COMMONWEALTH OF MASSACHUSETTS

Toward Financial Sustainability

Water Infrastructure Finance Commission
Initial Report

June 29, 2011

The Commission will be submitting its final report in the fall of 2011

This document has been prepared for the Water Infrastructure Finance Commission of the Commonwealth of Massachusetts, pursuant to Section 145 of Chapter 27 of the Acts of 2009.

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"When the well is dry, we know the wealth of water."
Benjamin Franklin

Massachusetts' water infrastructure – its drinking water, wastewater, and stormwater facilities – is integral to the Commonwealth's economic, environmental and cultural vitality. Maintaining existing infrastructure, meeting new regulatory requirements aimed at protecting public health and water quality, as well as supporting economic development and growth creates a large and growing demand for investments in water, wastewater, and stormwater infrastructure.

If you've ever experienced a disruption in water or sewer service, you are quickly reminded of the inconveniences and urgencies posed by these sudden interruptions; reminded that water systems are vulnerable and easy to take for granted; that redundancies and emergency planning can make a huge difference.

Environmental advocates, engineers, and water professionals have, for a number of years, been pointing to the serious implications of our failure to adequately invest in the drinking water, wastewater, and stormwater infrastructure of our nation, and Massachusetts is one of the first states to step up and examine the situation. The objective of this initial report of the Commission is to highlight the important themes that have emerged in the Commission's work to date and guide the remaining work needed to complete the final Commission's report. Most importantly, that work includes identifying the funding gap that needs to be filled to adequately manage our water service as well as ways the Commonwealth can mitigate this gap through sound planning and engaging all levels of government and the public in this important conversation.

The Stakes Are High

Water is an essential asset of the Commonwealth. A clean and plentiful supply of water is a vital underpinning for the economic, environmental and social wellbeing of the state. The viability of our drinking water, stormwater, and wastewater infrastructure systems has an impact on virtually every aspect of life in our communities and in the Commonwealth.

Massachusetts residents have an expectation that water systems will be 100% reliable, delivering clean and plentiful drinking water 24 hours a day, 365 days a year. Interruption of service is not just an inconvenience, but also a potential threat to the public health, to fire suppression capability, and to livelihoods, businesses and industries.

An overview of the important policy areas directly impacted by public water services serves as a reminder of the importance of investing in the infrastructure and management of water:

Public Health and Safety The most crucial function of our water infrastructure is to provide clean water for public use, and to safely dispose of wastewater. A well-maintained water infrastructure is critical for the prevention of waterborne diseases such as giardia, cholera, botulism and dysentery and for the safe functioning of our hospitals and health care facilities. Because our water treatment systems have been so effective, threats from these and other diseases can seem remote to most customers, and the expectation that safe water will flow from the tap leads to an under-appreciation of this most basic of society's public systems.

State and federal regulation of toxic chemicals and the clean-up of hazardous waste sites help safeguard the public health by protecting ground water supplies from contaminated plumes. New threats, such as contaminants of emerging concern, are always being evaluated and may pose unknown costs.

A reliable and adequate water supply is also critical in providing the water pressure necessary for fire protection.

Environmental Protection: Healthy rivers, streams, lakes, ponds, wetlands, and coastal resources are essential for the health and well being of Massachusetts residents, and to support the state's water supplies, wildlife, aquatic habitats, recreation, and the tourism industry. There is a deep connection between the way water is used, treated, and discharged on the one hand, and the health of our natural water systems on the other. There is a need to integrate science-based, sustainable principles into our water management to protect our water resources while using water wisely to support our economy and our residents.

Some areas of the state experience periodic, seasonal, or sustained degradations of the natural water systems – drought, low flow, frequent flooding, loss of wetlands, loss of habitat, or

eutrophication. These impacts highlight the need to manage our water with a focus on sustainability, quality, and conservation.

Economic Vitality: Massachusetts enjoys relatively plentiful rainfall, with an average of over 40" of precipitation a year. This replenishment of our water lends us many economic advantages. States with whom we compete for jobs, including southern and western states, are facing water challenges that may make Massachusetts an attractive economic alternative if we manage our water resources wisely. Massachusetts may be in a relatively more favorable situation, but the bottom line is that competition for water will increase, even here.

The availability of adequate and affordable water and sewer infrastructure is one of the primary requirements of firms looking to site and expand in Massachusetts. Today, some of the regions of the Commonwealth which have the potential to contribute to economic recovery are lacking in the water infrastructure investment needed to support growth. The availability of water for growth should be of particular concern in Massachusetts where the state is investing substantially in the life sciences sector; the life sciences industry is heavily reliant on world-class water systems. According to an industry source, a disruption in water service during a critical manufacturing period can cost thousands in lost time and productivity.

The Commission believes that Massachusetts has the potential to be a hub of innovation in the fields of water, wastewater, and stormwater management, using academic, technical, and professional expertise to support innovation, and to pilot successful treatment alternatives. There are significant opportunities for job creation and economic growth.

Investing in our water infrastructure has multiplier effects for the economy of Massachusetts. The Associated General Contractors of America have estimated that for every $1 billion spent on non-residential construction, approximately $2.2 billion is added to the state's Gross Domestic product, and about $680 million to personal earnings, created or sustaining 17,000 jobs directly or indirectly.

Tourism: Protecting our waters and the natural systems related to them is critical to preserving our tourism industry. This is true across the Commonwealth, from the Berkshires to Narragansett Bay, and from Cape Ann to Cape Cod. Our many natural resources that attract tourists – mountains, lakes, streams, beaches, and our historic and culturally rich cities and towns – all depend on plentiful and clean water. Many recreational activities – fishing, bird-watching, hiking, kayaking, sailing, and more – rely on fishable and swimmable waters and rich habitats for wildlife and fisheries.

Public Safety & National Security: Because water and wastewater infrastructure is so essential to the functioning of our economy and our daily lives, interruption of service can quickly and dramatically affect the Commonwealth. To the extent possible, it is critical to plan for resilience and redundancy in water-related infrastructure essential to the safety and security of the public.

Whether the threat is from a natural disaster such as a hurricane, from an unanticipated interruption in service due to a leak or contamination, or from a terrorist attack or asset failure, the state and its municipalities must plan for emergencies, employ back-up systems and redundancies, have public outreach capacity, and well trained personnel. Infrastructure planning and engineering must include preparation for possible human threats and natural disasters.

Municipalities Face Increasing Pressure Related to Water Infrastructure Investments

Themes from Four Public Hearings

The Commission held four public hearings across the state, in Boston, Westborough, Barnstable, and Springfield. Local municipal officials, water department and water district officials, groups and agencies interested in water policy, environmental and consumer protection groups, professionals in the fields of water supply engineering and pricing, and other interested members of the public were invited to participate.

These hearings provided both general comments on the status of water-related infrastructure in the Commonwealth and system-specific data about challenges facing municipalities and their publicly operated water and wastewater systems.

The Commission also received written testimony from cities and towns across the state. A number of towns submitted detailed letters that outlined the alarming rise in investment needed by their communities to meet new environmental regulation, to repair aging systems, and to provide services to an expanding or growing community. Towns whose water and sewer departments or public officials attended or contacted the Commission include: Acton, Attleboro, Barnstable, Buzzards Bay, Cambridge, Chicopee, Concord, Dennis, Fall River, Falmouth, Framingham, Gloucester, Grafton, Granby, Harwich, Holliston, Longmeadow, Medway, Monson, Natick, Norfolk, Orleans, Plainville, Spencer, Springfield, South Hadley, Southwick, Wareham, Westborough, Westport, Worcester, and Wrentham.

The hearings were also attended by representatives from environmental and professional organizations, as well as water professionals, engineers, regional planners, water planners, consultants, attorneys, and entrepreneurs.

The Commission found that the testimony illustrated –perhaps even more powerfully than statistics—the kinds of financial challenges we are facing in the Commonwealth. The hearings raised almost all the issues that the Commission ultimately studied, wrestled with, and included in their working agenda. Seven consistent themes emerged from municipal testimony:

1. **Aging Water Systems**: All of the municipalities highlighted concerns about aging water and sewer systems and diminishing resources available to maintain these systems. Some water and sewer systems in Massachusetts' older cities were constructed as early as the 1800's. Although major federal investments in water and wastewater in the 1970's and 1980's brought new plants and new technologies to many towns, many of these assets are

nearing the end of their intended service life.

Most municipalities are facing needed investment in their basic assets, such as power equipment, pipes, manholes, pumps, water and wastewater treatment plants, outfalls, filter beds, and the many other components of their water and sewer systems. Requirements for investments in thousands of miles of pipe alone – made of such diverse materials as wood, brick, cast iron, lead, clay, concrete, asbestos, and PVC – is substantial. Some of these pipes are over 100 years old and become blocked and corroded from the inside, impeding the flow of water or sewage. Others leak, allowing precious treated water to be wasted or contaminated sewage to leak into ground water. These issues can lead to degraded water quality, reduced pressure that can compromise fire protection, and occasionally, catastrophic failure that can affect a few homes, a neighborhood, an entire city, or a broad region.

2. **Increasing Costs of Environmental Compliance:** Another major concern is that many systems are in need of improvements and upgrades in their level of treatment in order to meet increasingly stringent environmental or public health requirements. Cities and towns are being asked to reduce nutrient levels in treated wastewater to ever-lower concentrations. Drinking water standards are also being continually updated, requiring higher levels of treatment that necessitate additional investment.

3. **Growth Requires New and/or Expanded Infrastructure:** Many municipalities, especially those outside of the metropolitan Boston area, have limited infrastructure currently and are facing the need to invest in new or expanded infrastructure to address demands due to commercial or residential growth or emerging problems with stormwater, private wells and/or private septic systems. These communities need solutions to provide water and wastewater services for homes, businesses, and industries in a manner that is cost-effective, supportive of the local economy, environmentally sustainable, and technologically reliable.

4. **Increasing Costs to Pay off Current Debt:** Due to diminishing sources of funding, some municipalities have taken on increasing levels of debt to maintain their water infrastructure. The cost of debt service is particularly pronounced for the Massachusetts Water Resources Authority (MWRA), which serves 43 communities for sewerage and 51 communities for water service, for a net total of 61 communities in Massachusetts. As the cost of debt continues to rise, more of the available finances will be consumed by debt service and be unavailable for needed maintenance and expansion projects.

5. **Stormwater Mitigation Costs are Looming:** The federal government is increasingly focused on mitigating environmental impacts of runoff from roadways and paved areas. This runoff, termed "stormwater," ends up in our rivers, lakes, streams, ponds, wetlands,

and groundwater and leads to health, wildlife and environmental impacts. New federal stormwater regulations are expected in early fall 2011, and while cost estimates can vary, they are very likely to require substantial investments in compliance by municipalities without a funding source, unlike water and wastewater upgrades which can access some funding through the State Revolving Fund (SRF). Many municipalities view these costs as an unfunded mandate and question what additional benefit will come from these investments. Several municipalities commented that funding for regulatory upgrades would come at the expense of maintaining existing systems unless additional funding is available.

6. **New Requirements for Operations, Maintenance, and Emergencies:** There are other costs facing water suppliers, waste-water treatment operators, and Departments of Public Works. They must plan for emergencies, have redundant supplies and transportation options in the case of problems, and have equipment and personnel to anticipate and handle all contingencies. The state and federal government have drafted new requirements for security of assets that require foresight, planning, and investment at a sustained level.

7. **The Public has Little Understanding of the Systems that Supply and Protect its Water:** Much of our water infrastructure is out of sight, underneath our streets or distant from our centers of commercial and civic life. When that infrastructure is ignored or goes without necessary maintenance for prolonged periods of time because of other pressing public needs, failures become much more likely.

   The public is often unaware of the true cost to operate, maintain, and invest in the Commonwealth's water-related infrastructure and of the public health, safety, environmental and economic consequences of failing to invest. Infrastructure failures can be small annoyances that affect a few homes, or they can be extremely disruptive due to the size of the failure, the length of time to repair, or the strategic location of the problem.

   While many of us see the value in high monthly fees for internet or cable service, we tend not to appreciate the cost of infrastructure needed to bring clean water to our homes and businesses, 24 hours a day, 7 days a week. Rates can vary significantly from community to community, and in some communities they do not reflect the true cost of investing in our assets, protecting our water supplies, and operating our systems.

The Imperative: Continue to Build on Our Remarkable Water Infrastructure Legacy

Our Legacy:

Drinking Water: A Priority Since our Earliest Days: The history of public water supplies in the Commonwealth dates back at least to the 1700's, as growing towns made efforts to provide water to residents. According to the MWRA, private water suppliers in 1795 developed a delivery system using wooden pipes to deliver water from Jamaica Pond into Boston.

During the 1800's, cities in Massachusetts began constructing water systems to supply residents with water for consumption and fire suppression. The city of Boston impounded tributaries of the Sudbury River as well as the Mystic Lakes in Winchester, Medford, and Arlington and developed distribution reservoirs around the city. In the 1890's, the city flooded portions of the Nashua River Valley at the Wachusett Dam. At the time the Wachusett Dam was built, its reservoir serviced 29 municipalities within 10 miles of the State House and was the largest public water supply reservoir in the world. The Quabbin Tunnels and Reservoir were constructed between 1926 and 1946. According the MWRA, at the time of its completion, the Quabbin too was the largest man made reservoir in the world devoted solely to water supply. High pressure aqueducts were completed to carry water and were paid for with water rates.

But the widespread treatment of water was rare in the United States until well into the 20th century. Poughkeepsie NY used sand filtration in the 1870's, and in 1908, Jersey City NJ began to chlorinate its water, techniques that were eventually widely adopted. Both of these steps had huge implications for the reduction of water disease outbreaks.

Eventually, the federal government began to regulate the quality of drinking water. The 1974 Safe Drinking Water Act established a system of nationwide standards for drinking water, and today EPA regulates more than 80 drinking water contaminants. As a result, the vast majority of the nation's population drinks treated water, and systems have only rare violations of drinking water standards.

In Massachusetts, the DEP Drinking Water Program administers and enforces the Safe Drinking Water Act of 1974 as well as relevant State statutes and regulations that protect the water supply. In particular, Massachusetts General Laws Chapter 111, Sections 159 and 160, grants the DEP responsibility for inland waters and designates the agency to enforce regulations for drinking water. These laws and regulations ensure that public water systems in Massachusetts deliver safe and pure drinking water according to national and state standards.

DEP also provides technical assistance to public water suppliers, municipal Boards of Health, and other local groups to assist these groups in complying with state and federal water supply regulations.

Today, approximately 78% of communities in Massachusetts have a public water supply. About 57% of the communities use groundwater as their primary water source, with the remaining 43% relying on surface water sources such as the Quabbin Reservoir.

On a per capita basis, **over 6.2 million residents (out of a total population of 6.6 million) get their water from public water systems**. Of that total, 2.4 million are served by the Mass Water Resources Authority (MWRA) and another 455,000 are served by multi-town water districts serving more than one community. The largest share, approximately 3.4 million get their water from municipal, publicly operated, water districts. Over 135,000 customers are served by privately owned public water systems. Over 378,000 residents are served by private wells.

Wastewater: Investments that Dramatically Impact Health, Quality of Life and the Economy:

Early sewer systems also followed the growth of towns and cities. Some of the state's centralized wastewater systems date back to the end of the nineteenth century, when industrialists harnessed rivers for manufacturing, built cities around factories and mills, and used the rivers of the Commonwealth for disposal of industrial and human waste. The first sewers and collection systems were built in the late 1800's, but these were largely collection and transport mechanisms, which collected waste and sent it into harbors or down rivers and streams. Treatment plants that attempted to clean water before disposal were an innovation of the twentieth century. In Boston, the first treatment plant for primary wastewater treatment was built at Nut Island in the 1950's.

Following the passage of the Clean Water Act in 1972, federal and state laws mandated primary and secondary treatment for all municipal sewer systems. In the decades that followed, extraordinary investments were made by the federal, state, and municipal governments, bringing many of our rivers back to fishable and swimmable quality, cleaning our harbors, and restoring wetlands and coastlines.

In November of 1997, on the 25th anniversary of the Clean Water Act, the Massachusetts Clean Water Council issued a report assessing the impressive progress made in improving the waters of the Commonwealth. These improvements came as a result of a variety of programs, at the state

and federal levels, which together regulated pollutants, built wastewater treatment plants, regulated industrial discharges, and "prevented millions of pounds of pollutants from entering Massachusetts Rivers." In 1972, at the time the Clean Water Act was passed, approximately 25% of the rivers in Massachusetts supported fishing and swimming. Since then, there has been steady and substantial progress, so that in 1997, fully 70% were ranked swimmable or fishable.

Improvements in management of wastewater have contributed to substantial improvements in the Commonwealth's public health, quality of life and economy. It is critical that investments needed to maintain these systems are made a priority.

Approximately 56% of the 351 cities and towns in the Commonwealth have some level of public sewerage service. According to the EPA, in 2008 seventy percent (70%) of Massachusetts residents received centralized wastewater treatment services at the secondary, advanced, or no discharge treatment level. Facilities known as "small community wastewater facilities" serve nine percent (9%) of the population, and comprise 10% of the total wastewater treatment and collection needs.

Stormwater: An Emerging Concern: Stormwater runoff is generated when precipitation from rain and snowmelt events flows over the ground or impervious surfaces, accumulating debris, chemicals, sediment or other pollutants that could adversely affect water quality, and if untreated, ends up in our ocean, rivers, lakes, streams, and eventually in groundwater – all of which are sources of our public water supplies. Both point and nonpoint source pollution also significantly degrade water quality and aquatic habitat.

As a Commonwealth and a nation we are just beginning to appreciate the magnitude of the challenge related to the need for increased management of stormwater. Studies recently conducted by a joint federal and state partnership (USGS, Mass DEP, Mass DCR, and Mass DFG) suggest that many of the environmental concerns related to rivers and fish populations are attributable in part to the impacts of stormwater runoff due to impervious surface and urbanization. Stormwater runoff has been recognized as a major cause of water quality degradation in lakes, ponds, streams, rivers, wetlands, and groundwater. Stormwater runoff also contributes generally to the contamination of drinking water supplies, the alteration or destruction of aquatic and wildlife habitat, and flooding.

However, the costs associated with the management of stormwater have not been funded, either through state or federal sources. Many municipalities view these costs as an unfunded mandate.

The Future:

A Sustainable Financial Approach: A central challenge is to find a sustainable approach to augmenting current levels of investment in water infrastructure so the Commonwealth can catch up with the rehabilitation of aging infrastructure, meet the challenges of environmental regulation, keep up a sustained asset management program to meet the backlog of unmet investment, and integrate our infrastructure to be more energy efficient, and more environmentally sustainable.

By taking on this issue, the Commonwealth has an opportunity to once again lead the nation, as we have in so many other policy areas.

All of the evidence examined by the Water Infrastructure Finance Commission (WIFC) about maintaining our public infrastructure reconfirms what most people already know to be true when it comes to maintaining their personal assets, whether it's their car, their home or a household appliance: in the long run, it is far more cost effective to properly maintain an asset, than to wait for it to deteriorate past the point of usefulness and then rush to replace it.

Traditional Solutions Complemented by Appropriate Innovation: As we build on our many accomplishments, the Commonwealth has an opportunity to continue to bring the most modern, science-based understanding of water resources to our future decisions and investments. We have the chance to address some of the adverse impacts of older, centralized systems, including high-energy demand to move water to centralized facilities, ground water drawdown, low in-stream flow, and drought risk.

This theme was set by the Commonwealth's Executive Office of Environmental Affairs' 2004 Water Policy, which stated, "Existing infrastructure often transports precipitation away from where it lands instead of letting it infiltrate. Transporting dirty water far from its source made sense historically, but today, with significant improvements in wastewater treatment techniques and standards, treatment levels often make the water available for reuse or recharge, thereby replenishing natural stream flows and aquifers in the basin or sub-basin."

Municipalities are faced not only with finding the financial resources to keep existing systems running, but also with decisions and imperatives about what kind of new investments they will make. As a Commonwealth, our future water resource protection investments will likely include a mix of natural and flexible decentralized approaches, integrated with infrastructure our municipalities already have in a way that optimizes water resource availability.

Fully integrating more modern systems that are open to our evolving comprehension of the aquatic environment into our current infrastructure is a process that will take decades and require the ability to test new solutions for their efficacy and economics. It will require permitting and

project review that is able to partner with local communities to realistically integrate new solutions into or away from existing assets in a way that makes sense, is financially viable, and is low-risk for communities that must meet state and federal standards.

Resiliency and Planning for Climate Change: A coming challenge that must be acknowledged and addressed is climate change and its potential effects on management of our water systems. The water infrastructure of the future must address the potential for rising seawater and increasingly severe rain events, changes that will affect some public systems more than others. Technologies that keep water local, replenish water closer to its use, and are more resilient in fluctuating climates will help to protect communities in the twenty-first century, and they should be pragmatically integrated with our current systems.

Downward Trends in State and Federal Funding Require A New Look at Financing Strategies.

Federal Funding and the State Revolving Fund (SRF): Since 1972, the federal government has spent billions of dollars in investments to drinking water and wastewater infrastructure nationwide. When leveraged with state and local contributions, over a trillion dollars has been spent across the country during these last forty years. However, the trend is that both federal and state funding available to municipalities has steadily decreased since the 1970's.

Each state participates in the state-federal partnership that uses federal dollars from the EPA combined with state dollars to create the State Revolving Funds (SRFs) that carefully loan the money at low interest rates to municipalities, water and wastewater districts, and public water suppliers to finance drinking water and wastewater infrastructure.

During the early years of the Clean Water and Drinking Water programs, federal money was disbursed in grant programs, offering 75% federal support for some programs. The state contributed a 15% match, and the municipality contributed the remaining 10%. The SRFs were created during a restructuring of the Clean Water and Drinking Water programs in 1989 and 1993, respectively, in which federal funding was converted from grants to low-interest loans, which are administered by the state SRF.

At this time, the SRF loan program is the federal government's primary investment in water infrastructure. It should be noted that, as important as SRF is, the shift from grants to loans has had a substantial impact on municipalities. Unlike the initial federal grant programs, SRF loans require that the municipality or local water district eventually pay back principle and interest, either through rates, or with debt service paid annually from the General Fund. This trend has resulted in an increasing reliance over the past thirty years on local water rates to fund water infrastructure.

Massachusetts Investments Have Substantially Leveraged Federal Dollars through the SRF:
The Clean Water and Drinking Water State Revolving Funds represent the most sustained and significant source of federal and state investment in water-related infrastructure in Massachusetts. Over the life of the program, the MA Water Pollution Abatement Trust has leveraged the federal capitalization grants by an average factor of 2.4, translating the $1.59 billion in federal grants into $5.44 billion in project financing. The Trust has financed $4.3 billion in clean water projects and

$1.1 billion in drinking water projects since the program began. In fact, the Commonwealth Massachusetts has one of the most highly leveraged SRF programs in the country.

Currently, Massachusetts uses a 2% interest rate for its SRF loans. In some years, the 2% SRF loans have compared favorably to what cities and towns could borrow on their own, but at current low interest rates, the differential with the bond market is less advantageous, but still important. Several municipalities that offered testimony at the public hearings requested that the loans be converted to 0% interest. Additionally, many smaller towns requested simplification of the SRF application to encourage greater participation.

The 2011 federal grant requires the states to distribute a share of the Clean Water SRF grant as additional subsidy. The CWSRF federal grant totals $50.14 million of which $4.65 million must be provided as additional subsidy. Massachusetts will distribute these funds in the form of principle forgiveness to Environmental Justice (EJ) and Renewable Energy (RE) projects as identified on Table 1. The funds will be distributed in a pro-rated share to all of the proponents meeting either or both criteria and who execute a construction contract on or before April 1, 2012.

In its 2011 SRF allocation, Congress also requires states to use a share of the Drinking Water SRF grant for additional loan subsidy. Additional subsidy is defined by Congress as principal forgiveness, grants or negative interest loans. For 2011, Congress requires 30% of the federal grant ($5.18 million) be allocated towards additional subsidy. MassDEP will easily meet this requirement by allocating additional subsidy for projects on the Final IUP that target two purposes: A) Renewable Energy Generation and B) certain Environmental Justice Communities. For 2011, MassDEP gave priority to communities with below average Median Household Income (MHI) as identified by the EOEAA Environmental Justice Program.

The State Revolving Funds Alone Can't Solve the Problem: The majority of SRF money goes to rehabilitation of infrastructure, including nutrient removal and upgrades of existing plants. The SRF loans are generally more difficult to use for innovative systems, or systems that benefit a smaller number of people. The SRF is generally NOT used for pipe replacement, manhole replacement, and other general maintenance projects. The SRFs do not cover operation and maintenance costs, debt service, routine asset management, or emergency repairs.

Each year the federal "pie" for SRF capitalizations must be approved by Congress. Dividing the "pie" among the states is done by a distribution based in part on the results of surveys of Documented Need in each state. The EPA is mandated by Congress to conduct a survey every four years to identify the needs of all the states for water and wastewater infrastructure improvements that qualify for SRF funding. These findings (known as the Drinking Water Needs Survey (DWNS) and Clean Water Needs Survey (CWNS)) are used to allocate Drinking Water State Revolving

Fund and Clean Water Revolving Fund capitalization grants to the state. To date, the surveys have not been structured to fully report the expected stormwater mitigation needs of the states.

Federal Spending Levels will Likely Continue to Decrease: There are several bills pending in Congress to reauthorize the Federal Clean Water Act, which capitalizes the Clean Water SRF. One of the bills calls for doubling the authorization, but this is seen as very unlikely. Others call for set asides for green projects, and principal forgiveness programs. Given the current conservative fiscal climate, the reauthorization, funding levels, and policy shifts are all difficult to predict, but it seems unlikely that funding levels would increase. New formulas could affect the proportion of the funding that comes to Massachusetts, increasing the uncertainty around federal funding sources.

Quantifying the Fiscal "Gap":

One of the Commission's central charges from the legislature is to assess how much funding will be required over the next 25 years to adequately finance our water infrastructure including wastewater, drinking water and stormwater.

The approach taken by the Commission will build on information gathered by the US EPA every four years in the Drinking Water and Clean Water Needs Surveys, and employ a common industry "gap analysis" approach to determining financial need for water and wastewater. The gap approach compares total funding need with available revenues; the difference is the "gap" that will require additional resources.

A Starting Point: US EPA Needs Surveys: The USEPA took on the task of estimating the Gap between needs and resources at a national level in 2002, at the thirty year anniversary of the landmark Clean Water Act of 1972. From their report:

> *"….the US Environmental Protection Agency (EPA) ….conducted a study to identify whether there is a quantifiable gap between projected clean water and drinking water investment needs over the twenty year period from 2000 to 2019 and current levels of spending. The analysis found that a significant funding gap could develop if the nation's clean water and drinking water systems maintain current spending and operations practices. "*

In calculating capital investment needs over the 20 year study period (2000-2019), the EPA utilized their every-four-year Needs Surveys as a starting point, and made adjustments to account for under-reporting of needs. Using various projections, estimates of 20 year capital needs for clean water (waste water) ranged from 331 billion to 450 billion nationally, and the estimates of capital needs for drinking water investments ranged from 154 billion to 446 billion nationally.

In January of 2003, the Assistant Administrator of the EPA, Mr. G. Tracy Mehan, put the concept of a Gap Analysis this way:

> "US News and World Report (6/12/00) called it the 'sickening sewer crisis' in an article that began with the description of an ordinary suburban family waking up to a basement flooded by a broken sewer line. … Wall Street might call it an 'investment gap.' An economist might even call it a 'pricing gap.' There are …different estimates of the size of this gap – the magnitude of our investment needs. But whatever our numbers and whatever our language, the problem we're here to discuss today is that our water and sewer systems are aging – even as our population is growing; and our clean water and drinking water rules are tightening."

The Proposed Massachusetts GAP Analysis Model:

For Massachusetts, the most recent EPA Needs Analysis surveys estimate needs of **$7.95 billion for clean water** (wastewater) **infrastructure investments and $6.79 billion for drinking water infrastructure investments over the next 20 years**.

To provide a true analysis of the Gap in Massachusetts, the Commission will use these federal figures as a starting point, with adjustments for factors that were not accounted for in the EPA surveys:

- The EPA surveys were intended to estimate capital investment needs that are eligible for Clean Water or Drinking Water State Revolving Fund grants, and were never intended to estimate the full costs of operating and investing in water systems in each state and across the country.
- The survey does not include costs of operation, maintenance, debt retirement, emergency repairs, and depreciation.

The Massachusetts model will also need to acknowledge the financial impact of increasing regulation and financial needs due to system expansion from growth or projected growth.

After discussions with representatives from the state of Pennsylvania, which completed a state-based needs analysis in November 2008, the Commission's GAP analysis will be based on the following methodology:

Formula for Estimating the Funding "GAP"

Needs: total capital + operation & maintenance need + debt service

minus

Revenues: projected 20 yr. available funding from federal, state and local sources

_____

= Funding "GAP"

Needs: The "needs" side of the equation will incorporate information from the federal EPA needs surveys which will be supplemented by estimates of operations & maintenance (O and M), debt service and data available from some of the larger city and regional systems. Impacts of regulation and growth are extremely difficult to quantify; however, the final recommendations of the Commission will recognize that these factors could result in significantly increased costs. Also, strategic and thoughtful policy decisions could, over the next 20 years, help reduce the need through better management, full-cost pricing, "smart" water use including conservation, and the use of a watershed approach to look at water resource decisions more broadly and allow for better prioritization of investments.

One of the more significant challenges for the Commission will be to estimate the financial need associated with stormwater mitigation. The federal trend is toward increasing regulation, however it is difficult to anticipate the scope or cost of future requirements. Most important with respect to stormwater is the need for Massachusetts to continue to actively engage with the EPA in the development of future federal regulation. This will ensure that the approach to addressing many valid stormwater concerns recognizes the economic realities faced by the state and our communities.

Revenues: On the "revenues" side of the equation, the Commission will present an assessment of the financial resources likely to be available over the next 20 years to meet the identified needs. The current economic climate that has led to widespread cuts in state and federal line items and stretched municipal budgets will likely continue, making investment difficult over a longer time. A survey of current sources of revenues from the federal and state government finds most such sources to be declining or at risk. The Commission believes that it is reasonable to expect that at most, current levels of state and federal investment in infrastructure will remain constant, but it is more likely that they will decline.

Closing the Gap:

Simply put, closing the Gap in Massachusetts will require the state to consider:

- ways to increase funds available for water-related infrastructure
- ways to reduce costs

Specific recommendations will be included in the Commission's final report.

Overview of Themes in Final Report
Fall of 2011

The Commission will present its final report to the Legislature in the fall of 2011. The Commission anticipates that the Final Report will provide additional information and recommendations on the following topics:

- State and Federal Partnership: The State Revolving Funds (SRF)
    - Funding levels, lending practices, and accomplishments
    - Trends in federal and state funding for the SRF
    - Suggestions for changes to SRF application procedures
    - Suggestions for changes to the loan program
- Other State and Federal Funds
    - Overview/trends of recent and existing federal funds
    - Overview/trends of recent and existing state funds
    - Proposals for augmented state funding
- User Rates and Other Local Sources of Funds
    - User rates
        - Overview of current situation
        - Full cost pricing
        - Rate structures
    - Other municipal sources
    - Choosing the best revenue tool (rates, betterments, property taxes, borrowing) for needed expenses
- Quantifying the Gap
    - Estimating the gap for Massachusetts
- Sustainability
    - Environmental sustainability
        - Principles of environmentally sustainable infrastructure
        - Potential for reducing long-term costs through watershed approaches, integrated and sustainable water management
        - Best management practices in water conservation, energy reduction, water reuse, water recharge

        - Incentives to encourage cities and towns to adopt best practices
    - Financial Sustainability
        - Principles of finance and accounting that optimize sustainability of drinking water, wastewater, and stormwater operations
        - Best management practices in full cost pricing, rate structures, enterprise funds, capital improvement programs, and asset management
        - Incentives to encourage cities and towns to adopt best practices
- Improved Project Delivery
- Permitting and Regulation
    - State "primacy" and implications of assuming state control over wastewater and stormwater permitting
    - Early collaboration
    - Joint applications
    - Prioritizing/streamlining types of applications
    - Integrate greenhouse gas regulation
    - Length of permit duration
- The Stormwater Issue
    - Stormwater fees/utilities
- Watershed/River Basin Planning
- The Role of Regionalization
- Municipal Finance
- Education

Recommendations

The Commission will make a full set of recommendations with its final report in the fall. At this time, the Commission makes just one recommendation, as follows:

The Commonwealth should provide funding to undertake an asset-based analysis of the gap between projected needs and revenues based on a survey of a statistically significant and regionally diverse sample of Massachusetts communities in order to provide a baseline of information to evaluate the success of efforts to meet the water infrastructure needs of the Commonwealth.

Appendix A

The Water Infrastructure Finance Commission

The Water Infrastructure Finance Commissionwas established by Act of the Legislature pursuant to Section 145 of Chapter 27 of the Acts of 2009. The Commission was charged with developing a comprehensive, long-range water infrastructure finance plan for the Commonwealth and its municipalities. (Appendix A)

Senator Jamie Eldridge was appointed Chair of the eighteen-member Commission by Governor Deval Patrick, and Representative Carolyn Dykema is the House appointee. Other members were appointed by the Governor, the Speaker of the House, the Senate President, and the Minority Leaders of the House and Senate. A full list of Commission Members is found in Appendix B.

The Commission was charged with:

- Examining the water infrastructure needs of the Commonwealth for the next 25 years
- Examining projected federal funding, state funding, local funding, fee-based funding, debt financing, and any other sources of projected funding to finance water infrastructure needs in the Commonwealth
- Examining the "Gap" between the needs of the Commonwealth and the projected availability of funding
- Developing mechanisms to provide additional funding for water infrastructure by increasing investments in critical water, wastewater, stormwater, and water conservation infrastructure
- Examining the threats to public health and public safety that result from shortfalls in funding for water infrastructure
- Examining and recommending ways the Commonwealth and its municipalities might meet operation, maintenance, and capital improvement needs for the next 25 years, including:
    - Debt reduction
    - Enhancing existing sources of revenues
    - Developing new sources of revenues
- Examining the expanded use of full accounting systems and enterprise funding, asset management systems and best management practices,
- Examining compliance with chapter 21G of the General Laws, and the Massachusetts water policy and current federal and state funding programs

- Examining the finances of municipal and regional water districts, making recommendations for improvements to financial policies and procedures
- Identifying areas where cost savings can be achieved across water agencies by consolidation, coordination, and reorganization
- Developing recommendations as to what funding or finance measures the Commonwealth or its municipalities might pursue to satisfy unmet funding needs
- Developing recommendations about interagency agreements, intermunicipal agreements, consolidations or mergers to enable the Commonwealth and its municipalities to make the most effective use of resources
- Indentifying fair and equitable means of financing water infrastructure investments through taxes, fees, user charges, or other sources.

The Commission, which was subject to the Open Meeting Law, met for the first time in May of 2010, and also met in June, July, September, October, and November of 2010 as well as February, March, April, and June of 2011.

Four Working Groups were created to undertake more detailed discussions of the following topics:

- Working Group One – Current water infrastructure needs and long term challenges
- Working Group Two – Municipal Utility and water district financing
- Working Group Three – Innovative water systems, technologies, and infrastructure
- Working Group Four - State and federal finance and investment practices

The Working Groups met in posted meetings starting in August of 2010. All meetings of the Commission and the Working Groups were open to the public.

A full list of meetings and hearings held by the Commission and its Working Groups is found in Appendix C.

Section 145 Chapter 27 of the Acts of 2009

SECTION 145. (a) There shall be a special water infrastructure finance commission to develop a comprehensive, long-range water infrastructure finance plan for the commonwealth and municipalities.

(b) The commission shall consist of the commissioner of environmental protection or his designee; the state treasurer or his designee; 2 people to be appointed by the president of the senate, 1 of whom shall be a member of the senate and 1 of whom shall be a representative of a planning organization, environmental consumer organization or other public interest organization; 2 people to be appointed by the speaker of the house of representatives, 1 of whom shall be a member of the house of representatives and 1 of whom shall be a representative of a planning organization, environmental consumer organization or other public interest organization; 1 person to be appointed by the minority leader of the senate and 1 person to be appointed by the minority leader of the house of representatives, each of whom shall be from different geographic regions of the commonwealth and who shall be representatives of the business community; a representative of the Boston Water and Sewer Commission; and 9 persons to be appointed by the governor who shall not be employees of the executive branch and who shall reside in different geographic regions of the commonwealth, 1 of whom shall be a representative of the American Council of Engineering Companies of Massachusetts, 1 of whom shall be a representative of the Utility Contractors' Association of New England, 1 of whom shall be a representative of the Massachusetts Waterworks Association, 1 of whom shall be a representative of the Massachusetts Municipal Association, 1 of whom shall be a representative of Clean Water Action, 1 of whom shall be a representative of Associated Industries of Massachusetts, 1 of whom shall be a representative of the Environmental League of Massachusetts, 1 of whom shall be a representative of the Conservation Law Foundation and 1 of whom shall be a representative of the Massachusetts Water Pollution Control Association. Each of those organizations shall provide a list of at least 3 but not more than 5 candidates for consideration by the governor. Each of the members shall be an expert or shall have experience in the field of law or public policy, water, wastewater or stormwater planning, design and construction of water, wastewater or stormwater projects, utility management, management consulting or organizational finance; provided, however, that at least 1 member shall have expertise in organizational finance. The governor shall designate a member to serve as the chairperson of the commission but the chairperson shall not be the commissioner of environmental protection, the state treasurer or their designees. The members of the commission shall be appointed not later 90 days after the effective date of this act and shall serve until the completion of the long-range infrastructure finance plan.

(c) In the course of its deliberations, the commission shall make it a priority to examine the technical and financial feasibility of sustaining, integrating and expanding public water systems, conservation and efficiency programs, wastewater systems and stormwater systems of municipalities and the commonwealth, including regional or district systems. Further, the commission shall: (1) examine the water infrastructure needs of the commonwealth for the next 25 years as they relate to the funding gap between the water infrastructure needs of the commonwealth and the existing, available sources of funding; (2) develop mechanisms for additional funding for water infrastructure by increasing investment in critical water, wastewater, stormwater and water conservation infrastructure; (3) provide mechanisms for improvements in the handling and management of water programs; (4) examine the

potential threats to public health and public safety from the existing shortfalls in funding for water infrastructure; (5) examine and develop recommendations on ways in which the commonwealth and its municipalities may meet operation and maintenance and capital improvement and reconstruction needs for the next 25 years including, without limitation, recommendations regarding debt reduction, enhancing existing sources of revenues, developing new sources of revenues, establishing new incentives for public-private partnerships in the development of real property resources and funding resources; and (6) examine the expanded use of full accounting systems and enterprise funding, asset management systems and best management practices, compliance with chapter 21G of the General Laws, the Massachusetts water policy and current federal and state funding programs.

(d) The commission shall examine the finances of the various municipalities and regional water districts, including state and federal aid levels, and make recommendations for improvements to financial policies and procedures. The commission shall identify areas where cost savings can be achieved across water agencies by consolidation, coordination and reorganization. The commission shall examine the projected federal funding, projected state funding, projected local funding, projected fee-based funding, debt financing and any other sources of projected funding to finance water infrastructure needs identified by the commission.

(e) The commission shall develop recommendations as to what funding or finance measures the commonwealth or municipalities may pursue to satisfy any unmet funding needs identified by the commission. The recommendations shall also include any recommendation for interagency agreements, intermunicipal agreements, consolidations or mergers to enable the commonwealth and municipalities to make the most effective use of water funding resources. The recommendations shall identify fair and equitable means of financing water infrastructure investments through taxes, fees, user charges or other sources.

(f) The commission may hold public hearings to assist in the collection and evaluation of data and testimony.

(g) The commission shall prepare a written report detailing its financials relative to identified funding sources and its recommendations, if any, together with drafts of legislation necessary to carry those recommendations into effect. The commission shall submit its initial report to the governor, the secretary of the executive office of energy and environmental affairs, the clerks of the senate and house of representatives, the chairs of the house and senate committees on ways and means and the joint committee on environment, natural resources and agriculture not later than 2 years after the effective date of this act.

(h) Any research, analysis or other staff support that the commission reasonably requires shall be provided by the executive office of energy and environmental affairs and its agencies, with assistance from the Massachusetts Water Resources Authority.

Appendix B

Water Infrastructure Finance Commission Members

Name	Appointed By:	Organization
Senator James Eldridge	Chairman – Senate President appointee	MA State Senate
Rep. Carolyn Dykema	Speaker appointee	MA House of Representatives
Steve Grossman	State Treasurer	State Treasurer
Paul Niedzwiecki	Senate President appointee	Executive Director Cape Cod Commission
Ken Kimmell	DEP Commissioner	DEP Commissioner
Martin Pillsbury	Speaker appointee	Environmental Division Manager, Metropolitan Area Planning Council
Dave Hanlon	House minority leader appointment	General Manager, Veterans Development Corporation
Tom Tilas	Senate minority leader appointment	Vice President AECOM
William Callahan	Governor appointee American Council of Engineering Companies of MA	Retired Senior Vice President Camp Dresser McKee Inc
Phil Jasset	Governor appointee – Utility Contractors Association of New England	Utility Contractors Association of New England (UCANE) Director of Regulatory Affairs and Honorary Board Member
Michael Martin	Governor appointee – MA Waterworks Association	Wareham Fire District Water Department
Bruce Tobey	Governor appointee – Mass Municipal Association	Of counsel, Pannone, Lopes, Devereaux & West; former Mayor of Gloucester Ma.; current City Councilor

Robert Zimmerman	Governor appointee – Environmental League of Massachusetts	Executive Director Charles River Watershed Association
Peter Shelley	Governor appointee – Conservation Law Foundation	Vice President, Conservation Law Foundation
Thomas Walsh	Governor appointee- Mass Water Pollution Control Association	Engineer, Director, and Treasurer Upper Blackstone Water Pollution Abatement District
Norman Bartlett (Ned)	Governor appointee – Associated Industries of Massachusetts	Senior Partner, Bowditch & Dewey LLP
Becky Smith	Governor appointee – Clean Water Action	Massachusetts Water Coordinator for Clean Water Action and Clean Water Fund in Boston
Vincent Mannering	Boston Water and Sewer Commission	Executive Director Boston Water and Sewer Commission

Appendix C

Meetings and Hearings

Water Infrastructure Finance Commission

Commission Meetings

May 5, 2010

June 15, 2010

July 14, 2010

September 28, 2010

October 25, 2010

November 30, 2010

February 8, 2011

March 22, 2011

April 12, 2011

June 15, 2011

June 28, 2011

Public Hearings

October 13, 2010- State House, Boston MA

October 20, 2010 -Forbes Municipal Building, Westborough MA

November 10, 2010 – Cape Cod Community College, Barnstable MA

November 15 – Pioneer Valley Planning Commission, Springfield MA

Working Group Meetings

Working Group One
(Current water infrastructure needs and long term challenges)
September 16, 2010
October 20, 2010

November 30, 2010
December 14, 2010
January 11, 2011
February 3, 2011
February 22, 2011
March 3, 2011
February 22, 2011
March 3, 2011
March 31, 2011
June 13, 2011
June 22, 2011

Working Group Two
(Municipal utility and water district financing)

August 23, 2010
September 14, 2010
October 18, 2010
December 8, 2010
January 10, 2011
February 14, 2011

Working Group Three
(Innovative water systems, technologies, and infrastructure)

September 15, 2010
October 13, 2010
December 7, 2010
December 14, 2010
January 18, 2010
March 1, 2010

Working Group Four
(State and federal finance and investment practices)

September 13, 2010
October 25, 2010
January 20, 2011
January 24, 2011
February 24, 2011
March 28, 2011
May 3, 2011
May 17, 2011
June 8, 2011