



Connecticut Department of  
**ENERGY &  
ENVIRONMENTAL  
PROTECTION**

**BUREAU OF AIR MANAGEMENT  
NEW SOURCE REVIEW PERMIT  
TO CONSTRUCT AND OPERATE A STATIONARY SOURCE**

Issued pursuant to Title 22a of the Connecticut General Statutes (CGS) and Section 22a-174-3a of the Regulations of Connecticut State Agencies (RCSA).

<b>Owner/Operator</b>	Frito-Lay, Inc. – Dayville Facility
<b>Address</b>	1886 Upper Maple Street, Dayville, CT 06241
<b>Equipment Location</b>	1886 Upper Maple Street, Dayville, CT 06241
<b>Equipment Description</b>	Centaur 50-6200S Gas Turbine with a 44.4 MMBtu/hr Duct Burner and Heat Recovery Steam Generator
<b>Town-Permit Numbers</b>	089-0105
<b>Premises Number</b>	0065
<b>Stack Number</b>	20
<b>Collateral Conditions</b>	Part VII of this permit contains collateral conditions concerning Starch Dryers 1 and 2.
<b>Modification Issue Date</b>	September 19, 2019
<b>Prior Permit Issue Date(s)</b>	April 8, 2019 (Minor Modification) May 10, 2012 (Minor Modification) May 9, 2008 (Original)
<b>Expiration Date</b>	None

/s/ Tracy Babbidge for  
Betsey C. Wingfield  
Deputy Commissioner

9/19/2019  
Date

This permit specifies necessary terms and conditions for the operation of this equipment to comply with state and federal air quality standards. The Permittee shall at all times comply with the terms and conditions stated herein.

## **PART I. DESIGN SPECIFICATIONS**

### **A. General Description**

The Combined Heat and Power (CHP) plant consists of a Solar Centaur 50-6200S natural gas combustion turbine with a 44.4 MMBTU/hr Coen duct burner and a heat recovery steam generator. Control equipment consists of a selective catalytic reduction (SCR) system for NO<sub>x</sub> control. Frito-Lay, Inc. will use the CHP plant as the source for facility process steam, power, and comfort heating as required.

A portion of the SCR-treated CHP plant exhaust gas is used as the primary source of heat and conveying gas for the two starch dryers that comprise the facility's Starch Recovery System. Alternatively, when the CHP plant is not operating, Starch Dryer No. 1 uses a steam heat exchanger to heat air used as the drying and conveying medium, while Starch Dryer No. 2 uses a direct fired natural gas heater burner.

### **B. Equipment Design Specifications**

1. Turbine
  - a. Maximum Natural Gas Firing Rate (cf/hr)<sup>1</sup>: 62,781
  - b. Maximum Gross Heat Input (MMBTU/hr)<sup>1</sup>: 64.2
2. Duct Burner
  - a. Maximum Fuel Firing Rate (cf/hr)<sup>1</sup>: 43,419
  - b. Maximum Gross Heat Input (MMBTU/hr)<sup>1</sup>: 44.4

*Note 1* Combined turbine/duct burner Maximum Fuel Firing Rate may be determined by equation in Part V.D of this permit.

### **C. Control Equipment Design Specifications**

1. Selective Catalytic Reduction (SCR)
  - a. Make and Model: Rentech
  - b. Catalyst Type: Cormetech Titanium-Tungsten based material
  - c. Manufacturer Rated Control Efficiency (%): Control Efficiency shall be such that the emission limits for NO<sub>x</sub> in Part III.A of this permit are not exceeded.
2. Low NO<sub>x</sub> Burner
  - a. Make and Model: Solar SoLoNO<sub>x</sub> Burners

### **D. Stack Parameters**

1. Minimum Stack Height (ft): 57
2. Minimum Exhaust Gas Flow Rate at 100% load (acfm): 50,222

3. Minimum Stack Exit Temperature at 100% load (°F): 378
4. Minimum Distance from Stack to Nearest Property Line (ft): 195

**PART II. OPERATIONAL CONDITIONS**

**A. Equipment**

1. Turbine and Duct Burner
  - a. Fuel Type: Pipeline Quality Natural Gas
  - b. Maximum Natural Gas Consumption over any 13 Consecutive (28-day) Periods:  
930,312,000 cf/yr

**PART III. ALLOWABLE EMISSION LIMITS**

The Permittee shall not cause or allow this equipment to exceed the emission limits stated herein at any time.

**A. Allowable Short Term Emission Limits**

1. Criteria Pollutants
  - a. Turbine and Duct Burner Operating on Natural Gas at 100% Load and ISO Standard Conditions

Pollutant	lb/hr	ppmvd @ 15% O <sub>2</sub>
PM	0.89	
PM <sub>10</sub>	0.89	
PM <sub>2.5</sub>	0.89	
SO <sub>2</sub>	0.17	
NO <sub>x</sub>	0.99	2.5
VOC	0.15	
CO	10.84	45.0

2. Non-Criteria Pollutants

For All Operating Scenarios:

Pollutant	lb/hr	ppmvd @ 15% O <sub>2</sub>
Ammonia	1.76	12.0
Formaldehyde (>50% Load)	4.88E-02	
Formaldehyde (<50% Load)	4.28E-02	

**B. Allowable Startup and Shutdown Emission Limits**

<b>Pollutant</b>	<b>Startup Emissions (lb/event)</b>	<b>Shutdown Emissions (lb/event)</b>
NO <sub>x</sub>	1	1
CO	67	65
VOC	17	15

1. The Permittee shall minimize emissions during periods of startup and shutdown by the following work practices and time constraints:
  - a. Start the ammonia injection as soon as minimum catalyst temperature is reached;
  - b. The duration of startup shall not exceed 60 minutes for a hot start;
  - c. The duration of startup shall not exceed 60 minutes for a warm start;
  - d. The duration of startup shall not exceed 180 minutes for a cold start;
  - e. A warm start shall be defined as startup when the turbine has been down for more than 8 hours;
  - f. A cold start shall be defined as startup when the turbine has been down for more than 48 hours; and
  - g. The duration of shutdown shall not exceed 30 minutes.

**C. Annual Emission Limits**

<b>Pollutant</b>	<b>tons per 13 consecutive (28-day) Periods</b>
PM <sub>10</sub>	3.90
PM <sub>2.5</sub>	3.90
SO <sub>2</sub>	0.74
NO <sub>x</sub>	4.33
VOC	0.66
CO	47.49
Ammonia	7.70
Formaldehyde	0.21

**D. Hazardous Air Pollutants**

This equipment shall not cause an exceedance of the Maximum Allowable Stack Concentration (MASC) for any hazardous air pollutant (HAP) emitted and listed in RCSA Section 22a-174-29. [STATE ONLY REQUIREMENT]

**E. Opacity**

This equipment shall not exceed 10% opacity during any six minute block average as measured by 40 CFR 60, Appendix A, Reference Method 9.

F. Demonstration of compliance with the above emission limits may be met by calculating the emission rates using emission factors from the following sources:

- *PM/PM<sub>10</sub>/PM<sub>2.5</sub>; SO<sub>2</sub>: AP-42, 5<sup>th</sup> Edition Section 1.4 (Duct Burner), July 1998 and 3.1 (Turbine), April 2000*
- *Formaldehyde: Manufacturer's Data*
- *NO<sub>x</sub>, CO, VOC, and Ammonia: Latest Stack test data*

The commissioner may require other means (e.g. stack testing) to demonstrate compliance with the above emission limits, as allowed by state or federal statute, law or regulation.

#### **PART IV. MONITORING, RECORD KEEPING AND REPORTING REQUIREMENTS**

##### **A. Monitoring**

1. The Permittee shall use individual non-resettable totalizing fuel metering devices or billing meters to continuously monitor fuel feed to the turbine and duct burner.
2. The Permittee shall monitor all startup/shutdown, and malfunction events.
3. The Permittee shall perform inspections of the SCR as recommended by the manufacturer.

##### **B. Record Keeping**

1. The Permittee shall calculate and record the 28-day period and consecutive 13 (28-day) period fuel consumption. The consecutive 13 (28-day) period fuel consumption shall be determined by adding the current 28-day period's fuel consumption that of the previous 12 (28-day) periods. The Permittee shall make these calculations within 28 days of the end of the previous 28-day period.
2. The Permittee shall calculate and record the 28-day period and consecutive 13 (28-day) period PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, NO<sub>x</sub>, VOC, CO, Ammonia, and Formaldehyde emissions in units of tons. The consecutive 13 (28-day) period emissions shall be determined by adding (for each pollutant) the current 28-day period's emissions to that of the previous 12 (28-day) periods. Such records shall include a sample calculation for each pollutant. The Permittee shall make these calculations within 28 days of the end of the previous 28-day period.

Emissions during startup and shutdown shall be counted towards the annual emission limitation in Part III.C of this permit.

3. The Permittee shall keep records of all exceedances of any operating parameter. Such records shall include:
  - a. the date and time of the exceedance;
  - b. a detailed description of the exceedance; and
  - c. the duration of the exceedance.
4. The Permittee shall keep records of the occurrence and duration of any startup, shutdown, or malfunction in the operation of the stationary gas turbine/duct burner or any malfunction of the air pollution control equipment. [40 CFR §60.7(b)]

- Such records shall contain the following information:
- a. type of event (startup, shutdown, or malfunction);
  - b. equipment affected;
  - c. date of event;
  - d. duration of event (minutes); and
  - e. total NO<sub>x</sub> and CO emissions emitted (lb) during the event.

These Emissions shall be counted towards the annual emissions limits in Part III.C of this permit.

5. The Permittee shall keep records of each delivery of anhydrous ammonia. The records shall include:
  - a. the date of delivery;
  - b. the name of the supplier;
  - c. the quantity of anhydrous ammonia delivered; and
  - d. Certificate of analysis for material delivered.
6. The Permittee shall keep records of the inspection and maintenance of the SCR. The records shall include:
  - a. the name of the person;
  - b. the date;
  - c. the results or actions; and
  - d. the date the catalyst is replaced.
7. The Permittee shall maintain records of the maintenance/repairs/parts replacement of the turbine. The maintenance records shall include, at a minimum:
  - a. a description of the maintenance activity; and
  - b. the date the maintenance was performed.
8. The Permittee shall keep all records required by this permit for a period of no less than five years and shall submit such records to the commissioner upon request.

### **C. Reporting**

1. The Permittee shall submit all reports as required pursuant to 40 CFR §60.4375.
2. The Permittee shall notify the commissioner in writing of any exceedance of an emission limitation, and shall identify the cause or likely cause of such exceedance, all corrective actions and preventive measures taken with respect thereto, and the dates of such actions and measures as follows:
  - a. For any hazardous air pollutant, no later than 24 hours after such exceedance commenced; and
  - b. For any other regulated air pollutant, no later than ten days after such exceedance commenced.
3. The Permittee shall notify the commissioner in writing of any malfunction of the stationary gas turbine or duct burner, the air pollution control equipment. The Permittee shall submit such notification within ten days of the malfunction. The notification shall include the following:
  - a. a description of the malfunction and a description of the circumstances surrounding the cause or likely cause of such malfunction; and

- b. a description of all corrective actions and preventive measures taken and/or planned with respect to such malfunction and the dates of such actions and measures.

## **PART V. STACK EMISSION TEST REQUIREMENTS**

**A.** Stack emission testing shall be performed in accordance with the [Emission Test Guidelines](#) available on the DEEP website.

**B.** Recurring stack testing shall be required for the following pollutant(s):

NO<sub>x</sub>     CO     VOC     Other (HAPs): Ammonia

Stack testing shall be conducted for the following operating modes: Turbine and duct burner on natural gas.

**C.** Annual/biennial stack testing for NO<sub>x</sub> shall be performed to demonstrate compliance with the NO<sub>x</sub> emission limits in accordance with 40 CFR §60.4400.

**D.** For the purposes of stack emission testing, the combined turbine and duct burner fuel firing rate (scf/hr) Maximum Rated Capacity (MRC) may be determined by the following:

1. For Air Inlet Temperatures <19.9°F, MRC shall be 106,200 scf/hr, and

2. For Air Inlet Temperatures ≥19.9°F, the following equation may be used

$$MRC = 109,295 - 155.63 * T$$

Where: T = Air Inlet Temperature (°F)

**E.** Recurrent stack testing for CO, VOC and ammonia shall be conducted within five years from the date of the previous stack test to demonstrate compliance with their respective limits. VOC testing shall be conducted at the next DEEP required testing for any pollutant after the issuance of this modified permit, Application No. 201812797.

**F.** Stack test results shall be reported as follows: all pollutants in units of lb/hr; NO<sub>x</sub>, CO and ammonia in units of ppmvd at 15% O<sub>2</sub>.

## **PART VI. OPERATION AND MAINTENANCE REQUIREMENTS**

**A.** The Permittee shall operate and maintain this equipment in accordance with the manufacturer's specifications and written recommendations.

**B.** The Permittee shall operate and maintain this equipment, air pollution control equipment, and monitoring equipment in a manner consistent with good air pollution control practices for minimizing emissions at all times including during startup, shutdown, and malfunction.

**C.** The Permittee shall properly operate the control equipment at all times that this equipment is in operation and emitting air pollutants.

## **PART VII. SPECIAL REQUIREMENTS**

- A.** The Permittee shall comply with all applicable sections of the following New Source Performance Standard at all times.

Title 40 CFR Part 60 Subparts KKKK and A.

Copies of the Code of Federal Regulations (CFR) are available online at the U.S. Government Printing Office website.

### **B. Starch Dryers 1 & 2**

1. Operational Conditions
  - a. Combined Design Maximum Rated Dry Starch Capacity (tons/yr): 3,700
  - b. Maximum Hourly Wet Starch Input, combined (lb/hr): 1,417
  - c. Maximum Hourly Dry Starch Throughput, combined (lb/hr): 850
  - d. Maximum Total Exhaust Flow Rate from the CHP Plant (acfm): 8,400
  - e. The exhaust gas from the CHP plant shall not bypass the CHP plant emission control system.
  - f. Minimum Stack Height (ft): 57
2. Monitoring Requirements
  - a. The Permittee shall install, calibrate, maintain and operate a flow meter to continuously monitor the total exhaust flow rate from the CHP plant to the starch dryers.
3. Record Keeping Requirements
  - a. The Permittee shall calculate and record the 28-day period and consecutive 13 (28-day) period fuel consumption for Starch Dryer No. 2. The consecutive 13 (28-day) period fuel consumption shall be determined by adding the current 28-day period's fuel consumption that of the previous 12 (28-day) periods. The Permittee shall make these calculations within 28 days of the end of the previous 28-day period.
  - b. The Permittee shall calculate and record the 28-day period and consecutive 13 (28-day) period starch production records. The consecutive 13 (28-day) period starch production shall be determined by adding the current 28-day period's starch production to that of the previous 12 (28-day) periods. The Permittee shall make these calculations within 28 days of the end of the previous 28-day period.
  - c. The Permittee shall calculate and record the 28 day period and consecutive 13 (28 day) period PM<sub>10</sub>/PM<sub>2.5</sub>, SO<sub>x</sub>, NO<sub>x</sub>, CO, and VOC emissions from the starch dryers in units of tons. The consecutive 13 (28-day) period emissions shall be determined by adding (for each pollutant) the current 28-day period's emissions to that of the previous 12 (28-day) periods. Such records shall include a sample calculation for each pollutant. The Permittee shall make these calculations within 28 days of the end of the previous 28-day period.

### **C. Premises Emissions Summary**

1. On January 1<sup>st</sup> of each calendar year, if the potential emissions of NO<sub>x</sub> and/or VOC from the premises are equal to or greater than 25 tons per year per pollutant, then for such pollutant(s), the Permittee shall:
  - a. Monitor NO<sub>x</sub> and/or VOC emissions, as applicable, from the premises for such calendar year.

- b. Calculate and record annual NO<sub>x</sub> and/or VOC emissions, as applicable, from the premises for such calendar year, in units of tons. The Permittee shall make these calculations on or before February 1<sup>st</sup> of the following year with respect to the previous calendar year. Such records shall include a sample calculation(s).
  - c. If actual NO<sub>x</sub> and/or VOC emissions, as applicable, from the premises are equal to or greater than 25 tons for such calendar year, the Permittee shall submit to the commissioner, on or before March 1<sup>st</sup> of the following year, an annual emissions summary with respect to the premises for the previous calendar year. Such summary shall be submitted on forms prescribed or provided by the commissioner.
2. A Permittee with either of the following premises is exempt from Part VII.C.1 requirements of this permit if, on January 1<sup>st</sup> of the subject year, the:
- a. Premises is operating in accordance with a valid Title V permit issued pursuant to RCSA section 22a-174-33; or
  - b. Premises is operating in accordance with a valid Approval of Registration issued pursuant to the General Permit to Limit Potential to Emit from Major Stationary Sources of Air Pollution issued on November 9, 2015.
- D.** In the event that a malfunction causing either an emission exceedance or a parameter monitored out of recommended range is not corrected within three hours, the Permittee shall immediately institute shutdown of the turbine/duct burner.
- E.** The Permittee shall operate this facility at all times in a manner so as not to violate or contribute significantly to the violation of any applicable state noise control regulations, as set forth in RCSA Sections 22a-69-1 through 22a-69-7.4. [STATE ONLY REQUIREMENT]

## **PART VIII. ADDITIONAL TERMS AND CONDITIONS**

- A.** This permit does not relieve the Permittee of the responsibility to conduct, maintain and operate the regulated activity in compliance with all applicable requirements of any federal, municipal or other state agency. Nothing in this permit shall relieve the Permittee of other obligations under applicable federal, state and local law.
- B.** Any representative of the DEEP may enter the Permittee's site in accordance with constitutional limitations at all reasonable times without prior notice, for the purposes of inspecting, monitoring and enforcing the terms and conditions of this permit and applicable state law.
- C.** This permit may be revoked, suspended, modified or transferred in accordance with applicable law.
- D.** This permit is subject to and in no way derogates from any present or future property rights or other rights or powers of the State of Connecticut and conveys no property rights in real estate or material, nor any exclusive privileges, and is further subject to any and all public and private rights and to any federal, state or local laws or regulations pertinent to the facility or regulated activity affected thereby. This permit shall neither create nor affect any rights of persons or municipalities who are not parties to this permit.
- E.** Any document, including any notice, which is required to be submitted to the commissioner under this permit shall be signed by a duly authorized representative of the Permittee and by the person who is responsible for actually preparing such document, each of whom shall certify in writing as follows: "I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that based on reasonable

investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that any false statement made in the submitted information may be punishable as a criminal offense under section 22a-175 of the Connecticut General Statutes, under section 53a-157b of the Connecticut General Statutes, and in accordance with any applicable statute.”

- F.** Nothing in this permit shall affect the commissioner's authority to institute any proceeding or take any other action to prevent or abate violations of law, prevent or abate pollution, recover costs and natural resource damages, and to impose penalties for violations of law, including but not limited to violations of this or any other permit issued to the Permittee by the commissioner.
- G.** Within 15 days of the date the Permittee becomes aware of a change in any information submitted to the commissioner under this permit, or that any such information was inaccurate or misleading or that any relevant information was omitted, the Permittee shall submit the correct or omitted information to the commissioner.
- H.** The date of submission to the commissioner of any document required by this permit shall be the date such document is received by the commissioner. The date of any notice by the commissioner under this permit, including but not limited to notice of approval or disapproval of any document or other action, shall be the date such notice is personally delivered or the date three days after it is mailed by the commissioner, whichever is earlier. Except as otherwise specified in this permit, the word "day" means calendar day. Any document or action which is required by this permit to be submitted or performed by a date which falls on a Saturday, Sunday or legal holiday shall be submitted or performed by the next business day thereafter.
- I.** Any document required to be submitted to the commissioner under this permit shall, unless otherwise specified in writing by the commissioner, be directed to: Office of Director; Engineering & Enforcement Division; Bureau of Air Management; Department of Energy and Environmental Protection; 79 Elm Street, 5th Floor; Hartford, Connecticut 06106-5127.