

## HEARING OFFICER'S REPORT

**TO:** The Honorable Shawn M. Garvin  
Cabinet Secretary, Department of Natural Resources and Environmental Control

**FROM:** Lisa A. Vest, Regulatory Specialist  
Department of Natural Resources and Environmental Control

**RE:** Coastal Zone Act Permit Application of AgroRefiner, LLC, to Operate a new Hemp Extraction Facility located at 51 Steel Drive, New Castle, Delaware

**DATE:** March 13, 2020

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### **I. BACKGROUND AND PROCEDURAL HISTORY:**

A public hearing was held on Wednesday, February 5, 2020, at 6:00 p.m. at the Department of Natural Resources and Environmental Control (“DNREC”, “Department”) located at 391 Lukens Drive, New Castle, Delaware, to receive comment on the application of AgroRefiner, LLC (“Applicant”, “AgroRefiner”), for a Coastal Zone Act (“CZA”) permit from DNREC, pursuant to 7 *Del. C.*, Ch. 70, *Coastal Zone Act*. The CZA regulates new manufacturing activities, or the expansion of existing manufacturing uses, within Delaware’s “Coastal Zone”, which is a geographic area along the Delaware Bay and Atlantic Ocean Coastlines, as defined by the CZA. This hearing was held pursuant to Delaware’s *Coastal Zone Act* and 7 DE Admin. Code 101, *Regulations Governing Delaware’s Coastal Zone* (“CZA Regulations”).

Pursuant to the Applicant’s CZA permit application received by the Department on December 10, 2019<sup>1</sup>, AgroRefiner seeks permission to operate a hemp extraction facility within an existing warehouse located at 51 Steel Drive in New Castle, Delaware (“Application”). The purpose of the operation would be to extract cannabidiol (“CBD”) and cannabinol (“CBN”) from the hemp to distribute to manufacturers of various consumer goods. The activity itself is considered to be a new manufacturing facility, pursuant to CZA Regulations’ Section 6.1.3.

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<sup>1</sup> The receipt date does not determine when an application is deemed administratively complete, pursuant to CZA Regulations 8.5.1 and 8.5.5. The application was deemed administratively complete on January 7, 2020.

The Applicant has registered as a Hemp Processor through the Delaware Department of Agriculture (“DDA”). The proposed process would utilize a portion of an existing warehouse, as noted above. Hemp would be delivered via refrigerated semi-trailers annually during the fall harvest in late September or early October. Some of the hemp would arrive already dried, but the rest would be dried using two natural gas-fired furnaces, which would operate a maximum of 600 hours per year. AgroRefiner estimates that the dried hemp from each harvest would take the entire year to process, for a maximum processing capacity of 78,000 pounds of dry hemp, yielding approximately 7716.2 pounds (3,500 kilograms) of CBD isolate, and 169.8 pounds (77 kilograms) of CBN. Final product distribution would be demand-driven.

The proposed CBD processing can be broken into four (4) basic parts: drying, extraction, distillation, and crystallization. Afterward, the remaining solution undergoes a process to isolate CBN.

The first step in the proposed process is drying the hemp. The two dryers operate at 400,000 BTUs each, with a temperature setting of 90 degrees Fahrenheit. According to the manufacturer, combined, the dryers can process an hourly maximum of 1,000 pounds of wet material, yielding approximately 220 pounds of dry material each hour. Once dried, a cold ethanol wash is used to isolate the extract from the dried plant material, which results in a crude extract. The Applicant estimates active ethanol usage at 60 gallons per day. Approximately 85% of the ethanol is recovered in this step of the closed-loop system.

After extraction, the crude oil is heated under a vacuum for three (3) hours to remove carbon dioxide using a decarboxylation vessel. A cold trap in the vacuum line collects approximately 12% more of the ethanol. The biomass is then centrifuged in an additional effort to collect ethanol, resulting in a total ethanol recovery of approximately 97%. The other 3% remains on the plant material and is disposed of with the waste biomass. The decarboxylated crude oil is distilled in a continuous process using a wipe film distillation system.

Next, the CBD distillate is crystallized and recrystallized to refine and form the final CBD product. Pentane induces crystallization, and the product is collected in a vacuum filtration process within a fume hood. Pentane usage is approximately four (4) gallons per day with 98% recovery by roto-evaporation. There is an estimated 2% loss in the process per day from evaporation and crystals recovered in the vacuum oven. An additional product, created post-crystallization, is known as CBN. The remaining solution after the crystallization (referred to in the application as “mother liquor”) undergoes a separation and purification process involving toluene, iodine, potassium thiosulfate, anhydrous sodium sulfate, and silica gel chromatography. Production is estimated to be 0.454 pounds (210 grams) per day.

Prior to distribution, a quality assurance test is completed to test the products for purity. The finished products are packaged into plastic pails and stored in a secure inventory storage area until distributed in bulk to third-party distributors and manufacturers. It should be noted that, in the State of Delaware, hemp is considered an agricultural commodity and is defined as a grain under Title 3 of the Delaware Code. The tetrahydrocannabinol (“THC”) concentration<sup>2</sup> for CBD and CBN is not to exceed 0.3 percent on a dry weight basis.

The Department requires a CZA Applicant to set forth in its application the proposed project’s possible environmental impacts, including, but not limited to, any increased air emissions of pollutants, water quality/water quantity/water use, and the disposal of solid and hazardous wastes. Furthermore, any application for a CZA permit for an activity or facility that will result in any negative environmental impact shall contain an offset proposal. Offset proposals must more than offset the proposed environmental impacts of any proposed project.<sup>3</sup>

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<sup>2</sup> THC is the principal psychoactive constituent of cannabis and is the chemical responsible for most of the psychological effects of marijuana.

<sup>3</sup> 7 DE Admin. Code 101, *Regulations Governing Delaware’s Coastal Zone*, Section 9.0, “Offsets”

Pursuant to Section 8.3.2 of Delaware's CZA Regulations, the Secretary shall, in assessing CZA permit applications, consider how a proposed project will affect the following six criteria, as set forth in 7 *Del.C. Ch. 70, Coastal Zone Act*: (1) Direct and cumulative environmental impacts; (2) Economic effects; (3) Aesthetic effects (4) Number and type of supporting facilities and their anticipated impacts; (5) Effect on neighboring land uses; and (6) Compatibility with local comprehensive plans. 7 *Del.C. §7004(b)*.

In the present matter, the Applicant's proposed project would result in air emissions associated with the operation of the hemp dryers, as well as pentane evaporation during crystallization and toluene evaporation during CBN isolation. The dryers are fueled by natural gas and operate at approximately 400,000 BTUs/hour each. If the furnaces were to run for 600 hours, total emissions of sulfur dioxide (SO<sub>2</sub>), nitrogen oxide (NO<sub>x</sub>), carbon monoxide (CO), particulate matter (PM), and volatile organic compounds (VOC) would be approximately 3.523 pounds per day (0.044 tons per year). Additionally, approximately 0.146 pounds per day of pentane would be emitted in a fume hood during the CBD crystallization step described above, and approximately 0.793 gallons (5.727 pounds) of toluene per day would be used in the process of isolating CBN from the mother liquor (calculations assume 100% evaporation). Based on this information, total daily emissions would be 9.396 pounds per day, which calculates to annual emissions of 1.116 tons per year.

The proposed project would operate within an existing warehouse, and would not impact stormwater, land erosion, wetlands, or habitat for flora and fauna. Furthermore, the proposed operation would not result in any changes in water use and water discharge to surface waters. Operations for the proposed project would occur entirely inside the existing warehouse, and the project location is not known by the Department's Division of Fish and Wildlife to have any threatened or endangered species present.

It is an objective of the Applicant's proposed project to reclaim and reuse as much of the solvents utilized within the process as possible. Any wastes would be tested to determine whether they should be classified as hazardous prior to disposal.

The proposed project would generate 78,000 pounds of waste biomass annually. Approximately 1.8 gallons (11.86 pounds per day) of ethanol would be disposed of with the biomass. Additionally, approximately 0.317 gallons (4.44 pounds) of thiosulfate and 13.228 pounds of silica gel waste would be generated daily and disposed of on a bi-weekly basis. It is intended for pentane to be fully recovered within the system. However, if any of the solvent is not able to be recovered, it will be disposed of lawfully, following all applicable local and state regulations.

The proposed project would not generate glare, heat, noise, vibration, radiation, or electromagnetic interference outside of the existing warehouse. Odors emitted during the drying process in September and October would be controlled through the employment of an in-duct odor mitigation system. The system generates ozone to alter the chemical structure of the odorous molecules through oxidation. The proposed system would produce approximately 0.0006 pounds per hour of ozone that would readily attach to odor molecules in the ventilation system and destroy them. If the system were to run without coming into contact with any odors during the 600 hours of dryer operation, approximately 0.36 pounds of ozone would be generated. However, a balanced system would result in net zero odor and ozone emissions.

Regarding the economic effects of AgroRefiner's proposed project, tenant improvements to the warehouse prior to the start of operations are estimated to have a total cost of \$750,000. Improvements expended locally are estimated to be \$500,000 with services such as engineering, general construction, electrical, plumbing, and HVAC upgrades. The project would employ 11 permanent workers. Total payroll for permanent employees is estimated to be \$740,000. State personal income taxes and State corporate income taxes attributable to this project are calculated to be \$65,674 and \$363,500, respectively.

The Applicant's proposed operation within an existing warehouse will not impact the aesthetics of the area. No supporting facilities are proposed. With regard to potential effect on neighboring land uses, the closest residence is approximately 360 feet away from the project location. The facility does not interfere with a person's ability to access recreational facilities or resources. Lastly, insofar as the proposed project's compatibility with current New Castle County plans, the Secretary's Environmental Assessment Report dated January 7, 2020 states that a New Castle County Building official has confirmed that the proposed project is consistent with both County and Municipal planning.

As noted previously, the Applicant's proposed project anticipates increased air emissions. Section 9.1.1 of the CZA Regulations states that any application for a CZA permit for an activity or facility that will result in a negative environmental impact shall contain an offset proposal. Moreover, such offset proposals must "...more than offset the negative environmental impact associated with the proposed project of activity requiring a permit." DNREC Policy stipulates that negative environmental impacts resulting from projects requiring a CZA Permit be offset at a 1.3:1 ratio.

With regard to AgroRefiner's offset proposal, the Applicant has proposed to purchase three (3) tons of emission reduction credits ("ERCs") from the Delaware Division of Small Business to more than offset their 1.12 tons of annual emissions. ERCs originate from the *Emissions Banking and Trading Program* (7 DE Admin. Code 1134), and are parsed into ozone season and non-ozone season for NO<sub>x</sub> and VOCs. More than 98% of the emissions of this proposed activity could be attributed to NO<sub>x</sub> and VOCs. Therefore, the CZA Program considers this proposal to be reasonable and practicable, given that the credits purchased should closely reflect actual emissions and time of year, to ensure that the emissions are more than offset.

The Department provided public notice of this CZA Application's submission, initially received by the Department on December 10, 2019, and the determination of an administratively complete application as set forth in the Secretary's Environmental Assessment Report, which was signed on January 7, 2020. Consequently, the Department held a public hearing on February 5, 2020 at the DNREC office located at 391 Lukens Drive, New Castle, Delaware.

The public hearing of February 5, 2020 was attended by Department staff, representatives of the Applicant, and a few members of the public. Only two members of the public appeared and offered comment, which will be discussed in further detail below. Proper notice of the hearing was provided as required by law.

## **II. SUMMARY OF THE PUBLIC HEARING RECORD:**

The public hearing record (“Record”) consists of the following documents: (1) a verbatim transcript; (2) eight documents introduced by responsible Department staff at the public hearing held on February 5, 2020, and marked by this Hearing Officer accordingly as “Department Exhibits 1-8”; and (3) Technical Response Memorandum Erin Wilson, Environmental Scientist, DNREC Division of Energy and Climate, dated February 25, 2020. The Department’s person primarily responsible for reviewing this CZA Application, Ms. Wilson, developed the record with the relevant documents in the Department’s files.

Representing the Applicant at the hearing was Howard Matz, who, following opening remarks from Ms. Wilson on behalf of the Department (and the introduction of the Department’s exhibits to be entered into the hearing record), proceeded to offer a brief background of the Applicant’s proposed operation. At the conclusion of the Applicant’s presentation, the floor was then opened for the purpose of offering public comment on the record regarding this proposed project.

The only comments received by the Department in this matter were those offered by Bill Dunn and Martin Willis at the time of the public hearing. While Mr. Willis expressed gratitude toward the Applicant for going through the Department’s Coastal Zone Application process to bring this new manufacturing opportunity to Delaware, Mr. Dunn had a few questions with respect to the Applicant’s proposed operation. To that end, this Hearing Officer requested a Technical Response Memorandum (“TRM”) from Ms. Wilson to specifically address those issues. This TRM (dated February 25, 2020) was provided to this Hearing Officer on March 2, 2020.

I find that the Department's TRM identifies all of the concerns raised by Mr. Dunn's comments offered at the public hearing of February 5, 2020 and responds to them in a thorough and balanced matter, accurately reflecting the information contained in the Record generated in this matter. Thus, for the benefit of the Record, both the Secretary's Environmental Assessment Report (dated January 7, 2020) and the aforementioned TRM (dated February 25, 2020) are attached hereto as Appendix "A" and "B," respectively, and are expressly incorporated herein as such.

### **III. RECOMMENDED FINDINGS AND CONCLUSIONS:**

This application is for a permit issued under the CZA. I find that the Applicant's facility is located within Delaware's "Coastal Zone". I also find that, while AgroRefiner's proposed project will result in increased air emissions, the Department has certified the proposed offsets are more than sufficient, as required per Section 9.1.1 of the CZA Regulations. The Applicant has proposed to acquire ERCs to be used as their offset at a ratio of 1.3:1, in order to more than offset the increased emissions that would result from the proposed operation as set forth above. The Department believes that the offset AgroRefiner has acquired and placed in their permit application complies with the applicable regulations.

The Department is to evaluate a CZA application based upon a consideration of the CZA's balancing of economic and environmental factors. The CZA requires the Department to consider the following issues of any given proposed project: (1) environmental impacts; (2) economic impacts; (3) aesthetic impacts; (4) the number and type of supporting facilities required and their impacts on all other factors; (5) the impact on neighboring land uses; and (6) the county and municipal comprehensive plans. 7 *Del.C.* §7004.

The Record developed in this matter indicates that the Department's experts have considered the above factors and have recommended issuance of a permit to the Applicant in this matter. Further, the experts recommended that the Applicant's Coastal Zone permit application, as well as the proposed offset proposal, was sufficient.

Based on the Record developed, I find and conclude that the Applicant has adequately demonstrated its compliance with all requirements of Delaware's *Coastal Zone Act* and its CZA Regulations, as noted herein, and that the Record supports approval of AgroRefiner's CZA permit application. In conclusion, I recommend that a Coastal Zone Permit consistent with the Record developed in this matter be issued by the Department in the customary form, and with appropriate conditions, to ensure continued improvement of environmental quality in the Coastal Zone of the State of Delaware.

Further, I recommend the Secretary adopt the following findings and conclusions:

1. The Department has jurisdiction under its statutory authority to issue a CZA Permit to the Applicant, subject to reasonable permit conditions deemed appropriate and consistent with the CZA's purposes;
2. The Department provided adequate and lawful public notice of the CZA Application of AgroRefiner, LLC, and of the public hearing held on February 5, 2020, and held said hearing to consider any public comment that may be offered on the Application, in a manner required by the law and regulations;
3. The permit applied for by AgroRefiner, LLC, is for a new manufacturing facility which will take place within the defined Coastal Zone of Delaware, specifically, the operation of a hemp extraction facility within an existing warehouse located at 51 Steel Drive in New Castle, Delaware. Environmental impacts are anticipated, however the ERCs acquired by the Applicant satisfy the Department's offset standard;
4. The Department has carefully considered the factors required to be weighed in issuing a CZA permit, and finds that the proposed project is acceptable for the Coastal Zone at the proposed location, and that it should be permitted as set forth in AgroRefiner, LLC's Application;

5. The Department shall issue a permit to the Applicant, AgroRefiner, LLC, and said permit shall include all conditions consistent with the final Order, and any other reasonable conditions that the Department includes in a CZA permit, to ensure that Delaware's environment will be protected from harm, consistent with the CZA and its Regulations;
6. The Department has carefully considered all the statutory factors to be considered in making a decision on a CZA permit, and those required to be considered under the CZA Regulations;
7. The issuance of the aforementioned CZA permit does not relieve AgroRefiner, LLC, of the legal obligation of compliance with all building permits, subdivision, and other applicable code requirements of the county or municipality wherein the permitted project is located;
8. If there are deviations from the Applicant's proposed plan and operations previously approved by the Secretary, AgroRefiner, LLC, shall notify the Secretary as soon as possible. If the Secretary receives information which he or she believes may alter the scope of the project, the Secretary may revoke the permit or require AgroRefiner, LLC, to submit a new application to reflect the altered nature of the project;
9. The aforementioned CZA permit will allow the Applicant to operate its business while reducing the overall environmental impacts to the Coastal Zone area, in furtherance of the purposes of *7 Del. C., Ch. 70*;
10. The Department has an adequate Record for its decision, and no further public hearing is appropriate or necessary; and

11. The Department shall serve and publish its Order on all affected persons in a manner consistent with the service and publication of the Secretary's Order.

/s/Lisa A. Vest  
LISA A. VEST  
Public Hearing Officer

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Attachments/Appendices:

Appendix A: Secretary's Assessment Report, (01/07/2020)

Appendix B: TRM (02/25/2020)