

March 25, 2025 – Town of Brunswick Q&A

Viridi Energy appreciates the discussion with the Town Council and the Brunswick community about our proposed biosolids processing facility at the Council's January workshop meeting. As part of that discussion, Viridi agreed to provide additional information about the project.

Executive Summary:

Viridi Energy's biosolids processing facility, located in Brunswick, ME, will provide environmental solutions, boost renewable energy and deliver economic advantages to the Town of Brunswick. The proposed project is an anaerobic digester system that will convert biosolids into renewable natural gas (RNG), deliver carbon-neutral fuel to the Maine market, significantly improve Maine's management of biosolids, and produce electricity.

In response to feedback received from the Town Council workshop in January, Viridi will be installing a wastewater filtration system at the renewable energy facility to virtually eliminate PFAS in water that is discharged to the Brunswick Sewer District. The wastewater stream will pass through an activated carbon filter (potentially supplemented by an ion exchange resin) that virtually eliminates any residual PFAS. The renewable energy facility will not add PFAS risk to the Brunswick Landing or broader Brunswick community in any material respect.

The facility will also generate renewable natural gas (RNG) and electricity, which reduces Brunswick's reliance on carbon-emitting fuels. Additionally, the project will drive economic growth through job creation, increased tax revenue, and lower wastewater treatment costs, making it a beneficial project for both the community and the environment.

Brunswick Clean Well Water Fund:

In addition to our renewable project, Viridi proposes to serve as an anchor donor to create a new community benefit fund for the purpose of helping Brunswick residents remove PFAS from local water wells. Funds could be used for installing residential filtration systems, testing and monitoring local wells for PFAS contamination, and connections to the public water system. The Town of Brunswick will have full discretion over the fund and will oversee its mission and its disbursement. Viridi is also committed to partnering with other local organizations and governing bodies to contribute to this fund. This initiative recognizes the commitment of the people of Brunswick to create a safer and more environmentally sustainable community. Viridi seeks to support those efforts.

Questions from the 1/29/25 Town Council Workshop

Will the digestion process destroy PFAS in the biosolids? If not, is that a future consideration?

The Town of Brunswick will deliver biosolids containing PFAS to the facility, yet the wastewater discharged back to Brunswick's sewer district will have travelled through highly effective PFAS filtration. This project alleviates PFAS levels for the Town of Brunswick and Brunswick Sewer District.

Viridi's facility isolates nearly all of the PFAS into the solid fraction of the residual product. The dried solids are more easily contained and transported to a landfill for safe disposal. The reduction in liquid volume makes this a sustainable solution for the biosolids in the region and a beneficial product for neighboring landfills.

The project will include an evaporator, followed by a lead-lag carbon bed system which removes a substantial amount of the PFAS from the wastewater stream. The wastewater product will be significantly reduced of PFAS.

Viridi continues to evaluate multiple engineered systems that will achieve the most effective PFAS removal for the project. We have not yet determined the final solution that will best serve the town and the project. Based on the precedence of success at other projects, the following processes will deliver a solution that substantially reduces PFAS volumes.

The following solutions are being considered, and are being evaluated:

- 1) Activated Carbon Filtration – NORIT and United Rentals
 - a) Technology Description: Fixed carbon media beds in a lead-lag vessel configuration
 - b) Multiple locations in the US are effectively utilizing this system design to treat and reduce PFAS both in industrial applications and water remediation
 - i) Project 1: located in Hyannis, MA
 - (1) Project Owner: Town of Barnstable DPW
 - (2) Project Size: 2.88 MM GPD
 - ii) Project 2: located in Spokane, WA
 - (1) Project Owner: US Airforce
 - (2) Project Size: 2.16 MM GPD
 - iii) Both projects above have successfully demonstrated significant PFAS (PFOA & PFOS) reduction in wastewater streams
 - 2) Activated Carbon in addition to Ion Exchange Resin
 - a) Technology Description: Activated Carbon followed by an ion exchange resin. Ion exchange resins have extended PFAS removal performance and lifetimes compared to traditional activated carbon. Viridi is gathering industry references for this media selection.
 - b) Multiple wastewater treatment plants in the US with high effluent discharge flows and PFAS concentrations are using this system.

Each PFAS filtration system requires an evaluation of appropriate residence times, pressures, as well as potential contaminant interference with the selected media. Viridi is conducting a thorough evaluation of all options to treat the wastewater stream.

Biosolids contain PFAS. Does any aspect of the operation pose a public health risk in the form of air or water quality to residents in and around Brunswick Landing?

No, neither the project nor its operations pose a health risk to residents or to air or water quality in and around the Town of Brunswick. Anaerobic digestion, liquid solid separation, and drying provide a combined solution to isolating and properly managing PFAS disposal, including approximately 10x reduction in the amount of material being disposed of. The current solution of raw biosolids being disposed of in landfills is unsustainable and needs a permanent solution that anaerobic digestion offers. Nearly all the PFAS will be collected into the dried digestate and transported to the landfill. The remaining wastewater will travel through a highly effective PFAS filter. Viridi's state-of-the-art facility is part of the PFAS solution.

As it relates to Air pollution, PFAS does not readily evaporate from solids during transport, so there is no material airborne PFAS risk from truck traffic. If any PFAS enters the biogas stream, it is removed by carbon filtration during the biogas upgrading process.

Will independent monitoring of the facility be done? How will you monitor PFAS incoming and leaving the facility?

Yes. The facility will be subject to independent monitoring, and Viridi will participate in the required monitoring by the relevant regulatory agencies:

- **Stormwater and Air Emissions:** Monitoring will be conducted and reported as required by the facility's stormwater discharge and air emission permits from the Maine Department of Environmental Protection.
- **Wastewater Discharge:** Monitoring will be conducted and reported by the facility's industrial user permit from the Brunswick Sewer District.

Viridi will proactively monitor PFAS levels through various methods:

1. Pre-qualify all biosolids material suppliers based on PFAS and other contamination criteria.
2. Conduct regular periodic sampling of wastewater discharge to Brunswick Sewer District to confirm the level of PFAS

Is there enough feedstock generated in Maine to support the operation at maximum efficiency? If not, what is Viridi's plan to source adequate amounts of material?

Yes, there is enough feedstock in Maine for the facility to operate at maximum efficiency. Our major biosolids supplier manages biosolids in the State of Maine approximately equal to the plant's capacity.

How many tons of biosolids will the facility process annually? On average, how many tons does each truck transport to, and from, the facility?

The facility has the capacity to process 85,000 tons of biosolids per year. Our major biosolids supplier manages biosolids in the State of Maine approximately equal to the plant's capacity. Each truck will deliver up to a maximum of 30 tons per visit and will leave the biosolids load completely at the site. The truck that delivers the biosolids will leave empty after being cleaned in the fully enclosed reception area.

What are the environmental benefits of this project for the town, the state, and the region?

This project provides several major environmental benefits for the town, the state, and the region.

New Source of Renewable Energy: First and foremost, the facility will inject renewable natural gas (RNG) into the Maine Natural Gas network – reducing reliance on fossil-derived natural gas. RNG has achieved global recognition as an immediate “drop in” solution that can substantially reduce the need for future drilling or fracking to capture fossilized natural gas.

Sustainably Transforming Existing Waste into Energy for Local Use: The facility is designed to generate renewable energy out of an existing waste product, placing it at the forefront of our industry's growing focus on sustainably transforming waste to energy. The RNG and electricity produced at this site can be used locally.

Increased Landfill Capacity: And finally, the facility's anaerobic digestion process will decrease the volume of biosolids waste sent to Juniper Ridge Landfill. It will help extend landfill capacity, while reducing the use of out-of-state bulking agents that are required in landfilling wastewater biosolids not treated through anaerobic digestion.

Reduce PFAS levels at Brunswick: The facility will collect nearly all the PFAS into dried digestate for transportation to a landfill. The remaining wastewater will pass through filtration to virtually eliminate PFAS levels before returning water to the Brunswick Sewer District. Additionally, the establishment of a fund to help Brunswick residents install residential filtration systems or connect residents to public water, as well as test and monitor local wells, will further reduce PFAS contamination.

How will this facility contribute economically to the town?

This facility will provide economic benefits to the town in several ways.

Tax & Revenue Benefits: The project will generate meaningful property tax revenue (estimated to be \$500,000+) contributing directly to Brunswick's economy. It will generate additional revenue for Brunswick Sewer District of approximately \$200,000 annually.

Reduced Sewer District Costs: The plant will provide a local outlet for the Brunswick Sewer District for the biosolids generated by Brunswick residents that the District currently pays to transport to Juniper Ridge Landfill in Old Town. Viridi's processing of those biosolids will significantly reduce current tipping fees and transportation costs.

Local Hiring and Contracts: Viridi has already partnered with local contractors for engineering, surveying, and mechanical work. Once operational, the facility will continue to utilize local businesses for maintenance and operations. Viridi will continue to increase the use of local labor and professional services if the project is approved. Some of the local contractors already involved include:

- Excel Mechanical – onsite work
- Newtility – electrical support
- Sitelines, PA – survey work
- Sebago Technics – civil engineering work
- R.W. Gillespie – geotechnical work

During construction, the project will rely heavily on local civil, electrical, and mechanical contractors. Once operational, the facility will continue to use local businesses for ongoing support and maintenance.

What type of new local jobs will this project create, how many jobs? Will employees be hired locally or brought in from other facilities?

In addition to numerous local contractors needed for construction and ongoing maintenance of the facility, the project is expected to create five high-paying permanent operations jobs. Employees will be hired locally, with experienced staff from other Viridi facilities providing training on the facility's technology.

Will the production of renewable natural gas benefit the town? If so, how is that determined?

Yes, the renewable natural gas (RNG) produced at the facility will be injected into the Maine Natural Gas network, which serves Brunswick and surrounding communities. This will help reduce dependence on fossil fuels, while sustainably transforming an existing waste product into a renewable source of energy for local use. Additionally, surplus electricity generated by the facility will be supplied to the Midcoast Regional Redevelopment Authority (MRRA), supporting regional energy needs.

What federal and state permits are required for the facility and does Viridi already have them?

Viridi Energy is complying with all applicable state and federal regulations and permitting requirements. At the state level, this includes the following:

- Air Permit Amendment has been filed with the Maine DEP and is in-process.
- Solid Waste Amendment is ready and will be submitted to the Maine DEP after our application for the Contract Zone Permit is submitted to the Town of Brunswick.
- Maine Multi-Sector Stormwater Permit will be submitted to the Maine DEP once the Contract Zone

approval is received.

Does Viridi have financing secured for the project?

Yes. Viridi has secured financing through its long-term financial backer, Warburg Pincus, a leading global growth investor. The firm has committed to funding the Brunswick digester project through a combination of equity and debt financing.

Will Viridi be able to operate at a profit if the town sets a limit on the amount of tons it can receive?

Viridi's plant expansion will require 85,000 tons annually to operate profitably. A lower tonnage limit would negatively impact the facility's economic viability. Viridi has no plans to expand the plant's capacity beyond 85,000 tons in annual volume for which it is designed.

What is the proposed/preferred transportation route through Brunswick Landing to the facility?

Viridi's proposed truck route primarily passes through commercial areas and does not require travel through residential neighborhoods, as we are highly attentive to residents' questions about truck traffic. The preferred route from U.S. Route 1 is to enter Brunswick Landing off of Admiral Fitch Avenue to Allagash Drive to Katahdin Drive. Upgrades to Allagash Drive are expected to be completed before the facility begins operations and would thus be utilized. Any new roads or routes developed in the future may be utilized, if the Town Council or other community leadership deem that they would improve traffic flow.

Viridi has indicated that there will be approximately 10 trucks per day coming to the facility - will those trucks be leaving the facility on the same day? Will there be any weekend truck traffic?

All trucks will leave the facility the same day they enter, after unloading. Unloading typically takes less than one hour. There may be limited truck traffic on Saturday mornings to maintain the plant's weekly schedule. There will be no biosolid truck traffic on Sundays.

Can Viridi guarantee that the trucks transporting the biosolids will not have foul odors? What steps will Viridi and/or Casella take to ensure that truck odor is not an issue?

Viridi understands the importance of odor control, and thus we have embedded such controls through the facility's design and planning. Odor mitigation is of utmost importance. We contractually require our haulers to use odor mitigation and containment techniques on all trailers and equipment. If any inbound truck is found to have excessive odors, Viridi has penalties it can apply against the supplier. Additionally, all incoming material will be handled inside a fully enclosed receiving bay, which is designed to contain the offloading odors. Viridi is taking extra steps and spending the incremental capital to fully enclose this process and to prevent any odor from leaving the site. After unloading, trucks will be cleaned and then leave the facility empty.

How will Viridi guarantee that the facility operations do not create odors?

Viridi has designed the facility to minimize odors through a series of control measures, and we enforce strict odor mitigation requirements for all transportation partners. Our permits with Maine DEP and our lease contain explicit requirements for controlling odors.

At other facilities with similar requirements, such as Lystek's facility in Ontario, Canada and BioConstruct facilities in the UK (both subcontractors for the Brunswick project), these control measures have successfully prevented odor issues. Our odor control measures include the following:

1. All equipment is housed indoors. If the RNG processing system is offline, biogas will be flared to control emissions and odors.

2. Trucks unload in a fully enclosed receiving bay and are washed down before exiting.
3. Truck staging will be coordinated through a logistics partner to minimize traffic and reduce potential odor concerns.
4. All building vents are routed through a dryer, then a chemical scrubber, to remove ammonia and VOCs from the air, with final remediation conducted through four vertical biofilters.
5. Residuals, which are solid byproducts from post-digestion and drying, are stored in an enclosed building and removed daily. These materials do not produce significant odors.

Similar to our other facilities, we will continuously evaluate performance and adjust protocols as needed.

What happens to the RNG and the electricity that you create?

The renewable natural gas (RNG) generated at the facility will be injected into the Maine Natural Gas system. Any surplus electricity is transmitted to the Midcoast Regional Redevelopment Authority (MRRA). As a result, the Brunswick community is supplied with additional locally produced renewable energy.

Does Viridi have an agreement in place with Maine Natural Gas? If so, is there a limit on how much they are willing to purchase?

Yes, Viridi has an agreement in place with Maine Natural Gas. There is no contractual limit on how much the utility will purchase, and facility flow analysis shows no capacity concerns. Maine Natural Gas has substantial demand beyond the supply that the project can provide.

After processing, where will the residual biosolids be transported for disposal?

The dried residual biosolids will be disposed of in appropriately certified landfills in the region including and most likely, Juniper Ridge Landfill in Old Town, ME.

Is Viridi only using biosolids from sewer treatment plants, or will they be able to accept other organic waste such as food waste?

The facility is currently designed to process biosolids from wastewater treatment plants. If the town is interested in incorporating other organic waste, such as food waste, Viridi is open to discussing. Currently, Viridi is building one of the largest and most sophisticated food waste-to-energy projects in the country, launching this year in Yaphank, NY to handle food waste from around the NYC metro area.

How does the proposed size of the digester compare to similar facilities operating in Maine, in New England, and in the US?

The proposed Brunswick digester is comparable in size compared to similar facilities in the Northeast and the United States.

1. **Maine:** The only other biosolids digester in the state, located in Lewiston-Auburn, has a 1.4 million gallon capacity – about half the size of the proposed Brunswick facility.
2. **New England:** Rhode Island's organics digester processes 100,000 tons of waste per year, slightly larger than Brunswick's planned capacity of 85,000 tons per year.
3. **U.S.:** Most digester plants operate with 2 to 4 digesters, and the Brunswick facility aligns with the scale of similar operations handling organic material.

Aside from the existing infrastructure of the former Village Green biodigester, what makes the Brunswick Landing location appropriate for this type of facility?

The Brunswick Landing location is well suited for this facility thanks to several factors:

- **Truck Route Considerations:** The proposed truck route primarily passes through commercial areas and does not require travel through residential neighborhoods.
- **Industrial Zoning:** The facility is located in the Growth Aviation zone, adjacent to Growth Industrial, both of which are appropriate zoning classifications for this type of operation.
- **Wastewater Treatment Capacity:** The Brunswick Sewer District (BSD) has the necessary capacity, interest, and infrastructure to properly treat wastewater discharged from the facility.
- **Energy Use and Infrastructure:** The Landing has a growing housing development that can utilize the exported electricity, along with an existing natural gas pipeline for RNG injection.
- **Expertise:** Governmental, environmental and commercial parties with relevant knowledge and working to solve the biosolids issues agree that Brunswick is an ideal location for an anaerobic digester.

These factors, combined with the existing infrastructure of the former Village Green biodigester, make Brunswick Landing an effective and appropriate location for this facility.

If the dryer and digester are shut down, what happens to the plant - where do the solids go?

If the plant cannot accept solids for a temporary period, Juniper Ridge Landfill, or other certified landfills in the region, would accept the material on an interim basis. The digester will continue operating and producing biogas, but material will not move through to the dryer until operations resume.

What does Viridi have to counteract a truck spill?

Viridi and its supplier have a long operating safety record and do not anticipate any spills. In the unlikely event of an accident, the project has plans and safeguards in place:

- **Prevention and Training:** Our transportation provider operates a large fleet and follows a detailed spill prevention and control plan. All drivers and operators are trained in spill prevention and response.
- **Cleanup and Containment:** In the unlikely event of a spill, our transportation partner has the necessary resources to quickly contain and clean up any spilled materials. Trained personnel and specialized cleanup equipment will be deployed immediately.
- **Material Properties:** The biosolids being transported are mostly solid and do not easily spread into groundwater, greatly reducing the risk of contamination. This makes containment and cleanup more manageable and more effective in the event a spill does occur.

Can you share facilities that use this technology that aren't at a WWTP?

Other non-wastewater treatment facilities using similar technology include:

- Hawk Ridge: Unity, Maine – composting and drying
- Synagro: Quincy, Massachusetts - drying
- Lystek Facility: Southgate, Ontario, Canada – thermal hydrolysis and storage
- Bioconstruct Facility: Roscommon, Ireland – anaerobic digestion
- Various other facilities in Europe operated by project partner Bioconstruct (<https://www.bioconstruct.com/references/>) – anaerobic digestion

What is the sequence of discrete processing operations anticipated at the facility? What exactly

happens at each stage of the process? What happens during these stages, specifically?

Please see below for a step-by-step sequence of operations at the facility:

- a. **Feedstock Receiving Hopper and Pumps** – Raw material is unloaded from trucks in a fully enclosed bay and pumped into the main anaerobic digester.
- b. **Primary Digester** – Biosolids are mixed with water and held for approximately 30 days, producing biogas and digestate. The digestate is then sent to the secondary digester.
- c. **Thermal Hydrolysis Process** – A portion of the primary digester material is treated with steam and sodium hydroxide (NaOH) to improve digestibility and volatile solids (VS) destruction. This treated material is mixed with raw biosolids to aid pumping into the main digester.
- d. **Secondary Digester** – Holds digestate for an additional 10 days, enhancing biogas production before the material moves to the next stage.
- e. **Volute Press** – Separates the digestate into two streams: solids, which go to the dryer, and liquids, which go to the evaporator.
- f. **Solids Dryer** – Uses heat and air from plant processes to increase solids concentration from 20% to approximately 90%, reducing overall volume for disposal.
- g. **Evaporator** – Uses steam to distill liquid from the volute press, producing a clean water stream for discharge to the Brunswick Sewer District and a concentrate stream, which is mixed with solids before drying.
- h. **RNG Upgrading Equipment** – Cleans and processes raw biogas from the digesters to meet pipeline-quality standards for injection into the Maine Natural Gas system.
- i. **Combined Heat and Power (CHP) Units** – Generate 2.125 MW of electricity using natural gas. Waste heat from the exhaust and cooling system is used to heat the dryer and digesters.
- j. **Steam Boiler** – Produces steam from natural gas for use in the thermal hydrolysis process and evaporator. It also generates hot water for the dryer and digesters.
- k. **Chemical Scrubber and Odor Control** – Collects building air through negative pressure, routes it through the dryer, and scrubs it with sulfuric acid to remove ammonia and VOCs before releasing it.

What are the inputs [e.g., WWTP sludge, additional feed water, anaerobic digestate, dried anaerobic digestate] and outputs [e.g., methane, wastewater (to Brunswick Sewer District), digestate, dried digestate, air emissions, biochar] of every processing stage?

- a. Feedstock Receiving Hopper and Pumps
 - Inputs - Wastewater treatment plant sludge and feed water
 - Output - Combined sludge to anaerobic digestion

- b. Primary Digester
 - Inputs - Sludge from feedstock receiving; THP sludge
 - Outputs - Biogas and digestate
- c. Thermal Hydrolysis Process
 - Input - Raw sludge
 - Output - Hydrolyzed sludge for recycling
- d. Secondary Digester
 - Input - Primary digester digestate
 - Output - Biogas and digestate
- e. Volute Press
 - Input - Secondary digester digestate
 - Outputs - Solids to dryer and effluent to evaporator
- f. Solids Dryer
 - Inputs - Solids from the volute press, concentrate from evaporator, heat from CHPs and steam boiler, air from process areas
 - Outputs - Dried solids to truck load out and air to chemical scrubber
- g. Evaporator
 - Inputs - Effluent from volute press, steam from steam boiler, waste from chemical scrubber
 - Outputs - Clean water stream to BSD or recycled; concentrate to solids dryer
- h. RNG Upgrading Equipment
 - Input - Biogas
 - Outputs - Natural gas, CO2, condensate to recycle
- i. Combined Heat and Power Units
 - Input - Natural gas
 - Outputs - Electricity and hot water
- j. Steam boiler
 - Inputs - Natural gas and clean water
 - Output - Steam
- k. Chemical Scrubber and Odor Control
 - Inputs - Air from dryer and process areas, sulfuric acid
 - Outputs - Clean air stream to biofilter, condensate stream to evaporator

Can you provide a mass balance analysis of every material [and important hazardous material or other compound, such as PFOS, PFOA, and other PFAS constituent chemicals], at every stage of this process?

The digestion process does not alter or destroy PFAS or any constituent chemicals. However, through the process it does concentrate, collect and isolate these chemicals to the dried solid digestate. A mass balance of every material at every stage of the process requires extensive third-party work and reports which are not yet finalized. We will provide this information when it is complete.

Are there Federal EPA approved methodologies supporting the mass balance calculations and testing of the various outputs at every stage of the process?

Yes, there are EPA-approved methodologies for certain aspects of the process. EPA methodologies support emissions calculations for the CHP units, flare, and steam boiler. Viridi used these methodologies to establish air permit limits with the Maine DEP.

What [if any] comparable facilities are operating in North America?

There are approximately 1,200 wastewater treatment plant digesters operating in North America that process biosolids. The Lystek facility in Southgate, Ontario, is the most comparable, as it also receives biosolids from multiple wastewater treatment plants via trucking. The facility has been in operation for 10 years and has received provincial awards for biosolids management.

What [if any] comparable facilities have Viridi engineered, constructed, and operated to date?

A comparable facility is Viridi's American Organic Energy (AOE) project in Yaphank, New York, which will process food waste from the NYC metro area beginning in third quarter of 2025. It is one of the largest food digesters in the country. With respect to Viridi's Brunswick RNG digester, the AOE facility features similar logistics considerations in managing feedstocks, similar odor control systems and methodologies, and similar trucking and routing coordination.

Specific to the pyrolysis process, can you explain this in detail and the chemistry associated with it? Is this technology operational at any location in North America at the scale you intend for the proposed project?

Viridi will not use pyrolysis for the proposed project, as this technology is not yet widely adopted in the biosolids industry. If future regulations or requirements mandate PFAS destruction in dried solids, pyrolysis could be considered in a later phase. However, it is not part of the current facility design. Viridi has the ability to add this later as technology develops and welcomes the potential for innovation.

What Maine DEP permits will be required? What is the status of these?

The facility requires two Maine DEP permits: An Air Permit Amendment that is currently in process, and a Solid Waste Permit Amendment that Viridi is ready to submit. Viridi has active and productive dialogue with Maine DEP.

How is Viridi capitalized? Who are its owners? How would the proposed project be financed and managed?

Viridi has a \$320 million equity commitment from its owner, Warburg Pincus, a leading global growth investor. A combination of equity and debt financing will be used to fund the project.

What are the technological, environmental, and economic risks associated with this project for Brunswick and the State of Maine? Are there potential compensating benefits?

- Technological risks are minimal. All selected technologies are proven industrial systems that are already in use at other wastewater treatment and biogas upgrading facilities.
- Primary environmental risks have been addressed through facility design, transport protocols, permitting and due diligence by Viridi and all project partners. Namely, biosolids handling will be fully enclosed to control odors and prevent potential environmental impacts, and transport trucks are designed to contain odors and spills.
- There is no economic risk to the town or state. The project is fully self-financed by Viridi, requiring no public funding or financial support. The project will carry sufficient liability and property insurance to cover environmental and operational risks.