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Toxic Chemicals Linked To Natural Gas Operations Detected In The Bodies Of Pavillion, WY Residents

Using Both Air Monitoring and New Biomonitoring Methods, Researchers Aim to Connect the Dots Between Air Emissions from Gas Operations and Human Health Impacts

For a full copy of the report and supporting materials [click here](#).

[Pavillion, WY] – Today, a coalition of community and environmental health groups released first-of-its-kind research combining air monitoring methods with new biomonitoring techniques to determine if toxic air emissions from natural gas operations could be detected in the bodies of nearby residents. The study, titled “*When the Wind Blows: Tracking Toxic Chemicals in Gas Fields and Impacted Communities*”, found evidence of eight hazardous chemicals emitted from Pavillion, Wyoming gas infrastructure in the urine of study participants. Many of those chemicals were present in the participants’ bodies at concentrations far exceeding background averages in the U.S. population.

“If your drinking water is contaminated with toxic chemicals you might be able to make do with another source, but if your air is toxic you can't choose to breathe somewhere else,” said **Deb Thomas, Director of ShaleTest**, who lives in Wyoming and was one of the study leaders. She continued, “No matter which way the wind blows, gas development involves so many emissions sources that people can't help but to be exposed to toxic chemicals from their operations. Unfortunately, this is what everybody who is living with oil or gas drilling now has to look forward to if that drilling leads to production.”

Science experts along with community members from Pavillion used a variety of air monitoring and biomonitoring methods in concert to understand if air emissions from gas production equipment are being absorbed into the bodies of nearby residents. They then used new biomonitoring methods that have been developed to detect the signature of hazardous chemicals in study participants through the metabolites, or 'break-down' products and other evidence of toxic chemical exposure.

John Fenton, a Pavillion resident and farmer said, “Our family has experienced phantom odors, rashes, hair loss, respiratory conditions, neurological problems, epileptic seizures, cancer, and huge hits to how we think and reason. These symptoms match up with the known effects of the toxic chemicals emitted in our air from gas production operations. This biomonitoring project was an opportunity to find out if the chemicals we know are in the air, are also in our bodies.”

Researchers found volatile organic compounds (VOCs) in the air emitted from gas operations in Pavillion, and in the air immediately surrounding people working and living in the area. Later,

researchers found evidence of these same chemicals in study participants' bodies. The study focused on VOCs, and a specific family of VOCs named BTEX chemicals (Benzene, Toluene, Ethylbenzene, and Xylenes), because these chemicals are known to be hazardous to human health, even at low levels. VOCs detected in this study are linked to chronic diseases such as cancer, reproductive or developmental disorders; as well as respiratory problems, headaches, nosebleeds, and skin rashes. Study leaders note that because VOCs are so ubiquitous in products and in our homes, it is possible that the VOCs detected in participants' bodies came from multiple sources. Having conducted this new “methods development” for air and biomonitoring of these toxic chemicals, researchers hope to improve upon these methods to further understand how these chemicals travel through the environment.

“When the Wind Blows” details these specific findings:

- **Air sampling found** toxic chemicals present in the air near Pavillion, including BTEX chemicals, which are consistent with those associated with oil and gas production and its associated infrastructure. This finding is consistent with previous air monitoring findings from the Pavillion area as well as many other oil and gas production sites across the nation.
- **Urine sample analysis (biomonitoring) found** hazardous breakdown products and evidence (metabolites) of BTEX chemicals and other VOCs associated oil and gas production – in the bodies of the Pavillion area residents who participated in this study.
- **Eight chemicals linked to chronic diseases** such as cancer or other illnesses, including reproductive or developmental disorders and health problems such as respiratory difficulties, headaches, nosebleeds, skin rashes, and depression, **were detected both in the air near Pavillion and in the bodies of project participants.**
- The results from both human and air monitoring indicate that communities living or working near gas development operations may be intermittently **exposed to complex mixtures of chemical substances** associated with oil and gas production. Little information exists about how VOCs in mixtures interact with each other and in the human body, but scientific research indicates that in some cases VOCs might interact in ways (or combine with other factors) that increase health risks humans in humans.
- Levels of some hazardous VOCs in **air both near the gas production sites and that study participants were breathing exceeded one or more Environmental Screening Level (ESLs)**, which are air concentration thresholds set by public health agencies and environmental regulators above which there is risk to human health.
- Hazardous breakdown products of VOCs were present in the urine of study participants at much higher levels than those found in the general population, with one example up to ten times higher.
- The high hazard of the chemicals emitted into the air, together with the findings that the levels of certain VOC metabolites in urine of the people studied are well above the levels in the general population, send a clear signal that further action needs to be taken to prevent exposures.

Wilma Subra, an award-winning biochemist and one of the scientists involved in the project, said, “It's outrageous that Pavillion residents don't know if toxic chemicals are in their air or bodies, especially since gas production has been going on here for decades. We may just be finding out, and proving, that they've been exposed to toxic chemicals in the air for thirty years. Hopefully, the methods that we developed through this study will help them get better protections from government agencies responsible for public health – and help other communities across the nation get the protections they deserve.”

The report also contains hazards assessments, conducted by **Clean Production Action**, for many of the toxic chemicals detected in the air or bodies of Pavillion residents. The *GreenScreen for Safer Chemicals* analysis presented in the report is a globally recognized tool designed to succinctly present known science on hazards associated with specific chemicals, as well as data gaps where hazard research hasn't been conducted. The GreenScreen analysis shows that many of the chemicals detected in the air around Pavillion and in the bodies of study participants are extremely hazardous, and should be avoided – although Pavillion residents have been unable to avoid these ongoing exposures now for decades.

Based on the findings of this report and the new methods developed to understand health impacts resulting from gas operation's air emissions, report authors and affiliated groups are making the following recommendations:

- Additional biomonitoring testing is needed to help understand and prevent exposure to toxic chemicals.
- Further investigation into the harmful impacts of cumulative exposure to multiple chemicals – and the endocrine disrupting effects of these chemicals – is needed.
- Implement precautionary regulations, and ensure disclosure and transparency for the public. Current regulations appear to be failing communities living near gas development operations, and regulatory agencies already have enough emissions data available to justify swift action to protect public health and the environment right now.
- Promote clean, renewable energy sources and stop promoting natural gas as “clean” and “safe.” The data and the hazard assessments presented in this report show VOC emissions, which appear unavoidable in natural gas production. This indicates that production cannot be carried out in a manner that truly protects workers or the public. Truly protecting workers, community members and the public from these toxic hazards requires a comprehensive change in our energy system – to clean energy like solar and wind power.
- Provide ongoing monitoring, health evaluation and site remediation to protect people already affected by oil and gas production.

Elizabeth Crowe, Co-Director of Coming Clean, an environmental health collaborative that coordinated the project, said, “The data collected through this research shows that oil and gas development poses daily health hazards to families and communities. Gas production is not safe or clean. We need protective action on toxic emissions from the EPA and state agencies, for existing oil and gas sites and at every phase of the oil and gas production cycle. This action will help move our economy toward safe, clean renewable energy sources that won’t harm our health or the environment.”

A full copy of “*When the Wind Blows: Tracking Toxic Chemicals in Gas Fields and Impacted Communities*” and supporting materials can be found here: <http://comingcleaninc.org/wind-blows>

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