



Group Against Smog and Pollution, Inc. Hotline



Fall 2012

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Group Against Smog and Pollution, Inc. (GASP) is a nonprofit citizens group in southwestern Pennsylvania working for a healthy, sustainable environment. Founded in 1969, GASP has been a diligent watchdog, educator, litigator, and policy maker on many environmental issues, with a focus on air quality in the Pittsburgh region.

Cyclists and Smartphone Users Gather Air Quality Data

by Jamin Bogi, GASP Education and Outreach Coordinator

Like in any urban area with a large numbers of vehicles, Pittsburgh breathers suffer from diesel pollution. Trucks, trains, boats, buses, and construction equipment all emit exhaust that contains ultrafine particles small enough to avoid the body's defense systems and travel straight into the bloodstream. These emissions are linked to cancers, cardiovascular diseases, respiratory illnesses, and premature deaths.

GASP hopes to get a handle on the region's diesel pollution with the help of local residents. Concerned about dirty diesels? If you have a bicycle or a smartphone, you can help collect data that will identify hotspots of diesel pollution in the region, whether due to high levels of diesel activity or individual companies with dirty fleets.

We need the help of cyclists to complete a reliable map of particulate matter in Pittsburgh. Volunteers will strap air monitors to the front of their bikes and gather data as they ride. We'll get a close-up picture of what cyclists, pedestrians, and motorists are encountering on their commutes. This will help us pinpoint areas of concentrated pollution.

The bike monitoring project was made possible by a grant from Google, which has many cycling commuters at their Bakery Square office in Pittsburgh. We'll overlay the air data onto Google Maps, so Pittsburghers can see potential problem areas. To learn more or to volunteer for the project, visit www.gasp-pgh.org/projects/bam.



This volunteer cyclist collects air quality data on his commute from the East End to the South Side.

GASP is also launching a less physically challenging project aimed at capturing diesel information. Smartphone owners can now send pictures of smoking diesel vehicles straight to GASP. The photos pop up on a map. Anyone can see the photos and map, and anyone can contribute pictures. We'll quickly get a sense of which companies show up a lot in the images, and which streets generate a lot of complaints. GASP will follow up with the worst offenders to see what the problem is. It's hard to argue with a hundred pictures.

The project is part of "SENSr," which came out of the Living Environments Lab

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Ongoing Environmental Violations at Shenango


by Karen Grzywinski, GASP Board Member

Settlement agreements between DTE Energy Resources, parent company of the Shenango, Inc. coke facility on Neville Island, and the US Environmental Protection Agency (EPA), the PA Department of Environmental Protection (DEP), and the Allegheny County Health Department (ACHD) were announced on July 24, 2012. The agreements, containing civil penalties totaling \$1.75 million, address ongoing environmental violations of both air and water regulations at the plant. Some of the violations date as far back as 2005. The air violations include emissions of sulfur and visible emissions of particulate matter. ACHD alone filed 114 violations of air quality regulations that occurred during a seven month period in 2011 against Shenango. The company was also charged with numerous violations of the Clean Water Act, including: exceeding the pollutant limits of the facility's permit for discharge of wastewater, failure to properly operate and maintain the facility's wastewater treatment plant, and unpermitted discharges of polluted runoff from coal piles directly into the Ohio River.

As part of their agreement, Shenango must reduce air pollution emissions within the coke plant through improved operating procedures and equipment upgrades and repairs. Additionally, ACHD has included a new standard for battery standpipe emissions in their consent agreement; the standard limits emissions to two minutes when a standpipe is open in preparation for pushing coke from the oven at the

end of a cycle. At all other times, standpipe emissions may not exceed 20% opacity. GASP volunteer smokereaders who monitor the Shenango facility regularly, have reported that battery emissions have been, and continue to be, the most significant source of emissions and the highest opacity emissions that smokereaders can observe. While smokereaders have yet to witness any significant decrease in battery emissions, ACHD has reported improvement, when compared to 2011 records, in air monitor readings and reports submitted by their inspectors. The plant is currently averaging 40 hours per month for emissions which is 29 hours above the ACHD mandated goal of 11 hours per month.

To address the water violations, Shenango must construct a storm management facility and replace its biological wastewater treatment plant. While the new treatment facility is under construction, Shenango must implement immediate upgrades to the existing treatment process. The company states that it has invested \$8 million in upgrades at the coke plant and will spend an additional \$34 million on the water treatment system and additional upgrades through 2017.

GASP board members have continued to attend monthly working group meetings held at the Shenango facility. The group consists of Shenango management and environmental staff, representatives from ACHD Air Quality Division, environmentalists, local residents, and council members and commissioners from the surrounding municipalities. 

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GASP Mission Statement

GASP will act to obtain for the residents of southwestern Pennsylvania clean air, water, and land in order to create the healthy, sustainable environment and quality of life to which we are entitled.

Methods of Achieving Mission

GASP is a citizens' group based in Southwestern PA which focuses on Allegheny County environmental issues. When pertinent to these concerns, we participate in state and national environmental decisions.

We believe in the public's right to receive accurate and thorough information on these issues and to actively participate in the decision making process.

To achieve our environmental goals on behalf of our membership, GASP will advocate, educate, serve as an environmental watchdog, mobilize action, and litigate when necessary.

We will work both independently and in cooperation with like-minded individuals and groups as determined by the Board of Directors.

We will uphold GASP's reputation for scientific integrity, honesty, and responsible involvement.

GASP Encourages Pollution Controls on Aging Compressor Stations to Reduce Emissions by 95%

by Lauren Burge, GASP Attorney

Much attention has been focused on the large numbers of Marcellus Shale wells and compressor stations that have been constructed in recent years in Pennsylvania. However, many people are unaware that we have had compressor stations in this area for decades. These facilities transmit natural gas along pipelines, and often include old, outdated equipment that emits much larger quantities of pollutants than those associated with a new compressor station.

Most of the new compressor stations being constructed today serve to gather natural gas from nearby unconventional wells, remove any water or other hydrocarbons, and send pipeline-quality compressed gas into pipelines. Transmission compressor stations are then located along pipelines to boost compression and allow gas to travel through long stretches of pipeline. Many of these transmission stations are quite old. The Holbrook Compressor Station in Greene County, for instance, is currently operating compressor engines that were installed in the late 1950's. Engine design and emission controls have advanced significantly since that time, so these aging engines have significantly higher emissions than we would expect from a modern compressor engine.

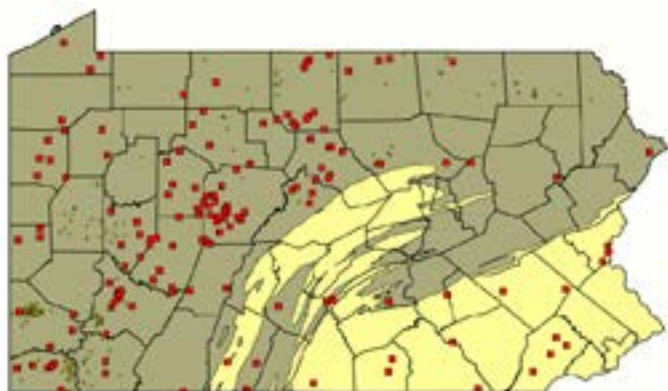
For example, a single 1,980 horsepower rich-burn natural gas-fired compressor engine recently permitted to be installed at the Welling Compressor Station in Washington County has the potential to emit 3.82 tons per year of NO_x, while a single 1,350 horsepower compressor engine installed

at Holbrook in 1956 has the potential to emit 153 tons per year of NO_x. This is over 40 times the NO_x emitted from a modern, well-controlled engine. NO_x is a precursor to ozone and particulate matter formation, and is of particular concern in southwestern Pennsylvania since this area fails to meet federal health-based standards for these pollutants.

GASP has reviewed permits for a number of these aging transmission stations as they come up for renewal, and is working to reduce emissions from these sources. Basic air dispersion modeling indicates that NO_x emissions from many of these facilities will violate the 1-hour National Ambient Air Quality Standard (NAAQS) for NO₂ of 100 parts per billion. GASP has been successful in demonstrating this fact to permitting agencies, leading to significant changes at sources to ensure the 1-hour standard is met.

In July 2011, GASP commented on the proposed permit for the Dice Compressor Station in Plum Boro, Allegheny County. As a result of GASP's comments to the Allegheny County Health Department, Peoples Natural Gas Company has committed to removing one engine from the facility, and installing pollution control devices on the remaining two engines that will reduce NO_x emissions by more than 95%. GASP has submitted similar comments on the Holbrook Compressor Station in Greene County and the Laurel Ridge/Rager Mountain Compressor Station in Cambria County to PA DEP, which are currently under review. ♻️

Changed Landscape: Well Sites and Compressor Stations Associated with the Shale Gas Boom



Pennsylvania, July 2008
157 compressor stations, 286 unconventional wells



Pennsylvania, July 2012
355 compressor stations, 5667 unconventional wells

Note: maps do not include compressor stations located in Philadelphia or Allegheny Counties.

What's the Air Like in Your Neighborhood? CMU's Mobile Lab Investigates

by Albert Presto, Center for Atmospheric Particle Studies, Carnegie Mellon University

Many people are aware that Pittsburgh has poor air quality. A combination of local sources, regional transport, and the rugged terrain lead to high concentrations of particulate matter (PM), ozone, and other pollutants.

When Pittsburgh is characterized as having "dirty" air, it represents an average for the region as a whole. To a large extent, this is true. For example, PM concentrations in Pittsburgh have what is called a regional character—they are basically the same over a large geographical area. That's not to say that air pollution in Pittsburgh is homogenous. There are many small-scale variations in pollutant concentrations, and these small variations might drive pollutant exposures for certain parts of the population.

Have you ever wondered if the air in your neighborhood is particularly clean or dirty? Intuitively, most folks know, or at least suspect, that the concentrations of air pollutants can be higher near large industrial sources, or near major roads, than in a rural area. There's a reason why people close their car windows when driving through tunnels, after all. What we don't know is *how large* these variations in pollutant concentrations are, and *how much* they matter from a public health perspective.

Researchers at Carnegie Mellon University are taking it to the streets—literally—to answer some of these questions. With funding from the Heinz Endowments, members of CMU's Center for Atmospheric Particle Studies (CAPS) developed a mobile air quality laboratory for conducting air pollution sampling. The project is led by Drs. Allen Robinson (who conceived the mobile laboratory) and Albert Presto. Since late 2011, the mobile laboratory has been engaged in air pollution sampling throughout southwestern Pennsylvania. In Allegheny County, we are mainly focusing



Photograph of the mobile air quality laboratory sampling at a Marcellus Shale site. The tubes exiting the roof of the van are the sample lines, and the instruments are inside. The pole on the front of the van is a weather station that collects temperature and wind speed data. The Marcellus site was a newly drilled well that was flaring at the time of sampling. It is the orange flame in the background.

on concentrations of PM and compounds known as air toxics. Air toxics are trace organic compounds in the atmosphere, and many of them, such as benzene, are carcinogens. Outside of Allegheny County, especially in Washington and Greene Counties, we are focusing on the impacts of Marcellus Shale drilling.

This is the first in a series of features on the exploits of CAPS's mobile sampling efforts. In the coming months, we hope to be able to report on all of our sampling activities.

continued on page 5

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- Phipps Conservatory and Botanical Gardens
- Carnegie Science Center
- Pittsburgh Zoo & PPG Aquarium
- Heinz History Center
- Children's Museum of Pittsburgh

This article focuses on a basic topic: *Why mobile sampling?*


Much of air pollution monitoring and atmospheric science research relies on what is called ambient sampling. Essentially, that means deploying a suite of air pollution monitors in a single location and measuring pollution levels in the air that floats past the sampling site. Regulatory agencies, such as the Allegheny County Health Department (ACHD), maintain monitoring sites to determine if a region is in compliance with the EPA's National Ambient Air Quality Standards.

There are pros and cons to traditional stationary monitoring sites. A major advantage is that, in many cases, data is collected around the clock for years and years. This makes monitoring stations wonderful sources of data for looking at long-term trends in air quality. However, data collected by the monitoring network is to some extent limited by the number of monitoring sites and the type of equipment available for each site. Covering the full spatial extent of a region as large as Allegheny County with comprehensive monitoring sites can be cost prohibitive.

For example ACHD, which runs a well-developed monitoring network, operates about 15 monitoring stations. The stations are targeted at the types of pollution we might expect to find in and around Pittsburgh: industrial areas near Neville Island and in the Monongahela River Valley, traffic dominated areas in the city proper, and "regional back-

ground" sites that provide data on what pollution is arriving via long-range transport. The county network covers a broad swath of the county, but there are still regions where we have little or no data. That's where mobile sampling comes in.

With mobile sampling, we trade time spent at a specific site for the ability to sample many sites. The stationary monitoring sites play a role in mobile sampling—all of the mobile data is related back to a reference site that we maintain on CMU's campus. Instead of spending 24/7 at a small number of locations, we spend shorter times (about an hour per week) at a much larger number of locations. The idea is that by increasing spatial coverage, we can gain a view of pollution in Allegheny County that is not provided by the stationary monitors alone. We can directly probe whether certain communities have higher pollutant concentrations than others, or if there are any unexpected "hotspots" for air pollution.

Future installments in the series will discuss in more detail how we handle the data, and what the outputs of the sampling are. In brief, we are using the mobile monitoring data to build pollution maps—to take the spatial average reported when we hear about Pittsburgh's dirty air, and to turn it into concrete assessments of where the air is merely bad, where it is truly awful, and where, in some cases, it can actually be clean. 



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Pittsburgh 2030 District

Pittsburgh Government, Companies, and Organizations Are Ready to Make Big Changes

by Leslie Montgomery, Communications Director at Green Building Alliance

Big changes are coming to downtown Pittsburgh. It won't happen overnight, but by the year 2030 the downtown business district will have drastically reduced its environmental impact. The Pittsburgh 2030 District—recently launched by Green Building Alliance (GBA) and its partners—aims for 50% reductions in energy, water, and transportation emissions by 2030 for existing buildings, and even more for new ones. Pittsburgh is one of only three cities to launch a 2030 district so far, the others being Seattle and Cleveland. These districts are defined geographic boundaries committed to the 2030 challenge. This challenge was issued by the independent nonprofit group Architecture 2030, whose mission is to dramatically reduce the greenhouse gas emissions of the building sector through better design, planning, and construction.

Pittsburgh's downtown business district, part of the North Shore, and the Civic Arena site are all in our boundary for the 2030 District. So far, GBA has commitments from more than 20 property partners representing over 60 buildings, more than 23 million square feet, and 39% of the square footage in the district. This is an impressive amount

of support, particularly because it has all been gained within six months. In addition to the property owners who are committing to these reductions in their buildings, the 2030 district has many community and resource partners—including GASP—that will assist the property owners in reaching these goals. GBA is also pioneering a new goal for 2030 districts: indoor air quality.

Where do we go from here? Baselines are currently being created, bimonthly partner meetings are being held, and GBA will begin reporting overall district progress in the months to come, with annual updates in the future. Additionally, GBA just hired Pittsburgh native Sean Luther as the new Director of the Pittsburgh 2030 District. Sean, who has spent the past few years as CEO of Downtown Roanoke, Inc., in Virginia, will return to Pittsburgh to continue the success of the Pittsburgh 2030 District. GBA is proud to be part of such an exciting initiative that will keep our city competitive and healthy long into the future!

You can learn more about the Pittsburgh 2030 District by visiting www.2030district.org/pittsburgh.



Schenley Park: Our Backyard Playground

On September 2nd, GASP, in partnership with Venture Outdoors, hosted a "Healthy Air Walk" through Schenley Park. Our Pittsburgh Parks Conservancy trail guide was eager to share his knowledge about the storied history of the park and its infrastructure. The result was a 3-mile hike that proved to be very informative.

Throughout the hike, our group of adventurers was introduced to native edibles such as the black walnut and the paw paw. The paw paw was cultivated and consumed by Native Americans and was a favorite dessert of George Washington. Our trail guide also pointed out invasive plants like the Japanese knotweed and porcelain berry which threaten these native species. Learning how to differentiate between natives and invasives is essential in the fight to maintain healthy parks. Our learning progressed along the trails that wove through the park. Jewelweed garnered lots of attention, after we learned that lightly touching this plant's seed pods will trigger a natural spring-loaded mechanism that shoots the seeds several feet into the air.

As exciting as it was to witness the quirks and discover the hidden gems of nature, we were constantly reminded that the park is a shared and respected resource in our city. We came across bikers, joggers, dog-walkers, and nature enthusiasts

enjoying the perks of having a playground right in their backyard. The combination of stress relief, fitness, and fun invite a wide demographic range.

Just as the park draws together people with many varied interests, the need for clean air unites them. Exercising in a wooded area can help protect



one's body from the harmful effects of dirty air. The walk, sponsored by GASP's Athletes United for Healthy Air Campaign, brought awareness to this issue, and with continuing support can create lasting improvement in our city's air quality.

If you have not had the opportunity to join us, it's not too late. **Sign up here to register for our next hike at Riverview Park on Sunday November 4th: www.ventureoutdoors.org.**



Will Algae Oil Save Us?

by Matt Ferrer, GSPIA Intern with GASP

Think about the possibilities of unlimited crude oil. What if there were no more oil conflicts? What if there were no more escalating gas prices? As appealing as these scenarios may be, they are extremely unlikely but nevertheless, what if? Insert: algae oil.

What is algae oil? In simple terms, it is oil created from the cultivation of algae. It sounds like a crazy science fair idea from middle school. But it's real, and it could very well transform our world.

Algae oil or algae fuel could very well replace many older forms of alternative fuels, such as corn ethanol. It does not affect the food supply as does harvesting from corn and sugar cane. It has a higher yield per acre than any other alternative fuel. Most importantly, it does not rely upon rare fertile land to grow. It's actually the opposite: algae fuel power plants can be placed in arid or even non-arable land. So how does it all work?

There are different kinds of patented processes being used in the algae-to-oil conversion. Of these, the more popular process involves selecting a strain of algae that thrives in the environment it is being grown in. The algae are mixed with water rich in phosphorus, nitrogen, carbon dioxide, and other fertilizers into clear tanks, also known as bioreactors, which are then placed in the sun. The sunlight reacts with the algae to stimulate photosynthesis, creating oil lipids. Every plant goes through this process but some plants create more oil lipids than others.

Algae (more specifically microalgae) have the highest lipid content in relation to their biomass, therefore yielding more oil than other plants as seen at the right.

| Crop | Oil yield (lb/ha) |
|-----------------------------|-------------------|
| Corn | 172 |
| Soybean | 446 |
| Peanut | 1,059 |
| Canola | 1,190 |
| Rapeseed | 1,190 |
| Jatropha | 1,892 |
| Karrija (Pongamia pinnata) | 2,590 |
| Coconut | 2,689 |
| Oil palm | 5,950 |
| Microalgae (70% oil by wt.) | 136,900 |
| Microalgae (30% oil by wt.) | 58,700 |

After the algae have gone through the final step of creating lipids, they are refined through mechanical or chemical methods resulting in two by-products: algae paste, which can be used as animal feed, and the precious black gold we call oil.

The possibilities of this new green fuel are enormous. However, there are some drawbacks that critics believe will hinder its development. The cost of infrastructure, such as bioreactors and refining stations, is still very high. Startup capital demands can be prohibitive. Other arguments cite high water consumption and carbon emissions. To counter these criticisms, many algae plants are substituting potable water with waste water found in retention pools or sewage plants. The carbon issue can be quelled by building algae oil production plants near carbon emitting sources such as a mill

or coal plant. As mentioned earlier, algae feed off carbon dioxide. What better way to mitigate carbon emissions than by using leftover emissions for the creation of biofuel! Locating an algae power plant near a carbon producing source such as coal plant is both feasible and attractive. In fact, a coal-fired power plant in Australia has successfully used algae bioreactors to capture a percentage of its carbon emissions.

Many governments, including our own, are already investing millions of dollars into research and development for this emerging industry. Millions of people know about its benefits but billions more do not. It is time to give algae oil the attention it deserves. It has the potential to help us meet energy needs, decrease foreign oil dependence, and improve our nation's energy security. Every great idea needs investment and time to mature. This is an investment worth keeping your eyes on.



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Get Involved: Use the SENSr app for clean air




SENSr is a tool to create, share and manage a citizen science project running on mobile devices to harness the power of citizen scientists. Download the SENSr app on your smartphone to help GASP find and fix the dirty diesel vehicles polluting our neighborhoods! Take a photo of a smoking diesel and try to note the company, vehicle number, license number, or any other information that can help us identify the owner. We'll find who and where the worst offenders are, and follow up to clean them up. Read more about this project on the front page.

Cyclists and Smartphone Users Gather Air Quality Data continued from page 1

at Carnegie Mellon University (CMU). Sunyoung Kim, a Ph.D candidate in Human-Computer Interaction Institute at CMU who developed the SENSr app, explains "as researchers and social activists, we explore ways to promote grassroots efforts and activism through technology. SENSr particularly focuses on lowering technical barriers for citizen science to easily make use of mobile and computing technologies. We hope that our efforts can help foster grassroots participation for our everyday life, health, and well-being."

For more information and to participate, download the SENSr app and choose "Dirty Diesels." You can also view the project and other citizen science projects at www.sensr.org.

These two programs allow concerned citizens to directly participate in making a difference in Pittsburgh. They're easy and fun to use, and don't require a big time commitment. A few minutes pushing a few buttons helps us better quantify our diesel problem. The more ways for citizens to have a say in their communities, the better. Don't just accept dirty air. 

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