

217/782-2113

CONSTRUCTION PERMIT

PERMITTEE

A. E. Staley Manufacturing Company
Attn: Don Moster
2200 East Eldorado Street
Decatur, Illinois 62521

Application No.: 03070016 I.D. No.: 115015ABX
Applicant's Designation: Xanthan Gum Facility (Building 99)
Date Received: July 10, 2003
Subject: Xanthan Gum Production
Date Issued: February 25, 2004
Location: 2200 East Eldorado Street, Decatur

Permit is hereby granted to the above-designated Permittee to CONSTRUCT emission unit(s) and/or air pollution control equipment consisting of a xanthan gum facility as described in the above-referenced application. This Permit is subject to standard conditions attached hereto and the following special conditions

1. Description

A. E. Staley Manufacturing Company has requested a construction permit for a xanthan gum production facility. The facility is a source of emissions of volatile organic material (VOM) due to the organic solvent that is used to separate and purify xanthan gum from the aqueous broth from the fermentation tanks.

2. List of Emission Units and Pollution Control Equipment

Emission Unit	Description	Emission Control Equipment
99-15	XG seed and main fermentation tanks (4) Batch fermentation process	None
99-16	XG Desolventizer and IPA condenser	Carbon Adsorption
99-17	XG Dryer	Cyclone
99-18	Mill Receiver	Baghouse
99-19	Blend Bins (3)	Baghouse
99-20	WG Box Packaging	Baghouse
99-21	Bag Packer, Xanthan Gum Packaging	Baghouse
99-22	XG House Vacuum	Baghouse

3. Applicability Provisions

a. The "affected xanthan gum process" for the purpose of these unit-specific conditions, is each piece of equipment as described in Condition 2 unless otherwise stated in the following conditions as unit specific.

b. The affected xanthan gum process is subject to 35 IAC 212.321(a), which provides that no person shall cause or allow the emission of particulate matter into the atmosphere in any one hour period from any new process emission unit, either alone or in combination with the emission of particulate matter from all other similar process emission units for which construction or modification commenced on or after April 14, 1972, at a source or premises, exceeds the allowable emission rates specified in subsection (c) of 35 IAC 212.321, [35 IAC 212.321(a)].

i. The emissions of particulate matter into the atmosphere in any one hour period from the affected xanthan gum process shall not exceed the allowable emission rates specified in the following equation:

$$E = A (P)^B$$

Where:

P = Process weight rate; and,
 E = Allowable emission rate; and,

A. For process weight rates up to 408 MG/hr (450 T/hr):

	<u>Metric</u>	<u>English</u>
P	Mg/hr	T/hr
E	kg/hr	lbs/hr
A	1.214	2.54
B	0.534	0.534

B. For process weight rates in excess of 408 MG/hr (450 T/hr):

	<u>Metric</u>	<u>English</u>
P	Mg/hr	T/hr
E	kg/hr	lbs/hr
A	11.42	24.8
B	0.16	0.16

Where:

P = Process weight rate in metric or English tons per hour, and

E = Allowable emission rate in kilograms or pounds per hour. [35 IAC 212.321]

c. No person shall cause or allow the emission of sulfur dioxide into the atmosphere from any process emission unit to exceed 2000 PPM, [35 IAC 214.301].

- d. No person shall cause or allow the discharge of more than 3.6 kg/hr (8 lb/hr) of organic material into the atmosphere from any emission unit, except as provided in 35 IAC 218.302, 218.303, 218.304 and the following exception: If no odor nuisance exists the limitation of 35 IAC 218 Subpart G shall apply only to photochemically reactive material [35 IAC 218.301].

4. Non-Applicability of Regulations of Concern

This permit is issued based on the addition of the affected xanthan gum process not constituting a major modification subject to 40 CFR 52.21, Prevention of Significant Deterioration, PSD. The Permittee has addressed the applicability of PSD demonstrating that the increase in emissions from the affected xanthan gum process should not result in a significant increase in emissions, subject to the limitations in Conditions 5 and 6.

5. Operational Limits and Work Practices

- a.
 - i. The VOM control system shall be designed to achieve at least 99.5 percent recovery of solvent in the exhaust stream.
 - ii. The Permittee shall track solvent (isopropyl alcohol) inventory and perform mass balance calculations sufficient to verify whether losses to the atmosphere are less than 31.5 tons on a 12-month rolling basis (see Condition 6(a)).
- b. The Permittee shall operate, maintain, and repair all air pollution VOM and particulate matter control equipment in a manner that assures the emission limits set in this permit are met. The actions taken by the Permittee to meet this requirement shall include as a minimum the following:
 - i. Operating Procedures: Written operating procedures shall be developed and maintained describing normal air pollution control equipment operation. Such procedures shall include maintenance practices and may incorporate the manufacturers recommended operating instructions.
 - ii. Inspections: Visual inspections of air pollution control equipment shall be conducted on at least a weekly basis.
 - iii. Repairs: Prompt repairs shall be made upon identification of need either as a consequence of formal inspections or other observations in conformance with good air pollution control practice.
 - iv. Records: Records of inspection, maintenance, and repair activities for all equipment shall be kept on site and shall include as a minimum:

- A. Date of inspection, maintenance, and repair activities.
- B. Description of maintenance or repair activity if not routine preventative maintenance.
- C. Probable cause for requiring maintenance or repair if not routine or preventative.

6. Emission Limitations

- a. Total facility emissions of VOM shall not exceed 35 tons per year. Compliance with this limit shall be determined on a rolling 12 month basis, calculated monthly in accordance with Condition 12.
 - i. Stack emissions of VOM from the facility shall not exceed 3.2 lb/hr and 14 tons per year. Compliance with this limit shall be determined at the exhaust of the carbon adsorption system.
 - ii. This permit is issued based on negligible emissions of VOM from the seed and fermentation tanks. For this purpose, VOM emission in total shall not exceed 3.5 tons/year.
- b. Operation and particulate matter emissions of equipment shall not exceed the following limits:

<u>Desig.</u>	<u>Equipment</u>	<u>Exhaust</u>		
		<u>Flow Rate</u> <u>(dscf/m)</u>	<u>PM₁₀ Emissions</u> <u>(Lb/Hr)</u>	<u>(Tons/Yr)</u>
99-17	Dryer (Cyclone)	1,700	0.44	1.91
99-18	Mill Receiver (Baghouse)	2,600	0.22	0.98
99-19	Blend Bins (3) (Baghouse)	1,500	0.13	0.58
99-20	Packaging (Baghouse)	1,300	0.11	0.50
99-21	Bag Packer (Baghouse)	1,300	0.11	0.50
99-22	Dust Collection Sys. (Baghouse)	750	0.07	<u>0.29</u>
			Total:	4.47

These limits are based on the information provided in the permit application.

- 7a. i. Within 180 days of startup, the VOM emissions from the VOM control system shall be measured at the Permittee's expense by an approved testing service, during conditions which are representative of maximum emissions to verify compliance with Condition 6(a).
- ii. Measurements of VOM and/or particulate matter emissions from specified emission unit(s) shall also be conducted upon reasonable written request from the Illinois EPA in accordance with such request.

- iii. The following methods and procedures shall also be conducted upon reasonable written request from the Illinois EPA. Refer to 40 CFR 60, Appendix A for USEPA test methods.

Location of Sample Points	USEPA Method 1
Gas Flow and Velocity	USEPA Method 2
Flue Gas Weight	USEPA Method 3
Moisture	USEPA Method 4
Particulate Matter (PM)	USEPA Method 5
PM ₁₀	USEPA Method 201 or 201A
Volatile Organic Material	USEPA Method 18, 25 or 25A, as appropriate

- b. The Permittee shall submit a written test plan to the Illinois EPA for review and comment for the initial testing for VOM and if a significant change in the procedures for this testing is planned from the procedures followed in the previous test. This plan shall be submitted at least 60 days prior to the actual date of testing and include the following information as a minimum:
 - i. A description of the planned test procedures.
 - ii. The person(s) who will be performing sampling and analysis and their experience with similar tests.
 - iii. The specific conditions under which testing will be performed, including a discussion of why these conditions will be representative of maximum emissions.
 - iv. The methodology that will be used to determine the operating rate during the period of testing, e.g., the rate of VOM introduced to the plant.
- c. The Permittee shall notify the Illinois EPA prior to conducting these measurements to enable the Illinois EPA to observe testing. 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 accept shorter advance notice if it does not interfere with the Illinois EPA's ability to observe testing.
- d. Copies of the Final Report(s) for these tests shall be submitted to the Illinois EPA within 30 days after the test results are compiled and finalized.
- e. The Final Report from testing shall include as a minimum:
 - i. A summary of results.
 - ii. General Information.

- iii. A detailed description of methodology for determination of the operating rate of the plant during the period of testing, with supporting information.
- iv. Detailed description of operating conditions of the emission unit(s) being tested, including:
 - A. Process information, process rate, e.g. raw material consumption; and
 - B. Control equipment information, i.e. equipment condition and operating parameters during testing.
- v. Data and calculations.
- vi. Conclusions.

8. Monitoring

- a. The Permittee shall install, maintain and operate continuous monitors on the affected xanthan gum process that supply continuous readings and store average hourly values for the following parameters:
 - i. Total hydrocarbon content or other indicator such as flammability for the level of organic material in the exhaust from the carbon adsorber.
 - ii. Outlet gas temperature from the condenser.
- b. The Permittee shall develop a written monitoring and maintenance plan for the carbon adsorption system based on manufactures recommended operation and maintenance and good engineering practices.

9. Recordkeeping

- a. The Permittee shall keep a file containing the following information:
 - i. The maximum exhaust flow rate, design dust loading, and maximum VOM concentration in the exhaust, if applicable, of the following units:
 - A. Mill Baghouse Receiver
 - B. Blend Bins
 - C. Packaging (Baghouse)
 - D. Bag Packer (baghouse)

E. House dust collection system

F. Dryer (cyclone)*

G. Seed and fermentation tanks

* VOM concentration data only needed as VOM emissions are present that are not addressed by solvent loss data.

ii. The maximum hourly emissions of PM from each of the above units, with supporting calculations.

iii. The maximum annual emissions of VOM from each of the above units for which VOM emissions are applicable, with supporting calculations.

b. The Permittee shall maintain the following operating records for the affected xanthan gum process.

i. Total hydrocarbon content or other indicator such as flammability for the level of organic material in the exhaust from the carbon adsorber.

ii. Outlet gas temperature from the condenser.

iii. The number of hours operated for the sources identified in the list of emission units and pollution control equipment.

iv. Solvent (isopropyl alcohol) losses on a 12-month rolling average, based on changes in inventory.

c. The Permittee shall keep records of all emission measurements conducted pursuant to Condition 7 and Condition 8.

d. The Permittee shall maintain records for any period during which any piece of equipment was in operation when its air pollution control equipment was not in operation or was not operating properly.

i. These records shall include each period of time when an operating parameter of a control system, as recorded above, deviated outside the level set as good air pollution control practice (date, duration, and description of the incident).

ii. These records shall also identify any such periods during which an emission unit exceeded the requirements of this permit, including applicable emission limits. This record shall include the cause for noncompliance, if known and the corrective action(s) and preventative measures taken to prevent any such reoccurrence if any.

- e. The Permittee shall keep the following records of emissions:
 - i. Monthly emissions of PM and VOM determined as the summation of the product of the above records.
 - ii. Annual emissions of PM and VOM.

10. Records Retained

- a. The Permittee shall retain all records required by this permit at the source for at least five years, at a location where the records are readily accessible for inspection by the Illinois EPA.
- b. The Permittee shall make all records required by this permit available for inspection at the source by the Illinois EPA, providing copies of records to Illinois EPA upon request. For this purpose, the Permittee may keep records in a computerized data system, provided that, upon request by Illinois EPA during the source's normal working hours, requested information is retrieved and available prior to inspection completion to the Illinois EPA.

11. Notification

- a. If there is an exceedance of the emission limits of this permit as determined by the records required by this permit or by other means, the Permittee shall submit a report to the Illinois EPA's Compliance Section in Springfield, Illinois within 30 days after the exceedance. The report shall include the emission released in accordance with the recordkeeping requirements, a copy of the relevant records, and a description of the exceedance or violation and efforts to reduce emissions and future occurrences.

12. Compliance Procedures

Compliance with the emission limits in condition 6 shall be based on the recordkeeping requirements in Condition 9 and the emission formula listed below:

VOM emissions from units not controlled by the carbon adsorption system, such as the feed and fermentation tanks, shall be calculated as follows:

$$E \text{ (lb/hr)} = [(C \text{ (ppm)} * MW * Q \text{ (scfm)} * 60 \text{ (min/hr)})] / 385.3 \text{ (lb-mole/ft}^3\text{)} * 10^6$$

Where:

E = Emissions Rate

C = Pollutant Concentration

MW = Molecular Weight

Q = Maximum Exit Gas Flowrate

H = Hours of Operation

PM emissions shall be calculated as follows:

$$E \text{ (lb/hr)} = [(C \text{ (gr/scf)} * Q \text{ (scfm)} * 60 \text{ (min/hr)})] / 7000 \text{ (gr/lb)}$$

Where:

E = Emissions Rate

C = Pollutant Concentration

Q = Exit Gas Flowrate

13. Illinois EPA Addresses

Any required reports and notifications concerning equipment operation, emissions testing, or a monitoring system, shall be sent to the Illinois EPA at the following address unless otherwise indicated:

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: 217/524-4710

A copy of all required reports and notifications, except the Annual Emission Report required by 35 IAC Part 201.302, shall also be sent to the Illinois EPA at the following address:

Illinois Environmental Protection Agency
Division of Air Pollution Control
2009 Mall Street
Collinsville, Illinois 62234
Telephone: 618/346-5120

14. Operation of the affected xanthan gum process is allowed under this construction permit for 270 days to allow for emissions testing and compliance demonstration as required by Condition 7 of this permit.

- a. If the emissions testing demonstrates compliance with this permit then operation of the affected xanthan gum process is allowed under this construction permit until the source's CAAPP permit is next revised or renewed.

Page 10

If you have any questions concerning this permit, please contact Kevin Smith at 217/782-2113.

Donald E. Sutton, P.E.
Manager, Permit Section
Division of Air Pollution Control

DES:KLS:psj

cc: Region 3