

Testimony of James Roberts, P.E.
Deputy Commissioner, New York City Department of Environmental Protection
before the
New York City Council Committee on Economic Development, the Committee on
Consumer Affairs and the Committee on Environmental Protection
concerning
Oversight - Assessing the Economic Impact of New York's Failing Infrastructure
Hearing 1: Gas, Steam and Water

Wednesday, June 18, 2014
Council Chambers, City Hall, 10 a.m.

Good afternoon Chairpersons Garodnick, Espinal, Richards and Members. I am James Roberts, Deputy Commissioner of the Bureau of Water and Sewer Operations (BWSO) in the New York City Department of Environmental Protection (DEP). I am joined today by James Garin, Director of Engineering in BWSO, Joseph Murin, Assistant Commissioner for Budget, and other DEP staff. Thank you for the opportunity to testify on the de Blasio Administration's efforts to address improving New York City's underground infrastructure.

One of the most important challenges we face is managing the nearly 15,000 miles of water and sewer infrastructure that is very much the lifeblood of the City. Like many older cities our infrastructure is aging; there is no secret about that. But what sets New York City apart has been our standing commitment to making the necessary investments to continue to improve and rebuild that infrastructure. Keeping this commitment has at times been difficult. We understood the challenge of escalating water and sewer charges during some difficult economic times. But we also understood that investments in critical infrastructure are essential. This year, with the support of Mayor de Blasio, we were able to deliver the lowest water and sewer rate increase in nine years, while increasing our spending on water and sewer projects. And, through the support of the Mayor in returning part of the rental payment, we will be spending an additional \$100 million per year on a program designed to accelerate replacement of the some of the oldest assets we have in the ground. I will say more about this program shortly.

In the past decade we have invested almost \$3.5 billion dollars in our water and sewer infrastructure, which is in addition to \$4.7 billion on City Water Tunnel No. 3 since construction began in the '70s. This past fall we activated stage II of Tunnel No. 3 in lower Manhattan and for the first time in my nearly 30-year career, we have reached the point where we are not completely dependent on City Tunnel No.1, which we put into service nearly a century ago in 1917. During the past decade we also invested \$3 billion on our new Croton Drinking Water Filtration Plant, the first of its kind in the City's history, and \$1.6 billion on our state-of-the-art Catskill / Delaware Ultraviolet Light Disinfection Facility, ensuring the quality and public health of the 8.5 million city residents (approximately 9 million New Yorkers) who enjoy the best water in the nation. We have invested \$5 billion, an extraordinary amount, in our Newtown Creek Wastewater Treatment Plant. Investments like this account for harbor water quality being the best it has been in a century.

While many of these major investments were mandated, thereby putting uncomfortable pressure on our water rates, we were also able to make critical investments in pieces of the system that are not as obvious to everyday New Yorkers. Projects like a new \$225 million Staten Island Siphon, to ensure drinking water supply to the borough, and the rehabilitation of the Gilboa Dam at the farthest reach of the watershed are examples of our commitment to keeping the system sound and reliable. We have budgeted \$262 million for the reconstruction of dams in our three watersheds and \$40 million for pressurization of a two-and-one-half mile segment of the Catskill Aqueduct, which will increase the volume of water available to the city and re-establish DEP's ability to bypass the Kensico Reservoir when necessary to access the highest quality water.

At the same time, our commitment to continued improvement of our in-city infrastructure has never wavered. Since 2002, we have constructed or reconstructed over 500 miles of sewer and 510 miles of water mains. We have constructed 61 out of 127 best-management-practice treatments of the Staten Island Blue Belt program for stormwater management; they will serve as part of the stormwater management system for one-third of the Staten Island. For example, from FY '02 -'13, DEP spent \$438 million on sewers and \$210 million on water mains in Southeast Queens alone. Going forward, DEP has \$582 million in the Four Year Plan (FY14-17) for Queens of which \$283.8 million is budgeted for Southeast Queens, including \$194.8 million for sewers and \$89 million for water mains.

Also in Queens, work on two shaft sites connected with the Brooklyn/Queens section (Stage II) of City Water Tunnel No. 3 is budgeted for \$43 million. We project \$143 million to evaluate, assess, and restore groundwater wells in Southeast Queens for the purpose of providing additional water during the Rondout bypass construction, and during any drought or other instances in which the City's surface water supplies are not adequate.

In Staten Island, the Executive Budget projects a total of \$492 million, of which \$321 million is for much needed sewers and \$182 million for the Blue Belt program. The Snug Harbor Blue Belt project is budgeted for \$23.9 million. Repairs to the Oakwood Beach Wastewater Treatment Plant and to the Hannah Street pumping station are projected to cost \$79.6 million.

In the Bronx, the Executive Budget projects \$533 million of capital spending from FY15-18. Approximately \$143 million is budgeted for the Hunts Point Wastewater Treatment Plant, including \$50 million for new centrifuges and \$91 million for new digesters. To reduce combined sewer overflows into Pugsley Creek and the Long Island Sound, DEP has budgeted \$72 million in FY 2015 for construction of a parallel sewer that will help divert flow away from the Creek. And for sewers we have \$84 million and water mains, \$93 million.

In Manhattan, the Executive Budget allocates \$720 million between FY15 and FY18. The largest single project is the \$175 million cogeneration project at the North River Wastewater Treatment Plant. The cogeneration project will replace existing equipment for recycling digester gas with a more efficient system that will allow more of the plant's energy needs to be generated by the plant itself, thereby reducing energy costs and air emissions. Another \$270 million is for several projects at the Wards Island Wastewater Treatment Plant: reconstruction of final tanks; reconstruction of the boiler complex; and installation of new dewatering centrifuges. In addition to the funds budgeted for City Water Tunnel No. 3, \$116 million will fund the construction of

water mains connecting two of the City Water Tunnel No. 3 shafts with the local water distribution system. Sewers are budgeted for \$35 million and water mains, \$162 million.

In Brooklyn, the Executive Budget includes \$860 million of planned commitments. The 26th Ward Wastewater Treatment Plant and associated sewer work to reduce CSOs into Fresh Creek account for \$282 million. An additional \$102 million is projected in FY15-18 for Coney Island sewers. Sewers overall in Brooklyn are budgeted for \$259 million and water mains are at \$118 million.

Over the past six years we have also improved our maintenance and repair programs significantly, driving our water main breaks to record lows and decreasing sewer back-up and flooding issues across the city. There is admittedly much work to be done, but I believe it is important to highlight that, for example, our water main break rate per 100 miles has been between 5-7, while accepted benchmarks across the nation are in the 22-25 range. We have reduced our catch basin repair backlog to less than 500 on a total of almost 150,000 basins and our critical hydrant repair numbers have been reduced from what had been 17 days to 3, on a basis of nearly 110,000 hydrants.

So, the news is not all bad. In fact some of it is very promising. At the direction of Mayor de Blasio and Deputy Mayor Shorris, an underground infrastructure working group, comprising key City agencies and private utility partners, was established and tasked with improving emergency response, coordination of underground construction, and accelerating the pace of improvements.

DEP is currently working on a pilot program to partner with the private gas utilities, Con Edison and National Grid, to identify potential areas of mutual need and concern. By sharing data on maintenance history and planned replacements we believe we can seize upon the natural nexus between the age of each system and the neighborhoods they lie in, and accelerate replacement of the older infrastructure in our systems, most of which is cast iron. DEP is currently working with both utilities to map areas of potential opportunity and we hope to begin actual construction on one or more locations by the end of the summer.

We believe that, in addition to the synergy of replacing the older infrastructure, there will be opportunity for efficiencies with street opening and repair as well. The Department of Design and Construction (DDC) already performs coordination on major capital projects it executes for both DEP and the Department of Transportation, but we intend to create a focused population of locations to be administered for the purpose of this accelerated program of \$100 million per year of additional spending. Finally, we have asked DDC to look at all our current projects for opportunities to include any older cast-iron facilities that may not have been included in the original project with an eye toward reducing the inventory of cast-iron water mains more rapidly than we have planned.

That completes my prepared statement. Thank you for the opportunity to present testimony. I look forward to answering any questions you may have.



**STATEMENT OF ROBERT A DeMARINIS TO THE
NEW YORK CITY COUNCIL
COMMITTEE ON ECONOMIC DEVELOPMENT
COMMITTEE ON CONSUMER AFFAIRS AND
THE COMMITTEE ON ENVIRONMENTAL PROTECTION**

Council Chambers – City Hall

June 18, 2014

Members of the City Council, distinguished colleagues from the utility industry, local elected representatives and others in attendance, I want to thank you for the opportunity to appear today to discuss the state of New York City's utility infrastructure.

My name is Robert DeMarinis. I am Vice President of Gas Operations for National Grid's New York gas business. I have worked for National Grid and its predecessor companies for 33 years in various positions in power generation, electric and gas operations.

In New York, National Grid owns and operates three gas distribution utilities that provide services to approximately 2.4 million customers in Upstate New York, Long Island and New York City – specifically Brooklyn, Staten Island and parts of Queens. These utilities operate more than 21,000 miles of gas transmission and distribution pipelines throughout the state, including 4,100 miles of main in New York City. We have approximately 2,000 highly skilled, dedicated National Grid employees working in the City, including a compliment of experienced field personnel.

National Grid's number one priority is the safety of the public, our customers and our employees. To that end, we are committed to the safe and reliable operation of our natural gas facilities – and we deliver on that commitment by prudently investing in our gas infrastructure. Over the past few years, National Grid has:

- Invested more than \$2.2 billion on gas infrastructure in New York from 2009 to 2013.
- Developed the Brooklyn/Queens Interconnect Project that will provide a new pipeline supply delivery point into New York City to address existing pipeline delivery system constraints. Once completed, this project will enhance the reliability of National Grid's distribution system throughout our service territory and permit National Grid to further diversify its supply sources and secure greater quantities of economical gas supplies. The BQI project is the first new gas supply delivery point in 50 years and will ensure clean, reliable energy in NYC for years to come.
- Converted nearly 15,000 customers per year from oil to natural gas in New York. As part of this effort, we supported the conversion of multifamily buildings from oil to clean, economic natural gas - averaging well over 1,000 such conversions per year in New York City alone.

- Partnered with the New York City Clean Heat Initiative to accelerate the phase-out of heavy oils in 750 buildings in National Grid's territory. Since the Clean Heat Program was launched in late 2011, National Grid has converted approximately 425 4/6 oil buildings to natural gas - with an additional 128 buildings in progress.
- In addition, National Grid's capital investment program has included "storm hardening" projects to strengthen the resilience of the gas system following Superstorm Sandy, including significant system upgrades in the hardest hit areas of the Rockaway Peninsula and Staten Island.

Our gas infrastructure was put to the test this past winter when the gas system was called on to deliver unprecedented volumes of gas to millions of customers during record-breaking cold spells, surpassing previous throughput records in New York City and Long Island without a single interruption to our firm customers.

National Grid's gas business faces the challenge of improving the integrity of a system that is among the oldest in the US, while simultaneously fulfilling the growing demands of new customers. We will meet this challenge through prudent, cost-effective investments in our gas system. Over the next two years, National Grid will invest more than \$1 billion in gas infrastructure projects in New York. These investments will be focused on:

- Significant reliability investments in upstream gas infrastructure that will allow for load growth to meet increasing demand, including the Flushing Meadow reinforcement project, Verrazano Narrows transmission upgrade, and Metropolitan Reliability Project that will increase access to gas supplies to meet growing demand in New York.
- The Northern Queens Transmission and Distribution Project – a \$111 million project to install over six miles of 20-inch transmission main, 20,000 feet of distribution main and other upgrades – that will increase capacity and reliability in a constrained area of the system; and
- Installing and upgrading mains and other facilities to accommodate the increasing number of prospective customers requesting oil-to-gas conversions, including investments to support the conversion of No. 4 and 6 oil customers.

Together with our regulators, elected officials and other stakeholders, National Grid is working to enhance the safety and reliability of New York's gas infrastructure to serve our customers now and in the future.

I'd like to address a few specific initiatives that are critical to our long-term goal of modernizing New York's gas infrastructure:

Accelerate Main Replacement

Gas utilities will need to make increasing levels of investment in their gas systems. For our part, National Grid will be focused on:

- Replacing old and leak-prone mains and services to enhance the safety and integrity of our gas distribution system;
- Installing and upgrading mains and other facilities to accommodate the increasing number of prospective customers requesting oil-to-gas conversions; and
- Investing in upstream gas infrastructure that will allow for significant load growth to meet increasing demand.

Accelerating the rate of main replacements is the best long-term approach to reducing leaks on the gas system and enhancing overall safe operations. Over time, accelerated main replacement will significantly reduce leak rates. However, these infrastructure improvements will come at a significant cost. The challenge for us is balancing the need to invest in our gas system while, at the same time, maintaining stable gas rates for our customers. Therefore, natural gas utilities and regulators should work cooperatively to develop mechanisms to fund accelerated main replacement.

Gas Growth Investments

Expanding gas service in New York can bring significant economic benefits in the form of energy cost savings, job creation and increased local tax revenues, as well as environmental benefits resulting from lower emissions. However, in order to serve new customers and realize the benefits of gas expansion, National Grid must make significant capital investments in the mains, services and system reinforcements that are required to connect these customers. In collaboration with our regulators and other stakeholders, National Grid is constantly considering new and innovative approaches to deploying capital cost-effectively to meet the growing demands of our customers.

Increased Use of Technology

The gas industry is focused on bringing new technology, methods and systems to our day-to-day work that will improve safety, reliability and efficiency. At National Grid, our investments in technology include:

- Developing an Integrated Leak Management System that will help the company monitor and address system leaks;
- Leveraging new pipeline inspection technologies, including self-propelled robotic crawlers, that allow for additional in-line inspections of pipeline segments with tight-radius bends and other features that had previously precluded such inspections;
- Deploying state-of-the-art combustible gas indicators, pipeline lining solutions and main inspection technology; and
- Increasing use of “low dig” technologies, such as horizontal directional drilling and keyhole mini-drill rigs that will allow us to work more efficiently and safely.

Over the next few years, we expect to see the continued development of cost-effective gas safety technologies that will further enhance our performance. National Grid will

look to be a leader in supporting technology that promotes safe and efficient gas operations.

Utility Industry Workforce

As I mentioned earlier, we currently have some of the best utility workers in the business, but National Grid, and the broader utility industry, is facing a challenge in the aging demographic of its workforce. In the coming years, many of our most experienced and skilled utility professionals will be eligible for a well-earned retirement. Therefore, as part of our ongoing investment, we are committed to attracting and retaining the next generation of utility workforce to support our business and help us operate and maintain our gas infrastructure – now and in the future. We are partnering with vocational schools, community colleges and veteran associations to feed a “pipeline” to jobs in the gas industry to all the work that needs to be done to support a safe and reliable gas system. We have enjoyed a strong partnership with the unions representing our workforce and our elected members in this area of natural common interest and we very much look forward to making even more progress on these issues of great concern to our common constituents.

Summary

National Grid welcomes the opportunity to work with the City Council, our regulators, gas utilities and other stakeholders to develop a strategy to enhance the safety and reliability of New York’s gas infrastructure - and as one of the largest natural gas utilities in New York and the country, National Grid is committed to taking a leadership position in the industry on this issue. Thank you for this opportunity to address the Committees.



FOR THE RECORD

**Statement of Ya-Ting Liu
Director, NYC Sustainability Program
New York League of Conservation Voters
Joint Committee Hearing: Environmental Protection, Economic
Development and Consumer Affairs**

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June 18, 2014

Good morning. My name is Ya-Ting Liu, and I am Director of the New York City Sustainability Program at the New York League of Conservation Voters (NYLCV). NYLCV represents over 25,000 members in New York City and we are committed to advancing a sustainability agenda that will make our people, our neighborhoods, and our economy healthier and more resilient.

NYLCV would like to thank Chair Richards, Garodnick and Espinal and members of the respective committees for holding this important hearing on the city's aging infrastructure, a problem made worse by our changing climate. Extreme weather events are the new normal and the city's infrastructure is crumbling, threatening our economy and quality of life.

We applaud the Center for an Urban Future's (CUF) comprehensive and sobering report on the city's mounting capital needs and shedding light on the huge gaps in funding to get our city to state of good repair. The FY15-18 capital plan totals \$34.7 billion for the construction and rehabilitation of the City's infrastructure which will provide funding targeted to building and improving schools, maintaining the drinking water system, improving transportation and providing affordable housing. However, as the Center for an Urban Future report notes this is not enough. In fact, the City's state-of-good-repair funding gap will reach \$34.2 billion over the next five years.

Of all the worthy recommendations in C.U.F.'s report, NYLCV asks the council to pay special attention to three of the most critical:

1. Find the Money – We cannot rely on federal and state support to meet the funding gaps. We need leadership from our city's elected officials to educate the public on these issues, explore and identify new dedicated revenue sources to pay for these critical projects.

2. Prioritize & Prepare – With at least \$34.2 billion in unfunded infrastructure needs, we have to be able to prioritize which projects can wait, which can't. Let's also plan for a changing future. Incorporate sustainability and resiliency into the capital program to ensure our infrastructure is environmentally and structurally sound.

3. Meet Multiple Goals – When agencies develop their capital plans, they don't necessarily consider the broader economic development goals or sustainability goals of the city. The city should link infrastructure projects with economic and environmental outcomes.

We look forward to working with members of the City Council and Mayor de Blasio to make sure New York City maintains its competitiveness and livability.

New York City's Natural Gas Infrastructure
NYC Hearing Assessing the Economic Impact of
New York's Failing Infrastructure
June 18, 2014

My name is Rebecca Smith and I live in Manhattan. I am speaking out of my concern for climate change and the contribution our city's leaking gas pipelines may be making toward heating the planet.

Natural gas is over 90% methane. The 2013 IPCC report (**Footnote 1**) has methane as 86 times as potent a greenhouse gas as carbon dioxide. This colorless, odorless gas is lighter than air and has enormous potential for leakage throughout the entire natural gas system – production, transmission, distribution and utilization. Our citywide pipeline infrastructure is the site of distribution and our homes and businesses are the sites of utilization. NOAA reported that methane levels have been climbing since 2009 and cites natural gas as a prime cause (**Footnote 2**).

Aging urban infrastructures are subject to leaks: how much does our gas system leak and what effect does it have on warming the planet?

Unfortunately we do not have the accurate information we need to answer that question. ConEd's numbers for fugitive methane emissions represent an old fashioned "back of the envelope" estimate -- estimates based on estimates (**Footnote 3**). Government needs to require accurate reporting which can be obtained by using the highly sensitive, accurate technology now available.

What if you take ConEd's own numbers for fugitive methane emissions and calculate how much global warming potential they produce? ConEd states that in 2013 their lost-and-unaccounted-for (LAUF) gas was 2.8% (**Footnote 4**) in NYC. Since Con Ed delivered 300 billion cubic feet per year in total, and Manhattan usage represents 30% of total gas usage, 90 billion cubic feet of gas were delivered to Manhattan. Therefore 2013 lost emissions amount to about 2.5 billion cubic feet per year. Using the equivalency calculator on the EPA website (**Footnote 5**), these emissions are equivalent to 1, 425,000 metric tons of carbon dioxide -- or the annual GHG emissions from 300,000 cars.

Distribution is only part of the natural gas life cycle. The DOE National Energy Technology Laboratory has estimated the gas lost in production and transmission (big, cross-country pipelines) at 1.8% (**Footnote 6**), which brings the total emissions for gas transmission and distribution combined -- based on government and industry estimates -- to 4.6%, or about 4 billion cubic feet (or 480,000 cars per year) -- just to service the energy needs for Manhattan. That's a big energy footprint for **MANHATTAN ONLY** coming from natural gas -- the so-called "greener bridge fuel". In fact, it is by even the most conservative estimate 1 and 1/2 times higher than the leak rate (**Footnote 7**) at which use of gas causes more GHG pollution than use of coal.

An independent environmental organization, Damascus Citizens for Sustainability, commissioned Gas Safety Inc. to make a preliminary investigation of methane emissions in the Borough of Manhattan in 2012.

This study -- now awaiting peer review -- indicates that the amount of methane coming out of Manhattan is significantly greater than ConEd estimates. This is information that no one has collected before, using actual, measured data -- that raises issues that badly need addressing. It is essential that the Council carefully consider the ground-breaking information contained in this report before it makes any decisions regarding infrastructure and emissions.

GSI surveyed 160 miles of selected Manhattan streets over 5 days using a leak surveyor installed in an automobile. Highly sensitive, extremely accurate equipment was utilized: a cavity ring-down spectrometer combined with a GPS system and computer control system -- generating over 700,000 data points.

DCS measured methane leaks in NYC using GasSafety,Inc, who also measured methane leaks in several other cities. The team produced several peer reviewed papers. Leaks can be viewed as emissions that, when released to the air, accumulate to produce global climate change impacts; and, if contained, can result in deadly explosions. With more gas, more gas infrastructure, more gas pressure in the infrastructure -- more explosions will occur.

REBECCA SMITH

There are many things causing global warming on this planet. Are we going to allow NYC's infrastructure to be one of them?

Footnotes

1 2013 Intergovernmental Paper on Climate Change

http://www.enn.com/press_releases/4210 , press release, third paragraph

2 National Oceanic & Atmospheric Administration

www.esrl.noaa.gov (methane chart showing rising levels)

www.noaa.gov/features/02_monitoring/methane.html /gmd/aggi/

(article citing role of natural gas and methane)

3 2013 Con Edison Annual Report

4 NYS Dept. of Public Service, Staff White Paper on Lost And Unaccounted For (LAUF) Gas, issued January 27, 2012

5 www.epa.gov/cleanenergy/energy-resources/calculator.html

6 Hughes, David H. Lifecycle Greenhouse Gas Emissions: From Shale Gas Compared to Coal. 2011

www.damascuscitizensforsustainability.org/2011/07/lifecycle-greenhouse-gas-emissions-from-shale-gas-compared-to-coal/

7 Howarth, 2014. A bridge to nowhere: Methane emissions and the greenhouse gas footprint of natural gas. *Energy Science & Engineering*.

www.eeb.cornell.edu/howarth/index.php

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June 18, 2014

New York City Council

Committee on Economic Development

Committee on Consumer Affairs

Committee on Environmental Protection

RE: Oversight: Assessing the Economic Impact of New York's
Failing Infrastructure Hearing 1: Gas, Steam and Water.

Gas Safety Inc. Background

Gas Safety inc. (GSI) is a Massachusetts based company that specializes in fugitive methane detection. GSI utilizes 30 years of natural gas industry experience to detect and quantify methane emitting from any source. GSI collects, compiles and analyzes data and reports on effects of methane leaks or seepages. GSI works with communities protecting trees from leaking natural gas distribution pipelines and trains arborists to detect natural gas leaks that damage vegetation. GSI collaborates with researchers on studies of natural gas distribution systems. The research team has detected thousands of leaks utilizing new Cavity Ringdown Spectrometer (CRDS) technology that detects methane in parts per billion and plots leaks from corresponding GPS coordinates. GSI uses CRDS technology to detect fugitive methane from mining operations and conducts methane baseline analysis of communities or given locations. GSI has developed a methodology to accurately measure methane flux rates from any given area.

Natural Gas Infrastructure of New York City

New York City is serviced by two natural gas operators, Consolidated Edison Co New York and Keyspan Energy Delivery – Ny City known as ConEd and NGRID. ConEd service territory is mainly Manhattan and Westchester County. The numbers cited below according to annual operator reports filed 6/2/2014, the two companies combined have approximately 6000 miles of gas mains consisting of 3000 miles of cast iron, 1700 miles of plastic and 1300 miles of steel material and service lines consisting of 600,000 plastic, 100,000 steel and 150,000 copper service pipelines.

The leak prone pipelines of concern are the thousands of miles of small diameter cast iron mains, bare steel mains, and steel service lines that are still in use today. Operators have 20-30 year replacement plans.

Safety

Third party damage to pipelines remains high at close to 400 incidents reported last year. Adherence to Dig Safe laws requires constant effort and the threat of a low probability high consequence incident remains high despite all of the effort to educate the public. Natural force leaks at 257 reported last year should be of equal concern. Many of these incidents are broken or cracked cast iron mains caused from frost conditions or other earth movements that have low probability high consequence incidents. Small diameter cast iron gas mains pose an inherent risk of cracking due to frost conditions and should be replaced as soon as possible and monitored on a daily basis during any frost conditions. Cast iron bell and spigot joints and other mechanical coupling devices are prone to leakage and contribute to a significant number of known existing leakages. Bare steel natural gas mains and services are susceptible to corrosion leakage and produce far more hazardous leaks than third party damage or natural forces but these corrosion leaks tend to have far less volume and less incident threat and many are more technically hazardous in nature. Replacement of bare steel mains and services remains a priority due to the existing threat of a high consequence incident.

Gas leak awareness and repair of gas leaks are critical to insure the public safety. City residents should constantly be reminded to report gas odors whenever present and the signs of a gas leak from the American Gas Association:

Smell: Because an odorant called mercaptan is added to natural gas by the utility to help you detect its presence, the best sign of a natural gas leak is if you smell something similar to rotten eggs.

Sight: Look for dirt blowing into the air, persistent bubbling in standing water, or discolored or dead vegetation around the pipeline area.

Sound: Listen for any unusual hissing or roaring sound.

Consumers

New York City uses close to 500Bcf of natural gas each year with NGRID about 60% (300 Bcf) and ConEd 40% (200Bcf) with Lost and Unaccounted (LAUF) (2013) for gas rates of 3.4 and 2.8% respectively yielding losses of 10.2Bcf and 5.6Bcf effectively \$75 million in consumer losses due to leakage from thousands of known non hazardous leaks throughout the city and other maintenance etc. annually for the consumers of New York. Citizens also bear the tree care costs from the thousands of city trees damaged by known gas leaks each year throughout the five boroughs. Repair of gas leaks will save consumer dollars.

Environment

According to 2013 Annual reports LUAF for ConEd at 2.8% and NGRID 3.4%, 16Bcf of methane is lost each year that should be included in any GHG inventory for New York City.. Many of these leaks may be small emitters and target of high emitters will significantly reduce loss. Gas leaks causing damage to trees and other vegetation require immediate repair to alleviate the adverse effects of the leaking gas on trees and other vegetation. The affects to humans of breathing leaking gas are not known.

Respectfully Submitted

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New York City Council Committees on Economic Development, Environmental Protection and Consumer Affairs, Joint Hearing on Water, Sewer, Gas, and Steam Infrastructure

June 18, 2014

**Testimony of Jeff Zimmerman, Legal Counsel to
Damascus Citizens for Sustainability, Inc. and NYH2O, Inc.**

Good morning, my testimony today will focus on gas infrastructure issues related to radioactivity in the natural gas distributed by Consolidated Edison and National Grid to consumers in the New York metropolitan area. Due to the time limitations to accommodate as many witnesses as possible, I would request that the record of this hearing be held open for a reasonable period of time to allow additional written material to be submitted for consideration by the committees.

What is radon?

Radon is a radioactive element formed by the radioactive decay of radium, uranium and thorium. At ordinary temperatures and pressures, radon is a gas. It is odorless, colorless and tasteless. It does not burn. It is only produced by radioactive decay and can only be destroyed by radioactive decay. It has an atomic number of 86 and an atomic weight of 222 in its most stable isotopic form, making it the heaviest noble gas.

Where does radon come from?

Radon 222 is created when an atom of radium 226 emits an alpha particle. Radium is found in either igneous or sedimentary deposits in the earth's crust. Sedimentary shale deposits found in many locations around the world contain trapped methane-rich natural gas and both radium and radon. It has been observed that the darker, more organic shale gas deposits, such as the Marcellus shale, contain higher concentrations of radium and radon.

Why should we be concerned about it?

When radon decays it emits high energy alpha particles and produces two longer lived isotopes, lead 210 and polonium 210. Unlike the gaseous radon, the lead and polonium isotopes are solids at ordinary temperatures and readily attach to particulate matter, including respirable particulate matter. When these two isotopes decay in the lungs, the emitted high energy alpha and beta particles can damage DNA and RNA, causing cancerous tissue to grow.

The widely accepted consensus of the medical and scientific community is that ionizing radiation follows the linear no-threshold model, meaning that there is no safe level below which there is no risk of contracting cancer from exposure to ionizing radiation.

What are the recommendations of governmental public health or environmental protection organizations?

The Agency for Toxic Substances and Disease Registry (ATSDR) estimates that there are 21,000 deaths per year due to radon exposure, making radon the number one cause of lung cancer among non-smokers. While the U.S. Environmental Protection Agency agrees that there is no safe level for exposure to ionizing radiation, the agency many years ago recommended implementation of aggressive mitigation measures for radon levels of 4 picocuries per liter or more. More recently, the United Nations' World Health Organization reduced its recommended mitigation level to 100 becquerels per liter. This corresponds to 2.7 picocuries per liter.

How much radon have New Yorkers been exposed to in the past?

Most of the radon exposure of individuals living in an urban environment such as New York City will come from gas-fired appliances such as furnaces, water heaters, clothes dryers, space heaters and kitchen stoves. In single family homes each of these appliances will contribute to the radon concentration collecting in the home. In multi-floor apartment buildings, heating equipment will be centralized and shared by each living unit while the hot air and combustion products will be vented to the outside air. Only the combustion sources such as dryers, space heaters and kitchen stoves will emit radon into the living space in these multi-story buildings.

There are just a smattering of radon levels reported in the scientific literature relevant for New York City. A 1980 U.S. Department of Energy report (Gogolak, et al.) gave a radon level of 1.5 picocuries in the gas distributed in New York and an average of 151 picocuries per liter in the devonian shale at the wellhead in the Marcellus shale area. A 1973 U.S. EPA report (Johnson, et al.) cited a level of 5.0 picocuries for Texas-Louisiana Gulf Coast gas. This was then and has continued until very recently to be the major gas supply source for the New York City area. Distance and rate of travel computations result in a projected radon level of about 1.0 to 1.25 picocuries per liter in New York City for gas starting at 5.0 picocuries at the well head in the Gulf Coast. Radon testing done voluntarily by several hundred residents of the five boroughs of New York City over the last three years confirm that almost all of the residents have ambient radon levels in their homes of 1.0 picocuries per liter or less.

Are exposure levels likely to go up in the future and why?

Some very limited additional data has recently become available from the U.S. Geological Survey (Rowan et al. 2012) that shows wellhead radon levels in three Marcellus shale gas wells of 79 picocuries per liter and a mean across six wells (the original three plus three more from

another part of the Marcellus) of 37 picocuries per liter. While these numbers may not seem to be that large, they are many times the World Health Organization's mitigation action level of 2.7 picocuries per liter

Moreover, because there is such a paucity of data currently available, the prudent and precautionous approach should be to start gathering data as quickly as possible and, in the meantime institute controls designed to keep the public's exposure levels to no more than they have been historically. Sounding perhaps an early warning, it is my understanding that there has been a slight uptick in the radon levels found in the third year of community sampling.

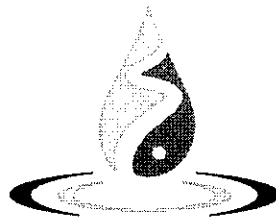
Can we get radon out of natural gas before New Yorkers are exposed to it?

There are at least two ways to remove the radon from the natural gas stream, but it must be remembered that as the radon decays it produces the longer lived isotopes, lead 210 and polonium 210. One way to reduce the radon level is to store it long enough for the radon to decay, but this results in increased amounts of the lead and polonium isotopes. The second way to reduce the radon concentration in the natural gas is to reduce the temperature of the gases until the radon is converted from a gas to a liquid. This occurs at -61 degrees centigrade, approximately 20 degrees after propane in the natural gas has liquefied at - 40 degrees centigrade. While the radon concentration of the natural gas has gone down, the radon concentration of the liquefied propane has gone up.

What are the implications for the New York gas infrastructure of radon and other radioactive elements in the natural gas distributed by the gas utilities?

In response to actions by the City Council and former mayor Bloomberg, the gas utilities are rapidly expanding their infrastructure to deliver far more natural gas to replace fuel oil as an energy source. Over the last three years from program inception, over 2400 buildings have converted to natural gas. Consequently, not only will millions more individuals be exposed to radioactivity in the natural gas distributed, but levels of radioactivity will also begin rising as a greater percentage of this expanded natural gas supply starts coming from the Marcellus shale area. Transit times will be much shorter, resulting in much higher radon levels in the vastly increased amount of natural gas being consumed. Consequently, unless we adopt a mechanism by which the gas utilities can require that the radon levels in the gas they receive to be no greater than they have been in the past, the risk of radon-induced lung cancer will go up, creating new public health issues. The more information the public, the gas distribution companies and the regulatory agencies have, the more likely it is that potential radon exposures can be reduced to the lowest levels reasonably achievable.





RIVERKEEPER.
NY's clean water advocate

Testimony of Sara Lupson, Special Assistant to the President of Riverkeeper

**New York City Council Committee on Economic Development, Committee on
Consumer Affairs, and Committee on Environmental Protection**

**Oversight - Assessing the Economic Impact of New York's Failing Infrastructure
Hearing 1: Gas, Steam and Water.**

June 18, 2014

Good morning and thank you for the opportunity to submit testimony on behalf of Riverkeeper. Riverkeeper is dedicated to defending the Hudson River and its tributaries and protecting the drinking water supply of nine million New York City and Hudson Valley Residents. I joined Riverkeeper in 2012 after completing a Masters in Engineering and Public Policy from the University of Maryland where I studied water and transportation issues. I also hold a Bachelors of Science in Civil Engineering from Lehigh University, and have been increasingly involved with Riverkeeper's green infrastructure initiatives.

From filling our water bottles to flushing our toilets, we rely every day on a vast network of pipes, regulators, pumping stations, treatment plants and reservoirs. Water infrastructure is truly an unsung hero of the city. I do not think I can illustrate it better than the General Manager of DC Water and Sewer Authority George S. Hawkins who is a vocal spokesman for the importance of funding improvements to water infrastructure. He was once challenged with the question how many jobs does DC Water create? He answered succinctly, "All of them." In truth, if you do not have water, the city shuts down and you cannot have jobs. Former Mayor Michael Bloomberg has repeatedly said that one of the small handful of things that could shut New York City down would be the loss of its access to clean water. There should be no doubt that our ability to supply drinking water and treat wastewater is critical to New York City.

And yet, we find ourselves with aging infrastructure and insufficient funds to make the necessary upgrades. In 2008, the New York State Department of Environmental Conservation (DEC) described the crisis of deferred wastewater maintenance as a "gathering storm." Indeed, more than 27 billion gallons of untreated sewage is estimated to enter the New York Harbor alone, each year. DEC puts the price tag at \$36 billion over 20 years to rebuild, replace and upgrade our sewers statewide, 30 percent of which are operating decades past their design life. A

recently released report by the Center For An Urban Future revealed that the average age of NYC water mains is 69 years, with 15% over the age of 100.

An investment in our aging water infrastructure is truly an investment in New York City's future. The American Society of Civil Engineers estimates that without new investments, by 2020 unreliable and insufficient water infrastructure will cost the average American household \$900 a year in higher water rates and lower wages. American businesses can expect an additional \$147 billion in increased costs and the economy will lose 700,000 jobs by 2020. On the other hand, spending on infrastructure is estimated to create 47,500 jobs per billion dollars of federal infrastructure funding spent. As DEC accurately concluded in their 2008 report, "The importance of modern, reliable, and efficient wastewater treatment systems is self-evident. The health of our communities, the protection of our water bodies, and the prospects for future economic growth and development, are linked to our ability to maintain, and as necessary, upgrade these facilities."

Riverkeeper urges New York City to adopt a robust Combined Sewer Overflow (CSO) management plan. Keeping the roughly 27 billion gallons of raw sewage and polluted storm water from entering New York City waterways each year would be a huge benefit to environment and would allow New Yorkers to reconnect with their waterways. We want them to be able to safely utilize the waterways because we know the more New Yorkers enjoy the waterways the more they are willing to fight for them.

We also urge New York City to consider green infrastructure as an important part of this CSO management plan. Green streets, planting trees, and green roofs could all be used to turn stormwater from a waste to a resource while providing other benefits to local communities as well.

We applaud the New York City Department of Environmental Protection's (DEP) initiative to use the Envision Sustainable Infrastructure Rating System as guide when internally vetting projects. Envision provides a holistic framework for evaluating the sustainability of infrastructure projects, seeking to answer not only are we doing the project right, but are we doing the right project? We encourage other New York City agencies to use this framework when evaluating infrastructure projects.

Riverkeeper thanks the New York City Council Committees on Economic Development, Consumer Affairs, and Environmental Protection for the opportunity to participate in today's hearing.

**Testimony by Milovan Blair,
Senior Vice President, Central Operations
Con Edison of New York
June 18, 2014**

Good morning Madam Speaker, Chairman Garodnick, Chairman Richards, Chairman Espinal and members of the Council. I am Milovan Blair, senior vice president of Central Operations for Con Edison of New York. Thank you for the opportunity to speak to you about our Steam operations, safety, and maintenance.

First, I would like to give you a little history of steam in New York City.

The New York Steam Company began providing service in Lower Manhattan on March 3, 1882.

The New York City steam system is a district heating system. Steam is produced by steam generating stations, and pipelines under the streets of Manhattan deliver steam to heat and cool high rise buildings and businesses.

Hospitals, dry cleaners, and other businesses also use the steam for cleaning, climate control, and sterilization.

Con Edison purchased New York Steam in 1936. Today we operate the largest commercial steam system in the United States, larger than the next nine largest steam systems combined. We have approximately 105 miles of mains and service pipes and 3,000 steam manholes.

Steam is generated at five Con Edison plants, four of which are in Manhattan, another in Queens, and also under contract from a steam plant at the Brooklyn Navy Yard.

We provide steam service to more than 1,700 customers including some of New York's most famous addresses such as the United Nations, the Empire State Building, the Metropolitan Museum of Art, Grand Central Terminal, Rockefeller Center, and the Chrysler Building.

Steam is clean and good for the environment and provides advantages over other energy sources. For example, oil furnaces or gas-fired boilers take up valuable space in buildings that rely on them for heating.

Customers who use steam instead of electricity to power their air conditioning systems help us to conserve

about 375 megawatts off our peak summer electric capacity. The steam system also offsets the need for additional electricity, natural gas, and oil infrastructure.

Approximately two-thirds of steam production comes from cogeneration, a very efficient process where the fuel input is used to produce both electricity and steam. Con Edison's newest steam plant, the East River Repowering Project, achieves 85 percent efficiency on average, while a typical new combined-cycle electric plant is only about 55 percent efficient.

The Con Edison steam supply reduces many pollutants, including about 1.6 million tons of carbon dioxide annually, equivalent to taking 270,000 cars off the road each year.

Roughly 23 billion pounds of steam flow through the system every year. At our summer peak, we send out nearly 5 million pounds of steam per hour, compared to our winter peak of 9.2 million pounds per hour.

We have a comprehensive maintenance plan for our equipment. We inspect our steam traps 6 times per year on a cycle of 10 weeks or less. Manholes associated with steam facilities are inspected annually.

We have installed remote monitoring devices throughout our distribution system. This allows us to monitor the functionality of our traps and to detect the intrusion of water in our structures at over 1300 locations.

We have added natural gas capacity to our 59th Street and 74th Street Generating Stations which will reduce emissions.

New Distributed Control Systems were installed at East River and 59th Street Generating Stations to improve reliability and security.

We launched our East River Aquatic Life Preservation Project, to help protect the river's ecosystem and comply with stricter state rules regulating water withdrawals.

As a result, we have significantly reduced the environmental impact of station operations on the East River.

Since Superstorm Sandy, fortifying our energy systems against extreme weather has been a priority. In 2013, we invested \$15.9 million in steam storm hardening work and plan to invest an additional \$145 million for 2014-2016. We are constructing more robust walls, doors and barriers. We have installed additional pumps with

redundant feeds and backup generators. We will raise critical equipment to exceed the latest FEMA flood level by three feet.

Providing safe and reliable steam energy is a responsibility we take very seriously.

**Testimony by Edward Foppiano,
Senior Vice President, Gas Operations**

Con Edison of New York

June 18, 2014

Good morning Madam Speaker, Chairman Garodnick, Chairman Richards, Chairman Espinal, and members of the City Council. I am Edward Foppiano, senior vice president of Gas Operations of Con Edison of New York. Thank you for the opportunity to speak to you today about natural gas safety and maintenance.

All of us at Con Edison are deeply saddened and concerned about the tragedy in East Harlem. We want to

get to the bottom of what happened, and we must do all we can to prevent anything like that from happening again.

We are working with the National Transportation Safety Board (NTSB) and other agencies to determine the root cause of the explosion, as well as all the factors that led up to it. As parties to the ongoing investigation, we cannot comment on any details of the event, or on the NTSB's preliminary findings.

I am here today to give you a sense of the scope of our gas system. Con Edison delivers gas to approximately 1 million customers in Manhattan, parts of Queens, the Bronx and Westchester County. We maintain 88 miles of gas transmission lines, and 4,300 miles of distribution gas

mains. We also maintain almost 368,000 gas service lines that run from the street to a building.

Public safety is the number one driver of our efforts every day. We are determined to deliver energy safely and reliably, and we want to do everything possible to prevent accidents.

At Con Edison we have redoubled our efforts to examine our maintenance and leak detection practices. We are also educating the public through a multi-lingual campaign about the importance of reporting gas leaks.

I cannot emphasize enough the importance of someone calling 911 right away if they smell gas. If a member of the public smells smoke, or sees a car

accident, or even a crime being committed, they don't think twice about calling 911. We need to get New Yorkers to treat an odor of gas the same way. If you smell gas, act fast. Leave the area and call 911 or your gas utility, immediately.

We have enhanced our gas safety awareness campaign through print, radio, and digital outlets. Our homepage features gas safety messages, and we promoted our multi-lingual gas safety videos on social media.

Currently, we meet or exceed federal and state codes for gas leak inspections. But our engineers have been looking at ways to substantially increase the number of gas leak patrols. We use specially outfitted vehicles to

survey 4,300 miles of gas mains at least once a year, and more frequently during severe weather. We also survey our gas service lines at least once every three years.

I am pleased to announce today that about a week ago, we began a pilot project combining our gas leak testing equipment and our contact voltage equipment in the same vehicle.

Currently, a fleet of vehicles scans our electric system 12 times per year, checking for contact, or stray voltage. Stray voltage is the presence of an electric charge sometimes found, for a variety of reasons, where it's not supposed to be, like on a streetlight, or manhole cover. During this pilot, we are checking for gas leaks and contact voltage at the same time. If successful, we will

expand this effort to substantially increase the number of gas leak patrols we perform each year.

We are also examining technology that allows us to simultaneously survey gas mains under the street, and gas service lines under the sidewalk.

Since the East Harlem tragedy, we have been holding meetings with the city's emergency officials to determine how we can improve the response to gas odor calls and other events involving street infrastructure.

We have discussed having the FDNY receive more, if not all, gas odor reports via 911. The Fire Department is best equipped to respond to these calls the fastest and to protect people and property.

Investigating the source of a leak, however, requires the skills of qualified gas utility personnel. Once the source of the gas odor is pinpointed, the leak is made safe.

With respect to the replacement of cast iron and unprotected steel pipes, we have nearly doubled our replacement program in recent years.

We plan to replace an average of 65 miles of priority pipe segments in each of the next three years. We also take advantage of opportunities to replace sections of pipe when the streets are excavated for other reasons.

We invest approximately \$500 million each year on our gas infrastructure and steel/cast iron replacement

program. We will spend an average of \$215 million annually over the next three years replacing gas mains.

This job is particularly expensive and more time consuming in Manhattan, which has a dense and complicated underground infrastructure with water, telecommunications, gas, steam and electric facilities. A typical gas main replacement job in Westchester might take a few days at a cost of \$500 per foot. The same job in Manhattan could take a couple of weeks, at a cost of almost \$2,000 per foot. We estimate the overall cost of replacing all cast iron and unprotected steel mains in our system would run about \$10 billion.

We respond to about 33,000 reports of gas odors each year. About 24,500 are from inside homes and

businesses, and about 8,500 are from gas odors on the street. Approximately 40 percent of these calls turn out NOT to be natural gas leaks, but we never discourage anyone from making the call, and we will always respond.

In 2013, on average, we responded to these calls within 22 minutes. When conditions warrant, we send additional personnel and coordinate the response with the Fire Department. We currently interact with the Fire Department on about 4,500 of these responses each year. As I mentioned earlier, we will be collaborating with the City on increasing Fire Department responses to gas emergency calls.

Natural gas is the nation's cleanest burning fossil fuel. Building owners are switching from heavy, dirty fuel oils to natural gas, which is helping all of us breathe easier. Gas has many great benefits, but as with all energy sources we use, we must always remain aware of the potential safety risks.

We accept our responsibility to provide energy safely, and we take it very seriously. It is our duty to protect the people living and working in communities we serve. We are your neighbors, and keeping us all safe is at the heart of our mission.