

Building Strong Collaborative Relationships for a Sustainable Water Resources Future:

STATE OF NEW YORK

SUMMARY OF STATE WATER PLANNING

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The findings contained in this report are based on the information collected from the literature search and interviews for this initiative and should not be construed as an official Department of the Army position, policy or decision unless so designated by other official documentation.

STATE OF NEW YORK

1. STATE/REGIONAL WATER PLANNING STATUS

The state does not have a comprehensive statewide plan. New York participates in regional water resources planning and management through partnerships with the Great Lakes Commission, the Susquehanna River Basin Commission, the Delaware River Basin Commission, and the Ohio River Valley Water Sanitation Commission. For the portion of the state not covered by a regional plan, the Hudson River watershed, the Department of Environmental Conservation conducts regional water quality and environmental planning.

State Environmental Conservation Law (ECL) states that DEC “shall develop and submit a complete statewide water resources management strategy to the water resources planning council for its review and adoption (ECL § 15-2901).”

The most recent statewide plan produced for the state of New York was created in 1989 along with 13 regional plans. These plans were to be reviewed and updated periodically but have not been to date. However, the general findings and recommendations of the plans are still valid for the most part and the department continues to work toward their full implementation.

Despite having all areas of the state covered by some sort of regional plan, the state has not made any efforts to consolidate or synthesize the strategies of the individual plans into a statewide water resources plan (i.e., a single working document). Based on the State Legislative Commission on Water Resource Needs of New York State and Long Island’s Fall/Winter 2008 Newsletter (Assembly, 2008), the state is concentrating primarily on climate change, wastewater infrastructure, securing environmental funding, and water quality, in general. These all appear to be separate planning initiatives.

New York also does have the components of a comprehensive plan. DEC’s water resources planning typically involves conducting assessments (e.g., *Wastewater Infrastructure Needs of New York State* [DEC, March 2008] and *30 Year Trends in Water Quality of Rivers and Streams in New York State Based on Macroinvertebrate Data 1972-2002* [DEC, 2004]) and continuing or initiating a state program aimed at solving or alleviating the identified water resources issues.

New York also has a Water Quality Management Plan. This plan is comprised of the *New York State Monitoring Strategy and Consolidated Assessment* and *Listing Methodology* (both updated in the NYS Section 305(b) Water Quality Report, 2008), the 2008 Section 303(d) *List of Impaired Waters* (which identifies waters requiring TMDL development), numbers approved TMDLs (see NYSDEC website at <http://www.dec.ny.gov/chemical/23835.html>), and basin and watershed plans (CCMPs, Action Plans, etc.) for most areas of the state. (Personal communication, Michael Holt, 3/26/09.)

During a follow up discussion to the draft summary, the state points of contacts did remark that they felt a comprehensive water resources supply plan would be beneficial to the state primarily to understand where there are issues of concern and to enhance the coordination and integration of the divisions and departments of the state.

2. RESPONSIBLE STATE AGENCIES/REGIONAL ENTITIES

DEC's Office of Water Resources (OWR) is the state's lead agency dealing with water resources. OWR's Division of Water administers numerous programs aimed at protecting and conserving the water resources of the state.

Within DEC-DW, there are six Bureaus:

1. Water Assessment and Management (BWAM)
2. Water Permits
3. Water Compliance
4. Water Resource Management (BWRM)
5. Flood Protection
6. Dam Safety and Program Resources

BWAM programs monitor and assess surface and ground water quality, and provide assistance to local governments with the development of management strategies (DEC-BWAM, 2008).

BWRM programs address both water supply and water quality, and include drought management; Great Lakes water withdrawal registration, interstate water supply partnerships; public water supply permitting; and water conservation. BWRM also manages DEC water quality and watershed protection programs for the New York City (NYC) water supply system (DEC-BWRM, 2008).

The New York State Department of Health is also involved in water quality planning and management. According to the NYS Department of Health website, "Thirty-six counties and New York City Health Department have direct oversight of the public drinking water systems within their jurisdiction. Public water systems within the remaining twenty-one counties in the state are directly regulated by staff in one of the nine State Health Department district offices." Along with its partners in the county health departments, the NYS Department of Health performs the following duties as part of their Drinking Water Program:

- *Regulates the operation, design and quality of public water supplies and commercial bottled water suppliers.*
- *Assures water sources are adequately protected.*
- *Provides financial assistance to public water suppliers.*
- *Reviews and approves plans for proposed realty subdivisions.*
- *Sets standards for constructing individual water supplies and individual wastewater systems (septic systems).*

The key points of contact for water resources management in the state include:

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 Bureau of Water Resource Management
 625 Broadway
 Albany, NY 12233-3500

(518) 402-8177

maklotz@gw.dec.state.ny.us

<http://www.dec.ny.gov/about/1149.html>

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(518) 402-8179
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<http://www.dec.ny.gov/about/853.html>

With assistance from DEC, NYC engages in comprehensive planning that includes water quality for environmental and water supply purposes as well as asset management for water infrastructure. NYC's plan, PlaNYC, was developed in 2007 by Mayor Bloomberg's Office of Long-Term Planning and Sustainability (The City of New York, 2007).

Office of Long-Term Planning and Sustainability
Mayor's Office of Operations
253 Broadway - 10th Floor
New York, NY 10007
(212) 788-1400
www.nyc.gov/PlaNYC2030

3. WATER MANAGEMENT VISION AND GOALS

DEC's mission is, "The quality of our environment is fundamental to our concern for the quality of life. It is hereby declared to be the policy of the State of New York to conserve, improve and protect its natural resources and environment and to prevent, abate and control water, land and air pollution, in order to enhance the health, safety and welfare of the people of the state and their overall economic and social well-being (ECL Article 1)."

DEC's overall goal is, "to achieve this mission by embracing the elements of sustainability - the simultaneous pursuit of environmental quality, public health, economic prosperity and social well-being, including environmental justice and the empowerment of individuals to participate in environmental decisions that affect their lives (DEC, 2008(b))."

To achieve this goal, DEC lays out a "Greenprint" for a "healthier, safer environment and stronger New York," that includes the following objectives (DEC, 2008(b)):

- *Combat climate change.*
 - *Reduce greenhouse gas emissions.*
 - *Encourage low-carbon design technologies.*
 - *Elevate climate change awareness, research and adaptation ability.*
 - *Foster carbon sequestration and sustainable forestry.*
 - *Lead state agencies' efforts to tackle climate change.*

- *Foster green and healthy communities.*
 - *Use DEC's program areas to encourage smart growth.*
 - *Clean up contaminated land, especially in urban centers.*
 - *Reduce local waste generation and maximize recycling.*
 - *Promote community greening and urban forestry.*
 - *Preserve open space and working landscapes.*
- *Connect New Yorkers to nature.*
 - *Promote environmental education and outdoor experiences for all age groups.*
 - *Increase participation in hiking, camping, fishing, hunting and trapping.*
 - *Provide state-of-the-art facilities and high-quality and unique outdoor experiences.*
 - *Preserve and provide access to green space close to where people live, work and play.*
- *Promote a toxic-free future.*
 - *Reduce waste and use of toxics.*
 - *Promote green alternatives and technologies.*
 - *Support alternatives to the use of hazardous pesticides.*
 - *Promote product stewardship.*
 - *Enhance public access to information on toxics.*
- *Safeguard New York's unique natural assets.*
 - *Conserve, protect and restore watersheds and coastal resources.*
 - *Apply state-of-the-art management techniques, including ecosystem-based management.*
 - *Ensure sufficient water management infrastructure for New York's future.*
 - *Promote sound land use and planning.*
 - *Add unique and valuable ecosystems to the Forest Preserve.*
 - *Protect biodiversity and unique ecosystems across New York.*

PlaNYC has ten overarching goals that the city hopes to meet by 2030 (NYC, 2008):

1. *Create homes for almost a million more New Yorkers, while making housing more affordable and sustainable.*
2. *Improve travel times by adding transit capacity for millions more residents, visitors, and workers.*
3. *Ensure that all New Yorkers live within a 10-minute walk of a park.*
4. *Develop critical back-up systems for our aging water network to ensure long-term reliability.*
5. *Reach a full "state of good repair" on New York City's roads, subways, and rails for the first time in history.*
6. *Provide cleaner, more reliable power for every New Yorkers by upgrading our energy infrastructure.*
7. *Reduce global warming emissions by more than 30 percent.*
8. *Achieve the cleanest air of any big city in America.*
9. *Clean up all contaminated land in New York City.*

10. *Open 90 percent of our waterways for recreation by reducing water pollution and preserving our natural areas.*

The mission of DEC's Hudson River Estuary Program is to, "conserve the natural resources for which the Hudson is legendary; promote full public use and enjoyment of the river, and clean up the pollution that affects our ability to use and enjoy it. Our program is founded in science and implemented in ways that support the quality of life of the Hudson Valley's citizens (DEC, 2007)."

The Hudson River Estuary Action Agenda 2005-2009 lists 12 goals:

1. *Restore the signature fisheries of the estuary to their full potential, ensuring future generations the opportunity to make a seasonal living from the Hudson's bounty, and to fish for sport and consume their catch without concern for their health.*
2. *Conserve, protect, and, where possible, enhance critical river and shoreline habitats to assure that the life cycles of key species are supported for human enjoyment and to sustain a healthy ecosystem.*
3. *Conserve for future generations the rich diversity of plants, animals and habitats that are key to the vitality, natural beauty and environmental quality of the Hudson River Valley.*
4. *Protect and restore the streams, their corridors, and the watersheds that replenish the estuary and nourish its web of life—a system critical to the health and well-being of Hudson Valley residents and the estuary.*
5. *Conserve key elements of the human, pastoral landscapes that define the character of the Hudson River Valley and its setting of history and mystique.*
6. *Conserve the key features of the world-famous river scenery—the inspiration for the Hudson River School of American painting and for the tales of Washington Irving—and provide new and enhanced vistas where residents and visitors can enjoy Hudson River views.*
7. *Establish a regional system of access points and linkages so that every community along the Hudson has at least one new or upgraded access point to the river for fishing, boating, swimming, hunting, hiking, education, or river-watching.*
8. *Promote public understanding of the Hudson River, including the life it supports and its role in the global ecosystem, and ensure that the public understands the challenges the Hudson River faces and how they can be met.*
9. *Revitalize all the waterfronts of the valley so that the Hudson is once again the front door for river communities, where scenery and natural habitats combine with economic and cultural opportunity, public access, and lively green ports and harbors to sustain vital human population centers.*
10. *Ensure that the Hudson River will be swimmable from its source high in the Adirondack Mountains all the way to New York City.*
11. *Remove or remediate pollutants and their sources so that all life stages of key species are viable, and people can safely eat Hudson River fish, and so our harbors are free of the contaminants that constrain their operation.*
12. *Track our progress and celebrate our successes.*

During discussions undertaken in formulating this summary, representatives from the BWRM identified the following items as paramount to addressing and meeting the priority water resource goals in the state of New York both current and future:

- Funding and staff to carry out programs
- Funding to invest in infrastructure over the next 20 years (water supply, navigation-related, etc.)
- Federal resources:
 - The transition from a federal grant to a federal loan program in the funding of treatment facilities has contributed to a degradation of water quality and infrastructure.
 - Resources are needed to maintain the stream gauging facilities operated by the USGS in order to ensure the availability of quantity and quality data which impacts the ability to make sound judgment on projects.
- Technology
 - New York is behind in developing a system of information dissemination to the public and other state and federal agencies which could facilitate better decision making.
 - There is a need to provide quality geographic information to the public as well as project developers.

4. SCOPE OF WATER RESOURCES PLANNING AND MANAGEMENT

In addition to partnerships with the various regional river basin planning commissions, the state has nine, in-state regional planning commissions that assist local governments with local water resources management and planning. These planning commissions are county-based, although they roughly correspond to the state's various watersheds (Figure 1). Collectively, the nine commissions are known as the New York State Association of Regional Councils (NYSARC).

Water quality monitoring is conducted by DEC throughout the state through BWAM's comprehensive assessment strategy (Figure 2) (DEC, 2008(e)). Regionally, some of the river basin commissions (e.g., Susquehanna and Delaware) monitor water quality as well.

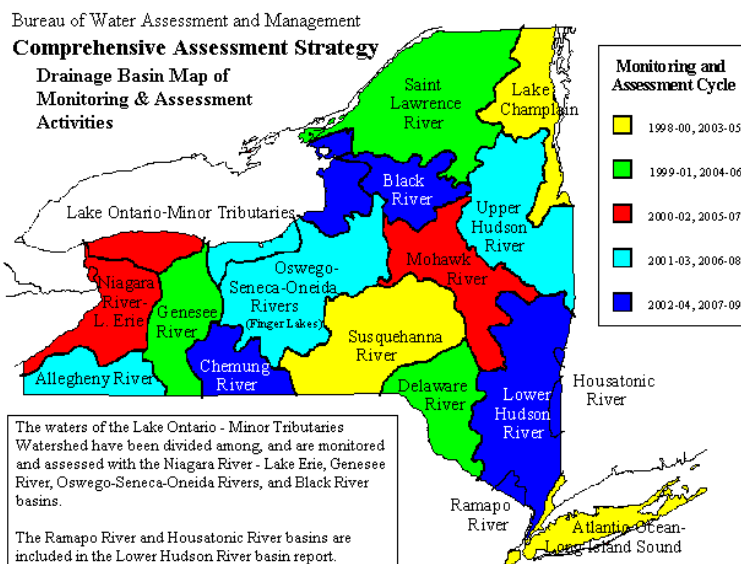


Figure 2. Statewide Monitoring and Assessment Schedule (DEC, 2008(e))

In addition to aging infrastructure, climate change is emerging as a serious water resources issue. PlaNYC says, “Cutting across all of these issues [growth, infrastructure, and environment] is one increasingly urgent challenge: climate change.” Throughout the plan, the city considers the current and future effect of climate change on their planning initiatives.

At the state level, there is a New York State Sea Level Rise Task Force (SLRTF) currently assessing the impacts of climate change on the state’s coastal areas (DEC, 2008(d)). The SLRTF is expected to produce a report to the Governor by December 31, 2009 that includes the following:

- *An assessment of the anticipated impacts of sea level rise*
- *Recommendations to provide more protective standards for coastal development, wetlands protection, shoreline armoring and post-storm recovery*
- *Recommendations of measures to:*
 - *Protect and connect habitats to facilitate [species] range shifts*
 - *Protect and restore critical habitats and ecosystem services*
 - *Identify and monitor climate change effects on natural biota*
 - *Integrate climate change adaptation strategies into state environmental plans*
- *Recommendations on regulatory and/or statutory alterations to respond to sea level rise*

The geographic scope of the report will include New York City’s five boroughs, Westchester, Nassau, and Suffolk counties, and the tidal waters of the Hudson River to the federal dam at Troy (DEC, 2008(d)).

The final report of SLRTF will be a framework for future planning initiatives. According to the DEC website on SLRTF’s Framework for Implementation, the final report will not include a comprehensive vulnerability assessment and site-specific risk reduction strategies. Instead, “emphasis will be placed on describing the potential risk of coastal inundation along New York’s

shorelines and the likely affected sectors, identifying research and monitoring needs, suggesting adaptation strategies, and developing a roadmap for future work.”

Other significant areas of concern identified include:

- Transitioning into the regulatory requirements of the Great Lakes Compact preventing diversions out of the basin and additional requirements dealing with withdrawals and consumption.
- Suburban growth in southeast NY putting a strain on water resources in areas that are the at the headwaters of the Susquehanna and Delaware River basins.
- Natural gas drilling presenting issues of groundwater quality and the need for a high degree of coordination with the state of Pennsylvania as well as the Delaware and Susquehanna River Basin Commissions.
- The need to develop a better understanding of existing water use (who, where, and what for?).

Along the state’s canal systems integrated water resource management is challenged by competition for water needed for water supply, navigation, recreation, and flood control. Within the Delaware River basin, the City of New York’s water supply needs (1.2 BGD average) need to be balanced with downstream state and habitat needs. The BWRM has developed models to aid in decision making. Currently the agency has models that help to understand the relationships between water storage in reservoirs and the affect on flood management, habitats, various downstream needs, and water supply for New York City.

Another challenge recognized is competition for resources that exists due to the development and operation of hydropower facilities. Meeting these demands can cause a conflict among the water resources needs for water supply, in-stream uses for habitat and recreation.

5. PARTNERSHIPS, STAKEHOLDER, AND PUBLIC INVOLVEMENT

New York is involved in numerous federal, state, regional, and interstate partnerships. Federal partners include the USGS, USACE and USEPA. State agencies involved in water resources planning and management include DEC, Department of State, Department of Transportation, NYS Energy Research and Development Authority, NYS Fish and Wildlife Management Board, NYS Conservation Fund Advisory Board, NYS Environmental Board, and the NYS Conservation Council. Through memberships in various river basin commissions, New York partners with Pennsylvania, New Jersey, Illinois, Indiana, Wisconsin, Ohio, Kentucky, Tennessee, West Virginia, Delaware, and Maryland.

The federal government’s role is important in supporting New York’s water resources planning needs. The BWRM’s partnership with the USGS is valuable for monitoring and data collection, their partnership with the USACE is vital in assisting with developing plans, and past involvement with the USEPA through a federal grant program providing funds for wastewater treatment projects were key in supporting state water planning needs.

Public involvement in regional and state level planning is solicited by DEC through events, workshops, hearings, and meetings open to the public and sponsored by DEC. Meeting locations, dates and times can be found on DEC's new online Events Calendar (DEC, 2008(a)).

6. PLAN IMPLEMENTATION STRATEGY

The state implements actions primarily through state programs and through regional partnerships.

The Hudson River Action Agenda provides a series of goals, and immediate (< 4 years) and long-term (5-15 year) objectives. However, the Action Agenda does not provide an implementation strategy.

PlaNYC includes water infrastructure-related and water quality-related implementation strategies: Infrastructure-related strategies of PlaNYC include:

Ensure the quality of our drinking water.

1. Continue the Watershed Protection Program.
 - *We will also continue to work with local communities to repair an estimated 300 residential septic systems per year, and install new wastewater treatment systems in a number of communities.*
2. Construct an ultraviolet disinfection plant for the Catskill and Delaware systems.
 - *We will open the world's largest ultraviolet disinfection facility in 2012.*
3. Build the Croton Filtration Plant.
 - *The Croton filtration plant—the city's first—will be constructed within the Mosholu Golf Course in Van Cortlandt Park in the Norwood section of the Bronx by 2012. It will have the capacity to filter 290 mgd of water, and will also feature the City's largest green roof for public year-round recreational use.*

Create redundancy for aqueducts to New York City.

4. Launch a major new water conservation effort.
5. Maximize existing facilities.
 - *DEP will begin upgrading the groundwater system in southeast Queens and begin construction on an enhanced treatment plant between 2011 and 2012. By 2016, the Jamaica [water supply] system will provide an additional 10 mgd.*
 - *Today, the New Croton Aqueduct is the only way to bring water from the Croton Watershed into the city. But the Delaware Aqueduct passes directly through the Croton Watershed; strong pumps could force the water into the Delaware Aqueduct below the point of the leak described earlier.*
 - *Although we currently have hydraulic pumps in place, they lose three gallons of water for every gallon successfully transferred. Upgrading these pumps to more*

efficient models will enable us to convey 125 mgd of Croton Water through the Delaware Aqueduct. We expect these new pumps to be operational by 2011 and cost \$62 million.

6. Evaluate new water sources.

- *A new aqueduct connecting the Rondout Reservoir with the West Branch Reservoir across the Hudson River would completely meet the city's water demand if the Delaware Aqueduct was required to be shut for repair. This new 45-mile section would run parallel to the Delaware Aqueduct and into the Croton Watershed, providing a second means of carrying water from the Delaware System into the city. We could also expand the capacity of the Catskill Aqueduct to 660 mgd, a 10 percent increase, by pressurizing sections of the tunnel to improve water velocity.*

Modernize in-city distribution.

7. Complete Water Tunnel No. 3.

- *Stage 1, which serves northern Manhattan and parts of the Bronx, was projected to cost \$238 million and be completed within eight years. It finally opened in 1998—at a cost of a billion dollars.*
- *Stage 2 is currently under construction in Brooklyn, Queens, and Manhattan and will begin delivering water in two stages: the Brooklyn/Queens leg will open in 2009, with the Manhattan leg following in 2012. Although Stage 2 will not provide full redundancy for the in-city distribution, its completion will enable Water Tunnel No. 1 to be shut down for repairs, which are estimated to cost \$365 million.*
- *The third stage of the water tunnel, also known as the Kensico-City Tunnel (KCT), will extend from the Kensico Reservoir to the valve chamber in the Bronx. This 16-mile section, currently in the planning stage will provide critical redundancy between the Kensico and Hillview reservoirs. Although this stage is estimated to cost between \$4 and \$6 billion, just \$239 million is currently included in the 10-year plan.*
- *Stage 4 of Water Tunnel No. 3 will be 14 miles long and run from the valve chamber in the Bronx under the East River into Queens. It will provide more distribution in Queens and provide full coverage during the eventual shutdown and repair of Water Tunnel No. 2.*

8. Complete a backup tunnel to Staten Island.

- *DEP will partner with the Army Corps to build a new 72-inch water main that will replace the pipes, ensuring a continued reliable water supply for Staten Island.*

9. Accelerate upgrades to water main infrastructure.

- *Once it leaves our in-city tunnels, water travels through 6,700 miles of water mains to reach our homes, over 1,000 of which were installed over a century ago. These aging pipes require constant repair and continual upgrades. We are currently replacing 60 miles of water mains annually. At our current pace of replacing 1 percent of our infrastructure every year, a full upgrade will take a century to complete. Over the next decade, we will accelerate the pace of upgrades to over 80 miles annually. In addition, we will spend approximately \$575 million to link Stage 2 of Water Tunnel*

No. 3 with the water main distribution system. Over 10 miles of new trunk water mains will be installed in Manhattan for this purpose.

PlaNYC water quality strategies are:

Continue implementing infrastructure upgrades.

1. Develop and implement Long-Term Control Plans.
 - *In the upcoming months, we will submit the Waterbody/Watershed (WB/WS) Plans for 18 waterbodies to the State's Department of Environmental Conservation (DEC), detailing strategies for CSO reduction. These plans will rely on proven infrastructure upgrades to expand the capacity of our wastewater treatment plants, by constructing holding tanks, and optimizing our sewer infrastructure. The WB/WS plans will be integrated into the 14 watershed-specific Long-Term Control Plans (LTCP) also mandated by DEC.*
 - *Preliminary projections estimate that the implementation of the LTCPs will result in an increase in CSOs captured from approximately 70% to 75%. In addition, the plan will specify other enhancements, including reducing floating debris such as bottles, bags, and other trash through netting facilities.*
2. Expand wet weather capacity at treatment plants.
 - *In addition to upgrading our treatment facilities to reliably comply with existing and emerging regulatory requirements, we are also maximizing the volume of water these treatment plants can process during storms.*
 - *Currently, all treatment facilities are required to treat twice the amount of flows that would occur on a normal day without rain. But at Newtown Creek, the 26th Ward, and Jamaica Waste Water Treatment Plants, we will be expanding the wet weather capacity. This should reduce the CSO discharges in these sewersheds by more than 185 million gallons per day (mgd) during rainstorms.*

Pursue proven solutions to prevent stormwater from entering the system.

3. Increase use of High Level Storm Sewers (HLSS).
 - *We will convert combined sewers into HLSS and integrate HLSS into major new developments, as appropriate.*
4. Capture the benefits of our open space plan.
 - *Over the next 25 years, we will undertake 40 new Greenstreets projects every planting season, bringing the citywide total to more than 3,000 by 2030. A one-acre Greenstreet can hold about 55,000 gallons of storm water. The existing total acreage of Greenstreets sites in New York City is almost 164 acres, which translates into nine million gallon capacity citywide. With an additional 40 new Greenstreet projects, covering 75 acres, the capacity to hold stormwater will increase by four million gallons.*

- *In addition to increasing stormwater storage through Greenstreets, we will increase the number of trees in the city by one million. New designs for the tree pits could significantly increase this capacity as well.*
5. Expand the Bluebelt program.
- *Nearly 36 percent of Staten Island’s precipitation drains into the current Bluebelt system which covers nearly 10,000 acres. Over the next 25 years, we will seek to add an additional 4,000 acres in the borough, spread across South Beach, New Creek, and Oakwood Beach.*

Expand, track, and analyze new Best Management Practices (BMPs) on a broad scale.

6. Form an interagency BMP Task Force.
- *We will establish the New York City Interagency BMP Task Force which will bring together all relevant City agencies to analyze ways to incorporate BMPs into the design and construction of projects. This year, the Task Force will pilot three of the most promising BMPs followed by a series of additional pilots across New York and measure the results. After 18 months, the Task Force will announce a plan to integrate the most successful BMPs on a larger scale. The recommendations of this plan will not only reduce CSO volumes, they will also help cool the city and reduce construction and demolition waste creation by City agencies.*
 - *The Task Force also will create a set of performance metrics to be published annually. Possible metrics include market penetration of BMPs on private development, acres of permeable surfaces, storm water capture rates, and improvement in water quality such as reductions in fecal-coliform levels and increases in dissolved oxygen. It will develop a process to monitor, assess, and report agency and BMP performance, as well as a process to reevaluate and modify the report every two years.*
7. Pilot promising BMPs.
- *The Task Force will begin by piloting the following three BMPs, selected for their feasibility and proven effectiveness in other programs across the United States:*
 - *Create a mollusk habitat pilot program*
 - *Plant trees with improved pit design*
 - *Create vegetated ditches (swales) along highways*
 - *Within the next two years, the City will also pilot other BMPs, including developing storm water BMPs for ballfields along the Bronx River, using vacant public property to create urban storm water systems that offer greater infiltration and protect wildlife habitat. We will also study the treatment and capture of storm water from large parking lots using vegetation and infiltration through pilots in the Jamaica Bay Watershed.*
8. Require greening of parking lots.
- *The City will modify the zoning resolution to require perimeter landscaping of commercial and community facility parking lots over 6,000 square feet as well as*

street tree planting on the adjacent sidewalks. Parking lots over 12,000 square feet would also be required to provide a specified number of canopy trees in planting islands within each lot. The intention of this proposal is to reduce the eyesore of large asphalt expanses while more effectively managing storm water runoff and helping to cool the air.

- *In addition to the zoning modification, the City will analyze the costs and benefits of integrating additional BMP's into parking lots. From these findings, we will create appropriate policy to improve storm water capture and storage for parking lots as part of the New York City Interagency BMP Plan.*

9. Provide incentives for green roofs.

- *The City is developing four residential and two commercial pilots to analyze the potential cumulative benefits of green roofs on the city's combined sewer system. The expected cost for each is \$100,000 for design and \$1.3 million for construction and equipment. The City currently provides incentives for the private development of two BMPs through DEP's Comprehensive Water Reuse Program. This program offers buildings that install "blackwater" or "greywater" systems a 25% discount off their water and sewer charges. "Blackwater" systems capture and treat sanitary wastewater and recycle it within the building for non-potable use. "Greywater" systems capture used water from washing machines, dishwashers, and showers and then reuses that water for toilets or other non-potable applications.*
- *Starting in 2007, the City will begin providing incentives for green roofs, as well. New York City will support the installation of extensive green roofs by enacting property tax abatement to off-set 35% of the installation cost of a green roof. The pilot incentive will sunset in five years, when it will be reassessed for extension and inclusion of other technologies.*

10. Protect wetlands.

- *We will launch a study to identify gaps, or areas not effectively addressed under existing Federal and State laws. Specifically, we will assess where existing regulations fall short of protecting New York City's remaining wetlands. This assessment will be the first step in the development of a comprehensive policy to protect and manage wetlands in the city.*

7. OUTCOMES ASSESSMENT PROCESS

At the state level, DEC has not conducted any reviews or assessed its water resources planning process (including the Hudson River Estuary Action Plan).

In the opening to PlaNYC: Progress Report 2008, Mayor Bloomberg says:

- *I'm pleased to report that PlaNYC has been as well received locally as it has been nationally and internationally. It has received numerous awards, from groups ranging from the American Institute of Architects to the New York Water Environment Association.*

- *Too often in government, plans are unveiled, photo-ops are held, and then all is forgotten. We were determined to avoid that mistake, and to hold ourselves accountable for results. That is why PlaNYC includes an implementation timeline with incremental targets that will help ensure steady progress. Since last April, we have launched 118 of our 127 initiatives—and we have already completed several.*

According to its 2008 Progress Report, NYC’s progress in the area of water quality includes, “Passed new landscaping requirement for commercial parking lots and began work on stormwater management plan.” Progress in NYC’s water network is, “Received new Filtration Avoidance Determination from EPA, purchased more than 5,000 acres to protect the watersheds, and began construction on Croton Filtration Plant.”

All water quality initiatives listed in PlaNYC have been launched and all water network initiatives have also been launched with the exception of “Launch a major new water conservation effort.” Despite an initial \$6 million required for computer programming of the water usage collection and billing system, due to budget constraints, an expanded conservation program is currently deferred.

8. NEEDS, CHALLENGES AND CRITICAL PRIORITIES - INTERVIEW INSIGHTS

The key water resources issues/needs in the State of New York are:

- Population growth, an aging infrastructure, and environmental uncertainties (including climate change) present a statewide water supply and water quality challenge. \$36.2 and \$38.7 billion respectively are needed for wastewater and water supply infrastructure improvements over the next 20 years.
- Suburban growth in the headwaters of the Susquehanna and Delaware River Basins is putting a strain on water resources.
- Addressing the water quality management issues that emerge from the rapid increase in natural gas exploration in the Marcellus Shale structure of the state through interaction and collaboration with the Susquehanna and Delaware River Basin Commissions.
- Need for uniform management program for all significant water withdrawals throughout the state. Integrated water resources management to deal with competing interests along the state’s canal systems. A significant competitor for water is New York City.
- Managing the conflicts involved in meeting peak power demands met through hydroelectric power generation and other in-stream needs.
- Improving the understanding of existing water use in New York.

Meeting the challenges mentioned above will demand, above all, money and staff. The investments required to meet the growing water supply and water quality infrastructure needs of the state over the next 20 to 30 years are immense. Funding is also needed to develop improved data management, integration, and dissemination to facilitate more sound decision making. In addition, additional staff resources are needed to effectively implement the state’s water resources programs.

Working with outside partners, both state and federal, is seen as an important tactic in effectively addressing the state's key water resource issues. Partnerships with the USGS are needed to contribute to enhanced monitoring abilities contributing to better overall decision making. Collaboration with the USACE is necessary for assistance in water resources planning. Overall, a lack of federal funding in recent years has impacted the state's ability to make sound judgment on water resources projects.

9. REFERENCES

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