Cheryl Payne
Vice President
Gas Engineering

September 30, 2015

By Electronic Mail
Hon. Kathleen H. Burgess
Secretary to the Commission
New York State Public Service Commission
Three Empire State Plaza
Albany, NY 12223-1350

Subject: Consolidated Edison Risk Assessment, Case 11-G-0565

Dear Secretary Burgess,

In accordance with ordering clause eight of the Public Service Commission's ("Commission") February 20, 2014 order in the above-referenced proceeding ("Order"), Consolidated Edison Company of New York, Inc. ("Con Edison" or the "Company") submits this Risk Assessment of the Company's distribution system required by the Order.

As we previously reported, Con Edison and other LDCs, acting through the Northeast Gas Association ("NGA"), partnered with the Gas Technology Institute ("GTI") to develop a statistically-based approach to sample operator in-ground gas services and mains to determine the potential extent of damaged gas services and mains from third-party damage during water and sewer installations by municipalities. The method developed and validated by GTI includes: (1) the ability to calculate the probability of damaged gas services and mains with a confidence level; (2) the establishment of an adaptive, random sampling mechanism (i.e. it learns on-the-fly), and focuses continued sampling of the service and main population where the uncertainty is greatest or the data density is lowest; (3) an approach that is scalable, and receptive to customization by each operator, while maintaining its rigor and statistical soundness; and (4) a training manual and considerations on how the adaptive sampling method can be integrated into a balanced risk assessment and management program for the affected gas service and main assets by allowing focus on mitigating the highest risk areas first.

Con Edison utilized the statistical calculator developed by GTI to determine its sampling program. The Company divided its service territory into two "regions," consisting of Region 1 - Westchester County and Region 2 – Manhattan, the Bronx, and the first and third wards of

Queens. The Company selected a Confidence Level of 92% (with an upper level of 96%), which required a sample size of 79 excavations in each region, for a total of 158. The Company further subdivided each "region" into sub-regions, each containing similar inventories of pipe (21 sub-regions for Westchester and 25 sub-regions for the City of New York). Each sub-region required two to seven excavations of plastic and metallic mains, and plastic and metallic services.

Based on the results of the statistical calculator, the Company randomly excavated gas mains and services of various materials and diameters throughout its service territory at crossings of underground water and sewer facilities looking for evidence of third-party damage. In order to maintain consistency across its gas distribution system, the Company developed an excavation and inspection protocol (see Attachment 1 – Horseheads Sampling Excavations Protocol), as well as an excavation data sheet (see Attachment 2 – Horseheads Sampling Excavations Data Sheet). The following table summarizes the excavation breakdown, by material and location.

	Services		**Mains**		
	PE	**Metallic**	**PE**	**Metallic**	**Total**
Westchester	16	25	12	26	79
Manhattan	7	6	4	4	21
Bronx	10	9	4	7	30
Queens	10	7	5	6	28
Total	**43**	**47**	**25**	**43**	**158**

On August 31, the Company completed the required 158 digs (see Attachment 3 – Horseheads Digs Overview - NYC and Attachment 4 – Horseheads Digs Overview - Westchester). Of these 158 digs, three digs revealed coating damage to a gas facility. One damage was a steel service in New York City (the Bronx), which was determined to have been caused by excavation. Based on GTI's Statistical Calculator, the Company predicts that the expected value of excavation damage in New York City is 1.3%, with 96% confidence that the excavation damage level is less than or equal to 6.1% (see Attachment 5 – Statistical Calculator Plots). The other two damages discovered were on steel services in Westchester, and were determined to have been caused by excavation. Based on GTI's Statistical Calculator, we predict that the expected value of excavation damage in Westchester is 2.5%, with 96% confidence that the excavation damage level in Westchester is less than or equal to 8.0% (see Attachment 5). The Company will replace the three services where coating damage was found.

There was no evidence of improper backfilling techniques in connection with the three damaged services and these services did not have any similarities to the service damage in the Horseheads incident. Damage to plastic, cast iron or copper was not found. Based on the results of the Company's scientific random sampling program and in consultation with GTI's subject matter expert, latent third party damages to gas mains and services similar to those found in Horseheads are not an issue in Con Edison's service territory.

Excavation damages will continue to be monitored as part of the Distribution Integrity Management Program. This program includes various actions that the Company takes to prevent excavation damages, such as contractor oversight, its gas damage committee which reviews each gas damage, the installation of marker balls, and Company representatives on the One-Call Boards. The Company's Public Awareness Program will continue to educate excavators on safe digging practices including proper backfilling procedures (see Attachment 6 – 2014 Mailer to Excavators).

If you have any questions or comments, please contact me or Chief Engineer Tom Hernandez at (718) 839-1751.

Sincerely,

Horseheads Sampling Excavations Protocol

1. Find a location where the gas main or gas service crosses or is crossed by a water main, water service, sewer main, or sewer lateral.

2. Excavate over gas main or service to a depth of 6” below the gas facility to fully expose the gas facility utilizing vacuum excavation equipment or hand tools to minimize the possibility of damage to the facilities being exposed.

   Note: The crossing facility (i.e. water or sewer) does not need to be exposed.

3. Examine the gas main or service, and document the as-found condition on the **Horseheads Sampling Excavations Data Sheet.** Pay particular attention to any damage which may have been caused by prior excavation work (e.g. dents, gouges, scraping) or any other evidence of poor excavation practices (e.g. improper backfilling techniques, improper backfill material). Clearly document all findings on the **Horseheads Sampling Excavations Data Sheet**, including a detailed sketch of the excavation identifying all facilities found with the depth of cover and clearances between facilities noted on the sketch**.** Use the Remarks section on the Data Sheet if needed.

4. Take several photographs of the gas piping within the excavation clearly showing the as-found condition of the gas facility. Save photographs to SharePoint site.

5. If damage to a gas facility is found that will necessitate a repair or replacement, contact the local Gas Operations area for guidance.

6. Restore excavations as per Company and local requirements.

7. Save completed Data Sheet to SharePoint site.

Notes:

1. The excavation requirements of this protocol do not override any federal, state, and local requirements (e.g. Code 753, permits, restoration and paving, traffic protection, OSHA regulations).

2. If a gas odor is detected, leave the immediate area and contact 1-800-75CONED or 911.

Horseheads Sampling Excavations Data Sheet

Location		
Address:		Nearest Cross Street:
Boro/County:		Municipality:
Code 753 Number:		Permit Number:
Street Depression Prior to Excavating (Yes/No):		

Gas Facility Information		
Gas Main or Gas Service:		Year of Installation:
Material:	Diameter:	Depth of Cover:
M&S Plate Number:	Type of Cover (Grass, Asphalt, Concrete, other):	

Crossing Facility Information

Facility crossing gas facility (Water main, water service, sewer main, sewer lateral):

As-found Condition

Visible Pipe Damage Present (Yes/No):_____

If Yes – describe in detail:

Type of Damage	Present?	Description
Prior Excavation Damage		
Corrosion Damage (Steel only)		
Manufacturer's Damage		
Construction Damage		
Outside Forces		
Natural Forces		
Other		

For Coated Steel Services Only:

Visible Pipe Coating Damage (Yes/No):

If Yes, describe in detail:

For Uncoated Steel Service Only:

External pitting present (Yes/No): Wall loss present (Yes/No):

If Yes, describe in detail:

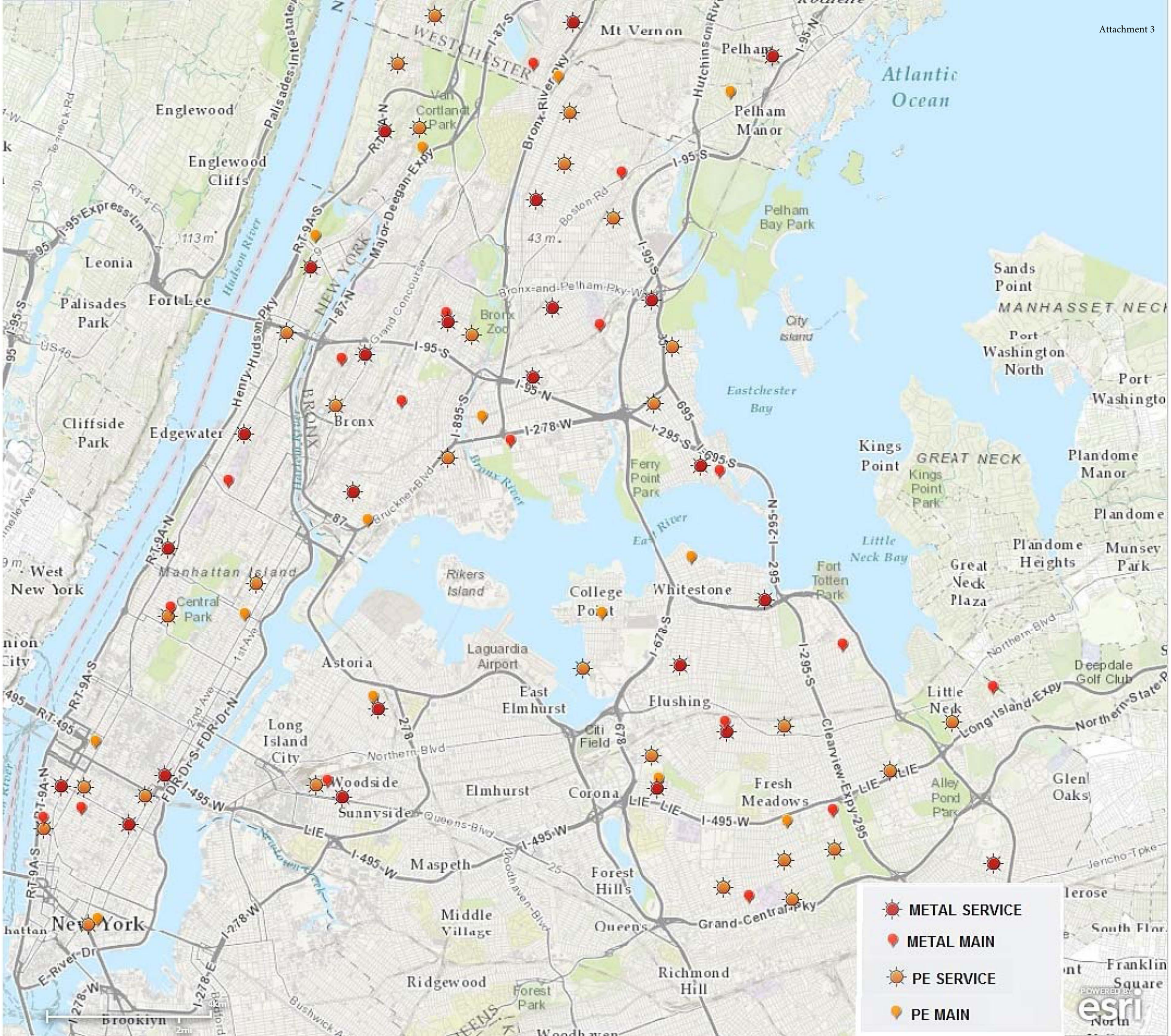
Soil Type: Clay☐ Sand☐ Loam☐ Peat☐ Other☐

Backfill Condition (e.g. Good, Poor):

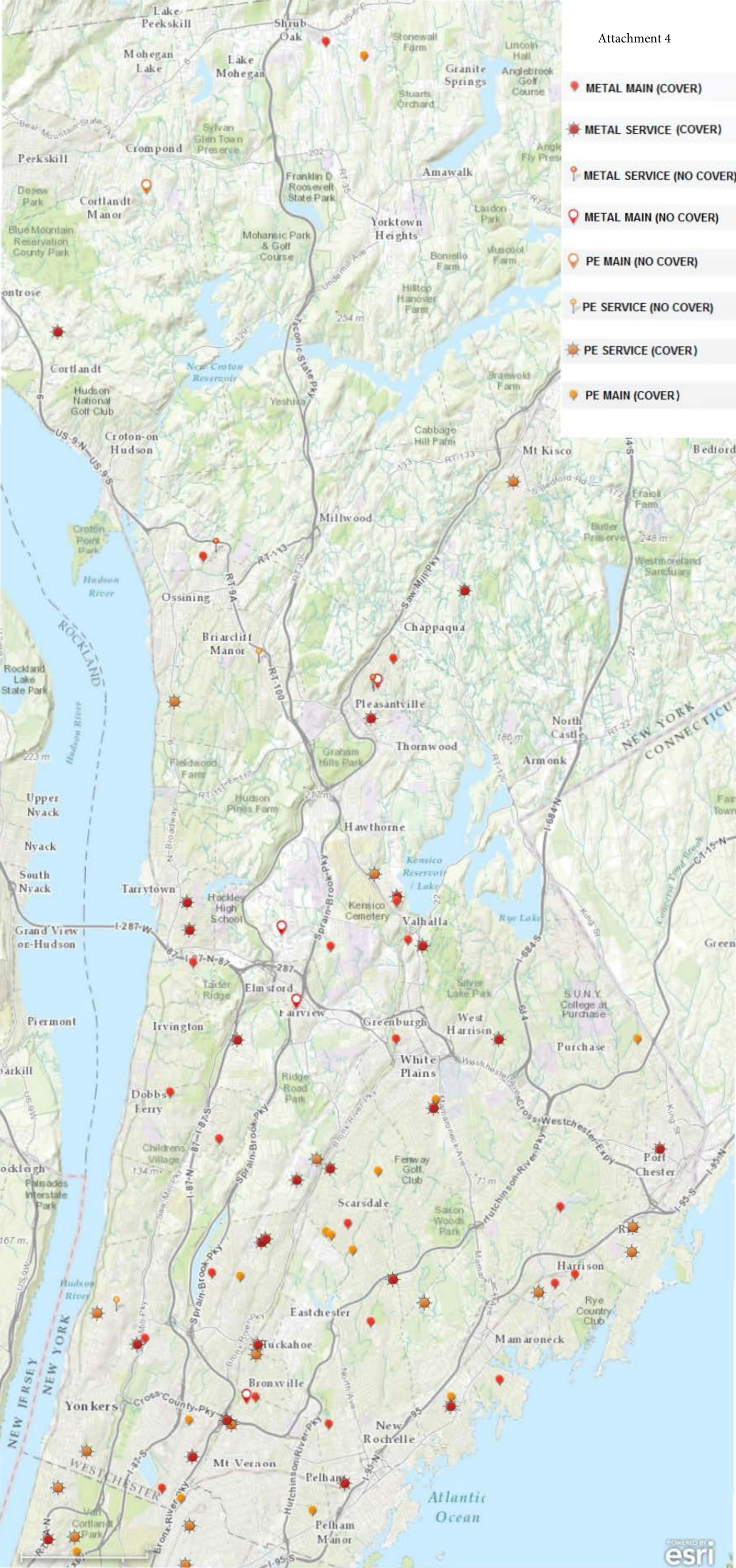
If Poor – describe in detail:

Backfill Material (e.g. Sand, Soil, Rock, Asphalt, Concrete, Other):

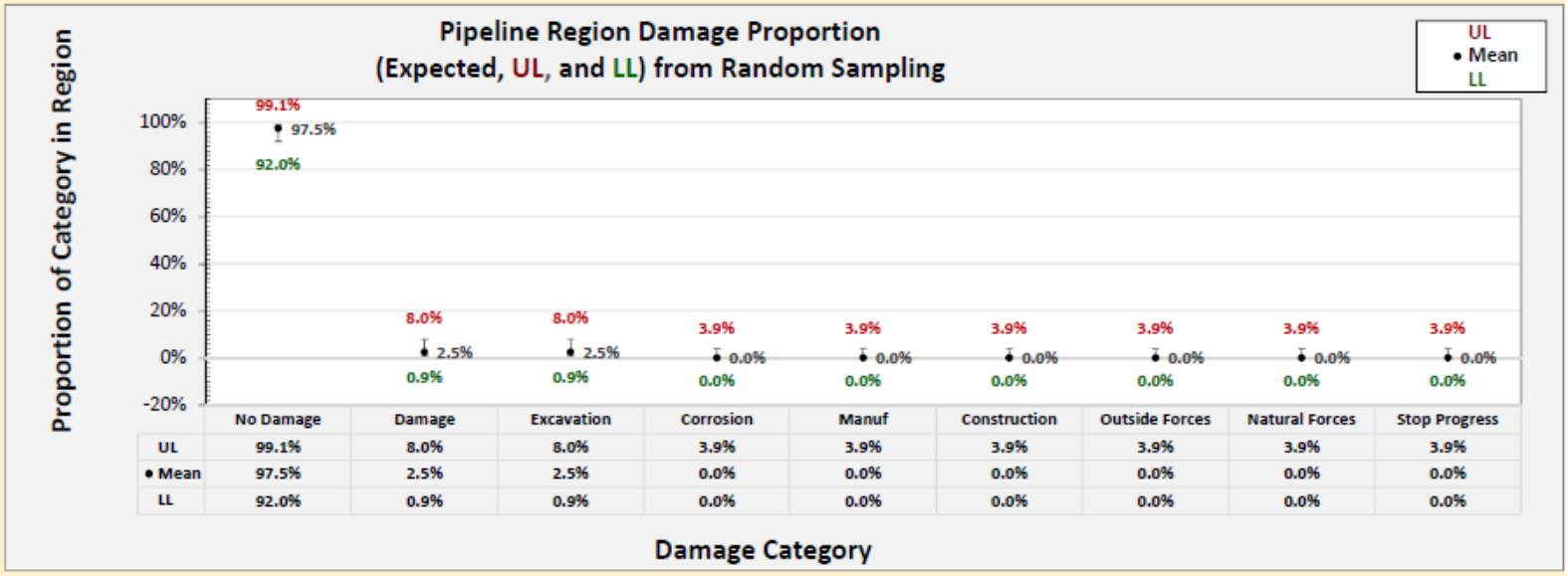
Leak Information	
Existing Leak Found (Yes/No):	
Leak Ticket Number (if required):	
Inspection Information	
Name of Excavating Company:	
Name of Person Performing Inspection:	
Company Organization of Person Performing Inspection:	
Signature of Person Performing Inspection:	
Date of Inspection:	Photographs Taken (Yes/No): If No, State Reason:
Remarks (include any pertinent information not previously covered):	
N ↑ Sketch of Excavation (Include and identify all facilities with depth of cover) and clearances between facilities.	


METAL SERVICE
METAL MAIN
PE SERVICE
PE MAIN
Englewood
Englewood Cliffs
Leonia
Palisades Park
Fort Lee
Cliffside Park
Edgewater
Bronx
Mt Vernon
Pelham
Pelham Manor
Pelham Bay Park
Van Cortlandt Park
Bronx Zoo
City Island
Sands Point
Port Washington North
Kings Point
Plandome Manor
Plandome
Plandome Heights
Munsey Park
Great Neck Plaza
Fort Totten Park
Whitestone
College Point
Rikers Island
Laguardia Airport
Astoria
East Elmhurst
Long Island City
Woodside
Sunnyside
Elmhurst
Corona
Flushing
Citi Field
Fresh Meadows
Little Neck
Deepdale Golf Club
Glen Oaks
Alley Pond Park
Maspeth
Middle Village
Forest Hills
Queens
Ridgewood
Forest Park
Richmond Hill
Jamaica
Franklin Square
South Flor
Ferry Point Park
Kings Point Park
Great Neck
Manhattan Island
Central Park
West New York
New York
Brooklyn
Atlantic Ocean
Eastchester Bay
Little Neck Bay
Hudson River
East River
Bronx River
Harlem River
NEW YORK
WESTCHESTER
MANHASSET NECK
Palisades Interstate Pky
Henry Hudson Pky
Major Deegan Expy
Bronx-River Pky
Hutchinson River Pky
Bronx-and-Pelham-Pky-W
Grand Concourse
Boston Rd
Bruckner Blvd
Northern Blvd
Queens Blvd
Woodhaven Blvd
Jericho Tpke
Long Island Expy
Northern State P
Grand Central Pky
Clearview Expy-295
FDR Dr-S
FDR Dr-N
E River Dr
1st Ave
2nd Ave
Rt 4 E
Rt 9A-N
Rt 9A-S
Rt 495
I-95 Express Ln
I-95-S
I-95-N
I-87-N
I-87-S
I-895-S
I-278-W
I-278-E
I-495-W
I-678-S
I-295-S
I-295-N
I-695-S
LIE
US 46
113 m
43 m
4mi
2mi
esri

Attachment 4

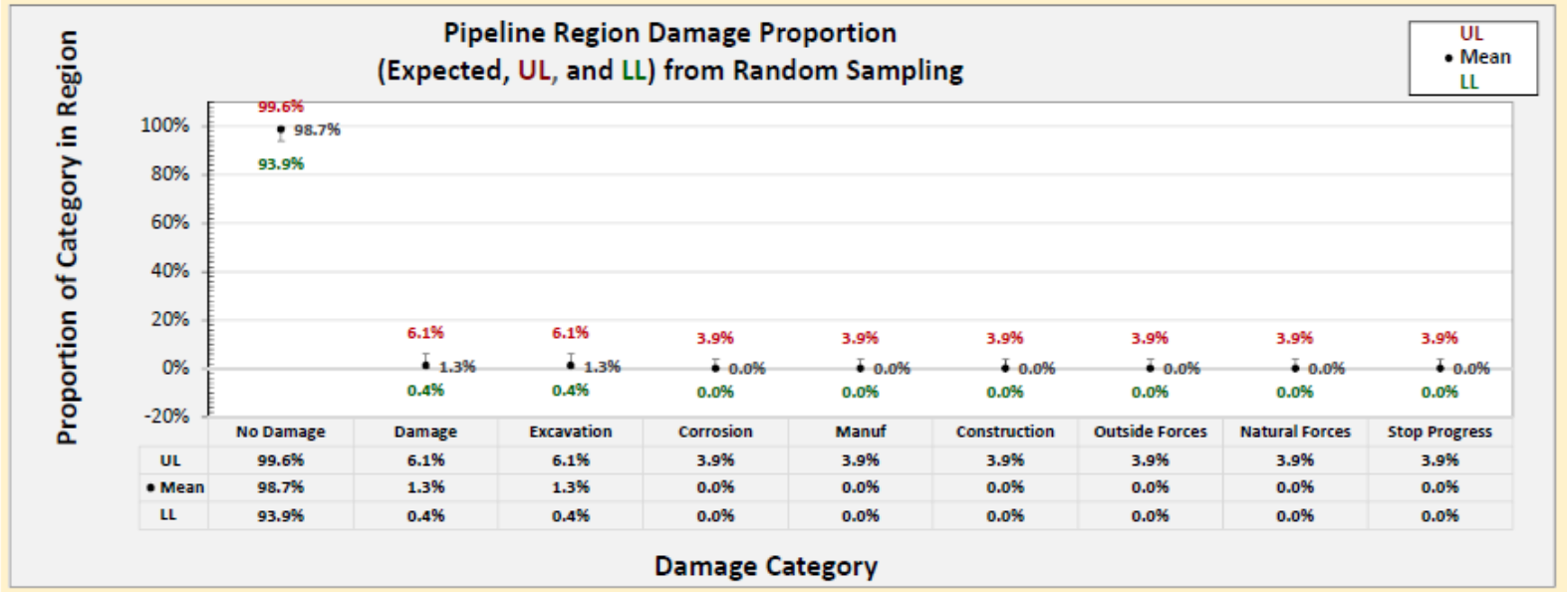


Confidence Level 92.0 %
Upper Level of 96.0 %
Region: WESTCHESTER
Region No.: R1
Sample Size 79



	No Damage	Damage	Excavation	Corrosion	Manuf	Construction	Outside Forces	Natural Forces	Stop Progress
UL	99.1%	8.0%	8.0%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%
• Mean	97.5%	2.5%	2.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
LL	92.0%	0.9%	0.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Confidence Level 92.0 %
Upper Level of 96.0 %
Region: NYC
Region No.: R2
Sample Size 79



	No Damage	Damage	Excavation	Corrosion	Manuf	Construction	Outside Forces	Natural Forces	Stop Progress
UL	99.6%	6.1%	6.1%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%
• Mean	98.7%	1.3%	1.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
LL	93.9%	0.4%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

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*Call **811** before you dig.*

Excavator Safety

Near Underground Natural Gas Pipes

HANG THIS POSTER

Help Protect Natural Gas Pipelines

- Con Edison pipelines deliver natural gas safely and reliably to homes and businesses across Manhattan, the Bronx, Queens, and Westchester County. We regularly inspect these pipelines for corrosion and defects, monitor for leaks, and conduct routine maintenance.
- The greatest risk to gas pipelines is accidental damage during excavation.
- Hitting a natural gas pipeline has serious consequences. Even a tiny gouge, scrape, dent, or crease to a gas pipe or its coating may cause a leak that could lead to a catastrophic fire or explosion.

Make the Call or Don't Dig at All

- State law requires you to call 811 at least two full working days before any excavation starts, excluding weekends and holidays.
  - This free service will arrange for the marking of buried natural gas lines and other utilities so you can work a safe distance away from them.
  - **For NYC excavations,** call New York 811 of NYC & LI at 811 or 1-800-272-4480, or visit NewYork-811.com.
  - **For Westchester excavations,** call Dig Safely NY at 811 or 1-800-962-7962, or visit DigSafelyNY.com.
- Before you call, pre-mark your proposed dig area with white paint, flags, or stakes.
- Wait for utilities to be marked before digging and confirm utility response through the Automated Positive Response system (APR).
- Physically locate marked natural gas pipelines by hand digging. If you cannot locate marked pipelines, STOP digging and contact Con Edison immediately.
- Do not use mechanical excavation equipment within the "tolerance zone," which spans the width of a marked utility plus 24 inches from each indicated outside edge. Use ONLY hand tools or vacuum technology within this safety zone.
- If you are working near an exposed natural gas cast iron pipe, contact Con Edison.

Use Caution Around Pipeline Markers

- High-visibility markers with Con Edison's 24-hour emergency phone number indicate the general location of our high-pressure natural gas pipelines. "TM" (Transmission Main) spray-painted on the surface of a roadway or asphalt also indicates transmission pipelines.
- If you notice any type of suspicious activity near a pipeline marker, or you see a marker that has been damaged, call Con Edison immediately at the number listed on the marker.
- For security purposes, these markers do not show the exact location, path, depth, or number of gas pipelines in the area. In addition, pipelines may not follow a straight course between markers.
- Never use pipeline markers or maps as a substitute for calling 811 to have all utility lines in your dig area located and marked.

Gas Leak Recognition and Response

Smell Gas. Act Fast.

Most gas is odorized, however do not rely on your nose alone to detect a leak. Be alert for any of these gas leak warning signs:

- A distinctive, sulfur-like odor
- A hissing, roaring, or whistling sound
- Dirt spraying or blowing into the air
- Continual bubbling in ponds, creeks, or areas of standing water
- Plants or grass dead or dying for no apparent reason in an otherwise moist area, especially near a pipeline
- If you contact a natural gas pipeline and/or suspect a gas leak, assume there's a danger. Warn others. Do not turn off equipment—leave the area quickly and leave your equipment behind. Stay away until utility personnel say it is safe to return. Do not use matches, lighters, or anything electrical—even a phone. Do not attempt to stop the flow of gas. From a safe location, call 911 and Con Edison.

In a gas emergency, call 911 and Con Edison at 1-800-75-CONED (1-800-752-6633)
Available 24 hours a day—7 days a week
National Grid customers in Queens can call 1-718-643-4050

Tear along perforated line.

Respond Safely to Natural Gas Emergencies

Keep this card in your vehicle visor as a quick reference guide.

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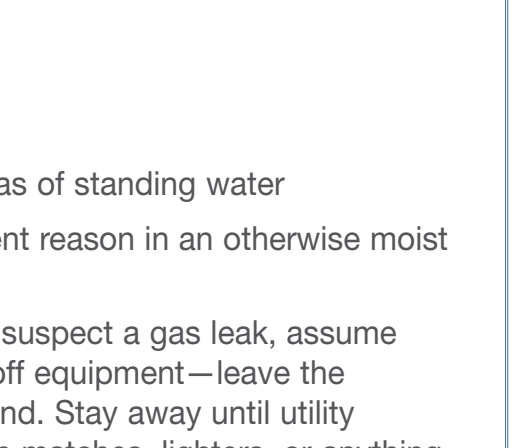
Gas Leak Signs: Most gas is odorized. A gas leak may have a distinctive, sulfur-like odor, but don't rely on your nose alone. Other signs may include a hissing or roaring sound, dirt spraying or blowing into the air, continual bubbling in water, and grass or plants dead or dying for no apparent reason.

If You Contact a Natural Gas Pipeline

1. **Leave your equipment behind.** Warn others of the danger and leave the area quickly. Stay away until utility personnel say it is safe to return.
2. **Do not use matches, lighters, or anything electrical—even a phone.** A spark could ignite the gas.
3. **Do not operate underground pipeline valves or attempt to stop the flow of gas.** Never bury a contacted pipeline. Should there be a gas burning fire, do not attempt to extinguish it.
4. **From a safe location, call 911 and Con Edison.**
5. **Report the incident to your supervisor.**

Call 911 and Con Edison if you suspect a gas leak or if you make ANY contact with a natural gas line, even if you just nick the pipeline or damage its coating.



In a gas emergency, call 911 and Con Edison at 1-800-75-CONED (1-800-752-6633)
Available 24 hours a day—7 days a week

Excavator Safety

Near Underground Natural Gas Pipes

Protect yourself, your crew, and the public. It's the law!

Urge your employees to follow the enclosed safety tips while working around natural gas lines.

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*Call **811** before you dig.*

Smell Gas. Act Fast.

Important natural gas safety information enclosed.

conEdison

104 Bridge Road
Salisbury, MA 01952

conEdison

Make the call or don't dig at all.

Dear Excavator:

Con Edison is committed to worker and public safety. Whether using handheld tools or operating heavy equipment, it's critical that every worker know the requirements and techniques for working safely around underground utilities—critical for themselves, their business, and the public.

Con Edison monitors and inspects its gas system to ensure public safety. Please take an active role in helping us keep our 4,300 miles of underground pipelines safe.

Call 811 to Have Underground Pipelines Located and Marked

To protect underground pipelines, New York state law requires you to call the local one-call center at **811** two to ten days before you dig or excavate on public or private property.

Before you dig in New York City, call **New York 811** at **811** or **1-800-272-4480**, or visit **NewYork-811.com**.

Before you dig in Westchester County, call **Dig Safely NY** at **811** or **1-800-962-7962,** or visit **DigSafelyNY.com**.

Con Edison will be notified of your intent to excavate when you contact 811, and will mark the approximate location of any pipelines in your proposed excavation area at no charge to you. Please keep in mind that Con Edison's marks will not indicate the presence of any protrusions, appurtenances, fittings, or valves that are inherent to underground pipelines. Please note that Con Edison will not provide facility depth information due to the possibility that a third party may have altered the grade in the digging area.

Excavator Requirements Once Gas Utilities Have Been Marked

After pipelines have been marked, you must determine their exact location using safe and acceptable means. State law prohibits the use of powered digging equipment within 24 inches on either side of marked underground facilities. If you must excavate within this 24-inch zone, use only hand tools and proceed with extreme caution. Even seemingly minor damage (such as a nick, dent, cut, or scrape of the pipeline surface, coating, marker balls, or tracer wire) could cause the pipeline to fail in the future.

Support long spans of exposed facilities to prevent collapse or sagging. Backfill carefully to prevent damage to facilities and to provide support beneath exposed facilities.

More details on New York City excavator requirements are available at **NewYork-811.com**.

More details on Westchester County excavator requirements are available at **DigSafelyNY.com**.

Stay Safe!

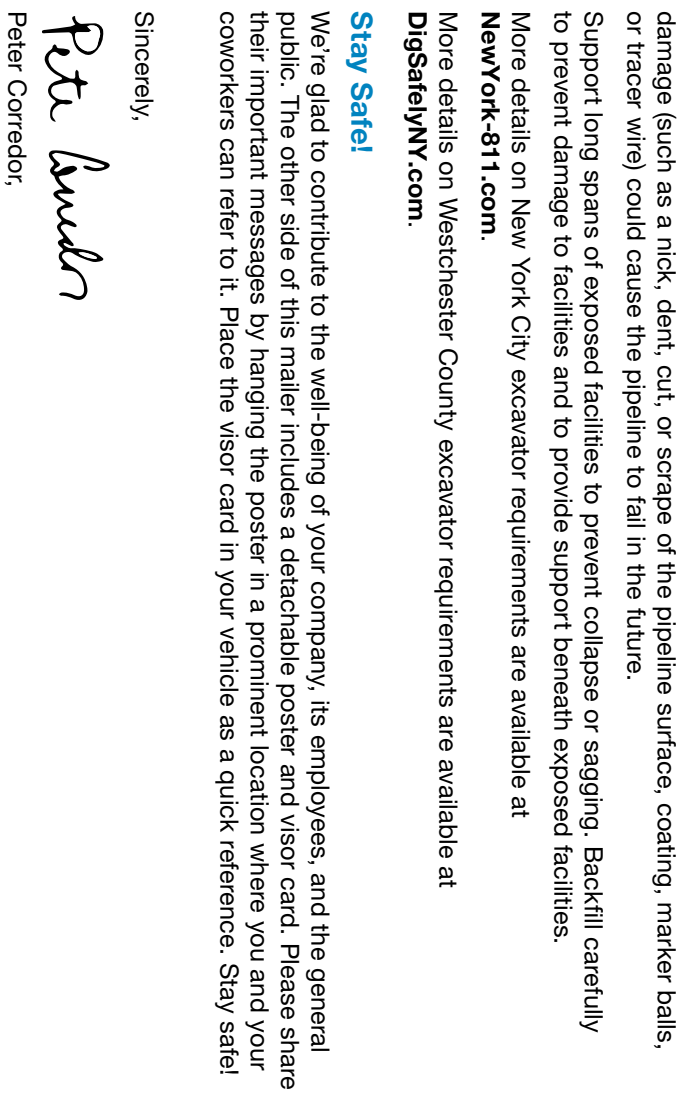
We're glad to contribute to the well-being of your company, its employees, and the general public. The other side of this mailer includes a detachable poster and visor card. Please share their important messages by hanging the poster in a prominent location where you and your coworkers can refer to it. Place the visor card in your vehicle as a quick reference. Stay safe!

Sincerely,

Peter Corredor,
Damage Prevention
Construction/Facilities Protection Group

Backfill for Pipeline Safety

- Remove sharp objects, trash, debris, wire, and rocks from the trench.
- Backfill 4–6" around the bottom and sides and 12" on the top of natural gas pipelines with 3/8" sand or clean fill.
- Remove rocks over 2" in diameter from the padding level to grade.
- Use only clean backfill materials: no paving materials, cinders, ash, or flowable fill.
- Compact soil in 12" wetted lifts to density readings of the compacted fill equal to 95% of the readings of the in-place material or per local and state requirements.
- Hand tamp around fittings where mechanical compaction cannot be used.
- Do not damage the copper wire that may be running near a plastic natural gas pipeline or yellow marker balls attached to gas facilities.
- Use special care to protect cast iron pipelines from damage.



This mailer is an important notice. Please have it translated.
Este es un aviso importante. Por favor traducir.

Work Safely Around Natural Gas Pipelines

*Call **811** before you dig.*

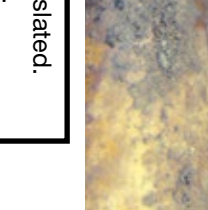
conEdison

Five Steps for Safe Excavation

1. **Plan your job and pre-mark your dig area** with white paint, flags, and/or stakes.
2. **Call 811** at least two working days before you dig.
3. **Wait the required time** for utilities to locate and mark their lines.
4. **Respect the marks** when digging.
5. **Dig with care** and follow hand-excavating rules.

811 Know what's **below.** **Call** before you dig.

American Public Works Association Color Code for Locator Marks



- Electric Power Lines
- Temporary Survey Markings
- Proposed Excavation
- Gas, Oil, or Steam
- Potable Water
- Sewer and Drain Lines
- Communications Lines, Cables, or Conduit
- Reclaimed Water, Irrigation, and Slurry Lines

If you find an unmarked line, stop digging and call 811 immediately.

In a gas emergency, call 911 and Con Edison at 1-800-75-CONED (1-800-752-6633)

Available 24 hours a day—7 days a week