PXVNEO
PHOENIXVILLE NEW ENERGY OPTIMIZATION

BOROUGH OF PHOENIXVILLE
351 Bridge Street, Phoenixville, PA 19460
P: (610) 933-1208 **Phoenixville.org**

HIGH ON BENEFITS, PXVNEO IMPROVES BOROUGH ECOLOGY

Phoenixville, PA's Hydrothermal Carbonization Plant Kills COVID and More

PHOENIXVILLE, PA—APRIL 5, 2022— In February, the Borough of Phoenixville announced a revolutionary upgrade to the town's wastewater treatment plant that made national news.

The hydrothermal carbonization system that is currently being installed will eventually replace the less desirable anaerobic digestion method of treating Borough wastewater. Phoenixville will become the very first municipality in North America to install a hydrothermal carbonization system and, it turns out, a lot of others are waiting to see the results.

Hydrothermal carbonization is a closed system that uses heat and pressure to transform wastewater into clean water and—depending upon the sophistication of the system and the "bolt on" upgrades it includes—several beneficial byproducts or, as the designer of the system likes to call them, "bioproducts."

Dan Spracklin, Founder and CEO of SOMAX Circular Solutions, proposed the advanced system to Phoenixville Borough Council and is coordinating installation of the system that Phoenixville branded **PXV**NEO. Spracklin, whose Spring City, PA business has already won an award from the U.S. Department of Energy, is a walking wealth of information regarding the process and municipal waste treatment in general.

COVID KILLER

"One of the most immediate benefits that the Borough of Phoenixville is likely to promote is the eradication of bacteria and viruses that are harmful to humans," says Spracklin. "All viruses essentially start to die without a host; when they leave the human body and are found in wastewater they're reaching their end but the combination of heat, pressure and time in the HTC system assures eradication."

Conversely, anaerobic digestion is biological, creating an environment that can incubate viruses and bacteria by mimicking conditions found in the stomach. **PXV**NEO will operate HTC at 375º F killing all pathogens as well as many other undesirable inclusions typically found in the end of the waste stream.

Measuring contaminants at Phoenixville's wastewater treatment plant headwaters is something that can and will be done regardless of the type of treatment system employed downstream.

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By measuring SARS-CoV-2 levels in untreated wastewater over time, public health officials can determine if infections are increasing or decreasing in a sewershed.

Wastewater surveillance can be an early indicator that the number of people with COVID-19 in the Phoenixville community is increasing or decreasing.

BETTER FARMING THROUGH HTC

There are essentially three options for the end-product of a municipal waste stream: contribute to a landfill, incinerate, or apply it to land.

Landfills are the worst choice, as space is finite, and waste takes hundreds of years to break down emitting CO2 while it does. Similarly, incineration contributes negatively to the atmosphere creating noxious airborne emissions including NOx, SOx, particulates, and smog.

Since the 1940s, when waste was cleaner, 60% of all waste has been applied to agricultural land as a fertilizer. Most states have laws that waste byproducts can only be applied to land that grows feed for livestock but, we are learning, even that can be harmful.

Today's waste byproduct largely contains many harmful contaminants including heavy metals, pharmaceuticals, microplastics, and forever chemicals. Forever chemicals, PFAS, and PFOA include more than 3000 different chemicals.

"In Maine," Spracklin relates, "Five major dairies were forced to shut down when the EPA discovered 500 times the legal limit of PFAS and all five had applied biosolids to their livestock feed fields for decades."

As a result, Maine, New Hampshire and Vermont have restricted the application of biosolids and, Spracklin predicts, in 15-20 years there will be no more land application of waste anywhere in the U.S. due to its negative effects on the environment.

PXVNEO reduces PFAS compounds from long chain to shorter chain compounds, which are then either completely destroyed In the energy generation process, or rendered Inert when embedded In concrete or asphalt.

Additionally, hydrothermal carbonization systems like **PXV**NEO can yield bioproducts that include contaminant free organic fertilizers like nitrogen and phosphorus, both essential to farming.

ENHANCING ECOLOGY

It's not only agricultural application negatively affecting our ecology, but also what comes from homes and businesses as waste.

"Land application is producing glasses of milk containing antidepressants because pharmaceuticals are not being effectively removed during the waste treatment process, says Spracklin. "Current technologies are ineffective at removing pharmaceuticals, and the human body only absorbs a small percentage of the medicines it ingests."

Since the dawn of civilization communities have evolved along rivers and, as industry and populations grew, so have pollutants and today, every time a load of laundry is done synthetic microfibers are released.

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> **Hydrocarbon thermalization is proven to eradicate all viruses, bacteria and pharmaceuticals, destroy 79% of all microplastics, and make harmful heavy metals inert.**

“There are species of fish in the Schuylkill River testing positive for endocrine disruptors,” says Spracklin.

Hydrocarbon thermalization is proven to eradicate all viruses, bacteria and pharmaceuticals, destroy 79% of all microplastics, and make harmful heavy metals inert.

The great news for the citizens of the Borough of Phoenixville, surrounding communities and the environment at large, is that Phoenixville’s forthcoming hydrothermal carbonization system, **PXV**NEO, will eradicate nearly any bad actor anywhere in the incoming feedstock.

PXVNEO FAST FACTS

Exceptional Technological Advantages
- Yields pathogen-free, sanitary bioproducts
- Antibiotic and pharmaceuticals destruction
- Elimination of PFAS/PFOAS (Forever Chemicals)

Efficient Energy Recovery
- Generates 10X more electrical energy than it consumes
- Creates 153% of electrical demand of WWTP operations
- Generates over 100% of thermal demand of HTC process

Industry Leading Carbon Efficiency
- Carbon Efficiency of 90%
- Increases energy density of blended feedstock by 46.5%
- Lowest GHG emissions of any biomass conversion process

Barrier Breaking Innovations
- Increases handling capacity by 10X in same plant size
- Polymer free dewatering of Biocoal over 50% TS
- Offers new pathways for nutrient recovery

For more information and to follow the progress of PXVNEO **please visit, www.phoenixville.org/pxvneo**

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A project of Phoenixville Borough Public Works.