



February 23, 2022

Neighborhood Researchers Find Hundreds of Methane Gas Leaks Across DC

Neighborhood researchers found nearly 400 active methane gas leaks from DC's gas utility across all eight wards of the District of Columbia. Over the past year, volunteers



from DC's environmental and faith communities tested air from vents in utility access caps on DC streets and sidewalks using an industry-grade methane detector, finding hundreds of leaks, including over a dozen at or over the methane concentration at which an explosion is possible.

In about 25 hours, volunteers with the Sierra Club, Washington Interfaith Network, Friends Meeting of Washington, and houses of worship from across the District found 389 leaks. This number

included 14 leaks at or exceeding 50,000 parts per million (5% or air volume), which is the level at which a leak is potentially explosive.

Many leaks were found at gas utility access caps, like the one in the image to the right. The neighborhood researchers also found methane gas in access caps for other underground piping, because gas from damaged pipes migrates through soil to air pockets around electric, water and telecommunications equipment. Researchers from Gas Safety Inc. and Boston University, with extensive





experience in methane detection, have said there is not sufficient organic matter under pavement to produce measurable methane.

The leak detection survey covered a wide sample of neighborhoods across all eight wards. The sampling includes only a small percentage of DC's total gas pipelines, meaning that the actual number of leaks is many times higher than the numbers reported here.¹

Climate Threat

Methane sold by Washington Gas accounts for 23% of the District's total greenhouse gas emissions.² Because gas leaks are approximately double official estimates, emissions from the gas sector are likely much higher.³ When released directly into the atmosphere, methane is 84 to 87 times more powerful than carbon dioxide as a global warming agent.⁴ When combusted, methane gas produces carbon dioxide, the most common greenhouse gas, as well as nitrogen dioxide, a precursor to ozone.⁵

Public Health Threat

Gas appliances fill our homes with many of the same pollutants as car exhaust – carbon monoxide, nitrogen dioxide, particulate matter, and formaldehyde.⁶ Because of this, the air we breathe indoors is often more polluted than outdoor air.⁷ Health impacts stemming from elevated nitrogen dioxide exposure include:



- Aggravated respiratory symptoms and higher susceptibility to lung infections⁸
- 42% increased risk of developing asthma symptoms⁹
- IQ and learning deficits in children¹⁰

¹ Survey locations were chosen to cover wards and neighborhoods across the District. Though locations were not randomly generated, survey sites were chosen without consideration of expected findings.

² [DOEE Greenhouse Gas Inventories](#)

³ [Assessment of methane emissions from the U.S. oil and gas supply chain, Science, July 13, 2018](#)

⁴ [Methane Matters: Scientists Work to Quantify the Effects of a Potent Greenhouse Gas, NASA Earth Observatory, March 8, 2016](#)

⁵ [Air quality and health, World Health Organization, 2022](#)

⁶ [Gas stoves can generate unsafe levels of indoor air pollution, Vox, May 11, 2020](#)

⁷ [Gas Stoves: Health and Air Quality Impacts and Solutions, RMI, 2020](#)

⁸ [Gas Stoves: Health and Air Quality Impacts and Solutions, RMI, 2020](#)

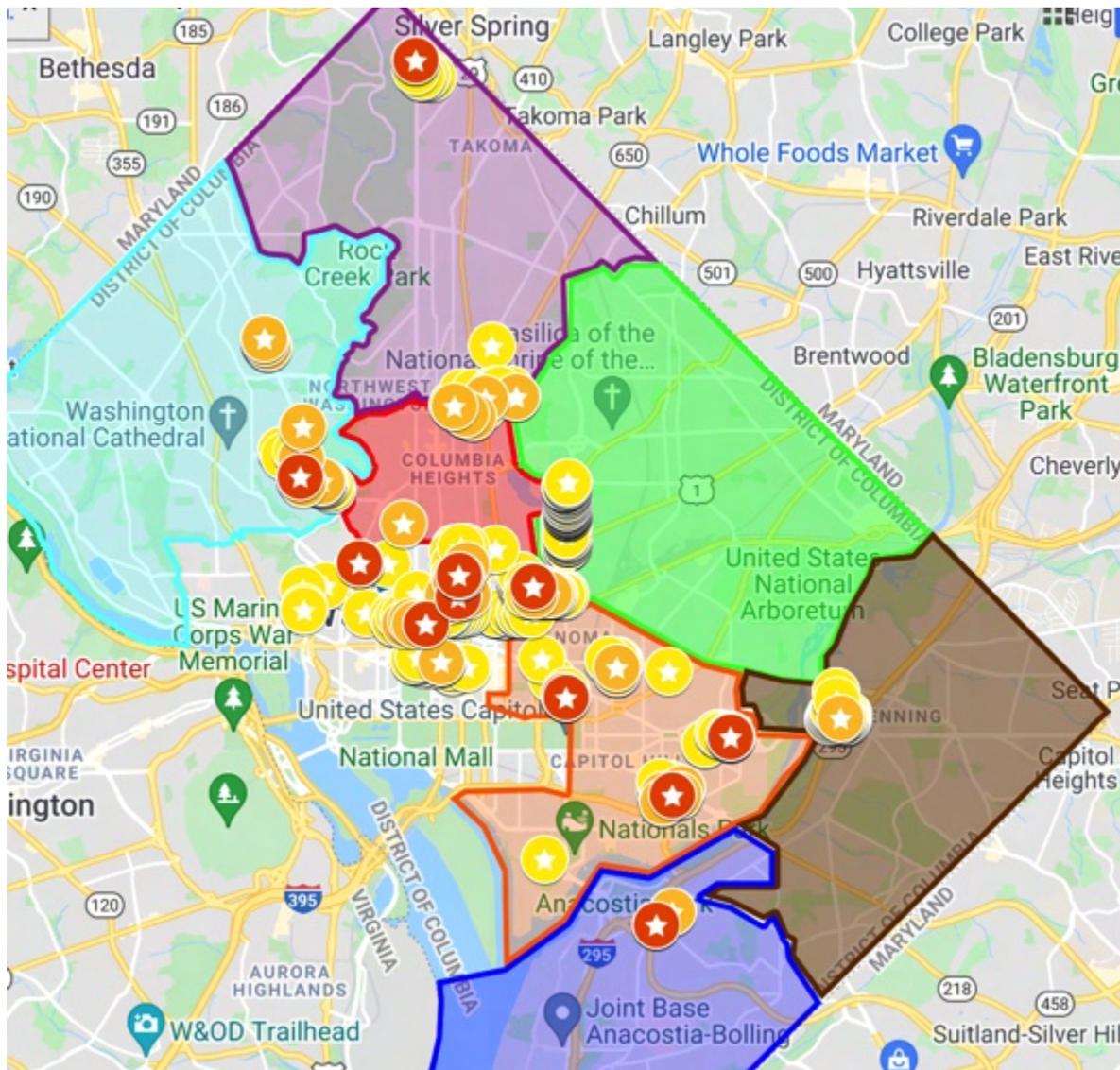
⁹ [Gas Stoves: Health and Air Quality Impacts and Solutions, RMI, 2020](#)

¹⁰ [Effects of prenatal exposure to NO2 on children's neurodevelopment: a systematic review and meta-analysis, Environmental Science and Pollution Research International, April 20, 2020](#)



Asthma rates among children living with gas stoves are comparable to those of children living with cigarette smokers, with one study attributing 12% of all childhood asthma to pollution from gas stoves.¹¹ Poor and Black children are disproportionately affected by indoor air pollution. Children in Ward 8 are 10 times more likely to go to the hospital because of an asthma attack than children in wealthier parts of DC.¹²

Gas Leak Map



The above map of leaks our volunteer teams identified is not a comprehensive list of gas leaks in DC. We measured a small fraction of the gas utility's access caps for

¹¹ [Kicking the Gas Habit: How Gas is Harming our Health. Climate Council \(Australia\). May 2021](#)

¹² [Doctors Blame D.C.'s High Asthma Rates in Part on Poor Housing. City Paper. May 22, 2019](#)



methane leakage, meaning the number of actual leaks is orders of magnitude higher than the leaks found by the neighborhood researchers.

Leak Data

| Date | Starting Location | Total Leaks | Large Leaks (over 2,000ppm) | Leaks \geq Lower Explosive Level | Leak detection team members |
|---------|--|-------------|-----------------------------|------------------------------------|--|
| 2/7/21 | Florida Ave. & Decatur Place NW (Ward 2) | 4 | 1 | 1 | Friends Meeting of Washington 1st Day School |
| 2/19/21 | 2101 St St NW (Ward 2) | 5 | 1 | 1 | Audubon Naturalist Society, Friends Meeting of Washington |
| 3/15/21 | N St. & 6th St. NW (Ward 2) | 33 | 0 | 0 | Audubon Naturalist Society, Friends Meeting of Washington |
| 3/23/21 | Adams St. & N Capitol NW (Ward 5) | 75 | 0 | 0 | Audubon Naturalist Society and Friends Meeting of Washington |
| 4/17/21 | 225 Anacostia Ave. NE (Ward 7) | 41 | 2 | 0 | Varick Memorial AME Zion & Washington Interfaith Network (WIN) |
| 5/1/21 | Klinge Trail & Tregaron (Ward 3) | 10 | 2 | 1 | Friends Meeting of Washington |
| 5/6/21 | Woodley Rd. & 29th St. NW (Ward 3) | 12 | 2 | 0 | Friends Meeting of Washington |
| 5/14/21 | Randolph St. & 5th St NW (Ward 4) | 25 | 5 | 0 | Audubon Naturalist Society, Friends Meeting of Washington |
| 5/21/21 | 15th St. & A St. SE (Ward 6) | 11 | 2 | 1 | St. Mark's Episcopal, Church of the Epiphany, WIN, FMW |



| | | | | | |
|---------------|---|------------|-----------|-----------|---|
| 6/11/21 | 2401 MLK Ave. SE (Ward 8) | 2 | 2 | 1 | St. Mark's Episcopal, Church of the Epiphany, WIN, FMW, St. Augustine |
| 6/19/21 | Rhode Island Ave. & St Matthews Ct. NW (Ward 2) | 16 | 2 | 1 | Cathedral of St. Matthews, WIN |
| 6/25/21 | 1717 Rhode Island Ave. (Ward 2) | 4 | 3 | 0 | Cathedral of St. Matthews, WIN |
| 7/2/21 | 700 13th St. NW (Ward 2) | 19 | 1 | 0 | Church of the Epiphany, WIN |
| 7/3/21 | N Capitol St. & E St. NE (Ward 6) | 18 | 4 | 2 | St. Mark's, St. Augustine, Church of Epiphany, WIN |
| 9/3/21 | 19 Logan Circle NW (Ward 2) | 29 | 4 | 1 | WIN, FMW |
| 9/11/21 | E St. & 12th St. SE (Ward 6) | 24 | 5 | 1 | Sierra Club |
| 10/9/21 | 4301 Connecticut Ave. (Ward 3) | 6 | 3 | 0 | St. Mark's, St Augustine, St Margarets, FMW |
| 1/15/22 | 2817 Cathedral Ave. NW (Ward 3) | 2 | 2 | 0 | FMW |
| 1/16/22 | 1442 Jonquil St. NW (Ward 4) | 10 | 1 | 1 | Tifereth Israel, FMW |
| 2/12/22 | 1535 4th St NW (Ward 5) | 22 | 5 | 1 | Masjid Muhammad |
| 2/12/22 | U Street Metro (Ward 1) | 19 | 4 | 2 | WIN Affordable Green Buildings team, St. John's Episcopal Church |
| Totals | | 388 | 51 | 14 | |

Methodology

From February 2021 to February 2022, neighborhood researchers used a hand-held, industry grade gas detector (Sensit Gold G2 Combustible Gas Leak Detector) with an



18-inch flexible tube that draws in air to be tested for the presence of methane. The researchers inserted the nozzle into utility access caps to measure the presence of methane.

The Sensit Gold G2 detector measured methane in parts per million (ppm). At methane concentrations of 2,000 ppm, the detector shifted to measuring gas concentration as a percentage of methane's lower explosive limit, which is the level at which an explosion can occur. The lower explosive limit is 5% of air volume or 50,000 parts per million. Our teams found 51 leaks of over 2,000 parts per million and 13 leaks at or exceeding the lower explosive limit.



The leak surveyors came from the Sierra Club, Washington Interfaith Network, Interfaith Power & Light, Friends Meeting of Washington, Audubon Naturalist Society, Varick Memorial AME Zion Church, St. Mark's Episcopal Church, Church of the Epiphany, St. Augustine Catholic Church, Cathedral of St. Matthew the Apostle, St. Margaret's Episcopal Church, St. John's Episcopal Church, All Souls Unitarian Church, Tifereth Israel Congregation and Masjid Muhammad - the Nation's Mosque.

Government & Academic Studies Confirm Widespread Gas Leakage

A gas leak study commissioned by the DC government in 2021 identified 3,346 locations with methane at concentrations higher than ambient background levels.¹³ In a smaller sampling of these locations, 100% were found to be in close proximity to a gas main, valve or service line. Massachusetts-based Gas Safety Inc. performed the study for the Department of Energy and Environment (DOEE). The study, released on October 31, 2021, covered DC's residential neighborhoods, comprising about 50% of the District's land area.

The Beyond Gas survey measured methane levels at the precise location where the gas concentrates under utility access caps. Our data reaffirm the DOEE study's findings

¹³ [2021 Fugitive Methane Emission Survey of the District of Columbia For the District of Columbia Department of Energy and Environment, October 31, 2021](#)

that leaks are ubiquitous across the District. In addition, our ground-level testing device was also able to measure gas concentration levels, which were troublingly high in many locations.



Research released by Stanford University in January 2022 found that gas stoves leak significant amounts of methane, even when turned off.¹⁴ Methane gas leaks from stoves cause climate damage equivalent to that caused by about 500,000 gasoline-powered cars, according to the Stanford study.

The Stanford researchers measured how much methane escapes from the moment a burner is turned on and when the flame ignites the gas. It also examined how much unburned methane is released during cooking and how much gas is leaked when the stove is off. The scientists from Stanford University conducted the study on gas cooktops in 53 California homes.

The scientists found no relationship between the age or cost of a stove and its emissions. New and more expensive stoves leaked gas at similar rates to older and less expensive gas cooktops.

“I don’t want to breathe any extra nitrogen oxides, carbon monoxide or formaldehyde,” said Rob Jackson, one of the researchers with Stanford. “Why not reduce the risk entirely? Switching to electric stoves will cut greenhouse gas emissions and indoor air pollution.”¹⁵

Conclusion

One seemingly obvious solution to the problem of gas leaks across DC (and the approach favored by the fracked gas industry) would be simply to repair the leaks.

¹⁴ [Methane and NOx Emissions from Natural Gas Stoves, Cooktops, and Ovens in Residential Homes. Environmental Science & Technology, January 27, 2022](#)

¹⁵ [Stanford scientists find the climate and health impacts of natural gas stoves are greater than previously thought. Stanford News Service, January 27, 2022](#)



Fixing the already-existing leaks would take decades, during which the climate and health damage caused by leaking and burning methane gas would continue. Additionally, as some leaks are fixed, new leaks would appear. A gas distribution system across DC with zero leaks is impossible. Fixing the leaks we know of is a whack-a-mole approach that will not stop new leaks from forming and eventually being discovered. As one of our neighborhood researchers succinctly put it: “Gas leaks.”

The cost of gas leaks isn’t only paid in climate and public health damage, there’s also an enormous financial price tag. The gas utility’s pipeline replacement program is estimated to cost up to \$4.5 billion, according to DOEE.¹⁶

Instead of spending billions of dollars on fracked gas infrastructure, another approach would be to electrify buildings with highly efficient heating systems using clean energy. Switching to modern, electric furnaces and water heaters would save 282,000 DC households \$100 million annually on utility bills. The savings are greatest for low- and moderate-income households because they have three times the energy burden (the portion of their income spent on home energy) as other households. DC families would save an average of \$378 a year.¹⁷

Building homes with clean electric appliances is less expensive than building with fossil fuel appliances. Foregoing gas piping in homes saves a median of nearly \$9,000. Electrifying existing buildings can also be cost effective, especially for households replacing both a gas furnace and an air conditioning unit, or bundling rooftop solar with electrification.¹⁸

The District’s official climate and energy policy is to achieve carbon neutrality and eliminate fossil fuel combustion. Meeting DC’s climate commitments will require transitioning from methane gas to highly efficient heating systems powered by electricity from renewable sources.

¹⁶ [District of Columbia Government Testimony before the Public Service Commission, Formal Case No. 1154 – In the Matter of Washington Gas Light Company’s Project Pipes 2 Application, June 15, 2020](#)

¹⁷ [District of Columbia: Benefits of Household Electrification, Rewiring America](#)

¹⁸ [The Economics of Electrifying Buildings, RMI, 2018](#)