		13.9	No expansions		13.9	No expansions		13.9	No expansions		13.9
Bear Creek WTP					Initial Construction		5.0	Expand	5.0	10.0	Expand	5.0	15.0
	Bear Creek Reservoir (Note 4)				New reservoir								
Palmetto WTP	Cedar Creek Reservoirs	No expansions		0.6	No expansions		0.6	No expansions		0.6	No expansions		0.6
Demand Projections & Total Capacity (PD-MGD)		**300 in Fulton 4 to Coweta 304 Total**		**308.9**	**306 in Fulton 5 to Coweta 311 Total**		**360.9**	**330 in Fulton 6 to Coweta 336 Total**		**375.9**	**365 in Fulton 10 to Coweta 375 Total**		**410.9**

Notes:
1) Plan schedule shown above is intended to be a general guideline to identify treatment capacity needs. Expansion capacities should be in operation before the end of the periods shown above, while planning, design and expansions may begin in the previous period. Exact timing
2) Demand and capacity are based upon the combined total demand and capacity of Fulton County as a whole. No attempt has been made to analyze demand by individual service providers within Fulton County, or to consider existing service areas and previous bonding commitments associated with the development of existing infrastructure.
3) The City of Roswell plant expansions include additional yield from Big Creek, offline storage and augmenting supplies with well water.
4) The service provider for the Bear Creek Reservoir should be determined through the Fulton county HB 489 renegotation process.

Other Programs
The following programs are specific to Fulton County. These programs are in addition to those that apply to all counties within the Metro Water District.
- Maintain interconnections with Clayton, Fayette, Coweta, DeKalb, and Forsyth Counties.
- Evaluate required improvements to accommodate routine sale of 10 PD-MGD to Coweta County.

Gwinnett County

Summary of Needs

Water Demands & Treatment Capacities	2035 Annual Average Day (AAD-MGD)	2035 Peak Day (PD-MGD)
Gwinnett County	140	224
Total Projected Demand	**140**	**224**
2006 Treatment Capacity	142	227
Additional Capacity Needed by 2035	0	0

Summary of Planned Sources

Source	Local Water Provider	Current Permitted Withdrawal (MGD) Monthly	Planned 2035 Withdrawal (MGD) Monthly	Planned 2035 Withdrawal (MGD) Peak Day
Lake Lanier	Gwinnett Co.	150	169	225
Lake Lanier	Buford	2	4	5
Sum		152	173	230

Capital Projects

- Buford WTP expansion.

Phasing Plan

Facilities (Note 1)	Sources	By 2010 Proposed Projects: Project Type	By 2010 Proposed Projects: Project Capacity (PD-MGD)	By 2010: Plant Capacity at End of Period (PD-MGD)	2011 to 2015 Proposed Projects: Project Type	2011 to 2015 Proposed Projects: Project Capacity (PD-MGD)	2011 to 2015: Plant Capacity at End of Period (PD-MGD)	2016 to 2025 Proposed Projects: Project Type	2016 to 2025 Proposed Projects: Project Capacity (PD-MGD)	2016 to 2025: Plant Capacity at End of Period (PD-MGD)	2026 to 2035 Proposed Projects: Project Type	2026 to 2035 Proposed Projects: Project Capacity (PD-MGD)	2026 to 2035: Plant Capacity at End of Period (PD-MGD)
Gwinnett Lanier WTP	Lake Lanier	No expansions		150.0	No expansions		150.0	No expansions		150.0	No expansions		150.0
Gwinnett Shoal Creek WTP	Lake Lanier	No expansions		75.0	No expansions		75.0	No expansions		75.0	No expansions		75.0
Buford WTP	Lake Lanier	Expand	2.83	4.83	No expansions		4.83	No expansions		4.83	No expansions		4.83
Demand Projections & Total Capacity (PD-MGD)				**229.83**	**185 in Gwinnett**		**229.83**	**205 in Gwinnett**		**229.83**	**224 in Gwinnett**		**229.83**

Notes:

1) Plan schedule shown above is intended to be a general guideline to identify treatment capacity needs. Expansion capacities should be in operation before the end of the periods shown above, while planning, design and expansions may begin in the previous period. Exact timing of expansions is to be determined by local water master planning. Specific conditions for withdrawal/operating permits will be determined by Georgia EPD.

Non-Capital Programs

The following non-capital programs are specific to Gwinnett County. These programs are in addition to those that apply to all counties within the Metro Water District.

- Maintain interconnections with Hall, Fulton, DeKalb, Forsyth and Rockdale Counties.

Hall County

Summary of Needs

Water Demands & Treatment Capacities	2035 Annual Average Day (AAD-MGD)	2035 Peak Day (PD-MGD)
Hall County	52	83
Total Projected Demand	**52**	**83**
2006 Treatment Capacity	22	35
Additional Capacity Needed by 2035	30	48

Summary of Planned Sources

Source	Local Water Provider	Current Permitted Withdrawal (MGD) Monthly	Planned 2035 Withdrawal (MGD)	
			Monthly	Peak Day
Lake Lanier	Gainesville	30	53	71
N Oconee River/Cedar Creek Reservoir	Gainesville	2	9	12
Glades Reservoir (Flat Creek)	Hall Co.	0	TBD	TBD
Sum		32	62	83

Capital Projects

- The Cedar Creek WTP should be constructed to 12 PD-MGD to fully utilize the yield of the Cedar Creek impoundment. This expansion will enable Hall County to partially meet its demand within the Oconee basin from an Oconee basin source. To fill the rest of the projected demand from Hall County, the City of Gainesville should construct one new WTP and expand one existing WTP.

Phasing Plan

Facilities (Note 1)	Sources	By 2010			2011 to 2015			2016 to 2025			2026 to 2035		
		Proposed Projects		Plant Capacity at End of Period (PD-MGD)	Proposed Projects		Plant Capacity at End of Period (PD-MGD)	Proposed Projects		Plant Capacity at End of Period (PD-MGD)	Proposed Projects		Plant Capacity at End of Period (PD-MGD)
		Project Type	Project Capacity (PD-MGD)		Project Type	Project Capacity (PD-MGD)		Project Type	Project Capacity (PD-MGD)		Project Type	Project Capacity (PD-MGD)	
Gainesville Lakeside WTP	Lake Lanier	No expansions		10.0	Expand	15.0	25.0	Expand	12.0	37.0	Expand	9.0	46.0
Gainesville Riverside WTP	Lake Lanier	No expansions		25.0	No expansions		25.0	No expansions		25.0	No expansions		25.0
Gainesville-Hall County Cedar Creek WTP (Note 2)	North Oconee River/Cedar Creek							Initial Construction	12.0	12.0	No expansions		12.0
	Glades Reservoir (Flat Creek)							New reservoir		-			
Demand Projections & Total Capacity (PD-MGD)				**35**	**49 in Hall**		**50**	**66 in Hall**		**74**	**83 in Hall**		**83**

Notes:

1) Plan schedule shown above is intended to be a general guideline to identify treatment capacity needs. Expansion capacities should be in operation before the end of the periods shown above, while planning, design and expansions may begin in the previous period. Exact timing of expansions is to be determined by local water master planning. Specific conditions for withdrawal/operating permits will be determined by Georgia EPD.
2) Depending on the outcome of tri-state negotiations and available supply, the capacity at the Cedar Creek WTP may be transferred or shared with the expansion of the Lakeside WTP.

Non-Capital Programs

The following non-capital programs are specific to Hall County. These programs are in addition to those that apply to all counties within the Metro Water District.

- Maintain interconnections and water supply agreements with Gwinnett and White Counties.
- Continue to explore development of the Glades Reservoir.

Henry County

Summary of Needs

Water Demands & Treatment Capacities	2035 Annual Average Day (AAD-MGD)	2035 Peak Day (PD-MGD)
Henry County	43	69
Total Projected Demand	**43**	**69**
2006 Treatment Capacity	25	39.73
Additional Capacity Needed by 2035	19	30

Summary of Planned Sources

Source	Local Water Provider	Current Permitted Withdrawal (MGD) Monthly	Planned 2035 Withdrawal (MGD) Monthly	Planned 2035 Withdrawal (MGD) Peak Day
Gardner (Indian Creek) Reservoir	Henry Co.	8	21.75	29
Rowland (Long Branch) Reservoir	Henry Co.	10		
Towaliga River Reservoirs (Strickland & Cole)	Henry Co.	Fills Gardner and Rowland Reservoirs		
Tussahaw Creek Reservoir	Henry Co.	13	39	52
Henry County Ocmulgee Reservoir	Henry Co.	0		
Fargason (Walnut Creek) Reservoir	McDonough	2.4	2.4	3.1
Brown Branch	Locust Grove	0.3	0.34	0.45
Sum		33.70	63.49	84.55

Capital Projects

- Expansion of Towaliga and Tussahaw WTPs to meet future water needs. Towaliga can currently only support 42 PD-MGD.

Phasing Plan

Facilities (Note 1)	Sources	By 2010 Proposed Projects: Project Type	By 2010 Proposed Projects: Project Capacity (PD-MGD)	By 2010: Plant Capacity at End of Period (PD-MGD)	2011 to 2015 Proposed Projects: Project Type	2011 to 2015 Proposed Projects: Project Capacity (PD-MGD)	2011 to 2015: Plant Capacity at End of Period (PD-MGD)	2016 to 2025 Proposed Projects: Project Type	2016 to 2025 Proposed Projects: Project Capacity (PD-MGD)	2016 to 2025: Plant Capacity at End of Period (PD-MGD)	2026 to 2035 Proposed Projects: Project Type	2026 to 2035 Proposed Projects: Project Capacity (PD-MGD)	2026 to 2035: Plant Capacity at End of Period (PD-MGD)
Henry Towaliga River WTP	S. Howell Gardner (Indian Creek) Reservoir and Rowland (Long Branch) Reservoir fed by Towaliga River Reservoirs (Strickland and Cole Reservoirs)	No expansions		24	No expansions		24	Expand	5	29	No expansions		29
Henry Tussahaw WTP	Tussahaw Creek Reservoir	Expand	13	26	No expansions		26	Expand	13	39	Expand	13	52
	Henry Co. Ocmulgee Reservoir							New reservoir					
McDonough WTP	Fargason (Walnut Creek) Reservoir	Expand	0.82	3.1	No expansions		3.1	No expansions		3.1	No expansions		3.1
Locust Grove WTP	Brown Branch	No Expansions		0.45	No Expansions		0.45	No Expansions		0.45	No Expansions		0.45
Demand Projections & Total Capacity (PD-MGD)				**53.55**	**39 in Henry**		**53.55**	**53 in Henry**		**71.55**	**69 in Henry**		**84.55**

Notes:

1) Plan schedule shown above is intended to be a general guideline to identify treatment capacity needs. Expansion capacities should be in operation before the end of the periods shown above, while planning, design and expansions may begin in the previous period. Exact timing of expansions is to be determined by local water master planning. Specific conditions for withdrawal/operating permits will be determined by Georgia EPD.

Non-Capital Programs

The following non-capital programs are specific to Henry County. These programs are in addition to those that apply to all counties within the Metro Water District.

- Maintain interconnections and water supply agreements with DeKalb, Clayton, Newton, Butts and Spalding Counties.

Paulding County

Summary of Needs

Water Demands & Treatment Capacities	2035 Annual Average Day (AAD-MGD)	2035 Peak Day (PD-MGD)
Paulding County	47	75
From CCMWA	-23	-36
Projected Demand Needs	**24**	**39**
2006 Treatment Capacity	0	0
Additional Capacity Needed by 2035	24	39

Summary of Planned Sources

Source	Local Water Provider	Current Permitted Withdrawal (MGD) Monthly	Planned 2035 Withdrawal (MGD) Monthly	Planned 2035 Withdrawal (MGD) Peak Day
Richland Creek Reservoir	Paulding Co.	0	30	40
Sum		0	30	40

Capital Projects

- Paulding County will continue to rely on CCMWA for a portion of its water supply, as shown below in the phasing plan.
- The proposed Richland Creek Reservoir project is currently in the permitting process; the 300-acre impoundment has an estimated yield of 35 AAD-MGD.
- Once Richland Creek Reservoir is completed, Paulding County plans to construct a water treatment plant at the reservoir site; Paulding County will still need to purchase up to 36 PD-MGD from CCMWA.

Phasing Plan

Facilities (Note 1)	Sources	By 2010 Proposed Projects: Project Type	By 2010 Proposed Projects: Project Capacity (PD-MGD)	By 2010: Plant Capacity at End of Period (PD-MGD)	2011 to 2015 Proposed Projects: Project Type	2011 to 2015 Proposed Projects: Project Capacity (PD-MGD)	2011 to 2015: Plant Capacity at End of Period (PD-MGD)	2016 to 2025 Proposed Projects: Project Type	2016 to 2025 Proposed Projects: Project Capacity (PD-MGD)	2016 to 2025: Plant Capacity at End of Period (PD-MGD)	2026 to 2035 Proposed Projects: Project Type	2026 to 2035 Proposed Projects: Project Capacity (PD-MGD)	2026 to 2035: Plant Capacity at End of Period (PD-MGD)
Paulding County WTP								Initial Construction	25	25	Expand	15	40
	Richland Creek Reservoir							New reservoir		-	No Expansions		-
Demand Projections & Total Capacity (PD-MGD)		**26 in Paulding -26 from CCMWA 0 Total**		**0**	**36 in Paulding -36 from CCMWA 0 Total**		**0**	**58 in Paulding - 36 from CCMWA 22 Total**		**25**	**75 in Paulding -36 from CCMWA 39 Total**		**40**

Notes:
1) Plan schedule shown above is intended to be a general guideline to identify treatment capacity needs. Expansion capacities should be in operation before the end of the periods shown above, while planning, design and expansions may begin in the previous period. Exact timing of expansions is to be determined by local water master planning. Specific conditions for withdrawal/operating permits will be determined by Georgia EPD.

Non-Capital Programs

The following non-capital programs are specific to Paulding County. These programs are in addition to those that apply to all counties within the Metro Water District.

- Maintain interconnections and water supply agreements with Cobb County.
- Evaulate required improvements to accommodate routine purchase of 36 PD-MGD from CCMWA.

Rockdale County

Summary of Needs

Water Demands & Treatment Capacities	2035 Annual Average Day (AAD-MGD)	2035 Peak Day (PD-MGD)
Rockdale County	17	27
Total Projected Demand	**17**	**27**
2006 Treatment Capacity	14	22.1
Additional Capacity Needed by 2035	3	5.0

Summary of Planned Sources

Source	Local Water Provider	Current Permitted Withdrawal (MGD) Monthly	Planned 2035 Withdrawal (MGD) Monthly	Planned 2035 Withdrawal (MGD) Peak Day
Big Haynes Creek (Randy Poynter Lake)	Rockdale Co.	22.1	22.1	27.1
Sum		22.1	22.1	27.1

Capital Projects

- Projections indicate that the Randy Poynter Lake should provide adequate supply through 2035. Rockdale County should expand its WTP to meet demand growth through 2035. Infrastructure should be kept in place to allow transfers from DeKalb and Gwinnett Counties to fill peak demands on an emergency basis.

Phasing Plan

Facilities (Note 1)	Source	By 2010 Proposed Projects Project Type	By 2010 Proposed Projects Project Capacity (PD-MGD)	By 2010 Plant Capacity at End of Period (PD-MGD)	2011 to 2015 Proposed Projects Project Type	2011 to 2015 Proposed Projects Project Capacity (PD-MGD)	2011 to 2015 Plant Capacity at End of Period (PD-MGD)	2016 to 2025 Proposed Projects Project Type	2016 to 2025 Proposed Projects Project Capacity (PD-MGD)	2016 to 2025 Plant Capacity at End of Period (PD-MGD)	2026 to 2035 Proposed Projects Project Type	2026 to 2035 Proposed Projects Project Capacity (PD-MGD)	2026 to 2035 Plant Capacity at End of Period (PD-MGD)
Rockdale WTP	Big Haynes Creek (Randy Poynter Lake)	No expansions		22.1	No expansions		22.1	Expand	5.0	27.1	No expansions		27.1
Demand Projections & Total Capacity (PD-MGD)				**22.1**	**19 in Rockdale**		**22.1**	**22 in Rockdale**		**27.1**	**27 in Rockdale**		**27.1**

Notes:

1) Plan schedule shown above is intended to be a general guideline to identify treatment capacity needs. Expansion capacities should be in operation before the end of the periods shown above, while planning, design and expansions may begin in the previous period. Exact timing of expansions is to be determined by local water master planning. Specific conditions for withdrawal/operating permits will be determined by Georgia EPD.

Non-Capital Programs

The following non-capital programs are specific to Rockdale County. These programs are in addition to those that apply to all counties within the Metro Water District.

- Maintain interconnections and water supply agreements with DeKalb, Gwinnett and Newton Counties.

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Online Comments – 2013 ACT DEIS

Commenter Information

Name: Carolyn Landrem
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Comment Metadata

Comment Number: 2013-0057

Date: 5/30/2013 4:36:03 PM

Interest:

Resource Area: Water Quality

Attachments: Corp Comments.docx

Comments:

WEISS LAKE IMPROVEMENT ASSOCIATION

P.O. Box 565
Centre, Alabama 35960

May 30, 2013

Colonel Steven J. Roemhildt
Mobile District, U.S. Army Corps of Engineers
P.O. Box2288
Mobile, Alabama 36628-0001

Re: Water Control Manual for Alabama-Coosa-Tallapoosa Basin

Dear Colonel Roemhildt:

Weiss Lake Improvement Association, a non-profit organization working to maintain, protect and enhance the quality of Weiss Lake and its fisheries for today's and future generations to enjoy, respectfully submit the following comments:

- Weiss Lake is a very nutrient rich lake and borders on being hyper eutrophic. Reduced outflows at Corps projects upstream will cause the water quality to further degrade. The flow of water into the lake and the retention time of the water in the lake affect the water quality as stated in a study conducted by Dr. David Bayne, The Potential Impact of Water Reallocation on Retention and Chlorophyll a Weiss Lake, 2003.
- Weiss Lake is located in Cherokee County, Alabama, a rural county dependent on the recreational and agricultural economic impact of the lake. Reduced flows and degraded water quality would have an impact on our economy and our ability to retain the current tourism dollars we currently are blessed with and to attract additional tourism, business and industry to Cherokee County.
- The Water Control Manual for the ACT Basin is a technical and voluminous document and not written in a manner that allows for everyday citizens that are affected by the requirements of this manual to properly understand. The complexity of the issues addressed in the manual and given the limited resources of organizations like ours, our ability to comment is dramatically restricted.
- This Water Control Manual for the ACT Basin did not consider the requested winter pool level increase by Alabama Power Company relicense application. The Army Corps of Engineers was involved in the relicensing process which began in the year 2000. The Alabama Power Company submitted the application in July of 2005 to the Federal Energy Regulatory Commission. In 2007 the Secretary of the Army directed that an update of the Master Water Control Manual for the ACT Basin be conducted. When you consider this timeline it would have been the best time for this request to be addressed, it was not. Now additional resources and time will be required to consider this request and amendments made to the Water Control Manual if the request is granted.

Your consideration of these comments is appreciated.

Carolyn Landrem

President, Weiss Lake Improvement Association, Inc.

Online Comments – 2013 ACT DEIS

Commenter Information

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Comment Metadata

Comment Number: 2013-0058

Date: 5/31/2013 2:51:06 PM

Interest:

Resource Area: Water Management Recommendations

Attachments: Ltr to U.S. Corp oof Engineers Alabama-Coosa-Talla

Comments:

QUANTITY QUALITY SAFETY
LMLPA
LOGAN MARTIN LAKE PROTECTION ASSOCIATION
P.O. Box 2002
Pell City, AL 35125

May 31, 2013

Colonel Steven J. Roemhildt
Mobile District, U.S. Army Corps of Engineers
P.O. Box 2288
Mobile, Alabama 36628-0001

Subject: Alabama-Coosa-Tallapoosa Basin Water Control Manual Update

Dear Colonel Roemhildt:

Logan Martin Lake Protection Association (LMLPA), a non-profit organization working to advocate and promote the general welfare of Logan Martin Lake and that of the homeowners, businesses, and users of Logan Martin Lake and the surrounding areas, respectfully submits the following comments:

- Reduced outflows at Corps projects upstream could have a detrimental impact on many areas of Logan Martin, including water quality and recreation/lake level.

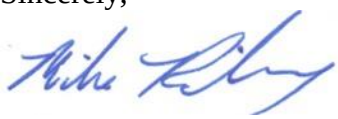
- A mission of LMLPA is to promote the general welfare of Logan Martin Lake. Reduced flows would have an impact on businesses in our region that depend on tourism dollars that are a direct result of Logan Martin Lake.

- The Water Control Manual for the ACT Basin did not consider the requested winter pool level increases by Alabama Power Company, which were fully supported and requested by LMLPA, in its relicense application to the FERC. The Army Corps of Engineers was deeply involved in the relicensing process from the beginning. During this relicensing process was the optimal time for this request to be addressed, but it was not. As a result, additional resources and time will be required to evaluate this request after the Water Control Manual is approved, whenever that may be, prolonging something that should have already happened.

- The Water Control Manual for the ACT Basin is a technical and voluminous document and not written in a way that the many stakeholder that will be directly affected by the requirements of this manual will understand. Our ability to effectively comment on every aspect of the Manuals is therefore limited. It could be beyond the comment period expiration before other issues have been realized and we reserve the right to submit further comments if need be.

Your consideration of these comments is appreciated.

Sincerely,



Mike Riley
President
Logan Martin Lake Protection Association

Online Comments – 2013 ACT DEIS

Commenter Information

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Comment Metadata

Comment Number: 2013-0059

Date: 5/31/2013 4:08:18 PM

Interest:

Resource Area: Biological Resources,Data, Studies, & Analytical Tools,Drought Operations,Flood Risk Management,Hydropower,National Environmental Policy Act,Navigatio

Attachments: ACT DEIS Comments.pdf

Comments:

Please find attached to this message comments on the Alabama-Coosa-Tallapoosa Water Control Manual Draft Environmental Impact Statement. These comments are submitted by the Southern Environmental Law Center on behalf of Alabama Rivers Alliance, American Rivers, Coosa River Basin Initiative, Coosa Riverkeeper, Georgia River Network, and Lake Watch. Thank you and kindest regards, Lauren Joy Southern Environmental Law Center

SOUTHERN ENVIRONMENTAL LAW CENTER

Telephone 404-521-9900

THE CANDLER BUILDING
127 PEACHTREE STREET NE, SUITE 605
ATLANTA, GA 30303-1840

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May 31, 2013

By Electronic Mail

Lt. Colonel Thomas F. Nelson
U.S. Army Corps of Engineers
Mobile District
ATTN: PD-EI (ACT-DEIS)
P.O. Box 2288
Mobile, AL 36628
act-wcm@usace.army.mil

RE: Comments on the Alabama-Coosa-Tallapoosa Master Water Control Manual Update Draft Environmental Impact Statement

Dear Colonel Nelson:

On behalf of Alabama Rivers Alliance, American Rivers, the Coosa River Basin Initiative, the Coosa Riverkeeper, Georgia River Network, and Lake Watch, the Southern Environmental Law Center ("SELC") offers the following comments on the Draft Environmental Impact Statement ("DEIS") for the proposed Alabama-Coosa-Tallapoosa ("ACT") *Master Water Control Manual* ("WCM" or "Master Manual") update.

SELC submitted scoping comments on the ACT WCM update on October 17, 2008 and attended a public meeting regarding the DEIS on March 26, 2013 in Rome, Georgia. In the discussion below we identify several shortcomings in the DEIS that require greater attention under the National Environmental Policy Act ("NEPA"), 42 U.S.C. § 4321, *et seq*. We have also included a number of suggestions to improve the updated master WCM drafted by the Army Corps of Engineers ("Corps").

I. BACKGROUND

The Corps is updating the Master Manual for the first time since 1951. The Corps must use this rare opportunity to fully consider the range of possible water management strategies for the entire ACT Basin that would meet Congressionally-authorized purposes. The authorized

purposes for the Corps' ACT projects include flood risk management, hydropower, navigation, recreation, water quality, water supply, and fish and wildlife conservation. Since 1951, the Corps has made incremental changes in the operation of specific ACT projects, has added new projects, and has updated a number of the individual-project water control manuals. The Corps is understandably updating the Master Manual to reflect these incremental changes that have occurred since 1951, but in order to comply with NEPA the Corps must also consider new or alternative management measures that reasonably meet the ACT projects' authorized purposes.

WCMs dictate how the Corps regulates reservoir and dam projects. The WCMs typically include background information on the project, water storage and release schedules (through guide curves and action zones), and drought contingency operations. The ACT WCM governs Corps management of its projects in the ACT Basin, covering 22,800 square miles in Georgia and Alabama. Within the ACT Basin, the Corps manages six dam projects:

1) Allatoona Lake and Dam (Etowah River, Georgia)
2) Carters Lake and Carters Dam (Coosawattee River, Georgia)
3) Carters Reregulation Dam (Coosawattee River, Georgia)[1]
4) Robert F. Henry Lock and Dam and R.E. "Bob" Woodruff Lake (Alabama River, Alabama)
5) Millers Ferry Lock and Dam and William "Bill" Dannelly Lake (Alabama River, Alabama)
6) Claiborne Lock and Dam and Lake (Alabama River, Alabama)

The three Alabama River projects are run-of-river projects that do not have significant conservation storage capacity compared to Lake Allatoona and Carters Lake. Yet management of the run-of-river projects, particularly those with hydropeaking operations, can still have significant impacts on downstream aquatic life in the ACT Basin. This is particularly important given that the ecologically-rich Mobile-Tensaw Delta lies directly downstream from the Corps' lower ACT projects. In addition to its own projects, the Corps also reviews and approves flood risk management plans and Reservoir Regulation Manuals for four Alabama Power Company ("APC") projects in the ACT Basin:

1) Weiss Dam (Coosa River, Alabama)
2) H. Neely Henry Dam (Coosa River, Alabama)
3) Logan Martin Dam (Coosa River, Alabama)
4) R.L. Harris Dam (Tallapoosa River, Alabama)

Additionally, the Corps maintains the navigation channel on the Alabama River between Mile 0 and Mile 72, at the Claiborne Lock and Dam. The Corps' proposed action for purposes of its NEPA analysis includes updating the Master Manual and updating nine project-level WCMs, included as appendices to the Master Manual.

[1] Carters Dam and Reregulation Dam are managed as one system.

II. NEPA PURPOSE AND NEED

NEPA requires a federal agency to create an environmental impact statement for any major federal action significantly affecting the quality of the human environment.[2] By its very nature, NEPA is a forward-looking statute, requiring federal agencies to take a hard look at a particular project to assess its impacts and alternatives so that the agency will make informed decisions with full knowledge of a project's effects on the environment.

The "Purpose and Need" section of an EIS briefly defines "the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action."[3] "Agencies are afforded considerable, although not unlimited discretion to define the purpose and need of a project."[4]

The Corps' stated purpose and need for the ACT WCM update is to "determine how the federal projects in the ACT Basin should be operated for their authorized purposes, in light of current conditions and applicable law, and to implement those operations through updated water control plans and manuals."[5] This purpose and need generally describes what the Corps is trying to achieve with its ACT WCM update. However, as described in greater detail below, the Corps has unfortunately undermined this statement of purpose and need. The Corps has excluded from consideration suggested management measures that could reasonably meet the Corps' stated purpose of determining how federal projects in the ACT Basin *should* be operated in light of current conditions in the basin and applicable law. The Corps has developed a scope for its actual analysis that is currently too narrow to meet the requirements of NEPA.

III. SCOPE OF THE DEIS

NEPA requires the Corps to take a broad, independent view of the scope of the project, its purpose, and its impacts. Agencies must define the scope so that they can consider all "reasonable alternatives" to the proposed action.[6] This is known as the "rule of reason."[7] Courts "have interpreted this [reasonableness] requirement to preclude agencies from defining the

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[2] NEPA § 102 (C), 42 U.S.C. § 4332 (C).
[3] 40 C.F.R. § 1502.13.
[4] Nw. Ecosystem Alliance v. Rey, 380 F. Supp. 2d 1175, 1185 (W.D. Wash. 2005).
[5] U.S. Army Corps of Engineers, Draft Environmental Impact Statement (2013), at 1-1.
[6] See, e.g., 40 C.F.R. § 1502.14; Alaska Wilderness Recreation & Tourism Ass'n v. Morrison, 67 F.3d 723, 729 (9th Cir. 1995) ("The goal of [NEPA] is to ensure that federal agencies infuse in project planning a thorough consideration of environmental values. The consideration of alternatives requirement furthers that goal by guaranteeing that agency decisionmakers have before them and take into proper account all possible approaches to a particular project.").
[7] Citizens Against Burlington, Inc. v. Busey, 938 F.2d 190, 195 (D.C. Cir. 1991).

objectives of their actions in terms so unreasonably narrow they can be accomplished by only one alternative."[8]

The Corps' current scope of the ACT WCM update is too narrow. Rather than taking a broad and independent view of the scope of its WCM update, its purpose, and impacts, the Corps has instead excluded a number of reasonable management alternatives and suggestions raised by SELC, the U.S. Fish and Wildlife Service ("FWS"), and other commenters during the scoping process.

The Corps used nine "screening criteria" to exclude a number of important management measures from consideration under the DEIS. In its DEIS, the Corps has provided a description of those management measures that were eliminated pursuant to these "screening criteria," which include but are not limited to the following:

1) Proposed changes to ACT Basin operations that would require "feasibility-level studies and congressional authorization";[9]
2) Measures proposing use of flood storage space for purposes other than flood storage, such as raising Lake Allatoona's conservation pool by 2 feet;
3) Suggested measures for increasing water supply for Metro Atlanta or other areas;
4) Suggested management measures "outside the Corps' authority to implement," such as "establish[ing] broad-based water conservation measures, impos[ing] surcharges on water supply storage used to supply needs outside the ACT Basin, or limit[ing] growth in the Atlanta area";[10]
5) Suggestions that the Corps should alter minimum flow requirements from its projects to ensure that other entities meet Clean Water Act requirements;
6) Suggestions to alter dam releases such as reducing peak flows for hydropower to "provide windows of no peak flows during spawning season";[11] altering dam operations at Lake Allatoona to more closely resemble a natural flow regime, or "minimiz[ing] the amount of water being released from Allatoona Lake during droughts";[12]
7) Management measures to mitigate "for the construction of the Carters Lake Project, for considering construction of structural measures to improve the water quality of releases, or for recommending restoration of habitat for federally listed species";[13]
8) Suggestions for actions relating to APC projects on the Coosa and Tallapoosa Rivers, which are characterized as "beyond the Corps' authority to address."[14]

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[8] Colo. Envtl. Coal. v. Dombeck, 185 F.3d 1162, 1174 (10th Cir. 1999).
[9] Id. at 1-7.
[10] Id. at 4-5.
[11] Id.
[12] Id.
[13] Id. at 4-5 – 4-6.
[14] Id. at 4-6.

By eliminating these alternative management measures, the Corps has adopted a scope that is too narrow for the purpose and need of this project and has arbitrarily excluded important and reasonable suggestions for management activities in the ACT Basin. The Corps should reconsider the application of its "screening criteria" for purposes of the DEIS scoping and instead evaluate the suggestions and measures listed above as part of a comprehensive alternatives analysis.

Additionally, the Corps should broaden the scope of its DEIS alternatives and impact analyses to include APC's proposed changes to APC-owned dam operations under the Federal Energy Regulatory Commission ("FERC") relicensing process. Specifically, the Corps should consider the potential impacts of concurring with APC's proposed changes to guide curves at Logan Martin Lake and Weiss Lake, over which the Corps has flood control authority. As noted by the Corps:

> The component parts of the master WCM would be nine project-level WCMs, presented as appendices. Only two of the four Alabama Power Company (APC) projects in the basin with Corps WCMs will be included in this WCM update. Additional studies would be required for Logan Martin Lake and Weiss Lake to address flood damage reduction prior to updating the manuals at those facilities. The Corps and APC will develop and execute separate Memoranda of Understanding that address only navigation and drought operations for Logan Martin and Weiss Lakes. Operations at those projects will be incorporated in the Master Manual Update.[15]

In adopting this approach, the Corps has artificially hamstrung its ability to complete a full and comprehensive analysis of the ACT Basin operations because it has separated out additional studies that would be required for changes in storage at Logan Martin and Weiss Lake.

IV. CONSIDERATION OF ALTERNATIVES

Because the Corps has too narrowly limited the scope of its DEIS, the Corps' alternatives analysis is likewise too narrow. The Corps should broaden its alternatives analysis, which is "the heart of the environmental impact statement."[16] The alternatives analysis is meant to offer "a clear basis for choice among options by the decisionmaker and the public."[17] In its alternatives analysis the Corps should "[r]igorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated."[18] The agency must include a thorough discussion of

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[15] Response from U.S. Army Corps of Engineers to U.S. Fish and Wildlife Service Planning Aid Letter (June 3, 2011), at p. 3.
[16] 40 C.F.R. § 1502.14.
[17] Id.
[18] Id.

available alternatives to a project that fulfill the project's underlying purpose and need, including "reasonable alternatives *not within the jurisdiction of the lead agency.*"[19] The Corps must also "[i]nclude appropriate mitigation measures not already included in the proposed action or alternatives."[20]

FWS has noted similar concerns with the narrowness of the Corps' alternatives analysis. In its Draft Fish and Wildlife Coordination Act Report, FWS states:

> Neither the Corps' Proposed Action nor the No Action Alternative, because of the limited scope of the proposed updates, will address all of the Service's conservation concerns in the ACT basin. These concerns include lack of improvement to water quality, lack of support for reintroduction and enhancements for listed species, minimal mimicking of components of the natural flow regime, no reduction of effects of hydropower peaking flows, and no recognition that fish passage at ACT dams is within the scope of the current effort.[21]

This is particularly apparent in the Environmental Consequences portion of the DEIS, where many of the analyses of the alternatives' impacts are the same or very similar for Alternative Plans D, F, and G. Minor changes to the Allatoona guide curve appear to be the only significant differences between alternatives D, F, and G, which were the only alternatives actually carried forward for analysis under the environmental effects portion of the DEIS.

We urge the Corps to reconsider its alternatives selection and analysis with particular attention to several management measures that have been prematurely excluded under the Corps' "screening criteria."

The Corps should reconsider altering minimum flow requirements for Lake Allatoona and Carters Lake to more closely resemble natural flows and improve water quality downstream of those projects. The Corps has proposed to do this for Carters Lake under proposed Action Zone 1 (non-drought conditions), but it may be possible for the Corps to more closely mimic natural flow variations under Action Zone 2 (drought conditions) as well. It is not clear from the DEIS whether the Corps has considered changing the current minimum flow requirement of 240 cubic feet per second ("cfs") for Carters Reregulation Dam or Allatoona Dam. The minimum flow of 240 cfs for these projects represents the annual 7Q10 flow, which is used for measuring water quality and waste assimilation under the Clean Water Act but is generally not considered protective of aquatic life.[22] The Corps should more thoroughly analyze whether this minimum

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[19] Id. (emphasis added).
[20] Id.
[21] U.S. Fish and Wildlife Service, Draft Fish and Wildlife Coordination Act Report (Dec. 21, 2012), at p. 29.
[22] In recognition of the importance of variable stream flow for aquatic life, Georgia has adopted an interim instream flow policy that incorporates a monthly 7Q10 requirement for surface water withdrawal permits, to replace the previous annual 7Q10 requirement. See Georgia DNR Water Issues White Paper, Appendix B (May 2001),

flow threshold is appropriate or ideal given that water quality and fish and wildlife conservation are authorized purposes for both Lake Allatoona and Carters Lake.

The Corps should reconsider its decision to exclude from its alternatives consideration any changes to water supply allocations in the ACT Basin. Water supply is an authorized purpose of both Lake Allatoona and Carters Lake. We are aware of at least one recent request, by the State of Georgia, for increased water supply storage in Lake Allatoona. While we do not take a position on the appropriateness of that request, it illustrates that the Corps is ignoring alternatives to water management operations in the ACT Basin by not addressing potential changes to water supply in its alternatives analysis. The Corps' water supply allocation decisions in fact have important implications for the entire ACT Basin. For example, in 2012, United States District Court Judge Bowdre dismissed Alabama's lawsuit against the Corps because there was no final agency action to challenge.[23] Through the lawsuit, Alabama attempted to limit withdrawals of water from the ACT Basin in Georgia, and the judge's decision hinged on what actions the Corps had undertaken up until that time. Now, however, the Corps is moving towards final action in updating its Master Manual, and this is the appropriate time to examine water supply allocations within Corps projects in the basin. An analysis of water supply alternatives is also warranted because of the potential indirect impacts such decisions may have on the development of other water supply reservoirs in or around the ACT Basin, particularly in the Metro Atlanta region of Georgia.[24]

The Corps should also consider in its alternatives analysis whether it should abandon certain minimum flow and operational requirements aimed at maintaining navigation along the Alabama River. In its alternatives analysis, the Corps only considers options to support navigation, even though commercial navigation at Alabama River projects has declined in recent years. FWS suggested in its 2010 Planning Aid Letter that the Corps conduct "a cost benefit analysis comparing the operation and maintenance of the current navigational channel and system of locks and dams on the Alabama River versus the costs and economic benefits associated with maintaining the same system for maximum environmental benefits."[25] FWS also suggested that "[a] summary of the number of commercial barges and other craft that have and are currently utilizing the navigational system should be made available as part of the DEIS."[26] We concur in these suggestions. The Corps must incorporate current commercial barge data into its alternatives analysis and consider the full range of reasonable navigation operation alternatives. Similarly, the Corps must analyze all direct, indirect, and cumulative impacts of

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available at
http://www.georgiaepd.org/Files_PDF/gaenviron/GADNR_InterimInstreamFlowProtectionStrategy_2001.pdf.

[23] Alabama v. U.S. Army Corps Eng'rs, No. 1:90-cv-01331-KOB (N.D. Ala. dismissed July 3, 2012).

[24] As in the ACT Basin, the Corps' decisions and actions in the Apalachicola-Chattahoochee-Flint Basin have significant implications for water supply allocation among states. See, e.g., Florida v. U.S. Army Corps Eng'rs (In re MDL-1824 Tri-State Water Rights Litig.), 644 F.3d 1160 (11th Cir. 2011) (holding water supply is authorized purpose of Lake Lanier).

[25] U.S. Fish and Wildlife Service, Planning Aid Letter (May 3, 2010), at p. 6.

[26] Id.

proposed navigation operations and dredging that may result from those operations in the DEIS impacts section.

FWS has suggested a number of additional management alternatives in its correspondence with the Corps that merit additional attention in the Corps' alternatives selection. For example, the Corps should consider applying a more adaptive management approach to its ACT operations.[27] This would involve including in the WCMs plans for additional and ongoing research and monitoring of project impacts. The Corps should consider the possibility of making structural changes to certain projects in the ACT Basin to improve downstream water quality.[28] It should consider additional measures to improve fish and aquatic organism passage beyond current operations at Allatoona Lake, Claiborne Lock and Dam, and Millers Ferry Lock and Dam.[29] Regarding temperature, the Corps should gather more data on temperature below its dams and compare it with what would occur in an unimpaired flow scenario.[30] If these figures differ significantly, FWS recommended that the Corps consider alternatives that would more closely resemble unimpaired temperatures.[31] Allatoona Dam is a hydropeaking operation, meaning that flow below the dam varies between 250 cfs and 7,500 cfs each weekday.[32] FWS suggested that the Corps consider alternatives that more closely mimic unimpaired flow releases from Corps projects.[33] FWS also suggested that the Corps implement a non-peaking window for hydropower production at Lake Allatoona during the time of year most sensitive for aquatic organisms downstream of the project. We support these recommendations, which would help to comprise the robust alternatives analysis required under NEPA.

V. EVALUATION OF DIRECT, INDIRECT, AND CUMULATIVE IMPACTS

The environmental consequences section of the DEIS "forms the scientific and analytic basis for the comparisons" of the alternatives including the proposed action.[34] "Agencies shall … identify any methodologies used and shall make explicit reference by footnote to the scientific and other sources relied upon for conclusions in the statement."[35] This section must also, among other requirements, include "[m]eans to mitigate adverse environmental impacts" if not addressed in the alternatives analysis.[36] Council on Environmental Quality ("CEQ") regulations

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[27] U.S. Fish and Wildlife Service, Draft Fish and Wildlife Coordination Act Report (Dec. 21, 2012), at pp. 28–29.
[28] Id. at 21.
[29] Id. at 24–26.
[30] See id. at 21–22.
[31] See id. The Corps should incorporate the FWS analysis of DO and temperature in the ACT Basin into its DEIS environmental impacts section. See id. at 20–24.
[32] U.S. Fish and Wildlife Service, Planning Aid Letter (May 3, 2010), at pp. 25–26.
[33] Id. at 26; U.S. Fish and Wildlife Service, Draft Fish and Wildlife Coordination Act Report (Dec. 21, 2012), at pp. 18–20.
[34] 40 C.F.R. § 1502.16.
[35] 40 C.F.R. § 1502.24.
[36] Id.

require that an EIS include "a full and fair discussion of significant environmental impacts" which should be "discussed in proportion to their significance."[37]

Direct and Indirect Impacts

CEQ regulations require federal agencies to consider both direct and indirect effects of a proposed action. Direct impacts are defined as those impacts which are "caused by the action and occur at the same time and place."[38] Indirect effects are defined as effects "caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable."[39] Importantly, where the agency lacks relevant and adequate evidence or scientific information, courts have required that the agency note the lack of information in the DEIS and further seek and include such additional evidence or scientific information if it is essential to the analysis, and if the costs of obtaining the additional information are not exorbitant.[40]

Changes to Lake Allatoona's guide curve can affect communities and species that are located many miles downstream, as well as water quality in the lake itself. Revisions to the ACT WCM have consequences for the ongoing uses of Lake Allatoona, for the amount of water released downstream, and for the aquatic habitat in the lake and the rest of the Etowah and Coosa River Basins. Because of these substantial direct impacts, the Corps must rely upon an objective and transparent body of scientific data to underpin its analysis of different water releases from this lake.

Our primary concern with the direct and indirect impacts analysis lies with the Corps' assessment of the impacts of its alternatives on biological resources. In its impacts analysis, the Corps has failed to adequately describe impacts of its proposed actions to wildlife, fish and aquatic resources, and protected species. Additionally, there is a lack of analysis in each of the sections of dredging impacts (for navigation) in the Alabama River downstream of the Claiborne Dam, despite the fact that dredging for navigation is contemplated in each of the alternatives considered in the impacts section of the DEIS.

In the Corps' analysis of the impacts to wildlife, the Corps states that "[t]he effects of implementing the No Action Alternative and [other alternatives] on wildlife resources would be expected to be negligible."[41] The Corps states that water quantity and stream flow changes would minimally affect wildlife and that only water quality changes may impact wildlife. The Corps should include a more thorough analysis of the potential effects of changes in water quantity or stream flow impacts on wildlife, particularly in light of the addition of a drought plan to the ACT WCM, proposed changes to the guide curve at Lake Allatoona, and the addition of

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[37] 40 C.F.R. §§ 1502.1, 1502.2(b).
[38] 40 C.F.R. § 1508.8(a).
[39] 40 C.F.R. § 1508.8(b).
[40] See 40 C.F.R. § 1502.22; Alaska v. Andrus, 580 F.2d 465 (D.C. Cir. 1978, rev'd on other grounds, W. Oil & Gas Ass'n v. Alaska, 439 U.S. 922 (1978).
[41] U.S. Army Corps of Engineers, Draft Environmental Impact Statement (2013), at 6-137.

action zones including Action Zone 1 with a more natural streamflow at Carters Lake. Regarding water quality, although the Corps briefly describes the predicted water quality changes based on its water quality impacts analysis, the Corps does not point to studies of wildlife and water quality or explain its reasoning for why "overall changes in water quality ... would be expected to have little effect on wildlife resources, and would most likely not be adverse effects."[42] This is the Corps' conclusion for each river segment throughout the ACT Basin despite varying predictions for changes in dissolved oxygen, nitrogen, water temperature, phosphorus, and chlorophyll *a*. This lack of reasoning as to both water quantity and water quality impacts on wildlife renders the Corps' ultimate determination of little to no impact arbitrary and conclusory.

In contrast to its wildlife impacts analysis, the Corps offers more analysis of the water quantity and stream flow impacts in its discussion of fish and aquatic species. However, the Corps still includes within each river segment analysis a conclusory statement that there would be no adverse effects on fish and aquatic resources, without a full explanation of how predicted changes to water quantity, water quality, or streamflow would actually impact these resources. To comply with CEQ regulations, the Corps must include references to scientific or other resources relied upon in its EIS and explain how it reached its conclusions. The Corps must provide a more thorough analysis of the fish and aquatic species impact in order to satisfy the requirements of NEPA.

The Corps must also include a thorough analysis of environmental impacts to protected species. FWS suggested to the Corps that updated surveys be conducted as part of the EIS process for federally-listed fishes and freshwater mollusks to "accurately assess the potential impacts of the Corps' alternative actions."[43] According to FWS in its 2008 scoping comments, the last comprehensive surveys of the federally-listed or endangered mussels and fish in the Georgia portion of the ACT Basin were conducted in 1997 and 1998.[44] Since 2008, FWS has indicated in correspondence with the Corps that some additional surveys studies have been conducted.[45] These surveys and studies must be incorporated into the Corps' environmental impacts analysis to enable effective review of the DEIS. In the DEIS impacts analysis as currently drafted, the Corps simply asserts that little information is known about the impacts to protected species and that "dedicated studies to address the impacts of the proposed operational changes on protected species are not available and are beyond the scope of this effort."[46] The Corps should include analysis of any relevant studies that have been conducted for protected species in the ACT Basin, and the Corps should reconsider its position that gathering additional information is beyond the scope of its NEPA obligations.

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[42] Id. at 6-137 (Etowah River); see also id. at 6-138 – 6-146 (other ACT reaches).
[43] Letter from U.S. Fish and Wildlife Service to U.S. Army Corps of Engineers (Oct. 16, 2008), at p. 2.
[44] Id.
[45] See U.S. Fish and Wildlife Service, Draft Fish and Wildlife Coordination Act Report (Dec. 21, 2012), at pp. 17–18 (citing various studies conducted in 2011).
[46] U.S. Army Corps of Engineers, Draft Environmental Impact Statement (2013), at 6-153 – 6-158.

The Corps should bolster its analysis of environmental impacts to the Mobile-Tensaw Delta and Mobile Bay. Although the Corps includes in the DEIS's environmental consequences section descriptions of impacts to different segments of the Alabama-Coosa-Tallapoosa system (for example, the Coosawattee River downstream of Carters Reregulation Dam and the Etowah River downstream of Allatoona Lake), its analysis abruptly stops at the Alabama River below Claiborne Dam.[47] The Corps should include throughout its impacts section an analysis of the environmental impacts of its proposed action on the Delta and Bay in addition to upstream portions of the ACT Basin. The Corps should also more explicitly note and explain the impacts of Millers Ferry hydropeaking operations on the downstream waterways.

Additionally, in its discussion of recreation impacts, the Corps should ensure that it analyzes impacts to recreation activities along the Alabama River in addition to impacts to recreational activities at Lake Allatoona and Carters Lake. The DEIS as currently drafted only includes an analysis of recreation impacts to Lake Allatoona and Carters Lake.[48] A discussion of recreation impacts on reaches of the Alabama River should include an analysis of impacts to recreational boating activities on the river in addition to impacts to shoreline activities.

Understanding the impacts of the Corps' proposed action to wildlife, fish and aquatic resources, protected species, and recreation throughout the entire ACT Basin is integral to completing an adequate EIS, the purpose of which is to allow the agency to make informed decisions with a full understanding of a proposed project's effects on the environment. The DEIS currently lacks this evaluation of impacts. The impacts analysis is also limited because the Corps compares the proposed alternatives to a baseline of existing Corps operations rather than pre-dam, unimpaired flow conditions.

Cumulative Impacts

Cumulative impacts result from the "incremental impacts on the environment from an action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions."[49] These impacts can arise from "individually minor but collectively significant actions taking place over a period of time."[50] Cumulative impacts are particularly significant in a highly-regulated system such as the ACT Basin.

"NEPA requires that where several actions have a cumulative or synergistic environmental effect, this consequence must be considered in an EIS."[51] "The purpose of the cumulative impact analysis is to provide readers with a complete understanding of the

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[47] The Corps should further its analysis of predicted impacts to fish and aquatic life in the estuary by assessing, for example, the impacts of dredging for navigation on fish and aquatic life. See id. at 6-151 – 6-152.
[48] See id. at 6-185 – 6-188.
[49] 40 C.F.R. § 1508.7.
[50] Id.
[51] City of Tenakee Springs v. Clough, 915 F.2d 1308, 1312 (9th Cir. 1990).

environmental effects a proposed action will cause."[52] "Separating the cumulative effects of related actions into discrete environmental impact statements eliminates the context necessary for readers to comprehend fully a project's overall environmental effects."[53] The cumulative impacts section should assess:

> (1) the area in which effects of the proposed project will be felt;
>
> (2) the impacts that are expected in that area from the proposed project;
>
> (3) other actions -- past, proposed, and reasonably foreseeable -- that have had or are expected to have had or are expected to have impacts in the same area;
>
> (4) the impacts or expected impacts from these other actions; and
>
> (5) the overall impact that can be expected if the individual impacts are allowed to accumulate.[54]

"The duty to discuss cumulative impacts in an EIS is mandatory."[55]

The Corps should thoroughly analyze the cumulative impacts of its own projects coupled with the ongoing federal relicensing process of APC dams in the ACT Basin, along with the cumulative effects of those dam operations on the overall health of the river system. As the Corps has already pointed out in its DEIS, "[f]low conditions [in the Alabama River at Montgomery, Alabama] are principally affected by water management activities at APC projects upstream on [the Coosa and Tallapoosa Rivers]."[56] The environmental impacts of the dams along the Coosa River are particularly significant and deserve a thorough analysis within the Corps' DEIS, particularly since the Corps operates projects both above and below the APC dams. In a March 2013 report, the World Wildlife Federation highlighted the Coosa River as "the most developed river in Alabama" with "one of the largest extinction rates in North America during the 20th century, with the extinction or extirpation of nearly 40 freshwater species."[57] It is not possible for the Corps to analyze the impacts of updating the ACT WCM on the whole ACT Basin without considering the cumulative impacts of water management at APC projects in conjunction with management of the Corps projects. As one example, the EIS should include a more thorough analysis of the potential environmental consequences of APC raising the winter pool levels of Weiss and Logan Martin Lakes, which APC has proposed as part of the

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[52] N.C. Alliance for Transp. Reform, Inc. v. U.S. Dep't of Transp., 151 F. Supp. 2d 661, 698 (M.D.N.C. 2001).
[53] Id.
[54] Fritiofson v. Alexander, 772 F.2d 1225, 1245 (5th Cir. 1985), abrogated on other grounds, Sabine River Auth. v. U.S. Dep't of Interior, 951 F.2d 669 (5th Cir. 1992).
[55] City of Carmel-By-The-Sea v. U.S. Department of Transp., 123 F.3d 1142, 1160 (9th Cir. 1997).
[56] Id. at 6-58.
[57] World Wildlife Federation, The Seven Sins of Dam Building 10 (2013) (internal quotation marks omitted), *available at* http://awsassets.panda.org/downloads/seven_sins_of_dam_building_wwf.pdf.

FERC relicensing process. In its DEIS, the Corps has eliminated this possibility from its analysis in an effort to improperly narrow the scope of its DEIS.

Additionally, FWS pointed out in its Draft Fish and Wildlife Coordination Act Report that several reservoirs in various planning and construction stages need to be thoroughly discussed in the EIS, including a discussion of their cumulative impacts on the watershed. According to FWS, these include: 1) Hickory Log Creek Reservoir, 2) Russell Creek Reservoir, 3) Richland Creek Reservoir, 4) Shoal Creek Reservoir, and 5) Calhoun Creek Reservoir.[58] The Corps includes some discussion of proposed reservoirs, but must ensure that it fully analyzes all reservoirs proposed for the ACT Basin and their cumulative impacts on the watershed, including growth-inducing impacts, in combination with the Corps' regulation of its projects in the ACT Basin. The Corps should also ensure that it has included in its analysis each proposed reservoir in the ACT Basin; for example, there is currently no analysis of the proposed Calhoun Creek Reservoir in the DEIS. The City of Dawsonville's proposed Calhoun Creek Reservoir would withdraw water from the Etowah River and the Chestatee River and ultimately transfer it to the Etowah or Chattahoochee River basins. In May 2013, the City of Dawsonville applied for $20 million from the Georgia Governor's Water Supply Program to acquire real property for the reservoir.[59] These additional reservoirs will have significant cumulative impacts on the ACT Basin as a whole, particularly the upper portion of the basin.

Similarly, the Corps should ensure that it includes in its cumulative impacts discussion a thorough analysis of reasonably foreseeable requests for additional water supply storage in Lake Allatoona or Carters Lake. For example, the Corps should include a discussion of Georgia's recent request for additional water supply from Lake Allatoona within its alternatives analysis. Increasing water supply storage availability in Lake Allatoona may have far less detrimental impact to the environment than the cumulative impact of the many current proposed or planned water supply reservoirs in the ACT Basin. Similarly, the Corps should include a robust discussion of impacts of existing and proposed interbasin transfers into and out of the ACT Basin on the basin as a whole and the Corps' management alternatives.

The Corps should address in its cumulative impacts section the impacts to the Mobile-Tensaw Delta and Mobile Bay from the Corps' operations in the ACT Basin in conjunction with its operations in the Black Warrior-Tombigbee River Basin. Each of these systems contributes to the flow and water quality of the Delta and Mobile Bay and should be analyzed together in the cumulative analysis section. In the DEIS, the Corps states that "[f]low alteration is not without potential effects on the estuary, especially on commercial fisheries, but the data on that impact are mixed."[60] The EIS must explain what specific data it is referring to and why the results are

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[58] U.S. Fish and Wildlife Service, Draft Fish and Wildlife Coordination Act Report (Dec. 21, 2012), at p. 14.
[59] To access application materials, see Georgia Environmental Finance Authority, GEFA News: Governor's Water Supply Program Applications Received, GEFA (May 9, 2013), https://www.gefa.org/index.aspx?recordid=557&page=50 (last visited May 30, 2013).
[60] U.S. Army Corps of Engineers, Draft Environmental Impact Statement (2013), at 6-195.

mixed. The Corps should additionally explain its reasoning for why it summarily finds that "[t]he proposed updates to the ACT Master Manual are likely to have inconsequential effects on the ecological function of the Mobile Bay estuary."[61]

The Corps should also fully evaluate as part of the cumulative impacts analysis any and all plans, proposals, or permits for additional hydropower facilities for any of its projects in the ACT Basin. For example, FERC has granted a preliminary permit to Northbrook Energy, LLC to pursue new hydropower production at Carters Dam.[62] In the past, there have also been proposals to add private hydropower projects to Claiborne Lock and Dam, which does not currently have a hydropower facility.[63] This is important to the cumulative impacts discussion because hydropower facilities, particularly peaking hydropower facilities, can degrade downstream fish and wildlife habitat and water quality, and impair the passage of migratory fishes.[64]

Mitigation

The Corps is required by CEQ regulations to consider and discuss mitigation in the scope of the EIS, in the alternatives analysis, and in its final decision.[65] According to CEQ regulations,

> "Mitigation" includes:
>
> (a) Avoiding the impact altogether by not taking a certain action or parts of an action.
>
> (b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
>
> (c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
>
> (d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
>
> (e) Compensating for the impact by replacing or providing substitute resources or environments.[66]

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[61] Id.
[62] Id. at 2-28.
[63] According to FWS, FERC has already issued a preliminary permit to Hydro Green Energy LLC to study the possible addition of hydropower to Claiborne Dam. U.S. Fish and Wildlife Service, Draft Fish and Wildlife Coordination Act Report (Dec. 21, 2012), at p. 19.
[64] See, e.g., U.S. Fish and Wildlife Service, Draft Fish and Wildlife Coordination Act Report (Dec. 21, 2012), at p. 19.
[65] 40 C.F.R. §§ 1508.25, 1502.14.
[66] 40 C.F.R. § 1508.20.

As the Corps has noted in its DEIS, mitigation can include "measures to avoid, reduce, minimize, or compensate for adverse impacts that could result from a selected course of action, in this case, the update of the Master Manual for the ACT Basin."[67] Mitigation is construed liberally for purposes of NEPA, and mitigation does not necessarily need to affect the particular action in question; instead, it can take the form of a separate action that would offset environmental impacts.

The Corps stated in the DEIS that "[i]mplementing Plan D, Plan F, or the Proposed Action Alternative may result in adverse effects on water quality at various locations in the ACT Basin during low-flow conditions that may necessitate reevaluation of NPDES permits. Affected water quality parameters include water temperature and pollutants (nitrogen, phosphorus, and chlorophyll *a*)."[68] Despite this finding, the Corps states in its mitigation analysis that, "[o]n the basis of the analysis of the Proposed Action Alternative and other alternatives, specific compensatory mitigation measures would not be required."[69] The Corps provides no evidence to support such a conclusion, which is flatly inconsistent with its earlier statement that adverse effects on water quality are foreseeable environmental consequences of alternative Corps operations.

One potential mitigation opportunity that may be considered a "separate action" from updating the WCM but could mitigate for potential adverse impacts from the proposed action alternative involves dissolved oxygen. According to the Corps in its DEIS, dissolved oxygen levels may decrease in parts of the ACT basin during dry-weather conditions as a result of the proposed action alternative.[70] The Corps also states that the "timing and quantity of flow influences the system's ability to assimilate oxygen-demanding pollutants" which can impact dissolved oxygen levels.[71] Specifically regarding the Allatoona project, the Corps' water quality and environmental assessment showed that the tailrace downstream of Allatoona Dam does not always meet state water quality standards for dissolved oxygen.[72] From 1968 to 1986 an oxygen diffuser was used to improve dissolved oxygen levels downstream of Lake Allatoona.[73] FWS suggested that the Corps consider modifying Allatoona dam operations to install a method to increase diffused oxygen levels below the dam; FWS went on to suggest methods such as "aerating turbines, surface-water pumps, low-pressure air blowers, aerating weirs, and oxygen injection systems."[74] The Corps should evaluate this suggestion in both its alternatives analysis and its mitigation analysis.

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[67] U.S. Army Corps of Engineers, Draft Environmental Impact Statement (2013), at 6-196.
[68] Id. at 6-196.
[69] Id. at 6-197.
[70] Id. at 6-85.
[71] Id. at 6-87.
[72] Id. at 2-118; see also U.S. Fish and Wildlife Service, Planning Aid Letter (May 3, 2010), at p. 26.
[73] U.S. Fish and Wildlife Service, Planning Aid Letter (May 3, 2010), at p. 26.
[74] U. S. Fish and Wildlife Service, Draft Fish and Wildlife Coordination Act Report (Dec. 21, 2012), at p. 21.

The Corps should also consider developing and implementing ongoing monitoring programs to gather more information about the impacts of Corps projects on downstream water quality, aquatic life, and protected species. The Corps asserted that there is a lack of information regarding impacts of its ACT dams on downstream protected species. Greater information gathering and monitoring would improve this situation. Similarly, the Corps should consider opportunities to augment or reintroduce mollusks and fishes into riverine habitats downstream of its ACT dams.[75]

Finally, the Corps should use the ACT WCM update as an opportunity to adopt mitigation measures for the loss of aquatic resources due to the building of Carters Dam in the 1970s. As suggested by FWS, the Corps should calculate the "[t]errestrial and stream impacts ... and mitigation measures should be implemented."[76]

VI. SUGGESTIONS TO IMPROVE THE REVISED WCM DOCUMENT

We would also like to suggest some revisions and pose questions that may improve the language of the updated Master Manual as currently drafted.

In general, the Corps could improve the Master Water Control Manual by giving more attention to stream and river flows. The Corps has many opportunities to address and increase knowledge of total basin flow history and the relation of flows to drought and water quality.

In Section 2-05b, "Precipitation" should include information about periods of time when precipitation was lacking. (p. 2-11)

In Section 2-06a, entitled "Storms and Floods," the Corps should address more than periods of high flow and their consequences. (p. 2-13 thru 2-19) The Corps includes an excellent definition of drought and brief descriptions of historic drought throughout the ACT basin in Exhibit C, the Drought Contingency Plan for the ACT (see pp. E-C-4 and E-C-6). This information should be included in Section 2-06a with a description of how municipalities, industries and other basin constituencies were affected and responded (for example, did municipalities and industrial water consumers issue conservation orders or ration supplies?). Additionally, the section could be re-titled "Storms, Floods, and Droughts." The Corps may also find a U.S.G.S. publication – "Droughts in Georgia" – helpful for identifying other significant drought periods that occurred in the Coosa basin, including the 1924-27 drought.[77]

In Chapter III, "General History of the Basin," in addition to information regarding historic drought, the Corps should include history of water quality investigations that took place in the Coosa River basin. For example, the National Resources Committee apparently completed

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[75] Id. at p. 29.
[76] Id.
[77] U.S.Geological Survey, Droughts in Georgia, U.S. Geological Open-File report 00-380 (October 2000).

an assessment of the Coosa River in the late 1930s, and the U.S. Public Health Service apparently convened a conference to collect public input after fish kills and citizen complaints about pollution in Lake Weiss in the 1960s.[78] Additionally, the Corps should revisit historic agency and Congressional documents and testimony regarding ACT water projects with an eye to drought and water quality references. Including this type of information in the WCM will demonstrate to all basin constituents the basin-wide and historic connections between drought, water quality, and healthy steam flows.

Section 2-10 "Economic Data," should use the most up-to-date population data – from the 2010 Census or estimates – available from the U.S. Census Bureau (p. 2-25). 2010 data is utilized in Section 4-09, "Economic Data," and the data use should be consistent throughout the document. (p. 4-13)

In Section 2-11 "Land Use," what does the term "desert pavement" refer to? (p. 2-28)

Regarding communication (Section 5-06 "Communication With Project;" Section 7-04 "Standing Instruction to Damtender"), we hope that lessons learned about communication and data sharing between the National Weather Service and the Corps during the 2010 Cumberland River flood of record in Nashville, Tennessee have been incorporated into the Mobile District's "Flood Emergency Action Plans" (Section 8-03).[79]

Section 7-10 "Hydroelectric Power:" How has the Corps – in consultation with the Southeast Power Administration ("SEPA"), Southeastern Electrical Reliability Corporation ("SERC"), the Southern Company and other parties – evaluated what changes to Corps peak operations and discharges will occur as more base generation sources (that is, coal-fired generators) are retired in the southeast? (p. 7-9)

VII. CONCLUSION

The Corps has not updated its Master Water Control Manual for the ACT Basin since 1951. At this time the Corps has an excellent opportunity, as the Corps points out in its statement of purpose and need, to determine how its projects in the ACT Basin *should* be managed. To this end, we encourage the Corps to fully consider the appropriateness of the scope of its DEIS, the range of reasonable alternatives considered, and the full impacts of those alternatives. The Corps should improve the scope and depth of its analysis before this EIS is finalized, pursuant to NEPA's requirements.

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[78] Craig Colten, "Southern Pollution Permissiveness: Another Regional Myth?, Southeastern Geographer 48, 1 (2008): 75-96.

[79] Communication Breakdowns Led to Confusion on Severity of Nashville Flooding, Tennessean, Oct. 17, 2010, *available at* http://www.tennessean.com/article/20101017/NEWS01/10170364/Communications-breakdowns-led-to-confusion-on-severity-of-flooding?odyssey=mod|newswell|text|PROJECTS01|s (last visited May 30, 2013).

We look forward to participating in the NEPA process as it moves forward. Thank you for your consideration of these comments. Please contact us if you have any further questions.

Sincerely yours,

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May 31, 2013

BY ELECTRONIC MAIL AND U.S. MAIL
Colonel Steven J. Roemhildt, Commander
U.S. Army Corps of Engineers, Mobile District
Attn: PD-EI (ACT-DEIS)
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Mobile, AL 36628

Re: Draft Master Water Control Manual Update and Environmental Impact Statement for the Alabama-Coosa-Tallapoosa River Basin: **Comments of the Cobb County-Marietta Water Authority and the Atlanta Regional Commission.**

Dear Colonel Roemhildt:

Please accept these comments on the Draft Water Control Manual (the "Manual") and Draft Environmental Impact Statement (the "EIS") on behalf of the Cobb County-Marietta Water Authority ("CCMWA") and the Atlanta Regional Commission.

The Water Control Manual Should Address *Future* Water Supply Needs

First, the Draft Manual and EIS should not be limited to "current conditions" in the basin. At a minimum, the new Manual must address conditions as they will exist during the foreseeable future while the Manual is in use, including projected water supply demands documented in the State of Georgia's recent water supply request.[1]

We are aware that this limitation on the scope of the Manual is an attempt by the Corps to honor promises made to the State of Alabama and its Senate delegation, but we urge you to reconsider nonetheless. The Army should adopt a policy of strict neutrality in this interstate dispute. When one State wants action and another State wants delay, "neutrality" requires acting on the merits of any request that is properly before the agency while leaving the States to pursue their legal and equitable claims in other venues. Any other response puts the Army in the position of having to adjudicate competing legal claims, which is exactly what is happening in the ACT. By bowing to Alabama's demand that it take no action to address water supply needs in Georgia, the Army has, in effect, granted Alabama a victory on claims that would never pass muster in court.

[1] Letter from Nathan Deal, Gov. of Georgia, to Hon. Jo-Ellen Darcy, Asst. Secretary of the Army for Civil Works re Lake Allatoona-Request for Final Agency Action (Jan. 24, 2013) with Affidavit of Judson H. Turner and all attachments.

Furthermore, if the Army is worried that a comprehensive update to the Manual would interfere with ongoing negotiations between the States, this fear is misplaced. After waiting almost a quarter of a century for the States to negotiate an amicable solution, it is long past time for the Army to conclude that the States are at an impasse and that it has no choice but to exercise its discretion to determine how the system should be operated.

The Description of "Current Conditions" in the Manual is Not Accurate

Second, we are also concerned that description of "current conditions" in the Manual and EIS is not accurate. There is no mention in either document of the existing levels of water supply withdrawals and returns, of the existing demands supplied by CCMWA and the City of Cartersville, or of the existence of the Hickory Log Creek Reservoir. At a minimum, the Manual and EIS must acknowledge these "facts on the ground" and state how they will be addressed when the new Manual is adopted.

1. The CCMWA Contract

The Draft Manual appears to suggest that the "existing condition" as it relates to water supply is a storage contract with a fixed yield of 34.5 mgd. This is how the storage contract with CCMWA is described in the text of the EIS,[2] and it is also how the withdrawal is modeled in RES-SIM, but it is not correct. To the contrary, as the Corps recently acknowledged, "[t]he contract does not establish fixed limits on withdrawals from the reservoir. Rather, the Contract provides CCMWA the right to utilize 13,140 acre-feet of storage space in the reservoir." *See* Letter from Col. Steven Roemhildt, USACE, to Glenn Page, CCMWA (Sept. 11, 2012) at 1 (emphasis added).[3]

In essence, CCMWA has purchased a bucket from the Army, and CCMWA is entitled to store such water in the bucket as may be allocated to it by the State of Georgia. The quantity of water that CCMWA can withdraw from the bucket depends upon (1) the permit issued to it by the State of Georgia; and (2) the availability of water in the bucket. The quantity of water in the bucket at any given point in time depends upon the timing and quantity of inflows in relation to the timing and quantity of withdrawals. It is the function of the storage accounting spreadsheet described in the Appendix to record these variables and to track the balance.[4]

When all of this is taken into account, as it must be, it is unclear whether CCMWA requires additional storage in Allatoona to support its existing water supply operations. The draft documents provide no indication one way or the other.

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[2] The Draft EIS states that the no action alternative, or "baseline," is "based on the amount of storage currently under contract," and that it "assume[s] that contract amounts establish limits or caps on the amount of water that can be withdrawn for water supply purposes." Draft EIS at 1-42.

[3] The contract was executed in 1963 and will soon be extended to provide permanent rights to storage in accordance with Pub. L. 88-140. *See* Letter from Col. Steven Roemhildt, USACE, to G. Page, CCMWA (Nov. 20, 2012).

[4] Draft Manual, Appendix A at 8-5.

2. Actual Withdrawals and Returns by CCMWA

Although 34.5 mgd is a not a meaningful threshold, it should be noted that CCMWA's average annual gross water withdrawal from Allatoona Lake has exceeded that number every year since 2000. The greatest single annual average withdrawal was 50.3 mgd and occurred in 2000. The lowest average withdrawal since 2000 was 34.52 mgd; this occurred in 2012, when plant production capacity was curtailed because of a major construction project.

Approximately one-third of the water withdrawn is returned to the reservoir from two wastewater treatment plants operated by Cobb County, one of the principal wholesale customers of CCMWA. As a result, the average annual net withdrawal by CCMWA has rarely exceeded 34.5 mgd.

3. Existing Demands Supplied by CCMWA

The water withdrawn by CCMWA is currently used to serve existing homes and businesses. Because these customers already exist, some action will have to be taken to meet their needs if withdrawals from Allatoona Lake are curtailed. If the Army is unable or unwilling to do anything, the State of Georgia and CCMWA will have no choice but to respond by building additional storage projects within the ACT basin to fill the gap.

Through an aggressive water conservation program, per capita usage within CCMWA's service area was reduced by more than 20% from 2001 to 2010. Especially with the economy rebounding, further reductions in the gross withdrawal by CCMWA would likely cause severe service limitations and disruptions to CCMWA and its customers.

4. Hickory Log Creek Reservoir

Another current condition of the ACT Basin is the existence of the Hickory Log Creek Reservoir ("HLCR"), a completed reservoir project the Manual and the EIS ignore in the evaluation of alternatives.

HLCR is an off-stream pumped-storage project located on a tributary of the Etowah River upstream of Allatoona. CCMWA partnered with the City of Canton to construct this project, which was completed in 2008 and is expected to yield 44 mgd. Georgia EPD has allocated 3/4 of the total yield (33 mgd) to CCMWA and 1/4 (11 mgd) to Canton.

The project was not designed to have a water treatment plant drawing directly from it. Instead, the concept is to store water in HLCR and to utilize the Etowah River to deliver this water to existing treatment facilities owned by the City of Canton and by CCMWA. Water is piped from storage in HLCR to the Etowah River, where it flows to the existing withdrawal and treatment facilities operated by the City of Canton (in the Etowah River) and CCMWA (in Allatoona Lake). The State of Georgia has approved this concept and has issued a permit stating that water released from storage in HLCR can be used only to provide water supply to Canton and CCMWA customers.

Although the project is fully constructed, the Army has been unable or unwilling to amend its storage accounting spreadsheet to provide a credit to CCMWA for water delivered to Allatoona from HLCR. CCMWA submitted a formal proposal detailing the required changes to

the storage accounting spreadsheet on August 26, 2010.[5] The Mobile District informed CCMWA in a letter dated September 11, 2012 that the Assistant Secretary of the Army "intends to address these storage accounting concepts as part of a broader, national review of water supply policies."[6] No further action has been taken, however, and there is no indication that the promised review has even commenced.

If the Army refuses to credit CCMWA for water delivered to Allatoona from Hickory Log Creek Reservoir, CCMWA will have no alternative but to construct new facilities to withdraw the water from the Etowah River and pipe it to the existing treatment facilities at Allatoona Lake. The end result will be the same—as CCMWA will remove 33 mgd from the system either way. The only difference between these two scenarios is that CCMWA may be forced to spend substantial sums (approximately $100 million) to construct a new pumping station and pipeline to replace the natural conduit provided by the Etowah River.

The Proposed Storage Accounting Spreadsheet Deprives CCMWA of Water Allocated to it by the State of Georgia.

The Draft Manual states the following formula will be used to track the balance in each user's account:

Account Balance =
Ending Storage - Beginning Storage + Inflow Share - Loss Share - User's Usage.

Draft Manual at 7-8 & Appendix A at 8-5.

If implemented, this formula would deprive CCMWA of a state law property right because it denies CCMWA credit for water that has been allocated to it by the State of Georgia—specifically return flows and water delivered to Allatoona from HLCR. It is the State of Georgia, and not the Corps, that has sole jurisdiction to allocate water rights—and the State of Georgia has determined that these flows should be credited to CCMWA. A decision by the Army to reject the State's allocation of this water to CCMWA would be the same as a bank deciding to credit one user's deposit to another user's account.

As explained by the General Counsel of the Army Corps of Engineers in a June 2012 memorandum to the United States Court of Appeals for the Eleventh Circuit, the Army's general practice has been to treat all inflow the same and to apportion it among users based on the size of each user's account.[7] Notwithstanding its protestations to the contrary, the effect of this practice is to equate storage rights with water rights: it assumes that a contract for 75% of the storage in a reservoir also conveys a right to impound 75% of the inflow. As stated above, the State of Georgia has rejected this approach and instead has determined that return flows and deliveries from HLCR should be allocated 100% to CCMWA.

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[5] *See* Letter from Glenn Page, CCMWA, to Col. Steven Roemhildt, USACE, re Hickory Log Creek Reservoir — Special Condition #15 (Aug. 26, 2010).

[6] *See* Letter from Col. Steven Roemhildt, USACE, to Glenn Page (Sept. 11, 2012).

[7] *See* Memorandum for the Chief of Engineers dated June 25, 2012 re Authority to Provide Municipal and Industrial Water Supply from Buford Dam /Lake Lanier Project, Georgia at 37.

To the extent relevant, note that Georgia's allocation of return flows and HLCR deliveries to CCMWA will not have any effect on the yield of Allatoona Lake or its ability to serve other authorized purposes. In the case of return flows, the discharge actually *increases* the yield beyond what the reservoir would naturally produce. The sole effect of the State's allocation is to assign this benefit to the entity responsible for producing it, whereas the effect of the Army's allocation would be to commandeer this additional water to benefit other users. The same is true with respect to HLCR. Because the State has already authorized CCMWA to withdraw 33 mgd, the only question is whether CCMWA can deliver the water to Allatoona Lake or whether it must construct new facilities to withdraw it from the Etowah River. The effect on Allatoona Lake will be the same either way.

The Storage Accounting Spreadsheet Also Includes Technical Errors

In addition to the legal errors described above, the Storage Accounting Spreadsheet also includes serious technical errors that must be fixed. These are outlined below and described more fully in previous correspondence.[8]

1. The Inflow Share Credited to CCMWA Should be 4.61% During the Summer and 13.39% During the Winter.

The concept utilized in the spreadsheet is that inflow should be divided *pro rata* based on the size of each storage account: if CCMWA holds 4.61% of the conservation storage, CCMWA gets 4.61% of the inflow. By this logic, the "Inflow Share" credited to CCMWA and the other water supply users should vary seasonally. Because CCMWA owns 4.61% of the summer pool and 13.39% of the winter pool, the Inflow Share credited to CCMWA should vary from 4.61% in the summer to 13.39% in the winter.[9] The spreadsheet currently allocates 4.61% to CCMWA at all times.

2. The Storage Accounting Spreadsheet Discriminates Against Water Supply Users by Giving Special Privileges to the Hydropower Account.

Another flaw in the storage accounting spreadsheet is that it does not handle "spill" correctly. Spill occurs when any account is full. Because the balance in each account depends in part on the amount that has been withdrawn, it is possible for one account to be full while others are empty.

There are four storage accounts altogether: the hydropower account and three water supply accounts. When any of the three water supply accounts fills up, the spreadsheet "spills" any addition inflow into the other accounts *pro rata*. The spreadsheet is not consistent, however,

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[8] *See* Letter from Glenn Page, CCMWA, to Col. Byron Jorns re Cobb County-Marietta Water Contract No. 01-076-CIVENG-64-116 (Nov. 19, 2007) with Exhibits A and B; Letter from Glenn Page, CCMWA to Col. Byron Jorns re Cobb County-Marietta Water Contract No. 01-076-CIVENG-64-116 (Dec. 5, 2007) with Exhibits C through G; and Letter from Glenn Page, CCMWA, to Col. Steven Roemhildt, USACE re letter of Sept. 11, 2012 (Oct. 22, 2012).

[9] CCMWA's storage account is fixed year-round at 13,140 acre-feet but conservation storage varies from 367,471 acre-feet in summer to 98,100 acre-feet in winter. Draft Manual at 3-3.

because the spreadsheet never allows the hydropower account to spill into the water supply accounts. Instead of redistributing water to the water supply account when the hydropower account is full, the spreadsheet allows hydropower to keep the surplus. In other words, the spreadsheet discriminates against water supply by capping the water supply accounts but not the hydropower account.

If all accounts were treated the same, as they must be, then the maximum that could be held in the hydropower account in winter (when the total conservation storage is 98,100 acre-feet) is 77,771 acre-feet of storage.[10] Whenever the volume of water in storage exceeds this amount, the excess can only be stored in the water supply accounts. It follows that all accounts must be full whenever Allatoona Lake is at or above its rule curve.

Another way to understand this problem is to observe that, because the sum of all the storage accounts equals total conservation storage, it is physically and mathematically impossible for conservation storage to be full while <u>*any*</u> storage account is less than full—and yet the spreadsheet allows this to happen.

<u>The "No Action Alternative" Does Not Comply with NEPA</u>

The errors and omissions described above constitute violations of the National Environmental Policy Act ("NEPA"), including the requirement to provide an accurate description of the "no action" alternative. *See* 40 C.F.R. §1502.14. Every EIS "*must* 'include the alternative of no action.' " *N.C. Wildlife Fed'n v. N.C. Dept. of Transp*., 677 F.3d 596, 602 (4th Cir. 2012). "Without [accurate baseline] data, an agency cannot carefully consider information about significant environment impacts." *See N. Plains Res. Council, Inc. v. Surface Transp. Bd*., 668 F.3d 1067, 1085 (9th Cir. 2011). This "mak[es] it impossible to accurately isolate and assess environmental impacts" of the proposed action. *N.C. Wildlife Fed'n*, 677 F.3d at 602.

It is especially important to identify the no action alternative here, because in this case the no action alternative may be the most damaging of all. "Where a choice of 'no action' by the agency would result in predictable actions by others, this consequence of the 'no action' alternative should be included in the analysis." Council on Envt'l Quality, *Memorandum to Agencies Containing Answers to 40 Most Asked Questions on NEPA Regulations*, 46 Fed. Reg. 18,026, 18,027 (Mar. 17, 1981). In this case, the consequence of a decision by the Corps to take no action to address current and future water supply demands would be to force CCMWA and/or the State of Georgia to address the resulting water supply shortages.

The actual impact will depend in part on whether the Corps intends to curtail existing withdrawals by CCMWA—a point on which neither the Draft Manual nor the Draft EIS is clear. If the Corps does intend to curtail existing withdrawals, this action would have significant and reasonably foreseeable effects. In the short-term, this would likely lead to drastic water shortages in the area served by CCMWA. In addition to the potential public health and safety impacts such a shortage would cause, this would likely lead to a moratorium on all new growth within the area served by CCMWA, and many existing homes and businesses will either be forced to relocate or to do without water. Further, emergency measures would need to be taken by CCMWA, its

[10] The rest belongs to water supply, as follows: 13,140 acre-feet to CCMWA, 6,371 acre-feet to Cartersville, and 818 to Chatsworth. Draft Manual at 7-8.

customers, and the State of Georgia to create new supplies to replace what is lost in Allatoona, including the construction of new water supply reservoirs. The environmental effects of such a course of action would be far more significant than the effect of allowing current usage to continue. None of these effects are considered in the EIS.

If the Corps' position is that no action will be taken to limit existing usage until final action is taken, the Corps must explain what it meant when it stated in the Draft EIS that "contract amounts establish limits or caps on the amount of water that can be withdrawn for water supply purposes." Draft EIS at 1-42.

If the Corps has not decided whether current withdrawals must be curtailed to comply with the contract, this too must be stated clearly. "Agencies violate NEPA when they fail to disclose that their analysis contains incomplete information." *N.C. Wildlife Fed'n v. N.C. Dept. of Transp*., 677 F. 3d 596, 603 (4th Cir. 2012). *See also N.M. ex rel. Richardson v. Bureau of Land Mgmt*., 565 F.3d 683, 708 (10th Cir.2009); *Native Ecosystems Council v. U.S. Forest Serv*., 418 F.3d 953, 964 (9th Cir. 2005); *Sierra Club v. U.S. Army Corps of Eng'rs*, 701 F.2d 1011, 1030 (2d Cir. 1983); *State Farm*, 463 U.S. 29, 43 (1983) (holding that an agency acts arbitrarily and capriciously when it fails to "examine the relevant data and articulate a satisfactory explanation for its action including a rational connection between the facts found and the choice made") (internal quotation marks omitted). Such required "up-front disclosures [include] relevant shortcomings in the data or models." *Lands Council v. Powell*, 395 F.3d 1019, 1032 (9th Cir. 2005); *see* 40 C.F.R. § 1502.22 (an agency "shall make clear" if there is "incomplete or unavailable information" in an environmental impact statement). Without this information, it is impossible to evaluate the social and environmental impacts of any alternative in comparison to the "no action" alternative.

The Alternatives Analysis Fails to Consider All Reasonable Alternatives to Address Current Water Supply Needs

Consistent with its decision to ignore current conditions relating to water supply, the Draft Manual and EIS also fail to consider reasonable alternatives to address current water supply needs. The alternatives analysis must "rigorously explore and objectively evaluate all reasonable alternatives," including "alternatives not within the jurisdiction of the lead agency," 50 C.F.R § 1502.14(a), (c).

Reasonable alternatives improperly excluded from analysis include but are not limited to the following: (1) taking action on the storage accounting issues described above to determine exactly how much water CCMWA can withdraw; (2) revising the storage accounting spreadsheet to honor the State's allocation of return flows and deliveries from HLCR to CCMWA; (3) to the extent CCMWA requires additional storage to meet current or future needs, taking action on outstanding reallocation requests by CCMWA and the State of Georgia to provide additional storage; (4) to the extent CCMWA requires additional storage to meet current or future needs, executing interim contracts to cover the need until a final decision is reached. All of these alternatives have been proposed by CCMWA and discussed extensively with the Corps prior to publishing the Draft EIS.

To the extent these alternatives were excluded "because no conceivable proposal exists that both states would support,"[11] this is not a valid justification for ignoring reasonable alternatives. It is wholly improper for the Army to give Alabama the power to veto Georgia's request.

Furthermore, Congressional authorization would not be required to pursue any of the alternatives noted above. The Corps is fully authorized by the Water Supply Act to allocate additional storage to water supply without further congressional authorization. The only limit on this authority is that the reallocation must not "significantly affect other project purposes" or require "major structural or operational changes."[12] A reallocation on the small scale needed to meet current and future water supply needs would not exceed these limits.[13]

But even if the Corps were worried that that Congressional authorization might be required for some or all alternatives, this would not justify excluding those alternatives from consideration. CEQ regulations expressly require that all reasonable alternatives be considered, including those not within the jurisdiction of the lead agency. The D.C. Circuit has explained that this duty extends to reasonable alternatives that exceed an agency's existing authority because an EIS "is not only for the exposition of the thinking of the agency, but also for the guidance of these ultimate decision-makers, and must provide them with the environmental effects of both the proposal and the alternatives, for their consideration along with the various other elements of the public interest." *Natural Res. Def. Council, Inc. v. Morton*, 458 F.2d 827, 835 (D.C. Cir. 1972). *See also* 46 Fed. Reg. at 18,027 ("An alternative that is outside the legal jurisdiction of the lead agency must still be analyzed in the EIS if it is reasonable. A potential conflict with local or federal law does not necessarily render an alternative unreasonable . . . . Alternatives that are outside the scope of what Congress has approved or funded must still be evaluated in the EIS if they are reasonable, because the EIS may serve as the basis for modifying the Congressional approval or funding in light of NEPA's goals and policies.").

The Cumulative Impact Study Fails to Consider All Reasonably Foreseeable Impacts during the Period While the Manual Will Govern Operations

The EIS also fails to address all reasonably foreseeable cumulative impacts of the proposed action. CEQ regulations state that an EIS must consider cumulative impacts on the environment. 40 C.F.R. § 1508.25(a)(1)-(3). *See also Kleppe v. Sierra Club*, 427 U.S. 390, 410 (1976). "A reasonable cumulative impacts analysis must to include" … "other actions—past, present, and reasonably foreseeable proposed—that have or are expected to have impacts in the same area"; "the impacts or expected impacts from these actions," and "the overall impact that can be expected if the individual impacts are allowed to accumulate.' " *Ga. River Network v. U.S. Army Corps of Eng'rs*, 334 F. Supp. 2d 1329, (N.D. Ga. 2003) (quoting *Grand Canyon*

[11] Draft EIS at 1-7, lines 24-25.

[12] 43 U.S.C. §§ 390b(b), (d).

[13] The Corps has previously explained the technical and project-specific inquiry that is required to determine whether additional congressional authorization is required. *See* Memorandum for the Chief of Engineers dated June 25, 2012 re Authority to Provide Municipal and Industrial Water Supply from Buford Dam /Lake Lanier Project, Georgia at 46.

Trust v. F.A.A., 290 F.3d 339, 342 (D.C. Cir. 2002); *see also D'Olive Bay Restoration & Pres. Comm., Inc. v. U.S. Army Corps of Eng'rs*, 513 F. Supp. 2d 1261, 1292-93 (S. D. Ala. 2007).

The cumulative impacts analysis in the EIS is inadequate because it ignores all future developments in the ACT Basin—federal, state, and private. At a minimum, the cumulative impacts analysis must address current conditions as well as reasonably foreseeable future impacts during the life of the Manual, which will remain in effect until it is amended. Given that it has taken almost half a century to update the existing water control plan, and given that no schedule has been adopted to update the WCM to address future conditions, it must be assumed that the WCM will remain in effect for an extended period of time—ten to twenty years at a minimum. All reasonably foreseeable future actions within that timeframe must be considered, including but not limited to the following.

1. Georgia's Water Supply Request

Anticipated growth in water demand on the scale documented in the pending reallocation requests by CCMWA and Georgia must be included. This projected growth is a reality that must be addressed one way or the other in the EIS: either studying the impact of granting the pending reallocation requests and thus meeting the demand or by studying the impact of denying the request and thus forcing homes and businesses to relocate.

2. Hickory Log Creek Reservoir Project

HLCR must also be included. To the extent it is unclear whether the withdrawal will be taken from the Etowah River or from Allatoona Lake, this should be stated, but the authorized withdrawal of 44 mgd (33 mgd by CCMWA; 11 mgd by Canton) should be included in the model because it will be removed from the system either way.

3. Proposed change to Alabama Rule Curve

The new license conditions proposed by Alabama Power Company for its projects on the Coosa and Tallapoosa River must also be included. Among other significant changes, Alabama Power has proposed a significant reduction in seasonal flood storage at these projects. These changes are neither "remote" nor "speculative"; they are included in a license application that has already been approved by FERC staff and declared to be ready for action by the Committee.

Incorporation by Reference of Previous Comments

Finally, we request that the following documents be reconsidered and included in the Administrative Record for this proceeding:

- Letter from Glenn Page, CCMWA, to Col. Byron Jorns re Cobb County-Marietta Water Contract No. 01-076-CIVENG-64-116 (Nov. 19, 2007) with Exhibits A and B;
- Letter from Carol Couch, Georgia EPD, to Col. Byron Jorns re Cobb County-Marietta Water Contract No. 01-076-CIVENG-64-116;

- Letter from Glenn Page, CCMWA to Col. Byron Jorns re Cobb County-Marietta Water Contract No. 01-076-CIVENG-64-116 (Dec. 5, 2007) with Exhibits C through G.
- Letter from Glenn Page, CCMWA to Col. Byron Jorns re Hickory Log Creek Reservoir (Dec. 20, 2007);
- Letter from Glenn Page, CCMWA, to Col. Steven Roemhildt re Hickory Log Creek Reservoir — Special Condition #15 (Aug. 26, 2010) with Exhibits A through D;
- Letter from Steven Stockton, Dir. of Civil Works, to Glenn Page, CCMWA (Mar. 6, 2012);
- Letter from Col. Roemhildt, USACE, to Glenn Page, CCMWA (May 15, 2012);
- Letter from Glenn Page, CCMWA, to Col. Roemhildt, USACE (June 22, 2012);
- Memorandum for the Chief of Engineers re Authority to Provide Municipal and Industrial Water Supply from the Buford Dam / Lake Lanier Project, Georgia (June 25, 2012);
- Letter from Col. Roemhildt, USACE, to Glenn Page (Sept. 11, 2012);
- Letter from Col. Roemhildt, USACE, to Glenn Page (Sept. 21, 2012);
- Letter from Glenn Page, CCMWA, to Col. Steven Roemhildt, USACE, re letter of Sept. 11, 2012;
- Letter from Glenn Page, CCMWA, to Col. Steven Roemhildt re Conversion of CCMW A Storage Contract (DA-01-076-CIVENG-64-116) to Reflect Permanent Right to Storage and Renewal of Easement (EASEMENT NO. DA-01-076-CIVENG-64-167) (Oct. 22, 2012) with Exhibits A through C;
- Letter from Col. Byron Jorns, USACE, to Glenn Page (Nov. 2, 2007);
- Letter from Steven Roemhildt, USACE, to Glenn Page, CCMWA (Nov. 20, 2012);
- Letter from Steven Roemhildt, USACE, to Glenn Page, CCMWA (Nov. 20, 2012);
- Letter from Nathan Deal, Gov. of Georgia, to Hon. Jo-Ellen Darcy, Asst. Secretary of the Army for Civil Works re Lake Allatoona-Request for Final Agency Action (Jan. 24, 2013) with Affidavit of Judson H. Turner and all attachments.
- Letter from Jo-Ellen Darcy, Asst. Secretary of the Army, to Hon. Nathan Deal, Gov. of Georgia (Apr. 29, 2013).

We have not attached copies of these documents because you should have them already, but please do not hesitate to ask if you cannot locate them.

CONCLUSION

In summary, the storage accounting formula must be fixed to address the legal and technical errors addressed above and the Manual and EIS must be revised to include alternatives to address current and future water supply needs. The Manual and EIS should also be revised to include a cumulative impacts analysis covering reasonably foreseeable impacts within the ACT Basin during the life of the manual.

Please do not hesitate to call if you require any additional information or if we can assist you in anyway.

Respectfully yours,

Glenn M. Page, P.E.
General Manager
Cobb County-Marietta Water Authority

Katherine H. Zitsch, PE, BCEE
Manager, Natural Resources Division
Atlanta Regional Commission

From:	Cristal Sailors
To:	ACT-WCM
Cc:	tsilliman@mckennalong.com; Jud Turner; Wei Zeng; Napoleon Caldwell
Subject:	Comments of the State of Georgia, Draft EIS Update Water Control Manual
Date:	Friday, May 31, 2013 4:49:41 PM
Attachments:	20130531153655.pdf

Please see the attached.

Thanks,

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May 31, 2013

BY ELECTRONIC MAIL AND U.S. MAIL

Colonel Steven J. Roemhildt, Commander
U.S. Army Corps of Engineers, Mobile District
Attn: PD-EI (ACT-DEIS)
P.O. Box 2288
Mobile, AL 36628

Re: Draft Environmental Impact Statement for Update of the Water Control Manual for the Alabama-Coosa-Tallapoosa River Basin Environmental Impact Statement
Comments of the State of Georgia

Dear Colonel Roemhildt:

In response to the Federal Register Notice of March 8, 2013 (78 Fed. Reg. 15,007), the State of Georgia submits the following comments regarding the U.S. Army Corps of Engineers' ("Corps") Draft Environmental Impact Statement ("DEIS") on the potential environmental impacts associated with the Corps' update of the water control manual ("WCM") for the Alabama-Coosa-Tallapoosa ("ACT") River Basin.

I. Introduction

As noted in the State of Georgia's October 20, 2008 comments regarding the Scoping Process for the ACT WCM, Georgia has a significant interest in the Corps' management of water resources within the ACT Basin. The headwaters of both the Coosa River Basin and the Tallapoosa River Basin are within the State. In addition, the Corps' two primary storage reservoirs in the ACT River Basin—Lake Allatoona and Carters Lake—are located in Georgia. Georgia relies upon both reservoirs for municipal and industrial water supply, recreation, support of water quality, and fish and wildlife habitat. More than 915,000 Georgians rely upon water supply withdrawals from Lake Allatoona alone. Several Georgia communities also rely on the Tallapoosa River and its tributaries to meet municipal and industrial water supply needs.

The State of Georgia submits these comments regarding deficiencies in the DEIS and WCM. The DEIS fails to assess current or future water supply demand and usage. The DEIS also fails to consider changes that Alabama Power Company ("APC") has proposed to flood control operations at APC's projects in the ACT Basin. These issues, as well as other concerns, are discussed in greater detail below.

II. Regulatory Requirements for Environmental Impact Statement and Water Control Manual

The National Environmental Policy Act ("NEPA") requires federal agencies to develop an Environmental Impact Statement ("EIS") before undertaking any major federal action "significantly affecting the quality of the human environment." 42 U.S.C. § 4332. Council on Environmental Quality ("CEQ") regulations establish parameters for analysis to be undertaken in an EIS.

The purpose of an EIS is to the "provide full and fair discussion of significant environmental impacts" and "inform decisionmakers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment." 40 C.F.R. § 1502.1. To comply with NEPA, an agency must "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves conflicts concerning alternative uses of available resources." 40 C.F.R. § 1501.2(c). Proposals that are related to each other should be evaluated as part of a single EIS. 40 C.F.R. § 1502.4. The EIS is to be used to evaluate potential actions before a decision is made, not to justify a decision that an agency has already made. 40 C.F.R. § 1502.5. The Corps must integrate its NEPA evaluation into its decision-making process at the earliest possible time. 40 C.F.R. § 1501.2.

The heart of any EIS is the consideration and analysis of alternatives. 40 C.F.R. § 1502.14. The EIS must rigorously "explore and objectively evaluate all reasonable alternatives." 40 C.F.R. § 1502.14(a). One such alternative that the agency must consider is the no action alternative. 40 C.F.R. § 1502.14(d). The no action alternative is the alternative that represents the *de facto* status quo with regard to agency action. *See Center for Biological Diversity v. United States Dept. of Interior*, 623 F.3d 633, 642 (9th Cir. 2010) ("A no action alternative in an EIS allows policymakers and the public to compare the environmental consequences of the status quo to the consequences of the proposed action."); *Custer County Action Ass'n v. Garvey,* 356 F.3d 1024, 1040 (10th Cir. 2001) (finding that the no action alternative must represent the "known impacts of maintaining the status quo," even if the agency's current actions might exceed its authority); Council on Environmental Quality, *Memorandum to Agencies Containing Answers to 40 Most Asked Questions on NEPA Regulations*, 46 Fed. Reg. 18,026, 18,027 (March 17, 1981) ("the regulations require the analysis of the no action alternative even if the agency is under a court order or legislative command to act. This analysis provides a benchmark, enabling decisionmakers to compare the magnitude of environmental effects of the action alternatives."). The agency also must consider reasonable alternatives, including those that are outside its jurisdiction. 40 C.F.R. § 1502.14(c).

The Corps must consider the cumulative impact of the no action alternative and other reasonable alternatives. "Cumulative impact" is defined to include the effects not only of the agency's actions but the actions of third parties that will result from the agency's actions or failure to act:

> Cumulative impact is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless

> of what agency (Federal or non-Federal) or person undertakes such other actions.

40 C.F.R. § 1508.7.

Environmental consequences are the "scientific and analytic basis for consideration of alternatives." 40 C.F.R. § 1502.16. Consequences to be considered include direct and indirect effects, and possible conflicts with state plans and polices. 40 C.F.R. § 1502.16(c). Effects to be considered include economic, ecological, aesthetic, historic, cultural, social, and health, whether direct, indirect, or cumulative. 40 C.F.R. § 1508.8. When economic and sociological effects are interrelated with environmental effects, then all of these effects on the human environment are to be studied. 40 C.F.R. § 1508.14.

III. The Corps' Analysis of Current Water Supply Needs and Water Supply Alternatives

Nearly a million residents of the State of Georgia rely upon withdrawals from Lake Allatoona to meet a wide range of municipal and industrial water supply needs. The State of Georgia expects these needs to increase in the foreseeable future as the State's population, particularly in the Atlanta metro area, continues to grow.

To address Georgia's future water supply needs, on January 29, 2013, Georgia Governor Nathan Deal submitted to the Assistant Secretary of the Army for Civil Works a formal request that the Corps manage the resources of Lake Allatoona to meet the projected water supply needs for water stored in Lake Allatoona (the "Allatoona Water Supply Request"). Governor Deal requested that the Corps (1) allow gross municipal and industrial water withdrawals from Lake Allatoona to increase to between 123.9 and 147.9 million gallons per day (MGD) annual average to meet 2040 demands; (2) allow the Cobb County-Marietta Water Authority ("CCMWA") to withdraw from its existing intake in Lake Allatoona water that is released from the Hickory Log Creek Reservoir specifically for CCMWA, without requiring CCMWA to acquire additional storage space for such withdrawals; (3) in determining the amount of water that may be withdrawn without exhausting the storage that a water supply user has purchased, credit to that user exclusively all returns of treated wastewater that the Georgia EPD has permitted and allocated to that user for withdrawal; and (4) enter into contracts that document the parties' understanding as to how the Corps will operate in support of Georgia's water supply needs.

On April 29, 2013, the Assistant Secretary issued a response to Governor Deal's request. The Assistant Secretary's letter states that the Allatoona Water Supply Request "will require additional evaluation," and that "the Corps is unable at this time to make a final decision on any of the aforementioned requests." The letter also says that "the Corps is not in a position to take final action on any of those issues prior to the completion of the updated ACT water control manual in fall 2103."

The letter states, therefore, that the "water control manual update only addresses the operational aspects of the federal reservoirs and the Alabama Power Company reservoirs that are incorporated for flood control and navigation into the federal system, taking into account congressional authorizations, current law, and current conditions affecting the system operations." It also says that the Corps is reviewing its policy for crediting of return flows and other storage accounting issues that Georgia has raised, that the WCM update "will not foreclose resolution or dictate the outcome" of Georgia's Allatoona Water Supply Request, and that the Corps intends to further revise the WCM as necessary after making a decision on the Water Supply Request.

The Assistant Secretary's letter appears to have helped clarify the Corps' intent in developing the WCM. That is, it appears to be the position of the Corps that it has not made a determination whether to credit return flows exclusively to CCMWA or other water supply users as directed under an allocation by the State of Georgia, whether to credit exclusively to CCMWA releases of stored water from Hickory Log Creek Reservoir, or how to address other storage accounting issues that the State of Georgia and CCMWA have raised. Therefore, the Corps has not made a final determination on how much water the storage space of CCMWA and Cartersville will produce at any given time, or whether CCMWA and Cartersville need additional storage to accommodate their current levels of water use. The Corps will need to make those findings before it can determine the amount of additional storage that may be needed to accommodate future water supply demands and decide whether to allocate such storage to water supply.

Assuming the WCM is not intended as a decision as to water supply, and therefore is intended only to continue the status quo with regard to Corps action pending a separate determination on water supply, the Corps should clarify that and should revise the DEIS to study that scenario. Contrary to what it suggests, the DEIS does not consider the "current conditions affecting system operations" at Lake Allatoona. The DEIS states that "[y]ear 2006 represented the greatest annual amount" of water use in the basin through the 1939-2008 simulation period and that, therefore, the "2006 net withdrawals are modeled as diversions." DEIS Appendix C, p. 31. The DEIS does not, however, use 2006 withdrawals, or any other figure that roughly approximates current levels of water supply use, at Lake Allatoona. Instead, the Corps assumes that water supply withdrawals from Lake Allatoona will be 34.5 MGD for CCMWA and 16.76 MGD for the City of Cartersville for each and every month of the year. These numbers are not accurate approximations of current water use in at least two ways: they are considerably less than current levels of withdrawal; and, in reality, withdrawals vary by month and season.[1] In 2006, for example, CCMWA's gross withdrawals from Lake Allatoona varied from 33.5 MGD in January to 62.9 MGD in June, and the annual average withdrawal was well above 34.5 MGD. CCMWA's gross withdrawals on an annual basis have been reduced since 2006 but remain well above 34.5 MGD

[1] In addition, although the DEIS notes a number of potential water projects within the ACT Basin, the DEIS fails to address the Hickory Log Creek Reservoir or include the reservoir's operations in modeling flows in the Basin. The Corps' failure to model operations related to the Hickory Log Creek Reservoir is another example of the DEIS's failure to address current conditions.

nearly every month. CCMWA's net withdrawals, by contrast, have been below 34.5 MGD in nearly every month.

The HEC-ResSim model that the Corps uses to evaluate impacts in the DEIS fails to accurately account not only for actual withdrawals from the Allatoona reach, it also fails to account for return flows of treated wastewater discharged directly into Lake Allatoona or indirectly back to the Lake via upstream tributaries. These return flows result in a discharge to the ACT Basin system of more than 20 MGD on an annual average basis. In addition, as is the case for system withdrawals, these return flows are seasonally variable. Because returns are a part of current operations at Lake Allatoona, the Corps should adjust its model to reflect this reality.

The Corps does not offer a rational basis for choosing the amounts it has assumed for current water supply withdrawals from Lake Allatoona. It appears that the amounts the Corps has assigned for water withdrawal correspond to an estimate of the critical yield from CCMWA's and Cartersville's storage space. This is inappropriate for multiple reasons. For one, even if the amounts of water that the storage accounts will produce were an appropriate estimation of current water use, the Corps has not properly calculated those withdrawal amounts. As the Corps is well aware, the amount of water that CCMWA's and Cartersville's storage accounts will produce at any given time is variable, and depends on, among other things, the amount of water entering the reservoir at any given time and storage accounting methodology. If numbers that the Corps has chosen approximate the water withdrawals available from CCMWA's and Cartersville's storage space in the critical period, they significantly underestimate the amount of water that CCMWA's and Cartersville's storage space will produce at other times.[2]

In addition, and more broadly, to the extent that the Corps intends the WCM to maintain the status quo pending a decision on the Allatoona Water Supply Request, the DEIS should utilize the best information for current withdrawals. Why the Corps may have chosen contracted-for storage levels (incorrectly calculated, as noted above) as a proxy for current water use is not clear. Some indication of the Corps' rationale may be contained in the Corps' response to a comment made during the scoping process. Comment BC6 states, "The baseline should be based on the amount of storage currently under contract and should assume that the contract amounts establish limits or caps on the amount of water that can be withdrawn for water supply purposes." DEIS p. 1-42, lines 11-13. Comment BC7 states, "The baseline should not assume that the current practice of allowing water withdrawals in excess of contract amounts by the CCMWA will be continued in the future." DEIS p. 1-42, lines 15-16. The Corps responds to both comments by stating, "The Corps agrees." DEIS p. 1-42. lines 14, 17.

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[2] On a related issue, as Georgia and CCMWA have previously suggested in comments to the Corps, the Corps, in its storage accounting should credit return flows exclusively to the storage account of water users to whom Georgia has allocated those return flows.

Not only are Comments BC6 and BC7 incorrect to the extent that they imply that CCMWA or Cartersville has overdrawn its storage account—that determination has not been made, as noted above—they also reflect a misunderstanding of the Corps' obligations under NEPA. An EIS must include an analysis of the no action alternative. The no action alternative represents the effect of the agency continuing to act, or not act, as it has been doing. Therefore, to analyze the no action alternative, the Corps must consider the effect of continuing to allow the current level of water supply withdrawals as they have occurred at Lake Allatoona, even if the Corps were to determine that current withdrawals exceed contracted-for amounts, and even if the Corps were required by law to restrict withdrawing parties to their contracted-for amounts (which it is not). *See supra* p. 3. By not assuming current levels of withdrawal, the DEIS does not include the correct no action alternative and therefore is fatally flawed.

If it desires to consider a reduction in water supply withdrawals to 34.5 MGD for CCMWA and 16.76 MGD for Cartersville as an action alternative, which Georgia submits is not a reasonable alternative, and therefore not worthy of consideration, the Corps at least would have to analyze the effects of this reduction. The cumulative effects of a reduction in water withdrawals from Lake Allatoona to those levels would include short-to-long-term water shortages, and the need for the State or other third parties to develop alternative supplies (dams and reservoirs in the ACT Basin, interbasin transfers from outside the basin, etc.). The DEIS does not address the environmental, human health, or economic effects of water shortages and new water resource projects in its cumulative effects analysis.

The Corps also fails to consider increased water supply withdrawals from Lake Allatoona as an action alternative. The Corps suggests that it has chosen this approach because Georgia's Allatoona Water Supply Request is under consideration and apparently will be addressed in a separate decision, ostensibly with another EIS.[3] Georgia will not prejudge that process, but Georgia points out that its future water supply need is reasonably foreseeable; therefore, the current EIS should at least consider it as an alternative, even if the Corps is not yet prepared to make such an increase the proposed action. In addition, because the Corps is authorized by the Water Supply Act of 1958 to allocate additional storage to water supply, water supply is a fully authorized purpose of Lake Allatoona. Without considering future levels of supply, the EIS has not rigorously explored and objectively evaluated all reasonable alternatives, contrary to 40 C.F.R. § 1502.14(a). Nor will the Corps have incorporated the NEPA evaluation into its decision-making process at the earliest

[3] The Corps also states, with regard to reallocation for water supply, that the Corps desires to remain neutral, and "no conceivable proposal exists that both states would support." DEIS p. 1-7, lines 24-25. While Georgia agrees that the Corps should remain neutral in the dispute between the States, taking no action ultimately with regard to reallocation would not be "neutral." The neutral and appropriate course is instead for the Corps to consider any request or need for reallocation on the merits, in accordance with applicable regulations.

possible time, contrary to 40 C.F.R. § 1501.2, or combined related actions in a single EIS, contrary to 40 C.F.R. § 1502.4.

IV. The DEIS Does Not Assess Alabama Power Company's Proposed Operations

The DEIS does not analyze the effects of rule curve changes that APC has proposed in the ongoing Federal Energy Regulatory Commission ("FERC") relicensing process for the Coosa River Project. In addition, the DEIS does not analyze changes that APC has proposed in the FERC relicensing process for the Lake Martin Project.

For Lake Weiss, APC proposes to raise the winter guide curve by 3 feet from elevation 558 feet to 561 feet from December 1 through March 1. There would be a constant rise in the lake elevation until reaching the normal elevation of 564 feet on May 1. The summer guide curve would be extended from August 31 to September 30. *See* DEIS p. 2-36, lines 3-11. For Logan Martin Lake, APC has proposed to raise the winter pool by 2 feet, from the existing winter elevation of 460 feet to 462 feet. From January 1 to April 14, the pool would be at 462 feet. Beginning on April 15, lake levels would gradually increase to the normal summer pool elevation of 465 feet. On October 1, the water elevation would begin to fall to the winter pool elevation of 462 feet by January 1. *See* DEIS p. 2-39, lines 29-33.

Despite acknowledging that both proposals "could have some adverse effects on the flood risk management function" on the respective projects and stating that the "Corps has not concurred with the APC proposal to FERC," the Corps elected not to consider these adverse effects as part of the DEIS. DEIS p. 2-36, lines 7-11; p. 2-39, lines 33-38. Instead, the DEIS states that before "implementing the proposed increase in the winter pool elevation, additional analysis (and NEPA documentation) would be required to allow revisions to the ACT manual beyond those considered in this EIS." *Id.*

The Corps' failure to consider APC's proposed rule curve changes violates the Corps' obligation to consider cumulative impacts under NEPA. In a response to a comment that the "Corps should conduct an analysis of cumulative effects of FERC relicensing process of eight APC dams in the ACT Basin," the Corps responds that the "environmental effects of the operations of the APC projects under the proposed FERC license are documented in Final Environmental Assessment (EA) for Hydropower License Coosa River Hydroelectric Project-FERC Project No. 2146-111 Alabama and Georgia, December 2009." ("FERC Coosa EA"). DEIS p. 1-38, lines 8-13.

The FERC Coosa EA does not, however, relieve the Corps of its obligations under NEPA regarding the ACT WCM. The proposed rule curve changes are "reasonably foreseeable future actions" that the Corps must consider as part of the NEPA process. The DEIS itself acknowledges that "additional analysis (and NEPA documentation) would be required" for the proposed rule curve changes. This statement is inconsistent with the Corps' position that the FERC Coosa EA has already addressed any potential environmental concerns regarding APC's operations. In addition, the analysis in the FERC Coosa EA is insufficient to meet the requirements of the EIS that the Corps is to develop for the ACT WCM. Finally, neither the FERC Coosa EA nor the DEIS address APC's

proposed changes for the Lake Martin Project. Therefore, the Final EIS for the ACT WCM must adequately consider the cumulative effects of the proposed changes to the APC projects in the ACT Basin.

V. General and Technical Comments

There are a number of other issues related to the DEIS, the Master ACT WCM and the individual project WCMs that the Corps must address prior to issuing the final documents:

A. General Comments

1. Clarity of Peaking Power Generation Requirements

Although the State of Georgia understands and appreciates the need for flexibility in the Corps' hydropower operations, the Corps' decisions as to how it plans to operate at Lake Allatoona in the proposed Zone 3 and during the winter drawdown period should be clarified so as to prevent confusion in the future. For Zone 3, the Corps' WCM for Allatoona provides that peaking power generation will be limited to between 0 and 2 hours per day when the Lake is in Zone 3. The Corps' HEC-ResSim model, however, provides that peaking power will be scheduled at 2 hours in the top 20% storage of Zone 3, 1 hour for the next 70% of Zone 3, and 0 hours when the Lake is in the lowest 10% of Zone 3. While Georgia does not wish to limit the Corps' flexibility in operations, when modeling the impact of the proposed operations on Lake Allatoona, the Corps may need to provide a range of possible outcomes.

2. Apparent Errors in Low Basin Inflow Guide

The values presented for the Low Basin Inflow Guide used in the Drought Contingency Plan in various locations, including Table 4.2-4 in the DEIS, Table 8 in the ACT Master WCM, and Table 7-7 in the Allatoona WCM do not appear to be accurate. Because the amount of storage at the turn of the year is the same, the positive and negative filling volume in the fall should aggregate to zero. That is not the case for the current numbers in the Corps documents.

Georgia EPD has independently calculated the storage change and believe the numbers to be as follows:

Month	Coosa Filling Volume	Tallapoosa Filling Volume	Total Filling Volume	7Q10 Flow	Required Basin Inflow
January	514	0	514	4640	5154
February	587	1800	2387	4640	7027

March	655	2955	3610	4640	8250
April	1734	2311	4045	4640	8685
May	316	46	361	4640	5001
June	0	0	0	4640	4640
July	0	0	0	4640	4640
August	0	0	0	4640	4640
September	-691	-918	-1608	4640	3032
October	-1396	-2103	-3499	4640	1141
November	-912	-2748	-3660	4640	980
December	-746	-1212	-1958	4640	2682

B. Draft Environmental Impact Statement (DEIS)

1. Page ES-28, Figure ES-6 and Lines 8-9 – Figure ES-6 states that hydropower generation is to be reduced in the months of September through November. Lines 8-9 state that "hydropower generation would be reduced during annual drawdown in the fall (September through October)." The Corps should correct this discrepancy.

2. Page 2-15, Line 17 – The word "that" after "being met less" should be changed to "than."

3. Page 2-21, Table 2.1-5, Figure 2.1-12 – Table 2.1-5 indicates that the conservation storage for Lake Martin is 49.3% of the total conservation storage in the ACT Basin. Figure 2.1-12 indicates that the conservation storage for Lake Martin is 48.7%. The Corps should correct this discrepancy.

4. Page 3-8, Line 26 – The DEIS incorrectly states that CCMWA's current contract for storage in Lake Allatoona expires in 2013. As the Corps is aware, CCMWA's storage contract provides that it expires (though CCMWA's entitlement to storage does not) 50 years after each particular storage space is placed into operation. Although CCMWA and the Corps entered into a storage contract for storage at Lake Allaoona in 1963, CCMWA did not begin using any of that storage until 1966. Therefore, CCMWA's storage contract does not expire until at least 2016. The Corps should make this correction in the Final EIS.

5. Pages 3-10 to 3-11 – The DEIS provides a discussion of the litigation history for the ACT and ACF River Basins. This discussion ends with negotiations between the states and the decision to update the ACT WCM in 2007. The Corps should update Section 3.1.10 of the EIS to indicate that all of Alabama's claims have been dismissed.

6. Page 4-3, Line 19 – "WMC" should be changed to "WCM."

7. Page 4-7, Figure 4.2-1 – Figure 4.2-1 is not consistent with Table 4.2-1 on page 4-8.

8. Page 5-5, Figure 5.1-3 – The drought curve in Figure 5.1-3 is different from the drought curve used in the HEC-ResSim model.

C. ACT Master Water Control Manual

1. Page 1-3, Table 1-1 – The conservation storage values listed in Table 1-1 for many of the reservoir projects in the ACT Basin are inconsistent with the conservation storage values used in the HEC-ResSim model. The following table provides a comparison:

Project	Conservation storage listed in manual (acre-feet)	Conservation storage in HEC-ResSim model (acre-feet)
Carters	141,402	141,402
Allatoona	284,580	284,589
Weiss	237,448	261,025
H. Neely Henry	43,205	118,300
Logan Martin	108,262	141,876
Lay	77,478	92,348
Mitchell	28,048	48,821
Jordan	15,969	16,965
Harris	191,129	207,318

Martin	1,183,356	1,202,291
Yates	5,976	6,918

2. Page 7-11, Figure 7-3 – The project curves in Figure 7-3 are not consistent with the values in Table 7-1 on page 7-12.

3. Page 7-14, Table 7-3 – The values in Table 7-3 are not consistent with the numbers shown in Figure 7-5. The values for December appear to be incorrect.

4. Page E-C-28, Table 9 – To allow for independent verification by Basin stakeholders, the Corps should specify the methodology or technical tool used to calculate the 7Q10 flows at the Georgia/Alabama line.

5. Pages E-C-30 and E-C-31 – The contents of Figures 14 and 15 appear to be incorrect.

D. Allatoona Water Control Manual

1. Page 7-3, Table 7-2; Page 7-11, Line 36 – Table 7-2 provides a list of "typical" peaking generation hours. Other portions of the Manual, including page 7-11, line 36, refer to these same hours as "minimum" generation hours. The Manual should consistently indicate that the generation hours are "typical" but do not represent minimum required hours.

2. Pages 7-11 to 7-12, Line 27 – The Hydroelectric Power section (7-10) makes no reference to a reduction in peaking power generation during the transition to winter draw down (September through November) even though the DEIS and the HEC-ResSim model both anticipate reduced hydropower generation during that period. The Corps should modify both the Master and Allatoona WCMs to account for reduced hydropower generation during the winter draw down period.

3. Page 7-15, Lines 35-45 – The Allatoona WCM does not clearly define "Basin Inflow" for drought operations. As written, the term could be confused with the "Navigation Basin Inflow." Basin Inflow should be defined as all of the water entering Alabama Power's reservoirs downstream of Lake Weiss and the local incremental flow entering Lake Weiss that originates from the drainage area of Weiss downstream of both Lake Allatoona and the Carters Re-Regulation Dam.

4. Plate 2-5 – The elevation-storage values for Lake Allatoona shown in Plate 2-5 differ from those used in the HEC-ResSim model. The following table compares the elevation-storage values:

Pool Elevation (ft)	Total Storage in Manual (acre-feet)	Total Storage in Model (acre-feet)
780	37,861	37,851
800	82,891	82,884
802	89,655	89,647
806	104,887	104,879
808	113,451	113,447
810	122,711	122,709
812	132,715	132,705
814	143,511	143,514
816	155,135	155,137
818	167,619	167,612
820	180,993	181,000
822	195,279	195,280
824	210,493	210,492
826	226,651	226,656
828	243,769	243,772
830	261,863	261,860
832	280,994	280,940
834	301,040	301,031
836	322,145	322,154

838	344,281	344,288
840	367,471	367,473
842	391,741	391,749
844	417,136	417,136
846	443,718	443,713
848	471,558	471,559
850	500,731	500,734
852	531,323	531,317
854	563,431	563,427
856	597,165	597,164
858	632,553	632,646
860	670,047	670,052
870	804,000	804,006

E. H.N. Henry Water Control Manual

1. Page 7-9, Line 1, Table 7-4 – The values in Table 7-4 for the month of December appear to be incorrect because the values are the same as for the month of January.

2. Page 8-1, Lines 24-29 – The Corps uses the temporary winter rule curve elevation of 507 feet for the water resources analysis but uses an elevation of 505 feet for the flood risk analysis. The Corps should use the same elevation for both analyses.

3. Page 2-3, Line 27 – The WCM references Plate 2-13, which is not incorporated in the document.

4. Plate 7-1 – The WCM contains two plates that are both titled Plate 7-1. One plate uses the temporary rule curve of 507 to 508 feet. The other plate uses the existing curve of 505 to 508 feet. It is confusing to have two sets of rule curves under the same plate title. In addition, it is not clear which plate the Corps uses for its evaluation.

5. Pages E-F-20 and E-F-30 – The values in Figures 14 and 15 appear to be different from the values used in the HEC-ResSim model.

F. Millers Ferry Water Control Manual

1. Page 2-3, Table 2-1 – Table 2-1 lists the total storage at elevation 71 feet as 214,950 acre-feet. The HEC-ResSim model uses the value of 214,650 acre-feet.

G. Carters Water Control Manual

1. Plate 7-2 – The storage numbers shown in Plate 7-2 differ from the values used in the HEC-ResSim model as follows:

Pool Elevation (ft)	Total Storage in Manual (acre-feet)	Total Storage in Model (acre-feet)
850	40,500	40,000
900	71,000	70,000
1000	195,000	200,000

H. Harris Water Control Manual

1. Plate 2-2 – Plate 2-2 is for the Neely Henry project, not the Harris project.

2. Plate 2-20 – The storage numbers shown in Plate 2-20 differ from the values used in the HEC-ResSim model as follows:

Pool Elevation (ft)	Total Storage in Manual (acre-feet)	Total Storage in Model (acre-feet)
767	211,812	212,036
768	218,025	218,403
769	224,373	224,770
770	230,858	231,276

771	237,485	237,901
772	244,254	244,685
773	251,171	251,607
774	258,234	258,688
775	265,449	265,928
776	272,818	273,306
777	280,344	280,844
778	288,031	288,540
779	295,881	296,394
780	303,898	304,436
781	321,086	312,637
782	320,445	321,012
783	328,982	329,564
784	337,701	338,298
785	346,603	347,216
786	355,695	356,324
787	364,979	365,625
788	374,459	375,122
789	384,141	384,821
790	394,028	394,724
791	404,126	404,840
792	414,438	415,170

793	424,969	425,721
794	435,725	436,495
795	446,711	447,501
796	457,932	458,742

3. Page E-D-28 – The storage values shown in Table 14 and 15 appear to be incorrect.

VI. Conclusion

Please give the foregoing comments careful consideration in making necessary revisions to the WCM and the EIS for the ACT WCM. Please contact me if you have any questions or if I can be a resource for additional information that would assist you in this process.

Respectfully Submitted,

Judson H. Turner
Director
Georgia Environmental Protection Division