



TOWN OF OLD SAYBROOK

Certificate of Zoning Compliance

Date Received: _____

Building Permit: Yes No

Application No.: _____

Application Fee: _____

APPLICANT INFORMATION

Applicant's Name: <u>William Hessert</u>	Telephone No.: <u>(203) 984- 3223</u>
Address: <u>19 Townwoods Rd. Ivoryton, CT 06442</u>	E-Mail Address: <u>will.hessert@bluskycarbon.com</u>
Owner's Name: <u>Jill Coan of Stark Properties LLC</u>	Telephone No.: <u>(860) 227- 2858</u>
Address: <u>390 Meadowlark Lane Ext. Westbrook, CT 06498</u>	

PROPERTY INFORMATION

Property Address: <u>175-5 Elm Street (35 Research Parkway)</u>	Subdivision: <u>Elm Industrial Park</u>
Assessor's Map: <u>039</u> Lot: <u>005</u>	Zoning District(s): <u>I-1</u>
Lot Size (s.f.): <u>128937.6</u> <input type="checkbox"/> Corner lot	Street Width: <u>50 feet</u>

LOGATION INFORMATION

Water supply: <input checked="" type="checkbox"/> Public (CWC) <input checked="" type="checkbox"/> Private Well	<input checked="" type="checkbox"/> Coastal Area Management (CAM) Zone
<input checked="" type="checkbox"/> Special Flood Hazard Area (SFHA) Flood zone: <u>AE9</u>	<input checked="" type="checkbox"/> Inland wetlands or watercourse within 100' IWWC Permit No.: <u>24-005</u>
<input type="checkbox"/> CT River Gateway Conservation (GC) Zone	<input type="checkbox"/> Tidal wetlands within 50'
<input type="checkbox"/> Aquifer Protection Area (APA) Zone - Level A	<input type="checkbox"/> Historic District (HD)

PROJECT INFORMATION

Existing Use & Structures (i.e.: describe height, square footage of each floor and accessory structures):
 Wall height is 18 feet, the square footage of the first floor is 24,634 and second floor is 6,640. The existing use is manufacturing.

Proposed Use & Structures (i.e.: describe project including height, additions, s.f. of each floor & accessory structures):
 See Attached Statement of Use

I acknowledge that it is the owner's/agent's responsibility to conform to the Old Saybrook Zoning Regulations, including Section 72.7.6 Measurements & Certifications, which requires the applicant to furnish a plot plan, site plan or A-2 survey if applicable, certified by a licensed surveyor licensed to practice in the State of CT, showing the location of and setback distances for buildings/structures on the lot "as built", prior to the issuance of a Certificate of Zoning Compliance by the Zoning Enforcement Officer.

William Hessert, Applicant/Agent Date: 2024-04-26

REQUIRED REVIEWS

SEPTIC SYSTEM/WATER SUPPLY by Connecticut River Area Health District (CRAHD) Approved by: _____ Date: _____
FLOOD AREA HAZARD PERMIT <input type="checkbox"/> Not Req'd Approved by: _____ Date: _____ Permit No.: _____
COASTAL SITE PLAN <input type="checkbox"/> Exempt Approved by: _____ Date: _____
Application for CERTIFICATE OF ZONING COMPLIANCE per Sections: _____ <input checked="" type="checkbox"/> Approved <input type="checkbox"/> Denied Zoning Enforcement Officer: _____ Date: _____

Certificate of Zoning Compliance

I certify that I have examined the uses and structures established by this application and find them to meet the requirements of the Old Saybrook Zoning Regulations.

_____, Zoning Enforcement Officer Date: _____



**Blusky
Statement of Use
35 Research Parkway**

Item	Value
Business Name	Bluski inc.
Business Address	35 Research Parkway
Type of Business	Light Manufacturing
Days and Hours of Operation	24/7
Number of Parking Spaces	66 (to be lowered)
Employees at Peak Hours (9-5)	Less than 40 (likely 25-35)
Employees at Off Peak Hours	Less than 10
Number of Customers at Peak Hours (9-5)	Less than 5
Number of Customers at Off Peak Hours	0
Use of Hazardous Substances	None
Outdoor Seating or Display Areas	None

Blusky will be operating a biochar production facility at 35 Research Parkway. The facility will implement multiple operational processes that will maximize the beneficial environmental impact of the company while minimizing disruption to the Old Saybrook community. These are the following components of Blusky's operations at 35 Research:

Wood Waste Collection

Local municipalities and tree service companies will deliver their natural, untreated wood waste to a collection facility in Middletown. At this facility, the waste wood is inspected to remove contaminants and to ensure 100% of the wood is untreated (e.g. not construction waste). If a supplier provides contaminants repeatedly, they will not longer be allowed to deliver waste wood to the collection facility.

The inspected and approved wood then passes through BluSky's trommel screen. This screen removes dust particles and wood chips too large for BluSky's system. The dust and large wood chips are mulched on site in Middletown. Removing dust makes for much cleaner feedstock by eliminating most particulate matter.

Properly sized wood chips are conveyed into a walking-floor trailer to await delivery to BluSky's facility at 35 Research.

Propane Pre-Heating

Operations at 35 Research will start at the beginning of each week. Initially, after safety inspections are completed, the pyrolysis system is pre-heated with propane for approximately 2 hours. Propane is pumped from the two liquid tanks placed in the back of the property, goes through piping into a vaporizer.

The vaporizer converts the liquid propane into gaseous propane, and it is pumped at 2 PSI through piping that is placed under the pavement behind the property into the building. The propane line then runs up to the ceiling and then back down directly to where the two pyrolysis system's propane burners are located.

The tanks and vaporizer are to be installed by Paraco, a reputable, local supplier with nearly 50 years of experience. All piping will be welded by certified gas welders. The placement of internal gas lines will be approved by the fire marshal. All piping will be inspected by the building inspector before use.

This process consumes about 50 gallons of propane per startup event, meaning propane delivery is only required once every few weeks. Propane delivery is to be scheduled when there are no wood chip deliveries to avoid traffic building up at the facility.

Wood Delivery

When the machine is ready to begin processing wood, a contractor delivers a walking floor trailer from the collection point to 35 Research Parkway. The trailer will enter the North entrance, following a one-way route to the back of the building. The trailer is backed into the large garage door on the back wall of the building and to the wood inlet pit placed inside the building.

Once the trailer is properly lined up with the pit, the walking floor will slowly push wood chips into the inlet pit for approximately 4-6 hours. The contractor's truck will leave the trailer at BluSky's facility and exit via the one-way route to the southern exit. The truck will then go back to the collection point.

If the pyrolysis machine must shut down, or there is a safety issue, BluSky will have a truck on site that can remove the walking floor and move it via the one-way route to the shipping pay in the front of the building. The contractor will then immediately return to 35 Research to remove the trailer from the premises until the issue has been resolved. At the same time, any wood can be removed from the inside of the facility and put back in the trailer with BluSky's onsite front loader.

In the absence of any issues, as the walking floor trailer gets close to empty, the contractor will bring a new walking floor trailer to the premises. Before the contractor arrives, BluSky will move the current trailer from within the building to the shipping bay in the front of the premises via the one way-route. The contractor will place the new trailer at the inlet pit and will then take the old trailer back to the collection point.

These deliveries will happen every 4-6 hours, minimizing traffic flow to the facility.

Biochar Production and Handling

As wood enters the pyrolysis system, it is heated in an oxygen-deprived kiln. The system has airlocks on both its inlet and outlet, and inline blowers throughout exhaust piping, all to ensure the reactor is a low-oxygen environment. This low-oxygen decomposition (pyrolysis) splits the wood into two main components: biochar and biogas.

Biochar is a carbon-negative soil additive that improves crop yields, reduces water consumption, remediates polluted soil, treats water, and many more items. As it exits the system, it is passed through a series of water jacket coolers that drop it below auto-ignition temperatures.

The cooling water for these water jackets is pumped from the larger cooling water tank constructed in the back of the building. The warm water returns through a parallel return line and then enters the cooling towers of the water tank, returning it to ambient temperature. The cooled water is then piped through the tanks roof structure.

As the biochar leaves the airlock and is exposed to oxygen, the biochar is quenched with water to bring it to 20-30% moisture. This moisture content not only makes it far better as an agricultural product, but it also makes the biochar safe for storage and transport.

The water for this quenching process is sourced from the condensed water vapor coming from the pyrolysis system's heating chamber. The system removes moisture from the input wood chips and then places it back into the resultant biochar. If a surplus of condensed water is produced, which is unlikely, the water will be stored in an internal water tank, and it will be removed from the facility as an industrial wastewater stream. This water will be non-toxic but must be handled as industrial wastewater for regulatory reasons.

Biochar is moved to the shipping bay in the front of the building to be loaded onto a trailer for transport. Biochar takes up far less volume than the wood used to make it, so the biochar can be loaded back into the emptied walking floor trailers used to deliver wood onto the facility. The biochar can then be transported back to the wood collection point from where it can be distributed. While the biochar has been quenched and is not a fire risk, BluSky bulk stores biochar outdoors at the collection facility in Middletown as an added safety measure.

Biogas Production and Handling

The biogas exiting the system is passed through a cyclone deduster, removing particulate emissions that may have been produced during the pyrolysis process (small dust particles of wood or char). The biogas is then passed into the pyrolysis system's heating chamber.

As biogas enters the heating chamber, after 2 hours of pre-heating from the propane, this biogas takes over the entire heating for the system. This eliminates the need to keep using propane and is why propane is only necessary for system startup.

Exhaust from the heating chamber is then passed through additional cyclone dedusters to further remove any accumulated particulate emissions. The heat from the exhaust is transferred into the pyrolysis system's pre-dryer. The exhaust exits the building's back wall and is passed into the exhaust cooling towers. The cooled exhaust then exits the chimney.

The pyrolysis system may produce a surplus of biogas. The surplus biogas cannot be directed into the heating chamber, as it will increase the system's temperature higher than desired. This biogas must therefore be exhausted from the facility.

This biogas is a mix of mostly hydrogen and carbon dioxide. The carbon dioxide makes it far less flammable than pure hydrogen, even less so than natural gas.

The presence of hydrogen in the exhaust stream does not pose a danger to the local community or wetlands, but it does create an atmospheric greenhouse effect. Hydrogen, being the lightest molecule, immediately rises to the upper atmosphere where it then becomes water vapor. High-atmospheric water vapor is a very potent greenhouse gas and contributes to climate change, which BluSky is dedicated to solving.

For this reason, surplus biogas is directed into an exhaust cleaning chamber placed on the raised concrete pad. The exhaust cleaning chamber has a series of small flames that combust the inlet biogas, converting the gas into carbon dioxide and water vapor. The chamber is built with brick and reinforcements to ensure that it can handle any heat or pressure created by the cleansing process. The chamber is also raised a few feet above the concrete pad to ensure it is safe from potential flooding.

Safety Measures

A motorized gas valve controls the flow of biogas, determining how much is directed into the pyrolysis heating chamber or the exhaust cleansing chamber. The system controls gas flow based on the temperature and pressure within the pyrolysis system, measured at various points.

If temperature or pressure approaches a critical threshold, the system will begin automatic shut-down procedures. An onsite operator removes the walking floor trailer from the facility. All wood stops entering the system as the inlet conveyors and airlock are turned off. The systems that eject biochar and gas from the system are sped up. The motorized gas valve automatically cuts all biogas from the heating chamber, directing all biogas to the cleansing chamber.

If the motorized gas valve fails, an onsite operator can turn the backup manual gas valves. If for some reason the onsite operator fails to do this, pressure inside the system will build, which will trigger the emergency pressure relief valve. This valve connects the chamber to an emergency exhaust system, allowing all gas to leave the system, preserving both the integrity of the system and eliminating danger to onsite personnel.

In the event of an emergency exhausting, inside gas monitors will be used to ensure no biogas has leaked into the facility. In the unlikely event it has, onsite personnel will follow established and rehearsed evacuation procedures, and the local fire department will be notified.

The presence of biogas within the facility can continue to be monitored through the inside sensors.

If an emergency exhausting occurs, BluSky will work with local officials to ensure the system runs safely in the future before operations resume.

Emissions Handling

BluSky's primary product is not the biochar being produced, but rather the Carbon Offset Removal Credits (CORCs) generated through the production of the biochar. The accreditation process to sell CORCs has strict emission monitoring requirements that must be implemented. This emission monitoring will not only ensure BluSky can sell CORCs, but will ensure emissions comply with local, state, and federal ordinances.

There are two main exhaust locations:

1. The chimney at the top of the second exhaust cooling tower
2. The chimney at the top of the exhaust cleaning chamber

At both exhaust locations, BluSky will monitor the following:

1. The opacity of the smoke does not have an opacity greater than Ringleman #2 for more than 5 minutes any 12-hour period, as per 61.2.1 of Current Zoning Regulations
2. The quantity of trace volatile organic compounds to ensure BluSky abides by CT DEEP and EPA Clean Air Act requirements
3. The quantity of trace nitrous oxides to ensure BluSky abides by CT DEEP and EPA Clean Air Act requirements
4. The quantity of trace amounts carbon monoxide, methane, or hydrogen to track greenhouse effect created by BluSky's processes (which must be deducted from our CORCs)
5. The quantity of trace amounts of particulate matter, ensuring safety to the local community under 61.2 of Current Zoning Regulations
6. The presence of additional, unlikely pollutants to ensure EPA Clean Air Act requirements, including but not limited to:
 - a. Sulfur Dioxide
 - b. Lead
 - c. Mercury
 - d. Dioxins
 - e. Cadmium
 - f. Hydrogen chloride

If opacity is detected to be at Ringleman #2, the system will automatically seek data for

- Incomplete combustion in the pyrolysis heating chamber – this will increase the inlet air blowers speed, sending more air into the chamber and ensuring complete combustion
- High moisture content for wood entering the pyrolysis system – this will automatically slow down the speed of the dryer, giving the wood more residence time in the dryer, lowering its moisture content
- Presence of other emissions – the system will then look at data from the other sensors to decide on the best course of action

Here is a table for how high concentrations of any other pollutants are to be handled both in the immediate and in the long term (if there is a persistent issue):

Pollutant	Immediate Corrective Action	Long Term Corrective Action
VOCs	Improved airflow and higher temperature	Industrial catalytic converter
NOx	System shutdown	Industrial catalytic converter or flue gas recirculation
Carbon Monoxide	Improved airflow and higher temperature	Industrial catalytic converter
Methane	Slower heating rate	Catalytic decomposition of methane
Hydrogen	Slower heating rate	Inspection for biogas leaks into exhaust
Lead, Mercury, Dioxins, Cadmium, Hydrogen Chloride, Sulfur Dioxide	System shutdown and inspection/return of feedstock	Deeper investigation into source of contaminated feedstock and removal of that feedstock from processes

The facility will have wood chips delivered from local suppliers, mostly local municipalities, via tri-axle dump trucks (or smaller vehicles). These trucks will enter the property on the North entrance and drive to the back of the building. The trucks will then enter the facility via the large garage door in the exterior of the building and will dump the wood chips directly into the facility. The trucks will then exit the building and drive around to exit via the South exit.

A handful of truck deliveries are required for a day's worth of operations (5 or less). Trucks are scheduled throughout the day, minimizing the traffic flow to the facility. Trucks are also scheduled to avoid any wood storage on site. If a truck dumps its wood chips, and then the machinery inside the facility shuts down, the wood chips can be stored in purpose-built containers on the Northeast of the building. All future wood chip deliveries would then be canceled until the machinery started running again.

Employees on-Site

BluSky will not have more than 50 different employees on site at 35 Research in any 24-hour period (day and night combined). During night operations (after 5:00 p.m. and before 8:00 a.m.) the facility will have no more than 20 employees on-site.

BluSky has validated that 35 Research Parkway, in its proposal, has sufficient parking spaces and septic capacity to handle this group of employees.

Please note approximately half of the 50 employees present will be working in operations, sales, and other office functions in the office space available at BluSky.

Garbage

Garbage is to be disposed of in a dumpster placed in the proposed concrete dumpster pad on the Southwest corner of the building. All Waste will do a weekly garbage pickup.