

RESOURCE RECOVERY PERMIT #SW-XX/XX

Original Issue Date: Month Day, Year

Facility Name: Bioenergy Innovation Center
Mailing Address: 28338 Enviro Way
Seaford, DE 19973

Contact Person: Jeff Deats
Facility Manager
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Alternate Contact Person: Christine McKiernan
Chief Engineering & Construction Officer
Phone Number: Cell: (201) 779-1958

Location of Approved Activity: 28338 Enviro Way
Seaford, DE 19973
Tax Parcel Number: 132-11.00-41.00 and
Tax Parcel Number: 132-11.00-41.02

I. GENERAL CONDITIONS:

- A. In accordance with Delaware's *Regulations Governing Solid Waste* ("DRGSW"), Section 2.5.2, the Department of Natural Resources and Environmental Control ("Department" and/or "DNREC") issues Resource Recovery Permit #SW XX/XX ("Permit") to Bioenergy Development Group ("BDC") for the purpose of accepting and processing agricultural residuals, hatchery waste, dissolved air flotation ("DAF") sludge and cake from wastewater treatment plants at poultry processing plants and soy bean processing plants, poultry litter, process water, and clean wood chips and successfully digesting them produce gas and digestate; digestate and the other acceptable materials will be processed on site to produce and market quality compost. The operations covered by this permit will occur on approximately one

hundred and twenty-four (124.26) acres of Tax Parcels # 132-11.00-41.00 & # 132-11.00-41.02 in Seaford, Delaware (see attached tax parcel map).

B. This Permit applies to:

1. Anaerobic Digester operations
2. Compost facility operations.

C. This Permit shall be conducted in accordance with the conditions herein and with the following documents, as submitted to the Department: (1) Bioenergy DevCo, LLC Resource Recovery Permit Application dated Month Day, Year and associated documents; (2) Financial assurance: a Letter of Credit and Standby Trust Agreement in the amount of \$1,196,400.00 effective Month Day, Year; and (3) other procedures and policies specifically referenced in this Permit. Conditions of this Permit shall take precedence over any of the above listed documents.

D. Failure to comply with any condition of this Permit or any provisions within the aforementioned documents is a violation of this Permit.

E. BDC shall, upon request, present a copy of this Permit to any law enforcement officer or representative of the Department.

F. BDC shall notify the Compliance and Permitting Section ("CAPS") in writing within twenty-four (24) hours of any changes in the ownership, facility operators, name, or company officials of BDC.

G. BDC shall notify the CAPS in writing at least thirty (30) days prior to the anticipated need to implement any change in waste characteristics, changes that will alter the beneficial use of the incoming waste material or the processed compost, or changes to processes, operations, or procedures described in the Application documents referenced above in section I.B., or to this Permit. BDC shall not implement said changes unless and until they have been notified in writing from the CAPS agreeing to the change(s).

H. This Permit may be modified by the Department at any time, including additional limitations, requirements and/or special conditions. In the event the regulations governing activities authorized in this Permit are revised, this Permit may be modified.

I. In the event that any condition of this Permit cannot be achieved or is violated, BDC shall immediately notify the CAPS and take immediate action to correct the violation.

II. **GENERAL CONSTRUCTION CONDITIONS**

A. Siting, Design and Construction

1. All local zoning and planning approvals for the site must be in place prior to construction commencing.
2. Resource recovery facilities must be planned and designed by a Delaware registered Professional Engineer and signed and sealed site plans submitted to DNREC prior to construction commencing.
3. All permits required by local, state, or federal programs must be obtained prior to construction commencing.

4. Modifications to previously approved documents must be reviewed and approved by applicable parties before implementation.

B. Standards for Construction

1. The plans provided by BDC will, at a minimum, conform to all the design requirements in DRGSW Section 9.3.4, Minimum Design Requirements.
2. Any additional standards required by permits other than WHS must be included in any design plans submitted for the Resource Recovery Facility.

C. Final Report

1. After construction has been completed and prior to the commencement of any operations of the anaerobic digester, BDC shall submit a final report for the Department's approval. The final report shall certify that the construction of the facility was completed in accordance with the design specifications submitted to the Department and approved as part of the Solid Waste Permitting process. BDC shall not commence operations until the Department has provided its written notification that the construction and the final report meet the requirements of the permit and the DRGSW. The final report shall include:
 - a. A cover letter presenting the final report and signed by the permittee after their review and concurrence.
 - b. Title page to include date, facility, project name, responsible party (BDC), and preparing firm.
 - c. Signature page.
 - d. Table of contents, to include a detailed list of the contents of the appendices.
 - e. Introductory narrative with project overview.
 - f. Qualifications and responsible parties. The 3rd party quality assurance engineer shall make a determination if all construction qualifications were met throughout the project for Quality Assurance Laboratories including but not limited to, the general contractor and all manufacturers and additional equipment installers that were part of the facility construction. This section shall also include a listing of key personnel involved with the project with business contact information to include the BDC project engineer, the design engineer, the consulting project engineer, the general contractor's representative(s) on-site, the installers representative(s) on-site, and all staff providing construction quality control and construction quality assurance staff oversight including those responsible for off-site conformance sampling.
 - g. Site topographic drawing showing property boundaries, outlines of all site buildings (e.g. digester tanks, gas systems, water/wastewater systems, compost operations, etc.), stormwater controls, stormwater

flow directions and all environmental monitoring locations required by this permit.

- h. Supporting documents for Construction Quality Assurance to include manufacturer's quality control program manuals, manufacturer's installation recommendations (as required by the technical specifications), site visits to manufacturing facilities (if applicable), CQA forms, logs, daily reports, record drawings, field quality control testing results, laboratory results, manufacturer's certifications and warranties, and project meeting minutes. The Permittee shall provide this information electronically, in a format acceptable to the Department and bookmarked by section to allow for easy retrieval and review.
 - i. Site plans/drawings, including all detailed schematics for control components (e.g. digester, gas system, water system(s), etc.). The permittee shall provide this information electronically, in a format acceptable to the Department and bookmarked to allow for easy review and retrieval.
 - j. Project photographs. The permittee shall provide project photographs electronically. Images shall be sorted by date and labeled to include a description of the material or activity pictured.
2. Other items specified by the Department.
- a. Approved and constructed design modifications during the construction phase of this Permit that impact any documents required for operations (e.g. Operations Plan, Engineering Plan, etc.) must be updated and approved by the Department prior to allowing BDC to commence operations at the facility.
 - b. BDC shall provide one paper copy of the final report and an electronic version included as appendices (for supporting information, record drawings and photographs). Additionally, BDC shall provide one complete, web-ready copy of the final report on electronically in a format acceptable to the Department. The web-ready copy shall be organized by section in accordance with the table of contents and bookmarked to allow for easy review and retrieval.

III. **GENERAL OPERATING CONDITIONS:**

- A. Operating hours: Incoming feedstock materials may be received at any time but must be managed in accordance with Section III of this Permit. BDC hours of operation are Monday through Friday 7:00 a.m. to 7:00 p.m. and Saturday and Sunday 7:00 a.m. to 1:00 p.m. Processing hours will occur 24 hours a day, 7 days per week. Employees in the waste receiving area, the anaerobic digester area, and the compost processing area may work beyond the stated hours as necessary.
- B. Security: Access to the BDC anaerobic digester and/or composting facilities shall be controlled to prohibit the entry of unauthorized individuals.

- C. Access: Representatives of DNREC may, at any reasonable time, inspect this facility to verify compliance with the requirements of this Permit, the DRGSW and 7 Del. C. Chapter 60.
- D. Community Engagement: Within 90 days of receipt of the first permit issued by DNREC, BDC shall submit a Community Engagement Plan to the Department for review and approval. The plan shall, at a minimum, include the following elements:
1. A list of communities that will be included in BDC's ongoing engagement efforts;
 2. The goals that the engagement plan seeks to achieve with the community/communities;
 3. A meeting schedule of community engagement events;
 4. Where applicable to provide meaningful engagement, appropriate translations services must be utilized to advertise the event.

Upon approval by DNREC, BDC shall follow the plan. All modifications to the plan shall be submitted to DNREC in advance for approval. The current plan shall be maintained on site and be available upon request.

- E. Litter control: Litter within and around the facility shall be controlled and collected daily. This includes collection, removal and proper disposal of any solid waste not approved for processing. It also includes collection and proper disposal of any incoming feedstock or outgoing compost product that falls along Enviro Way and Seaford Road (also known as Alternate Route 13) adjacent to the BDC site entrances. Prohibited waste, collected litter, and associated waste shall be stored in enclosed containers. Waste stored shall be removed by BDC the same day the container becomes full or within 72 hours of the Department's request to dispose of the waste (whichever comes first).
- F. Dust control: No dust shall be allowed to migrate off of the facility. Dust shall be controlled at the BDC facility by:
1. Closing mixing room doors while mixing dry material;
 2. Maintaining and utilizing the negative air pressure to mitigate dust within and migrating from the feedstock receiving buildings;
 3. Using the biofilter for the air exhausted from the Receiving Building;
 4. Spraying down the operations area with water;
 5. Using the Managed Organic Recycling, Inc, ("MOR") or other Department approved cover in the Covered Aerated Static Pile ("CASP") area; and
 6. Other means as necessary.
- G. Odor control: As part of the compost operator training, BDC operators shall be trained to recognize the improper odors associated with anaerobic decomposition or other improper composting techniques in the windrows and/or within stored compost piles and shall take corrective action to eliminate these odors by employing proper materials management and composting procedures. Odors resulting from the BDC facility shall not be perceived beyond the boundaries of the BDC property. Any odor complaints received shall be documented and records of the complaints shall be immediately available to the Department upon request. Odors shall be controlled at the BDC facility by:

1. Closing mixing room doors at all times other than receiving waste or transporting mixed waste into the CASP area for composting;
2. Maintaining and utilizing the negative air pressure and biofilter systems to mitigate odors within, and migrating from, the feedstock receiving buildings;
3. Proper storage and handling of digestate, finished compost and all wastes;
4. Spraying down the CASP and windrow composting areas with water, as needed, to remove the presence of potentially odor causing materials;
5. Using the MOR cover, or other Department approved cover, in the CASP area;
6. Maintaining optimal composting conditions in actively composting wastes to reduce the potential for anaerobic decomposition;
7. Control moisture in finished compost to reduce the potential for anaerobic decomposition;
8. Maintain, as designed, all feedstock receiving, processing, and discharge equipment for the anaerobic digester;
9. Maintain, as designed, all biogas collection, processing, storage, and discharge equipment, and
10. Other means as necessary.

H. Vector control:

1. BDC shall monitor the entire facility (Anaerobic Digester Intake and Compost Facility) for the presence of any rodents or other undesirable vectors daily. BDC shall document the presence of any undesirable vectors and legally eradicate them.
2. Material in the aerated static piles must meet the requirements for Vector Attraction Reduction ("VAR"), which states aerated static piles ("ASPs") shall maintain a temperature of 104 °F (40 °C) for at least 14 consecutive days, with an average temperature of over 113 °F (45 °C). BDC shall document daily temperatures of the ASPs and shall make the temperature records immediately available upon request by the Department.

I. Fire safety:

1. BDC shall conduct and record daily temperature monitoring for all digester tanks, ASPs and windrows in the composting process. If routine temperature monitoring shows a location in a tank or compost area where temperatures are greater than 160 degrees Fahrenheit or acceptable digester temperature, employees shall flag the location and report it to the site manager immediately.
2. BDC shall conduct and record weekly temperature monitoring for all digester tanks and compost facility windrows in the curing phase and feedstock piles provided that the conditions set forth in Section III.E.4 are met.
3. If smoke is detected at the compost facility, employees shall flag the location and report it to the site manager immediately.
4. BDC shall do a monthly walk through of the facility leak points with a handheld monitor and record the readings. These records should be

- included in the quarterly reporting provided to the Department outlined in Section III.Q.1 of this permit. In any case where gas is detected, the site manager shall follow the Operations Plan process to shut down the facility in case of a gas leak.
5. The site manager shall act promptly to investigate all issues related to fire or explosion safety. Employees shall be trained in the proper procedures for fighting a compost fire, gas fire, or explosion.
 6. If a fire or explosion is detected, BDC shall call 911 to request assistance from the local firefighting agency. BDC shall notify CAPS at (302) 739-9403 of any fire within 24 hours of detection.
 7. BDC management shall meet with the representatives from the Blades Volunteer Fire Company to ensure that their personnel are familiar with the layout of the facility, the sources of water for firefighting, and the methods of fighting a compost fire, gas fire or explosion. BDC shall develop a fire management plan with the Blades Volunteer Fire Company, which shall be implemented immediately, reviewed annually, and updated as needed.
- J. Employee Health and Safety: Employees shall work under appropriate health and safety guidelines established by the Occupational Safety and Health Administration. Use of personal protective equipment shall be in accordance with 29 CFR Part 1910.132 as a minimum. First aid equipment shall be maintained and available onsite. Emergency telephone numbers of nearby ambulance, hospital, police and fire services shall be prominently displayed on-site.
- K. Smoking: No smoking shall be permitted in the receiving, processing, screening, storage areas, or near potential sources of gas.
- L. Equipment Usage, Inspection, and Maintenance: A combination of processing equipment such as front-end loaders, a hammermill, screens, and a windrow turner will be used to implement this Permit. BDC shall use a combination of this equipment and manual labor to process the incoming waste material, feed the digesters, manage the gas system, move digestate, and to handle finished compost. Processing equipment at the anaerobic digester, gas system, and compost facility shall be selected and operated in a manner to meet DNREC Air Quality (DAQ) standards and conditions of applicable DAQ permits or registrations. BDC shall maintain all necessary air permits and registrations as long as they are required, and secure any other necessary DAQ permits and registrations in the future. All operating equipment shall be operated and inspected in accordance with the manufacturer's recommendation, any required permits, and this Permit. Equipment shall be maintained and operated in a manner that protects BDC employees, the public and the environment.
- M. Training: All employees who are to work at the anaerobic digester and/or compost facility must receive initial training, within 180 days of hiring, in (1) Health and safety procedures, (2) Fire prevention and protection, (3) Emergency first aid and (4) CPR. Prior to working in the composting operation, employees shall receive compost operator training including site specific training on the basics of the MOR process, biofilter operation, how to identify acceptable compost feedstock materials, how to identify and respond to prohibited waste, and how to conduct an

inspection of the facility. Similarly, employees working at the anaerobic digester plant shall receive appropriate training outlining materials acceptance, monitoring and mixing, and the processing and movement of digestate for use by the compost operation. All employees shall also receive equipment operation training conducted by the equipment manufacturer's representative or another person specifically knowledgeable in the operation of the equipment. Training shall include the manufacturer's operating and maintenance manual, operation instruction, equipment safety features, and hazards that might be encountered. Unless otherwise specified by a nationally recognized training provider (for example, the American Red Cross as a training provider for First Aid), training shall be required initially and annually thereafter.

N. Recordkeeping:

1. BDC shall maintain all training records on site for a period of three (3) years and the records shall be immediately provided to the Department upon request. These records shall document that required training has been provided to all employees who are to work in the waste receiving or compost processing areas.
2. BDC shall retain all records associated with the Community Engagement Plan, outlined in section III.D of this permit, for a minimum of three (3) years and records shall be provided to the Department upon request. This information shall include all elements outlined in the Community Engagement Plan that has been approved by the DNREC.
3. BDC shall record and maintain on site all data required by this Permit for a minimum of three (3) years and the records shall be immediately provided to the Department upon request, including:
 - a. Daily, monthly, and annual tonnages for all incoming waste and materials (listed by waste/material description)
 - b. Daily, monthly, and annual tonnages for all outgoing waste and materials, including prohibited wastes and residuals (listed by waste/material description)
 - c. A list of all buyers or outlets of products
 - d. Records from all monitoring and inspections described in this Permit and in BDC's Operations Plan
 - e. Daily compost process control and monitoring information, including all temperature records
 - f. Laboratory results from all sampling described in this Permit
 - g. Odor, dust, and vector complaints received from off site

O. Sampling and Analysis:

1. Sampling and analysis of actively composting batches can be performed without limitation. This shall be known as Work in Progress (WIP) Samples.
2. Final Samples shall be defined as samples collected when a batch is expected to be mature, for the purpose of determining if the compost meets the performance and analytical criteria in Table 1.
3. All Final Samples shall be designated as such prior to lab analysis.

4. All Final Samples shall be collected in accordance with the methods and protocols set forth in the U.S. Composting Council's *Test Methods for Evaluation of Compost and Composting* ("TMECC") and reported on a quarterly basis as described in Section II.O of this Permit.
5. Compost awaiting analytical sampling or analysis shall be stored separate from all other compost and windrows unless and until it can be shown to meet the analytical and performance criteria listed in Table 1, below.
6. Batches that meet all analytical and performance criteria listed in Table 1, as a result of a single Final Sample analysis, and have been screened, are approved for immediate sale.
7. In the event that compost fails to meet any of the criteria for any parameter listed in Table 1, BDC shall notify the Department in writing within 72 hours of BDC's receipt of the data and provide what corrective actions shall be taken to address this failure and prevent future failures. Such notification shall include identification of the failed batch(es) and the corresponding full laboratory report detailing results for all analytical and performance criteria identified in Table 1 of this Permit.
8. Compost that does not meet the criteria for Maturity, Stability, Soluble Salts, pH, total inerts, plastic, or carbon to nitrogen ratio shall not be marketed unless and until BDC receives written Department approval or additional management and subsequent analysis of the same batch of finished compost demonstrates it meets the criteria for those parameters.
9. A batch of finished compost product that fails to meet the criteria for Salmonella, Fecal coliform, or any metal listed in Table 1 may be resampled and analyzed once; however, BDC shall split samples with the CAPS.
10. In this event, BDC shall be responsible for the analytical costs of the Department's samples. If any of the samples fail to meet the criteria a second time, the compost shall be properly disposed of within 30 calendar days of BDC's receipt of the analytical data for that re-sampled batch.
11. Metals analysis shall be on a dry weight basis for arsenic, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, selenium, and zinc using EPA's SW-846 (*Test Methods for Evaluating Solid Waste, Physical/Chemical*) method 6010 in its most currently approved version. Metals in the finished compost shall not exceed the limits shown in Table 1:

TABLE 1. PERFORMANCE and ANALYTICAL CRITERIA

PARAMETER	CRITERIA
Maturity & Stability	≥ 6 based on Solvita® Compost Maturity Index ¹
Soluble Salts (Conductivity)	≤ 10 mmhos/cm
Salmonella	< 3 MPN per 4 g dry wt.
Fecal Coliform	$< 1,000$ MPN/g dry wt.
pH	5 – 8.5
Total Inerts	$< 1\%$, not to exceed 0.5% plastic
Carbon to Nitrogen Ratio	$< 20:1$
Arsenic, Total	< 11 mg/kg ²
Cadmium, Total	< 7 mg/kg
Chromium VI	0.29 mg/kg ³
Chromium, Total	< 214 mg/kg
Copper, Total	$< 1,000$ mg/kg ⁴
Lead, Total	< 400 mg/kg
Mercury, Total	< 1 mg/kg
Molybdenum, Total	< 39 mg/kg
Nickel, Total	< 150 mg/kg
Selenium, Total	< 39 mg/kg
Zinc, Total	$< 2,300$ mg/kg

¹ Alternate Criteria for Maturity using TMECC method 5.05-A (Seed emergence and seedling vigor): $> 80\%$ relative to positive control; Alternate Criteria for Stability using TMECC method 5.08-B (Carbon Dioxide evolution rate): < 4 mg CO₂-C/g VS /day.

² Division policy sets the limit for Arsenic at 11 ppm (mg/kg).

³ If the limit for Chromium VI is below the routine laboratory method detection limit (“MDL”), the routine MDL becomes the limit.

⁴ Permit-specific value based on Risk Assessment Analysis

P. Groundwater Monitoring

1. General Requirements

- a. BDC shall submit a groundwater monitoring plan that encompasses the eight (8) wells which were installed as part of the hydrogeologic assessment submitted as part of the application for this permit.
- b. BDC shall notify CAPS at least fifteen (15) business days prior to installing, modifying, or abandoning any monitoring wells. The installation of new monitoring wells, or modification or abandonment of existing monitoring wells, shall be performed in accordance with Delaware’s *Regulations Governing the Construction and Use of Wells* after receiving approval from CAPS to proceed.
- c. All water quality samples shall be collected as outlined in the DNREC Remediation document, *Standard Operating Procedure Monitoring Well/Piezometer Installation/Development and*

Groundwater Sampling currently dated May 2021. BDC shall confirm they are using the most up to date version of this document each time they sample.

- d. Each well shall be sounded during each water level measuring event and after the completion of sampling at each well.
- e. All water quality samples will be measured for the following field parameters:
 - a. Dissolved Oxygen
 - b. pH
 - c. Oxidation-Reduction Potential (ORP)
 - d. Specific Conductance/Specific Conductivity
 - e. Temperature
 - f. Turbidity
- f. Water Quality samples will be laboratory analyzed for the following indicator parameters:
 - a. Total Dissolved Solids (TDS)
 - b. Total Suspended Solids (TSS)
 - c. Chemical Oxygen Demand (C.O.D.)
 - d. Biological Oxygen Demand (B.O.D.)
 - e. Total Kjeldahl Nitrogen (TKN)
 - f. Total Organic Nitrogen (TON)
 - g. Ammonia (NH₃)
 - h. Nitrate (NO₃-)
 - i. Nitrite (NO₂-)
 - j. Cyanide
 - k. Total Phosphorus
 - l. Total Organic Phosphorus (T.O.P.)
 - m. Polyhydrolyzable Phosphorus
 - n. Orthophosphate
 - o. Dissolved Phosphorus
 - p. Dissolved Orthophosphate
 - q. Pesticides
 - r. Herbicides
 - s. Salmonella
 - t. Fecal Coliform
 - u. Campylobacter
- g. Test methods used for groundwater monitoring shall be those described in the most current legal edition of EPA Publication *SW-846*. If *SW-846* does not contain a test method for a required parameter, that parameter shall be tested according to methods described in the most recent edition of EPA Publication, *Methods of Chemical Analysis for Water and Wastes* or *Standard Methods for Examination of Water and Wastewater*. All samples shall be collected and analyzed using approved QA/QC procedures.

Q. Reporting:

1. Quarterly: BDC shall submit the results from all analyses conducted in a given quarter to the Department via e-mail or in hard copy on a quarterly basis by the following dates: April 15th, July 15th, October 15th, and January 15th. BDC shall include in these quarterly reports tonnages and volumes of:
 - a. Wood waste, hatchery waste, poultry litter, DAF sludge, and DAF cake, and any other incoming waste received, including state of origin, listed by waste type
 - b. Digestate produced for use at the compost facility
 - c. Finished compost produced
 - d. Finished compost shipped to, or picked up by, customers
 - e. Digestate shipped to, or picked up by customers
 - f. Finished compost used at or around the facility
 - g. All waste sent for disposal, recycling, or reuse, and the date and facility where sent. An attempt to provide a general description of the waste shall also be provided, i.e. plastic, treated lumber.
 - h. Compost or digestate failing to meet performance and analytical criteria in Table 1, including the parameter(s) that was not met and the facility at which the unacceptable material was disposed, if applicable
 - i. Rejected waste, tallied as number of loads, including reason for rejection, customer, and date it was brought to BDC
 - j. Finished compost stored
 - k. Finished digestate stored
 - l. Wood waste, screened-overs, hatchery waste, poultry litter, DAF sludge, DAF cake, and any other waste stored, listed by waste type and storage location.
 - m. Monthly logs showing gas monitoring walk through as outlined in Section III.O.4 of this permit.
2. Annually:
 - a. No later than February 1 of each calendar year, BDC shall provide an updated closure cost estimate, taking into account inflation. If the cost estimate has increased over the amount of financial assurance provided, BDC shall accordingly provide increased financial assurance, along with an updated Performance Bond, within six weeks of the submission of the updated closure cost estimate.
 - b. No later than February 1 of each calendar year, BDC shall submit an annual report outlining all activities performed under the approved Community Engagement Plan for the previous calendar year. The data points for reporting shall be those outlined by the Plan as per section III.D of this permit.
 - c. No later than February 1 of each calendar year, BDC shall submit an annual report for the previous calendar year in hard copy format, and include the following information:

1. Tonnages and volumes for the same materials described in Section III.Q.1.a, total of each for the year and including state of origin;
 2. Tonnages and volumes for the same materials described in Section III.Q.1.b-g, total of each for the year;
 3. Tonnages and volumes for the same materials described in Section III.Q.1 h-k, stored at the end of the year;
 4. A copy of the logs outline in Section III.Q.m;
 5. Names and addresses of all suppliers of DAF sludge, DAF cake, or hatchery waste;
 6. A summary of the performance and analytical results from the quarterly finished compost testing reports, to include the range of results for each parameter and BDC's interpretation of those results;
 7. Written discussion by BDC of the facility's operations and processes to include any adjustments made in the process as well as a summary of materials management knowledge and experience gained during the past calendar year.
3. All reports shall be submitted to the CAPS project officer Adam Schlachter via email or a hard copy using the information below:

Delaware Department of Natural Resources and Environmental Control
Waste and Hazardous Substances Division
Compliance and Permitting Section
89 Kings Highway
Dover, DE 19901
Attn: Adam Schlachter
Email: adam.schlachter@delaware.gov

R. Authorized Waste Types:

1. Only clean wood waste, poultry litter, DAF sludge, DAF cake, hatchery waste, digestate, and process water shall be accepted for processing into compost and these waste materials shall be managed in accordance with this Permit. Clean wood is defined as wood that is not painted, stained, coated or treated. Process water is defined by BDC as leachate collected from the CASP system, water from the stormwater pond, or other non-potable water from the composting site. Clean wood and process water shall not be included in annual permitted tonnage amounts.
2. DAF sludge and DAF cake shall be accepted only from the following locations:
 - a. Perdue Farms, Inc. - 20621 Savannah Rd, Georgetown, DE
 - b. Perdue Farms, Inc. - 255 N. Rehoboth Blvd, Milford, DE
 - c. Perdue Farms, Inc. - 521 Willow Street, Salisbury, MD
 - d. Perdue Farms, Inc. - 2401 East Cumberland Street, Lebanon, PA 17042

- e. Perdue Farms, Inc. – 6906 Zion Church Rd., ZCR Complex Hatcheries 2 & 3, Salisbury MD 21804
 - f. Mountaire Farms - 29005 John J Williams Hwy., Millsboro, DE 19966
 - g. Mountaire Farms - 55 Hosier Street, Selbyville, DE 19975
 - h. Amick Farms - 274 Nealson Street, Hurlock, MD 21643
 - i. Amick Farms - 39 Delaware Ave, Hurlock, MD 21643
 - j. Allen Harim Foods - 18752 Harbeson Road, Harbeson, DE 19951
 - k. Allen Harim Foods - 29984 Pinnacle Way, Millsboro, DE 19966
 - l. Tyson Foods - 11224 Lankford Hwy., Temperanceville, VA 23442
 - m. Valley Proteins/Darling Ingredients – 5420 Linkwood Rd., Linkwood, MD 21835
3. Hatchery waste shall be accepted only from the following locations:
- a. Perdue Farms, Inc. - 37 Delaware Avenue, Hurlock, MD
 - b. Perdue Farms, Inc. - 9891 Old Princess Anne Rd, Westover, MD
 - c. Perdue Farms, Inc. – 6906 Zion Church Rd, ZCR Complex Hatcheries 2 & 3, Salisbury, MD
 - d. Perdue Farms, Inc. - 2401 East Cumberland Street, Lebanon, PA 17042
 - e. Mountaire Farms - 29005 John J Williams Hwy., Millsboro, DE 19966
 - f. Mountaire Farms - 55 Hosier Street, Selbyville, DE 19975
 - g. Amick Farms - 274 Nealson Street, Hurlock, MD 21643
 - h. Amick Farms - 39 Delaware Ave, Hurlock, MD 21643
 - i. Allen Harim Foods - 18752 Harbeson Road, Harbeson, DE 19951
 - j. Allen Harim Foods - 29984 Pinnacle Way, Millsboro, DE 19966
 - k. Tyson Foods - 11224 Lankford Hwy., Temperanceville, VA 23442
4. Wood waste material, or “overs”, from the ½ inch screen, shall be an acceptable feedstock as long as they have gone through an effective process to mechanically remove non-compostable material. Overs shall not be included in annual permitted tonnage amounts.
5. No other waste shall be accepted unless and until BDC obtains approval from the Department.
- S. Prohibited Waste:
BDC shall exercise reasonable care to ascertain whether waste accepted by the facility is prohibited waste, and shall not accept the following prohibited waste, including, but not limited to:
- 1. Any plastics that are not certified compostable by the Biodegradable Plastics Institute (“BPI”) or equivalent certifying third party
 - 2. Glass, metal
 - 3. Painted, stained, coated, or treated wood; wood containing Chromated Copper Arsenate (“CCA”) or other chemical preservatives; wood

- containing creosote; and wood that is suspected of being contaminated with PCB's, petroleum products, or hazardous chemicals
4. Mixed municipal solid waste (trash/garbage), tires
 5. Batteries, electronics
 6. Sewage sludge and septage
 7. Infectious and medical wastes, radioactive materials, universal wastes or hazardous wastes
 8. Hatchery waste not specifically described to, and approved by, the Department.
 9. Waste, including DAF sludge and DAF cake, resulting from wastewater systems that contain a sanitary component are specifically prohibited.

Reasonable care shall include contacting the waste transporter or individual generator if a visual determination regarding the acceptability of the waste material cannot be made. Any loads that appear to contain any of the prohibited wastes listed above shall be rejected. These wastes shall be reloaded onto the truck and removed immediately. If these wastes are noticed after the hauler/customer has left BDC, these wastes shall be immediately containerized and lawfully removed from the site within 72 hours of initial receipt.¹

IV. **RAW MATERIAL ACCEPTANCE, PROCESSING, AND STORAGE:**

- A. Procedures for Waste Acceptance: Waste acceptance and processing shall be conducted in accordance with BDC's submitted *Operations Plan*, DRGSW, Delaware Code, and the conditions below.
1. All incoming waste, rejected waste, outgoing waste, and outgoing products shall be weighed and recorded.
 2. Upon arrival at the facility, all incoming loads of wood waste and poultry litter shall be inspected prior to, and after, unloading. Hatchery waste and DAF cake and sludge shall be inspected as it is dispensed or unloaded.
 3. Any prohibited wastes listed in Section III.R.2 of this permit that are visible shall be reloaded onto the truck and removed immediately. If these wastes are noticed after the hauler/customer has left BDC, these wastes shall be immediately containerized and lawfully removed from the site within 72 hours of initial receipt.¹
 4. BDC shall be limited to 250,000 tons of material which is split between the anaerobic digester (200,000 tons/year) and the compost facility (50,000 tons/year) which includes in-process and finished product, on site at any one time. This tonnage is currently limited to 30,000 tons based on the

¹ For information on the proper handling and disposal of sewage sludge and septage, please contact the Division of Water at (302) 739-9946. For information on the proper handling and disposal of all other listed prohibited wastes, please contact the CAPS at (302) 739-9403.

existing air permit that BDC has issued from DAQ. Until such time that BDC has received permission from DAQ to increase feedstock throughput, the 30,000 ton annual limit for composting will remain. This total includes all feedstocks, except clean wood, overs, and process water, which do not count towards total tonnage.

B. Procedures for Wood Waste Acceptance: BDC shall accept only clean wood waste that is not painted, treated, coated, or stained.

C. Procedures for Waste Handling:

1. DAF Sludge and Cake: DAF sludge and DAF cake shall be delivered to the BDC site in a covered, leak-proof vehicle or container. All DAF sludge shall be pumped from the vehicle to the storage tanks. DAF sludge shall be pumped from a storage tank into either the anaerobic digester or compost facility receiving building. When delivered to the compost facility receiving building, DAF sludge must be placed on top of or surrounded by absorbent, approved feedstock. DAF Cake shall be unloaded into the appropriate receiving building. No liquid residue from any DAF sludge or DAF cake shall leave the absorbent, approved feedstock or the receiving building floor. All DAF sludge or DAF cake dispensed or unloaded into the receiving building shall be mixed and placed in a digester tank or a CASP within twenty-four (24) hours of the DAF sludge or DAF cake being dispensed into the receiving building.
2. Digestate: Once the anaerobic digestion process has started, the digestate will be produced within each of the tanks. This material will be removed from the tanks and sent into an area of the plant where it will undergo processing. This will include a dewatering process which will separate the solids out and provide process water back into the digester tanks. This resulting digestate will be collected and placed on trucks within the anaerobic digestion loadout/storage area and then delivered to the compost facility mixing room to be utilized.
3. Hatchery Waste: Hatchery waste shall be delivered to the BDC site in a covered, leak-proof vehicle or container. Hatchery waste shall be unloaded into either anaerobic digester or compost receiving building. Hatchery waste shall be unloaded on top of or surrounded by absorbent, approved feedstock in the compost facility. No liquid residue from the hatchery waste shall leave the absorbent, approved feedstock or the receiving building floor. All hatchery waste shall be mixed and placed in a CASP within twenty-four (24) hours of the hatchery waste being received at the compost facility.
4. Poultry Litter: Poultry litter shall be unloaded into either the Receiving Building or a bunker in digester or the CASP area. Poultry litter shall be used as needed to achieve the optimum carbon to nitrogen ratio, moisture content and porosity of the mixture.
5. Wood Waste: Wood waste shall be added to the digester tanks or compost mixture to achieve the optimum carbon to nitrogen ratio, moisture content and porosity of the mixture.

6. (Screened) Overs: This is the woody material that is leftover when finished compost is screened for sale. This material can continue to be added back into active compost piles until such time that it fully decomposes.
7. Agricultural Residuals: This includes materials that are a result of processing agricultural crops into animal feed and is limited to the plants, their stalks/stems and any other organic byproduct that is leftover when feed crops, such as soybeans, get processed into animal food. Any agricultural residuals beyond food crops must be approved by the Department before BDC can accept them for use at either the anaerobic digester or compost facility.
8. Process water: Process water may be recycled back into digester tanks or added to the compost mixture to provide additional moisture as needed. BDC shall make every effort to ensure process water does not leave the receiving building floor.

D. Procedures for Storage of Waste:

1. BDC shall not store any hatchery waste or DAF cake other than is allowed for initial mixing. Hatchery waste and DAF cake shall be stored only in the appropriate receiving building. Storage of hatchery waste and DAF cake inside the receiving building is limited to twenty-four (24) hours from the time the hatchery waste is received by BDC.
2. Poultry litter shall be stored either in the appropriate receiving building or in a bunker in the CASP area. BDC shall store no more than 300 tons of poultry litter at any one time.
3. BDC shall store no more than 173 tons of DAF sludge. All DAF sludge shall be stored in the designated DAF storage tanks.
4. BDC shall store no more than 20,000 gallons of process water. All process water shall be stored in the designated process water storage tank.
5. BDC shall at all times store a minimum quantity of clean wood waste or screened overs sufficient for mixing with incoming feedstocks in batch-preparation proportion for the appropriate facility. Ground wood waste shall not be stored more than 12 feet in height.
6. The total amount of unprocessed waste stored in the receiving building shall not exceed 377 tons of material at any time. This total shall be any combination of hatchery waste, DAF cake, and poultry litter.
7. Wood waste material, or "overs", from the ½ inch screen, shall be an acceptable feedstock as long as they have gone through an effective process to mechanically remove non-compostable material.
8. The temperature of the piles of ground wood waste, including overs described above in Sections IV.C.5 and IV.C.6, shall be monitored and recorded at least once a week to ensure the temperature at the core of the pile does not exceed 160 degrees Fahrenheit. If the temperature is above 160 degrees Fahrenheit, BDC shall follow the fire safety procedures outlined in Section III.I above and take action to reduce the risk of fire. Records shall indicate the temperature measured as well as any actions taken to lower the temperature, if applicable.

9. Prohibited waste, collected litter, and associated waste shall be stored in enclosed containers. Stored waste shall be removed by BDC the same day the container becomes full or within 72 hours of the Department's request to dispose of the waste (whichever comes first).
10. Any other storage of waste not described in this Permit is prohibited.

E. Procedures for Waste in the Anaerobic Digester

1. All materials that are destined for the anaerobic digester should be delivered to the anaerobic digester receiving building, which includes a solids tipping floor as well as liquid receiving tanks depending on the waste stream delivered.
2. Once material has been delivered it will be fed into the pretanks. During this step, depending on the mix of materials going into the digester tanks, the appropriate amounts of feedstock will be moved from the receiving building into the pretanks. The pretank operates continuously so that all waste delivered into the facility will be integrated into the anaerobic digester within 24 hours.
3. The digester tanks will be fed continuously from the pretank until they reach their capacity of 2,000,000 gallons (approximately 50,000 tons of material). As material begins to breakdown within the anaerobic digester, gas will be formed that flows to a collection system at the top of the tank and solids will collect towards the bottom of the tank where paddles will be continuously mixing the material so that there is minimal clumping or buildup.
4. Material from the anaerobic digester tanks then flows to a separatory feed tank where digestate material (a mix of liquids and solids) goes through a screw press to reduce the liquid component.
5. The resulting dewatered material from the separator then goes to a centrifuge for further processing. During this state, the bulk of the liquid is removed and is either sent back into the digester tanks to be recycled or to a bioreactor which is the start of the wastewater treatment process. The 'solid' material remaining from the centrifuge is digestate. Digestate is then moved into the compost facility operation or may get sold as a product.
6. As stated, part of the water from the centrifuge goes into the digester tanks to be mixed back into the process. The portion of the water not designated for the digester tanks enters the wastewater treatment process which begins with a bioreactor. If the digester tanks require additional water, the material coming out of the bioreactor is diverted back again. Water that is not needed by the process goes through a final ultrafiltration process where it is then tanked and trucked to the City of Seaford Wastewater Treatment facility for processing.

F. Procedures for Biogas Production

1. Material that has been added to the Anaerobic Digester tanks produces gas which is collected from the top areas of each digester tank.
2. Once the gas exits the digester tank it is boosted, pressurized and fed into a biogas conditioning unit.

3. In instances where the biogas conditioning unit cannot accept gas, there is a flare, approved by the DAQ, that will burn off the gas being created by the anaerobic digester.
4. Gas that has been injected into the Biogas conditioning Unit undergoes a filtration process to first remove Hydrogen Sulfides (H₂S), moisture, and then Volatile Organic Compounds (VOCs). All filtration media for this process is included in the overall solid waste tonnage of the facility and must be disposed of accordingly. Any instances where this media can be 'recharged' or reused, are outlined in the BDC Operations Plan.
5. Gas that has been appropriately filtered is then passed into the biogas upgrade system which includes a compression step as well as the removal of excess Carbon Dioxide (CO₂). In cases where the CO₂ levels are above pipeline quality, the gas is diverted back to the compressor to be put through the removal process again.
6. Gas that has undergone appropriate upgrading will then be pumped into gas delivery trucks where it will be delivered to an inlet for the Chesapeake Utilities Natural Gas pipeline. All waste gas produced will be flared in accordance with Division of Air quality emissions permitting.

G. Procedures for Waste in Covered Aerated Static Piles:

1. Material in the CASPs must meet the requirements for the Process to Further Reduce Pathogens ("PFRP"). As such, the piles shall maintain a temperature of 131 °F (55 °C) or higher for 3 consecutive days.
2. All aerated static piles shall be completely covered by the MOR cover (or approved equivalent) such that no compost is exposed, and the MOR cover (or approved equivalent) shall be sufficiently weighted down so the cover does not move and the compost remains completely covered. The MOR cover (or approved equivalent) shall be monitored for wear and tear and shall be repaired or replaced as necessary to perform properly.
3. No aerated static pile shall exceed 165 feet in length, 25 feet in width or 12 feet in height. No aerated static pile shall extend beyond the concrete walls separating the piles.
4. The total amount of blended material and compost in the CASP Area, Windrow Composting Area and Finished Product Storage Area, including compost awaiting sampling or analysis, shall not exceed 30,000 tons at this time. Once DAQ has approved new feedstock throughput, for BDC's compost facility air permit, the total allowable tonnage will increase to a maximum of 50,000 tons. Clean wood and overs are excluded from this total.
5. All leachate collected from the trench drain located underneath the CASPs shall flow through a sewer line to the process water storage tank.
6. Temperature monitoring for active compost being processed in CASPs shall be monitored daily until such time as it moves from the CASP to curing.

E. Procedures for Compost in the Curing Process:

1. No windrow shall exceed 165 feet in length, 25 feet in width, or 12 feet in height. Windrows shall be at least six feet apart at the base and at least 12 feet apart at the top.
2. Compost in the curing phase shall be stored in the Windrow Composting Area or in the CASP Area if necessary, to generate proper composting conditions. Compost that has been cured may be placed in the CASP area if forced aeration is needed to aid in the drying process. Any material placed in the CASP area that is not actively composting must be clearly identified and able to be distinguished from active composting CASPs.
3. The total amount of blended material and compost in the CASP Area, Windrow Composting Area and Finished Product Storage Area, including compost awaiting sampling or analysis, shall not exceed the current 30,000 ton limit. Once DAQ has approved new feedstock throughput for BDC, the total maximum tonnage at the compost facility shall not exceed 50,000 tons.
4. Compost in the curing phase of the process must have its temperature checked daily until such time as the temperature is below 105°F. At this time, monitoring of temperature will shift to weekly. In the event a curing windrow is disturbed, such as through turning or addition of material, temperature monitoring will revert to daily for a minimum of five (5) days with a decreasing temperature trend and measurements below 105°F have been reestablished.
5. Water may be added to the windrows for additional moisture using well water or process water. If process water is used, the windrowed material shall again meet PFRP. For windrows, the PFRP requires material to be held at 131°F (55°C) for 15 days or longer. During the period when the compost is maintained at 131°F (55°C) or higher, there shall be a minimum of five turnings of the windrow. In these cases, the temperature checks shall go back to daily to ensure that the 131°F (55°C) level is maintained.

IV. STORAGE OF FINISHED COMPOST:

- A. The total amount of blended material and compost in the CASP Area, Windrow Composting Area and Finished Product Storage Area, including compost awaiting sampling or analysis, shall not exceed the current 30,000 ton limit. Once DAQ has approved new feedstock throughput calculations for BDC's compost facility permit, the total maximum tonnage shall not exceed 50,000 tons.
- B. Finished compost is defined as compost that has completed the curing phase, has been screened through a ½-inch screen (or smaller), has satisfied all performance and analytical criteria specified in Table 1 of this Permit, and is immediately available for distribution to a customer, whether paid or unpaid.
- C. Finished compost shall be stored as designated on the attached site map.

V. FINISHED COMPOST USE AND APPLICATION:

- A. Compost
 - a. BDC shall be responsible for ensuring all necessary permits have been obtained prior to marketing the compost;
 - b. Finished compost may be used as a soil amendment;
 - c. Finished compost with a Solvita Maturity Index of ≥ 6 may be used for Bedding Plants; Container media; Potting mixes; Seedling starters; Hothouse beds; Greenhouses; Orchards; Pastures; Hay crops; Turf; Topsoil Substitute Blends; and General gardening.
- B. Digestate
 - a. BDC shall be responsible for ensuring all necessary permits have been obtained prior to marketing the digestate;
 - b. Finished digestate may be used as a soil amendment.

VI. **CLOSURE:**

- A. BDC shall immediately notify the Department in writing the estimated date of facility closure and/or the date wastes will no longer be accepted for anaerobic digestion and/or composting.
- B. BDC shall notify the Department in writing when closure activities are started, and again when closure is complete.
- C. Should BDC cease the acceptance of waste to the anaerobic digester or processing of waste into compost, within one hundred and eighty (180) days of cessation of operation, all feedstocks, waste material in the process of digestion or composting, and compost product shall be properly recycled, reused, or disposed of off-site. All disposal, reuse, and recycling activities undertaken in this section must be conducted per the requirements of the DRGSW and Delaware Code.
- D. During the 180 day closure period, the total amount of digestate and/or compost stored in the CASP Area, Windrow Composting Area and Finished Product Storage Area, including compost awaiting sampling or analysis, shall not exceed the current 30,000 ton limit. Once DAQ has approved new feedstock throughput calculations for BDC's compost facility permit, the total maximum tonnage shall not exceed a total of 50,000 tons. By the end of the 180-day period, all compost, including compost which did not meet the analytical criteria established in Table 1 of this Permit, shall be properly removed from the site.

VII. **ADDITIONAL CONDITIONS:**

- A. The Department retains the right to collect samples of any material at any time. The Department and BDC retain the right to obtain split samples from each other's sampling events for separate analysis. BDC shall bear the expenses or reimburse the Department for the cost of analysis of all samples obtained and analyzed by, or for, the Department once per quarter.

- B. BDC shall obtain and maintain proper coverage under the Department's National Pollutant Discharge Elimination System ("NPDES") stormwater permit program. If the stormwater discharge associated with BDC results in an increase in nutrient load, additional best management practices shall be employed. If increased loading cannot be addressed strictly through Best Management Practice implementation, an offset plan shall be required.
- C. If BDC desires to renew this Permit, BDC shall submit a new application with all supporting documentation no later than 180 days prior to its date of expiration. BDC may be required to submit additional documentation as needed at the Department's sole discretion. The date which a renewal application must be received by the Department is **Day, Month Year.**
- D. This Permit does not relieve BDC from complying with any other applicable Federal, State, or Local laws, regulations or ordinances.
- E. Any violation of any condition of this Permit, regulation promulgated by the Department, Secretary's Orders, or provision of 7 *Del.C.* Chapter 60, shall justify termination of this Permit, and implementation of appropriate enforcement action.

VIII. Permit Renewal and Transfer History:

- A. December 2, 2016
 - 1. Composting Permit # SW-16/13 issued to Seaford AgriSoil, LLC:
 - a. Initial composting permit;
 - b. Issued for one year expiring December 2, 2017.
- B. November 29, 2017
 - 1. Permit # SW-16/13 extension granted:
 - a. Existing permit extended six months to June 2, 2018;
 - b. Facility name updated to Purdue AgriRecycle, LLC.
- C. June 1, 2018
 - 1. Permit # SW-18/03 issued to Purdue AgriRecycle, LLC:
 - a. Issued for two years expiring June 2, 2020.
- D. January 21, 2020
 - 1. Permit # SW-18/03 transferred to Bioenergy Development Group.
- E. May 26, 2020
 - 1. Minor Modification to Permit # SW-18/03 issued:
 - a. Removed limitations of feedstock by type in Section III.A. Monthly and annual feedstock tonnage limits remain unchanged;
 - b. Changed temperature monitoring requirements in Section II.H.1 from "daily" to "weekly";
 - c. Changed notification requirements from "24 hours" to "72 hours" for compost failing analytical criteria in Section II.N.3;
 - d. Changed C:N ratio criteria from "10:1-20:1" to "<20:1" in Table 1;
 - e. Removed end use restrictions associated with Solvita 6 in Table 1 and Section V.C;
 - f. Changed wood storage requirements from "minimum of double the volume or tonnage of wood waste required for optimum compost

mixture of a single CASP” to “100 tons of either clean wood waste or recycled wood” in Section III.C;

- g. Updated Section III.D.6, III.E.4 and III.E.5 to clarify weekly temperature monitoring when conditions are met. Additionally, clarification of when monitoring must go back to daily with the addition of process water in compost in the curing phase.

2. Permit # SW-18/03 extension issued:

- a. Modified permit extended 18 months to December 2, 2021.

F. November 19, 2020

1. Minor Modification to Permit #SW-18/03 issued:

- i. Updated section III.N Sampling and Analysis;
- ii. Defined Work in Progress Samples and Final Samples to clarify sampling protocols;
- iii. Defined when a batch is approved for sale based solely on Final Sample results;
- iv. Updated batch failure reporting requirements to include batch identification and submission of the associated full lab report.

- b. Updated Project Officer contact info for reporting submissions.

G. June 8, 2021

- 1. Updated permit to add additional locations and vendors for acceptable material to be sourced from.

H. September 3, 2021

- 1. Modified permit to allow time to prepare for proposed facility expansion. Granted a 1-year extension to expire December 2, 2022;
- 2. Updated facility name from Bioenergy Development Group, LLC to Bioenergy Devco;
- 3. Updated facility address from previous address in Columbia, MD to a current address in Annapolis, MD

I. April 21, 2022

- 1. Updated permit to add additional locations and vendors for acceptable DAF material to be sourced from.

J. August 2, 2022

- 1. Added Valley Proteins/Darling Ingredients as a new vendor for DAF material to be sourced from.

K. October 18, 2022

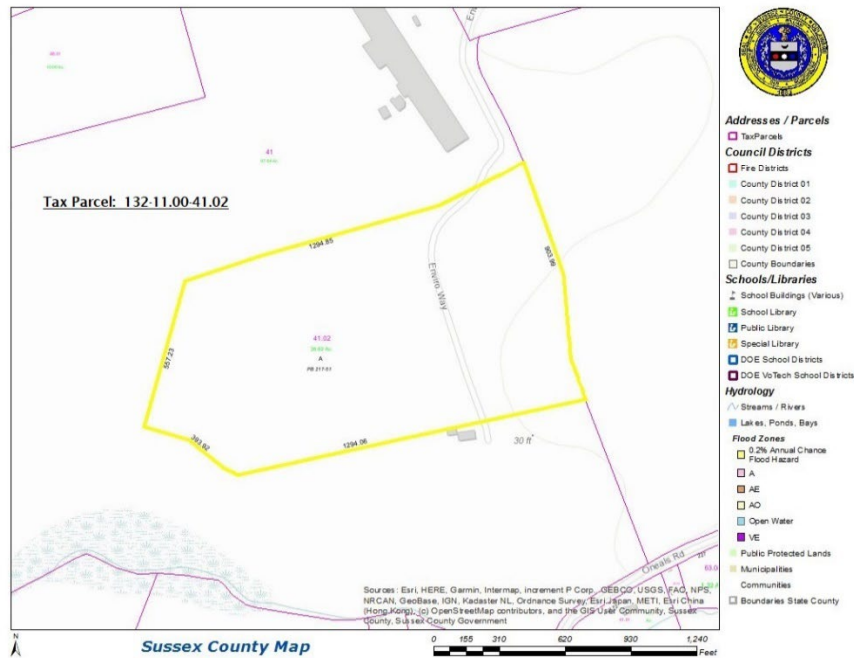
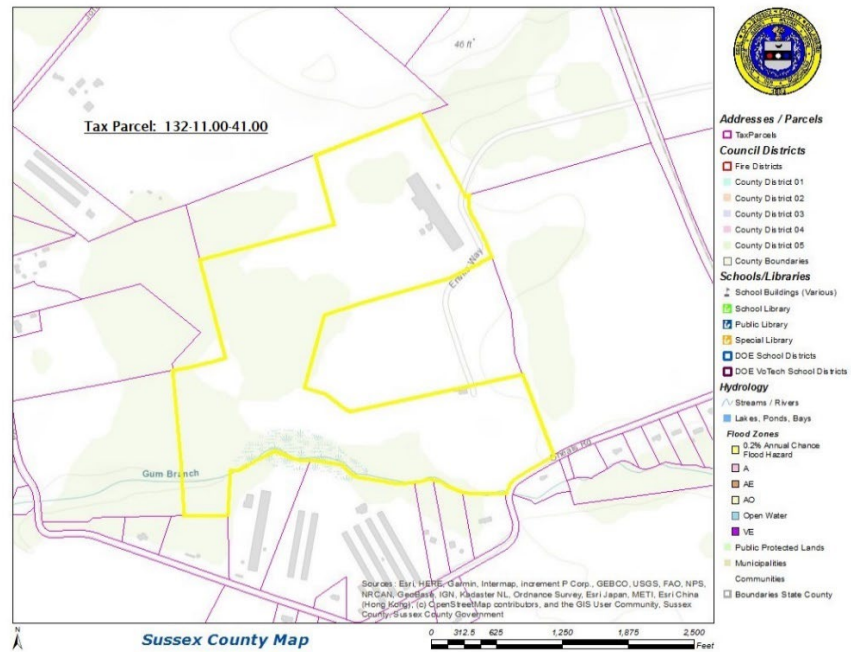
- 1. Extended permit to accommodate the resource recovery facility application review which is current in-process for proposed expansion to operations. Granted extension through December 31, 2023.

Jason W. Sunde
Environmental Program Administrator
Compliance and Permitting Section

Date

DRAFT

TAX PARCEL MAP



SITE MAP

