Environmental Protection
Michael R. Bloomberg, Mayor
Cas Holloway, Commissioner

WEEKLY
PIPELINE

January 4, 2011
Volume II • Issue 53

Digesting the Wastewater Treatment Process

At DEP we are proud of our ability to provide nine million New Yorkers with one billion gallons of water a day and our ability to treat even more than that—an average of 1.3 billion gallons a day of wastewater from domestic and industrial use and storm runoff. Untreated wastewater can endanger public health, degrade the city's surrounding waters, and cause unpleasant sights and smells. However, New York Harbor is the cleanest it has been since the Metropolitan Sewerage Commission, DEP's predecessor, began testing harbor conditions more than 100 years ago, and with the progress of upgrades at Newtown Creek, all 14 of our in-city wastewater treatment plants now meet secondary treatment standards mandated by EPA. This has happened because of a multi-step treatment process that keeps our waterways clean.

The treatment process includes physical, chemical, and biological processes that remove at least 85% of pollutants and disease-causing pathogens from wastewater. The first step of the process is preliminary treatment, where a series of grates called bar screens remove solid objects—such as rags and pieces of wood that wash down storm sewers—from wastewater. Giant pumps then raise the wastewater to a series of settling tanks for primary treatment, another physical process in

(Continued on reverse side)

Spotlight on Safety

Safe Driving

Did you know that accidents involving injuries to DEP employees while driving on DEP related business are down by 63% from 2009? This is great news and a testament to increasing awareness by DEP employees and the effectiveness of DEP's defensive driving courses. Keep up the great work!

Safe driving does not just happen by luck; it happens by keeping personal and public safety foremost in our minds when we get behind the wheel. Reckless driving while on City business, is not only a recipe for an accident, it reflects poorly on DEP as a whole and may result in disciplinary action. Reckless driving is not only linked to being overly aggressive, going too fast or just being careless. Its root cause is just as likely to be related to what may seem like more mundane omissions (e.g. not signaling, not coming to a full stop, etc.) and can appropriately be remedied by driving defensively. This means YOU should:

- Drive attentively
- Communicate your intentions
- Watch your distance
- Adapt to road conditions
- Keep your vehicle well maintained and perform daily visual inspections
- Use your seat belts and ensure that all safety equipment is in good working order
- Avoid distractions; and
- Stay Alert!

For more information, please see Defensive Driving Tips.

At DEP, everyone is responsible for safety. If you or anyone on your team is concerned about your working conditions, it's okay to ask your supervisor or your bureau's EHS liaison how they can help. If you've still got questions, you can call the EHS Employee Concerns Hotline. It's DEP's responsibility to acknowledge and fix unsafe situations, procedures, and practices. With your help, we'll not only get the job done, we'll make it safer for ourselves, our coworkers, our families, and our city.

CALL (800) 897-9677 OR SEND A MESSAGE THROUGH PIPELINE. HELP IS ON THE WAY.

Commissioner's Corner

Happy New Year and welcome to Volume 2 of the Weekly Pipeline. I'd like to start by thanking everyone who assisted with the citywide snow clean-up efforts last week, in addition to making sure that DEP continued to supply, distribute, and treat the water that nine million New Yorkers use every day. And that includes holidays.

On December 31, I kicked off the New Year's weekend by visiting employees responsible for operating the water system so that everyone else could enjoy a day off. My first stop was upstate in Westchester at Shaft 18 of the Delaware Aqueduct on the Kensico Reservoir. Kensico Regional Manager **Ralph Marchitelli** and the on-duty team—**Anthony Frisenda, Adam Firstencel, Ed Melendez, Dan Massi, Joseph Young** and **Kevin Svoboda**—gave me a tour of the facility, where we add chlorine for disinfection. I also visited the fluoride building, where I met **Tom Mintern,** who explained the fluoridation process, and the New York City Health Code standards that were put in place to improve long-term dental hygiene. After Shaft 18, I travelled to the Bronx to see one of our BWSO crews in action. On the corner of 135th Street and the Bruckner Expressway Service Road, District Supervisor **Kieran Quigley,** Supervisor **Steve Popich, Frank Rubolino, Richard Segarra** and **Rene Torres** were repairing a manhole cover that had been recently damaged during the snow storm clean-up. The work included excavating the area to install new gravel and cement in order to set the new cover. After the Bronx it was on to the Rockaway and Coney Island wastewater treatment plants. In Rockaway, I met with Stationary Engineer Electric **James Farrell** and his team. This plant has been operating since 1952 and serves the entire Rockaway peninsula. At the Coney Island plant, which dates back to the 1930s and serves roughly 600,000 South Brooklyn residents, I met Stationary Engineer Electric **David Bartik** and the entire on-duty crew, who described the plant's efforts to reduce the use of diesel oil by increasing the beneficial use of digester gas as fuel.

I'm sorry I couldn't see everyone who had to work on the New Year's holiday, but I'll continue site visits in 2011, and hope to see as many of you as possible. As I said in the first Weekly Pipeline edition last year, we want to hear from you. We've gotten great feedback and questions in 2010 (one of my favorites explained the many different manhole covers that are part of the water and sewer system), and I hope it will continue in 2011 and beyond (askcas@dep.nyc.gov). We've got an ambitious agenda in 2011 that I'll say more about next week—and everyone at DEP has an important part to play if we're going to succeed. Keep up the great work!

Focus on the Field

Process Control Engineer **Moein Karim's** job proves how the many parts of our treatment plants' ecosystems can each have a huge effect on New York Harbor. A self-described "troubleshooter" at the Newtown Creek Wastewater Treatment Plant, Moein monitors each unit operation to figure out if any part of the treatment processes aren't working up to full efficiency, and if not, how to fix the problem. Thorough wastewater treatment is vital in keeping our surrounding waters clean and protecting public health. Moein uses a variety of methods to monitor plant operations: he visually inspects wastewater as it travels through the plant, examines the activated sludge under a microscope, and reviews lab data. Moein says, "You want to maintain a certain concentrations of sludge to keep the effluent clean," and since the activated sludge process relies on live organisms to treat wastewater to certain predefined standards, plant operators continually make adjustments to meet DEP's goals. And though Moein's primary responsibility is to ensure high levels of treatment, he must do so in the most cost-effective way, by minimizing energy and chemical usage to contain costs.

Although Moein has worked at Newtown Creek for more than seven years, he admits that he didn't know much about wastewater treatment before his introduction to DEP as a summer intern. Since then he earned his bachelor's degree in civil engineering and a master's degree in environmental engineering, and he has had the chance to put his skills to use during the upgrades to Newtown Creek. Moein says, "It was an interesting challenge to figure out where to put the pumps, how to learn the new computer systems, use real-time information, and solve issues faster. This kind of opportunity doesn't happen all the time."

In his free time Moein enjoys playing with his four children. Like his job, it definitely "keeps him busy."

Kudos Corner

Captain **Robert Wisker,** Chief **Peter Fusco, Christina Chan,** Deputy Commissioner **Kevin McBride** and members of the Hillview Precinct, including Officer **Ian Beecher,** Officer **Jose Salas,** Officer **Jason Rossi,** Sergeant **Joseph Andreani** (who dressed up for the children), Lieutenant **Mike Reda,** Officer **Allen Walker,** Sergeant **Max Lambert,** and **Christine Dresser** (who coordinated the visit) delivered toys on December 17 to children at the Maria Fareri Children's Hospital in Westchester.

Also, last week's snowstorm cancelled a number of planned blood drives throughout the city, causing a critical shortage in the city's blood supply. DEP, under the direction of Director of Employee Benefits **Arlene Siegel-Fishman** and Supervisor of Workers' Compensation **Malini Strickland,** organized an emergency blood drive yesterday, and DEP employees donated 51 pints of blood.

Ask Cas

askcas@dep.nyc.gov

Q. We all know that rain can cause a combined sewer overflow, but what about snow? When there is a heavy accumulation, like we just had recently, does the melting snow overwhelm our system?

A. While it's not impossible, snowmelt typically doesn't create enough runoff to cause a CSO. That is because the rate at which snow melts is much slower than the rainfall provided by a significant storm. In locations where the Department of Sanitation (DSNY) does snow melting operations, DEP evaluates whether the local regulator chamber can handle the flow. Last week, DSNY did snow melting throughout the city in places such as Lower Manhattan and Coney Island. Read a NY Times article about it here.

Did You Know

…that naturally-occurring microorganisms are used in the wastewater treatment process? Different species of microorganisms are cultivated during treatment to process the organic waste in raw sewage. Microbes such as *Amoeboids, Flagellates,* and *Ciliates* are the predominant microbes and since they require air to live are called aerobic. Anaerobic microbes, such as *methanotrophs* thrive in oxygen-free spaces like the egg-shaped digesters at Newtown Creek.

(Digesting the Wastewater Treatment Process… continued)

which the flow is reduced from a speed of two feet per second to roughly one foot per minute to allow heavy waste to settle to the bottom and lighter waste to rise to the top. Slow-moving bars skim the waste from the top and bottom.

Suspended material that neither sinks nor floats moves to another series of tanks for secondary treatment, or the activated sludge process. Much like bacteria breaks down food during digestion in a human body, in this process good bacteria consume the waste in an oxygen-rich environment. The bacteria become heavier, settle to the bottom of another battery of tanks, and are then removed. Finally, the remaining flow is disinfected with sodium hypochlorite—a stronger version of household bleach—before we release it into receiving waters.

Each step of wastewater treatment removes pollutants and impurities that we cannot release into surrounding waters; DEP has a parallel process to manage this waste, which is called sewage sludge. Primary sludge removed during primary treatment is de-gritted with a cyclone to remove stones and debris small enough to pass through the bar screens. The remaining sludge from primary and secondary treatment is thickened through the force of gravity so that the remaining processing is as efficient as possible; any water that thickening removes returns to the entrance of the plant and restarts the entire process.

The next step is digestion, where the thickened sludge is subject to bacteria in a warm, oxygen-depleted environment to render the organic matter more stable and less hazardous to the environment and public health. South Area Engineer for Wastewater Process Control **Hayman Lochan** says, "Anaerobic digestion operation is an integral part of wastewater treatment that breaks down as much as 65% of the organic content that our plants receive." Another product of digestion is methane gas that DEP uses to generate power and heat for the treatment plants. Finally, the digested sludge is dewatered to further reduce volume; since not all plants can dewater sludge onsite, DEP maintains a fleet of three sludge boats to move sludge inexpensively from the plants without this capability to those with. Some digested sludge is also transported by pipeline. DEP recently issued a Request for Expression of Interest for new ways to use this material, including as fertilizer and a source of energy.

Milestones

Congratulations to **Isam Osman,** OEHS, and his wife **Hadeel** on the birth of their son **Omer,** on December 26, 2010. Both baby and mom are doing well.

We welcome your feedback! To submit an announcement or suggestion, please email us at: newsletter@dep.nyc.gov.