



**Environmental
Protection**

Michael R. Bloomberg, Mayor
Cas Holloway, Commissioner

STRATEGY 2011-2014



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LETTER FROM THE MAYOR



Michael R. Bloomberg
Mayor

Dear Friends:

As one of the most vibrant cities in the world, New York continues to attract the best and brightest from around the globe. It's no surprise: our City offers unrivaled cultural, educational, and business opportunities for residents and visitors alike. Supporting all that our City has to offer is a core of agencies filled with thousands of dedicated public servants who keep New York running day in and day out—and central to that effort is the Department of Environmental Protection.

DEP's work benefits all New Yorkers in a variety of ways. As one of only five large cities in the nation to have an unfiltered water supply, New York City has invested more than \$500 million in recent years to help DEP maintain and preserve our high-quality drinking water. Moreover, after 100 years of collecting data on water quality in New York Harbor, and a \$6 billion investment over the last eight years, our waterways are cleaner than they've been at any time in the last century—thanks to DEP. And in 2007, the noise code was revised by DEP for the first time in more than 30 years to maintain the City's vibrancy by balancing the need for construction, development, and an exciting nightlife with New Yorkers' right to peace and quiet.

Still, we have much more to do. Building on the successes of the past eight years, DEP has developed this exciting strategic plan that lays out the next generation of improvements to our water system, as well as ambitious strategies such as a Green Infrastructure Plan to reduce combined sewer overflows that will transform the City and improve water quality. We will continue to make core infrastructure investments—like fixing the leak in the Delaware Aqueduct—and to improve services to our nine million customers including faster response times to water main breaks, faster permitting, and real-time consumption data.

This plan lays out the distinct strategies and initiatives needed to carry out DEP's vital mission, and we'll hold ourselves accountable for implementing each one of them. We'll complete some within the next three years, and some will extend many years past that—to 2030 and beyond, ensuring that New York continues to be one of the largest, greenest, and most sustainable cities in the world.

Sincerely,

A handwritten signature in black ink that reads "Michael R. Bloomberg". The signature is fluid and cursive, with a long, sweeping tail on the final letter.

Michael R. Bloomberg
Mayor

LETTER FROM THE DEPUTY MAYOR FOR OPERATIONS



Stephen Goldsmith
Deputy Mayor for Operations

Dear Friends,

New York City's Department of Environmental Protection (DEP) is the largest municipal water utility in the nation: we deliver one billion gallons of clean, fresh water to more than nine million people every day, and treat 1.3 billion gallons of wastewater to protect public health and keep our environment clean. The digester eggs visible from the Kosciusko Bridge (among other places) are just one of the dozens of innovations over more than 100 years that enable DEP to deliver services on such a monumental scale. Continuing that tradition is essential to the continued growth of New York City; and to improving the service we provide, while at the same time cutting the cost to provide it.

The NYC Green Infrastructure plan is just one example of the ways that DEP is using new ideas to address age-old problems—and get the most benefit out of every public dollar. The plan will improve water quality and create open green spaces, lower energy costs, and improve air quality—all for more than a billion dollars less than New Yorkers would otherwise have to spend.

DEP also has unique assets to develop renewable energy sources that can be tapped through public-private partnerships here in New York City, and in the more than 1.2 million-acre watershed that is home to our water supply. And DEP is improving customer service by investing in better and more efficient technology like wireless meter reading, which reduces overall costs—and minimizes the need for future water rate increases.

This strategic plan represents the future of New York City government. It demonstrates that innovation can—and must—be embedded in the way we do business every day. I look forward to working with DEP to help them achieve their goals by implementing the 100 initiatives in this plan in the coming years. The results will transform our neighborhoods and environment in ways that will benefit us all.

Sincerely,

A handwritten signature in black ink, appearing to read "Steve Goldsmith". The signature is stylized and cursive.

Stephen Goldsmith
Deputy Mayor of Operations

LETTER FROM THE COMMISSIONER



Caswell F. Holloway
Commissioner

Dear Friends:

When Mayor Bloomberg appointed me Commissioner of the Department of Environmental Protection (DEP) in January 2010, he asked for two things: accountability and results. The result DEP needs to achieve is clear: supply, deliver, and treat the high-quality water that more than nine million New Yorkers need every day; and protect and improve the air we breathe, the waterways that surround us, and our overall quality of life by preventing excessive noise and the other environmental hazards that New Yorkers confront in a city of 8.4 million (and growing).

This plan establishes 29 goals and 100 specific strategies and initiatives to achieve them to get that result—at a cost New Yorkers can afford. Four core functions contribute to achieving DEP’s mission, and are reflected in the structure and organization of this plan:

- We are a customer service organization that serves more than nine million New Yorkers, including 835,000 property owners who pay their water bills, and thousands of people and businesses who need to hook into the water system to build homes and businesses throughout the five boroughs;
- We are the largest municipal water and wastewater utility in the country, supplying and distributing more than one billion gallons of drinking water each day, and treating 1.3 billion gallons of wastewater generated in New York City and the watershed;
- We have one of the largest capital programs in the region, with \$14 billion of projects currently in active design and construction, including City Water Tunnel No. 3, and the \$5 billion re-construction of Newtown Creek Wastewater Treatment Plant; and
- We have a key role in making New York City sustainable today and for future generations by providing clean water, clean air, and a healthy environment for all New Yorkers, and the millions of commuters and visitors who come to the city every day.

Performing each of these functions well requires clear goals and the means to achieve them, and that’s what this plan is intended to provide. It is also designed so that New Yorkers—and all of DEP’s many stakeholders—can hold us accountable for getting the great results that you have a right to expect. Whether you are a customer concerned about a bill, a contractor who needs to get paid, a developer or entrepreneur trying to open a new restaurant, or a citizen or regulator concerned about water quality in New York Harbor, this plan articulates clear goals and how we intend to achieve them.

I want to thank our nearly 6,000 skilled and dedicated employees for their unwavering commitment to DEP, and to the City we serve. Thanks to their hard work, New Yorkers need only turn on the tap to enjoy one of the City’s greatest resources: NYC water.

A handwritten signature in black ink, appearing to read 'Caswell F. Holloway'.

Caswell F. Holloway
Commissioner



INTRODUCTION

This strategic plan, and the 100 distinct strategies and initiatives it contains, explains how DEP will achieve its goal to become the safest, most effective, cost-efficient, and transparent water utility in the nation over the next four years and beyond. DEP's core mission is to supply and distribute more than one billion gallons of high-quality water to nine million New Yorkers every day, and to treat the 1.3 billion gallons of wastewater we generate daily so that it has the smallest possible impact on water quality in New York Harbor. Beyond these core utility functions, we are also responsible for improving air quality, reducing noise pollution, and protecting New Yorkers from hazardous substances—like asbestos and chemicals found at dry cleaners, auto body repair shops, hospitals, and factories.

To carry out our expansive environmental mission, DEP serves many types of customers each day: 835,000 property owners who pay their water bills; 8.4 million New York City residents who consume our water; 55 municipalities and more than one million upstate residents who purchase and consume NYC water; 66,000 residences, businesses, and industries that comply with air pollution emission requirements; 26,000 businesses, homeowners, and developers who need to connect to the water and sewer network to live and operate; and hundreds of restaurant owners who install grease traps to protect our sewer infrastructure. We have an obligation to provide fast, efficient, and reliable service to these many customers at the lowest possible cost.

To achieve DEP's mission, we must successfully execute our four strategic functions:

- **Provide effective and responsive customer service,**
- **Operate a safe and high-performing water utility for the lowest possible cost,**
- **Make cost-effective capital investments, and**
- **Achieve a sustainable quality of life for all New Yorkers.**

DEP's management is structured to carry out these four core strategic functions and our success will depend on how well we perform in each of these areas. The sections that follow establish **Goals** for each of DEP's core functions and set out **Strategies and Initiatives** that explain how we will achieve those goals over the next four years and beyond.

This strategic plan is a blueprint for achieving our core objectives over the long term and is intended to guide our nearly 6,000 employees in the work they do every day. It will also provide greater insight for New Yorkers who would like to learn more about how DEP operates and manages the tremendous resources we need to provide critical water and wastewater services to the greatest city in the world. By fulfilling these 100 unique initiatives in the coming years, we will ensure a fresh supply of drinking water, robust and modernized infrastructure, and a clean and healthy environment for generations to come.

STRATEGIC PLANNING AND PERFORMANCE

1 Launch H₂OStat to ensure the efficient and cost-effective operation of the water system and the entire agency.

In 2011, DEP will launch the first phase of H₂OStat, an agency-wide effort to assess real-time performance, improve operational efficiency, and establish metrics to determine how the agency is performing. DEP currently tracks more than 200 indicators and uses more than 30 different analytic models, multiple SCADA systems, and databases. Nearly 6,000 employees operate 19 reservoirs, three controlled lakes, 26 dams, more than 295 miles of aqueducts, more than 200,000 valves, 6,600 miles of water mains, 7,400 miles of sewers, 21 wastewater treatment plants (14 in the five boroughs and seven in the upstate watersheds), and thousands more pumps, tanks, and electrical connections. H₂OStat will be DEP's data clearinghouse and will drive performance management and increase accountability by setting performance benchmarks in each of our core strategic functions: effective customer service, safe and compliant water and sewer operations, cost-effective capital investments, and a sustainable quality of life for all New Yorkers.



DEP's mission to operate an efficient and healthy water supply and treatment system and practice good environmental stewardship depends on the performance of our nearly 6,000 employees.

PlaNYC

Released in 2007, PlaNYC is both a growth plan to accommodate one million new residents by 2030 and a climate action plan to reduce total city greenhouse gas emissions over the same time period. The plan also seeks to achieve cleaner air, increase parks and open space, improve harbor water quality, and modernize water supply infrastructure, just to name a few of its goals. PlaNYC links what have traditionally been considered separate, if not conflicting, issues in urban development—economic growth, environmental sustainability, and quality of life—into a unified strategic framework for developing New York City over the long term.



2 Innovate and implement best practices through active engagement with our partner water utilities and stakeholder organizations around the country and the world.

DEP and its predecessor agencies have a long history of pioneering achievements in water and wastewater science and technology. From the artisans who painstakingly bricked the New Croton Aqueduct, to the scientists, engineers, and construction trades who brought eight digester eggs to Greenpoint, DEP has built the infrastructure necessary for New York City to grow and thrive. Innovation and performance management have been, and will always be, the keys to DEP's success. We cannot do it alone. Thanks to a strong network of stakeholder organizations that bring together the best professionals in the world to tackle the toughest challenges, we do not have to.

The Water Environment Federation (WEF), Water Research Foundation (WRF), and Association of Metropolitan Water Agencies (AMWA) are among the collective organizations that will enable DEP to use the best operations and management practices to achieve its mission. And the work of organizations like the American Water Works Association (AWWA) and the National Association of Clean Water Agencies (NACWA), and governmental partners including the US Geological Survey (USGS), the National Oceanic and Atmospheric Administration (NOAA), and the US Army Corps of Engineers (USACE) form the building blocks for our regulatory policy and operational and capital investments. DEP will remain a committed participant in and partner with these entities. To stay at the cutting edge of innovation, DEP will convene a Sustainability and Technology Advisory Board comprised of leaders in government, industry, and academia.



NYC water keeps people and dogs cool and refreshed on a hot summer day.

Vision 2020

Vision 2020 is a comprehensive plan to enhance New York City's waterfront and waterways, one of the city's most valuable assets. The plan's recommendations set forth a ten-year vision, recognizing the diversity of the waterfront and balancing the city's many needs including public access, recreation, the natural environment, maritime industries, housing, and commercial activity. The original *Comprehensive Waterfront Plan*, published by City Planning in 1992, called for the redevelopment of our waterfront, opening it up to New Yorkers as a resource for enjoyment. *Vision 2020* is taking the next step into the water itself and establishes policies for the use of our Blue Network for transportation, recreation and education, for improving water quality, and for the first time addresses the challenges of global warming and sea-level rise. This new plan provides a vision for the city's waterfront as well as an assessment of current challenges and opportunities. It also sets forth both citywide proposals as well as specific strategies for each of the 22 reaches that compose our waterfront.





CUSTOMER SERVICE GOALS

- ▶ Provide the highest quality service to nine million New Yorkers, including our 835,000 bill-paying customers.
- ▶ Ensure effective and fair revenue collection.
- ▶ Encourage economic development by simplifying and improving permitting processes.

DEP delivers water to nine million New Yorkers every day. Eight million live in New York City, and one million live in Westchester, Putnam, Ulster, and Orange counties. The 835,000 bill-paying customers who pay for water and sewer services make it possible to operate, maintain, and build the city's water and sewer infrastructure, and we have a special obligation to these customers to provide transparent, high-quality, and efficient customer service.

That means explaining water and sewer bills to our customers and telling them how their money is being spent, getting bills right, treating customers fairly, making corrections quickly when a mistake is made, making it easy to pay a bill, and providing fast, professional assistance on any issue. We also have a responsibility to keep water rates as low as possible by running the system efficiently and taking the steps necessary to ensure that all New Yorkers who can afford to pay their water and sewer charges actually pay. For New Yorkers facing economic hardship, we must continue to offer payment plans and ensure that every effort is made to tell people about exemptions and programs for which they may be qualified.

DEP is also responsible for developing citywide drainage plans to ensure that our water and sewer infrastructure can meet the current and future demands of a growing city. PlaNYC, Mayor Bloomberg's sustainability blueprint, projects that New York City's population will grow by one million people by 2030. In the next four years, the City and private developers will make major investments in infrastructure connections as a result of the more than 100 re-zonings that the Department of City Planning has implemented since 2002 to open large portions of the city to sustainable residential, commercial, and industrial development. DEP must work closely with the development community to expedite projects and make sure that the city's water and sewer infrastructure can support any proposed development.



DEP's Customer Services unit operates a call center and is installing wireless water meter readers for all of our 835,000 bill-paying customers. Opposite: a customer service representative.

To achieve these goals and improve the way we interface with engineers, construction companies, developers, and other customers, DEP will simplify the permitting process, clarify requirements and regulations, and increase outreach to our many stakeholders. DEP has made significant strides in these areas during the past several years. With smart investments in technology and strong performance management, we will become a more customer service-oriented organization by focusing on transparency, responsiveness, and efficiency.

STRATEGIES & INITIATIVES

Goal: Provide the highest quality service to nine million New Yorkers, including our 835,000 bill-paying customers.

3 Substantially complete the installation of Automated Meter Reading (AMR) devices citywide by January 2012 and continue to improve the online AMR tool.

AMR provides accurate, wireless water meter readings to DEP at least four times per day and hourly for larger customers. This technology will eliminate the need to estimate water bills and will enable DEP to provide precise consumption information to our customers on a daily basis. In July 2010, Mayor Bloomberg and Commissioner Holloway launched AMR online through nyc.gov. By signing up, customers can manage their water use daily and identify problems, like leaks, that can drive up water bills if they are not fixed quickly. DEP will roll out new features for AMR online based on customer feedback and suggestions.

AUTOMATED METER READING

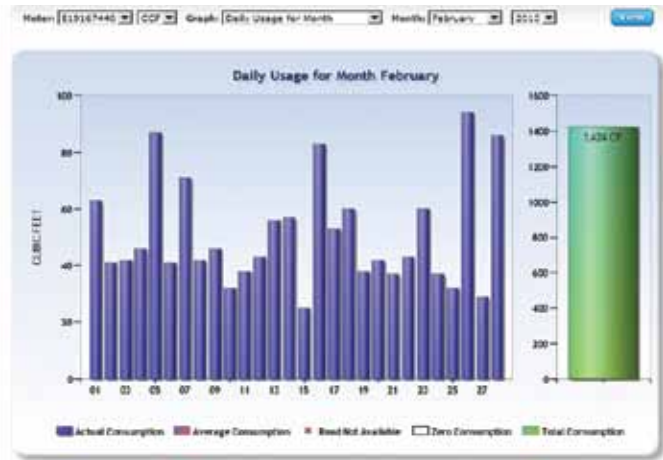
DEP is committed to providing more accurate and timely billing information to its customers. In pursuit of this goal, DEP is installing Automated Meter Reading (AMR) technology for all customers citywide. AMR will allow DEP to eliminate estimated bills and provide more accurate billing and consumption information to customers on a more frequent schedule. Customers will be able to track their water consumption in near real-time and manage their water usage more effectively than in the past.



Older water meters were only read four times per year, but wireless meter readers provide real-time data on water use that customers can access online.

4 Develop a leak notification system for customers who want to know when their water use deviates from normal consumption patterns.

Using new real-time consumption data available through AMR online, DEP will launch a voluntary notification program by January 2011 to alert property owners when their water consumption appears to deviate from normal usage. Spikes in water use can indicate a leak that could substantially increase a homeowner's water bills if not quickly addressed. We will also develop a smart phone application that will allow customers to track their water use and respond to potential leaks and consumption spikes on the go.



Customers can now track and manage their water use in near real-time.

5 Reduce call response time to 30 seconds or less.

DEP has expanded customer service call center hours for customer convenience and has dramatically reduced call wait time from an average of 4 minutes 24 seconds in 2006, to just 58 seconds today. We will continue to reduce response times to meet Mayor Bloomberg's goal of 30 seconds or less for customer service inquiries, while still maintaining the accurate and friendly service standards that our customers expect.

6 Continue and expand programs for customers in financial distress.

DEP currently runs two programs that provide support and assistance for customers in financial distress: the Safety Net Referral Program (SNRP) uses an existing network of City agency and not-for-profit programs to help customers with financial counseling, low-cost loans, and legal services. The Water Debt Assistance Program (WDAP) provides temporary water debt relief for qualified property owners who are at risk of mortgage foreclosure. In addition to these programs, we will continue to offer payment plans for customers who may have difficulty paying their entire bill at once. We will also undertake an aggressive communications campaign to make sure customers know about these programs and any exclusions they may be qualified to receive, such as the Senior Citizens Homeowner's Exemption (SCHE) and the Disabled Homeowner's Exemption (DHE).

WATER DEBT ASSISTANCE PROGRAM

Since we announced the Water Debt Assistance Program (WDAP) in February 2010, DEP has approved over 800 property owner applications and set aside over \$4 million in debt. Customers who are at risk of foreclosure and face enforcement action can have their long-term debt set aside until their property is sold or refinanced. WDAP serves as an important component of Mayor Bloomberg's goal to launch the most ambitious home foreclosure prevention effort of any city in the nation.

7 Offer customers a service line protection plan.

A significant majority of water infrastructure leaks that DEP responds to involve private service lines that connect customer properties to the distribution system. Property owners are responsible for service line repairs, which must be completed by a qualified contractor. As a result, customers are often forced to pay thousands of dollars to repair a damaged service line, or risk termination of service. To reduce this risk, DEP will explore offering customers a service line protection plan in which participating customers would pay a small monthly premium in exchange for guaranteed repair of a service line break. A protection plan would spare homeowners the high costs of unexpected service line repairs, and would free up DEP resources to repair, maintain, and improve the water and sewer network.

8 Promote NYC water by building partnerships with community organizations, businesses, and other city agencies.

To engage New Yorkers and increase awareness of the benefits of NYC water and DEP's role in providing it, we will expand and strengthen our partnerships with not-for-profit organizations and businesses, and will broaden our education outreach to public and independent schools. As part of this effort we will expand Water-On-the-Go, our program that brings portable public water fountains to neighborhoods and events throughout the five boroughs. And we will work with community partners and other city agencies to promote tap water as a healthy, affordable, and environmentally conscious alternative to soda, bottled water, and other drinks.

Goal: Ensure effective and fair revenue collection.

9 Replace the DEP customer information data system and convert to monthly account billing.

DEP currently sends its customers a quarterly bill that provides minimal information about historical and comparative water use. This is mainly due to the limitations of our customer information data system, which is outdated and inflexible. Working with IBM, DEP is building a new customer information system that will go live by 2012. In connection

CUSTOMER INFORMATION SYSTEM

To take advantage of more robust customer data as it becomes available through AMR technology, DEP will also implement a new Customer Information System (CIS) that will allow account information to be tracked and managed more effectively. The new system, together with the AMR data, will facilitate DEP's tracking, planning, and budgeting for water consumption.



DEP holds regular outreach events in all five boroughs to give customers an opportunity to learn about ways to reduce bills or participate in DEP's assistance programs.

with the switch, DEP will convert from quarterly to monthly billing so that customers can better keep track of their water and sewer charges. The new monthly bills will provide more customer-specific information about year-to-year water use, and will increase monthly revenue collection, which will help to keep future water rate increases as low as possible.

10 Convert customers to paperless billing and online payment methods.

Our customers should be able to pay their bills quickly and easily. In the spring of 2010, DEP launched a direct-debit payment option through nyc.gov that allows customers to get a 2% discount on their water and sewer bill. DEP launched a paperless billing option in 2010. Customers who sign up will no longer receive a paper bill in the mail and will instead receive an email from DEP with a link to an online location where they can view and pay their bill. If just 10% of customers sign up for paperless billing, DEP would save approximately \$170,000 per year in printing and postage costs.

ONLINE OPTIONS AND PAPERLESS BILLING

DEP customers can see and pay their bill and track their water use online at one convenient location.

We encourage all our customers to switch to paperless billing, a cost-effective way to reduce our environmental impact. For each customer that goes paperless, DEP will save more than \$2.00 per year.

Go to www.nyc.gov/dep and click on the blue My DEP Account button to get started.



11 Increase revenue collection with new collection tools and by targeting specific customer segments.

The vast majority of DEP's customers pay their water bills in full and on time. However, a small population of chronic nonpayers have the means to pay, but simply choose not to. DEP will aggressively pursue these nonpaying customers through traditional and new methods, including piloting a contract with a third-party collection agency to increase the scope and success of our collection efforts.

12 Renew and expand DEP's lien sale authority.

DEP's authority to sell liens on seriously delinquent water and sewer charges expired at the end of 2010. Without this vital enforcement mechanism to encourage regular payment of water and sewer bills, the New York City Water Board would have had to raise water rates an additional 2.2% each year in fiscal years 2009, 2010, and 2011, further shifting the burden of running the water system from those who don't pay their bills to those who do. Single family homes are currently exempt from the lien sale and are instead put through a service termination process to collect on delinquent payments. Service termination is a time consuming process that ties up DEP field staff, creates a potential public health risk, and costs DEP approximately \$2,700 per home. Extending lien sale authority to single family homes would not only eliminate service terminations for non-payment of water bills, it would significantly increase revenue collection at little to no cost. We estimate that expanding lien sale authority to single family homes would yield an additional \$25 million in annual revenue, or the equivalent of a 1% discount on the water rate with virtually no additional operational expense involved.

DEP is working with the City Council to reauthorize and expand lien sale authority to keep water rates as low as possible and to ensure that all New Yorkers pay their fair share for water and sewer services.

13 Replace approximately 30,000 large meters on industry-recommended cycles over the next 10 years.

Today, DEP still bills many of its largest water users on an annual flat fee that often does not accurately reflect a property's actual water use. To ensure that large users fully pay for what they consume, DEP has begun a systematic effort to replace the city's 30,000 largest meters on regular industry-recommended cycles over the next 10 years. This effort will increase the number of large customers on metered billing and could save millions in otherwise lost revenue. DEP has also developed a "Hard to Access" process that will place account holders on a more expensive "Denial of Access" water rate if they restrict access to their meter.

14 Evaluate new water rate structures.

Based on a comprehensive rate study we completed in December 2009, DEP plans to evaluate the current water rate structure and make modifications where appropriate.

- **Frontage Rate.** While DEP does not currently subsidize water and sewer charges, a frontage, or flat-rate charge, is applied to certain residential buildings. The frontage rate provides a measure of predictability to property owners and DEP but does not reflect actual water use. The current frontage rate is scheduled to expire in July 2012, and DEP will work with the New York City Water Board and the affected property owners to determine whether—and to what extent—we should continue to offer a frontage rate once AMR installations are completed citywide. DEP will look into the possibility of developing a conservation frontage program that would credit property owners who reduce their metered water consumption below their frontage rate; this would allow customers to stay on frontage billing while incentivizing lower consumption.
- **Fixed Rate.** With the decline in water consumption expected to continue and with plans for future capital work, such as fixing the leak in the Delaware Aqueduct, that could require periods of water conservation, DEP will consider introducing a fixed rate for a portion of annual water and sewer charges.
- **Stormwater Charge.** Beginning in the first half of 2011, DEP will assess a stormwater charge on a pilot basis to standalone parking lots that do not have water service, and therefore pay nothing towards DEP's costs to collect and treat stormwater. DEP will use the results of this pilot to determine whether and to what extent a stormwater charge could be applied more broadly throughout the city.



Replacing water meters on a regular basis is critical to ensure accurate consumption data and billing information.

- **New Development Charge.** Every time a new development is built in New York City, an additional burden is placed on DEP's water and sewer infrastructure due to increases in water usage and wastewater generation. By charging a system buy-in fee for new developments, DEP could ensure that the infrastructure investment costs associated with building out water and wastewater infrastructure are more fairly distributed across city users.

Goal: Encourage economic development by simplifying and improving permitting processes.

15 Increase online permitting for businesses, engineers, and contractors.

DEP will make the permitting process more transparent and straightforward for developers and construction contractors. Within three years, we will convert to online permitting and publish user-friendly guidance and requirement checklists for site connection permits. We will establish standard service turnaround times and set clear expectations about required documentation. We have already begun to refine the permitting process to eliminate unnecessary steps and will engage the business community to make the improvements that they believe will be most effective.

16 Consolidate permitting functions to simplify customer interactions with DEP.

Today, developers and homeowners must visit multiple offices and city agencies to complete their approval for a connection to the water and sewer system. DEP is co-locating these functions with other city agency field offices to improve both the customer experience and turnaround times for business permits and licenses. Mayor Bloomberg has made improving and simplifying business interactions with the City a top priority, and DEP is working hard to ensure that businesses are able to easily navigate the often complex world of City permitting. Small businesses are the engine that drives New York's economy and we must ensure that they are not burdened by unnecessary or overly complicated permit requirements.

17 Update and improve DEP's air permitting database.

Some businesses throughout the city remain out of compliance with air quality regulations; certain business owners are simply uninformed while others willfully fail to comply with the New York City Air Code. To facilitate more effective enforcement, DEP will update its air permitting database, which will also assist businesses in applying for permits. DEP will also provide our inspectors with handheld computers to make data collection and management faster and more accurate.

OUTREACH TO CUSTOMERS

Interacting with the public and ensuring that customers are well informed is a critical part of DEP's mission. DEP will continue to hold annual meetings in communities throughout the city to inform the public about projects that affect their neighborhoods and programs that may be available to provide bill payment assistance. DEP's Economic Development Unit also holds regular meetings with business communities that DEP regulates, including automotive repair shops and restaurant owners.

18 Publish an annual regulatory agenda.

DEP will engage the business community to publish an annual regulatory agenda to provide compliance assistance and increase awareness of regulatory processes. As a regulator of businesses and individuals under our pretreatment, sewer hookup, and air, noise, and asbestos permitting programs, DEP must be transparent and flexible with businesses while at the same time protecting the environment and improving New Yorkers' quality of life. Publishing an annual regulatory agenda will increase awareness of regulatory processes and ultimately achieve meaningful improvements in public health through close consultation with businesses and other stakeholders.

19 Publish regulatory guidance manuals.

DEP's Economic Development Unit provides compliance assistance to a variety of business sectors through workshops, consultations, and written guidance. The unit has developed a series of fact sheets that outline detailed regulatory requirements for the automotive repair and collision sectors. DEP has also created a sewer design and construction guidebook that provides professional engineers, contractors, and developers with the specifications and design elements required for private sewer construction. To simplify and enhance compliance standards for the many businesses DEP regulates, we will develop user-friendly online guidance documents for major business sectors in New York City and will ensure that all information about regulations is easily accessible to the business community through nyc.gov.

20 Simplify the reporting process for businesses and other entities that are required to report hazardous substances to DEP.

Businesses and other entities that own or store hazardous materials over a certain quantity are required to report to DEP on an annual basis. For years, customers filed their hazardous materials reports through a paper-based manual system. In January 2006, DEP launched the initial Tier II Online Filing System to make it easier for businesses to file their hazardous material reports. As part of this effort, in January 2011, DEP will release a newly enhanced filing system to greatly simplify the filing process for businesses that store significant quantities of hazardous materials.

DEP'S ECONOMIC DEVELOPMENT UNIT

Did you know that DEP has an economic development unit? This group is responsible for fostering the joint goals of economic development and environmental protection by offering compliance and technical assistance to New York City industrial and commercial establishments and promoting environmentally sound business practices.



Our inspectors work hard to ensure that businesses comply with City regulations. Opposite: NYC sewer cover.



NYC SEWER

WORKER SAFETY, PUBLIC HEALTH, AND ENVIRONMENTAL PROTECTION

DEP's mission to supply, deliver, and treat one billion gallons of water or more every day is a complex business. Our operations require extensive, ongoing, and targeted training to perform safely and in compliance with the many state and federal regulations that establish standards for water quality, clean air, worker safety, and other aspects of DEP's daily work. That's why we administer a consistent, efficient, and comprehensive Environmental Health and Safety program throughout DEP.

Our goal is to run the safest operations and capital program in the country with the best environmental compliance record of any large water and wastewater utility. Above all, this means we must foster a culture of safety and compliance, reward success and innovation, and recognize and achieve continuous improvement.

We will work hard to meet this goal and will hold ourselves accountable for the results. Our operations must be safe for our nearly 6,000 employees, nearly 90 contractors working on 175 contracts at more than 65 sites in the five boroughs and the city's watershed, and the nine million New Yorkers we serve. And compliance with the environmental, health, and safety rules that govern our operations must be a top priority for the scientists who conduct 500,000 water quality tests every year; the operators who handle wastewater treatment chemicals; the engineers and workers on our construction sites; the crews that repair our water mains; the sewage treatment workers who treat over 1.3 billion gallons of wastewater each day; and everyone else who has a role in fulfilling DEP's mission.

DEP's Environmental, Health and Safety, or EHS, program is pursuing four strategies to achieve the agency's mission.



EHS standards have evolved over the years and now include rigorous guidelines for the use of personal protective equipment such as goggles, gloves, and lab coats. DEP holds workshops and outreach meetings throughout the year to keep its nearly 6,000 employees current on safety practices.

21 Measure EHS performance and demand success.

To know whether DEP is operating safely and in a way that protects the environment, we will launch a new agency-level audit program to measure performance and foster an environment of root cause identification, system improvement, and management accountability. To accurately measure and assess our performance, we will establish safety and compliance metrics and targets in each of our operations, administration, and capital divisions, and for our construction contractors.

22 Integrate EHS compliance into every aspect of DEP operations and construction.

Our employees, consultants, and contractors must think about safety from the moment they arrive at work until the moment they leave for the day. To strengthen EHS awareness, we will continue to publish “Safety Spotlight” in the *Weekly Pipeline, EHS Matters*, a safety newsletter that focuses on case studies, conduct an annual agency-wide EHS survey, and implement the EHS Matters Employee Recognition program.

23 Ensure effective EHS training and education for all employees.

Effective EHS education means that employees not only retain important information, but also learn how to think about safety as it applies to their jobs. DEP will make training more accessible to all employees through increased computer-based training where appropriate; this will reduce travel time and allow individuals to complete training sessions at their personal work stations instead of in a single location. We will also increase opportunities for hands-on training specific to operational proficiency and safety, standardize EHS program training to provide a consistent message to all employees, and provide professional development opportunities for EHS training staff.

24 Encourage open, frequent, and candid communication about EHS issues.

Open communication is essential to identify and address safety and compliance issues. We will encourage DEP employees and contractors to report unsafe conditions and potential compliance violations. If employees feel that reporting an issue could lead to retaliation or problems in the workplace, they are likely to let unsafe conditions persist rather than address them. We will provide multiple outlets to report safety and compliance issues, including anonymous reporting. And we will encourage open communication about health and safety issues by recognizing employees who identify and correct unsafe conditions.

CAPITAL CONSTRUCTION EHS PROGRAM

Contractor safety is of paramount importance to DEP. Through our Contractor Selection and Management Policy we hire the safest and most environmentally compliant contractors. DEP’s EHS team works extensively with contractors to embed EHS into every aspect of the project life cycle, from design to project completion.

DEP achieves success in construction safety through clear contract requirements for contractors and construction managers. We require daily and weekly compliance inspections and hold contractors responsible for identifying the risks or potentially hazardous tasks associated with their projects. A project-specific Health and Safety Plan (HASP) must be developed before construction work begins.

DEP has an aggressive inspection program to monitor and audit all of our project sites. Our EHS team has conducted a total of 14,000 inspections of its construction projects over the past six years. In addition, we host meetings and conduct outreach programs for internal and external project managers to ensure maximum accountability. When inspection results and performance indicators do not meet our expectations, DEP requires contractors to implement effective corrective action plans.

OPERATIONS



WATER SUPPLY GOALS

- ▶ **Supply high-quality drinking water.**
- ▶ **Protect New York City's watershed.**
- ▶ **Maintain robust, secure, and cost-effective water supply infrastructure and improve operational efficiency with new technology.**

Clean, abundant drinking water is essential. New York City's water supply and the infrastructure needed to carry it here has played a large part in the city's steady growth for more than 150 years. In 1840, two years prior to the activation of the Old Croton Aqueduct, the city had 313,000 residents. Three aqueducts and three city water tunnels later, our population is 8.4 million and growing.

With a capacity of 580 billion gallons in 19 upstate storage reservoirs and three controlled lakes, New York City's water supply is robust. The city's water travels from its home up to 125 miles away through 295 miles of aqueducts. These hallmarks of civil engineering use the driving force of gravity to deliver more than a billion gallons of water every day using little or no energy.

Thanks to a Filtration Avoidance Determination (FAD) issued by US Environmental Protection Agency (EPA), and a historic 1997 Memorandum of Agreement (MOA) between New York City, New York State, EPA, and other stakeholders, the city is not required to filter water from the Catskill and Delaware watersheds. Maintenance of the quality of this unfiltered water depends on continued protection of watershed lands by making sure that their use remains compatible with high water quality. DEP must vigilantly protect the Catskill and Delaware watersheds from activities—such as natural gas drilling—that threaten water quality. At the same time, we must work with upstate communities to promote economic development and recreational opportunities that are sustainable over the long term.



New York City's water is delivered from watersheds that extend more than 125 miles from the city and comprise 19 reservoirs and three controlled lakes. Our new water filtration and ultraviolet disinfection plants will ensure that NYC's supply of water meets stringent federal guidelines. Opposite: the Ashokan Reservoir.

STRATEGIES & INITIATIVES

Goal: Supply high-quality drinking water.

25 Maintain the city's Filtration Avoidance Determination (FAD).

We will protect our water supply by meeting all requirements of the FAD and Watershed Memorandum of Agreement (MOA), including the purchase of sensitive watershed lands, careful review of development activities, and the implementation of partnership programs that protect water quality in a way that facilitates environmentally sustainable economic development. Through these efforts, DEP will position itself to sustain our FAD through the 2012 review, renew it in 2017, and avoid filtration over the long term.

26 Purchase watershed lands that protect water quality.

Land acquisition is one of the most critical components of our source water protection program; without it, the city would almost certainly be required to filter water from the Catskill and Delaware watersheds. DEP has already purchased more than 115,000 acres of land in the watershed and will continue this successful program by contacting the owners of at least 50,000 acres of land every year in order to meet the requirements of our current filtration avoidance determination. The current land acquisition permit issued by the State Department of Environmental Conservation (DEC) is effective through 2025.

27 Complete and operate the Catskill/Delaware Ultraviolet (UV) Disinfection Facility to comply with the federal mandate for secondary disinfection of the Catskill and Delaware water supplies.

In 2012, DEP must complete and begin to operate the ultraviolet disinfection facility currently under construction at Eastview, just north of the city. The \$1.6 billion plant is necessary to comply with a federal mandate that requires treatment of surface-level drinking water supplies with two forms of disinfection. Right now, DEP treats water from the Catskill and Delaware watersheds with chlorine. Once the new treatment plant is operational it will be the largest UV disinfection facility in the world.

28 Complete and operate the Croton Water Filtration Plant by 2013.

The Croton Watershed was first tapped to augment the city's water supply in 1840 when Westchester County was still a bucolic country neighbor. Today this watershed is highly developed, and although the water supply meets all health-based water quality standards, Croton water has seasonal variations in color, odor, and taste. Under the federal Safe Drinking Water Act, DEP is required to filter Croton water. The \$3 billion Croton Water Filtration Plant is approximately two-thirds complete as of December 2010. Once operational, the Croton plant will enable DEP to supply 290 million gallons of water per day—approximately 30% of daily demand—from our oldest watershed.



New York City's Water Supply System

- Catskill / Delaware Watershed Area
- Croton Watershed Area
- Rivers and Reservoirs
- Catskill Aqueduct and Tunnels
- Croton Aqueduct
- Delaware Aqueduct and Tunnels
- County Borders
- State Borders

www.nyc.gov/dep

Goal: Protect New York City's watershed.

29 Protect the water supply from hydrofracking for natural gas in the New York City watershed.

The need for clean domestic energy has accelerated interest in natural gas drilling in the Marcellus Shale in southeastern New York State, including New York City's watershed. DEP commissioned an independent scientific assessment that concluded that hydrofracking requires a level of industrialization that would threaten drinking water quality for nine million New Yorkers, and based on current science and technology cannot safely be conducted in the city's watershed. DEC took a step towards the same conclusion when it excluded unfiltered water supplies from the permitting program currently under consideration for New York State. We will continue to press DEC to prohibit hydrofracking in the watershed, a necessary step to maintain and protect the city's water quality over the long term.

30 Support economic development compatible with watershed protection.

At the core of the city's source water protection program is the belief that economic development can and must be compatible with water quality. Through our partnership with the Catskill Watershed Corporation (CWC), the City loaned \$48 million to 203 watershed businesses over the last 12 years to support tourism, hospitality, manufacturing, and other industries. We have funded the extension of sewers, rehabilitated more than 3,500 septic systems, restored streams, and supported many other activities through CWC. Our partnership with the Watershed Agricultural Council (WAC) promotes farming and protects water quality, but we can do more. DEP will continue to support environmentally sustainable economic development in the watershed, including a re-examination of partnership opportunities for renewable energy production, the feasibility of bringing broadband coverage to rural areas, and ensuring that the Catskill Fund for the Future (CFF) continues to make loans to businesses in the watershed.

WATERSHED AGRICULTURAL COUNCIL

Since 1992, the Watershed Agricultural Council (WAC) has worked with nearly 1,000 farm and forest landowners in eight watershed counties to protect farmland and clean drinking water through land conservation approaches that support working landscapes. WAC has helped more than 400 farms to install stream buffers, cover manure, relocate feed lots, and construct stream crossings for livestock to keep bacteria and chemicals out of the city's reservoirs. The Council also works with forest landowners and professionals to manage woodlands, as trees provide the best natural water filtration and storage mechanisms. Thanks to strong outreach efforts, WAC now holds conservation easements on more than 20,700 acres of farm and forest land; these easements exist in perpetuity and protect watershed land from development while allowing farming to continue on the property. The Council also spearheads two "buy local" programs under the Pure Catskills branding campaigns for regional food and wood products. We will work with WAC to expand the conservation easement program and with in-city partners, such as GrowNYC, to promote regional agriculture from family farms and make the freshest, most nutritious food available to the city's residents.



Water Man at the Delaware County Fair represents the water that New Yorkers use every day. Photo: WAC

CATSKILL FUND FOR THE FUTURE

The Catskill Fund for the Future (CFF) supports tourism, hospitality, manufacturing, and other industries in the New York City watershed through small loans. Bread Alone started as a small bakery in Boiceville. In 2002, the CFF loaned Bread Alone \$400,000 to support the growth of this environmentally friendly business. Today, it operates in two watershed locations, supplies 13 farmers markets, and has a wholesale business.



Once it is completed in 2012, the Catskill/Delaware Ultraviolet Disinfection Facility will keep NYC Water clean and healthy before it enters the city's distribution system. Portable Water-On-the-Go fountains increase accessibility to and awareness of New York City's healthy, delicious, and affordable drinking water.

31 Expand recreational opportunities in the city's watershed.

Over the last two years, thousands of local residents and visitors have enjoyed expanded recreational opportunities throughout the watershed. More than 117,000 people hold access permits to watershed lands, more than 11,300 people have boat tags for the city's reservoirs, and the watershed is a growing tourist destination. We will continue to expand the acreage of watershed lands open to the public for hunting, hiking, and fishing, and we will seek to expand recreational boating to include the Neversink and Pepacton reservoirs.



DEP opens as much watershed land as possible for recreational purposes.

Goal: Maintain robust, secure, and cost-effective water supply infrastructure and improve operational efficiency with new technology.

32 Develop and implement a plan to repair the Delaware Aqueduct.

The greatest water supply challenge DEP currently faces is the leak in the 45-mile Rondout-West Branch Tunnel of the Delaware Aqueduct that links New York City to half of its water supply. DEP has developed a comprehensive plan to build a three-mile bypass of the leaking section of the tunnel near Roseton, and repair parts of the concrete liner in other parts near Wawarsing. DEP has engaged in extensive preparations in anticipation of this project, including a geological survey of the area, a study of over 100,000 photographs of the interior of the tunnel, and the formation of a Public Advisory Committee to keep the community informed about our progress. We will break ground on the bypass before the end of 2013, and expect the project to be complete in 2019.

33 Pressurize the Catskill Aqueduct.

Once the Catskill/Delaware UV Disinfection Facility is operating, the Catskill Aqueduct will not be able to sustain the water pressures needed to convey water between Kensico Reservoir and the Catskill/Delaware UV facility, because the new facility will require us to reroute incoming water in a way that eliminates 40 feet of gravitational pressure. Pressurizing the Catskill Aqueduct will increase the volume of water available to the city and will re-establish DEP's ability to bypass Kensico Reservoir when necessary to access the highest quality water.

34 Connect the Delaware and Catskill aqueducts.

The Delaware and Catskill aqueducts cross within yards of each other in Ulster County. DEP is designing a connection between the two aqueducts that will allow water from the Delaware system to cross the Hudson River through the Catskill Aqueduct. Due to steep slopes and fine soils left from glacial lakes, runoff from the Catskill watershed can sometimes cause the waters in Ashokan Reservoir to become turbid, or less clear, from an increase in the amount of matter suspended in the water. The connection will move cleaner Delaware water into the Catskill Aqueduct, thereby increasing our conveyance capacity by up to 300 million gallons per day from four key reservoirs. We expect to start construction on the Catskill/Delaware connection in 2012.

35 Develop cost-effective groundwater and other supplemental water supply alternatives.

In connection with the repair of the Rondout-West Branch Tunnel, DEP must develop reliable alternative sources of supply for the period when the tunnel will be offline to make the bypass connection. One promising source of supply is the groundwater that used to supply the Jamaica Water Supply System in southeast Queens. DEP is investigating a number of other alternatives and will develop and implement a plan to ensure that the city has adequate supply during and after the repair of the Rondout-West Branch Tunnel.

36 Operate and maintain DEP's network of dams.

The city owns 32 "high hazard" dams based on the likelihood of serious economic damage, environmental harm, and loss of human life if they were to fail, including 29 upstate as well as the earthen dams that hold the Jerome Park Reservoir, Central Park Reservoir, and Silver Lake in the city. In addition, we have purchased 69 small dams through the Land Acquisition Program since 1997. Twelve dams have been upgraded over the last 25 years, and we will rehabilitate the Gilboa Dam over the next five years. In addition, we will continue to carry out programmatic dam maintenance and inspections and will complete engineering assessments required to meet the state's 2009 Dam Safety Regulations.



DEP's upstate operations carefully monitor reservoir conditions and weather forecasts to ensure an ample and flexible supply of clean water, while DEP Environmental Police Officers protect vital water infrastructure, including our 23 upstate dams.

37 Optimize water delivery by integrating next-generation forecasting models into daily operations.

DEP is developing next-generation forecasting technology to ensure optimal use of the entire reservoir system for New Yorkers and, to the maximum extent possible, for downstream stakeholders and habitats. The Operations Support Tool (OST) will enable DEP to more precisely anticipate storms, forecast weather events and hydrologic conditions and their impacts on water quantity and water quality, and supply the highest quality water to the city. OST will also allow us to increase the volumes we can safely release to our partners or the Delaware River Basin Commission without any additional risk to our ability to supply high-quality water to our nine million customers.

38 Continue to protect the NYC watershed and water infrastructure.

To ensure that New York City's watershed and related infrastructure is protected from terrorism, crime, and pollution, DEP Police will increase security patrols, develop new access controls at key facilities, and use video surveillance and other technology to maximize its effectiveness. In addition, we will continue to participate in programs, including the Contaminant Warning System Demonstration Pilot, that test new security techniques and systems that could better protect the water system. The Contaminant Warning System is piloting new sensors and procedures to detect potentially contaminated water in the distribution system as early as possible so that it can be isolated and kept out of in-city distribution.

WATER DISTRIBUTION

GOALS

- ▶ **Complete key infrastructure projects to improve delivery of water to New Yorkers.**
- ▶ **Build out sewer and stormwater infrastructure to improve water quality in New York Harbor, reduce flooding, and support economic growth.**
- ▶ **Increase the efficiency of field crews to optimize the maintenance and performance of the water and sewer networks.**
- ▶ **Protect public health and water and sewer infrastructure by promoting and enforcing the installation of backflow preventers, grease traps, and other critical equipment.**

Deep below the five boroughs, City Water Tunnels Nos. 1, 2, and portions of City Water Tunnel No. 3 distribute one billion gallons of water through 6,600 miles of water mains. Thousands of regulators, pumps, and valves calibrate the pressure to keep this system safe. About 7,400 miles of sewers carry 1.3 billion gallons of wastewater and stormwater from homes and businesses to a 148-mile network of interceptor sewers that are the primary veins that feed the city's 14 wastewater treatment plants; green components such as the Staten Island Bluebelt absorb additional stormwater runoff that never enters the sewer system. Maintaining these massive networks is a 24/7 responsibility: DEP field crews respond to thousands of calls—from three-alarm fires to clogged catch basins—every year. This complex undertaking protects the water quality of New York Harbor and its tributaries.

Investment in the maintenance and construction of water mains—and the fire safety, basic sanitation, and clean drinking water they provide—is critical to the city's residential, commercial, and industrial growth. Since 2002, Mayor Bloomberg and the City Council have rezoned nearly one fifth of the city in over 100 areas to set the stage for new development in formerly industrial waterfront areas such as Williamsburg, western Queens, and Hunts Point. Partnering with the City's Department of Design & Construction (DDC), DEP replaces an average of 80 miles of water mains and sewers annually and continues to build out sanitary and stormwater sewers in neighborhoods where residential and commercial development have outstripped the capacity of existing infrastructure, or where new land uses have required upgrades to existing capacity. DEP plans the construction of these networks to be as cost-effective and sustainable as possible.

Public health depends on our maintenance of the system and on the reliability of the connections to private homes and businesses. We strive to provide customers with clear direction and fast, efficient service while ensuring that private developers and homeowners meet design, construction, and public health and safety standards.

STRATEGIES & INITIATIVES

Goal: Complete key infrastructure projects to improve delivery of water to New Yorkers.

39 Activate Stage 2 of City Water Tunnel No. 3.

City Water Tunnel No. 3 is one of the longest running civil works projects in the city's history. When complete, it will improve the reliability of the city's water supply and enable DEP to inspect City Water Tunnel No. 1 for the first time since it came on-line in 1917. Before we can activate the Manhattan portion of the tunnel by the end of 2013, we must integrate the tunnel into the city's existing distribution network. New York State recently granted the City permission to allow cooperative bids from private construction firms to expedite the network connections needed to activate Stage 2 of City Water Tunnel No. 3 as soon as possible.



Mayor Bloomberg has made finishing City Water Tunnel No. 3 a top priority, investing more funds for the tunnel than the previous five administrations combined.

40 Build the Staten Island Siphon.

The Richmond Tunnel, completed in 1972, is Staten Island's primary connection to the water supply system. Two older mains provide backup supply in the event that the Richmond Tunnel has to be taken offline. To spur economic development in the region, the Port Authority of New York and New Jersey is deepening the harbor channel for container ships to dock in New York Harbor. Dredging for this project requires DEP to replace Staten Island's back-up water supply lines. In partnership with the Port Authority, the Army Corps of Engineers, and New York City Economic Development Corporation, DEP will construct a new 72-inch water tunnel that can deliver more than 150 million gallons to the island per day. DEP will break ground on the siphon by 2011 and expects to complete construction by 2014.

41 Build out and replace critical water supply infrastructure to support residential, commercial, and industrial growth throughout the city.

To ensure the vibrancy of the Manhattan central business district, support the growth of Coney Island's amusement district, and make the thousands of housing units and offices at Atlantic Yards possible, DEP will construct trunk water mains up to 72 inches in size to accommodate increased water use in these areas. We will also replace distribution mains in Jamaica Estates and Pelham Parkway, and complete the trunk main network in the Rockaways.

Goal: Build out sewer and stormwater infrastructure to improve water quality in New York Harbor, reduce flooding, and support economic growth.

42 Build out and upgrade the sewer network in southeast Queens, Staten Island, and other neighborhoods that need additional capacity.

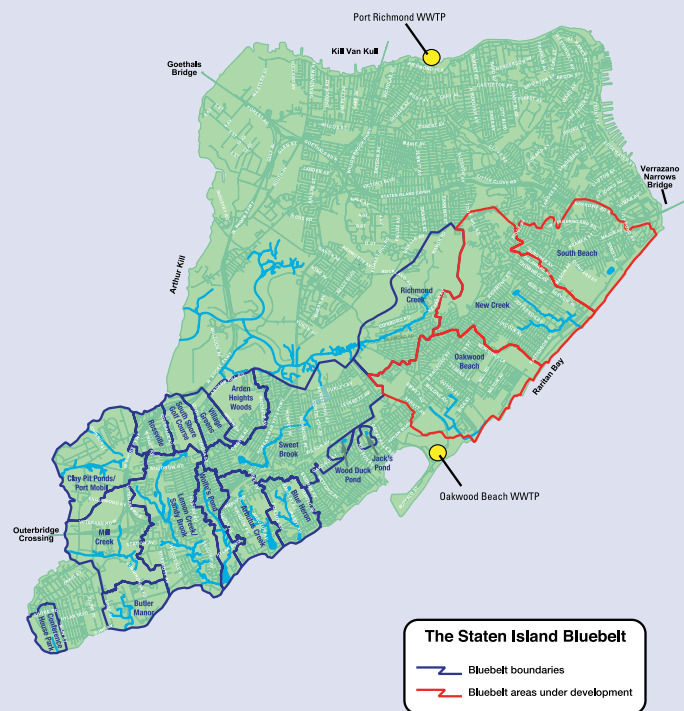
A robust sewer expansion and replacement program is essential to protecting public health and improving the ecology of New York Harbor. DEP will prioritize the extension of sanitary and storm sewers to neighborhoods throughout the five boroughs that need additional capacity to support current residents and future growth. Over the next four years, DEP will start or finish key projects on the South Shore and Mid-Island of Staten Island and in the Springfield Gardens, Laurelton, and Maspeth-Middle Village sections of Queens.

43 Complete a comprehensive drainage investment strategy for the city.

By 2013 DEP will develop a comprehensive drainage investment strategy that will highlight the integration of the NYC Green Infrastructure Plan with traditional methods of stormwater management to support Mayor Bloomberg's sustainability and development goals over the long term. This plan will build on existing drainage plans and will expand the Bluebelt in the Mid-Island section of Staten Island, integrate high-level storm sewers into Laurelton and Park Slope, and meet the needs of the major rezoning of Jamaica that allows for the construction of hotels and office towers. A comprehensive drainage strategy will ensure that DEP meets all responsibilities outlined in the City Charter to eliminate flooding so that these communities can develop and thrive.

STATEN ISLAND BLUEBELT

Many communities in Staten Island benefit from the Bluebelt, DEP's innovative stormwater management system. Comprised of streams, ponds, and other wetland areas, the Bluebelt preserves the ability of wetland systems to convey, store, and filter stormwater before it reaches the sewers, thus saving tens of millions of dollars in infrastructure costs over conventional storm sewers while providing comparable results. The Bluebelt also provides open space and important wildlife habitats and demonstrates that wetland preservation can be economically prudent and environmentally responsible. DEP will continue to build out the Staten Island Bluebelt and will create new Bluebelts in other areas of the city, including Twin Ponds and Springfield Lake in Queens. For areas in which leveraging green technology is not a viable solution to managing stormwater, DEP will invest in targeted improvements to the sewer system, such as high-level storm sewers to reduce the impacts of CSOs.



DEP operates an extensive 7,400-mile sewer system in all five boroughs that transports wastewater from homes and businesses to 14 wastewater treatment plants.

ROCKAWAY PENINSULA

On the Rockaway peninsula, DEP has spent \$54.75 million since 2002 to build separate storm sewers; this improvement has eliminated combined sewer overflows and reduced sewer backup and flooding complaints in the drainage area—a substantial accomplishment that improves water quality for the 140,000 residents living in Rockaway and the thousands of annual visitors to the area's beaches.

Goal: Increase the efficiency of field crews to optimize the maintenance and performance of the water and sewer networks.

44 Decrease water main breaks and sewer backups and improve response time.

Water and sewer main breaks disrupt residential life, suspend business, hamper transportation networks, damage property, and endanger public health and safety. DEP has 24/7 response teams and a leak detection unit that use cutting edge technology to locate and repair leaking valves and pipes. Water and sewer main breaks declined in 2010, but we can do better. With enhanced pressure-boundary management, more preventive maintenance, and expanded sewer cleaning, we will reduce the number of water main breaks, respond to water and sewer emergencies within one hour, and reduce our targeted resolution time for sewer backups by at least 10%.

45 Expand catch basin cleanings and rehabilitation to prevent flooding and protect water quality.

During heavy rain, street litter can wash into our sewers and end up in the harbor and on the city's beaches. The city's 144,000 catch basins keep garbage and debris out of the sewer system and the water bodies we protect. DEP will inspect all catch basins by 2014 and institute a three-year year inspection cycle. More than 2,350 catch basins are also in need of repair. DEP will establish a system to prioritize repairs by risk, set targets for catch basin repair time, and seek to substantially eliminate the repair backlog by 2014.



Vactor trucks proactively clean out the city's largest sewers, called interceptors, with a powerful vacuum system that removes debris and increases the sewer system's ability to convey wastewater flow to DEP's 14 wastewater treatment plants.

46 Expand the preventive maintenance program for critical water infrastructure.

The shafts, valves, and pressure regulators that deliver high-quality water at a safe pressure to 8.4 million residents of New York City every day are the workhorses of our water system. While maintaining adequate pressure is critical for firefighting and residential use, excessive pressure increases the likelihood of water main breaks, costly emergency repairs, leaks, and disruptions to residents and businesses. To better maintain our system and ensure reliable distribution, DEP will expand its preventive maintenance program to target pressure reducing valves, exercise more than 200 tunnel valves annually to keep them in good working order, and conduct 200 monthly inspections of our 500 pressure regulators.

47 Improve hydrant repair response time.

The first fire hydrant was installed in 1808 at the corner of Williams and Liberty streets. The Great Fire of 1835 and the loss of nearly 700 buildings in Lower Manhattan prompted both the creation of the Fire Department and the construction of the Old Croton Aqueduct. Today, more than 109,000 fire hydrants deliver more than 750 gallons of water per minute and are key to public safety. DEP repairs approximately 20,000 fire hydrants annually. Because of the critical nature of fire protection, DEP is committed to repairing high-priority fire hydrants—those near schools and hospitals—within 10 days.

48 Increase field crew productivity to improve system performance.

DEP will undertake a number of initiatives to increase field crew productivity and the overall performance of the water and sewer networks:

- **Pilot GPS technology:** GPS technology will improve the efficiency of DEP's fleet of over 2,000 vehicles by reducing fuel and maintenance costs. It will also allow managers to more effectively deploy field personnel.
- **Enhanced GIS mapping:** DEP invested in GIS mapping of the distribution and collection system to consolidate decades of paper maps into a modeling tool that can predict system performance under many different conditions. This tool will enable us to identify problems faster, and will improve the overall management of agency assets.
- **Onboard computers:** Time is of the essence at water main breaks and other emergencies. DEP is outfitting its field crews with onboard computers so that they can access mapping and construction documents in the field that will allow them to reduce repair time and more quickly restore service to customers.



DEP works with FDNY to make sure that sprinkler caps are available at all firehouses during the summer so that communities can open hydrants safely for relief from the heat.

Goal: Protect public health and water and sewer infrastructure by promoting and enforcing the installation of backflow preventers, grease traps, and other critical equipment.

49 Increase backflow prevention inspections.

DEP requires large buildings and certain businesses in New York City to install and maintain backflow preventers to prevent contaminated water from entering the city's distribution system. For example, car washes with strong pumping capacities could inadvertently pump contaminated water into distribution if they did not have backflow preventers. In 2010, DEP notified more than 16,000 property owners of the need to install a backflow preventer. Over the next four years, we plan to inspect more than 20,000 buildings based on the potential risk that the building or business poses to the water supply.

50 Update grease trap regulations, increase inspections, and educate the business and development communities about compliance.

Restaurants, nursing homes, and other businesses with commercial kitchens must install grease traps to prevent fats, oils, and greases from entering the sewer system where they clog service lines and backup sewers. Currently, both the Department of Buildings (DOB) and DEP are responsible for regulating grease interceptors; this can cause confusion for business owners since DOB and DEP have not standardized the regulations. DEP will work with DOB to standardize and streamline the regulations and DEP's grease team will inspect at least 8% of food service facilities within two years to determine if they are being implemented properly. DEP will also continue to develop print and online educational materials and will conduct outreach to stakeholders to help the public understand proper disposal methods for grease and the importance of backflow preventers.

51 Promote and incentivize yellow grease recycling for use as biodiesel fuel.

Mayor Bloomberg recently signed legislation requiring all heating oil to contain at least 2% biodiesel by October 1, 2012. Yellow kitchen grease from fryers and other cooking equipment can be recycled for use in biodiesel, which will decrease the amount of grease that could otherwise end up in the sewer system. DEP will work with the Business Integrity Commission (BIC) and the NYC Department of Health and Mental Hygiene to encourage the collection of yellow grease by licensed haulers through new incentives, write educational materials for business owners, and create enforcement mechanisms to increase yellow grease recycling.

WASTEWATER TREATMENT GOALS

- ▶ **Certify citywide compliance with Clean Water Act standards for secondary wastewater treatment.**
- ▶ **Continue to improve water quality in New York Harbor to facilitate new development and increased waterfront access for all New Yorkers.**
- ▶ **Optimize the efficiency and reliability of wastewater treatment operations.**
- ▶ **Evaluate the economic, ecological, and social effects of DEP's capital investments and wastewater treatment operations.**

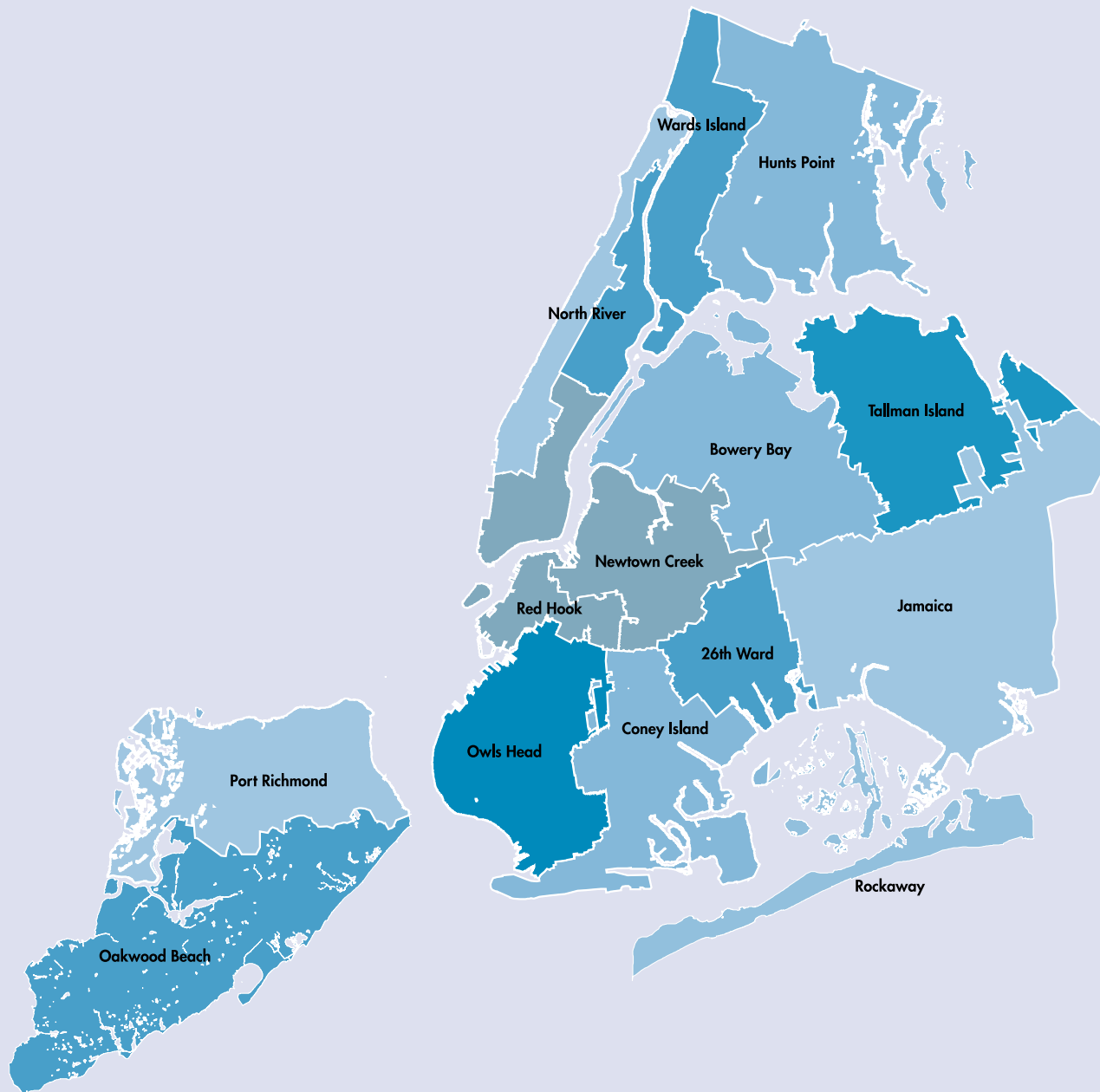
Improving water quality in New York City's harbor is essential to continuing Mayor Bloomberg's historic transformation of the city's waterfront from a relic to a vibrant area with residential, commercial, and modern industrial uses. DEP is investing billions of dollars to implement cutting-edge technologies and restore natural treatments—like oysters, wetlands, and eelgrass—to meet state and federal water quality standards and continue to restore the harbor's ecological health. Our investments are paying off: water quality in New York Harbor is better now than at any time in the last 100 years, but we have more work to do.

To improve harbor water quality we must improve the way we treat the 1.3 billion gallons of wastewater New Yorkers generate every day. We can achieve this by increasing the capacity of our wastewater treatment plants and controlling the sources of wastewater before it reaches the sewer system. Because treating 1.3 billion gallons of wastewater a day is so resource intensive—requiring energy, chemicals and hundreds of highly-skilled workers—more treatment is not good enough. We have to be smarter too. That means making our treatment plants more efficient and partnering with the private sector to help us convert the natural byproducts of the sewage treatment process, such as methane gas, from waste to energy. Working smarter also means tapping into the talent and skills of our workforce—the sewage treatment workers, electricians, oilers, and superintendents—who know the plants best and can help DEP identify cost-effective ways to improve operations. Finally, DEP needs to continue to work closely with community partners in the neighborhoods where our wastewater facilities are located.



New York Harbor is at its cleanest in a century thanks to extensive upgrades at our wastewater treatment plants. The Newtown Creek Wastewater Treatment Plant is undergoing a \$5 billion upgrade, including improved treatment systems and a new microbiology lab that conducts rigorous tests to make sure New York Harbor remains clean and accessible.

New York City's Wastewater Drainage Areas



As of December 2010

New York City's wastewater drains to 14 treatment plants in all five boroughs, mainly through the force of gravity.

STRATEGIES & INITIATIVES

Goal: Certify citywide compliance with Clean Water Act standards for secondary wastewater treatment.

52 Certify that the Newtown Creek Wastewater Treatment Plant meets secondary treatment standards by June 2011.

In June 2010 DEP began meeting monthly Clean Water Act secondary treatment standards harborwide that dictate that we must remove 85% of pollutants from wastewater. In 2011 DEP will certify that the Newtown Creek Wastewater Treatment Plant meets the effluent discharge requirements of the Clean Water Act; this will mean that all 14 of the city's wastewater treatment plants will be meeting monthly secondary treatment standards for the first time since the standards were established in 1972.

53 Complete \$2.6 billion in upgrades underway at six wastewater treatment plants.

DEP has been aggressively modernizing its wastewater treatment plants to ensure high levels of treatment well into the future. The pumps and tanks at these plants take a beating from the rags, debris, and grit that flow in with sewage and must be constantly rehabilitated. In addition to Newtown Creek, several other city treatment plants are currently undergoing major capital upgrades that will total \$2.6 billion by 2014. The upgrade at the Hunts Point Wastewater Treatment Plant in the Bronx, which includes new systems to remove nitrogen from wastewater, will exceed \$500 million when completed in 2013.

Goal: Continue to improve water quality in New York Harbor to facilitate new development and increased waterfront access for all New Yorkers.

54 Implement the NYC Green Infrastructure Plan.

In September 2010, Mayor Bloomberg launched the NYC Green Infrastructure Plan, a comprehensive, 20-year effort to reduce combined sewer overflows and meet water quality standards through a combination of green installations and cost-effective grey infrastructure. This includes leveraging cost-effective grey infrastructure and maximizing existing capacity. DEP will increase wastewater storage capacity by regularly cleaning the dirt and debris that clogs the large interceptor sewers that feed wastewater treatment plants and will pilot an increase in the cycle time of bar screens that protect motors and pumps from large debris. We will also install new devices—including gates, inflatable dams, bending weirs, and mechanical throttling gates—to store wastewater until peak flow subsides. We will keep seawater out of the interceptor sewers by inspecting and repairing 25 tide gates per month until all 500 gates are in a state of good repair.

55 Activate the SHARON and ARP treatment technologies to remove oxygen-depleting nitrogen from wastewater.

In February 2010 DEP committed \$115 million in an agreement with the State Department of Environmental Conservation, the National Resources Defense Council, and other environmental stakeholders to protect, preserve, and restore marshlands by reducing nitrogen discharges that accelerate algae growth and degrade the harbor's natural ecosystem. This commitment is part of more than \$1 billion in investments in advanced treatment systems at eight treatment plants to remove oxygen-depleting nitrogen from wastewater. As part of this effort we will install cutting-edge

technologies at two plants: SHARON (single reactor system for high activity ammonium removal over nitrite) and ARP (ammonia removal process). Both nutrient removal systems use patented processes with smaller footprints, lower energy consumption, and fewer chemicals than conventional biological nitrogen removal processes. We project that these investments will reduce nitrogen amounts by at least 50% by 2020.

JAMAICA BAY AGREEMENT AND EDUCATION RESOURCE DIRECTORY

Jamaica Bay is a 31-square-mile waterbody with a broader watershed of approximately 142 square miles, including portions of Brooklyn, Queens, and Nassau County. It supports multiple habitats—including open water, salt marshes, grasslands, coastal woodlands, maritime shrublands, and brackish and freshwater wetlands—as well as 91 species of fish and 325 species of birds. The February 2010 Jamaica Bay agreement with DEC and NRDC to improve the overall water quality included \$100 million in nitrogen control upgrades at the 26th Ward, Coney Island, and Rockaway wastewater treatment plants and \$15 million to restore marshlands, with the possibility of an additional \$30 million in federal matching funds. DEP also recently published the Jamaica Bay Education Resource Directory as part of the 2005 Jamaica Bay Protection Plan.

Goal: Optimize the efficiency and reliability of wastewater treatment operations.

56 Pilot contracting competition between city workers and private contractors.

DEP currently uses a combination of in-house labor and private contractors to perform equipment maintenance at treatment plants and pumping stations. Private contractors and DEP employees are each assigned to specific tasks that do not overlap. To provide opportunities to our skilled workforce and achieve savings, DEP will pilot a program to offer municipal labor unions the opportunity to bid on maintenance contracts. If DEP employees provide the lowest responsible bid, they will win the job. This allows employees to earn extra pay and allows us to complete the work at a lower cost.

57 Improve inventory management and planning.

DEP is rolling out the Computerized Maintenance Management System (CMMS) at our 14 wastewater treatment plants to keep a real-time inventory of materials. The system includes wireless barcode scanners to track parts so that plant operators can locate common, shareable parts at any DEP location instead of ordering new stock. CMMS will also develop predictive maintenance schedules and estimate the full cost of repairs. These improvements will reduce operating costs and increase the efficiency of wastewater operation. Cooperation and planning will help DEP budget for wastewater treatment in the long run.

58 Use new technology to constantly monitor pump stations and other infrastructure and maximize the storage capacity of the sewer system.

DEP is installing telemetry systems at its remote facilities that provide instant performance information to a single system operator. These systems, coupled with the expanded use of computerized supervisory control systems, have already eliminated the frequency of in-person inspections of many of our pump stations and regulators. As the system becomes operational, it will enable DEP to manage wet weather storage in the sewers and interceptors, which will reduce CSOs and improve harbor water quality.

Goal: Evaluate the economic, ecological, and social effects of DEP's capital investments and wastewater treatment operations.

59 Develop and implement a long-term, sustainable citywide sludge management program.

The volume of sludge that our wastewater treatment plants produce is increasing as we improve our system to remove nutrients like nitrogen and treat additional wet weather flows. Managing sludge, including conveyance by vessel or pipeline, dewatering, and off-site removal, is one of DEP's most expensive operations. We will develop a long-term sludge management plan through a transparent public process that will consider upgrades to the dewatering process and that pursues a cost-effective sustainable reuse for the 1,200 tons of sludge per day we currently produce.



DEP's fleet of three sludge boats convey sludge from the eight wastewater treatment plants without dewatering facilities to the six plants with this capability. Sludge boats have been a part of the city's sludge transportation and disposal system since the late 1930s and each vessel makes 14 round trips a week.

60 Expand and strengthen DEP community partnerships throughout the five boroughs.

Wastewater treatment facilities are a necessary burden. In New York City's space-constrained, densely-packed neighborhoods, communication and partnerships with local community groups are critical to maintaining and upgrading the infrastructure the city needs to continue to thrive. DEP will continue its partnerships with the Croton Facility, Newtown Creek, Hunts Point, and Brookfield monitoring committees, as well as the Jamaica Bay Advisory Committee, the North Community Environmental Review Board, and other groups who help us to ensure that DEP is a good neighbor throughout the city.

NEWTOWN CREEK MONITORING COMMITTEE

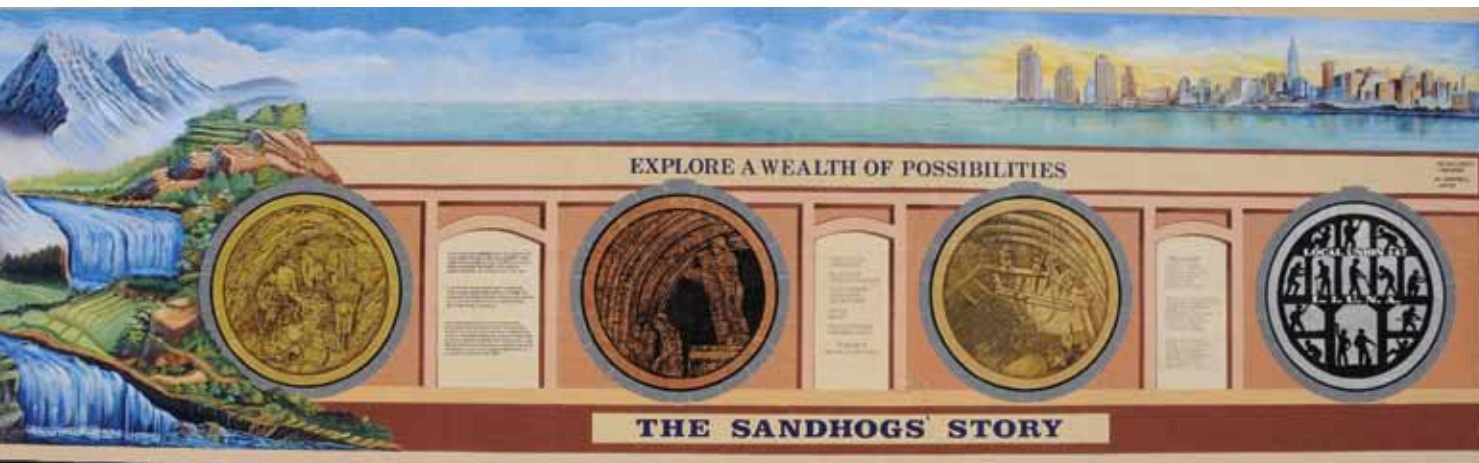
Since 1996, the Newtown Creek Monitoring Committee (NCMC) has worked with DEP to identify and design community amenities such as the Nature Walk at the wastewater treatment plant and provide recommendations to mitigate potential impacts to the Greenpoint community associated with the plant upgrades. A committee of volunteers and one of the longest standing citizen oversight committees in New York City, NCMC is an excellent example of a strong partnership between government and community that has exceeded expectations. We look forward to our continued work with NCMC and community partners throughout the city.

CAPITAL GOALS

- ▶ **Implement strong capital project controls to deliver projects on time and on budget.**
- ▶ **Achieve \$100 million in savings through value engineering and by deferring projects.**
- ▶ **Strengthen technical expertise in design and construction management.**
- ▶ **Become the owner of choice in the regional and national design and construction community.**

DEP has the largest capital program of any city agency and one of the largest of any public utility in the country. We have more than \$13 billion in projects in some phase of design and construction, and approximately \$14 billion of work in our 10-year capital plan. Many of the projects we are building have been described in the preceding sections, including the \$3 billion Croton Water Filtration Plant, the \$5 billion City Water Tunnel No. 3, and the \$5 billion upgrade of the Newtown Creek Wastewater Treatment Plant. The unprecedented level of investment we are making in the water system now is preparing it to serve the nine million New Yorkers who rely on DEP today and the generations that will follow.

But financing these megaprojects—many of which are required by unfunded federal and state mandates—has necessitated four consecutive years of double-digit water rate increases and the ability of our 835,000 bill-paying customers to absorb these increases is strained. Moving forward, we must reduce the cost of our capital program by making tough decisions about what we build and how and when we build it. That means justifying each project on its merits, and engaging with federal and state authorities about the necessity and timing of satisfying unfunded mandates in the future. Where less expensive alternatives like the NYC Green Infrastructure Plan are viable, we must build consensus and pursue them vigorously.



DEP builds and manages multi-billion dollar construction projects to support its mission of supplying, distributing, and treating water for nine million New Yorkers. The Sandhogs, or Local 147 of the Laborer's International Union of North America, build the majority of New York City's tunnels, including City Water Tunnel No. 3.

STRATEGIES & INITIATIVES

Goal: Implement strong capital project controls to deliver projects on time and on budget.

61 Implement new project controls business processes.

DEP is implementing new business processes to achieve consistency in the way we manage the scope, schedule, and budget of every capital project. A new, flatter organizational structure will help us better use our limited resources, drive decision making down within the organization, and create single-point accountability for all projects.

62 Create a Project Controls Division.

In fall 2010 DEP formed a new Project Controls Division comprised of experts in the field of construction-cost estimating and schedule management to help project managers deliver jobs on time and on budget. The Project Controls Division oversees the development of a sound cost estimate and delivery schedule for each capital project. Project managers, design consultants, and contractors will be held accountable for missed milestones and cost overruns.

63 Create a new capital Project Management Information System.

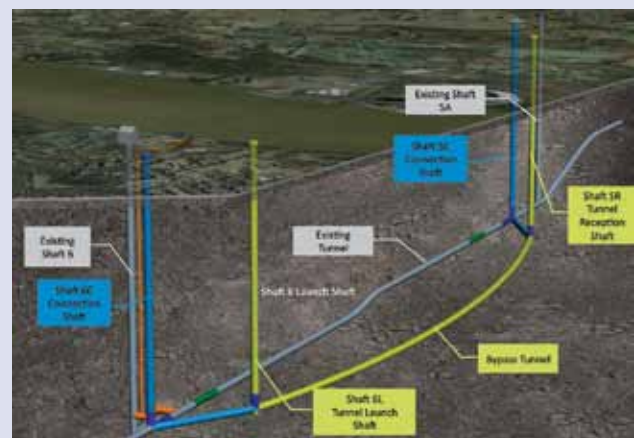
DEP will develop and implement a new Project Management Information System (PMIS) to provide complete transparency into the project scope, budget, and schedule of every project, and to automate the project management workflow of every project in DEP's capital program.

64 Provide public transparency into DEP capital projects.

We will provide public, web-based access to basic information about all DEP capital projects through nyc.gov. The website will allow the public to identify projects either planned or under construction in their neighborhood, including project descriptions, the latest design and construction updates, and whether the project is on schedule and on budget.

RONDOUT-WEST BRANCH TUNNEL REPAIR PROJECT

In 1990 DEP identified leaks in the Delaware Aqueduct, one of New York City's primary drinking water supply tunnels. Based on a 10-year investigation and more than \$200 million of preparatory construction work, DEP is currently designing a bypass for a section of the Delaware Aqueduct in Roseton and internal repairs for a tunnel section in Wawarsing. Since we must shut down the Aqueduct when we are ready to connect the bypass tunnel, DEP is working on projects that will supplement the city's drinking supply during the shutdown. We expect to break ground on the bypass in 2013 and complete the work in 2019.



Goal: Achieve \$100 million in savings through value engineering and by deferring projects.

65 Implement an Asset Management Program to make the right capital investments at the right time.

The high cost of maintaining aging water and sewer infrastructure is not unique to New York City. Municipalities and public utilities across the country are grappling with massive infrastructure needs at a time of nearly unprecedented fiscal constraints, stringent federal and state regulatory mandates imposed without financial support, and intense competing demands for government services. Many DEP facilities are more than 30 years old, and some assets were built more than a century ago. The failure of a critical piece of equipment—such as a sewage force main or a water supply shaft—could have major impacts on water quality in New York Harbor or DEP’s ability to maintain water pressure for critical facilities.

Making the right decisions about capital investments at the right time can save the city and our nine million customers—particularly the 835,000 who pay the water bills—millions of dollars every year. DEP will implement an Asset Management Program to support decision making about asset renewal and investment. The program will be supported with powerful analytic tools to help us efficiently manage thousands of capital assets, including centralized tracking of asset age, condition, performance, maintenance records, replacement costs, and consequences of failure.

66 Develop a 10-year capital plan that prioritizes funding for critical assets and minimizes the need for future water rate increases.

In January 2011 DEP proposed its 10-year capital investment plan for 2012 through 2021. Since 2003, DEP has committed \$18.8 billion in capital work, including \$13.4 billion (69%) for projects mandated but not funded by the New York State and Federal governments. As a result, debt service during this period has increased nearly 1.5 times, from \$496.7 million to \$1,231.2 million, and water rates have increased 104.5%, from \$399 for the average single-family home in 2003, to an estimated \$816 in fiscal year 2011. The key challenges for the next 10-year plan are to meet DEP’s critical capital needs and strategic objectives, while minimizing the need for future water rate increases. The 10-year plan is an opportunity to look beyond the immediate horizon to improve the stewardship of our capital asset base and fund innovative projects to harness clean energy and develop green infrastructure. The asset management program will help us to identify the most cost-effective ways to maintain our infrastructure and select projects that have multiple benefits, such as lower operating costs and cleaner emissions.



DEP conducts outreach events to attract the best and brightest companies, including minority- and women-owned business enterprises, to work on our construction projects. DEP has one of the largest construction programs in the region, including \$11 billion currently in construction and \$3 billion in design and planning. DEP’s capital work will generate approximately 5,000 jobs for each of the next four years.

Goal: Strengthen technical expertise in design and construction management.

67 Enhance expertise through balanced dependence on consultant support.

New York City has a rich history of designing and building its own water infrastructure, including City Water Tunnel No. 1 at the turn of last century and the Olivebridge Dam in 1915. Over the past few decades, DEP's reliance on outside consultants to design and build the majority of our capital projects has depleted internal expertise in management and design necessary to manage the multi-million dollar projects in our capital portfolio. Over the next four years, we will strengthen in-house design and construction management of our capital program by standardizing project management, implementing stronger project controls, and increasing our capacity to manage projects in-house.

68 Recruit top engineering talent to pave the way for future success.

DEP will target and recruit architects, engineers, designers, and other skilled professionals from the best regional and national professional schools. Our goal is to recruit the "best and brightest" to build a sustainable organization dedicated to engineering excellence. The opportunity to work on some of the most innovative and challenging infrastructure projects in the world will be a valuable recruitment tool that will encourage young engineers to start or make their careers in public service.

69 Implement a workforce development program.

DEP strives to create a culture of highly motivated staff by providing challenging opportunities in an environment of teamwork and mentoring. To help us achieve that, we will implement a new workforce development program to identify job skills and expectations for all levels within the capital program and help promote growth opportunities for our employees.

Goal: Become the owner of choice in the regional and national design and construction community.

70 Improve DEP's standard construction contract language and processes.

In order to make the procurement process more efficient for our vendors and increase the number of quality contractors that bid on DEP capital projects, we will implement fair and balanced contract terms and broadly implement Damages for Delay provisions to encourage more contractors to bid on DEP's work where appropriate. We will also streamline our business processes and improve performance in the critical areas that affect contractor cash flow, including procurement duration, change order processing times, payment review and approval, and project closeouts where we release all funds previously held as collateral.

71 Strengthen outreach to design and construction industry partners and expand minority- and women-owned business participation.

DEP will hold quarterly meetings with key construction industry stakeholders to solicit feedback on areas of improvement, and will partner with them to implement solutions, such as formal partnering sessions that build trust and expedite projects. To encourage more diversity in our capital program, we will reach out and market our quality-based selection process to more minority- and women-owned businesses (MWBs) and regional and national engineering firms that do not currently do significant work with DEP.



DEP holds community events to discuss upcoming projects with minority- and women-owned businesses. Opposite: Newtown Creek Wastewater Treatment Plant digester eggs. Photo: © 2008 Walter Dufresne, Photographer / walterdufresne.com







DEP is transforming former City-owned landfills into parks, including the Pennsylvania Avenue Landfill in Brooklyn, and recently planted 1,000 trees at the site to help MillionTreesNYC reach its PlaNYC goal of adding one million new trees throughout the city over the next decade. Opposite: Jamaica Bay: Photo: Don Riepe, Jamaica Bay Guardian.

SUSTAINABILITY

Sustainability unites environmental protection and economic development to create a more livable city. Rather than conceiving of environmental protection coming at the expense of economic growth, or vice versa, sustainable initiatives maximize synergies and minimize tradeoffs among energy, air, water, land, and climate policies. Environmental justice considerations and robust public engagement generate innovative solutions and determine shared priorities for spending scarce public resources to meet our greatest social needs.

Until the landmark federal environmental legislation of the 1970s, including the Clean Air Act, the Clean Water Act, and the Safe Drinking Water Act, DEP and its predecessors made decisions through local processes, and based on local considerations, about how best to serve New Yorkers' needs for essential services, recreational outlets, and economic development. For example, some of the first wastewater treatment plants in the United States were built in New York City because residents and resort owners demanded clean bathing beaches at Coney Island. Similarly, our world-class drinking water infrastructure was built with local funding, designs, and construction oversight to meet the residential and industrial needs of a growing city. These initiatives provided significant environmental, public health, and economic benefits. A consensus is emerging about the need to make sustainability part of the calculus that drives decisions by utilities like DEP and future regulatory mandates by the state and federal governments.

In 2010, we appointed a Deputy Commissioner for Sustainability to implement PlaNYC and make sustainability a core consideration for our operational, compliance, and capital investment decisions. To do this we will focus on unifying environmental and economic initiatives in five major areas: overall regulatory relationships and policy, water quality, energy, hazardous materials management, and air and noise pollution.

REGULATORY RELATIONSHIPS AND POLICY GOALS

- ▶ **Enlist stakeholders to develop investment priorities and help secure funding for water and wastewater infrastructure.**
- ▶ **Engage state and federal regulators in proactive regulatory review and reform to incorporate sustainability principles into clean water regulations and initiatives.**

DEP's mission requires billions of dollars in scarce public resources. A sustainability framework can be the basis for a candid, open discussion about water quality investments and how they relate to other civic goals. As DEP looks to the future it is critical that we make these investments—whether self-selected or mandated—based on a scientific assessment of overall effectiveness, consensus about priorities and methods, and a broad understanding of how investments can advance other public needs. The success of ambitious initiatives like the NYC Green Infrastructure Plan depends on the willingness of environmental regulators and other stakeholders to embrace a sustainability framework.

STRATEGIES & INITIATIVES

Goal: Enlist stakeholders to develop investment priorities and help secure funding for water and wastewater infrastructure.

72 Form a clean water and clean air partnership with civic groups, customers, regulators, and other stakeholders.

DEP will convene a full range of stakeholders—regulators, customers, environmental groups, businesses, and developers—to collaborate about future water quality investments and the costs and benefits of alternative pollution prevention measures and approaches. This collaboration will initially focus on some of the most important issues we face: green infrastructure and other combined sewer overflow (CSO) controls, turbidity controls for drinking water, and water supply dependability in connection with the repair of the Delaware Aqueduct.

73 Advocate for federal funding for water and wastewater infrastructure.

A generation ago, significant federal funding supported the Clean Water Act and its mandatory scheme of effluent controls. Over the last 20 years, federal funding has steadily and precipitously declined even as regulations have become more stringent, giving rise to large unfunded federal mandates. For example, of the \$6.3 billion New York City has spent to improve water quality in New York Harbor since 2002, only \$41 million, or 0.64%, has been paid for with federal grants. The lack of federal support to match increasingly stringent pollution controls has forced utilities like DEP to defer critical state-of-good-repair investments to comply with mandates that may be unnecessary, or a lower priority in New York City. DEP will advocate for increased federal funding for the Clean Water state Revolving Fund, the Drinking Water State Revolving Fund, and other sources.

Goal: Engage state and federal regulators in proactive regulatory review and reform to incorporate sustainability principles into clean water regulations and initiatives.

74 Accelerate meaningful regulatory reform.

DEP and DEC have initiated a joint review of outdated permit conditions and consent orders to end obsolete practices and reallocate resources to productive uses. For example, DEP's permits currently require that 72 personnel be assigned to an Industrial Pretreatment Program despite a steady and significant decline in the number of enrolled businesses over the past 20 years. DEC is considering allowing us to shift many of these personnel to tide gate repair and other stormwater-related uses with a more immediate impact. DEP hopes to accelerate an across-the-board review of outdated regulations and permit conditions to maximize the resources that are productively dedicated to improving water quality.

75 Advocate for flexible new state and federal regulations that accommodate local conditions.

The last 10 years of water quality investments by New York City have made clear that a one-size-fits-all water quality regulation is not working. The benefits of a single rule—clarity and ease of enforcement—are far too often outweighed by missed opportunities to spend resources on local needs. DEP will advocate, together with other cities and utilities, for EPA and DEC to base regulations on sound scientific studies of public health risks, the relative magnitude of those risks, and the likely effectiveness of proposed solutions.

76 Seek affordability criteria that make sense for urban areas.

DEP will work with other cities and utilities to expand EPA's consideration of affordability criteria when it sets compliance schedules or issues regulations. In New York City and other areas, affordability criteria should not be limited to a percentage of median household income across the city, but rather should expressly recognize that our diverse population includes low-income communities with tight household budgets which face many competing demands, including higher housing and food costs, and other unavoidable expenses of urban living. The pace and scale of rate increases to fund mandated and other necessary infrastructure should also factor into the affordability calculus.



Recent investments, including those at the Newtown Creek Wastewater Treatment Plant, will help DEP meet mandated treatment standards in 2011.

77 Press for state and federal adoption of a watershed management approach to environmental compliance.

A historic 1997 Memorandum of Agreement established a flexible, partnership-based approach to watershed management that has allowed New York City drinking water from the Catskill and Delaware watersheds to remain unfiltered. This has ensured the long-term protection of our source waters while saving the city billions of dollars; provided new wastewater treatment plants and other benefits to upstate communities; and expanded recreational opportunities in protected watershed lands. DEP will advocate with EPA and DEC to shift away from chemical- and pollutant-specific regulation toward watershed-based management for the entire water cycle that incorporates stakeholder participation, considers the most cost-effective means of improving water quality, and complements other social needs.

78 Refine dissolved oxygen criteria and measurements to open up new recreational opportunities.

Dissolved oxygen criteria are formulated as “never less than” a certain concentration; the modeling to predict performance of control measures is premised on a worst case scenario of oxygen content at the bottom of the water column. As a result, many waters that would otherwise meet pathogen criteria for primary contact recreation are classified for secondary recreation because of dissolved oxygen levels predicted for the bottom of the water column that are slightly lower than the oxygen criteria. Averaging dissolved oxygen levels throughout the water column would more accurately assess water quality and would enable DEP to work with the state, community members, and other stakeholders to expand the areas in the New York City that are classified for primary contact recreation.

RECREATION OPPORTUNITIES AND LAND USE DESIGNATIONS

DEP will work with community stakeholders and city, state, and federal agencies to designate additional areas for swimming and boating and to realize the full recreational, economic, and residential potential of the waterfront. We will ensure that water quality standards are factored into decisions about adjacent land uses.

HARBOR WATER QUALITY GOALS

- ▶ Maximize the use of green infrastructure and other source controls to improve water quality.
- ▶ Restore natural systems that can reduce pollution while providing recreational opportunities, habitat, and climate adaptation benefits.

New York Harbor is cleaner than it has been in 100 years as the city has steadily eliminated public health threats. By the late 1980s, pathogen levels from sewage had dropped in many areas of the harbor by as much as 99% from historic levels, and most open waters in the harbor achieved a level of quality that makes boating and other recreational activities possible. After billions of dollars of past and current investments in upgrades at wastewater treatment plants, harborwide pathogen and dissolved oxygen levels are now consistently better than state standards, and this year—for the first time ever—all 14 of DEP’s wastewater treatment plants are collectively meeting monthly Clean Water Act standards for pollutant removal. Indeed, well over 75% of the New York side of the harbor now meets pathogen standards for swimming and other primary contact recreation and an additional 19% meets pathogen standards for boating and other secondary contact recreation. Despite this progress, impaired tributaries comprise 7% of the harbor and do not yet meet water quality standards for pathogens.

Our biggest remaining challenge is to further reduce combined sewer overflows (CSO) when it rains. We have made great progress over the past 20 years—CSO capture has increased from 30% in the 1980s to more than 72% annually today; and sewage is a smaller proportion of overflows, decreasing from 30% by volume in the 1980s to 12% in 2010. A traditional approach would require the construction of massive “grey” infrastructure—tanks and tunnels to store all of this combined flow temporarily until it can be pumped to a treatment plant after flow volume returns to normal. But the remaining opportunities for this end-of-pipe approach are very expensive and do not provide the additional sustainability benefits that create more vibrant communities. The NYC Green Infrastructure Plan that Mayor Bloomberg launched in September 2010 will achieve those benefits in addition to CSO reductions, and DEP is working hard to get the plan approved and begin its implementation.



Schematic diagrams of green infrastructure installations show how they capture rain where it falls before it ever enters the sewer system in order to reduce wastewater volumes at our treatment plants. From left: a green roof, a rain barrel, an enhanced tree pit, and a street-side bioswale.

STRATEGIES & INITIATIVES

Goal: Maximize the use of green infrastructure and other source controls to improve water quality.

79 Reduce runoff from new and existing development by capturing the first inch of rainfall on 10% of the impervious areas in CSO watersheds over the next 20 years.

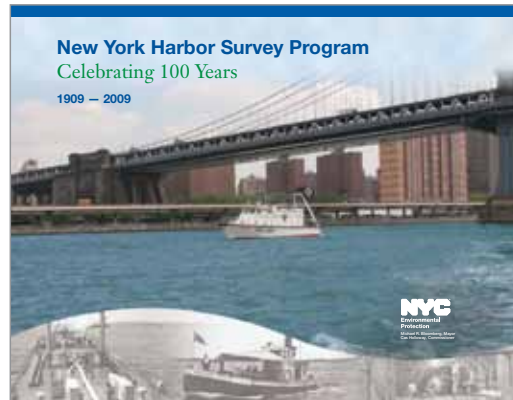
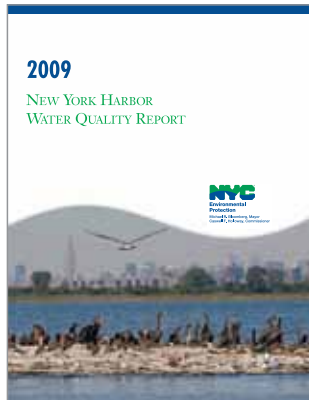
As the most densely developed city in the United States, New York City generates a tremendous volume of runoff from rooftops, streets, and other impervious surfaces every time it rains. If the root cause of runoff—impermeable surfaces—is not addressed, DEP will have to build more expensive tanks and tunnels to manage our stormwater flows, which will further increase with climate change. The NYC Green Infrastructure Plan calls for \$2.4 billion of public and private investment in swales, green roofs, and other source controls to control runoff, and will provide additional benefits, including improved air quality, cooler temperatures, lower energy bills, more green space, and increased property values that the existing grey strategy cannot. If approved by DEC and EPA, the NYC Green Infrastructure Plan will transform the city and reduce CSOs by 12 billion gallons per year—two billion gallons more than the existing grey strategy at a savings of more than \$2 billion over the 20-year implementation period.



The city already has more than 30 green infrastructure demonstration projects throughout the five boroughs to absorb stormwater and beautify our streets.

80 Expand the number of water-quality parameters and testing sites in the New York Harbor Survey.

Since the New York Metropolitan Sewerage Commission, DEP's predecessor, started the Harbor Survey in 1909 with 12 monitoring stations around Manhattan, this survey has evolved into a tool that regulators, scientists, managers, educators, and citizens rely on to assess impacts, trends, and improvements in water quality. Today, DEP tests 20 water quality parameters from 65 stations in the waterways surrounding all five boroughs. To better understand both the impact of CSOs and forthcoming improvements under the NYC Green Infrastructure Plan, DEP will increase the number of monitoring sites throughout the harbor and at the mouths of key tributaries to 85 sites, and we will collect samples approximately once a week in the summer, and monthly during other seasons. We will also seek to expand the monitoring parameters at certain locations to include biotic and ecosystem measures, such as the number of bird and animal species and the rate of growth or decline of wetlands, eelgrass beds, and other native habitats.



2009 marked the 100th anniversary of the New York Harbor Survey, which measures the quality of the water in New York Harbor. A century of investments in wastewater treatment, public education, and changing industry regulations have helped make the harbor the cleanest it has been in the past 100 years.

81 Measure CSO volumes.

Monitoring is critical to our ability to manage water quality and verify the models that form the basis for the city's Long Term Control Plan due in 2017. DEP has installed water elevation meters and telemetry equipment at 110 regulators to help determine whether a CSO has occurred. However, measuring the volumes of CSOs is difficult in combined sewer systems that are affected by tidal waters, so although DEP has conducted pilot studies, none of the available technology measures CSO flow with reliable accuracy. We will launch a renewed applied research effort to challenge the wastewater engineering and technology community to develop a reliable way to measure and monitor CSO volumes.



DEP has distributed rain barrels and encourages homeowners and businesses to install green and blue roofs to reduce stormwater runoff.

Goal: Restore natural systems that can reduce pollution while providing recreational, habitat, and climate adaptation benefits.

82 Restore wetlands habitat in and around Jamaica Bay.

Jamaica Bay is a diverse ecological resource and national treasure that supports multiple habitats, including open water, salt marshes, grasslands, coastal woodlands, maritime shrublands, and brackish and freshwater wetlands. DEP is responsible for protecting and restoring this diverse ecological resource and has been an active local partner with other city agencies on restoration efforts. DEP will continue to restore wetlands habitat in and around Jamaica Bay by investing \$15 million in additional funds for saltwater marsh restoration projects, and by seeking to leverage an additional \$30 million or more in federal matching funds. And we are investing an additional \$100 million at our wastewater treatment plants to reduce nitrogen discharges into Jamaica Bay by more than 50% over the next 10 years.

83 Expand the Staten Island Bluebelt.

The Staten Island Bluebelt provides ecologically sound, cost-effective stormwater management for approximately one-third of Staten Island's land area by preserving streams, ponds, and other wetland areas. These natural systems convey, store, and filter stormwater, and provide valuable open space and diverse habitats. Since the inception of the program, New York City has purchased approximately 325 acres of wetlands and invested \$300 million in sewer construction projects in the South Shore Bluebelt watershed. DEP will expand the Mid-Island Bluebelt to Oakwood Beach, New Creek, and South Beach and will expand the use of this approach in parts of Queens and other boroughs where it is cost-effective and there is sufficient space.



The award-winning Staten Island Bluebelt reduces the city's reliance on storm sewers and provides many co-benefits such as increased property values through beautification and restored habitats for wildlife.

CLIMATE CHANGE

The impacts of climate change in New York City are uncertain. Climate models indicate that by the 2080s, New York City and its watershed region may be 4°F to 7.5°F warmer, with a 5% to 10% increase in precipitation. Scientists anticipate that extreme weather events, such as hurricanes and tropical storms, may also become more frequent. At the magnitudes currently anticipated, climate change could compromise existing water supply and treatment systems. For instance, heavier precipitation and more frequent storms could threaten DEP's unfiltered water systems by increasing turbidity and warmer weather could affect the amount of snowpack and the timing of snowmelt to change the flow into our reservoirs.

Some of the investments we are making now—such as the Croton Water Filtration Plant—will address the potential impact of climate change on the water supply, and some projects—such as the repair of the Delaware Aqueduct—will increase system redundancy and operational flexibility. But there is more to do. In 2008, DEP convened a task force to study the effects of climate change on the city's water system; the task force produced an assessment and action plan that we are now working to implement, including efforts to monitor and model the effects of weather and climate trends on our water supply system. We will also study existing capacity constraints, especially in areas prone to flooding, sewer backups, and combined sewer overflow, and will develop a stormwater drainage strategy to ensure that design criteria for infrastructure investments minimize the risks of population growth and increased rainfall intensity.



DEP restored wetlands and reintroduced local plant life to a 16-acre section of Alley Pond Park in Bayside, Queens to reduce combined sewer overflows into Alley Creek and Little Neck Bay.

ENERGY GOALS

- ▶ **Reduce DEP's carbon footprint.**
- ▶ **Reduce electricity demand.**
- ▶ **Explore and invest in cost-effective clean energy projects.**

DEP is the second largest municipal consumer of electric power in New York City, and our power consumption is expected to grow by 53% over the next five years as we complete and begin to operate the the Catskill/Delaware Ultraviolet Disinfection Facility, the Croton Water Filtration Plant, nitrogen removal processes, and other new facilities required under water quality mandates. An aggressive energy strategy is crucial to maintain the reliability of the water system, as well as meet the PlaNYC goals of reducing our greenhouse gas emissions by 30% by 2017.

In addition to being a large consumer of energy, DEP has the opportunity to become a significant producer of clean energy in New York State. Within the city, DEP owns and operates facilities with a favorable footprint for developing renewable energy sources such as solar photovoltaics (PV), wind turbines, and biogas for power generation. Further upstate, our reservoirs in the Catskill, Delaware, and Croton watersheds offer the prospect of harnessing clean, safe, and environmentally-friendly hydroelectric power.

We are developing a comprehensive energy strategy with three main goals consistent with broader city initiatives: (1) to reduce DEP's carbon footprint, including its emissions of greenhouse gases and criteria pollutants consistent with the goals set out in PlaNYC; (2) to reduce our electricity demand, the cost of which is expected to almost double by 2014 in the absence of aggressive energy efficiency investments; and (3) to explore and invest in cost-effective clean energy projects. DEP will also take a lead role in developing the city's overall energy strategy, managing third party energy infrastructure and City-funded projects, and representing New York City in energy regulatory matters that affect municipal consumers and all energy ratepayers in New York City. Working with the Department of Citywide Administrative Services, the Mayor's Office of Long-Term Planning and Sustainability, the Economic Development Corporation, and other stakeholder we will ensure that New York City remains at the cutting edge of innovation and that residents enjoy clean, reliable, and affordable energy.

STRATEGIES & INITIATIVES

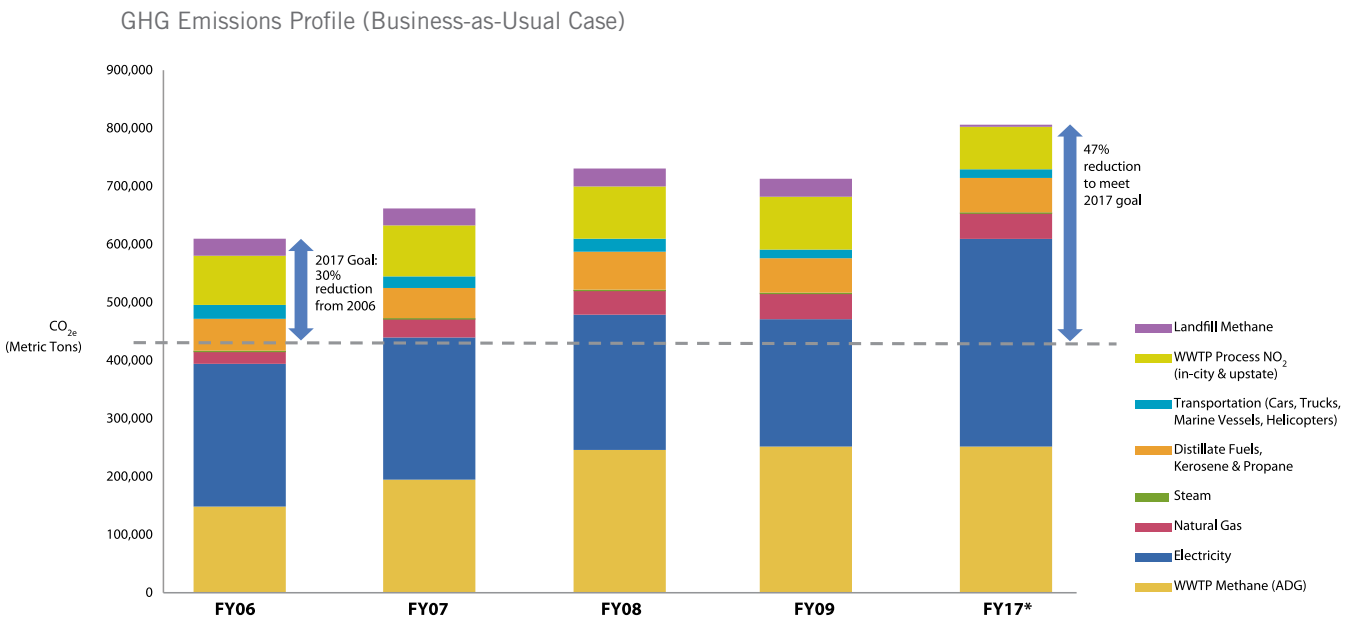
Goal: Reduce DEP's carbon footprint.

84 Implement strategies to reduce DEP greenhouse gas emissions by 30% from 2006 levels to meet Mayor Bloomberg's PlaNYC goals.

DEP is one of the largest emitters of greenhouse gases in New York City and roughly one-third of our emissions are associated with our consumption of electricity. Emissions of methane—a major component of anaerobic digester gas at our wastewater treatment plants—are the second biggest contributor. Our greenhouse gas emissions are expected to grow by approximately 200,000 metric tons between 2006 and 2017 due to increased power consumption and increased methane production from improved digester processes. As a result, by 2017 DEP's 30% reduction target is effectively a 47% reduction from our 2006 baseline emission forecast (Figure 1). We are looking across the agency for cost-effective supply- and demand-side investments to help us reach this aggressive carbon reduction target, while at the same time improving our core utility operations. DEP has identified projects between FY 2010 to 2014 that will reduce our greenhouse gas emissions by 304,000 metric tons that include: improved and expanded digester gas distribution systems to handle anaerobic digester gas; new or rehabilitated power and heat generation equipment such as engines, boilers, and fuel cells; and more energy-efficient equipment such as new centrifuges.

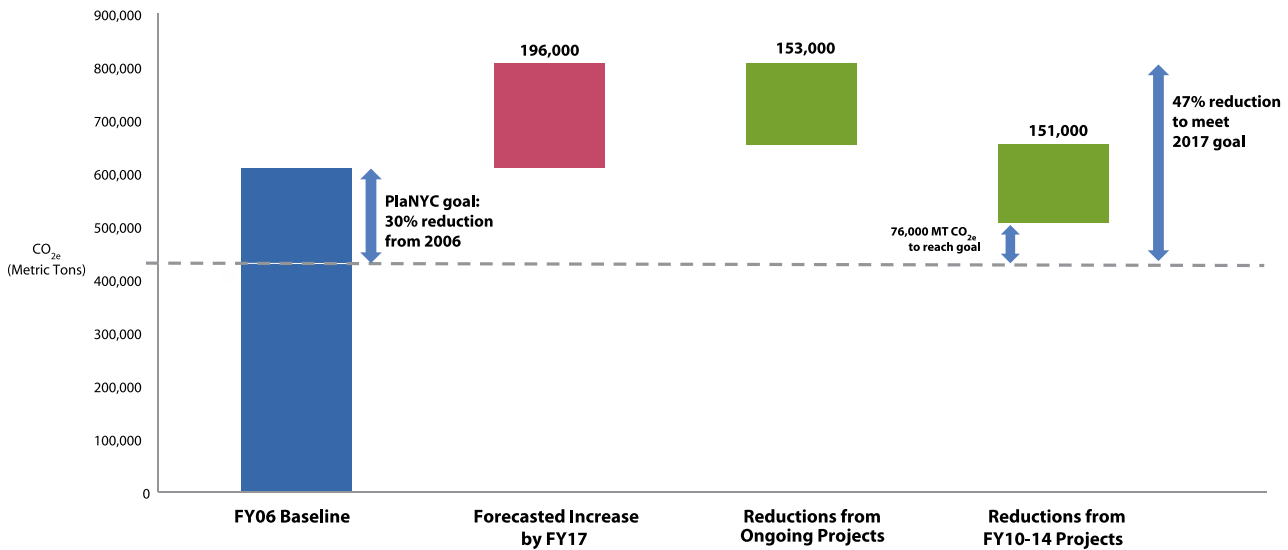
This set of investments will bring the agency to within 75% of its ambitious greenhouse gas reduction target (Figure 2). DEP is evaluating the most cost-effective investments to bridge the remaining gap by 2017. We believe this target is reachable through a combination of additional investments in the use of anaerobic digester gas and hydroelectric power, more efficient lighting, heating, ventilation, and cooling systems, operational changes at wastewater treatment plants, and selected replacements of inefficient process equipment.

Figure 1: Projected DEP Greenhouse Gas Emissions (2006-2017)



* FY17 emissions forecast assumes no additional ADG use or energy efficiency investments other than what is currently in the 10-year Capital Plan. Does not include emissions from steam consumption at the Red Hook and Wards Island wastewater treatment plants. Includes a reduction of landfill methane emissions as a result of the natural decomposition of the landfill and the implementation of a flare at the Brookfield Landfill. Includes reduction of NO₂ emissions associated with implementation of biological nitrogen removal at six of the in-city and upstate wastewater treatment facilities.

Figure 2: DEP Projects and Greenhouse Gas Reduction (2010-2014)



Goal: Reduce electricity demand.

85 Ensure the reliability of our power supply.

Treating 1.3 billion gallons of wastewater every day is energy-intensive and requires a reliable supply of electricity. As the city continues to grow and demands on the power grid increase, we must find ways to reduce our electricity needs by operating our wastewater treatment plants more efficiently and generating more power onsite at our wastewater treatment plants. To ensure that our minimum power needs are always met, we must strengthen our partnerships with utilities including Con Edison, the New York Power Authority, and the Long Island Power Authority, and establish protocols for communication and coordination during peak demand periods. As part of this effort, we must work closely with our state and federal regulators to institutionalize emergency protocols that will maximize DEP's ability to use on-site generator power when doing so will reduce the strain—and likelihood of a power disruption—on local grids.

86 Implement aggressive demand-side management practices to mitigate a projected 53% increase in electricity demand over the next five years.

Energy costs comprise approximately 11% of DEP's operating budget and are expected to grow as we complete and begin to operate new water and wastewater treatment facilities to meet state and federal water quality mandates that will increase our annual electricity consumption by more than 53% (an additional 373 million kilowatt-hours) by the end of the decade (see Figure 3). These additional facilities include the Catskill/Delaware Ultraviolet (UV) Disinfection Facility, Newtown Creek Wastewater Treatment Plant upgrades, the Croton Water Filtration Plant, combined sewer overflow detention facilities, and the Biological Nitrogen Reduction (BNR) programs. DEP must implement an aggressive demand-side management program since we are on track to become the largest consumer of power among city agencies by 2015. We are conducting facility-level audits to identify the most cost-effective options to reduce energy consumption, including modifications to operational practices, more efficient buildings, and capital upgrades to our core process equipment to improve energy efficiency and reliability.

■ Operational efficiency

DEP regularly engages its in-house experts to determine the most effective solutions to improve energy efficiency. For example, our plant superintendents are exploring how to modify operational practices such as adjusting the flow rates of blowers at wastewater treatment plants to reduce energy loads while still maintaining wastewater treatment standards.

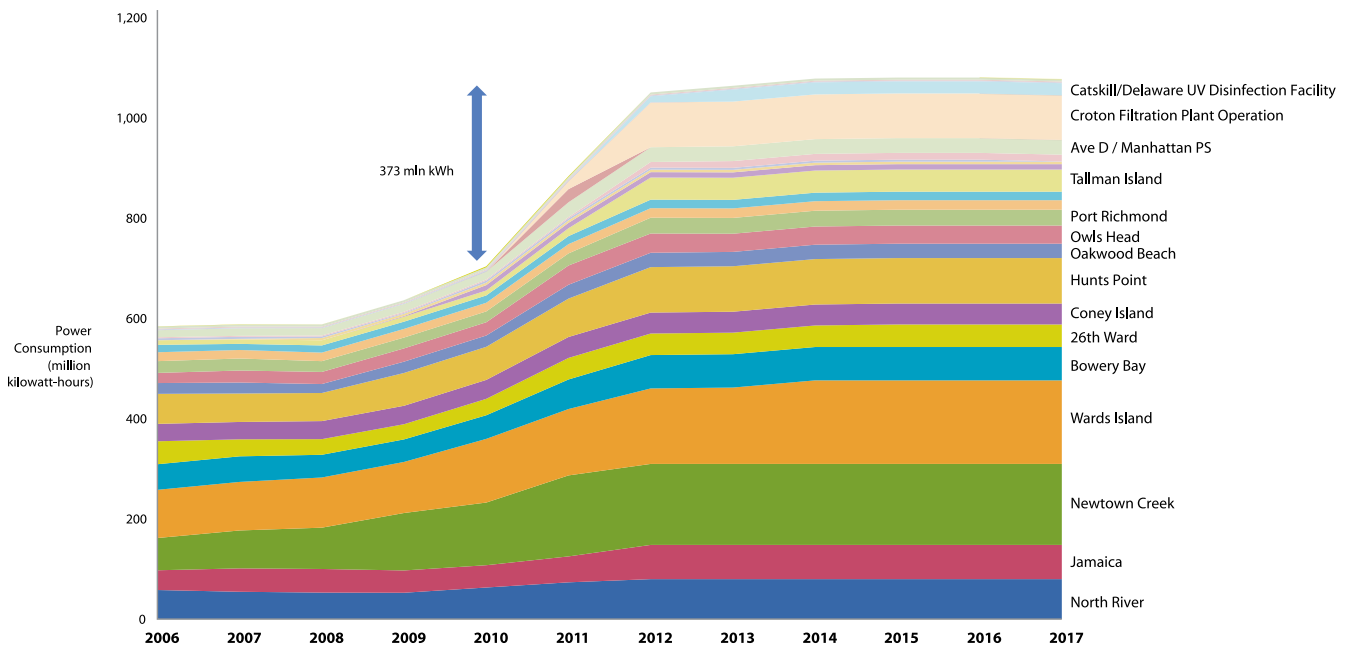
■ Lighting and HVAC replacement

We are currently evaluating capital upgrades such as more efficient heating, ventilation and cooling systems (HVAC) in buildings, and the replacement of old lighting infrastructure with more efficient light emitting diodes (LEDs).

■ Capital upgrades to process equipment

As part of our capital asset management program we are replacing aging and inefficient equipment, such as pumps and centrifuges, to improve the reliability of our operations and reduce our energy costs. Energy will now be an integral consideration in choosing the right capital investments throughout the agency.

Figure 3: Projected DEP Power Consumption (2010-2017)



PEAK LOAD MANAGEMENT

We are participating in a Peak Load Management program in partnership with Con Edison in which our Owls Head and Coney Island wastewater treatment plants will reduce their power consumption during times of greatest electricity demand—either by using less electricity or by using alternative sources of generation. Due to federal restrictions on pollutants, such as National Emissions Standards for Hazardous Air Pollutants (NESHAP), most of our generators no longer operate during peak periods but only when there is an impending blackout or other emergency. DEP is working closely with its electric utility partners, including Con Edison, to coordinate the deployment of these generators during emergency situations so that service is not interrupted to wastewater treatment plants or the city's energy grid. DEP also operates emergency generators at all 14 wastewater treatment plants in the five boroughs that can support primary treatment needs during a power outage.

87 Facilitate new gas transmission projects into New York City to lower gas and power prices, increase the reliability of power and gas supply, and decrease fuel oil consumption.

Despite the slowdown of the energy market since the economic recession, New York City residents still face some of the highest retail electricity and gas prices in the nation and an aging infrastructure in need of expansion and modernization. Specifically, no new natural gas pipeline capacity has been built to serve the city in almost 40 years and the city has limited gas storage capacity. This increases energy costs and jeopardizes longer term reliability. And since more than 90% of the generating capacity in the city uses natural gas as its primary fuel, there is a very close relationship between the availability of natural gas and our ability to ensure adequate and affordable electricity for 8.4 million residents and the many millions more who visit and work here in New York City every day.

DEP is working with private developers of gas pipeline projects and the Federal Energy Regulatory Commission (FERC) to represent NYC stakeholders and to bring vital new gas supply into the city and protect the city infrastructure that these projects might affect. For example, one project proposed by Spectra Energy could increase the city's access to natural gas by up to 7.6 billion cubic feet per day—enough to heat more than 2 million homes—and would support our efforts to achieve a number of key citywide goals, including decreased use of fuel oil in the five boroughs.

Goal: Explore and invest in cost-effective clean energy projects.

88 Develop 30-50 megawatts of clean energy supply at DEP facilities through public/private partnerships.

DEP will evaluate targeted investments in 30-50 megawatts of clean energy supply where it has a comparative advantage and where there is a sufficient return on investment. DEP is examining the following potential sources of clean power supply:

■ Harness clean hydroelectric power to reduce DEP's carbon footprint and spur economic development

Hydroelectric power is a key component of DEP's efforts to create a clean power portfolio, support economic development in host communities in upstate New York, generate revenues for the City of New York, and reduce our overall carbon footprint. The infrastructure that impounds New York City's drinking water currently contains five hydroelectric facilities. In 2008, FERC granted the City a preliminary permit to study opportunities for four additional facilities at the Neversink, Pepacton, Cannonsville, and Schoharie reservoirs that could provide up to approximately 15 megawatts of power. In November 2010, DEP issued a Request for Expressions of Interest to energy developers and financiers to design, build, and/or finance hydroelectric facilities on the four reservoirs to further explore this clean energy opportunity.

Further downstream, DEP is investigating how to efficiently harness the potential and thermal energy in our water distribution and wastewater treatment systems to reduce power and heat loads. Our distribution system has multiple hydraulic gradients—such as the effluent from our wastewater processes that sometimes drops into the ambient water from a significant elevation—that we can transform into electric power for our wastewater treatment plants. We are also studying the prospects for using the heat in our sewer systems to power the heating, ventilation, and cooling operations at nearby buildings.

■ Use anaerobic digester gas and eliminate emissions

Large digesters at wastewater treatment plants act like giant stomachs to remove solids from water. This process creates a large volume of anaerobic digester gas, including methane and heavier hydrocarbons. Although anaerobic digester gas is currently a source of carbon emissions, it is also a useful energy source. A central component of our greenhouse gas reduction strategy will be to capture the anaerobic digester gas we currently waste to power wastewater operations, meet on-site heat and electricity needs, and, where feasible, sell excess energy to the market. The most effective way to do this is through public-private partnerships that leverage the expertise, creativity, and incentives of the private sector;

we will pursue these partnerships wherever they make sense. In addition to gas-to-grid projects, we will pursue partnerships to build cogeneration facilities that create electricity and usable heat or steam at our wastewater treatment plants. In November 2010 we released a Request for Expressions of Interest (RFEI) to develop a cogeneration facility near our Wards Island Wastewater Treatment Plant and we hope to pursue a viable proposal next year.

■ **Develop solar and wind energy**

DEP's real estate portfolio includes a number of the best locations in the city to produce renewable solar and wind energy, including a 200,000 square foot roof at the Port Richmond Wastewater Treatment Plant in Staten Island. A number of DEP-operated landfill sites also contain large, unshaded parcels of land that are at a premium in New York City and offer the potential for large-scale solar and wind power installations. Newtown Creek and other wastewater treatment plants are also large enough and have local power and heat loads ideal for solar development. We are currently conducting a feasibility study for the development of a 1.5 megawatt wind turbine at our Oakwood Beach Wastewater Treatment Plant in Staten Island, which would be the first standalone wind turbine in the city. As with anaerobic digester gas and cogeneration projects, partnerships with the private sector will be essential to make these projects a reality.

89 Support city energy initiatives by working with regulators and utilities to promote competitive energy markets and efficient and fair incentives for New York City.

In addition to managing the energy strategy for our core water utility assets, DEP will play a central role in developing and supporting citywide energy initiatives, including representing the City on all energy regulatory matters with the Public Service Commission, New York Independent System Operator (NYISO), and FERC. We will actively pursue clean, reliable, and affordable energy for DEP and the city's 8.4 million residents. As chair of both New York City's Energy Policy Task Force and Energy Planning Board, we will work with stakeholders to support our energy priorities, including the continued operation of the Indian Point nuclear plant, a key component in the achievement of citywide greenhouse gas reduction goals.

Effective energy market design must fully reflect the needs of energy ratepayers for safe, reliable, and affordable power, and DEP is the city's voting representative at NYISO, which has overall responsibility for market design for the wholesale electricity market. We will support key city goals with regulators, including our continuing interest in modernizing older, inefficient power generation facilities. DEP will also advocate for the continued development of competitive energy markets to ensure that clean energy technologies, including renewable and repowered assets, can compete in the market and enable the city to lower its emissions, and become a center for innovation in energy.

State and federal incentives for energy efficiency and clean distributed energy investments will play an increasingly critical role in New York City's efforts to limit the cost of consumers' energy bills, reduce citywide greenhouse gas emissions by 30% by 2030, and improve the reliability of the overall energy system. DEP will work with state and federal regulators to develop the most efficient and transparent state energy efficiency programs and ensure that New York City receives its fair share of state funding for energy projects.

DEP will also foster the development of innovative energy projects in and around the city, including renewable power and smart grid technologies. For example, offshore wind turbines represent an opportunity to harness utility-scale renewable power located in proximity to the city; DEP is an active member of the Offshore Wind Collaborative, along with Con Edison, Long Island Power Authority (LIPA), and New York Power Authority (NYPA), and will work closely with federal and state authorities and utilities to pursue this potential opportunity. DEP will also work with Con Edison and other stakeholders to help the transition to a smarter energy grid for New York City that will improve system reliability, provide better pricing signals for energy consumption, and facilitate the greater use of clean energy technologies.

HAZARDOUS MATERIALS GOALS

- ▶ Prevent public and ecosystem exposure to contaminated sediments and soils, return water to providing ecological services, and reuse clean soils and sediments.
- ▶ Ensure proper management of hazardous materials.

Like all cities with an industrial past, New York has land and waterways that are contaminated from historic disposal and handling practices. In fact, much of the city was built on soil that contains low levels of contamination. The remediation and restoration of contaminated sediments complements DEP's work to improve water quality and ecology. DEP will work with the New York City Office of Environmental Remediation, EPA, DEC, and private parties to investigate and remediate contaminated sediments. DEP also regulates the management of hazardous materials by industrial and commercial facilities under Local Law 26 and other authorities and responds to emergency spills. DEP will improve its delivery of these critical security and public health functions.

Additionally, DEP regulates the removal of asbestos and recently overhauled the city's asbestos regulations to improve safety for workers, first responders, and the public. We will continue to implement these measures and make sure that bad actors are barred from the industry.



DEP works with business owners and construction contractors to ensure that workers are safe and hazardous materials are carefully stored and disposed of properly.

STRATEGIES & INITIATIVES

Goal: Prevent public and ecosystem exposure to contaminated sediments and soils, return water to providing ecological services, and reuse clean soils and sediments.

90 Continue to work with EPA to clean up Superfund-designated sites.

In the Gowanus Canal, DEP is addressing stagnant water, high volumes of nutrients, and odor through a multi-pronged improvement plan that includes reducing combined sewer overflow by building a new interceptor sewer, repairing and upgrading the flushing tunnel that brings more oxygen-rich water from Buttermilk Channel along the East River into the Gowanus Canal, and installing an aeration system during the construction period. On Newtown Creek, DEP is spending \$5 billion to upgrade the city's largest wastewater treatment plant. In 2010, EPA designated Gowanus Canal and Newtown Creek as Superfund sites based on the historic industrial discharges of pollutants that remain in the sediment of these urban waterways. In addition to our long-standing water quality efforts, we will work with EPA, DEC, and industrial polluters to complete the remediation of contaminated sites as quickly as possible for the benefit of local communities.



The Gowanus Canal and Newtown Creek are working waterways with environmental degradation from decades of industrial use.

91 Secure the repeal of GASB Standard 49.

In 2006, the Government Accounting Standards Board (GASB) issued an interpretation that municipalities can no longer use capital funds to investigate or remediate environmentally contaminated sites. After limited waivers expire in 2011, the City will not be able to fund as much of the critical remediation work needed to return properties to productive use. DEP will work with the Office of Management and Budget to seek an amendment to GASB 49 to once again allow us to use capital funds to pay for environmental cleanups.

BROWNFIELD REMEDIATION

New York City established the Mayor's Office of Environmental Remediation (OER) to accomplish the 11 PlaNYC initiatives that address brownfield properties throughout the city. Since its creation in June 2008, OER has worked with DEP and other city agencies to launch the first municipally-run brownfield cleanup program, create a brownfield incentive program that provides more than \$9 million of City investment in brownfield investigation and cleanup, and develop a GIS-based web application to facilitate property research and identify brownfield sites. DEP looks forward to continuing this strong relationship and will continue to provide the services and expertise to ensure that brownfields are properly managed and returned to productive use.



Brownfields in Greenpoint, Chelsea, and Long Island City are undergoing remediation so that they may be usefully redeveloped.

92 Promote beneficial use determinations (BUDs).

Some soil that is excavated during construction projects can be reused for certain purposes, such as landfill caps and contours. Reuse avoids unnecessary emissions and the expense of shipping and disposing of these materials at distant landfills. DEP will work with DEC and the Army Corp of Engineers to standardize BUD applications, develop a multi-agency BUD team, and increase appropriate reuse of sediments.

Goal: Ensure proper management of hazardous materials.

93 Continue to meet all of the requirements of the Construction, Demolition, and Abatement (CDA) laws and improve asbestos compliance.

Exposure to airborne, friable asbestos remains a significant public health risk decades after it was banned, as the city's older building stock continues to be rehabilitated. DEP has a comprehensive program to train and certify asbestos removal workers and managers, permit asbestos removal activities, and enforce asbestos safety rules. DEP's Asbestos Control Program has undergone a major overhaul to implement the Construction, Demolition and Abatement law and will continue to complete all of the CDA initiatives and promulgate rules for asbestos abatement during demolition. We will increase office audits and will complete at least 500 field inspections each year going forward.

In 2009, DEP created the online Asbestos Reporting and Tracking System (ARTS) to allow applicants to submit applications and receive approvals electronically. DEP will continue to improve and update DEP's permit database to allow for online permit filing and renewal and will ensure that only certified asbestos inspectors submit applications. DEP also started a data sharing and notification process with EPA, DEC, and other city agencies to maintain the integrity of asbestos inspector certifications.



DEP promotes public safety by making sure that contractors abate asbestos safely.

94 Improve and refine hazardous material management systems.

Local Law 26, the Community Right-to-Know Law, mandates that all facilities that handle hazardous materials must report information about their materials to DEP. We maintain an inventory of more than 7,600 businesses and facilities that store, use, process, or handle hazardous materials, such as hospitals, factories, dry cleaners, and auto body repair shops, and track an additional 49,400 power utility facilities.

DEP annually conducts more than 5,000 inspections to ensure compliance with Local Law 26 and issues enforcement orders, oversees cleanups of spills, and responds to public complaints of odors, chemical spills, and abandoned chemicals. We also collaborate with law enforcement agencies to monitor major public facilities and events for toxic air pollutants.

DEP will work to refine and strengthen its web-based reporting system to improve the accessibility and quality of the information available to communities, workers, and emergency response personnel. Furthermore, DEP will increase inspections at targeted facilities with numerous citations or confirmed violations of regulatory standards. We will also continue to reduce the amount of Extremely Hazardous Substances within city limits and the overall risk these materials pose by promoting prevention and avoidance strategies in facilities that file Risk Management Plans for Extremely Hazardous Substances.

95 Improve responses to emergencies.

DEP's Emergency Response & Technical Assessment (DERTA) unit is comprised of approximately 35 qualified HazMat responders who protect public health and safety by responding to emergencies caused by releases, or threatened releases, of potentially hazardous substances into the environment. This unit is one of the most technically accredited groups in the country and continues to receive specialized training in the use of highly advanced tools at the cutting edge of technology. We will improve response efficiency by streamlining the criteria and the type of events that require a response and will enhance public safety by restructuring operational procedures to improve the efficiency of hazardous material mitigation.

AIR AND NOISE POLLUTION GOALS

- ▶ Improve air quality and public health in New York City by controlling local sources of air pollution.
- ▶ Reduce noise through targeted enforcement and code changes.

Air quality and excessive noise are critical quality of life issues; indeed, air quality is a primary factor that affects public health and life expectancy throughout the city. While New York's air has been getting cleaner, it does not meet national standards for two primary pollutants: fine particulate matter (soot or PM 2.5) and ozone (smog). In addition, EPA is adopting new national standards for nitrogen oxides and sulfur oxides that New York City may be out of compliance with when they become effective. DEP will continue to work with EPA and DEC to control upwind sources, and will continue to reduce and eliminate local sources of air pollutants throughout the five boroughs. New York City has a history of bold action to improve air quality, and we will soon establish rules for boiler installation and repair to essentially phase out the use of No. 6 and all but low-sulfur No. 4 heating oil in the city.

We will also conduct the first review of our groundbreaking Noise Code since its adoption in 2005 to reflect both our experiences in its application and technological improvements.



DEP works with construction contractors to develop comprehensive noise mitigation plans that are sensitive to community needs.

STRATEGIES & INITIATIVES

Goal: Improve air quality and public health in New York City by controlling local sources of air pollution.

96 Reduce air emissions from idling.

Mobile sources are a significant source of local pollution. DEP can reduce emissions from construction vehicles, city fleets, and other sources that are within local control through enforcement and the promotion of new technology. DEP will continue to review new technology that both reduces idling and achieves comparable results, including auxiliary engines. In addition, DEP will work to increase compliance with local anti-idling laws, including the new one-minute limit in school zones, through targeted enforcement and education.

97 Reduce local air emissions from the use of residual heating oil.

Small, diffuse sources can emit significant levels of pollution and still evade federal or state regulation. For example, according to EPA's National Emissions Inventory, as much as 14% of local PM 2.5 emissions come from the relatively small oil and gas burners we use to heat buildings or water. DEP and other agencies have already worked to enact Local Law 43 of 2010 to reduce heating oil pollution by requiring the use of biodiesel blends and creating a new class of low-sulfur heating oil. DEP will amend its regulations to reduce the use of residual oil while minimizing capital costs that low-income residents must bear.

98 Update the New York City Air Code for the first time since 1970.

The New York City Air Pollution Code, or Air Code, regulates any industry or group, such as the automotive industry and owners of buildings with boilers, or activity that can emit potentially harmful substances into the air, including chemicals and particulate matter. Over the past 30 years, the New York City Council has amended the Air Code in piecemeal fashion. Since 1970 there have been many advances in regulation and technology, and the City Council needs to update the entire Air Code to fully reflect these changes. DEP will take the lead in a comprehensive update of the Air Code that will focus on ways to streamline compliance processes and will encourage innovative ways to reduce local sources of pollution while maintaining rigorous standards to protect public health.

99 Expand and refine local air emission inventories with DOHMH and relevant stakeholders.

In 2009, the Department of Health and Mental Hygiene (DOHMH) released the first ever New York City Community Air Survey, a report of neighborhood levels of fine particles, elemental carbon, nitrogen dioxide, and sulfur dioxide collected during the winter of 2008-2009. The findings show a significant correlation between street level air pollution and certain local sources, such as heating oil. This monitoring effort will continue for several more years, and DEP will continue to work with DOHMH and other stakeholders to expand and refine local air emissions inventories to better understand the type, location, and exposure risk of local sources of air pollution.

Goal: Reduce noise by targeted enforcement and code changes.

100 Enhance the 2005 Noise Code.

Noise complaints are among the highest volume 311 referrals to DEP every year, and there is a growing scientific consensus that noise pollution has a significant impact on public health. In 2005, DEP adopted a comprehensive Noise Code that substantially reduced noise and related complaints, especially regarding construction activity. Beginning in 2011, DEP will assess methods of further reducing noise from the sectors that generate the most significant complaints and will work with the Department of Buildings to incorporate additional noise mitigation standards into the Noise and Building Codes.

Noise meters allow DEP to accurately enforce the Noise Code and issue violations in the field.





New York Harbor. Photo: Kristen Artz

CONCLUSION

The 29 goals and 100 initiatives in this strategic plan are ambitious and achievable. Taken together, they will enable DEP to continue to provide high-quality drinking water to our nine million customers, significantly improve harbor water quality, facilitate development essential to the city's continued growth, and protect our shared environment. Over the next four years and beyond we will work hard to implement this plan, and we will release an annual report card on our progress. For more information about DEP and future updates on this plan, visit www.nyc.gov/dep or follow us at www.facebook.com/nycwater. We want your feedback.

DEP Strategy 2011-2014

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100 GOALS & INITIATIVES

STRATEGIC PLANNING AND PERFORMANCE

- 1 Launch H₂OStat to ensure the efficient and cost-effective operation of the water system and the entire agency.
- 2 Innovate and implement best practices through active engagement with our partner water utilities and stakeholder organizations around the country and the world.

CUSTOMER SERVICE

Goal: Provide the highest quality service to nine million New Yorkers, including our 835,000 bill-paying customers.

- 3 Substantially complete the installation of Automated Meter Reading (AMR) devices citywide by January 2012 and continue to improve the online AMR tool.
- 4 Develop a leak notification system for customers who want to know when their water use deviates from normal consumption patterns.
- 5 Reduce call response time to 30 seconds or less.
- 6 Continue and expand programs for customers in financial distress.
- 7 Offer customers a service line protection plan.
- 8 Promote NYC water by building partnerships with community organizations, businesses, and other city agencies.

Goal: Ensure effective and fair revenue collection.

- 9 Replace the DEP customer information data system and convert to monthly account billing.
- 10 Convert customers to paperless billing and online payment methods.
- 11 Increase revenue collection with new collection tools and by targeting specific customer segments.
- 12 Renew and expand DEP's lien sale authority.
- 13 Replace approximately 30,000 large meters on industry-recommended cycles over the next 10 years.
- 14 Evaluate new water rate structures.

Goal: Encourage economic development by simplifying and improving permitting processes.

- 15 Increase online permitting for businesses, engineers, and contractors.
- 16 Consolidate permitting functions to simplify customer interactions with DEP.
- 17 Update and improve DEP's air permitting database.
- 18 Publish an annual regulatory agenda.
- 19 Publish regulatory guidance manuals.
- 20 Simplify the reporting process for businesses and other entities that are required to report hazardous substances to DEP.

WORKER SAFETY, PUBLIC HEALTH, AND ENVIRONMENTAL PROTECTION

- 21 Measure EHS performance and demand success.
- 22 Integrate EHS compliance into every aspect of DEP operations and construction.
- 23 Ensure effective EHS training and education for all employees.
- 24 Encourage open, frequent, and candid communication about EHS issues.

OPERATIONS

Water Supply

Goal: Supply high-quality drinking water.

- 25 Maintain the city's Filtration Avoidance Determination (FAD).
- 26 Purchase watershed lands that protect water quality.
- 27 Complete and operate the Catskill/Delaware Ultraviolet (UV) Disinfection Facility to comply with the federal mandate for secondary disinfection of the Catskill and Delaware water supplies.
- 28 Complete and operate the Croton Water Filtration Plant by 2013.

Goal: Protect New York City's watershed.

- 29 Protect the water supply from hydrofracking for natural gas in the New York City watershed.
- 30 Support economic development compatible with watershed protection.
- 31 Expand recreational opportunities in the city's watershed.

Goal: Maintain robust, secure, and cost-effective water supply infrastructure and improve operational efficiency with new technology.

- 32 Develop and implement a plan to repair the Delaware Aqueduct.
- 33 Pressurize the Catskill Aqueduct.
- 34 Connect the Delaware and Catskill aqueducts.
- 35 Develop cost-effective groundwater and other supplemental water supply alternatives.
- 36 Operate and maintain DEP's network of dams.
- 37 Optimize water delivery by integrating next-generation forecasting models into daily operations.
- 38 Continue to protect the NYC watershed and water infrastructure.

Water Distribution

Goal: Complete key infrastructure projects to improve delivery of water to New Yorkers.

- 39 Activate Stage 2 of City Water Tunnel No. 3.
- 40 Build the Staten Island Siphon.
- 41 Build out and replace critical water supply infrastructure to support residential, commercial, and industrial growth throughout the city.

Goal: Build out sewer and stormwater infrastructure to improve water quality in New York Harbor, reduce flooding, and support economic growth.

- 42 Build out and upgrade the sewer network in southeast Queens, Staten Island, and other neighborhoods that need additional capacity.
- 43 Complete a comprehensive drainage investment strategy for the city.

Goal: Increase the efficiency of field crews to optimize the maintenance and performance of the water and sewer networks.

- 44 Decrease water main breaks and sewer backups and improve response time.
- 45 Expand catch basin cleanings and rehabilitation to prevent flooding and protect water quality.
- 46 Expand the preventive maintenance program for critical water infrastructure.
- 47 Improve hydrant repair response time.
- 48 Increase field crew productivity to improve system performance.

Goal: Protect public health and water and sewer infrastructure by promoting and enforcing the installation of backflow preventers, grease traps, and other critical equipment.

- 49 Increase backflow prevention inspections.
- 50 Update grease trap regulations, increase inspections, and educate the business and development communities about compliance.
- 51 Promote and incentivize yellow grease recycling for use as biodiesel fuel.

Wastewater Treatment

Goal: Certify citywide compliance with Clean Water Act standards for secondary wastewater treatment.

- 52 Certify that the Newtown Creek Wastewater Treatment Plant meets secondary treatment standards by June 2011.
- 53 Complete \$2.6 billion in upgrades underway at six wastewater treatment plants.

Goal: Continue to improve water quality in New York Harbor to facilitate new development and increased waterfront access for all New Yorkers.

- 54 Implement the NYC Green Infrastructure Plan.
- 55 Activate the SHARON and ARP treatment technologies to remove oxygen-depleting nitrogen from wastewater.

Goal: Optimize the efficiency and reliability of wastewater treatment operations.

- 56 Pilot contracting competition between city workers and private contractors.
- 57 Improve inventory management and planning.
- 58 Use new technology to constantly monitor pump stations and other infrastructure and maximize the storage capacity of the sewer system.

Goal: Evaluate the economic, ecological, and social effects of DEP's capital investments and wastewater treatment operations.

- 59 Develop and implement a long-term, sustainable citywide sludge management program.
- 60 Expand and strengthen DEP community partnerships throughout the five boroughs.

Capital

Goal: Implement strong capital project controls to deliver projects on time and on budget.

- 61 Implement new project controls business processes.
- 62 Create a Project Controls Division.
- 63 Create a new capital Project Management Information System.
- 64 Provide public transparency into DEP capital projects.

Goal: Achieve \$100 million in savings through value engineering and by deferring projects.

- 65 Implement an Asset Management Program to make the right capital investments at the right time.
- 66 Develop a 10-year capital plan that prioritizes funding for critical assets and minimizes the need for future water rate increases.

Goal: Strengthen technical expertise in design and construction management.

- 67 Enhance expertise through balanced dependence on consultant support.
- 68 Recruit top engineering talent to pave the way for future success.
- 69 Implement a workforce development program..

Goal: Become the owner of choice in the regional and national design and construction community.

- 70 Improve DEP's standard construction contract language and processes.
- 71 Strengthen outreach to design and construction industry partners and expand minority- and women-owned business participation.

SUSTAINABILITY

Regulatory Relationships and Policy

Goal: Enlist stakeholders to develop investment priorities and help secure funding for water and wastewater infrastructure.

- 72 Form a clean water and clean air partnership with civic groups, customers, regulators, and other stakeholders.
- 73 Advocate for federal funding for water and wastewater infrastructure.

Goal: Engage state and federal regulators in proactive regulatory review and reform to incorporate sustainability principles into clean water regulations and initiatives.

- 74 Accelerate meaningful regulatory reform.
- 75 Advocate for flexible new state and federal regulations that accommodate local conditions.
- 76 Seek affordability criteria that make sense for urban areas.
- 77 Press for state and federal adoption of a watershed management approach to environmental compliance.
- 78 Refine dissolved oxygen criteria and measurements to open up new recreational opportunities.

Harbor Water Quality

Goal: Maximize the use of green infrastructure and other source controls to improve water quality.

- 79 Reduce runoff from new and existing development by capturing the first inch of rainfall on 10% of the impervious areas in CSO watersheds over the next 20 years.
- 80 Expand the number of water-quality parameters and testing sites in the New York Harbor Survey.
- 81 Measure CSO volumes.

Goal: Restore natural systems that can reduce pollution while providing recreational, habitat, and climate adaptation benefits.

- 82 Restore wetlands habitat in and around Jamaica Bay.
- 83 Expand the Staten Island Bluebelt.

Energy

Goal: Reduce DEP's carbon footprint.

- 84 Implement strategies to reduce DEP greenhouse gas emissions by 30% from 2006 levels to meet Mayor Bloomberg's PlaNYC goals.

Goal: Reduce electricity demand.

- 85 Ensure the reliability of our power supply.
- 86 Implement aggressive demand-side management practices to mitigate a projected 53% increase in electricity demand over the next five years.
- 87 Facilitate new gas transmission projects into New York City to lower gas and power prices, increase the reliability of power and gas supply, and decrease fuel oil consumption.

Goal: Explore and invest in cost-effective clean energy projects.

- 88 Develop 30-50 megawatts of clean energy supply at DEP facilities through public/private partnerships.
- 89 Support city energy initiatives by working with regulators and utilities to promote competitive energy markets and efficient and fair incentives for New York City.

Hazardous Materials

Goal: Prevent public and ecosystem exposure to contaminated sediments and soils, return water to providing ecological services, and reuse clean soils and sediments.

- 90 Continue to work with EPA to clean up Superfund-designated sites.
- 91 Secure the repeal of GASB Standard 49.
- 92 Promote beneficial use determinations (BUDs).

Goal: Ensure proper management of hazardous materials.

- 93 Continue to meet all of the requirements of the Construction, Demolition, and Abatement (CDA) laws and improve asbestos compliance.
- 94 Improve and refine hazardous material management systems.
- 95 Improve responses to emergencies.

Air and Noise Pollution

Goal: Improve air quality and public health in New York City by controlling local sources of air pollution.

- 96 Reduce air emissions from idling.
- 97 Reduce local air emissions from the use of residual heating oil.
- 98 Update the New York City Air Code for the first time since 1970.
- 99 Expand and refine local air emission inventories with DOHMH and relevant stakeholders.

Goal: Reduce noise by targeted enforcement and code changes.

- 100 Enhance the 2005 Noise Code.

OTHER ORGANIZATIONS

AMWA	Association of Metropolitan Water Agencies	www.amwa.net
AWWA	American Water Works Association	www.awwa.org
BIC	Business Integrity Commission	www.nyc.gov/bic
CNYCN	Center for New York City Neighborhoods	www.cnycn.org
ConEd	Con Edison	www.coned.com
CWC	Catskill Watershed Corporation	www.cwconline.org
DCP	NYC Department of City Planning	www.nyc.gov/dcp
DEC	New York State Department of Environmental Conservation	www.dec.ny.gov
DOB	NYC Department of Buildings	www.nyc.gov/buildings
DOHMH	NYC Department of Health and Mental Hygiene	www.nyc.gov/health
DPR	City of New York Department of Parks and Recreation	www.nyc.gov/parks
EDC	NYC Economic Development Corporation	www.nycedc.com
EPA	United States Environmental Protection Agency	www.epa.gov
FERC	Federal Energy Regulatory Commission	www.ferc.gov
	GrowNYC	www.grownyc.org
ISO	New York Independent System Operator	www.nyiso.com
NACWA	National Association of Clean Water Agencies	www.nacwa.org
NGRID	National Grid	www.nationalgridus.com
NOAA	National Oceanic and Atmospheric Administration	www.noaa.gov
NRDC	Natural Resources Defense Council	www.nrdc.org
NYCHA	New York City Housing Authority	www.nyc.gov/nycha
NYP&A	New York Power Authority	www.nypa.gov
PANYNJ	Port Authority of New York and New Jersey	www.panynj.gov
PSC	New York State Public Service Commission	www.dps.state.ny.us
USACE	United States Army Corps of Engineers	www.usace.army.mil
USGS	United States Geological Survey	www.usgs.gov
WAC	Watershed Agricultural Council	www.nycwatershed.org
WEF	Water Environment Federation	www.wef.org
WFA	New York Water Finance Authority	www.nyc.gov/nywfa
WRF	Water Research Foundation	www.waterresearchfoundation.org

GLOSSARY

Anaerobic digester gas	A mixture of gases, including methane, produced during the breakdown of biodegradable material in the absence of oxygen.
Asbestos Reporting and Tracking System	An online tool that enables applicants to submit applications and/or receive approvals (or objections) electronically.
Backflow preventer	A plumbing device that prevents contaminated water or chemicals from flowing back into the drinking water supply if there is a sudden change in water pressure.
Bar screen	Metal bars with a mechanical rake at the inlet of wastewater treatment plants and pumping stations that prevent debris in wastewater from reaching and damaging pumps.
Bending weir	A weighted, hinged device affixed to a regulator chamber that stores storm flows under specified hydraulic conditions.
Beneficial Use Determinations	A process led by State DEC to determine appropriate reuse for materials as an alternative to dumping them in a landfill.
Biosolids	Solid organic matter recovered from the sewage treatment process and often used as fertilizer.
Bluebelt	Natural drainage corridors including streams, ponds, and other wetland areas that convey, store, and filter stormwater while preserving open space and wildlife habitats.
Brownfield	Environmentally degraded land that often remains underdeveloped, abandoned, or unused.
Catch basin	A drainage structure designed to capture stormwater and help convey it to storm or combined sewers. Catch basins help control flooding during periods of heavy rain and snow.
City Water Tunnel No. 3	A tunnel that carries water from Hillview Reservoir in Yonkers to Manhattan, the Bronx, Queens, and Brooklyn and will provide critical redundancy to the aging City Water Tunnels Nos. 1 and 2. It is the largest of the three in-city water tunnels and has a maximum diameter of 24 feet.
Clean Air Act	Passed by Congress in 1970 and since amended multiple times, this act authorized the development of comprehensive federal and state regulations to limit emissions from both stationary and mobile sources.
Clean Water Act	Passed by Congress in 1972 and since amended multiple times, this act established the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters.
Combined sewer	A sewer that carries both sanitary wastewater and stormwater runoff.
Combined sewer overflow (CSO)	Excess amounts of sanitary waste and stormwater that flow directly into waterways through permitted relief structures in the collection system. CSOs generally occur during periods of heavy rain.
Denial of Access charge	Additional charges imposed on customers who fail to provide access to DEP personnel attempting to read or repair a water meter.
Dewater	The process of removing water in sludge to reduce its volume to make it less expensive to handle, store, and transport.
Effluent	Partially or completely treated wastewater that flows out of a wastewater treatment process or plant.
Filtration Avoidance Determination (FAD)	A ruling by EPA that exempts New York City from certain filtration requirements in recognition of its superior drinking water quality and aggressive watershed protection program.
Frontage	A flat-rate method of billing customers for water use calculated with a formula that accounts for the front width of the building and the number of water-using fixtures within the building. DEP bills frontage customers annually rather than quarterly.

GIS (geographic information system)	A software system that allows an individual to visualize, manipulate, analyze, and display spatial data by linking maps to databases.
Grease trap/interceptor	A plumbing device that prevents fats, oils, and greases from entering and clogging sewer lines.
Green infrastructure	Green infrastructure, or source controls, is a set of techniques that detain or retain stormwater runoff through capture and controlled release, infiltration into the ground, vegetative uptake, and evapotranspiration, thereby reducing the need for end-of-pipe stormwater storage and treatment systems. Green infrastructure installations include green and blue roofs, rain barrels, street-side infiltration swales, and enhanced tree pits and are noted for their co-benefits, including improved air quality, wildlife habitat, neighborhood beautification, and increased adjacent property values.
Green roof	A vegetative layer that grows in a specially designed soil that sits on top of a drainage layer on a building's roof.
Grey infrastructure	Traditional infrastructure installations such as sewers and holding tanks.
Grit	Heavy inorganic material present in wastewater, such as sand, gravel, and cinders.
Hydrofracking (hydraulic fracturing)	A process that uses high-pressure water and proprietary chemicals to release natural gas that is bound to underground shale.
Industrial Pretreatment Program	A program in the wastewater treatment process to control pollutants from the industrial users that may pass through or interfere with wastewater treatment processes or that may contaminate sewage sludge.
Inflatable dam	A balloon-like device installed in an interceptor that expands using compressed air to store storm flows in wastewater treatment plants.
Interceptor sewer	Pipes that range from three to 10 feet in diameter that convey wastewater directly into the city's 14 wastewater treatment plants.
Lien sale	A legal claim against real property for unpaid property taxes, water, sewer, or other property charges. When outstanding amounts have been delinquent for a legally specified period of time, the City is allowed to sell the liens to a private collection agency, which becomes the lienholder. The new lienholder then has the authority to collect the money that was previously owed to the City of New York plus other fees and interest.
Marcellus Shale	A layer of deep sedimentary rock deposited by an ancient river delta extending from Tennessee to the Southern Tier of New York, including the Catskills and the West-of-Hudson portion of New York City's watershed. Marcellus Shale is a source of natural gas.
New York City Water Board	A body responsible for establishing rates and charges and collecting user payments from customers for services provided by the water and wastewater utility systems of the City of New York. The Water Board is comprised of seven members appointed by the Mayor. At least one member must have experience in the science of water resource development and no member may be a member of the New York City Municipal Water Finance Authority. The chair is appointed by the Mayor.
Primary treatment	A wastewater treatment process that uses physical methods, such as screening and settling, to remove most of the organic and inorganic solid material in wastewater.
Pumping station	A facility with pump equipment designed to raise the elevation and energy level of water across the wastewater treatment plant. Water supply pumping stations typically raise water to elevations above the level of the source water supply.
Regulator	During heavy storms, the amount of wastewater entering the sewer system can exceed the rated capacity of a treatment plant. To prevent the plant from being flooded, regulators are installed at specific points within a drainage area to divert excess flow away from the plant.
Safe Drinking Water Act	The main federal law, passed in 1974, that sets standards for drinking water quality. The Safe Drinking Water Act allows the federal government to oversee the states, municipalities, and water utilities that implement these standards.

Sanitary sewer	A sewer that carries domestic wastewater from homes, businesses, schools, and other facilities to wastewater treatment plants.
SCADA Systems	Supervisory Control and Data Acquisition systems allow remote monitoring of wastewater treatment plants and collection systems, valves, pumps, gas pressures, and liquid levels.
Secondary treatment	A wastewater treatment process that uses biological methods to convert dissolved or suspended materials into a form that is more readily separated from wastewater.
Service line	A pipe that brings water from DEP's water mains into private homes and buildings.
Service termination	An enforcement tool that allows DEP to shut off water service to single family homeowners who are delinquent by more than \$500 for a period of six or more months.
Sludge	An accumulation of solid particles primarily produced by the growth of microorganisms in aeration tanks at wastewater treatment plants.
Storm sewer	Sewers that are specially designated to convey stormwater.
Stormwater	Water from rain and melting snow that is conveyed over impervious surfaces such as rooftops, streets, and sidewalks.
Telemetry	Technology that allows for the remote, automatic data collection and transmission from sites such as pumping stations and wastewater treatment plants.
Throttling gate	A device inside a sewer line that closes to allow the sewer line to store wastewater. Throttling gates decrease CSOs by holding wastewater until the wastewater treatment plant has the capacity to process the flow.
Tide gate	A gate that prevents seawater from entering the sewer system at high tide. This preserves the capacity of sewers near outfalls.
Trunk main	Large diameter water mains that serve as a primary transmission line within a water distribution system. Trunk mains are the largest element of our street distribution system and are typically greater than 20 inches in diameter.
Turbidity	A measurement of cloudiness in a normally clear liquid due to the suspension of solid particles.
Ultraviolet disinfection facility	A disinfection facility that uses ultraviolet light to kill microorganisms that may naturally occur in drinking water.
Valve	A device designed to control or regulate water flow within a distribution system.
Wastewater	A combination of stormwater and sanitary waste that flows through the sewer system.
Watershed Memorandum of Agreement	A 1997 agreement between the City; the state; EPA; watershed counties, towns, and villages; and environmental and public interest groups to implement the Watershed Protection Plan required by NYC's Filtration Avoidance Determination. The Watershed Protection Plan includes economic development programs, upgrades to wastewater treatment plants, the Land Acquisition Program, and other activities designed to protect the watershed.
Wireless meter reading/AMR	A system of small, low-power radio transmitters connected to individual water meters that send daily readings to a network of rooftop receivers throughout the city.
Yellow grease	Used cooking oil that can be collected and recycled.

DEP Commissioners

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Francis X. McArdle

1982 — 1986

Joseph T. McGough

1986 — 1989

Harvey W. Schultz

1990 — 1994

Albert F. Appleton

1994 — 1996

Marilyn Gelber

1996 — 2002

Joel A. Miele

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