



# A Sustainable Approach to Water Supply and Use in Rhode Island

Initial Findings and Recommendations

*Hunt River nearly stops flowing. August 2005*

## Coalition for Water Security

April 2006

# About the Coalition for Water Security

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The Coalition for Water Security was formed to address water supply issues in Rhode Island. Clean, affordable water is critical to the health and well being of our state. Rhode Islanders need clean water to drink, sufficient clean water in the state's streams, lakes, and wetlands to support healthy ecosystems, and sufficient water for economic development. The Coalition for Water Security supports legislation to develop a coherent, comprehensive water policy for the state.

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*(n.b. These groups have not reviewed this report).*

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Narrow River Preservation Association  
Sierra Club of Rhode Island  
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# Executive Summary

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The Coalition for Water Security's initial findings indicate that Rhode Island, in addressing water supply and use issues in Kent County and statewide, needs to focus its efforts in three major areas:

- **Efficiency of water use** – Inefficient and non-essential uses of water are increasing system costs and imposing unnecessary burdens on the environment. Planning, incentives and regulations for more efficient use and reuse of existing water resources should be implemented without delay.
- **Environmental protection** – Current water withdrawal practices present serious threats to the state's surface waters and wetlands. Protective environmental guidelines need to be developed and put in place.
- **Coordinated management** – The current water management structure in the state needs to be evaluated, and a more coordinated, systematic approach that begins at the state level and extends to regional and local levels needs to be devised.

## Kent County Water Challenges

With specific reference to water supply management in Kent County, the Coalition's research indicates that:

- As a result of residential outdoor water use, summer water use is twice that for the rest of the year. Any shortage of water in Kent County for economic development and other essential uses results directly from the excessive use of potable water to irrigate lawns.
- The Kent County Water Authority's (KCWA) efforts to address water demand have been thwarted by the Public Utilities Commission's unwillingness to approve funding to support education and enforcement programs essential to implementing its Water Conservation Action Plan.

- The environmental situation in the Hunt River is critical, and standards defining minimum flows in the Hunt River that would be protective of the aquatic environment have not been adopted.
- Withdrawals continue from the Hunt River from three independent water suppliers without coordination and balancing of competing demands, protective environmental standards, or a means to optimize withdrawal patterns across the various available supply sources at critical times.
- Opportunities are available to the Quonset Development Corporation (QDC) to demonstrate how wastewater can be reused beneficially.

## Statewide Water Challenges

From a statewide perspective, the Coalition's initial research indicates that water supply policies, operations, and regulations are fragmented and not coordinated among the multitude of independent water authorities and state agencies involved.

Additionally, plans for commercial and residential development typically proceed without adequate consideration of the available water supply in the area or cumulative impacts of withdrawals from a common source.

## Recommendations

Based on these findings, the Coalition for Water Security recommends that:

1. The General Assembly should establish a study commission to examine existing and emerging water resource conditions in all regions of the state, best use practices, and environmental protection options, and to develop recommendations on how to achieve a statewide coordinated management system.
2. The Public Utilities Commission should allow the KCWA to use ratepayer funds to advance

its well-conceived conservation program – by far the most cost effective way to meet water needs.

3. The General Assembly should direct the Department of Environmental Management to set protective standards for the Hunt River by no later than July 2006.
4. The Water Resources Board should act as an allocation authority for the Hunt River withdrawals, and must have adequate enforcement powers.
5. The Quonset Development Corporation should take the lead in demonstrating beneficial wastewater reuse practices at Quonset Point.
6. The Kent County Water Authority should develop groundwater wells in the Big River Management Area, and not pursue the development of a reservoir in this area at this time.

## Introduction

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How water is supplied and used have critical ramifications for environmental protection and restoration efforts, and for achieving economic development goals. As the current water supply issues in Kent County exemplify, there is a growing need to examine carefully, from both a regional and statewide level, how we plan for, make and implement choices about water supply.

Over the past few months, members of the Coalition for Water Security have been actively engaged in gathering and discussing information pertaining to the water supply and use situation in Kent County, as well as broader statewide concerns. This report summarizes the Coalition's initial findings, along with its recommendations for immediate actions.

**The information in this report is organized and presented from these two perspectives: 1) Water management in Kent County, and 2) Statewide water use and supply issues. Imbedded in the report are three recurring topics:**

- **Efficiency of water use**
- **Environmental protection**
- **Coordinated management**

These are the subject areas the Coalition has concluded the state needs to focus on in finding the right solutions for meeting Rhode Island's water needs and protecting the state's natural resources. Taking appropriate actions now in these areas is critical to the state's future water security.

## Water Supply Management in Kent County

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### Current Status

To the extent that there is an actual or potential immediate water shortage in the Kent County Water Authority (KCWA) service area, it will occur only at times of maximum demand and only in the High Service Area. (T. Brown testimony, 29 March 2006). The KCWA appears to be taking all reasonable steps to increase supply in the intermediate term (two to four years), by obtaining an additional 5 million

gallons of water per day (MGD) from the Providence Water Supply Board (PWSB), piloting water treatment for manganese-containing water from the Mishnock wells and increasing pumping capacity for the High Service Area. KCWA's 2004 Water Conservation Action Plan sets out an excellent and ambitious approach to demand management, but few elements of this plan have been implemented.

A modest beginning, a KCWA newsletter to consumers to encourage more effective use of outdoor water, was blocked by the unwillingness of the Public Utilities Commission (PUC) to allow use of ratepayers' funds for this purpose.

The daily maximum demand determines the size of necessary infrastructure of any water system, to allow adequate supply and storage for fire control. Summer demand in the KCWA service area is double the average daily demand and is approximately 150% of the winter demand.

**Since more than three-quarters of the increased demand results from the residential outdoor use of water, no significant reduction in the summer peak is possible without reducing the amount of water used for residential lawn irrigation.**

KCWA's current approach of alternate-day watering does not appear to have reduced demand significantly, so further action is required. Fortunately there are models for effective reduction in outdoor water use. Acton, MA reduced their summer peak by half with the following program, enhanced by an intensive education and enforcement program:

- Even numbered houses may use water outdoors on Tuesday, Thursday and Saturday.
- Odd numbered houses may use water outdoors on Wednesday, Friday and Sunday.
- No outdoor water use on Mondays.
- No lawn watering from 7am to 7pm

KCWA could institute such a program this summer, but lacks the funds for effective education or enforcement, because the PUC apparently does not view these as allowable expenses. **Our Coalition believes that this Commission should recommend that expenses of an effective water conservation program should be an allowed expense from ratepayers' funds.**

One option might be a legislative authorization in this session for ratepayers' funds to be used for any water conservation program that has been approved by the Water Resources Board

(WRB). Since such an authorization need not require PUC approval, an effective program could be implemented this summer, if necessary. A longer-term option might be legislative instruction to the PUC to act promptly to approve the funding of conservation programs.

KCWA's 2004 Water Conservation Action Plan includes a number of programs that have been effective in other jurisdictions, such as requiring the use of soil moisture sensors with automatic lawn watering systems and the installation of automatic meter reading equipment to allow seasonal rates and monthly billing. If expenses for these programs are allowed, KCWA might reach their goal of serving as a model for other water supply systems as they implement water efficiency programs.

## Environmental Protection

In August 2005, an average of 4.8 million gallons per day (MGD) was withdrawn from the Hunt River basin by public water suppliers: 1.1 MGD by KCWA, 3 MGD by North Kingstown (NK) and 0.8 MGD by the Quonset Development Corporation (QDC). As a direct consequence of this withdrawal, for nearly half of August, the flow in the Hunt River was at or below two cubic ft./sec. and fell to 10% of the average August flow (1.1 cubic ft./sec.). While the summer of 2005 was relatively dry, it never reached the stage of drought advisory, the lowest level of drought designation. The two cubic ft./sec flow is only a quarter of the lowest natural flow that would be expected for the driest week in a ten-year period (the 7Q10) – far too low to be protective of the aquatic environment.

For 2006, the KCWA has the ability and has indicated the intention to withdraw 2 MGD from their Hunt River well. This level of withdrawal in August 2005 would have nearly stopped all flow. Add to this the fact that the QDC Master Plan calls for *tripling* their withdrawals from the Hunt River. Further, since that master plan was developed, QDC has been working to attract a biotech firm that will have major water requirements, perhaps as high as 2 MGD. **We view the environmental situation in the Hunt**

**River as critical, requiring immediate attention from the legislature and action by DEM and the WRB.**

Currently there are no standards that define the minimum flows in the Hunt that would be protective of the aquatic environment. DEM has the legal authority to adopt such standards, but its current practice is to set flow standards only on a case-by-case basis, *after* an application is made for a new well. As a consequence, because there is no pending application for a new well in the Hunt River, the DEM has set no protective standards for the Hunt, despite the low flows in the river and the projected substantial increases of withdrawals. The USGS has completed a detailed study of this river basin, so high quality information is available for use in setting standards. **We believe that this Commission's report should recommend legislative direction to DEM to set protective standards for the Hunt River by no later than July 2006.**

At present, withdrawals from the Hunt by KCWA, NK and QDC are uncoordinated. Each supplier is withdrawing according to its needs and without any balancing of the competing demands of the other suppliers. Uninformed by environmentally protective standards, suppliers have had no guidance on what action is necessary on their part to protect river flows. Nor does there appear to be any optimizing of withdrawal patterns across the various supply sources available to the water suppliers.

According to the Providence Water Supply Board, there is no reason that the KCWA could not draw more of their allotted Scituate water during the summer months, thus reducing KCWA withdrawals from the Hunt at a time when that river is most stressed.

The Water Resources Board has the unique authority to allocate water (RIGL 46-15.7-1(b)(4)), and to coordinate such withdrawals in a way to protect the environment. In 2001, the USGS completed a modeling study of the Hunt-Annaquatucket-Pettaquamscutt basin that demonstrated that coordinated management of the wells in this basin could relieve the stress on

the Hunt, but this option has largely not been implemented. **This Commission should determine whether the WRB needs a more specific legislative directive to begin allocation in the Hunt River, and if so, this Commission should recommend such a directive be provided in time to relieve stress this summer.**

It is important that the Mishnock well field is brought back into operation as expeditiously as possible, and KCWA has that process underway. When treatment facilities for water from the Mishnock are completed, we believe that water from this source should be used, at least in the summer months, to replace water now taken from the Hunt, thus reducing the pressure on that stressed river system. **The WRB, under its allocation authority, should ensure that Mishnock well water is used to reduce demands on the Hunt River at critical times.**

While the WRB's authorizing legislation unambiguously assigns allocation authority, there is less clarity on the powers of the WRB to enforce allocation decisions. **This Commission should determine whether the WRB has legal authority to enforce allocation decisions in the Hunt River. If it does not, the Commission's report should recommend legislation to authorize adequate enforcement powers.**

**The QDC, as a quasi-state agency, should take the lead in demonstrating how wastewater can be reused beneficially.** The QDC and NK could relieve some of the pressure on the Hunt by using treated wastewater from the QDC treatment plant to irrigate the NK golf course. This practice could reduce QDC's withdrawal from the Hunt during the summer by 150,000 gallons/day.

**Developing Water Resources in the Big River Management Area**  
Our Coalition supports the development of groundwater wells in the BRMA and we are participating in the drafting of a request for a consultant to plan for this development.

It is critical for DEM to define clearly what information will be needed to set environmentally protective flow and groundwater level standards for the BRMA, so that this information can be provided by the consultant and facilitate an efficient permitting process.

**This Commission's report should make clear to DEM that a list of necessary information for licensing wells in the BRMA be provided to the WRB promptly.**

We have examined the engineering report used by KWCA to demonstrate a supply shortfall in the high service area and thus to argue for the

construction of a reservoir. We find that the maximum day demand projected for Amgen is nearly triple the maximum demand that Amgen expects (a difference of 1.3 MGD). Maximum demand for single-family residences similarly is over-estimated, by approximately 100%. While new development in the Kent County region doubtless in time will require additional supply, it does not appear that the issue is as urgent as it has been presented. **Our Coalition does not recommend further investigation of a reservoir in the BRMA at this time.**

## Statewide Water Supply Issues

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### General Findings

The issues and concerns raised during the hearings conducted by the Joint Legislative Commission to Study All Aspects of the Kent County Water Authority, and the approaches being recommended by the Coalition to address the Kent County water situation, are applicable statewide. Requirements to ensure efficiency of use, establish environmental protection measures to safeguard water flow in our surface waters and wetlands, and coordinate withdrawals from common sources, are themes inherent in statewide water supply and use issues.

Currently there are some 480 independent water authorities statewide, and four primary state agencies (Water Resources Board, Department of Environmental Management, Public Utilities Commission, and Department of Health) working on water supply related matters, resulting in a fragmented, uncoordinated approach to water supply policy, operations, and regulations.

There are no environmental standards that clearly define how much water can safely be withdrawn from aquifers without jeopardizing the environmental integrity of surface water and wetland ecosystems. Lacking guidance from such standards, water suppliers are withdrawing at levels that are stressing these systems. The Hunt

River and the Chipuxet/Mink River basins are examples of such stressed systems.

On a statewide basis, coordination is needed between economic development initiatives and water supply planning. Plans for commercial and residential development typically proceed without any consideration of the available water supply in the area or cumulative impacts of withdrawals from a common source. *[Information relayed to Coalition by Dan Varin, RI Water Resources Board at January 9, 2006 meeting.]* Once development is in place, the focus is on developing new water sources to meet increasing water demands without enacting effective requirements for using potable water efficiently or replenishing streams and aquifers.

The recommended approaches outlined above for Kent County for establishing measures to ensure efficiency of use, setting environmental protection standards on a basin specific basis to protect aquatic ecosystems, allocating appropriate withdrawal levels, and coordinating the activities of major water suppliers need to be taken in other areas of the state as well. At the same time, communications from residents in areas outside of the Kent County area indicate there are particular water supply and use issues and concerns in other regions. For example, Prudence Island is facing a threat of saltwater intrusion. Each area poses unique challenges for

accommodating growth and protecting natural resources. There is a growing need to consider carefully how we approach water management from a statewide as well as regional and local perspective. And there is a clear need for a comprehensive, coordinated approach to water supply and use in the state.

### Recommendation:

Establish a legislative study commission to begin work in mid 2006 on statewide water supply and use issues. The focus of the commission's work should be on developing recommendations to achieve a statewide coordinated water management system, and should address the following areas of study:

- Existing and emerging conditions in regions of the state
- Incentives and regulations to reduce waste and control demand
- Environmental protection
- Coordinated management

### Existing and Emerging Conditions

The legislative study commission should begin its investigation with a statewide survey of regional water supply issues and concerns, with priority attention being placed on areas where water supply sources are close to or beyond environmentally sustainable yields. (Examples: Chipuxet-Mink aquifer, Prudence Island.) Survey information should focus on identifying existing sources and water demands; potential economic and population growth; stressed river, streams, and wetland ecosystems, and possible threats to drinking water quality.

### Reduce Waste and Control Demand

The study commission should research best methods to implement water use efficiency, wastewater reuse requirements, and replenishment strategies utilized in other states. Particular attention should be paid to approaches aimed at limiting outdoor use of potable water. While the WRB has the responsibility to oversee water conservation, it does not appear to have the authority to ensure that best conservation

practices are put in place. The commission should recommend the necessary amendments to the WRB's authorizing legislation to allow it to carry out its conservation responsibilities. The PUC has been unwilling to allow use of ratepayers' funds for implementing conservation plans, and an effective legislative instruction to require them to do so should be identified.

### Environmental Protection

The study commission needs to conduct a careful investigation of the methods currently being employed by DEM to provide stream flow protection, particularly in stressed basins and at critical times in natural cycles. This investigation needs to include a review of how existing regulatory authorities are being applied, and if additional regulatory authorities are needed.

The study commission also should review the status of information critical to establishing environmentally sustainable yields and assessing the impacts of current withdrawals within water basins. This information review should include an assessment of the adequacy of existing stream flow data, and water withdrawal reporting.

### Coordinated Management

How to achieve a more integrated, coordinated water supply system should be at the core of the study commission's scope of work, with emphasis on investigating various means of establishing a more centralized approach to water supply management. Options to assess include creation of a centralized management agency, creation of regional agencies, and oversight of existing suppliers by a state agency.

From a statewide perspective, the study commission should also address how to better integrate economic development and land use decisions with water supply availability, focusing on how to better coordinate the related activities of state agencies, quasi-state entities, and local boards, councils, commissions, and authorities. Development of a coordinated water supply system should also entail plans on how to best implement state policies and plans at the local and regional levels.

# Summary

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Major conclusions drawn from the Coalition for Water Security's initial work include the following:

- **Water supply and use needs to be examined from a statewide perspective.** The issues and concerns raised in the Kent County situation exist or are emerging in other regions of the state as well, along with particular concerns related to particular areas. Water supply and use is critical to our state's future and needs to be addressed comprehensively.
- **Efficient use of existing water resources needs to be a high priority.** The emphasis has been on developing new, and more costly water supply sources without serious consideration of measures aimed at making more efficient use of existing resources.
- **Current water supply practices present serious threats to the state's surface waters and wetlands.** Water supply needs must be met in accordance with protective environmental guidelines in order to preserve the state's most valuable assets – its natural resources.
- **Coordinated water management is needed.** There is an urgent need to evaluate the strengths and weaknesses of the current water management structure in the state, and devise a more coordinated, systematic approach that begins at the state level and extends to regional and local levels as well.