

CONSTRUCTION PERMIT

**draft**

PERMITTEE

Bunge Foods Corporation  
Attn: Ray Landry  
855 North Kinzie  
Bradley, Illinois 60915

Application No.: 02100028  
Applicant's Designation:  
Subject: Overhaul Gas Turbine  
Date Issued: ---  
Location: 855 North Kinzie, Bradley

I.D. No.: 091801AAH  
Date Received: October 15, 2002

Permit is hereby granted to the above-designated Permittee to CONSTRUCT emission source(s) and/or air pollution control equipment consisting of a overhaul gas fired turbine as described in the above-referenced application. This Permit is subject to standard conditions attached hereto and the following special condition(s):

VAR - Gas fired turbine

1.0 Unit Combustion Turbine  
Control None

1.1 Description

The combustion turbine is used to generate electricity for the source. The combustion turbine will be overhauled and certain parts specifically the gas producer module and the power turbine module will be like kind replaced at the source, as part of the maintenance program at the source.

1.2 List of Emission Units and Pollution Control Equipment

Emission Unit	Process Description	Emission Control Equipment
G2	Solar Centaur Turbine	None

1.3 Applicability Provisions and Applicable Regulations

- a. The "affected turbine" for the purpose of these unit-specific conditions is the new natural gas turbine described in Condition 1.1 and 1.2
- b. The affected turbine is subject to the New Source Performance Standard(NSPS) for Stationary Gas Turbines, 40 CFR 60 Subparts A and GG, because the heat input at peak load is equal to or greater than 10 million Btu/hr. The Illinois EPA administers the NSPS for subject

sources in Illinois pursuant to a delegation agreement with the USEPA.

- i. Pursuant to the NSPS, 40 CFR 60.332(a)(2), the affected gas turbine shall not discharge into the atmosphere, any gases which contain nitrogen oxides in excess of:

$$\text{STD} = 0.0150 \frac{(14.4)}{Y} + F$$

Where:

STD = Allowable NO<sub>x</sub> emissions (percent by volume at 15 percent oxygen and on a dry basis).

Y = Manufacturer's rated heat rate at manufacturer's peak load (kilojoules per watt hour), or actual measured heat rate based on lower heater value of fuel as measured at actual peak load for the facility. The value of Y shall not exceed 14.4 kilojoules per watt-hour.

F = NO<sub>x</sub> emission allowance for fuel-bound nitrogen calculated from the nitrogen content of the fuel in accordance with 40 CFR 60.332(a)(3).

- ii. Pursuant to the NSPS 40 CFR 60.333, the affected turbine shall comply with one of the following standards:

A. The affected turbine shall not discharge into the atmosphere any gases, which contain sulfur dioxide in excess of 0.015 percent by volume at 15 percent oxygen and on a dry basis.

B. The affected turbine shall not burn any fuel that contains sulfur in excess of 0.8 percent by weight.

- c. The emissions of smoke or other particulate matter from the affected turbine shall not have an opacity greater than 30 percent, pursuant to

35 IAC 212.123(a), except as allowed by 35 IAC 201.149, 212.123(b), or 212.124.

1.4 Non-Applicability of Regulations of Concern

- a. This permit is issued based on construction of the affected turbine not being subject to the federal rules for Prevention of Significant Deterioration(PSD), 40 CFR 52.21, because the source's emission are less than major source thresholds for purposes of PSD(i.e., less than 250 tons/year). See Condition 2 and Attachment A.
- b. This permit is issued based on the affected gas turbine not being subject to 35 IAC 212.321 because due to the nature of this process, such rule cannot reasonably be applied.
- c. For the purpose of the proposed National Emission Standard for Hazardous Air Pollutants(NESHAP), 40 CFR 63, Subpart YYYY, this permit is issued based on The affected turbine being an existing turbine, which commenced construction before January 14, 2003, because the affected turbine is being overhauled and does not meet the definition of new source or reconstructed turbine, as defined in 40 CFR 63.2.

Note: The affected turbine may not be subject to the NESHAP, 40 CFR 63, Subpart YYYY upon its promulgation.

1.5 Operational and Production Limits and Work Practices

- a.
  - i. Natural gas shall be the only fuel fired in the affected turbine.
  - ii. The firing rate of the affected turbine shall not exceed 53 Million Btu/hr or the output of the associated generator shall not exceed 4431KW.
- b. At all times, the Permittee shall, to the extent practicable, maintain and operate the affected turbine in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Illinois EPA or the USEPA, which may include, but is not limited to review of operating and maintenance procedures, and inspection of the source [40 CFR 60.11(d)].

1.6 Emission Limitations

Emissions from the affected turbine shall not exceed the following:

<u>Pollutant</u>	<u>Lb/hr</u>	<u>To/Yr</u>
NO <sub>x</sub>	19.20	83.50
CO	4.45	19.35
VOM	0.11	0.49
PM <sub>10</sub>	0.35	1.53
SO <sub>2</sub>	0.30	1.30

These limits are based on manufacturer's data for the affected turbine as provided in the application and continuous operation, 8,760 hr/yr. The above limits are established to address applicability of 40 CFR 52.21, the federal rules for Prevention of Significant Deterioration of Air Quality(PSD). These limits, together with other provisions of this permit, ensure that the construction and operation of the affected turbine do not constitute a major source pursuant to PSD.

1.7 Testing Requirements

- a. Upon request by the Illinois EPA , the Permittee shall have emissions tests for the affected turbine performed at the greatest load at which it will normally be operated and by an approved testing service as follows:
- b. The following USEPA methods and procedures shall be used for testing of emissions. For the turbine, measurement of NO<sub>x</sub> emissions shall be conducted and data collected in accordance with the test methods and procedures specified in 40 CFR 60.335, unless USEPA approves alternative procedures for testing:

Location of Sample Points	USEPA Method 1 or 19
Flow and Velocity	USEPA Method 2 or 19
Flue Gas Weight	USEPA Method 3 or 3A or 19
Moisture	USEPA Method 4 or 19
Nitrogen Oxides	USEPA Method 20
Carbon Monoxide	USEPA Method 10
Opacity	USEPA Method 9

- c. At least 60 days prior to the actual date of testing, a written test plan shall be submitted to the Illinois EPA for review. This plan shall describe the specific procedures for testing and shall include as a minimum:

- i. The person(s) who will be performing sampling and analysis and their experience with similar tests.
  - ii. The specific conditions under which testing shall be performed including a discussion of why these conditions will be representative of maximum emissions and the means by which the operating parameters for the turbine will be tracked and recorded.
  - iii. The specific determination of emission that is intended to be made, including sampling and monitoring locations. As part of this plan, the Permittee may set forth a proposal for approval by the performing emission testing of selected turbines provided that all turbines are fitted for testing; the identity of the engine to be tested is determined immediately before testing, by the Illinois EPA or otherwise randomly.
  - iv. The test method(s), which will be used, with the specific analysis method, if the method can be used with different analysis methods.
- d. The Illinois EPA shall be notified prior to these tests to enable it to observe these tests. Notification for the expected date of testing shall be submitted a minimum of 30 days prior to the expected date. Notification of the actual date and expected time of testing shall be submitted a minimum of 5 working days prior to the actual date of the test. The Illinois EPA may at its discretion accept notifications with shorter advance notice provided that the Illinois EPA will not accept such notifications if it interferes with the Illinois EPA's ability to observe testing.
- e. Three copies of the Final Reports for these tests shall be forwarded to the Illinois EPA, within 60 days after the completion of testing. The Final Report from testing shall contain a minimum:
- i. A summary of results;
  - ii. General information;
  - iii. Description of test method(s), including a description of sampling points, sampling train, analysis equipment, and test schedule;
  - iv. Detailed description of test conditions, including:
    - A. Fuel consumption (standard ft<sup>3</sup>);

B. Firing rate (million Btu/hr);

C. Ambient temperature.

- v. Data and calculations, including copies of all raw data sheets and records of laboratory analysis, sample calculations, and data on equipment calibration.

#### 1.8 Monitoring Requirements

Unless such monitoring is waived by USEPA or a custom schedule for sampling and analysis of fuel is approved by USEPA, in which case the Permittee shall comply with the terms of such approval, pursuant to 40 CFR 60.334(b)(2), the Permittee shall monitor sulfur content and nitrogen content of the fuel being fired in the affected turbine on a daily basis.

The analysis may be performed by the Permittee, a service contractor retained by the owner or operator, the fuel vendor, or any other qualified agency [40 CFR 60.335(e)].

#### 1.9 Recordkeeping Requirements

- a. The Permittee shall keep all applicable records pursuant to the NSPS 40 CFR 60.330 for the affected turbine.
- b. The Permittee shall maintain records of the following items for the affected turbine to demonstrate compliance with Condition 1.3, 1.5 and 1.6:
- i. Inspection, maintenance, and repair logs with dates and nature for the turbine.
  - ii. Natural gas fuel usage for the turbine, scf/mo and scf/yr;
  - iii. Log of hourly operation of the affected turbine indicating kilowatts output based on fuel input.
  - iv. The heat content of the natural gas, the sulfur content in the turbine as monitored or otherwise determined pursuant to Condition 1.8;
  - v. Annual NO<sub>x</sub>, CO, VOM, SO<sub>2</sub> and PM/PM<sub>10</sub> emissions from the affected turbine, based on fuel usage and the applicable emission factors, with supporting calculations(tons/year).

1.10 Reporting Requirements

- a. The Permittee shall fulfill applicable notification and reporting requirements of the NSPS, 40 CFR 60.7 (a) and (b).
- b.
  - i. The Permittee shall promptly notify the Illinois EPA of noncompliance with applicable requirements.
  - ii. Pursuant to 40 CFR 60.334(c)(2), periods of excess emissions for sulfur dioxide for purpose of Condition 1.3(b)(i)(B) that shall be reported are defined as follows:
    - Any daily period during which the sulfur content of the fuel being fired in the gas turbine exceeds 0.8 percent by weight.
- c. Two copies of submittals and notification required by this permit shall be made to the Illinois EPA at the following:

Illinois Environmental Protection Agency  
Division of Air Pollution Control  
Compliance Section (#40)  
P.O. Box 19276  
Springfield, Illinois 62794-9276  
Telephone: 217/782-5811 Fax: 217/782-6348

Illinois Environmental Protection Agency  
Division of Air Pollution Control  
9511 West Harrison  
Des Plaines, Illinois 60016  
Telephone: 847/294-4000 Fax: 847/294-4018

1.11 Operational Flexibility/Anticipated Operating Scenarios

N/A

1.12 Compliance Procedures

- a. Compliance for the affected turbine with Condition 1.3(b)(ii) is to be demonstrated by the sampling and analysis of natural gas for sulfur content as required by Condition 1.8.
- b. Compliance with the emission limits in Condition 1.6 shall be based on the recordkeeping requirements in Condition 1.9 and appropriate emission factors;
  - i. For NO<sub>x</sub> and CO the emission factors developed from those measured during

emission testing, if the affected turbine is properly operated. Otherwise, emissions shall be determined using the most appropriate emission factors selected based on good engineering judgment.

- ii. For SO<sub>2</sub>, emission factor(s) based on the sulfur content of natural gas as determined in accordance with Condition 1.8.
- iii. For VOM and PM/PM<sub>10</sub> standard emission factors.

2.0 Unit Existing Emission units.

2.1 Description

The existing emission units at the source consists of fuel combustion equipment (hydrogen reformer, steam boiler 1, duct burner, eclipse dowtherm and first thermal dowtherm), the refinery and the dry material handling & storage(dry mix plant silos & material handling and bleaching clay silos).

The existing emission units are used to produce edible oil products from vegetable oil, which is refined hydrogenated and blended to meet customer specifications. The operations emit volatile organic material(VOM), which is primarily hexane, a hazardous air pollutant, due to trace levels of organic solvent remaining in the raw oil from the extraction process that separates the oil from the grain or oil seed.

The existing units are not being modified by the Permittee in conjunction with the new gas turbine.

2.2 List of Emission Units and Air Pollution Control Equipment

Emission Unit	Description	Emission Control Equipment
HR	Hydrogen Reformer (gas maximum 12.2 million Btu/hr)	None
SB1	Steam Boiler No. 1 (gas/oil maximum 100 million Btu/hr)	None
DB	Duct Burner (gas maximum 58.4 million Btu/hr)	None
ED	Eclipse Dowtherm (gas maximum 5.71 million Btu/hr)	None
FTD	First Thermal Dowtherm (gas maximum 7.14 million Btu/hr)	None
Refinery	Refinery	None
DMH&S	Vegetable oil Dry Material Handling & Storage	Baghouses

2.3 Applicability Provisions and Applicable Regulations

- a. The "affected fuel combustion units" for the purpose of these unit-specific conditions, are emission units HR, SB1, DB, ED and FTD, which burn fuel to produce heat or power by indirect

heat transfer, as described in Conditions 2.1 and 2.2.

- b. Affected fuel combustion units, other than the Dowtherm units (ED and FTD), are subject to 35 IAC 216.121, which states that the emission of CO into the atmosphere from any fuel combustion emission source with actual heat input greater than 2.9 MW (10 million Btu/hr) shall not exceed 200 ppm, corrected to 50 percent excess air [35 IAC 216.121].
- c.
  - i. Boiler No. 1(SB1) is subject to 35 IAC 212.206 and 212.207, which provide that no person, shall cause or allow the emission of particulate matter into the atmosphere in any one hour period from a fuel combustion emission unit burning distillate oil to exceed 0.1 lb/million Btu heat input to the unit from oil.
  - ii. Boiler No. 1(SB1) is subject to 35 IAC 214.161 and 214.162, which provides that no person shall cause or allow the emission of sulfur dioxide into the atmosphere in any one hour period from a fuel combustion emission unit burning distillate oil to exceed 0.3 lb/million Btu heat input to the unit from oil.

#### 2.4 Non-Applicability of Regulations of Concern

This permit is issued based on the vegetable oil refinery not being subject to the National Emission Standard for Hazardous Air Pollutants(NESHAP), 40 CFR Subpart GGGG, even though it is a major source for hazardous air pollutants(HAP's) emissions, because this NESHAP only addresses extraction of vegetable oil from grain or seeds and does not address subsequent refining of the vegetable oil.

#### 2.5 Operational And Production Limits And Work Practices

- a. Natural gas shall be the only fuel fired in the hydrogen reformer, duct burner and dowtherm units.
- b.
  - i. Boiler #1 shall only fired natural gas and distillate fuel oil.
  - ii. Fuel oil usage fired in Boiler #1 shall not exceed 531,429 gallons/month and 1.59429 million gallons/year.
  - iii. For Boiler #1, the Permittee shall not keep, store, or use distillate fuel oil (Grades No. 1 and 2) with a sulfur content

greater than the larger of the following two values:

- A. 0.28 weight percent, or
  - B. The weight percent given by the formula: maximum weight percent sulfur = (0.000015) x (Gross heating value of oil, Btu/lb).
- c. Organic liquid by-products or waste materials shall not be used in the affected fuel combustion units without written approval from the Illinois EPA.
- d. i. The maximum amount of vegetable oil processed in the refinery shall not exceed 42.42 million pounds/month and 509 million pounds/year.
- ii. The Permittee shall not introduce organic solvent, e.g., hexane, into the vegetable oil during refining at the plant, so that VOM emissions of the refining process result from organic solvent contained in the raw oil received by the source.
- e. At all times, the Permittee shall, to the extent practicable, maintain and operate the affected fuel combustion units, refinery and dry material handling and storage in a manner consistent with good air pollution control practice for minimizing emissions.

2.6 Emission Limitations

- a. i. Hourly emission from the affected fuel combustion equipment shall not exceed the following:

<u>Equipment</u>	<u>NO<sub>x</sub></u> <u>Lb/hr</u>	<u>CO</u> <u>Lb/hr</u>	<u>VOM</u> <u>Lb/hr</u>	<u>PM<sub>10</sub></u> <u>Lb/hr</u>	<u>SO<sub>2</sub></u> <u>Lb/hr</u>
HR	1.22	1.02	0.07	0.1	0.01
SB1	10.0	8.40	0.55	0.76	7.24
DB	5.84	4.9	0.32	0.44	0.04
ED	0.57	0.48	--	--	--
FTD(each)	0.71	0.60	--	--	--

- ii. Total annual emissions from the affected fuel combustion equipment shall not exceed the followings:

<u>Equipment</u>	<u>NO<sub>x</sub></u> <u>To/Yr</u>	<u>CO</u> <u>To/Yr</u>	<u>VOM</u> <u>To/Yr</u>	<u>PM<sub>10</sub></u> <u>To/Yr</u>	<u>SO<sub>2</sub></u> <u>To/Yr</u>
HR	5.34	4.5	0.3	0.4	0.03

SB1	43.8	36.8	2.4	3.3	31.7
DB	25.6	21.5	1.4	1.9	0.2
ED	2.5	2.1	0.14	0.19	0.02
FTD(total 2)	<u>6.3</u>	<u>5.3</u>	<u>0.34</u>	<u>0.48</u>	<u>0.04</u>
TOTALS:	83.5	70.2	4.6	6.3	32.0

- b. Emissions of VOM from the refinery shall not exceed 5.34 tons/month and 64.1 tons/year.
- c. This permit is issued based on negligible emissions of PM from the dry material handling and storage. For this purpose, emissions from each individual unit or control device shall not exceed 0.1 lb/hr and 0.44 tons/year combined.
- d. This permit does not revise or relax any requirements contained in the CAAPP Permit for the existing units, including any associated requirements for monitoring, recordkeeping or reporting.

2.7 Testing Requirements

The Illinois EPA shall be allowed to sample all fuels stored at this source.

2.8 Monitoring Requirements

None

2.9 Recordkeeping Requirements

- a. The Permittee shall maintain records of the following items for the affected fuel combustion units to demonstrate compliance with Condition 2.5 and 2.6:
  - i. Fuel oil usage on boiler #1 (gallons/month and gallons/year).
  - ii. Natural gas usage for the existing fuel combustion units (scf/month and scf/year).
  - iii. Maximum sulfur content (weight percent) and the gross heating value of oil (Btu/lb) for each supplier of fuel oil
  - iv. Annual aggregate NO<sub>x</sub>, CO, PM, SO<sub>2</sub> and VOM emissions from the affected fuel combustion units, based on fuel consumption and applicable emission factors, with supporting calculations.
- b. The Permittee shall maintain records of the following items for the refinery to demonstrate compliance with Condition 2.5 and 2.6:

- i. Total amount of vegetable oil processed in the refinery(lb/month and lb/yr).
  - ii. Organic solvent contained in raw vegetable oil, e.g., hexane, if the Permittee is relying on actual measurements rather than the maximum organic solvent in the oil as stated in the application i.e., 252 ppm.
  - iii. Annual aggregate PM/PM<sub>10</sub> from the silos system and VOM from the refinery, with all supporting documents and calculations.
- c. The Permittee shall maintain logs of inspection, maintenance, and repair for the baghouses controlling the dry material handling and storage.

2.10 Reporting Requirements

- a. The Permittee shall promptly notify the Illinois EPA, of deviations of the existing units with the permit requirements. Reports shall describe the probable cause of such deviations, and any corrective actions or preventive measures taken.
- b. Two copies of submittals and notification required by this permit shall be made to the Illinois EPA at the following:

Illinois Environmental Protection Agency  
Division of Air Pollution Control  
Compliance Section (#40)  
P.O. Box 19276  
Springfield, Illinois 62794-9276  
Telephone: 217/782-5811 Fax: 217/782-6348

Illinois Environmental Protection Agency  
Division of Air Pollution Control  
9511 West Harrison  
Des Plaines, Illinois 60016  
Telephone: 847/294-4000 Fax: 847/294-4018

2.11 Operational Flexibility/Anticipated Operating Scenarios

None

2.12 Compliance Procedures

- a. Compliance with the PM and CO emission limits in Condition 2.3(b) and (c)(i) is inherent with the normal operation of the subject fuel combustion units, so that no compliance

procedures are set in this permit addressing this requirement.

- b. Compliance with the SO<sub>2</sub> emission limit in Condition 2.3(c)(ii) is demonstrated by use of distillate fuel oil with a sulfur content meeting the specifications of Condition 2.5.
- c. Compliance with the emission limits of this permit in Condition 2.6(a) shall be based on the recordkeeping requirements in Condition 2.9 and appropriate emission factors.
  - i. Emissions from burning natural gas shall be calculated with the following emission factors, if the units are operating normally:

<u>Pollutant</u>	<u>Emission Factor</u> <u>(lb/10<sup>6</sup> ft<sup>3</sup>)</u>
PM	7.6
SO <sub>2</sub>	0.6
VOM	5.5
NO <sub>x</sub>	100.0
CO	84.0

These are the emission factors for uncontrolled natural gas combustion in small boilers (< 100 million Btu/hr), Tables 1.4-1 and 1.4-2, AP-42, Volume I, Supplement F, March 1998.

- ii. Emissions from burning distillate fuel oil shall be calculated with the following emission factors, if the units are operating normally.

<u>Pollutant</u>	<u>Emission Factor</u> <u>(lb/10<sup>3</sup> gallons)</u>
PM	3.3
NO <sub>x</sub>	20.0
SO <sub>2</sub>	142*S
VOM	0.2
CO	5.0

These are the emission factors for uncontrolled fuel oil combustion in small (<100 million Btu/hr) industrial boilers, Tables 1.3-1, 1.3-2, and 1.3-3, AP-42, Volume I, Supplement E, September 1998. "S" indicates that the weight percent of sulfur in the oil should be multiplied by the value given. For example, if the fuel is 1% sulfur, then S=1.

iii. For Boiler #1, total emissions of each pollutant shall be determined by summing the emissions for burning gas and oil.

e. For the refinery, VOM emissions shall be determined by material balance assuming that all organic solvents in the raw vegetable oil, e.g., hexane is lost to the atmosphere as VOM emissions during processing of the oil at the source.

3.0 Upon successful compliance demonstration with the requirements in Condition 1.7 the Permittee may operate the affected turbine under this Construction Permit until the CAAPP Permit is next reissued.

Ricardo Ng

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**Attachment A**

Emission Summary(Tons per year)

<u>Equipment</u>	NO <sub>x</sub>	CO	VOM	PM/PM <sub>10</sub>	SO <sub>2</sub>
Steam Boiler #1	43.8	36.8	2.4	3.3	31.7
Turbine Generator	83.5	19.3	0.5	1.5	1.3
Duct Burner	25.6	21.5	1.4	1.9	0.2
Hydrogen Reformer	5.34	4.5	0.3	0.4	0.03
Eclipse Dowtherm	2.5	2.1	0.14	0.2	0.02
Refinery	--	--	64.1	--	--
First Thermal Dowtherm	6.3	5.3	0.34	0.48	0.04
Dry Material Storage & Handling	--	--	--	0.44	--
TOTALS	167.04	89.5	69.18	8.22	33.29

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