

## Transmittal Note

This document presents a revision of two chapters of *Georgia's Water Resources: A Blueprint for the Future*, submitted by EPD to the Water Council on June 28, 2007. The chapter titled "Draft Comprehensive Statewide Water Management Plan" has been revised following the direction provided by the Water Council at their August 23, 2007 meeting, and supercedes that chapter of the June 28 draft. The chapter titled "Implementation of Regional Planning" has been revised to be consistent with changes in the draft plan.

Following Water Council action on September 20, the Revised Draft Comprehensive Statewide Water Management Plan will be incorporated in *Georgia's Water Resources: A Blueprint for the Future*, and that revised document will be distributed for a second round of review and comment. Public hearings will be held in October and the Water Council will consider additional revisions in November.

Per the Water Council's direction, the following changes have been made in this revision:

- Formal rule language has been removed and implementation actions clarified;
- Revisions made in response to comments on on-site sewage management systems, land applications systems, and water conservation;
- Definitions have been refined and added;
- Language has been added to clarify applicability to the Metropolitan North Georgia Water Planning District; and
- Minor editing done for clarification and readability.

It should be noted that, during the public comment period on the June 28 draft, 230 individual comments from 49 respondents were received through the Water Council's website. Over 300 letters and emails were also received. The changes shown here address only a portion of those comments. The remainder will be addressed in the next revision, scheduled to go to the Water Council on November 2, 2007 following a second round of public review.

It should also be noted the June 28 document, *Georgia's Water Resources: A Blueprint for the Future*, presents an introduction to statewide water planning and an overview of Georgia's water resources. It may be useful to reference this information when the Revised Draft Comprehensive Statewide Water Management Plan presented here is reviewed.

# Revised Draft Comprehensive Statewide Water Management Plan

## Section 1: PURPOSE

### *Background*

Georgia's current approach to water management has evolved in a piecemeal fashion over several decades, mainly through reactions to federal legislative mandates and localized and immediate water issues such as droughts. However, as the population and economy of the state grow and the demands on our water resources increase, a comprehensive approach to water management will be necessary.

The purpose of this plan, as stated by O.C.G.A. §12-5-522(a), is to guide Georgia in managing 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. The plan lays out statewide policies, management practices, and guidance for regional planning. The provisions of this plan are intended to guide river basin and aquifer management plans and regional water planning efforts statewide in a manner consistent with O.C.G.A. §§12-5-522 and 12-5-570 et seq.

The plan employs concepts which are innovative for Georgia. The first is the use of thorough evaluation of resources, called Water Resource Assessments. We cannot effectively plan for and manage what we do not measure. Selecting the optimum water management strategies requires precise information about the capacities of our water resources. We must determine how much water we can consume from our major rivers, lakes, or aquifers without causing negative impacts; this amount of water is also called the sustainable yield. We also must determine the assimilative capacity, which is the amount of wastewater and stormwater streams can assimilate before water quality begins to degrade. EPD will begin the process of assessment by identifying the hydrologic boundaries of watersheds and aquifers to be used for assessment purposes. EPD will analyze existing information, and when that information is not sufficient, undertake enhanced monitoring.

The second new concept is the development of regional forecasts of water supply and assimilative capacity demands. These forecasts will be developed for planning regions that will be designed to reflect jurisdictional boundaries and economic interdependencies as well as hydrologic boundaries. Regional forecasts will be compared with the water resource assessments for each planning region so that areas that may face water challenges in the future can be identified. A package of management practices, tailored to local needs and resource

conditions, can then be selected to meet those challenges.

The third concept is the regional water development and conservation plans. These plans, which will be developed for all of the planning regions, will describe the water management practices to be employed in each area. Since water resources, their conditions, and their uses vary greatly across the state, selection and implementation of management practices on a regional and local level is the most effective way to ensure that current and future needs for water supply and assimilative capacity are met. The management practices specified in the water development and conservation plans for each region will be supported by statewide guidance.

All three of these water management concepts are supported by and consistent with current Georgia law. State law provides the foundation for development and implementation of a comprehensive statewide water management plan, and this plan is designed to be consistent with Georgia's current statutes. Most fundamentally, the regulated riparian legal doctrine and provisions regarding reasonable use will continue to guide water management in Georgia. Other provisions of our current management system will remain in place and the plan will not change priorities for water use, compel interbasin transfers, or favor one area of the state over another.

The plan builds upon Georgia's current statutory framework to create a more integrated water management policy consistent with the vision and guiding principles presented in the chapter introducing statewide water planning. Figure 1 depicts the overall approach to integrated water management laid out in this plan. The process is a cycle, rather than a one-time plan. Based on current state laws and policies, the cycle has four major steps that will be addressed in regional planning conducted following the provisions of this plan:

1. The cycle begins with completion of a set of water resource assessments by EPD. These assessments will define the capabilities of Georgia's water resources in terms of water supply and capacity to assimilate pollution.
2. A regional water planning council will then be responsible for using regional population and employment estimates to forecast needs for water and assimilative capacity within a water planning region.
3. A regional water development and conservation plan will be prepared by EPD or by regional water planning councils. The plan will identify the management practices to be employed to ensure that the forecasted regional water and wastewater needs can be met without exceeding the water quantity and water quality capacities identified in the resource assessments. In some situations, the regional water plan may identify management practices that will

supplement the resource capacities in a manner that conforms to policies and criteria presented in this plan. The regional water management plans will be reviewed by the EPD, and if they are consistent with established guidance, adopted by EPD.

- Once adopted, the plans would be implemented by the water users in the water planning region and EPD will make water permitting decisions based on the plans.

and regulations promulgated to date by the Board of Natural Resources. Other actions will require amendment of the rules and regulations promulgated by Board of Natural Resources. Each section generally contains a statement of policies followed by specific implementation steps.

**Guiding Policies**

- Georgia’s surface waters have assimilative and water supply capacities that govern their use for instream and offstream purposes. Georgia’s groundwaters have similar capacities that govern their use. Exceeding these capacities, or supplementing them in ways that foreclose opportunities for other users and uses, is likely to have detrimental effects on current and future users and on the health and well-being of Georgians and natural systems.
- Water uses, wastewater discharges and runoff in one water source affect the assimilative and water supply capacities of hydrologically connected water sources.
- “Water use” refers to the particular purposes or end uses for which water is employed in Georgia, whether instream, offstream or pumped from an aquifer. Water use includes human consumption, irrigation and other farm uses, industrial and commercial production, wastewater assimilation, recreation, hydropower, habitat maintenance and species protection, among others. “Water users” refers to those within Georgia using the water such as water utilities, homeowners, farmers, industries, and commercial businesses. Georgia’s water resources will be managed to support water uses related to both human needs and natural systems.
- Water quality and quantity and surface and groundwater are interrelated and require integrated planning as well as reasonable and efficient use.
- Water resources management must have a sound scientific foundation and recognize that economic prosperity and environmental quality are interdependent.
- Improving the information base for water management is critical to supporting current and future human use of water and the needs of natural systems. While the information base is being improved, management decisions must be based on the best information available at the time and on the laws, rules, plans, and administrative procedures in place at the time. Water use and management, including decisions regarding water permits, will proceed under these terms as resource assessments are conducted and regional water plans are developed.
- In order to support the state’s economy, protect public health and natural systems, and enhance citizens’ quality of life, Georgia must protect the ability of our water resources to meet needs for water supply and assimilation of wastewater.

Georgia Comprehensive Statewide Water Management Plan

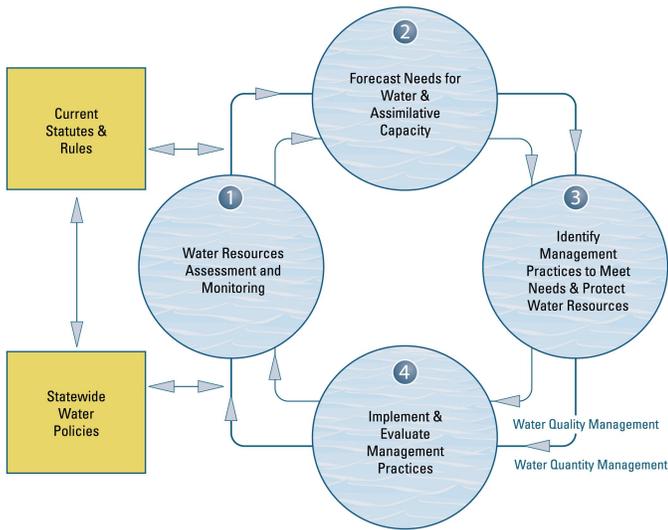


Figure 1

EPD, in cooperation with federal agencies, local governments, and other partners, will continue to monitor water resources to maintain and update information on the status and condition of the state’s waters. This information will support future revisions in resource assessments and management practices.

This plan lays out the basic framework for the management cycle depicted in Figure 1. It has four major components:

- Integrated water policies that will govern water management decisions in the state;
- Provisions for assessment of the capacities of our water resources;
- A “toolbox” of water quantity and water quality management practices; and
- Provisions for regional planning to select the management practices that best fit the resource conditions and uses in different regions throughout the state.

The sections that follow describe each of these components in greater detail. A portion of the actions required to implement this plan can be taken by EPD within its current statutory authority and administrative procedures specified in the rules

## Section 2: DEFINITIONS

In the sections that follow, the terms defined below are highlighted in bold the first time they are used.

- 1) “Assimilative capacity” is the amount of contaminant load that can be discharged to a specific waterbody without exceeding water quality standards or criteria. Assimilative capacity is used to define the ability of a waterbody to naturally absorb and use a discharged substance without water quality becoming impaired or aquatic life being harmed.
- 2) “Basin” refers to the land area that drains to one of the 14 river basins that cover all or parts of Georgia's mainland landmass: the Altamaha, Chattahoochee, Coosa, Flint, Ochlockonee, Ocmulgee, Oconee, Ogeechee, Satilla, Savannah, St. Marys, Suwannee, Tallapoosa, and Tennessee river basins.
- 3) “Condition(s)” in permits means any limitation established by the Director on quantities, rates, or concentrations, or a combination thereof, of chemical, physical, biological, or other constituents which are discharged into the waters of the State.
- 4) Conservation-oriented rate structure: a rate structure adopted by a water utility or water provider this is designed to reflect the cost of providing water, send a price signal about the marginal cost of additional water, and encourage efficient use of water by customers.
- 5) “Consumptive use” is the difference between the amount of water withdrawn from a source and the amount of water returned to that water source.
- 6) “Consumptive use budget” is the water reliably available for consumption over a specified period of time from a water source in a dry year, beyond the quantities needed to meet in-aquifer needs or downstream flow regime requirements. Consumptive use budget amounts may be increased through either selected modifications of the source or supplementing the source.
- 7) “Director” is the Director of the Environmental Protection Division of the Department of Natural Resources.
- 8) “Division” means the Environmental Protection Division of the Department of Natural Resources.
- 9) “Dry year” means the time period of lowest precipitation and streamflow for which water supply and wastewater facilities are designed and operated.
- 10) “Excess capacity” means the amount of water supply available in a water supply reservoir over and above the water demand expected to be placed on the reservoir's storage and the storage dedicated to other purposes.
- 11) “Flow regime” is a description of the pattern of flow variability for an individual surface water source. Flow regime involves the magnitude, timing, duration, frequency and rate of water movement.
- 12) “Full yield” means the maximum amount of water that a reservoir can supply for a specific purpose during a specified time interval under a given set of assumptions related to drought and reliability, when that specific purpose is the only one for which the active storage is used.
- 13) “Future” means the time period over which one might reasonably forecast water uses and users.
- 14) “Green infrastructure” is an interconnected network of protected land, water, and other open spaces that supports native species, maintains natural ecological processes, sustains air and water resources, and contributes to the health and quality of life for Georgia’s communities and people. In the context of stormwater management, green infrastructure refers to those systems and practices that use or mimic natural processes to facilitate stormwater infiltration, evapotranspiration (the return of water to the atmosphere either through evaporation or by plants), or reuse on-site.
- 15) “Human use” refers to all ways in which water is employed for public health and human consumption.
- 16) “Hydrologically connected” means the process whereby defined surface areas and/or subsurface areas drain to common points or regions under natural conditions.
- 17) “Impervious surface” means any surface such as pavement, roofs, roadways or others surface material that water does not permeate.
- 18) “Instream uses” means all those human and ecological uses of water which occur within the banks of rivers and streams, including waste assimilation, hydropower production, recreation, maintenance of aquatic habitats, and support of biological integrity.
- 19) “Interbasin transfer” is a withdrawal or diversion of water from one river basin, followed by use and 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..
- 20) “Low impact development” is a comprehensive land planning and engineering design approach to stormwater management that attempts to mimic a site’s pre-development hydrology by using techniques that filter, store, and detain runoff close to its source and aid in infiltration and evaporation.
- 21) “Management practices” are reasonable methods, considering available technology and economic factors, for managing water demand, water supply, return of water to surface water sources, and prevention and control of pollution of the waters of the state.
- 22) “Natural systems” means the biological, ecological, and physical systems that arise and persist through mechanisms of nature as opposed to having been designed, constructed, and operated by mankind.
- 23) “Non-point source pollution” is diffuse contamination

- including sediment, litter, bacteria, pesticides, fertilizers, metals, oils, grease, industrial chemicals and other pollutants entering bodies of water. Non-point source pollution may be transmitted by stormwater runoff, precipitation, atmospheric deposition, drainage, and/or seepage. Stormwater itself may also detrimentally alter a stream's hydrology, flow rate, temperature, and other physical and biological characteristics.
- 24) "Offstream uses" means the purposes for which water is withdrawn from streams, rivers, lakes, or aquifers.
- 25) "On-site sewage management "system(s)" means 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.
- 26) "Permit holders" means those persons or entities that have been issued a signed permit by the Director to supply drinking water, withdraw surface or ground water, or discharge treated wastewater or stormwater.
- 27) "Point source pollution" is contamination that emanates from discharges of treated wastewater or stormwater regulated under the National Pollutant Discharge Elimination System (NPDES).
- 28) "Raw water interbasin transfer" is the transfer of untreated water from a site in a political jurisdiction of a donor river basin to a second political jurisdiction in a receiving river basin for treatment, use, and disposal in the receiving river basin."
- 29) "Reclaimed water" is wastewater that has received treatment to urban water reuse standards, meets the treatment criteria specified in 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.
- 30) "Reservoir" means a lake or pond that is designed, constructed, and operated for the purpose of storing water for some period of time.
- 31) "Septage" means the liquid or solid material removed from an on-site sewage management system, cesspool, portable toilet, type III marine sanitation device, or a similar system that receives only domestic sewage. Septage does not include liquid or solid material removed from an on-site sewage management system or similar treatment works that receives either commercial wastewater or industrial wastewater. Septage does not include grease removed from a grease trap.
- 32) "Stormwater" means stormwater runoff, snow melt runoff, and surface runoff and drainage.
- 33) "Sustainable" means use that can be continued with minimal long-term effect on the environment; use of a resource to meet the needs of the present without compromising the ability to meet the needs of the future.
- 34) "Sustainable yield" is the amount of water a source can supply for current and future consumption without causing unreasonable injury or detriment to other users, or without causing unacceptable alteration of the physical, biological, or chemical integrity of the water source. Sustainable yield can be increased through selected modification of the water source.
- 35) "Values and opportunities provided by historic flow patterns" means the beneficial uses to which the waters of a flow regime are put by humankind and nature, and the values and opportunities created by placing such flow regimes to these beneficial uses.
- 36) "Water conservation" is the beneficial reduction of water use, water waste, and water loss.
- 37) "Water Council" is the coordinating committee composed of 14 individuals, established by O.C.G.A. §12-5-524, representing the Georgia Legislature, State officials, and the public, whose responsibility it is to recommend a comprehensive statewide water management plan to the General Assembly
- 38) "Water permit" includes any permit administered or issued by the EPD related to water or watershed protection, including drinking water supply, surface or ground water withdrawal, wastewater discharge, and stormwater.
- 39) "Water planning region" is a geo/politically defined area that includes one or more water quantity and/or quality resources as defined by the Director
- 40) "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 cooling towers, concrete mixing, and car washes.
- 41) "Water resource" is a source of water that is useful or potentially useful for agricultural, industrial, household, recreational, or environmental activities.
- 42) "Water supply reservoir" is a lake or pond constructed and operated to store water primarily for the purposes of public water supply.
- 43) "Water use efficiency" generally addresses how efficiently water is used or the act of achieving a water use function with the minimal amount of water possible.
- 44) "Water use" means utilization of water for natural and anthropogenic purposes. See also human use, instream use and offstream use.
- 45) "Water users" means those who utilize water for anthropogenic purposes.
- 46) "Watershed" means the land area tributary to a given point

along a stream or river.

- 47) “Watershed permitting” is an approach to developing wastewater permits for multiple sources within a defined geographic area or watershed.

### Section 3: INTEGRATED WATER POLICY

#### Background

Throughout Georgia’s history, we have used the state’s **water resources** for a wide variety of **offstream** purposes. Rivers and streams have also served as receptacles for our wastewater. While these two types of **water use** are interrelated, the state has not consistently regulated water withdrawals and wastewater discharges in an integrated fashion. Historically, our regulatory decisions on the capability of sources to support water withdrawals have not always considered how those withdrawals may directly and indirectly affect water quality. Likewise, when making decisions about wastewater treatment practices, we have not always considered how such practices affect the **flow regimes** of streams. We often make decisions regarding the location of discharges of treated wastewater without considering whether the water will be returned to the same source from which it was withdrawn.

The disconnection between the regulation of water quantity and water quality is largely a result of disconnected water policies. Our water quality policies have historically been driven by federal legislative mandates and programs, while our water quantity policies have emanated from state legislation. However, water quality and quantity, and surface water and groundwater, are interrelated. The water management challenges Georgia will face as it continues along a path of vibrant economic and population growth in the decades ahead will require consistent integration of water policies.

This plan establishes an integrated water policy based on the premise that our water resources have certain capacities to provide water for offstream uses and to assimilate pollution, and that water withdrawals and returns can and do affect other **water users**. We must consider the full impacts of water management decisions, and employ **management practices** that can mitigate those impacts. For example, when a decision is made to use septic tanks as a water quality management practice, consideration must be given to the effect of that choice on water quantity downstream. Similarly, it is important to consider how increased water withdrawals may facilitate land use decisions that in turn cause significant increases in pollution.

Georgia’s water resources have certain capacities that govern their use. The integrated policy recognizes that exceeding these capacities is likely to have detrimental effects on current and/or future users and on the health and well-being of Georgians and/or **natural systems**. The integrated water policy also recognizes, however, that these capacities can, under some

circumstances, be supplemented in a **sustainable** manner, provided that is done following specific criteria to ensure that opportunities for other uses and users are not unduly foreclosed. Criteria for specific management practices are included in the plan.

In concert with a comprehensive consideration of the myriad effects of water quantity decisions, the State of Georgia will manage uses of water from surface water and groundwater sources to ensure that sufficient amounts remain to allow all users and uses – present and future – the opportunity to benefit from the values and opportunities provided by the resources. This comprehensive approach will require consideration of the collective impacts on flow regimes from the set of water withdrawals and water uses for each water source.

Likewise, in concert with a comprehensive consideration of the myriad effects of water quality decisions, the State of Georgia will manage point and **non-point source pollution** to Georgia’s waters on a **watershed** basis to ensure the physical, chemical and biological integrity of those waters and maintain **assimilative capacity**, now and in the future. This requires protecting waters that currently meet water quality standards and restoring waters whose physical, chemical, or biological integrity are impaired.

The integrated policy is predicated on the notion that use of the waters of the state must be “reasonable.” The legal doctrine of reasonable use guides use of a common resource by riparian owners and has long been the foundation of water management in Georgia. Such reasonable use must be accomplished in a manner that does not unduly foreclose opportunities for other users and uses of the resource.

The first steps in implementing the integrated water policy are the water resource assessments detailed in section 6 of this plan. Once the capacities of water resources have been determined and current and forecasted uses quantified, an array of management practices may be applied to ensure sustainable use of each source – use that will not result in unacceptable adverse consequences to the source or other users of the source.

#### Integrated Water Policy

- (1) Georgia’s economic well-being, the health and welfare of its citizens, and the diversity and health of its natural environment is dependent on the availability of clean water in the rivers, streams, lakes, wetlands, estuaries, coastal waters and groundwaters of the state.
- (2) Water resources in Georgia will be managed in a manner that recognizes the importance of clean water, provides for the protection and/or restoration of water quality, embraces the **values and opportunities provided by historic flow patterns**, and maintains use of surface waters, groundwaters, and assimilative capacity for current and future uses and users.

- (3) The quantity and quality of water needed in a given water body may vary widely from one natural system to another. Furthermore, the quantity and quality of water needed for a particular natural system may differ from the water needs of a similar natural system in another water body.
- (4) The effective management of Georgia's water resources requires a thorough scientific understanding of the quantity and quality of available surface and groundwater and the extent to which available supplies will support current and future uses and users.
- (5) In accordance with O.C.G.A. §12-5-522(b)(5), water quality and quantity and surface and groundwater are interrelated and require integrated planning.

### Implementation Actions

The **Division** will implement the integrated water policy through its existing statutory authority for permitting of water withdrawals and discharge of pollutants under O.C.G.A. §§12-5-31, 12-5-30(a), 12-5-30(b), 12-5-96 and 12-5-105. The Board of Natural Resources is directed, upon adoption of this plan, to amend its rules and regulations to provide the following:

1. To require the **Director**, when permitting water withdrawals and discharges of pollutants in accordance with O.C.G.A. §§12-5-31, 12-5-30(a) and 12-5-30(b), in addition to consideration of DNR Rules 391-3-6-.06, 391-3-6-.07, and 391-3-2-.03, to consider the extent to which such permits, if issued, will influence the amounts and timing of waters returning to streams or other waters; the character, amounts and timing of flow of pollutants to streams or other waters; and the implications these considerations may have on the continued sustainable use and physical, chemical, and biological integrity of affected waters;
2. To authorize the Director to place appropriate conditions in said permits to reflect full evaluation of such considerations.

## Section 4: WATER QUANTITY POLICY

### Background

The water quantity policy is to manage the **consumptive use** of water on a watershed basis so that sufficient amounts remain within a water source to allow all users and uses – present and future – the opportunity to benefit from the values and opportunities provided by the resources. Water use is consumptive when water is removed from the water source and is not returned to that source within a time frame that allows contemporary users and uses to avail themselves of the benefits of that quantity of water.

Consideration of consumptive use, in addition to water withdrawals, can more clearly show how water uses in some

areas affect the water availability at other points within the water source and at points **hydrologically connected** to the source. The cumulative consumption from a water source can be quantified and compared with the source's **sustainable yield** or a **consumptive use budget** that incorporates surface water storage or other practices that supplement available water. Regional water plans can then be developed to ensure that consumptive use stays within the sustainable yield for that water source, or within a consumptive use budget that is based on practices that supplement the sustainable yield in a way that recognizes the values and opportunities provided by historic flow patterns and the shared nature of water resources.

The water resource assessment activities detailed in section 6 of this plan will provide the foundation for management of consumptive use. Resource assessments will require definition of hydrologic units and identification of the geographic boundaries from which a water source derives its waters (i.e., sub-basins or watersheds, aquifers). Such boundaries may be coincidental with political boundaries, but most often are not. The next step would be to determine the sustainable yield of each water source. Sustainable yield determinations would be based on **dry year** conditions, so that the regional water plans are prepared for the worst case scenario. For surface waters, flows will generally be higher in normal and wet years than flows accounted for in the sustainable yield determination.

A similar comprehensive accounting of the yields for all aquifers in Georgia is likely to be extraordinarily expensive, time consuming, and may not produce results that are equally useful for each aquifer or overlying geographic area. Therefore, in deciding where and when to apply capital to this task, we must consider the functional characteristics of the aquifer, existing evidence of adverse affects due to withdrawals from the aquifer, and whether forecasts suggest significant increases in demands placed on that aquifer in the years ahead. While the process to be employed to determine sustainable yield of a given aquifer must be fundamentally the same across the state, this approach will allow priorities and financial resources to be properly placed.

The policy also requires forecasting of future needs for consumptive use of water. Taken together, these resource assessments and forecasts would allow identification of gaps between water needs and the sustainable water yields expected to be available under dry year conditions. They would also support selection of the management practices to be used to meet current and future needs while protecting resource users and uses. This policy provides flexibility in the use of an array of water quantity management practices. Management practices are addressed in greater detail in sections 7 through 13 of this plan. **Water conservation**, which can be the most economically efficient way of meeting water needs, will be a priority water quantity management practice for implementation across the state.

### Water Quantity Policy

- (1) Water resources in Georgia will be managed in a manner that recognizes the values and opportunities provided by historic flow patterns. The flow pattern in Georgia's rivers and streams varies widely across the state, and the opportunities for offstream and **instream** uses of water that are supported by these flow patterns likewise varies across the state. Historic flow patterns in different rivers and streams, and the opportunities for offstream and instream water use that they afford, are of prime importance in making water management decisions.
- (2) In concert with the integrated water policy, the State of Georgia will manage consumptive uses of surface water and groundwater, alterations of flows through storage, and other actions that affect flow regimes, to ensure that sufficient amounts remain to allow all users and uses – present and future – the opportunity to benefit from the values and opportunities provided by the resources.

### Implementation Actions

On the state level, the Environmental Protection Division (EPD) will implement management of consumptive use through its current statutory authority. Under this plan, the EPD will take the following actions:

1. In accordance with O.C.G.A. §12-5-31(g) and DNR Rule 391-3-6-.07 regarding factors to be considered by the Division in evaluating applications for withdrawals from surface water sources, the Division will evaluate the extent to which the cumulative present and forecasted consumptive uses of surface water can be supplied within the sustainable yield of that source.
2. In accordance with O.C.G.A. §12-5-96(d) and DNR Rule 391-3-2-.05, which describe factors to be considered by the Division in evaluating applications for groundwater withdrawal permits, the Division will evaluate the extent to which the cumulative present and forecasted consumptive uses of groundwater can be supplied within the sustainable yield of groundwater sources.
  - a. For some groundwater sources, the Director may determine that there is not sufficient evidence to suggest that increased use of the source will result in unacceptable adverse impacts on current or future uses of that source and that it is not practical to determine the sustainable yield of that source within reasonable time and cost constraints. The Director may allow increased use of these groundwater sources without a sustainable yield determination. Use of these sources will be subject to results of recurrent monitoring of aquifer response to increased withdrawals.
3. The Division will determine the sustainable yield of water sources as set forth in section 6 of this plan. The Division will provide sustainable yield determinations for each water source in a planning region to water planning councils as

guidance for production of a water development and conservation plan, in accordance with O.C.G.A. §§12-5-31(h) and 12-5-96(e).

## Section 5: WATER QUALITY POLICY

### Background

Pollutants are discharged to the state's surface waters each day in treated wastewater, known as **point source pollution**. Georgia has been managing these wastewater treatment plant discharges for more than 35 years, and doing so with a high degree of success. Far more contamination is washed into rivers and streams by urban runoff after storm events and agricultural runoff (i.e., non-point source pollution). As our population grows and more land is converted to urban uses, the amounts of pollutants we send to our streams via urban runoff will likely dramatically increase unless **stormwater** and land disturbance are managed more effectively.

Our streams and rivers are able to assimilate a portion of the pollution they receive. However, their ability to assimilate pollutants is limited. In Georgia, there are over 6,000 miles of streams that do not meet water quality standards. Most impairments are caused by non-point source pollution. National and state water quality protection policies do not allow discharges to exceed the assimilative capacities of water. In many areas across the state, however, growth and urbanization of rural lands is happening faster than state and local governments are able to develop and implement the management practices required to minimize non-point source water pollution and maintain assimilative capacity.

Clean water and its assimilative capacity provide values and opportunities to current and future Georgians. Protecting those values and opportunities will require that we use appropriate standards in assessing the status and condition of Georgia's waters. It will also require a better understanding of the assimilative capacity of Georgia's waters, and of the management practices that can be implemented to assure point and non-point source discharges do not exceed those assimilative capacities or cause water quality violations.

To fully implement the water quality policy, wasteload allocation procedures for point source discharges will be updated to assess current and future needs for assimilative capacity on a watershed basis and to identify gaps between future assimilative capacity needs and the assimilative capacity available to meet those needs. The Division will establish new water quality standards for surface waters where appropriate, with revisions to the fecal coliform and dissolved oxygen standards currently under consideration. The Division will also assess the ways in which activities on land, and the ways in which land is developed, affect water quality and assimilative

capacity.

Any gap between forecasted needs for assimilative capacity and the assimilative capacity that is available will be addressed by the selection of appropriate management practices. These practices will have the goals of managing assimilative capacity on a watershed basis, restoring impaired waters, and/or protecting waters that are not yet impaired. As with the water quantity policy, the water quality management practices would be implemented at a local level to address the unique conditions affecting water quality in specific areas.

#### Water Quality Policy

- (1) In concert with the integrated water policy, the State of Georgia will manage point and non-point source pollution on a watershed basis to provide for the protection of water quality, the restoration of impaired waters and the management of assimilative capacity for current and future uses and users.

#### Implementation Actions

On the state level, the EPD will implement the water quality management policy through its current statutory authority and rules related to setting water quality standards, controlling water pollution and issuing discharge permits. Under this plan, the EPD will take the following actions:

- (1) In accordance with O.C.G.A. §12-5-23(c)(9), the Board of Natural Resources will establish the surface water quality standards necessary to ensure that water use classifications and water quality criteria are adequate to protect public health and maintain or restore the physical, chemical and biological integrity of the of the state's waters, now and in the future.
- (2) In accordance with O.C.G.A. §§12-5-23-(c)(2), 12-5-30-(a), and 12-5-30-(b), the Director is responsible for managing pollution to Georgia's waters to protect public health and to ensure the physical, chemical and biological integrity of those waters, now and in the future. This requires the implementation of management practices to protect waters that currently attain water quality standards and restore waters whose physical, chemical, or biological integrity are impaired.
- (3) In accordance with O.C.G.A. §§12-5-23-(c)(2), 12-5-30-(a), and 12-5-30-(b), the Director will manage assimilative capacity on a watershed basis using forecasts of future discharge needs within a watershed and **conditions** in permits to assure compliance with water quality standards, in accordance with section 6 of this plan.
- (4) Subsequent to the Division's determination of the conditions for permits to assure compliance with water quality standards in a watershed, the Division will provide said conditions as guidance for production of a water development and conservation plan for the **water planning region** in which that watershed lies. Following

adoption of a water development and conservation plan, the Director will incorporate said conditions in permits for facilities or operations discharging pollutants in the water planning region.

## Section 6: WATER RESOURCE ASSESSMENT

### Background

Georgia has more than 70,000 miles of streams, 400,000 acres of lakes, 4,500,000 acres of freshwater wetlands, 384,000 acres of tidal wetlands, 854 square miles of estuaries, 100 miles of coastline, and an enormous amount of water in aquifers. Additionally, over the course of an average year Georgia will receive fifty inches of precipitation. These waters are used in a wide variety of ways, and are affected by a number of human activities.

Assessing these resources and their condition, as well as determining what factors influence our ability to utilize these resources in a sustainable manner, is vital to effective water management. Many current water management efforts, such as source water protection plans and watershed protection plans, have water resource assessment components. While varied, the information gathered as a part of these efforts provides a foundation on which to base our management of those resources. To ensure that long-term needs for water are met in a sustainable manner, however, we must build on existing data with a systematic assessment of water availability and assimilative capacity. This assessment must be statewide, but can best be conducted at the regional level.

In the last several decades, Georgia has experienced significant economic growth and development. Georgia is one of the fastest growing states in the nation and as Georgia grows, the demand for water and assimilative capacity will increase. In addition, in the past two decades, Georgia experienced the two worst droughts on record and major flooding, including a one hundred year flood and a five hundred year flood. The spring of 2007 was one of the driest on record and many parts of the state entered the dry summer season with a significant rainfall deficit. In light of these extremes, Georgians are increasingly aware of the need for better information on the capacities of our water resources to assist in regional planning and identification of the practices that can effectively manage those resources in a sustainable manner.

If Georgia is to develop water resource plans that will allow continued sustainable use and enjoyment of our water resources, the state must first define the capabilities of these water resources. These resource capabilities must be defined in terms of the ability of each water resource to support additional water withdrawals and to safely assimilate larger masses of pollutants without foreclosing opportunities for other users and uses of the resource.

Assessment of resource capacity will require compilation of a substantial information base, a comprehensive monitoring program, and a well-coordinated system for information management. This system would include the compilation of existing data, the coordination and integration of ongoing governmental and voluntary monitoring programs, the identification of gaps in current information and the development of a program to fill the gaps. The information collected and analyzed for these resource assessments must also be available to state agencies and other entities involved in planning and implementing resource management plans, as well as to the general public.

### **Water Resource Assessment Policy**

- (1) In accordance with O.C.G.A. §12-5-522(b)(4), the effective management of Georgia's water resources requires a sound scientific foundation which includes a scientific understanding of the condition of the water resources, in terms of the quantity of water available to support current and future instream and offstream uses and the capacity of the water resources to assimilate pollution.
- (2) In accordance with O.C.G.A. §12-5-522(b)(6), a comprehensive and accessible database must be developed to provide sound scientific and technical information upon which effective water resource management decisions can be based.
- (3) Georgia must invest additional resources to coordinate current monitoring efforts and expand monitoring as needed for a statewide assessment of the condition and capacities of Georgia's water resources. This information will support regional planning and comprehensive water management.

### **Implementation Actions**

Under existing statutory authority and rules, the following actions will be taken to assess Georgia's water resources:

#### (1) Plan and Budget

- a. In accordance with the policies above and with O.C.G.A. §12-5-23(c)(4), the Director will develop an assessment plan and budget that will direct the collection of the scientific data and information necessary to support implementation of the comprehensive statewide water management plan. This assessment plan will include provisions for:
  - i. The compilation of existing data;
  - ii. The coordination, integration, and creation of standards for ongoing governmental, industry, and volunteer monitoring programs, including monitoring required by permits;
  - iii. The identification of gaps in current monitoring and data management programs; and
  - iv. The development of a monitoring and data management program to fill said gaps.

#### (2) Water Quantity Resource Assessments

- a. In accordance with O.C.G.A. §12-5-522 (b), the Director will implement a monitoring program to document surface water flows and groundwater levels. Water resources management efforts must have a sound scientific foundation. Assessment of the quantity of water available to support current and future **human use**, the needs of natural systems, and other instream uses requires enhanced information on surface water flows and groundwater levels.
- b. The Director will determine the extent to which each water source is capable of yielding quantities of water for offstream use while preserving opportunities for both instream and offstream uses of the water source and water sources that are hydrologically connected. This determination of sustainable yield from water sources will be known as a water quantity resource assessment, and will be source-specific.
- c. In completing any water quantity resource assessment for any water source, the Division will define the aggregate geographic boundaries from which water naturally accrues to that water resource.
- d. In completing a water quantity resource assessment for any water source, the Division will determine the extent to which any specific water source contributes to the flow regimes of hydrologically connected adjoining water sources, so as to ensure preservation of opportunities for other water users and uses. In determining flow support from a water source to other hydrologically connected water resources, the Director will consider the entire history of flows, natural and altered, in the connected water resources, and the flow contributions the source in question has historically made to the hydrologically connected water resources.
- e. In completing any water quantity resource assessment for any water source, the Division will consider the extent to which the water withdrawn from a surface water source will be, after reasonable use, returned to the water source within a time frame that allows contemporary users of that surface water source, and users of hydrologically connected surface water sources, to make corresponding reasonable use of that returned water. In considering the extent and timing of the return of withdrawn water, the Division will evaluate the impact of **on-site sewage management systems**, land application systems, transfers of withdrawn waters to sources that are not by nature hydrologically connected to the subject source, and other water management practices that may impact the quantity and timing of return flows.
- f. In completing any water quantity resource assessment for a water source, the Division will consider the extent to which prior water development and management practices have affected the sustainable yield of a source. The Division will evaluate the impact of the size and operational characteristics of water storage projects, the

discharge characteristics of waters from **interbasin transfers**, and other current water management practices that have altered the natural sustainable yield of the source.

- g. In completing water quantity resource assessments, a distinction will be made between the flow regime requirements related to the sustainable yield of a water source and the instream flow conditions applied to surface water withdrawals from that water source. Instream flow conditions for surface water withdrawal permits will be determined pursuant to the instream flow protection strategy adopted by the Board of Natural Resources on May 23, 2001, or the most recent revision thereof. Assessments of sustainable yield and related flow regime requirements may contribute to the information base that will be required to adapt the instream flow protection strategy to different regions of the state, but will not themselves change instream flow conditions applied to surface water withdrawal permits.

(3) Water Quality Resource Assessments

- a. In accordance with O.C.G.A. §12-5-23(c)(4), the Director will implement a monitoring program to survey the waters of the state to assess water quality conditions and compliance with water quality standards.
- b. In accordance with O.C.G.A. §12-5-23(c)(2) the Director will act in the interest of the people to restore and maintain water quality.
- c. In accordance with O.C.G.A. §§12-5-30(a), 12-5-30(b), and 12-5-30(c), any person desiring to operate facilities that will result in the discharge of pollutants into the waters of the state is required to obtain a permit from the Director to make such discharge. The Director is authorized to issue permits upon the condition that discharges meet or will meet all water quality standards. In accordance with O.C.G.A. §12-5-30(c), the Director is authorized to prescribe conditions in permits to assure compliance with water quality standards.
- d. The Division will define the hydrologic boundaries or watersheds for the determination of conditions for use in permits to assure compliance with water quality standards.
- e. Local governments and water users in the watershed will be responsible for providing forecasts that quantify future discharge needs in terms of discharge flow and discharge location. Such forecasts shall be based on guidelines established by the Director.
- f. The Director will consider present discharge needs and forecasts of future discharge needs in the watershed to establish conditions in permits to assure compliance with water quality standards.

## Section 7: WATER QUANTITY MANAGEMENT PRACTICES

### *Background*

This plan requires water users within defined water planning regions to collectively plan for the sustainable future use of the water resources that serve that planning region. The state will establish the water planning regions according to section 14 of this plan, and will provide regions with the water resource assessments for the sources within that area. The regional water development and conservation plans will use the water resource assessments, in combination with forecasts of future water demands, to identify the array of water quantity management practices that will be implemented to ensure that water demands are met in a sustainable manner. These management practices will largely address the management of consumptive use of water.

Meeting water demands in a sustainable manner will require managing the consumptive use of water. 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. Managing consumptive use also requires that we consider other implications of consumption, including the water quality implications. There are innumerable ways to combine sets of demand, return, and supply supplementation practices to ensure that future consumption from a water source does not exceed the capability of that source, and to ensure that proper attention has been given to protecting and preserving water quality.

A variety of water quantity management practices can be implemented to manage and use water resources in conformity with the integrated water policy established by this plan. The purpose of these practices is to manage the consumptive use of water from a given source in a sustainable manner by managing demand and returns or, when it can be done without foreclosing opportunities for reasonable use by other water users, to supplement the sustainable yield of a water source. The process of preparing regional water plans will allow and encourage flexibility in selecting the appropriate mix of management practices for a given water source. It will also allow innovation in response to new information and changing conditions.

### *Policy: Water Quantity Management Practices*

- (1) The purpose of water quantity management practices is to manage the consumptive use of water from a given source in a sustainable manner by managing demand and returns or, when it can be done without unreasonably foreclosing opportunities for other users and uses, to supplement the sustainable yield of a water source.
- (2) A variety of water quantity management practices may be

implemented to manage and use water resources in conformity with Georgia's integrated water policy. These practices include but are not limited to:

- a. Water demand management practices, including water conservation and **water reuse**;
- b. Water return management practices, including optimal management of centralized wastewater treatment facilities, on-site sewage management systems and land application systems; and
- c. Water supply management practices, including the construction of **water supply reservoirs** and adoption of reservoir management policies that optimize water supply storage and maintain necessary flow regimes following specified criteria; interbasin transfers that meet specified criteria; and aquifer storage and recovery. Desalination may be an important water supply management practice in the future. These practices are addressed in sections 8 through 10 of this plan.

(3) Water conservation will be a priority water quantity management practice implemented to help meet water needs in all areas of the state, and will be practiced by all water use sectors.

(4) Other practices, included but not limited to those described here, will be implemented as consistent with the regional water development and conservation plan adopted by the Division, pursuant to section 14 of this plan.

#### **Implementation Actions**

Implementation actions for specific management practices are described in sections 8 through 10.

## **Section 8: WATER DEMAND MANAGEMENT PRACTICES**

### **Background**

The first priority in implementation of water quantity management practices must be conservation-related practices that effectively reduce our current and future water demands. Current statewide water conservation requirements can be dramatically enhanced. Development of water conservation plans is currently required for water withdrawal permits for non-farm use. EPD's rules, however, do not require demonstration of implementation or progress toward water conservation. Even when conservation plans are voluntarily implemented by the water user, the results are not always evaluated for their effectiveness. Meeting the state's long-term water needs will require greater emphasis on implementation of conservation practices and progress toward specific conservation goals.

Specific goals, standards, and guidance will be required to effectively implement water conservation statewide. To

provide this guidance, the Division will, with assistance from stakeholders from multiple water use sectors, develop a water conservation implementation plan. The water conservation implementation plan will provide a compilation of regulatory and non-regulatory tools that can and will be used to progress toward water conservation goals. It will identify the non-discretionary practices and/or standards which, as described below, will ultimately be required of permittees under amendments of the rules and regulations of the Board of Natural Resources. It will also identify a variety of discretionary practices that may be beneficial in some geographic areas and can be encouraged by incentives, education and outreach, and other mechanisms. As water conservation practices are implemented, water users will also implement the other water quantity management practices specified in the region's water development and conservation plan.

Implementation of water conservation practices and progress toward more efficient use of water will also require amendment of the rules and regulations for water withdrawal permitting promulgated by the Board of Natural Resources. Amendments are needed to improve implementation of the water conservation plans that applicants are currently required to submit. The amendments should also provide flexibility in demonstration of progress on implementation of water conservation. More specifically, the state should be required to consider existing **water use efficiency** in its permitting decisions. Amendments should also, in conjunction with the water conservation implementation plan, provide guidance on cost-effective practices for applicants that have not, to date, made significant investments in water conservation.

### **Policy: Water Demand Management Practices**

- (1) Water conservation is an effective and efficient management practice to meet the needs of all water users in the state. To support current and future use of water, and in accordance with DNR Rules 391-3-2-.04(11) and 391-3-6-.07(4)(b)(8)(ix), water conservation must be incorporated into long-term water demand and supply planning and measurable progress must be made toward water conservation goals and more efficient use of water.
- (2) Water reuse, or the use of **reclaimed water** as a substitute for another, generally higher quality water source, is a viable water management practice that may help sustain Georgia's water resources. Water reuse will be permitted and managed following the provisions of DNR Rule 391-3-6-.11 and EPD's guidelines for Water Reclamation and Urban Water Reuse (revised February 20, 2002 and any subsequent revisions).

### **Implementation Actions**

- (1) The Division will lead the development of a water conservation implementation plan. Specific elements of the water conservation implementation plan will include,

but not be limited to, the following:

- a. Goals for water conservation and water use efficiency;
  - b. Guidance for required water conservation practices for each water use sector;
  - c. State resources to help achieve water conservation goals;
  - d. Funding to help achieve goals for water conservation and water use efficiency;
  - e. Timelines for plan implementation and update; and
  - f. Such other elements as are reasonably necessary to carry out the purposes of this plan.
- (2) The Board of Natural Resources is directed, upon adoption of this plan, to amend its rules and regulations to provide the following in compliance with O.C.G.A. §§12-5-31(d), 12-5-91, and 12-5-96(a)(2):
- a. To require applicants for withdrawal permits or permit modifications for non-farm uses to demonstrate progress toward water conservation goals or water efficiency standards identified in the water conservation implementation plan, or to demonstrate the implementation of the appropriate water conservation practices listed in this section as well as DNR Rules 391-3-6-.07(4) and 391-3-2-.04(11), as follows:
    - i. If the applicant does not have an existing service area or operation, the applicant must develop a water conservation plan including the practices listed in this section or practices determined to be acceptable in the water conservation implementation plan. The applicant must also develop an implementation schedule for all water conservation practices.
    - ii. If an applicant has an existing service area or operation, the applicant may demonstrate, through methods approved by the Director, acceptable water conservation results and/or compliance with water use efficiency standards or goals as identified in the water conservation implementation plan. In reviewing such demonstration and/or compliance with the water conservation implementation plan, the Director will take into account any conservation measures already in place as well as those scheduled to be implemented. If the applicant is unable to demonstrate acceptable results and/or compliance, the Director may include within the permit a schedule for the implementation of appropriate conservation practices.
    - iii. If an applicant has an existing service area or operation, and is unable to demonstrate water conservation results and/or compliance with water use efficiency standards or goals, the applicant must demonstrate the implementation of the water conservation practices listed in this section prior to the issuance of withdrawal permits.
  - b. To authorize the Director to require municipal and private water utilities and water providers to develop a water conservation plan in accordance with DNR Rules 391-3-6-.07 and 391-3-2-.04(11) and to implement some or all of the following water conservation practices:
    - i. Conduct regular water system audit following methods approved by the Director;
    - ii. Implement a tiered **conservation-oriented rate structure** for all customers and adopt water bills that clearly reflect consumer usage;
    - iii. Adopt a water loss control program approved by the Director;
    - iv. In compliance with DNR Rules 391-3-5-.06(a)(1)&(2), meter all water uses (current and future), including all outdoor water uses that are not currently metered (i.e. public uses);
    - v. Adopt a meter calibration, repair, and replacement program;
    - vi. Require new multi-family residential buildings to install individual meters or report individual water usage;
    - vii. In compliance with DNR Rule 391-3-30, enforce current outdoor water use schedule;
    - viii. Meter all uses of reclaimed reuse water and report use on a regular basis following guidance issued by the Director;
    - ix. Conduct reuse feasibility studies, when no such study has been conducted in the past five years; and
    - x. Update water conservation plans on a regular basis, following guidance issued by the Director, to reflect new and changing circumstances in water management.
  - c. To authorize the Director to require industrial water withdrawal permittees or permit applicants to develop a water conservation plan in accordance with DNR Rules 391-3-6-.07 and 391-3-2-.04(11) and to implement some or all of the following water conservation practices:
    - i. Conduct facility-specific water audits every three years or when major process changes occur, which ever happens first, to include:
      - (1) In-process reuse capability (i.e. condensate recovery);
      - (2) Cross-process reuse capability (i.e. using process water in other processes);
      - (3) Reusing treated wastewater in-house (end-of-pipe reuse);
      - (4) Potential of taking treated wastewater from another source.
    - ii. Measure all water use not currently measured;
    - iii. Measure all uses of reclaimed reuse or recycled water and report use on a regular basis following guidance issued by the Director;

- iv. Adopt maintenance and repair program for pipelines, intakes and discharge structures;
  - v. Install rain or moisture sensor shut-off on devices on new and existing irrigation systems;
  - vi. Irrigate landscape in compliance with the current outdoor water use schedule defined in DNR Rule 391-3-30;
  - vii. Conduct reuse feasibility studies, if no such study has been conducted over the past 5 years; and
  - viii. Update water conservation plans on a regular basis, following guidance issued by the Director, to reflect new and changing circumstances in water management.
- d. Water withdrawal **permit holders** or drinking water providers submitting annual reports on non-farm water use to the Division in accordance with DNR Rules 391-3-6-.07(4)(viii), 391-3-6-.07(15)(e) and 391-3-5-.17(7) shall include in such reports data and information regarding levels of water efficiency and where applicable, progress toward water conservation goals and/or efficiency standards, using guidance provided by the Division.
- e. As required in DNR Rule 391-3-6-.07(4)(vii), for non-farm water use, progress reports outlining efforts to conserve water and reduce water loss shall be submitted to the Division on a regular basis and shall include measurable improvements related to water use efficiency and reduction in water loss and waste, following guidance by the Director and using a format and/or forms provided by the Division.
- f. The following shall be provided by the permit holders and/or applicants for non-farm water use and considered by the Director when evaluating the implementation of water conservation practices, compliance with water efficiency standards, and/or progress toward water conservation goals:
- i. Measurable outcomes in terms of reduced or maintained water production or usage. Outcomes may be expressed on a per capita, per connection, total system, or other basis as approved by the Director;
  - ii. Impact any water conservation practices or programs have had on the consumptive use of water for that water planning region;
  - iii. A schedule for implementing water conservation practices or achieving water use efficiency goals;
  - iv. Feasible and efficient re-use of reclaimed water as an alternative for another generally higher quality water source; and
  - v. Other considerations, as determined by the Director.
- g. Through the Georgia Department of Agriculture, the Georgia Soil and Water Conservation Commission, the University of Georgia Cooperative Extension Service, and other partners, entities with farm-related water use permits, including those for urban

agricultural water uses, shall be encouraged to use the most efficient, practicable irrigation practices, as described in the water conservation implementation plan, and to use tillage practices that make the most efficient use of the irrigation water that is applied.

## Section 9: WATER RETURN MANAGEMENT PRACTICES

### *Background*

Different wastewater management practices return water to surface water bodies at varying rates, and therefore contribute in varying degrees to consumptive use.

All of these considerations will be relevant considerations in decisions about the appropriate mix of return management practices that will be specified in regional water development and conservation plans.

### *On-Site Sewage Management Systems*

On-site sewage management systems have been effectively used to address domestic wastewater management in Georgia for decades, and it is expected that there will be many more such circumstances in the future where this choice will be an effective water quality management practice. Although an effective water quality management practice, on-site sewage management was never intended to be a management practice aimed at the fairly immediate return of water to the network of streams from which that water might have originated. Depending upon soil and geological conditions, on-site sewage systems can be slower to return water to streams than centralized wastewater treatment systems that return water to streams via direct discharges.

Long-term, a significant portion of the water that is discharged from septic systems returns to groundwater and contributes to stream baseflow, and so can be available for downstream users. In the shorter term, however, returns to surface water can lag to varying degrees under varying circumstances. While the exact quantity and timing of returns will vary with location and other site conditions, some portion of the water treated in septic systems is not returned to the water source in a time frame that allows contemporary users of that water source, and users of hydrologically-connected adjoining water sources, to make corresponding reasonable use of that returned water.

This short-term lag contributes to the cumulative consumptive use in a sub-basin or watershed. The significance of this component, however, will vary for different water sources. There are also significant information gaps and legitimate scientific debate about rates and timing of surface water returns from on-site sewage systems under varying conditions

throughout Georgia. In addition, current and projected population density, as well as infrastructure conditions and costs, need to be considered when evaluating use of on-site wastewater management versus centralized wastewater treatment.

#### **Policy: On-Site Sewage Management Systems**

- (1) Properly sited, constructed, and maintained on-site sewage management systems are a cost-effective, long-term option for meeting public health and water quality goals, particularly in less densely populated areas.
- (2) Depending upon soil and geological conditions, on-site sewage systems can be slower to return water to streams than centralized wastewater treatment systems that return water to streams via direct discharges. While the exact quantity and timing of returns will vary with location and other site conditions, some portion of the water treated in septic systems is not returned to the water source in a time frame that allows contemporary users of that water source, and users of hydrologically-connected adjoining water sources, to make corresponding reasonable use of that returned water. For practical purposes, this temporarily absent water contributes to the cumulative consumptive use in a sub-basin or watershed.
- (3) Managing the effect of on-site sewage management systems on the quantity of water returned to surface water sources must be a component of managing consumptive use. The significance of this component will vary with the condition of individual water sources and the characteristics of the uses of that source. This component of consumptive use is more important to manage in areas where the source of the water is surface water, and where consumptive use from that source is approaching its sustainable yield.

#### **Implementation Actions**

- (1) The Division's guidance for regional planning written pursuant to section 14 of this plan will address benchmarks for return flows to individual water sources and mechanisms for meeting those benchmarks. This guidance will be based on the best available information on quantities and timing of surface water returns from on-site systems in different parts of the state. The guidance will recognize the factors that determine the relative significance of this component of consumptive use of individual water sources and the factors that can determine the feasibility of different return management practices in different regions.
- (2) During preparation of regional water development and conservation plans, mechanisms to adjust the future use of septic systems as necessary to meet benchmarks for return flows will be considered following guidance to be provided by the Division.
- (3) On-site sewage management systems shall continue to comply with Department of Human Resources Rule 290-

5-26.

- (4) Use of on-site sewage management systems shall comply with provisions for water quality management practices specified in section 13 as well as the provisions specified here.

#### **Land Application Systems**

Similarly, land application systems are an effective wastewater management practice, which should continue to be used under appropriate circumstances. Land application systems, however, can also affect the quantities and timing of returns to surface waters. Again, the concern here is the short-term lag in returns.

In the future, evaluation of the use of land application systems must consider the extent to which these systems lag the return of treated wastewater to streams when compared to central wastewater treatment that returns water via direct discharges. As with on-site sewage management systems, there are considerable information gaps about rates and timing of returns from land application systems. The limited body of work to date suggests that, under some conditions, the lag in returns can be relatively short. More information, however, is clearly needed.

#### **Policy: Land Application Systems**

- (1) Land application systems have been effectively used for two decades to manage the introduction of waterborne pollutants into surface water, and must continue to be used as a water quality management practice under appropriate circumstances..
- (2) Land application systems can affect the quantities and timing of returns to surface waters. Some portion of the water treated in land application systems is not returned to surface waters in a time frame that allows contemporary users of that water source, and users of hydrologically-connected adjoining water sources, to make corresponding reasonable use of that returned water. For practical purposes, this short-term lag in returns contributes to the cumulative consumptive use in a sub-basin or watershed.
- (3) Managing the effect of land application systems on the quantity of water returned to surface water sources must be a component of managing consumptive use. The significance of this component will vary depending on the condition of a water source and the characteristics of its use. This component of consumptive use is more important to manage in areas where the source of water is surface water, and where consumptive use of that source is approaching the sustainable yield. The quality of the receiving waters and the availability of assimilative capacity is also a factor that has to be considered in evaluating the future use of land application systems.

### Implementation Actions

- (1) EPD guidance for regional water planning written pursuant to section 14 of this plan will address benchmarks for return flows to individual water sources. Regional plans for use of land application systems will conform with benchmarks for return flows to the water source(s) within a water planning region, following guidance to be provided by the Division and as consistent with DNR Rule 391-3-6-.03(2)(b)
- (2) Land application systems will be permitted and managed following the provisions of DNR Rules 391-3-6-11, 391-3-6-19 and 391-3-6-24.

### Centralized Wastewater Treatment

Water Pollution Control Plants provide relatively rapid returns of water to surface water sources. Since returns to surface waters are not significantly delayed, contemporary users of that water source, and users of hydrologically-connected adjoining water sources, are able to make corresponding reasonable use of that returned water.

### Policy: Centralized Wastewater Treatment Policy

- (1) Water Pollution Control Plants can provide relatively rapid returns of water to surface water sources.
- (2) Managing the return of water to surface water sources by Water Pollution Control Plants must be a component of managing consumptive use.
- (3) Where water quality or quantity considerations dictate the reuse of effluent, the effluent should be used as a replacement for another generally higher quality water source.

### Implementation Actions

- (1) Water Pollution Control Plants will be permitted and managed following the provisions of DNR Rule 391-3-6-.06.

## Section 10: WATER SUPPLY MANAGEMENT PRACTICES

### Background

Practices that supplement water supply can be an important part of addressing water supply and water quality needs in some parts of the state. However, these practices can both have adverse impacts on water resources and on opportunities for reasonable water use by other users.

This plan addresses three water supply management practices: surface water storage, interbasin transfers, and aquifer storage and recovery. To manage adverse impacts and ensure opportunities for other water use and users, the plan provides for action by EPD in its guidance of regional planning and action by the Board of Natural Resources to amend the rules and regulations that govern water withdrawal permitting.

### Surface Water Storage

#### Policy: Surface Water Storage

- (1) Water supply reservoirs are an important part of Georgia's water resource infrastructure, and additional surface water storage is likely to be a critical supplement to the natural capacities of streams to meet water supply needs in certain parts of the state. However, a number of factors limit the viability of reservoir sites. In addition, reservoirs can have a variety of negative impacts, including significant changes in flow regimes, alteration of aquatic environments, and loss of free-flowing stream habitat. These changes can impact downstream users as well as instream uses.
- (2) The State of Georgia will ensure that new water supply reservoirs are designed, sited, and operated in a sustainable manner to maximize opportunities for reasonable offstream water uses while minimizing harm to the environment.

### Implementation Actions

- (1) Regional water development and conservation plans, as further described in section 14, will identify areas where additional storage may be needed to meet water supply demands. This process should include:
  - a. Water demand forecasts.
  - b. The assessment of water supply alternatives, including implementation of water conservation and reuse practices, and the utilization of alternate sources, including purchasing water from adjacent utilities or water providers and the use of groundwater and existing surface storage.
- (2) The Division will screen the areas identified in regional planning for feasibility. Elements to be considered during the feasibility screening shall include, but will not be limited to, overall forecasted demand for the planning area, potential service areas, and the total storage potential available for that water source.
- (3) The Board of Natural Resources is directed, upon adoption of this plan, to amend its rules and regulations to provide that, in evaluating applications for permits associated with a water supply reservoir, the Director shall consider the factors specified in DNR Rules 391-3-5, 391-3-6-.07, and 391-3-8, as well as the following:
  - a. Demonstration of need over a 50-year planning horizon
    - i. Demand forecasts should be based on populations that do not already have supply allocated from other existing or planned projects.
    - ii. Assessment of the project's capacity to serve a multi-jurisdictional area
    - iii. Use of **full yield** for water supply. Water supply reservoirs that do not use the full yield for water supply will not be permitted.
  - b. Full consideration of all water supply alternatives concurrent with reservoir planning.
    - i. Implementation of water conservation and reuse

- practices to achieve efficient use of current supplies;
  - ii. Reduction in future demand anticipated from water conservation and/or reuse;
  - iii. Utilization of existing sources, including purchase of water from adjacent utilities or water providers, use of **excess capacity** in existing wells, and/or use of excess capacity in existing reservoirs; and
  - iv. Assessment of alternate sources.
  - c. Site selection to minimize environmental impacts
    - i. Avoidance of streams or sites that currently provide high quality habitat for aquatic biota
    - ii. Siting on tributaries or smaller streams or completely off of a streambed, utilizing pumped storage as needed
    - iii. Minimal contribution to fragmentation of the stream system
    - iv. Impacts on critical species or habitats in the reservoir pool area and immediately downstream
  - d. Water supply watershed protection provisions, pursuant to DNR Rule 391-3-16-.01, including application of criteria by all jurisdictions in the watershed
  - e. Provision of flows to meet instream needs
  - f. Water quality protection provisions
- (4) Reservoirs should be designed and operated to ensure that the volume and timing of flows are provided as necessary to meet instream flow needs, as determined by the Director, downstream of such reservoirs. The current instream flow strategy, adopted in a policy passed by the Department of Natural Resources Board on May 23, 2001, or any subsequent revisions, will continue to be applied to surface water withdrawal permits. The Division and other agencies will continue to build the information base required to adapt these requirements to specific instream flow needs in different regions of the state.

### Interbasin Transfers

#### **Policy: Interbasin Transfers**

- (1) Interbasin transfer is a management practice that addresses water supply and/or water quality needs in some parts of the state. However, these transfers may have adverse impacts on water resources in the receiving and donor basins and on opportunities for reasonable water use in the donor basin.
- (2) The State of Georgia will protect the reasonable use of water in donor basins through the regulation of interbasin transfers.
- (3) Interbasin transfers may be undertaken to meet water needs in areas facing limitations on their water sources, as indicated when the forecasted consumption of water from a specific source approaches the defined sustainable yield, as long as the transfer does not unreasonably foreclose opportunities for water use in the donor basin.

### **Implementation Actions**

- (1) Interbasin transfers of raw water will not be permitted until sustainable yield determinations have been completed for the affected water sources, pursuant to section 6 of this plan, and water development and conservation plans have been completed for the affected water planning regions, pursuant to section 14.
- (2) The Board of Natural Resources is directed, upon adoption of this plan, to amend its rules and regulations to provide that, in evaluating a permit application for a new interbasin transfer, the Director should consider the factors specified in DNR Rule 391-3-6-.07(14) as well as the following:
  - a. Donor basin considerations
    - i. The quantity of the proposed withdrawal and the stream flow of the donor basin, with special consideration for dry years and low flow conditions.
    - ii. The current and reasonably foreseeable future water needs of the donor basin, with special consideration for dry years and low flow conditions.
    - iii. Protection of water quality in the donor basin, with special consideration for dry years and low flow conditions.
    - iv. Any offsetting increases in flow in the donor basin that may be arranged through permit conditions.
    - v. The number of downstream river miles from which water will be diverted as a result of the transfer.
    - vi. The connection between surface water and groundwater in the donor basin, and the effect of the proposed transfer on either or both.
  - b. Receiving basin considerations
    - i. Determination of whether or not the applicant's proposed use is reasonable, including consideration of whether the applicant has implemented water conservation practices and achieved reasonable water conservation goals.
    - ii. Assessment of the wastewater treatment capacity of the receiving basin.
    - iii. The supply of water presently available to the receiving basin, as well as the estimates of overall current water demand and the reasonable foreseeable future water needs of the receiving basin.
    - iv. The beneficial impact of any proposed transfer, and the demonstrated capability of the applicant to effectively implement its responsibilities under the requested permit.
    - v. The impact of the proposed transfer on water conservation.
    - vi. The applicant's efforts to explore all reasonable options for use of reclaimed water and recycling of available sources to meet the needs of the receiving basin.

- vii. Assessment of the adequacy of treatment capacity and current water quality conditions.
- c. Considerations affecting both basins
  - i. The economic feasibility, cost effectiveness, and environmental impacts of the proposed transfer in relation to alternative sources of water supply.
  - ii. The cumulative impacts of the current and proposed interbasin transfers in the basin.
  - iii. The requirements of the state and federal agencies with authority related to water resources.
  - iv. The availability of water for responding to emergencies, including drought, in the donor basin and the receiving basin.
  - v. The impact, whether beneficial or detrimental, on navigation, hydropower or other power generation, fish and wildlife habitats, aesthetics, or recreation.
  - vi. The quantity, quality, location, and timing of water returned to the basin of donor basin, receiving basin, and basins downstream.
  - vii. Climatic conditions
  - viii. Impact on interstate water use.
  - ix. The cumulative effect on the donor basin and the receiving basin of any water transfer or consumptive use that is authorized or forecasted.
  - x. Such other factors as are reasonably necessary to carry out the purposes of Georgia law.
- (3) Use of interbasin transfers shall comply with the water quality policy specified in section 5 of this plan.

### Aquifer Storage and Recovery

#### **Policy: Aquifer Storage and Recovery**

- (1) Aquifer Storage and Recovery (ASR), a process in which water is recharged through a well into an aquifer and later withdrawn, may prove to be a viable way to supplement water availability in some parts of the state. O.C.G.A. §12-5-135 prohibits the injection of surface water into the Floridan Aquifer in any county governed by the Georgia Coastal Zone Management program, created by O.C.G.A. § 12-5-327, until December 31, 2009.

#### **Implementation Actions**

- (1) The Division may develop a protocol to assess the viability of ASR as a water management practice. Assessment of ASR would include:
  - i. Identification of recharge water sources and aquifers that are potential candidates for ASR recharge.
  - ii. Comparison of the potential cost of ASR to other management practices.
  - iii. Study of the legal issues related to ASR.
  - iv. Environmental assessment including the following:
    - A. Study of the subsurface geology and hydraulic properties of ASR target aquifers, adjacent aquifers, and confining units; mineralogy and

chemistry of target aquifer matrices, and the chemistries of recharge water and target aquifer.

- B. Bench testing and chemical equilibrium modeling to determine how introduction of oxygenated surface water may cause leaching of trace metals and how such leaching could be detrimental to the ASR system.
- C. Pilot scale testing of an ASR well or wells, permitted according to DNR Rule 391-3-6-.13 (Underground Injection Control Class V well) to determine the feasibility of ASR and to provide information for the design and operation of an ASR system.
- D. Quantitative analysis and possibly computer modeling to predict how ASR could affect movement of recharge water within the target aquifer and how water could move between aquifers in complex hydrogeologic regimes.

## **Section 11: WATER QUALITY MANAGEMENT PRACTICES**

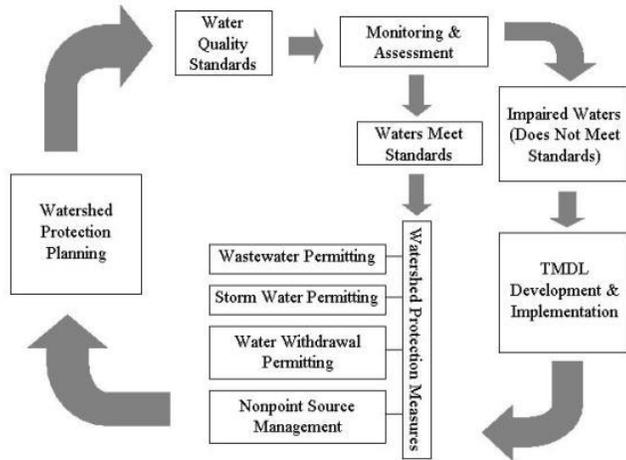
### **Background**

While we have made significant progress in management of pollution from centralized wastewater treatment systems, Georgia's continuing growth will continue to be accompanied by conversion of land cover, more intensive land uses, and significant increases in the volume of pollutants discharged to our waters from both point and non-point sources. If not managed properly, these increases will compromise our ability to beneficially use the state's waters.

In accordance with O.C.G.A. § 12-5-21(b), it is the responsibility of the Division to establish methods for preventing and controlling the pollution of the waters of the state. As demands on our water resources increase, the State must increase its efforts to protect our water from pollution emanating from wastewater discharges and urban and rural runoff. This effort, however, must be flexible enough to address the unique water quality issues in different parts of the state.

An array of management practices are available to support implementation of the integrated water policy in this plan and progress toward the goals of protection of clean water, restoration of impaired waters and management of assimilative capacity for current and future uses and users.

State and local government agencies, regulated entities and individual stakeholders currently implement a watershed approach to water quality protection. This cyclical approach is illustrated in the following figure.



The state designates uses for each water body, such as fishing and recreation. The state also sets criteria that must be met in order for the waters to be classified as supporting the designated use. There are criteria for parameters which indicate the health of the stream, such as pH and dissolved oxygen, and criteria for contaminants, such as pesticides, metals, and fecal coliform bacteria. These standards set goals for Georgia's waters.

Water quality monitoring is conducted to assess progress toward those goals. Currently, approximately 20% of the state's waters are tested. Waters found to be exceeding water quality standards are placed on Georgia's list of impaired waters and Total Maximum Daily Loads (TMDLs) are prepared for the listed waters. TMDLs are implemented through regulatory permitting processes for point sources of pollution, and voluntary best management practices are used to address non-point sources of pollution.

Georgia's fourteen major river basins have been divided into five major groups and the monitoring, assessment, impaired waters listing, TMDL development, and implementation steps of the watershed approach are completed for each basin group over a five year period. This five year rotating river basin cycle provides an opportunity to coordinate work over an entire river basin. Each year different activities are ongoing in each of the five major basin groups.

Implementation of the watershed protection approach will continue in concert with this comprehensive water management plan. To build on these on-going practices, this plan also provides for enhancements in water quality management in two areas:

1. Practices to enhance water quality standards and monitoring, and
2. Practices to enhance the management of pollution including consistent implementation of and compliance with

existing laws, TMDL implementation in tributaries to impaired waters, best management practices to address land use and non-point source pollution, coordinated planning and permitting, practices to manage on-site sewage treatment systems and new tools such as **watershed permitting** and water quality trading.

These practices, and the actions the EPD plans to take to encourage and implement these practices, are detailed below. In general, water quality management practices are most effective when implemented on a watershed basis. Again, flexibility is needed to address different water quality problems in different parts of the state. The regional planning process will allow flexibility in application of these management practices as well as innovation in response to new information and changing information. Other water quality management practices, beyond those described here, may be implemented as consistent with the regional water development and conservation plans ultimately adopted by the EPD.

#### Policy: Water Quality Management Practices

- (1) The purpose of water quality management practices is to manage point and non-point source pollution on a watershed basis in order to protect clean waters, restore impaired waters, and manage assimilative capacity for current and future users.
- (2) As of 2006, there were over 6,000 miles of streams on Georgia's list of impaired waters.
- (3) In accordance with O.C.G.A. § 12-5-21(b), it is the responsibility of the Division to establish reasonable methods for preventing and controlling the pollution of the waters of the state.
- (4) Water quality management practices are most effective when implemented on a watershed basis.

#### Implementation Actions

Implementation actions for specific management practices are described in sections 12 and 13.

## Section 12: ENHANCED WATER QUALITY STANDARDS AND MONITORING PRACTICES

### Background

Water quality standards and monitoring programs are crucial to the success of Georgia's water planning and protection efforts. Under the federal Clean Water Act, Georgia periodically reviews water quality standards to ensure that correct standards are in place and that the standards are appropriate for the areas of the state in which they are being applied.

Several improvements in the current standards may be necessary. For example, the state currently uses one standard for dissolved oxygen for all of the waters of the state. More

than 15% of Georgia's impaired waters are due to a violation of the current statewide dissolved oxygen standard. However, the state's waters have naturally varying levels of dissolved oxygen, and a level of dissolved oxygen that causes a problem in one stream may be healthy in another.

More than 62% of impairments of Georgia's waters are due to a violation of the current bacteria standard. Some research, however, has questioned whether the current fecal coliform standards accurately identify public health concerns. In order to create water quality criteria that most accurately identify impaired waters, EPD must make a significant investment in water monitoring.

The state also needs to revise the designated uses it currently assigns to surface waters. Currently, the designations for wild and scenic river and outstanding national resource water are extraordinarily stringent, but the designations for fishing are not stringent enough for certain sensitive ecosystems. A new classification of Significant Natural Resource Waters will provide a higher, but attainable, level of protection for selected waters. This additional designated use would allow the state more flexibility in determining the most appropriate criteria for waters across the state.

Revisions of water quality standards will be supported by the comprehensive monitoring program and water quality resource assessments described in section 6 of this plan.

#### **Policy: Enhanced Water Quality Standards and Monitoring**

- (1) In accordance with O.C.G.A. §12-5-23(c)(9), it is the responsibility of the Director to review water quality standards on a periodic basis and establish or revise standards of water purity for any waters of the state.
- (2) Except for 70 miles of streams located in national forests, all Georgia waters are currently classified as High Quality Waters subject to anti-degradation review. Higher classifications such as Wild River, Scenic River, or Outstanding Natural Resource Waters require stringent controls to preclude any alteration in natural water quality. A new classification of Significant Natural Resource Waters will provide a higher, but attainable, level of protection for selected waters.
- (3) Water quality standards for bacteria should be reviewed and updated based on current research to ensure that the best available criteria are used in Georgia to protect public health.
- (4) Water quality standards for dissolved oxygen should be reviewed and updated to reflect the natural variability in Georgia waters.

#### **Implementation Actions**

- (1) The EPD will implement the enhanced monitoring and assessment program developed according to the Water Resource Assessment section of this plan. This program

will collect, manage, and use the scientific data and information needed to implement this plan.

- (2) The Board of Natural Resources is directed, upon adoption of this plan, to amend its rules and regulations to add a designation for Significant Natural Resource Waters to the use classifications in section 391-3-6-.03(4) of the DNR Rules and Regulations for Water Quality Control. This designation will provide additional protections for high quality waters but not be as stringent as wild river, scenic river or outstanding natural resource water, which generally preclude any alteration in natural water quality. This designation would support the Georgia Land Conservation Program's objective of protecting lands with high environmental values or conservation benefits. The rule creating this designation should include:
  - a. A definition for Significant Natural Resource Waters, including the characteristics that would qualify a waterbody for the designation, and
  - b. The criteria for additional protection for these waters.
- (3) The Board of Natural Resources is directed, upon adoption of this plan, to amend its rules and regulations to update water quality standards for bacteria and dissolved oxygen so that the standards are correct and appropriate for different areas of the state.

## **Section 13: ENHANCED POLLUTION MANAGEMENT PRACTICES**

### **Background**

Several practices can be used to address both point and non-point sources of pollution. Considerable progress has been made in management of pollution from centralized wastewater treatment facilities and other point sources, and management of these sources will continue to be a critical element of Georgia's water quality protection program. For non-point sources, effective non-point source management will continue to require a combination of regulatory, voluntary, self-regulatory, incentive-based and educational approaches to manage polluted runoff. These efforts often involve multiple entities, including Federal, State, and local governments, organizations, regulated entities, individuals, and other stakeholders.

To enhance management of point and non-point sources of pollution, this plan addresses practices in the following areas:

- improving compliance,
- managing non-point source pollution,
- coordinating the environmental planning activities of state and local government,
- regulating on-site sewage management systems, and developing and applying new innovative tools, such as watershed permitting and water quality trading.

### Improving Compliance

There are a number of state laws and regulations and local government ordinances in place to manage water pollution. Enhancing the implementation of and compliance with existing laws and regulations on a consistent basis across the State is an effective way to protect and restore water quality. While inspection and enforcement certainly contribute to compliance, other practices, such as provision of regulatory flexibility, may be desirable to improve compliance. Since environmental compliance is the ultimate goal, regulated entities with a significant record of long-term superior environmental performance should be considered for benefits such as a reduced administrative burden (e.g., less compliance testing and reporting, less frequent inspections) and/or expedited requests for permit changes.

#### **Policy: Improving Compliance**

- (1) There are a number of laws currently in place in Georgia designed to control water pollution. Implementation of and compliance with these laws should be enhanced.

#### **Implementation Actions**

- (1) The Director will update current compliance inspection and enforcement capabilities and recommend enhancements as appropriate to provide consistent implementation of existing laws and rules and regulations across the State and among local issuing authorities authorized pursuant to O.C.G.A. §12-7-8.

### Managing Non-Point Source Pollution

A key part of addressing non-point source pollution, which causes the majority of water quality problems in the state, is addressing the impact that changing land use can have on water quality. A critical link exists between land use, stormwater and water quality. When pervious land cover, such as forests and other natural areas, are paved over or otherwise converted to **impervious surfaces**, rainwater is no longer able to infiltrate into the soil. Stormwater washes across surfaces and into nearby streams, washing mud, oil, chemicals, and bacteria into creeks and rivers. Impervious surfaces increase the volume of stormwater and stormwater-associated pollution, which streams are unable to assimilate. The volume and velocity of flow in streamflows during wet weather is also greatly increased, which often causes erosion and sedimentation.

Effective management of stormwater and the impacts of impervious surfaces on a watershed basis can reduce the adverse effects of runoff. Innovative ways to manage impervious surfaces and to increase infiltration of stormwater include enhancing or expanding existing programs such as post-construction stormwater management, quality growth and low-impact development initiatives, **green infrastructure** planning, and land conservation and open space protection programs. These and related practices can be applied on a watershed basis to help maintain infiltration and groundwater

recharge and reduce or eliminate the adverse impacts of stormwater. These practices are critical elements of effective management of non-point source pollution and protection of Georgia's waters.

Establishing and/or enhancing voluntary, self-regulatory and incentive-based programs will increase the breadth and reach of non-point source management. Incentive-based programs to address non-point source pollution from agricultural lands have been in place for many years through various federal programs and state and local partners. For urban and developing areas, potential incentive programs include reducing loan rates, increasing priority for certain grants and loans, enhancing existing recognition programs (e.g., Georgia Green Growth Certified Program, Clean Marinas Programs) and creating innovative new programs. Self-regulatory programs may include a combination of established and acceptable management practices, industry-specific education and training, and self-inspection and monitoring. The forestry industry currently uses a self-regulation approach to non-point source management. Opportunities may exist to expand this approach to other entities or industries that exhibit successful characteristics such as highly motivated members, stewardship attitudes, a high level of interest in self-management, and a certain level of internal organization. Self-regulation also offers the opportunity to avoid future regulations by demonstrating successful environmental compliance.

#### **Policy: Non-Point Source Pollution**

- (1) Effective management of stormwater and the impacts of impervious surfaces are critical to water quality protection and maintenance of assimilative capacity. Land use changes affect water quality largely because the conversion of pervious land cover (e.g., forests and other natural areas) to impervious land cover (e.g., buildings, concrete surfaces) causes a larger volume of stormwater and stormwater-associated pollution, which streams are unable to assimilate.
- (2) Impervious cover also prevents water infiltration into the soil, which under natural conditions is responsible for degrading pollutants, recharging groundwater and maintaining the stream baseflows needed to maintain assimilative capacity.
- (3) Some stormwater and land use management practices can be applied on a watershed basis that will maintain infiltration and groundwater recharge and reduce or eliminate the adverse impacts of stormwater. These practices are critical elements of effective management of non-point source pollution and protection of Georgia's waters.
- (4) While there have been regional improvements in management of non-point source pollution, practices to control non-point source pollution from urban areas and lands being converted to developed uses, in particular, have been marginally effective. Management of non-

point source pollution from urban areas and lands being converted to developed uses needs to be reviewed and recommendations made to improve the effectiveness of these practices.

### **Implementation Actions**

- (1) The Director will partner with regulated entities, state and local government agencies involved in land and water management, and other appropriate stakeholders to enhance current approaches to managing non-point sources of pollution, so that sources are managed on a watershed basis in an effective and integrated fashion. The following actions will be undertaken:
  - a. Updating the Georgia Stormwater Management Manual.
  - b. Encouraging local stormwater utilities as a mechanism for funding the administration, operations and maintenance, and capital costs of stormwater and non-point source pollution controls.
  - c. The Division will develop guidance for local government programs to manage fertilizer for lawn use in watersheds where phosphorus loading is an issue.
  - d. The Division will work with appropriate stakeholders to develop industry-specific best management practices and provisions for self-monitoring and enforcement.
  - e. The Division will work with appropriate stakeholders to develop watershed education programs to address non-point source pollution in the urban and home setting.
  - f. The regional planning undertaken pursuant to section 14 shall include elements that address stormwater management, including projections of stormflows, evaluation of stormwater permitting requirements, and assessment of practices to promote infiltration and control non-point source pollutant loading.
- (2) In consultation with state and local government agencies involved in land and water management, as well as other appropriate stakeholders, the Director will evaluate the following actions, among others:
  - a. Watershed limitations on effective impervious surfaces
  - b. Innovative programs for protection of riparian buffers as well as requirements for revegetation of buffers
  - c. State or local government requirements related to **low impact development**, improved site design, and growth management consistent with watershed protection and maintenance of water quality standards
  - d. Enhanced incentives or requirements for land conservation, wildlife conservation, greenspace protection or other land protection programs, including the use of statewide Green Infrastructure Planning requirements to protect land resources with high environmental value or conservation benefits

from non-point source pollution.

- e. Requirements for implementation of best management practices to restore waters and watersheds currently impacted by non-point sources of pollution.
- f. Closer coordination between state and local government agencies with respect to land use decisions and the protection of water resources.

### ***Coordinated Environmental Planning***

Changing land uses can be one of the most significant causes of poor water quality. Increasing coordination of environmental planning can help reduce the adverse effects of land use and stormwater on water quality. One way to mitigate certain effects of land use on water quality is completion and implementation of the comprehensive plans required by the Georgia Planning Act. These plans enhance local government authority to make land use decisions to protect water quality.

Another way to mitigate some of the effects of land use change on water quality is to plan for watershed protection in growing areas. As localities grow, the need for additional capacity to assimilate the treated wastewaters is often needed. At the same time, the growth within the municipality significantly increases the potential for non-point source pollution, placing a further demand on assimilative capacities of water bodies in the area. Local governments that request a wastewater discharge permit are currently required to conduct watershed assessments and develop watershed protection plans. These plans are a tool that can, if implemented, minimize the impact on water quality of both the treated wastewater discharge and the potential increase in non-point source pollution associated with growth and development. Specific purposes of the watershed protection plans are to: 1) address water quality standards violations, 2) develop and implement best management practices to prevent future water quality standards violations, and 3) provide ongoing monitoring to either verify the effectiveness of the best management practices or provide information necessary to modify those practices to achieve water quality standards.

As described below, EPD will simplify the planning process by combining planning requirements so that one consolidated plan will cover as many of EPD's regulatory requirements as possible.

### ***Policy: Coordinated Environmental Planning***

- (1) Coordination of environmental planning and management between state agencies, permittees, and local government entities responsible for land use planning and management will serve to reduce the adverse effects of land use and stormwater on water quality.

### **Implementation Actions**

- (1) The Board of Natural Resources is directed, upon adoption of this plan, to amend its rules and regulations to provide the following:

- a. To prohibit the Director from issuing a requested new or expanded water withdrawal, drinking water, discharge or land application permit unless the local government applicant has Qualified Local Government status as approved by the Georgia Department of Community Affairs, in accordance with O.C.G.A. §§12-2-8 and 50-8-30 et seq. For permit renewals to governments without Qualified Local Government status, additional permit conditions may be added.
- b. To require that watershed assessments and protection plans, developed pursuant to O.C.G.A. §12-5-23(a)(1)(S), be prepared in accordance with the latest guidance provided by the Division and implemented following the schedule indicated in the plan. Population forecasts used in support of permit applications shall be used to assess whether local governments are projected to become subject to municipal stormwater permitting requirements pursuant to DNR Rule 391-3-6-.16(3)(b)(7). For those local governments projected to become subject to stormwater permitting requirements, watershed protection plans shall include pre-planning for stormwater management to ensure compliance with permitting requirements when applicable.
- c. In review of water withdrawal and drinking water permit applications, require the Director to evaluate the information in, and status of, any watershed assessments and watershed protection plans affected by the water use and associated discharge.
- d. The Division will work with local governments, other State agencies, and regulated entities to coordinate and integrate watershed monitoring, assessment and protection planning requirements associated with various State water programs in support of regional planning performed pursuant to section 14 of this plan. Information from watershed monitoring and assessments will be incorporated in water quality assessments pursuant to section 6 of this plan.

### On-site Sewage Management Systems

On-site sewage management systems are fixed sewage management systems that do not discharge directly to a public sewer. One of the most common on-site systems is the residential septic tank. In order to minimize the risk of water quality impacts from on-site sewage management systems to surface waters and groundwater, these systems must be properly sited, designed, installed, and maintained. **Septage** from these systems must also be managed in an environmentally sound manner. Laws and rules are currently in place and implemented by the Department of Human Resources, Division of Public Health to address siting, design and installation.

### **Policy: On-Site Sewage Management Systems**

- (1) On-site sewage management systems that are properly sited, designed and maintained can effectively reduce most human health or environmental threats. On-site sewage management systems should be properly sited, designed, installed, and maintained to ensure long-term performance so that negative impacts to surface water and groundwater quality are effectively reduced or eliminated.
- (2) Georgia faces environmental and health hazards associated with the illegal disposal of septage. Acceptable methods of disposal of septage include discharge to a wastewater treatment plant; discharge to a separate septage handling facility; or direct land application to land with a low potential for public exposure.

### **Implementation Actions**

- (1) The Director will partner with state and local agencies and regulated entities involved in land and water management to enhance requirements for inspection and maintenance of on-site sewage management systems. The Director will evaluate the effect of the following requirements, among others:
  - i. Inspection and maintenance ordinances implemented by local governments as a condition of public water supply system permits.
  - ii. Inspection and the disclosure of the presence and the general location of on-site sewage management systems at the time of the sale of a property.
  - iii. State and local government implementation of “Voluntary Guidelines for Management of Onsite and Decentralized Wastewater Systems” produced by the EPA.
- (2) The Division will continue to coordinate with the Department of Human Resources on proper septage disposal. In accordance with O.C.G.A. §12-8-41, the Division will regulate and permit land disposal sites that receive septage from a septage pumping or hauling business.

### Potential New Tools for Pollution Management.

Watershed permitting and water quality trading may be useful tools for managing water quality. Watershed permitting involves consideration of the condition of an entire watershed and the variety of discharges to the water source, instead of examining each individual point source discharger.

Water quality trading, which is also called pollutant allocation trading, is an innovative approach to achieving water quality goals more efficiently. Sources in a watershed can face very different costs to control the same pollutant. Trading programs allow facilities to meet regulatory obligations by purchasing equivalent or superior pollution reductions from another source, achieving water quality improvements in a cost-effective manner.

The EPA has endorsed the use of watershed permitting and water quality trading as tools for achieving watershed goals, and has provided guidance on watershed permitting as an approach to developing discharge permits. The United States Natural Resources Conservation Service has also endorsed the use of water quality trading, signing a Partnership Agreement with the U.S. Environmental Protection Agency in October 2006 to promote the concept.

Application of these tools in Georgia may help accomplish water quality protection goals. However, there are a number of unanswered questions about how best to apply the tools here to ensure water quality protection, and their potential use should be carefully evaluated following guidance to be developed in consultation with water-related interests across the state.

#### **Policy: New Tools**

- (1) The State should assess new water quality management tools, such as watershed permitting and pollutant allocation trading, to determine if they can be effectively applied to support the objectives of this plan and Georgia's water quality control program.

#### **Implementation Actions**

- (1) The Director will partner with state and local government agencies, regulated entities, and other appropriate stakeholders involved in land and water management to review the practice of watershed permitting to determine the potential for use of this tool in Georgia.
- (2) The Director will partner with state and local government agencies, regulated entities, and other appropriate stakeholders involved in land and water management to review the practice of pollutant allocation trading to determine the potential for use of this tool in Georgia.

## **Section 14: REGIONAL WATER PLANNING**

### **Background**

The characteristics of water resources and water users vary significantly in differing regions across Georgia. In order to meet Georgia's water resource needs in a sustainable manner, we must develop long-term plans for each of our major surface water and groundwater resources. To serve this purpose, this plan provides for the preparation of regional water development and conservation plans (WDCPs) throughout the state.

As described in detail below, regional water development and conservation plans will be prepared by an EPD-designated water planning council or by EPD. Water planning councils will be diverse and broadly representative of local governments, water users, and other water-related interests in each planning region. Membership will depend on the existing

water-related organizations and institutions in each region as well as the characteristics of regional water resources and water uses.

Water planning councils will be responsible for overseeing the preparation of a recommended plan, following EPD guidance and with support from consultants under contract with EPD. EPD's water quantity and water quality assessments for each major water resource in the planning region will be provided as guidance for plan preparation. WDCPs will include forecasts of future water supply and assimilative capacity needs and will identify the optimal water management practices for that planning region. Each water planning council will submit a recommended plan to EPD, which will adopt the plan if it is complete and consistent with EPD guidance.

Once adopted by EPD, the regional WDCPs will be used by EPD as a basis for making permitting decisions. They will also guide decisions regarding state grants and loans from the Georgia Environmental Facilities Authority for water-related projects in each water planning region. The water planning councils are not expected to have a direct role in implementation of the adopted WDCPs. Rather, implementation of management practices specified in the WDCPs will be the responsibility of water users in the region, including local governments and others with the capacity to develop water infrastructure and apply for the required permits, grants, and loans.

EPD will ensure that water planning is carried out consistently and equitably across water planning regions, and that the resultant plans will lead to management of water resources so that opportunities for current and future use of water resources are maintained.

#### **Regional Water Planning Policy**

- (1) The characteristics of water resources and water users vary significantly in differing regions across Georgia. Protecting the ability of our water resources to meet needs for water supply and assimilation of wastewater will require regional, resource-based plans that identify the management practices appropriate to the resources and users in each region.

#### **Implementation Actions**

- (1) The Board of Natural Resources, as authorized by O.C.G.A. §§12-5-31 and 12-5-96, and in a manner consistent with O.C.G.A. §§ 12-5-522 and 12-5-570 et seq., is directed to promulgate rules and regulations to establish the process for designation of Water Planning Councils and for preparation of water development and conservation plans, with provisions as follows. Other agencies with water-related responsibilities may also promulgate rules in support of regional water planning, as consistent with their statutory authorities.

- (2) Following promulgation of rules for regional water planning, the Director shall issue guidance consistent with those rules as necessary to support preparation of regional water development and conservation plans.
- (3) Delineation of Water Planning Regions.
  - a. The Director, in consultation with the Department of Community Affairs, will delineate county-based water planning regions that reflect major hydrologic boundaries and economic interconnections. Water planning regions will include one or more major surface or groundwater resource(s) as defined in section 6 of this plan.
  - b. The Director will propose an initial delineation of water planning region boundaries. Following public input and consultation with local governments and water-related interests, the Director shall publish a final delineation.
  - c. One regional water planning entity already exists in Georgia: the Metropolitan North Georgia Water Planning District, a planning area with boundaries established by O.C.G.A. §12-5-573. Delineation of other water planning regions cannot alter the boundaries of the Metropolitan North Georgia Water Planning District without a corresponding change in state law, which is beyond the scope of this current Plan.
  - d. Local jurisdictions that rely on water resources that lie in more than one water planning region, including those jurisdictions that are part of the Metropolitan North Georgia Water Planning District, will have the option of contributing to preparation of more than one water development and conservation plan. Decisions about which planning region is most appropriate for individual localities, and decisions about participation in more than planning region, will be guided by an assessment of the resources that the localities rely upon or impact.
- (4) Water Quantity and Water Quality Assessments.
  - a. For each water resource (as defined by the Director), the Division will complete an assessment of the water resources' capability for water supply and assimilative capacity, as described in section 6 of this plan. These assessments will be provided to the Water Planning Councils as guidance for regional planning. Assessments for resources relied upon or impacted by jurisdictions within the Metropolitan North Georgia Water Planning District will be provided to the District as guidance for revisions of the plans required by §12-5-570 et seq.
  - b. Resource assessments will have to be updated to reflect new information and changing conditions over time. As resource assessments are modified for other water planning regions of Georgia, the respective regional water plans must also be modified to respect these updated resource assessments.
- (5) Designation of Water Planning Councils.
  - a. The Director, in consultation with the Department of Community Affairs, will designate water planning councils to prepare regional water development and conservation plans for each water planning region.
  - b. To the greatest extent practicable, membership of each water planning council shall be diverse and broadly representative of local governments and water-related interests in the water planning region. Composition of water planning councils may vary between regions, reflecting variation in water resources and water use. Consistent with O.C.G.A. §12-5-523(b), each water planning council will include, at a minimum, representatives of nonprofit advocacy organizations, business organizations, local government entities and associations of local government entities, and regional development centers.
  - c. Each water planning council will, through a memorandum of agreement (MOA) with EPD, establish procedures including but not limited to:
    - i. Decision-making procedures;
    - ii. Provisions for appropriate public sector involvement in plan development and implementation of management practices;
    - iii. Specifications for advisory bodies and processes, including opportunities for meaningful public participation in plan development;
    - iv. Provisions for the participation of any local government located outside the planning region boundary that relies on, or impacts, water resources within the planning region;
    - v. Other requirements established by guidance issued by the Director.
  - d. Memoranda of agreement between EPD and water planning councils shall have a three-year term and be subject to renewal. In the event of vacancies, the Director shall make additional appointments to a water planning council during the term of the agreement. Renewal of a MOA shall be contingent on performance, which shall be evaluated according to regional water planning guidance.
  - e. Local governments subject to the Metropolitan North Georgia Water Planning District Act, O.C.G.A. §12-5-570 et seq., may participate in the water planning councils described in this plan.
- (6) Provision of guidance and technical assistance
  - a. Following promulgation of rules for regional planning, the Division shall develop guidance for the process of creation, finalization and revisions of regional water development and conservation plans. This guidance shall include, but not be limited to:
    - i. Procedures and criteria for forecasting water demands and needs for assimilative capacity.
    - ii. The criteria for review of such plans, including provisions to ensure that plan implementation

- shall not cause undue adverse impacts on water users or water uses in the subject planning area or in other planning areas.
- iii. Procedures and criteria for future review and revision of water development and conservation plans.
  - iv. Procedures for providing state water planning funds to contractors to assist water planning councils in plan development.
- b. The Division shall provide technical assistance to water planning councils in preparation of water development and conservation plans. The Division shall also contract for services needed to support the preparation of the plan. Each water planning council shall assist EPD in directing the work of contractor(s) for their water planning region.
- c. The Director shall take the steps necessary to ensure communication and coordination between water planning councils charged with preparation of plans for water resources that are hydrologically-connected or those affected by water management activities in adjacent planning regions.
- d. Guidance for regional water planning will also apply to future revisions of the regional plans of the Metropolitan North Georgia Water Planning District. In 2003, the District completed their initial plans following guidance from EPD. Draft plans were subject to review and approval by the EPD Director, and the final plans now guide EPD permitting decisions. O.C.G.A. §12-5-570 et seq. requires that the District's plans be revised every five years, and the 2008 revision is currently underway, again following EPD guidance. EPD guidance for future revisions of District plans will be similar to that provided for preparation of water development and conservation plans, and will include assessments of water supply capabilities and assimilative capacities for the District's water resources that conform to those provided to the water planning councils established under this plan.
- (7) Regional Water Development and Conservation Plans (WDCPs).
- a. Water planning councils shall, following guidance to be provided by the Director, oversee preparation of regional water development and conservation plans. Plans shall include forecasts of water supply and assimilative capacity needs for each water source within each planning area, developed in consultation with the Division.
  - b. In accordance with O.C.G.A. §12-5-522 et seq., regional water development and conservation plans shall promote the sustainable use of Georgia's waters, through the selection of an array of management practices, to support the state's economy, to protect public health and natural systems, and to enhance the quality of life for all citizens. The plans shall identify steps which will be taken to ensure that the forecasted needs can be met within the water resources' capabilities, as specified in the water resource assessments defined by the Director.
- c. Plans shall include the following principal elements, which shall be developed according to guidance issued by the Director:
- i. Local governments lying in whole or part within the water planning region;
  - ii. Planning for regions at the periphery of the water planning region that may be located in more than one regional water planning region;
  - iii. Major water users;
  - iv. Surface water and groundwater sources and their conditions;
  - v. Forecasts of 10-, 20-, 30-, and 40-year population expectations, water demands, wastewater returns, land surface types and distribution, and employment characteristics, developed in consultation with EPD;
  - vi. Forecasted uses of water bodies for water supply, wastewater discharge, and storm flows for each forecast period;
  - vii. Comparisons of those forecasts with the sustainable yields and assimilative capacities of water resources as determined by the water quantity and water quality assessments.
  - viii. Water quantity and quality management objectives for 10-, 20, 30-, and 40-year time horizons.
  - ix. Recommendations for appropriate management practices for stormwater management, wastewater treatment, water supply, water conservation, and the general protection of water quality within the planning region. Management practices shall help meet the water quality and water quantity management objectives of the WDCP and provide for sustainable use of available water or practices that supplement water availability when consistent with specified criteria. Practices should also ensure the sustainable use of assimilative capacity on a watershed basis, the restoration of impaired waters and protection of waters that currently meet water quality standards.
  - x. Proposals for addressing data and information needs;
  - xi. Benchmarks for assessment of plan effectiveness and identification of required revisions;
  - xii. Actions required of the state to support objectives in the recommended water development and conservation plan.
  - xiii. Other elements established by guidance issued by the Director.
- (8) Regional Water Development and Conservation Plan

Review and Approval.

- a. Regional water planning councils shall submit recommended regional water development and conservation plans to the Director. The Director will review recommended regional water development and conservation plans and any amendments thereto to determine if they are consistent with the rules for regional water planning and guidance adopted pursuant to those rules. The Division will then take one of three actions:
  - i. Adopt a recommended plan if it is complete and consistent with the provisions of the rules for regional water planning and guidance adopted pursuant to those rules; or
  - ii. Advise the regional water planning council as to additional measures that should be taken to complete a recommended plan and make it consistent with the provisions of the rules for regional water planning and guidance adopted pursuant to those rules; or
  - iii. Adopt a recommended plan with conditions.
- b.

For any water planning region for which a recommended plan is not submitted by the date specified in the guidance for plan development, the Director shall prepare the regional water development and conservation plan and identify management practices as described above.

- c. Upon adoption, the Director shall use the water development and conservation plans to guide decisions regarding permitting. Plans will also guide state grants and loans from the Georgia Environmental Facilities Authority for water-related projects within that water planning region.
- 9) Future revisions of water development and conservation plans shall follow the rules and guidance developed pursuant to this plan and meet the criteria listed above.

## Implementation of Regional Water Planning

Implementation of the comprehensive statewide water management plan will be accomplished through regional water planning, which will produce resource-based plans that identify the management practices to be implemented in each water planning region. Selection and implementation of management practices on a local and regional level is the most effective way to ensure that current and future needs for water supply and assimilative capacity are met.

As described in the preceding chapter, regional water planning will require delineation of boundaries for resource assessment and boundaries for regional water planning; assessment of water supply capability and assimilative capacity; designation of water planning councils; forecasting of water and assimilative capacity needs; and preparation of water development and conservation plans. Each of these steps are outlined below. This section concludes with a brief discussion of information needs and timeframe for regional planning.

### ***Boundaries for Resource Assessment and Regional Water Planning***

Regional planning will require that two kinds of geographical boundaries be established. First, hydrologic boundaries will be required to divide river basins and aquifers into units that can be individually assessed for water supply capability (i.e., sustainable yield) and assimilative capacity.

For surface water sources, boundaries for water quantity assessment need to be of sufficient size to include major water sources, include the significant influences on the condition of those water sources, and provide flexibility in selection of water management practices to be employed by water users within the boundary. Delineation of boundaries for assessment of resources will also have to consider availability of data on current and historical flow patterns and/or nodes appropriate for estimation of historical flow patterns. For groundwater sources, delineation of boundaries may consider recharge areas, areas of heaviest use and major zones of influence, and discharge areas.

Boundaries for water quality assessments will most likely be nested within the larger boundaries used for the water quantity assessment. Water quality assessments will require delineation of sub-basins or watersheds of an appropriate size for water quality modeling. The sub-basins or watersheds will be based on significant hydrologic features such as dams. These hydrologic features will provide boundaries for water quality modeling purposes. Delineation of boundaries for water quality assessment will also consider the complexity and number of point source discharges in a watershed.

The second set of geographical boundaries will delineate county-based water planning regions that reflect hydrologic boundaries. EPD, in consultation with DCA, will develop an initial proposal for water planning regions. After review and comment by local governments, water-related interests, and the general public, EPD will revise the proposed water planning regions and finalize the boundaries for regional planning, in consultation with DCA.

When developing the initial proposal for water planning regions, EPD will start with the resource assessment boundaries described above, but will adjust those boundaries in light of practical considerations. Most water management practices will be implemented by cities, counties, and water/sewer authorities, so planning boundaries will be aligned with jurisdictional lines. EPD will also consider existing infrastructure, surface-groundwater interactions, the extent of the geographic area that may impact a water source, and other factors.

Some localities may rely on, or impact, water resources being addressed by different water planning councils. The process for delineation of water planning regions will provide flexibility for those localities, and representatives of those localities will be able to participate in preparation of more than one water development and conservation plan. If this proves too burdensome or costly, a jurisdiction should participate in preparation of the WDCP addressing the resource or resources that jurisdiction most affects.

Decisions about what planning region is most appropriate for individual localities should be guided by an assessment of the resources to which they are linked and the resources on which they are likely to place stress.

Water planning boundaries must be consistent with the statutorily-defined boundaries of the Metropolitan North Georgia Water Planning District (the District). The District's cities and counties, however, will not be precluded from participating in contiguous Water Planning Councils. Localities in the District will be eligible to participate in more than one regional plan, with their participation again guided by assessment of the resources to which they are linked and the resources on which they are likely to place stress.

A water development and conservation plan will be developed for each planning region. Water planning regions may encompass several water sources, each with a distinct resource assessment. The WDCPs developed for these planning regions will address each of the water sources within the region's boundaries, starting from the water quantity and water quality assessments that EPD will conduct for individual water resources. As described in section 6 of the preceding chapter, these assessments will produce estimates of water supply capability, or sustainable yield, and assimilative capacity for each water resource.

## ASSESSMENT OF RESOURCE CAPACITY

### ***Water Quantity Resource Assessment***

For each major water source, EPD will assess the quantity of water that source can yield, under current conditions of development, without causing negative impacts to the source or to opportunities for water use. This amount of water can be called the sustainable yield.

Determination of sustainable yield for surface water sources will include assessments of historical flows and flow patterns, currently as well as post-development. These determinations will consider the factors that influenced historical stream flows, such as the location, size and operational policies of water storage facilities, water withdrawals, and water returns.

EPD will develop, or contract with others to develop, hydrologic planning tools that can be used to calculate the impact of various water management practices on consumptive use and sustainable yield of surface water sources. These hydrologic planning tools will be based on mathematical models. The variables used in the models, including the locations of nodes, desired flow regimes, and the consumptive use impacts of various management practices, will be developed by the EPD with appropriate input from technical professionals and in consultation with water-related interests from all sectors across the state.

To determine the sustainable yield of groundwater sources, EPD will consider the major factors that influence the quantity of water that can be sustainably pumped from an aquifer. Some of the major factors include aquifer recharge rates, inter-aquifer leakage, and aquifer/surface interactions. The EPD will give considerable attention to the effect of current withdrawals on aquifers and the streams that are fed by the aquifers, especially in areas where drops in groundwater levels have limited the availability of water for some users or have contributed to saltwater intrusion.

For some aquifers, however, future increases in withdrawals that can be reasonably expected are highly unlikely to have unacceptable adverse impacts on the aquifer, and it will not be possible to evaluate sustainable yield within reasonable time and cost constraints. Management of these aquifers will focus on targeted, recurrent monitoring of aquifer response to withdrawal to provide early warning of any adverse effects.

The EPD will determine the sustainable yield of aquifers using input from hydrogeologists, engineers, biologists, and experts from other related fields. The EPD will create advisory bodies for consultation with water-related interests in all sectors and enter into contractual arrangements as necessary to complement the expertise of EPD staff.

### ***Water Quality Resource Assessment***

Assessment of the capability of waters within a watershed to assimilate pollutants will require water quality modeling. The initial step will be the development of steady state tabletop water quality models using conservative assumptions and existing data and information. The second step in the process is to forecast the flows and location of proposed discharges in the water planning region. Water planning councils will compile this information, which should include flow projections and proposed discharge locations for wastewater treatment plants. EPD will use this information in the water quality models to determine permit conditions to assure compliance with water quality standards within a given water planning region.

In some watersheds, the assimilative capacity may not be adequate to support the projected needs and/or very stringent treatment levels may be predicted by the tabletop models. For these areas, it may be advisable to collect water quality data to calibrate the models. This step will require additional time and resources, but will result in more defensible water quality models. Similarly, modeling of some watersheds may be complicated by variable hydrologic features such as the release from a dam, multiple point sources, and/or requirements for very substantial investment in infrastructure. For these areas, steady state models may be inadequate and hydrodynamic water quality models will be needed. These models may initially be tabletop models; however, it is likely that the decisions to be made will warrant the collection of water quality data for use in calibrating the hydrodynamic models.

EPD will develop – or contract with others to develop – the water quality models to be used to determine permit conditions to assure compliance with water quality standards. A number of mathematical modeling assumptions and decisions are required in constructing water quality models, all of which shall be made under EPD's purview with input from technical professionals and in consultation with water-related interests in the planning region.

### ***Review and Revision of Resource Assessments***

Water quantity and water quality assessments may be reviewed and, potentially, revised as the statewide water management plan is revised pursuant to O.C.G.A §12-5-525(c). As described in the preceding chapter, monitoring will be enhanced to track the condition of water resources, including indicators of sustainable water use and physical, chemical, and biological integrity. Results of that monitoring will be used to refine the judgments and projections in the resource assessments. If new information indicates that desired flow regimes are not being met, for example, the EPD may need to revise the water quantity resource assessment. Likewise, if data indicates that waters violate water quality standards, effluent limitations may be revised.

## WATER PLANNING COUNCILS

As set forth in section 6 of the preceding chapter, the principal goal of the resource assessments is to support the development of regional water development and conservation plans (WDCPs). These WDCPs will specify the most appropriate water management practices for each water planning region and include plans for the implementation of these practices. When adopted by the Director, WDCPs will guide EPD's water permitting and use of state grants and loans.

EPD, in consultation with DCA, will designate a water planning council for each planning region, which will be responsible for developing a recommended water development and conservation plans. Preparation of WDCPs provides an opportunity for regional leadership in identifying and selecting the water management practices that are most in keeping with local goals and capabilities. Water users will be able to participate in creating the plans that will guide their actions in the future. EPD's view is that the best plan is one developed by local governments and water-related interests in each water planning region; these plans can be more timely and reflect the region's unique characteristics, leading to more effective implementation.

For each water planning region, the Director will provide guidance specifying the water use sectors and water-related interests that, at a minimum, shall be represented on the water planning council. Guidance will also include qualifications and criteria for selection of council members. The Director will accept nominations of candidates for each water planning council and, in consultation with DCA, designate council members based on that guidance.

Water planning councils will operate using procedures specified in memoranda of agreement with EPD. Water Planning Councils will have to draw on appropriate technical expertise, ensure that stakeholder perspectives and input are incorporated during plan development, and have explicit decision making processes. As described in section 14 of the preceding chapter, operating memoranda of agreement should specify procedures for decision making, public sector involvement in plan preparation, and stakeholder and public participation. Memoranda of agreement may also be expected to address provisions for collaboration or partnerships with existing water-related organizations and institutions in the water planning region, provisions for consultation or coordination with adjoining WPCs, and conflict of interest provisions. Required elements will be specified in guidance from the Director.

EPD will work with each WPC to develop contracts and scopes of work for services in support of planning. EPD will prepare a

generic request for proposals (RFP), which water planning councils may tailor to the water resources, water users, and planning issues in each water planning region. EPD will work with each water planning council to develop RFPs and scopes of work appropriate to the water planning region and will execute contracts for the agreed-upon services.

## WATER DEVELOPMENT AND CONSERVATION PLANS

### *Forecasting Future Water and Assimilative Capacity Needs*

As the first step in preparing water development and conservation plans, and in consultation with EPD, WPCs will be responsible for converting regional population and employment forecasts (provided by the state) into forecasts of water supply needs and assimilative capacity needs. Water planning councils will then be responsible for comparing their forecasts with the findings in EPD's water quantity and water quality assessments and identifying the management practices that can be implemented to meet the region's water resource needs.

EPD, in consultation with DCA, technical experts, local governments, and water-related interests, will develop a standard methodology and provide guidance for forecasting future water supply and wastewater discharge needs. This standard methodology will include consideration of regional population and employment forecasts. To support these regional forecasts, EPD will seek the oversight of the Department of Community Affairs and other appropriate state resources in the development of statewide population and economic forecasts. The State will begin developing this statewide forecast soon after the adoption of the statewide water management plan.

Once a standard methodology is established, water planning councils, with support from contractors, will develop regional forecasts of water supply needs, wastewater discharges, and stormflows for the hydrologic units within the water planning region. Water planning councils should work cooperatively with the Department of Community Affairs, regional development centers, local governments, and other entities that compile relevant data or have recently developed projections. WPCs should also allow the public to review the forecasts as they are developed. In consultation with DCA, EPD will review forecasts for consistency with guidelines and criteria before detailed planning of management practices is undertaken.

### *Preparation of Recommended Water Development and Conservation Plans*

Once forecasts are finalized, the water planning councils, with contractor support, will be responsible for completing

recommended Water Development and Conservation Plans (WDCPs), following EPD guidance, and submitting them to the Director for adoption. These management plans will specify the practices to be implemented by water users, including cities, counties, authorities, and others, to protect water quality and manage water supply, wastewater, and stormwater. Plans will also specify implementation responsibilities and funding mechanisms. When appropriate, WDCPs may specify that non-governmental entities and public-private partnerships will implement certain management practices.

Water conservation will be a priority for implementation in all water planning regions. Plans will specify the water conservation measures to be implemented in the water planning region, pursuant to section 8 of the preceding chapter and the water conservation implementation plan described there.

When communities within a water planning region utilize multiple water sources, whether surface water or groundwater sources, WDCPs will address the management of all sources. In coastal areas, plans should also address the protection of estuarine resources. When appropriate, WDCPs should build on or integrate existing management plans, such as local water and sewer plans and watershed protection plans. Plans should also draw on TMDL implementation plans and may prescribe additional monitoring and assessment to improve information on the sources of pollution that contribute to water quality impairment. Plans could also address other improvements in the information on cumulative water use and resource capacities (e.g., inventory of water withdrawals that fall below permitting thresholds and/or decentralized water and wastewater treatment systems).

The plans should also address the projected impact of water management practices on adjacent water planning regions. For areas contiguous to the Metropolitan North Georgia Water Planning District, updates of the District plans will ultimately be based on resource assessments and regional forecasts developed with the same methodology used in other planning regions. Future revisions of the District's plans will also be subject to the same regional planning guidance that as the water development and conservation plans. This consistency will allow coordinated planning for contiguous areas and evaluation of impacts on shared water resources.

EPD will prepare guidance on the preparation of WDCPs by WPCs. The guidance will provide WPCs with the results of the EPD's water resource assessments for each water source in the water planning region, which will serve as a basis for water management decisions. The guidance will address specific water management practices and how they can affect overall water quality and water quantity. Guidance will also include a schedule for the preparation of plans, which will include specific tasks and milestones in the planning process.

The milestones will provide designated points for preliminary review by the EPD, so the Division can ensure that the plan development is proceeding consistent with guidance. The exact schedule for completing tasks and reaching milestones will vary among the WPCs, depending on the availability of information and the status of water resources in the water planning region. Schedules for WDCP development will also depend in part on State completion of resource assessments and statewide population and economic forecasts.

Plans shall include benchmarks for evaluation of plan effectiveness. EPD guidance will include an initial set of evaluation metrics and WPCs may adapt these metrics if supported by a specific rationale. Plans will be revised on a three year cycle, consistent with O.C.G.A. §12-5-525(c).

WPCs should seek the involvement of those who will be affected by the plan set forth in the WDCPs, so that future conflict can be avoided as much as possible. Documentation of the WPC's deliberations and decisions shall be available to the public, and opportunities for public and stakeholder involvement shall be provided throughout preparation of the WDCP. WPCs should also cooperate with adjacent WPCs through joint work sessions, planning conferences, inclusion of representatives from adjacent WPCs, the creation of advisory committees composed of representatives from several water planning regions, or other collaborative methods.

EPD oversight of forecasts and plan development are also mechanisms to decrease the need for formal dispute resolution processes. In some cases, formal mediation or related approaches may be useful in resolving disputes during plan development or implementation. DCA provides information on alternate dispute resolution and mediation to assist in local and regional comprehensive planning, and this information is a resource potentially useful in regional water planning as well. In addition, EPD permitting processes will be a primary mechanism for implementation of WDCPs. These processes provide opportunities for public comment on specific permits as well as mechanisms for appealing a permit or other legal action.

EPD staff will work actively with the WPCs to support preparation of water development and conservation plans. EPD will provide the WPC with a complete inventory of permit holders (withdrawal, wastewater discharge, stormwater discharge, large and small drinking water systems). EPD may designate liaisons to each WPC, who could work to ensure the compatibility of plans for adjacent water planning regions, and who could also coordinate WPC interactions with Water Council agencies beyond EPD as needed. EPD will also work with other state agencies and partners to coordinate education, outreach and technical assistance in support of regional planning and implementation of WDCPs.

### **Adoption of Water Development and Conservation Plans**

Recommended WDCPs will be submitted to the Director by the water planning councils. Plans will be evaluated by the EPD according to procedures outlined in guidance for plan preparation. Each plan must meet three overarching criteria:

- Is consistent with the vision for water management established in Georgia law;
- Will ensure that long-term needs for water use and water protection in the water planning region will be met; and
- Will not cause undue adverse impacts on water users or water uses.

If a plan meets these criteria, is consistent with that guidance, and does not have significant incompatibilities with plans for adjacent or hydrologically-connected planning regions, it will be adopted as submitted. If a WDCP cannot be adopted as submitted, EPD will work with the WPC to identify the actions required to make the plan consistent with guidance and these criteria. Once those actions are taken, the plan will be adopted.

If a water planning council fails to take these steps within a specified timeframe, EPD will take the steps necessary to add the conditions required to make the plan consistent with guidance. EPD will then adopt the plan with conditions.

Given resource constraints, it is likely that WDCPs will be completed in some parts of the state before they are completed in others. If a submitted WDCP may have impacts in water planning regions for which WDCPs have not yet been adopted, EPD may adopt the plan on a contingent basis, or only adopt it in part, pending completion of WDCPs in adjacent regions.

### **INFORMATION NEEDS, TIMETABLE, AND BUDGET DEVELOPMENT**

Regional planning will require completion of a number of tasks related to the assessment of water supply capability and assimilative capacity. Many of these tasks entail the analysis and evaluation of information on water quality and water quantity. Based on these evaluations, management practices (i.e., actions and activities) will be selected and implemented to ensure future reasonable uses of water resources in beneficial and sustainable ways. Implementing the management practices required to meet this goal may have significant cost and behavior implications for both direct and indirect users of Georgia's water resources.

Protection of our water resources, and the cost and characteristics of our management practices, are dependent on the quality of the information available for management decisions. Given this dependence, it is imperative that we

regularly collect the range of water quality and water quantity information needed to make informed water management decisions. Some information on the condition and use of Georgia's water resources is currently available through programs operated by EPD or by the United States Geological Survey (USGS) under contract with EPD. Programs that provide information that can support resource assessments and regional water planning include the following:

- Georgia Water-Use Program, which captures periodic water withdrawal data reported to EPD by holders of non-agricultural withdrawal permits;
- HydroWatch Monitoring Network, which records streamflows and rainfall at intervals for stations throughout the state;
- Stream Water Quality Ambient Monitoring Network, which provides stream water quality data from monitoring stations statewide; and
- Groundwater Monitoring Network, which measures and displays water levels and water quality data from wells across the state.

Water resource assessments, to be initiated in 2008, will provide an opportunity to build on and improve the available information. These assessments will also require periodic updates, allowing incorporation of additional data and information for areas where the current information base has gaps or weaknesses. Additional information will be needed to refine four types of analysis: forecasts of water and wastewater needs, water quantity resource assessments for surface water sources, water quantity resource assessments for groundwater sources, and water quality resource assessments.

A comprehensive monitoring plan will be needed to address generally acknowledged weaknesses in the information base available for these analyses. One weakness is the paucity of information on the quality of waters throughout Georgia. Assessing the future assimilative capacities of our streams, and designing management practices that will allow sustainable use of those capacities, will depend largely upon collecting the data needed to characterize stream conditions. A second weakness is a lack of information on surface water flows, groundwater levels, and the water use that these can support in a sustainable manner. These weaknesses can be partially addressed by establishing a more comprehensive statewide network of surface water and groundwater monitoring stations. More monitoring sites are needed to ensure the data are available to assess the capabilities of water resources, and to assess the impact that increased use in some areas might have on those who share the resource.

Periodic updates of water resource assessments will provide an understanding of changes in the condition and status of water resources, an opportunity to measure and report on progress, and information to ensure that we meeting water use and

environmental objectives.

Accomplishing all of this will require a comprehensive water monitoring plan that defines what information is needed; where, when, and how such information is to be collected; and what entities shall assume responsibilities for collection, management, and use of this information. This monitoring plan, and the cost of implementing it, will be closely related to the contents of the comprehensive statewide water management plan to be submitted to the Legislature in January 2008.

As the Water Council refines the draft comprehensive statewide water management plan in the months approaching December 2007, EPD will establish a scientific advisory board, and coordinate with the Georgia Water Resources Institute at the Georgia Institute of Technology, to assist in design and review of a comprehensive assessment and monitoring plan, with associated budget. The comprehensive assessment and monitoring plan will be designed to support resource assessments, regional planning, and implementation of the comprehensive statewide water management plan.

It is expected that state funding to support implementation of the comprehensive statewide water management plan, including funding for work by EPD, other state agencies, and contractors, will be developed as part of the Governor's FY09 budget proposal. Preparatory work in FY08 would include delineation of water planning regions, designation of water planning councils, and development of initial RFPs and scopes of work for services in support of preparation of WDCPs.

Contingent on funding, activities in FY09 may include development of guidance for resource assessments, guidance for forecasting water supply and wastewater needs, and guidance for preparation of water development and conservation plans. Contracting for services in support of regional planning, development of resource assessments, and forecasting of water supply and wastewater needs may be initiated in FY09, with early drafts of recommended water development and conservation plans completed for some water planning regions in FY10. Again contingent on funding, adoption of WDCPs for all water planning regions may be completed in FY11.