

APPLICANT: Cargill, Incorporated	SITE LOCATION: Raleigh	COUNTY: Wake	
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APPLICATION NUMBER: 920208A5.A	EXISTING PERMIT NUMBER: 03840R25	NEW PERMIT NUMBER: 03840T26	

I. Introduction

The U.S. Environmental Protection Agency (EPA) has given final approval to North Carolina’s Title V operating permits program effective on October 1, 2001. This EPA approval triggered the requirements for Title V facilities to submit permit applications to the Division of Air Quality. Title V facilities are required to obtain an operating permit which addresses all applicable regulations under the State Implementation Plan, Federal Implementation Plan, and other provisions of the Clean Air Act (CAA). The Title V Operating Permit will define all of the facility’s obligations under the CAA.

This Initial Title V Air Permit application Review intends to convey all pertinent emissions data, rules, policies, and engineering assumptions used to construct the DRAFT Title V operating permit. The primary source of information used to construct the DRAFT permit is the above referenced air permit application.

II. Background Information

The DRAFT Title V operating permit replaces an existing Air Quality Construction and Operation Permit No. 03840R25 issued on February 22, 2002 and is currently scheduled to expire on November 30, 2004.

Pursuant to 15A NCAC 2Q .0506 Cargill, Inc., Raleigh Plant submitted its initial Title V application to the Division of Air Quality on February 13, 1996. The application was considered complete for processing on April 13, 1996. The DRAFT permit is required to go to public notice pursuant to 15A NCAC 2Q .0521.

III. Facility Description

Cargill, Incorporated, Raleigh Plant is a soybean meal and oil manufacturing facility. Soybeans are delivered to site via truck (local crop) or railcar (Midwestern crop). Soybeans are dried, cracked (dehulled), heat conditioned, and pressed into flakes to increase the surface area. The flakes are mixed with n-hexane to extract the oil. The soybean oil/ hexane is decanted from the water (from the steam entering the process), and the soybean oil/ hexane mixture is separated in a four step distillation process. A very large percentage of the hexane gets recovered. Approximately, 500 gallons per minute of hexane are used in the process, and approximately 500 gallons per day are required as makeup. This facility produces approximately five railcar tanks of soybean oil per day and 50 to 60 trucks (or 18 railcars per day) of soybean meal. Most of the soybean meal is sold to N.C. farmers, and the soybean oil, which is still very yellow from the impurities, is sent to Cargill Refineries to refine it further to be sold to vegetable oil producers such as Wesson and Crisco.

Cargill, Inc., Raleigh Plant is Title V due to the fact that they emit greater than 100 tons per year of PM (113.5 tpy) and VOC (430.7 tpy), and greater than 10 tons per year of hexane (429.5 tpy), an individual HAP. (Emission levels in parenthesis are actual emissions.)

IV. Statement of Compliance

The DAQ has reviewed the compliance status of this facility. The last facility inspection was conducted on October 29, 1999 by Bernard McKee of the Raleigh Regional Office, and the facility appeared to be in compliance. The facility is currently in compliance with all applicable requirements. The applicant has certified that the facility will be in compliance with all applicable requirements. The applicant has also certified that the facility will be in compliance with any applicable requirements taking effect during the term of the permit and will meet such requirements on a timely basis.

V. Summary of Emission Sources and Control Devices

The following table identifies all emission sources and associated control devices for which the Initial Title V Operating Permit is being issued.

Emission Source ID No.	Emission Source Description	Control Device ID No.	Control Device Description
ES-1	Truck grain receiving hopper	BF-1160	One bagfilter (1,160 square feet of filter area)
<u>NSPS</u> ES-3	Natural gas/ No. 2 fuel oil-fired Berico column type grain dryer system (24 million Btu per hour heat input capacity, 120 tons/hr whole soybeans processing capacity)	C-3A, C-3	One filter system consisting of mesh screens with perforations which are 0.094 inches or less in diameter in series with a cyclone (54 inches in diameter, for recycle air only (approximately 4% of air throughput))
ES-4	Natural gas/ No. 2 fuel oil-fired Shanzer column type grain dryer system (27 million Btu per hour heat input capacity, 90 tons/hr whole soybeans processing capacity)	C-4	One filter system consisting of mesh screens with perforations which are 0.094 inches or less in diameter
ES-5	Soybean aspiration system	821	One bagfilter (3,060 square feet of filter area)
ES-6, and ES-7	Ground pod transfer system/ hull transfer and storage system	15	One bagfilter (160 square feet of filter area)
ES-8	Soybean conditioning and flaking process	825	One simple cyclone (96 inches in diameter)
ES-9	Hexane solvent, soybean oil extraction process	C-9	One solvent recovery system consisting of a mineral oil scrubber
ES-10-1 and ES-10-2	Whole soybean cleaning aspiration and pod grinding system	818A, 820, 819	One bagfilter (2,820 square feet of filter area) installed in series with two cyclones (56 inches in diameter and 48 inches in diameter, respectively)

ES-13	Soybean meal screening and grinding process	831	one bagfilter (1,462 square feet of filter area)
ES-14	Railcar meal loading system	BF-320	One bagfilter (510 square feet of filter area)
ES-15A and ES-24	Meal storage system and clay storage tank, respectively	15A-C	One bagfilter (208 square feet of filter area)
ES-15B	Meal storage tank	15B-C	One bagfilter (85 square feet of filter area)
ES-16	Truck and rail meal loadout enclosure	BF-1750	One bagfilter (1,750 square feet of filter area)
ES-17	Natural gas/ No. 6 fuel/ Vegetable oil-fired boiler (46.5 million Btu per hour)	n/a	n/a
ES-19	Railroad soybean receiving hopper/ Dust tank	S232RF10, CK-36	One bagfilter (2960 square feet of filter area) in series with one cyclone (36 inches in diameter)
ES-20	Auxiliary truck soybean receiving enclosure	BF-448	One bagfilter (448 square feet of filter area)
ES-22	Secondary dehulling system	BF-1987	One bagfilter (1,987 square feet of filter area)
ES-25	Soybean meal dryer/ cooler	25-A, 25-B, 25-C, and 25-D	Four cyclones installed in parallel (96 inches in diameter each)
ES-26	Natural gas/ No. 2 fuel oil/ No. 6 fuel oil/ Vegetable fuel oil-fired boiler (75.3 million Btu per hour heat input rate)	n/a	n/a
SSB1 through SSB9	Soybean storage bins (seven at 200,000 bushels capacity and two at 500,000 bushels capacity)	C-SSB1 through C-SSB9	Nine bagfilters (67 square feet of filter area each)
NSPS ES-9A and ES-9B	Hexane Storage Tank #1 and Hexane Storage Tank #2	CD-9	One packed column mineral oil scrubber (ceramic saddle, 8 gallons per minute mineral oil injection rate)
NSPS ES-2 and ES-2A	Two 25,000 gallons capacity storage tanks containing No. 2 fuel oil and No. 6 fuel oil	n/a	n/a

VI. Emission Source-by-Source Evaluation

A. Truck grain receiving hopper (ID No. ES-1) with associated bagfilter (ID No. BF-1160, 1,160 square feet of filter area)

1. Description

The truck grain receiving hopper (ID No. ES-1) is the primary truck receiving hopper for the facility. Soybeans are dumped into the hopper and are aspirated and conveyed to storage. Hopper aspirations are filtered by the bagfilter (ID No. BF-1160). It was established prior to 1978, and NSPS Subpart DD does not apply.

2. Applicable Regulatory Requirements

The following provides a summary of limits and/or standards for the emission source(s) described above. A review of the information in the application was performed to ensure the appropriate limits and associated calculations used to show compliance were correct.

Regulated Pollutant	Limits/Standards	Applicable Regulation
particulate matter	$E=55.0P^{0.11} - 40$ where E =allowable emission rate in pounds per hour P =process weight in tons per hour	15A NCAC 2D .0515
visible emissions	20 percent opacity	15A NCAC 2D .0521

a. **2D .0515 “Particulates from Miscellaneous Industrial Processes”**

i. Regulatory Analysis

The allowable particulate emission limit is calculated by the following equation:

For process weights greater than 30 tons per hour:

$$E' 55.0P^{0.11}&40$$

where: E = allowable emission rate for particulate matter in pounds per hour, and
P = process weight in tons per hour

According to permit application, this source has a maximum hourly process rate of 300 tons per hour of soybeans. Thus, the allowable emission rate for process rates greater than 30 tons per hour is:

$$E = 55.0 \times (300 \text{ tons/hour})^{0.11} - 40 = 63.0 \text{ lbs/hour.}$$

According to the applicant, the before and after control emission rate are 23.48 lbs/hour and 0.02 lb/hour, respectively. The applicant reports a 99.9% control efficiency for the bagfilter. The DAQ Bagfilter Evaluation spreadsheet confirms that this bagfilter is adequate with a 99.95% control efficiency reported. The Bagfilter Evaluation spreadsheet states that the filtering velocity is exceeded by 38%. However, compliance should be achieved with this regulation, since uncontrolled emissions are less than allowable.

ii. Monitoring Requirements

To ensure that optimum control efficiency of particulate matter is obtained by the bagfilter, monthly inspections will be performed and maintenance will be performed as recommended by the manufacturer. As a minimum, the inspections will include a monthly external inspection of the bagfilter and ductwork, and an annual internal inspection of the bagfilter to ensure structural integrity.

iii. Recordkeeping Requirements

The results of the inspection and maintenance will be kept in a log.

iv. Reporting Requirements

A summary report of the monitoring will be submitted by January 30 and July 30 of each year. The results of any maintenance to the control devices shall be reported within 30 days of a written request by DAQ.

b. **2D .0521 “Control of Visible Emissions”**

i. Regulatory Analysis

According to the permit application, the truck grain receiving hopper was established after July 1, 1971, and it is subject to 2D .0521(d). Per this regulation, visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period except that six-minute averaging not more than 87 percent opacity may occur not more than once any hour nor more than four times in any 24-hour period. Compliance is indicated with this regulation, because the latest inspection report did not cite any opacity exceedances.

ii. Monitoring Requirements

The Permittee will either observe the emission points of the sources above once a month for visible emissions above normal or perform a Method 9. Monthly observations should provide reasonable assurance of compliance. The Permittee will establish what normal visible emissions are through recordkeeping.

iii. Recordkeeping Requirements

The results of the observations and tests along with any corrective actions taken to reduce visible emissions shall be recorded in a log.

iv. Reporting Requirements

A summary report of the observation results will be submitted by January 30 and July 30 of each year.

B. Soybean Dryers Consisting of:

NSPS

- C Natural gas/ No. 2 fuel oil-fired Berico column type grain dryer system (ID No. 3, 24 million Btu per hour heat input capacity, 120 tons/hr whole soybeans processing capacity) with one associated filter system (ID No. C-3A) consisting of mesh screens with perforations which are 0.094 inches or less in diameter in series with a cyclone (ID No. C-3, 54 inches in diameter, for recycle air only (approximately 4% of air throughput))**
- C Natural gas/ No. 2 fuel oil-fired Shanzer column type grain dryer system (ID No. 4, 27 million Btu per hour heat input capacity, 90 tons/hr whole soybeans processing capacity) with one associated filter system (ID No. C-4) consisting of mesh screens with perforations which are 0.094 inches or less in diameter**

1. Description

A portion of the soybeans at this facility are dried in the Berico Column Dryer (ID No. 3). This dryer, which has a maximum process rate of 120.0 tons per hour of soybeans, uses natural gas and No. 2 fuel oil and has a maximum firing rate of 24 million Btu per hour. This dryer is controlled by a filter system (ID No. C-3A) consisting of mesh screens with perforations of 0.094 inches in diameter or less. This dryer is subject to NSPS Subpart DD. As the mesh screen perforations are less than 0.094 inches in diameter, the particulate matter standard in 60.302(a) [0 percent opacity] does not apply. Initial notification and recordkeeping requirements however do apply. Initial notification of construction and operation for this source has been satisfied (ref. Paul Greywall, August 8, 2003). In addition, a simple cyclone (ID No. C-3) has been installed for the dryer recycle air.

A portion of the soybeans at this facility are dried in the Shanzer Column Dryer (ID No. 4). This dryer, which has a maximum process rate of 90.0 tons per hour of soybeans, uses natural gas and No. 2 fuel oil and has a maximum firing rate of 27 million Btu per hour. This dryer is controlled by a filter system (ID No. C-4) consisting of mesh screens with perforations of 0.094 inches in diameter or less. The Shanzer dryer was established prior to 1978, and NSPS Subpart DD does not apply.

2. Applicable Regulatory Requirements

The following provides a summary of limits and/or standards for the emission source(s) described above. A review of the information in the application was performed to ensure the appropriate limits and associated calculations used to show compliance were correct.

Regulated Pollutant	Limits/Standards	Applicable Regulation
particulate matter	$E=55.0P^{0.11} - 40$ where E =allowable emission rate in pounds per hour P =process weight in tons per hour	15A NCAC 2D .0515
sulfur dioxide	2.3 pounds per million Btu heat input	15A NCAC 2D .0516
visible emissions	20 percent opacity	15A NCAC 2D .0521

a. **2D .0515 “Particulates from Miscellaneous Industrial Processes”**

i. Regulatory Analysis

The allowable particulate emission limit is calculated by the following equation:

For process weights greater than 30 tons per hour:

$$E' 55.0P^{0.11}\&40$$

where: E = allowable emission rate for particulate matter in pounds per hour, and
P= process weight in tons per hour

Berico Column Dryer (ID No. 3)

According to permit application, the Berico Column Dryer (ID No. 3) has a maximum hourly process rate of 120 tons per hour of soybeans. Thus, the allowable emission rate for process rates

greater than 30 tons per hour is:

$$E = 55.0 \times (120 \text{ tons/hour})^{0.11} - 40 = 53.13 \text{ lbs/hour.}$$

According to the applicant, the before and after control emission rate are 12.32 lbs/hour and 11.09 lbs./hour, respectively. In addition, the applicant reports an 85% control efficiency for the cyclone (ID No. C-3) which only controls 4% of the airstream with a before and after control rate of 0.44 and 0.07 lb./hour, respectively.

Shanzer Column Dryer (ID No. 4)

According to permit application, the Shanzer Column Dryer (ID No. 4) has a maximum hourly process rate of 90 tons per hour of soybeans. Thus, the allowable emission rate for process rates greater than 30 tons per hour is:

$$E = 55.0 \times (90 \text{ tons/hour})^{0.11} - 40 = 50.22 \text{ lbs/hour.}$$

According to the applicant, the before and after control emission rates are 9.87 lbs/hour and 8.88 lbs./hour, respectively.

Compliance with 2D .0515 is indicated for both of these dryers.

ii. Monitoring Requirements

To ensure that optimum control efficiency of particulate matter is obtained by the mesh screen filter systems (ID Nos. C-3A and C-4) installed on the Berico dryer and the Shanzer dryer, respectively, the mesh screen filters shall be cleaned of collection material as frequently as needed to ensure design performance and integrity of the facility.

To ensure that optimum control efficiency of particulate matter is obtained by the cyclone (ID No. C-3) installed on the Berico dryer, monthly inspections will be performed and maintenance will be performed as recommended by the manufacturer. As a minimum, the inspections will include a monthly external inspection of the cyclone and ductwork.

iii. Recordkeeping Requirements

The results of the inspection and maintenance will be kept in a log.

iv. Reporting Requirements

A summary report of the monitoring will be submitted by January 30 and July 30 of each year. The results of any maintenance

b. **2D .0516 "Sulfur Dioxide Emissions From Combustion Sources"**

i. Regulatory Analysis

Sulfur dioxide emissions from any source of combustion that is discharged from any vent, stack, or chimney shall not exceed 2.3 pounds per million Btu heat input. Both dryers (ID Nos. 3 and 4) are operated on natural gas and No. 2 fuel oil.

ii. Monitoring/Recordkeeping/Reporting Requirements

There are no testing, monitoring, recordkeeping, and reporting requirements for this source due to the inherently low sulfur content of natural gas and No. 2 fuel oil.

The AP-42 emission factor for total sulfur dioxide emissions from natural gas combustion is 0.6 pounds of sulfur dioxide per million cubic feet combusted [ref: AP-42 Table 1.4-2; July 1998]. Assuming a heating value of 1,020 Btu per cubic foot, this equates to:

$$\frac{0.6 \text{ lb particulate}}{1,000,000 \text{ cubic ft}} \times \frac{1 \text{ cuft}}{1,020 \text{ Btu}} \times \frac{1,000,000 \text{ Btu}}{\text{million Btu}} = 0.0006 \frac{\text{pounds sulfur dioxide}}{\text{million Btu heat input}}$$

The AP-42 emission factor for sulfur dioxide emissions from the combustion of No. 2 fuel oil based on the fuel oil containing 0.5 weight percent sulfur is 71 pounds per 1000 gallons combusted. No. 2 fuel oil has a heating value of 141,000 Btu per gallon. Sulfur dioxide emissions from firing No. 2 fuel oil in the burners is as follows:

$$\frac{71 \text{ lb SO}_2}{1,000 \text{ gal}} \times \frac{\text{gallon}}{141,000 \text{ Btu}} \times \frac{1,000,000 \text{ Btu}}{\text{million Btu}} = 0.50 \frac{\text{pounds sulfur dioxide}}{\text{million Btu heat input}}$$

Thus, compliance with this regulation is indicated for the combustion of natural gas and No. 2 fuel oil in the Berico dryer (ID No. 3) and the Shanzer dryer (ID No. 4).

c. **2D .0521 “Control of Visible Emissions”**

i. Regulatory Analysis

The Berico Dryer system (ID No. 3) and the Shanzer dryer (ID No. 4) were established after July 1, 1971 and are subject to 2D .0521(d). Per this regulation, visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period except that six-minute averaging not more than 87 percent opacity may occur not more than once any hour nor more than four times in any 24-hour period. Compliance is indicated with this regulation, because the latest inspection report did not cite any opacity exceedances.

ii. Monitoring Requirements

The Permittee will either observe the emission points of the sources above once a month for visible emissions above normal or perform a Method 9. Monthly observations should provide reasonable assurance of compliance. The Permittee will establish what normal visible emissions are through recordkeeping.

iii. Recordkeeping Requirements

The results of the observations and tests along with any corrective actions taken to reduce visible emissions shall be recorded in a log.

iv. Reporting Requirements

A summary report of the observation results will be submitted by January 30 and July 30 of each year.

C. Soybean storage and processing facilities consisting of:

- C One soybean aspiration system (ID No. 5) with associated bagfilter (ID No. 821, 3,060 square feet of filter area)
- C One ground pod transfer system/ hull transfer and storage system (ID Nos. 6 and 7) with one associated bagfilter (ID No. 15, 160 square feet of filter area)
- C One soybean conditioning and flaking process (ID No. 8) with one associated simple cyclone (ID No. 825, 96 inches in diameter)

1. Description

In the **soybean aspiration system (ID No. 5)**, whole soybeans are conveyed to the crush facility. A bagfilter (ID No. 821) is used to filter aspiration from the associated conveyance.

In the **ground pod transfer system/ hull transfer and storage system (ID Nos. 6 and 7)**, ground pods are transferred to storage with a pneumatic blower. A bagfilter (ID No. 15) is used to remove particulates from air leaving the system at storage.

In this **soybean conditioning and flaking process (ID No. 8)**, cracked soybeans are conveyed to the conditioner where the beans are heated. The cracked beans are then transferred to the flakers. The conditioner vent vapors and aspiration off the flaking system are pulled through a simple cyclone (ID No. 825).

The above sources were established prior to 1978 and are not subject to NSPS Subpart DD.

2. Applicable Regulatory Requirements

The following provides a summary of limits and/or standards for the emission source(s) described above. A review of the information in the application was performed to ensure the appropriate limits and associated calculations used to show compliance were correct.

Regulated Pollutant	Limits/Standards	Applicable Regulation
particulate matter	$E=4.10P^{0.67}$ or $E=55.0P^{0.11} - 40$ where E =allowable emission rate in pounds per hour P =process weight in tons per hour	15A NCAC 2D .0515
visible emissions	20 percent opacity	15A NCAC 2D .0521

a. **2D .0515 “Particulates from Miscellaneous Industrial Processes”**

i. Regulatory Analysis

For process weights less than 30 tons per hour:

$$E' 4.10P^{0.67}$$

For process weights greater than 30 tons per hour:

$$E = 55.0P^{0.11} - 40$$

where: E = allowable emission rate for particulate matter in pounds per hour, and
P = process weight in tons per hour

Soybean aspiration system (ID No. 5)

According to permit application, this source (ID No. 5) has a process rate of 660 tons per hour of whole soybeans. Thus, the allowable emission rate is:

$$E = 55.0 \times (660 \text{ tons/hour})^{0.11} - 40 = 72.33 \text{ lbs/hour.}$$

According to the applicant, the before and after control emission rate to bagfilter (ID No. 821) is 284.44 lbs/hour and 0.28 lb/hour with a 99.9% bagfilter efficiency predicted. The DAQ bagfilter evaluation spreadsheet confirms the estimated collection efficiency is reasonable with a 99.95% control efficiency predicted. Compliance should be achieved with this regulation, since uncontrolled emissions are less than allowable.

Ground pod transfer system/ hull transfer and storage system (ID Nos. 6 and 7)

According to permit application, this source has a process rate of 7.1 tons per hour of soybeans. Thus, the allowable emission rate is:

$$E = 4.10 \times (7.1 \text{ tons/hour})^{0.67} = 15.2 \text{ lbs/hour.}$$

According to the applicant, the before and after control emission rate to bagfilter (ID No. 15) is 10.45 lbs/hour and 0.01 lb/hour with a 99.9% bagfilter efficiency predicted. The DAQ bagfilter evaluation spreadsheet confirms this predicted collection efficiency is reasonable with a 99.95% control efficiency predicted. Compliance should be achieved with this regulation, since uncontrolled emissions are less than allowable.

Soybean conditioning and flaking process (ID No. 8)

According to permit application, this source (ID No. 8) has a process rate of 130.6 tons per hour. Thus, the allowable emission rate is:

$$E = 55.0 \times (130.6 \text{ tons/hour})^{0.11} - 40 = 54.0 \text{ lbs/hour.}$$

According to the applicant, the before and after control emission rate to the cyclone (ID No. 825) 47.41 lbs/hour and 1.90 lb/hour with a 96% cyclone efficiency predicted. The cyclone evaluation spreadsheet predicts that this control efficiency is a little high with a 92% control efficiency predicted using the Method of Leith-Licht. However, since even uncontrolled emissions are reported to be less than allowable, compliance should be achieved with a 92% efficient cyclone.

ii. Monitoring Requirements

To ensure that optimum control efficiency of particulate matter is obtained by the bagfilters (ID Nos. 821 and 15) and cyclone (ID No. 825), monthly inspections will be performed and maintenance will be performed as recommended by the manufacturer. As a minimum, the inspections will include a monthly external inspection of the bagfilters, cyclone, and ductwork, and an annual internal inspection of the bagfilters to ensure structural integrity.

iii. Recordkeeping Requirements

The results of the inspection and maintenance will be kept in a log.

iv. Reporting Requirements

A summary report of the monitoring will be submitted by January 30 and July 30 of each year. The results of any maintenance to the control devices shall be reported within 30 days of a written request by DAQ.

b. **2D .0521 “Control of Visible Emissions”**

i. Regulatory Analysis

This soybean aspiration system (ID No. 5), the ground pod transfer system/hull transfer and storage system (ID Nos. 6 and 7), and the soybean conditioning and flaking process (ID No. 8) were established after July 1, 1971, and are subject to 2D .0521(d). Per this regulation, visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period except that six-minute averaging not more than 87 percent opacity may occur not more than once any hour nor more than four times in any 24-hour period. Compliance is indicated with this regulation, because the latest inspection report did not cite any opacity exceedances.

ii. Monitoring Requirements

The Permittee will either observe the emission points of the sources above once a month for visible emissions above normal or perform a Method 9. Monthly observations should provide reasonable assurance of compliance. The Permittee will establish what normal visible emissions are through recordkeeping.

iii. Recordkeeping Requirements

The results of the observations and tests along with any corrective actions taken to reduce visible emissions shall be recorded in a log.

iv. Reporting Requirements

A summary report of the observation results will be submitted by January 30 and July 30 of each year.

D. One hexane solvent, soybean oil extraction process (ID No. 9) with one associated solvent recovery system consisting of a mineral oil scrubber (ID No. C-9)

1. Description

In this process, hexane is used to extract soybean oil from the soybeans. This source is controlled by a mineral oil scrubber with ceramic saddle packing which recovers the n-hexane with a reported 95% control efficiency. The facility has taken HAP limits to avoid MACT, Subpart GGGG applicability.

2. Applicable Regulatory Requirements

The following provides a summary of limits and/or standards for the emission source(s) described above. A review of the information in the application was performed to ensure the appropriate limits and associated calculations used to show compliance were correct.

Regulated Pollutant	Limits/Standards	Applicable Regulation
visible emissions	20 percent opacity	15A NCAC 2D .0521
odors	See Section VII.(A)(1); State-enforceable only	15A NCAC 2D .1806
toxic air pollutants	Less than 2.348 tons per day (4,696 pounds per day) of n-hexane; See Section VII.(A)(2); State-enforceable only	Avoidance of 15A NCAC 2Q .0711
volatile organic compounds	See Section VII.(B)(1)	15A NCAC 2D .0958
	Less than 661 tons per year of n-hexane; See Section VII.(C)(1)	Avoidance of 15A NCAC 2D .0530
hazardous air pollutants	See Section VII.(D)(1)	Avoidance of 15A NCAC 2D .1111 (Subpart GGGG)

a. **2D .0521 “Control of Visible Emissions”**

i. Regulatory Analysis

The soybean oil/ hexane solvent extraction process (ID No. 9) was established after July 1, 1971 and is subject to 2D .0521(d). Per this regulation, visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period except that six-minute averaging not more than 87 percent opacity may occur not more than once any hour nor more than four times in any 24-hour period. Compliance is indicated with this regulation, because the latest inspection report did not cite any opacity exceedances.

ii. Monitoring Requirements

The Permittee will either observe the emission points of the soybean oil/ hexane solvent extraction process (ID No. 9) once a month for visible emissions above normal or perform a Method 9. Monthly observations should provide reasonable assurance of compliance. The Permittee will establish what normal visible emissions are through recordkeeping.

iii. Recordkeeping Requirements

The results of the observations and tests along with any corrective actions taken to reduce visible emissions shall be recorded in a log.

iv. Reporting Requirements

A summary report of the observation results will be submitted by January 30 and July 30 of each year.

E. Soybean storage and processing facilities consisting of:

- C Whole soybean cleaning aspiration (ID No. 10-1) with associated cyclone (ID No. 820, 56 inches in diameter) and pod grinding system (ID No. 10-2) with associated cyclone (ID No. 819, 48 inches in**

diameter) and bean aspiration all controlled by one bagfilter (ID No. 818A, 2,820 square feet of filter area)

- C Soybean meal screening and grinding process (ID No. 13) with associated bagfilter (ID No. 831, 1,462 square feet of filter area)
- C Railcar meal loading system (ID No. 14) and one associated bagfilter (ID No. BF-320, 510 square feet of filter area)
- C Meal storage tank (ID No. 15A) and clay storage tank (ID No. 24) with associated bagfilter (ID No. 15A-C, 208 square feet of filter area)
- C One meal storage tank (ID No. 15B) with associated bagfilter (ID No. 15B-C, 85 square feet of filter area)
- C One truck and rail meal loadout enclosure (ID No. 16) with associated bagfilter (ID No. BF-1750, 1,750 square feet of filter area)

1. Description

In the **whole soybean cleaning aspiration (ID No. 10-1) and pod grinding system (ID No. 10-2), and bean aspiration system**, aspiration off the conveyance, cleaner, and grinder are sent to a bagfilter (ID No. 818A). In **soybean meal screening and grinding process (ID No. 13)**, the soybean meal is ground and screened prior to transfer to finished storage. Aspiration off the grinding and screening processes sent to a bagfilter (ID No. 831). In the **railcar meal loading operation (ID No. 14)**, soybean meal is conveyed from storage to rail loadout. Aspiration off the rail loadout system is sent to a bagfilter (ID No. BF-320, 510 square feet of filter area). The **soybean meal storage tank (ID No. 15A) and the clay storage tank (ID No. 24)** vent through the bagfilter (ID No. 15A-C), and the **meal storage tank (ID No. 15B)** vents through the bagfilter (ID No. 15B-C). At the **truck and rail meal loadout enclosure (ID No. 16)**, the dust generated within the loadout enclosure during the loading of soybean meal to trucks and railcars is collected with a bagfilter (ID No. BF-1750). The above sources were established prior to 1978 and are not subject to NSPS Subpart DD.

2. Applicable Regulatory Requirements

The following provides a summary of limits and/or standards for the emission source(s) described above. A review of the information in the application was performed to ensure the appropriate limits and associated calculations used to show compliance were correct.

Regulated Pollutant	Limits/Standards	Applicable Regulation
particulate matter	$E=55.0P^{0.11} - 40$ where E =allowable emission rate in pounds per hour P =process weight in tons per hour	15A NCAC 2D .0515
visible emissions	20 percent opacity	15A NCAC 2D .0521

a. **2D .0515 “Particulates from Miscellaneous Industrial Processes”**

i. Regulatory Analysis

For process weights greater than 30 tons per hour:

$$E = 55.0P^{0.11} - 40$$

where: E = allowable emission rate for particulate matter in pounds per hour, and
P = process weight in tons per hour

The whole soybean cleaning aspiration (ID No. 10-1) and pod grinding system (ID No. 10-2), and bean aspiration system

According to permit application, this source has a process rate of 210 tons per hour of soybeans. Thus, the allowable emission rate is:

$$E = 55.0 \times (210 \text{ tons/hour})^{0.11} - 40 = 59.04 \text{ lbs./hour.}$$

According to the applicant, the before control and after control emission rate to cyclone (ID No. 820) from the whole soybean cleaning aspiration system (ID No. 10-1) is 442.02 lbs./hour and 17.68 lbs./hour, respectively with a 96% control efficiency. The DAQ Cyclone Evaluation spreadsheet confirms that this is reasonable with a 96.8% control efficiency predicted for cyclone (ID No. 820).

According to the applicant, the before control and after control emission rate to cyclone (ID No. 819) from the pod grinding system (ID No. 10-2) is 442.02 lbs./hour and 17.68 lbs./hour, respectively with a 96% control efficiency. The DAQ Cyclone Evaluation spreadsheet confirms that this is reasonable with a 96.6% control efficiency predicted for cyclone (ID No. 819).

The bagfilter (ID No. 818A) controls emissions from the bean aspiration system, the soybean cleaning cyclone (ID No. 820) and the pod grinding system (ID No. 819). The applicant reports that this bagfilter has a 99.9% control efficiency with a before and after control rate of 477.4 lbs./hour and 0.44 lbs./hour, respectively. The DAQ Bagfilter Evaluation spreadsheet confirms that the estimated control efficiency for this bagfilter is reasonable with a 99.95% control efficiency predicted.

Soybean meal screening and grinding process (ID No. 13),

According to permit application, this source (ID No. 13) has a process rate of 105.8 tons per hour of soybean meal. Thus, the allowable emission rate is:

$$E = 55.0 \times (105.8 \text{ tons/hour})^{0.11} - 40 = 51.9 \text{ lbs./hour.}$$

According to the permit application, the bagfilter (ID No. 831) has a control efficiency of 99.9% and a before and after control emission rate of 97 and 0.097 lbs./hour, respectively. According to the DAQ bagfilter evaluation spreadsheet, this control efficiency is reasonable with a 99.95% efficiency predicted. Thus, compliance with 2D .0515 is expected.

Railcar meal loading operation (ID No. 14)

According to permit application, this source (ID No. 14) has a process rate of 300 tons per hour of soybean meal. Thus, the allowable emission rate is:

$$E = 55.0 (300 \text{ tons/hour})^{0.11} - 40 = 63.0 \text{ lbs./hour.}$$

According to the applicant, the before and after control emission rate to the bagfilter (ID No. BF-320) are 14.79 lbs./hour and 0.01 lbs./hour, respectively with a 99.9% control efficiency predicted. The DAQ Bagfilter Evaluation spreadsheet confirms that this is reasonable with a 99.95% control efficiency predicted. Thus, compliance with 2D .0515 is expected.

Soybean meal storage tank (ID No. 15A) and the clay storage tank (ID No. 24)

According to permit application, this source has a process rate of 90 tons per hour of soybean meal/ clay. Thus, the allowable emission rate is:

$$E = 55.0 \times (90 \text{ tons/hour})^{0.11} - 40 = 50.23 \text{ lbs/hour.}$$

According to the applicant, the before control and after control emission rate to the bagfilter (ID No. 15A-C) is 243.77 lbs/hour and 0.24 lbs./hour with a 99.9% bagfilter control efficiency. The DAQ Bagfilter Evaluation spreadsheet confirms that this control efficiency is reasonable with a 99.95% control efficiency predicted. Thus, compliance with this regulation is expected.

Meal storage tank (ID No. 15B)

According to permit application, this source has a loading rate of 329.4 tons per hour of meal. Thus, the allowable emission rate is:

$$E = 55.0 \times (329.4 \text{ tons/hour})^{0.11} - 40 = 64.1 \text{ lbs/hour.}$$

According to the applicant, the before control and after control emission rate to the bagfilter (ID No. 15B-C) are 123.84 lbs/hour and 0.12 lbs./hour with a 99.9% bagfilter control efficiency. The DAQ Bagfilter Evaluation spreadsheet confirms that this control efficiency is reasonable with a 99.95% control efficiency predicted. Thus, compliance with this regulation is expected.

One truck and rail meal loadout enclosure (ID No. 16) with associated bagfilter (ID No. BF-1750, 1,750 square feet of filter area)

According to permit application, this source (ID No. 16) has a process rate of 300 tons per hour of soybean meal. Thus, the allowable emission rate is:

$$E = 55.0 (300 \text{ tons/hour})^{0.11} - 40 = 63.0 \text{ lbs/hour.}$$

According to the applicant, the before and after control emission rate to the bagfilter (ID No. BF-1750) are 4.93 lbs./hour and 0.00493 lbs./hour, respectively with a 99.8% control efficiency predicted. The DAQ Bagfilter Evaluation spreadsheet confirms that this is reasonable with a 99.95% control efficiency predicted. Thus, compliance with 2D .0515 is expected.

ii. Monitoring Requirements

To ensure that optimum control efficiency of particulate matter is obtained by the cyclones and bagfilters, monthly inspections will be performed and maintenance will be performed as recommended by the manufacturer. As a minimum, the inspections will include a monthly external inspection of the cyclones, bagfilters, and ductwork and an annual internal inspection of the bagfilters to ensure structural integrity.

iii. Recordkeeping Requirements

The results of the inspection and maintenance will be kept in a log.

iv. Reporting Requirements

A summary report of the monitoring will be submitted by January 30 and July 30 of each year. The

results of any maintenance to the control devices shall be reported within 30 days of a written request by DAQ.

b. 2D .0521 “Control of Visible Emissions”

i. Regulatory Analysis

The whole soybean cleaning aspiration (ID No. 10-1), the pod grinding system (ID No. 10-2), the bean aspiration system, the soybean meal screening and grinding process (ID No. 13), the railcar meal loading operation (ID No. 14), the soybean meal storage tank (ID No. 15A), the clay storage tank (ID No. 24), the meal storage tank (ID No. 15B), and the truck and rail meal loadout enclosure (ID No. 16) were established after July 1, 1971 and are subject to 2D .0521(d). Per this regulation, visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period except that six-minute averaging not more than 87 percent opacity may occur not more than once any hour nor more than four times in any 24-hour period. Compliance is indicated with this regulation, because the latest inspection report did not cite any opacity exceedances.

ii. Monitoring Requirements

The Permittee will either observe the emission points of the sources above once a month for visible emissions above normal or perform a Method 9. Monthly observations should provide reasonable assurance of compliance. The Permittee will establish what normal visible emissions are through recordkeeping.

iii. Recordkeeping Requirements

The results of the observations and tests along with any corrective actions taken to reduce visible emissions shall be recorded in a log.

iv. Reporting Requirements

A summary report of the observation results will be submitted by January 30 and July 30 of each year.

F. One natural gas/ No. 6 fuel oil/ vegetable oil-fired boiler (ID No. 17, 46.5 million Btu per hour heat input rate)

1. Description:

This boiler is fired on natural gas and No. 6 fuel oil. In addition, vegetable fuel oil was recently added to save on fuel costs. This boiler was first operated prior to June 1989 and is not subject to NSPS, Subpart Dc.

2. Applicable Regulatory Requirements

The following provides a summary of limits and/or standards for the emission source(s) described above. A review of the information in the application was performed to ensure the appropriate limits and associated calculations used to show compliance were correct.

Regulated Pollutant	Limits/Standards	Applicable Regulation
particulate matter	0.346 pound per million Btu	15A NCAC 2D .0503

sulfur dioxide	2.3 pounds per million Btu	15A NCAC 2D .0516
visible emissions	20% opacity	15A NCAC 2D .0521

a. **2D .0503 “Particulates from Fuel Burning Indirect Heat Exchangers”**

i. Regulatory Analysis

This boiler is subject to 2D .0503(a) since No. 6 fuel oil, vegetable oil, and natural gas can be burned for the primary purpose of producing heat by indirect heat transfer. Allowable emissions of particulate matter from fuel combustion shall be calculated as follows:

$$E = 1.09 Q^{-0.2594}$$

where E = allowable particulate emission rate in pounds per million Btu, and
Q = maximum permitted heat input rate in million Btu per hour

Allowable particulate emissions for Boiler (ID No. 17) are determined based on a total plant site heat input rate from the boilers at the facility at the time Boiler (ID No. 17) was installed of Q=87 million per hour. Therefore allowable particulate emissions are:

$$E = 1.09 \times (87)^{-0.2594} = 0.346 \text{ pound per million Btu, or}$$

$$E = 0.35 \text{ lb/million Btu} \times 46.5 \text{ million Btu per hour} = 16.08 \text{ lbs/hour}$$

Natural Gas

The AP-42 emission factor for total particulate emissions from natural gas combustion is 7.6 pounds of particulate per million cubic feet combusted [ref: AP-42 Table 1.4-2; July 1998]. Assuming a heating value of 1,020 Btu per cubic foot, this equates to:

$$\frac{7.6 \text{ lb particulate}}{1,000,000 \text{ cubic ft}} \times \frac{1 \text{ cuft}}{1,020 \text{ Btu}} \times \frac{1,000,000 \text{ Btu}}{\text{million Btu}} = 0.007 \frac{\text{pounds particulate}}{\text{million Btu heat input}}$$

No. 6 Fuel Oil

The DAQ’s “Fuel Oil Combustion Emissions Calculator” spreadsheet uses AP-42 emission factors to estimate worst case particulate emissions from the firing of No. 6 fuel oil. This emission factor of 24 pounds per 1,000 gallons adds the 22.5 lbs./1000 gal filterable particulate matter and 1.5 lbs./1000 gal condensible particulate matter. According to the applicant, the standard heat content of No. 6 fuel oil of 150,000 Btu per gallon, and the worst case particulate emissions are estimated to be 0.16 pound of particulate matter per million Btu as follows:

$$\frac{24 \text{ lbs. particulate}}{1,000 \text{ gallon}} \times \frac{150,000 \text{ Btu}}{\text{gallon}} \times \frac{1,000,000 \text{ Btu}}{\text{million Btu}} = 0.16 \frac{\text{pounds particulate}}{\text{million Btu}}$$

Vegetable Fuel Oil

As per the permit review of November 16, 2001 by Jeff Twisdale, particulate matter emissions from the vegetable fuel oil-fired boiler are based on stack testing emission factors (filterable (front half) Method 5). This resulted in particulate emissions of 0.022 lb./million Btu.

Compliance is indicated, since estimated emissions are less than allowable.

ii. Monitoring/Recordkeeping/Reporting Requirements

Since potential particulate emissions are less than allowable, no monitoring, recordkeeping, and reporting is required. Stack testing is not required to ensure compliance with this regulation. However, the test method condition will be put in the permit in the event that DAQ finds that, due to improper operation, violations, etc., source testing is required.

b. **2D .0516 “Sulfur Dioxide Emissions from Combustion Sources”**

i. Regulatory Analysis

This boiler is a source of combustion which discharges through a stack and therefore is subject to 2D .0516(a). Allowable emissions of sulfur dioxide from this source while firing No. 6 fuel oil or natural gas shall not exceed 2.3 pounds per million Btu.

The worst case sulfur dioxide emissions are estimated to be 2.2 pounds per million Btu while firing No. 6 fuel oil. Natural gas is an inherently low sulfur dioxide emitting fuel with emissions of 0.0006 lb./million Btu, and vegetable oil firing was reported to result in an emission rate of 0.110 lb./million Btu per Jeff Twisdale’s November 16, 2001 permit review. Therefore, compliance is indicated with this regulation since the worst case estimated emissions are less than the allowable.

ii. Monitoring/Recordkeeping Requirements

The sulfur content of the No. 6 fuel oil received will be monitored using supplier certification to ensure compliance with the emission limit of 2.3 pounds of sulfur dioxide per million Btu. The maximum sulfur content in No. 6 fuel oil should not exceed 2.1 percent by weight to assure compliance. Stack testing is not required to ensure compliance with this regulation. However the test method condition will be put in the permit in the event that DAQ or EPA finds that due to improper operation violations, etc, source testing is required. Testing requirements are specified in 2D .0501(c). There are no monitoring/recordkeeping requirements for natural gas and/or vegetable fuel oil.

iii. Reporting Requirements

The Permittee will report by January 30 and July 30 of each year records of the supplier certification for No. 6 fuel oil.

c. **2D .0521 “Control of Visible Emissions”**

i. Regulatory Analysis

This boiler was first operated after July 1, 1971 and is subject to 2D .0521(d). Per this regulation, visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period except that six-minute averaging not more than 87 percent opacity may occur not more than once in any hour nor more than four times in any 24-hour period. Compliance is indicated with this regulation, because the latest inspection report did not cite any opacity exceedances.

ii. Monitoring Requirements

For the combustion of No. 6 fuel oil, one daily visual observation of the emission stacks shall be performed with the requirement to reduce visible emissions to the greatest extent possible. There

are no monitoring requirements for natural gas and/ or vegetable fuel oil.

iii. Recordkeeping Requirements

The recordkeeping requirements to ensure compliance with the particulate matter standard will be followed. In addition, a log will be kept of the daily visible emission stack observation.

iv. Reporting Requirements

A summary report of the daily visible emission stack observation results will be submitted by January 30 and July 30 of each year.

G. Soybean storage and processing facilities consisting of:

- C One railroad soybean receiving hopper/ dust tank (ID No. 19) with associated bagfilter (ID No. S232RF10, 2,960 square feet of filter area) in series with one cyclone (ID No. CK-36, 36 inches in diameter)**
- C Auxiliary truck soybean receiving enclosure (ID No. 20) with associated bagfilter (ID No. BF-448, 448 square feet of filter area)**
- C Secondary dehulling system (ID No. 22) with associated bagfilter (ID No. BF-1987, 1,987 square feet of filter area)**
- C Soybean meal dryer/ cooler (ID No. 25) with four associated cyclones (96 inches in diameter each, ID Nos. 25-A, 25-B, 25-C, and 25-D) installed in parallel**

1. Description

One railroad soybean receiving hopper/ dust tank (ID No. 19) with associated bagfilter (ID No. S232RF10, 2,960 square feet of filter area) in series with one cyclone (ID No. CK-36, 36 inches in diameter)

In this source, soybeans, received by rail, are dumped to the receiving hopper and are transferred to storage. Aspiration from the hopper goes to a cyclone followed by a bagfilter. This source has a process rate of 600 tons per hour.

In the **auxiliary truck soybean receiving enclosure (ID No. 20)**, dust generated during the unloading of soybeans within the auxiliary truck receiving enclosure is collected by a bagfilter (ID No. BF-448). In the **secondary dehulling process (ID No. 22)**, hulls are removed from the cracked beans in the dehulling process. Aspiration off the secondary dehulling equipment goes to the bagfilter (ID No. BF-1987). In the **soybean meal dryer/ cooler system (ID No. 25)**, soybean meal is dried and cooled prior to sizing. Four cyclones (one on each of the dryer cooler decks) are installed for dust collection. The above sources were installed prior to 1978 and are not subject to NSPS Subpart DD.

2. Applicable Regulatory Requirements

The following provides a summary of limits and/or standards for the emission source(s) described above. A review of the information in the application was performed to ensure the appropriate limits and associated calculations used to show compliance were correct.

Regulated Pollutant	Limits/Standards	Applicable Regulation
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particulate matter	$E=4.10P^{0.67}$ $E=55.0P^{0.11} - 40$ where E =allowable emission rate in pounds per hour P =process weight in tons per hour	15A NCAC 2D .0515
visible emissions	20 percent opacity	15A NCAC 2D .0521

a. **2D .0515 “Particulates from Miscellaneous Industrial Processes”**

i. Regulatory Analysis

For process weights less than 30 tons per hour:

$$E = 4.10P^{0.67}$$

where: E = allowable emission rate for particulate matter in pounds per hour, and
 P = process weight in tons per hour

For process weights greater than 30 tons per hour:

$$E = 55.0P^{0.11} - 40$$

where: E = allowable emission rate for particulate matter in pounds per hour, and
 P = process weight in tons per hour

One railroad soybean receiving hopper/ dust tank (ID No. 19)

According to permit application, this source has a process rate of 600 tons per hour of whole soybeans. Thus, the allowable emission rate is:

$$E = 55.0 \times (600 \text{ tons/hour})^{0.11} - 40 = 71.16 \text{ lbs/hour.}$$

Auxiliary truck soybean receiving enclosure (ID No. 20)

According to permit application, this source has a process rate of 300 tons per hour of whole soybeans. Thus, the allowable emission rate is:

$$E = 55.0 \times (300 \text{ tons/hour})^{0.11} - 40 = 63.00 \text{ lbs/hour.}$$

According to the applicant, the before control and after control emission rate to the bagfilter (ID No. 15B-C) are 5.86 lbs./hour and 0.00586 lbs./hour, respectively with a 99.9% bagfilter control efficiency. The DAQ Bagfilter Evaluation spreadsheet confirms that this control efficiency is reasonable with a 99.95% control efficiency predicted. Thus, compliance with 2D .0515 is expected for this source.

Secondary dehulling system (ID No. 22) with associated bagfilter (ID No. BF-1987, 1,987 square feet of filter area)

According to permit application, this source has a process rate of 7.98 tons per hour of whole soybeans. Thus, the allowable emission rate is:

$$E = 55.0 \times (7.98 \text{ tons/hour})^{0.67} = 16.48 \text{ lbs./hour}$$

According to the applicant, the before control and after control emission rate to the bagfilter (ID No. BF-1987) are 3.02 lbs./hour and 0.00302 lbs./hour, respectively with a 99.9% bagfilter control efficiency. The DAQ Bagfilter Evaluation spreadsheet confirms that this control efficiency is reasonable with a 99.95% control efficiency predicted. Thus, compliance with 2D .0515 is expected for this source.

Soybean meal dryer/ cooler system (ID No. 25) with four associated cyclones installed in parallel (ID Nos. 25-A, 25-B, 25-C, and 25-D, 96 inches in diameter each)

According to permit application, this soybean meal dryer/ cooler system (ID No. 25) has a process rate of 94.84 tons per hour of soybean meal. Thus, the allowable emission rate is:

$$E = 55.0 \times (105.4 \text{ tons/hour})^{0.11} - 40 = 50.75 \text{ lbs./hour.}$$

According to the applicant, the before control and after control emission rate to each of the parallel cyclones (ID Nos. 25A, 25B, 25C, and 25D) are 107.61 lbs./hour and 4.3 lbs./hour, respectively, with a 96% cyclone control efficiency predicted. The DAQ Cyclone Evaluation spreadsheet confirms that this control efficiency is reasonable with a 96.7% control efficiency predicted for each of the cyclones using the Method of Leith-Licht. Thus, since controlled emissions are less than allowable, compliance with 2D .0515 is expected.

ii. Monitoring Requirements

To ensure that optimum control efficiency of particulate matter is obtained by the bagfilters and cyclones, monthly inspections will be performed and maintenance will be performed as recommended by the manufacturer. As a minimum, the inspections will include a monthly external inspection of the bagfilters, cyclones, and ductwork and an annual internal inspection of the bagfilters to ensure structural integrity.

iii. Recordkeeping Requirements

The results of the inspection and maintenance will be kept in a log.

iv. Reporting Requirements

A summary report of the monitoring will be submitted by January 30 and July 30 of each year. The results of any maintenance to the control devices shall be reported within 30 days of a written request by DAQ.

b. 2D .0521 "Control of Visible Emissions"

i. Regulatory Analysis

The railroad soybean receiving hopper/ dust tank (ID No. 19), the auxiliary truck soybean receiving enclosure (ID No. 20), the secondary dehulling system (ID No. 22), and the soybean meal dryer/ cooler (ID No. 25) were established after July 1, 1971, it is subject to 2D .0521(d). Per this regulation, visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period except that six-minute averaging not more than 87 percent opacity may occur not more than once any hour nor more than four times in any 24-hour period. Compliance is indicated with this regulation, because the latest inspection report did not cite any opacity exceedances.

ii. Monitoring Requirements

The Permittee will either observe the emission points of the sources above once a month for visible emissions above normal or perform a Method 9. Monthly observations should provide reasonable assurance of compliance. The Permittee will establish what normal visible emissions are through recordkeeping.

iii. Recordkeeping Requirements

The results of the observations and tests along with any corrective actions taken to reduce visible emissions shall be recorded in a log.

iv. Reporting Requirements

A summary report of the observation results will be submitted by January 30 and July 30 of each year.

H. One natural gas/ No. 2 fuel oil/ No. 6 fuel oil/ vegetable oil-fired boiler (ID No. 26, 75.3 million Btu per hour heat input rate)

1. Description:

This boiler is fired on natural gas, No. 2 fuel oil, and No. 6 fuel oil. In addition, vegetable fuel oil was recently added to save on fuel costs. This boiler was first operated in 1988 (prior to June 1989) and is not subject to NSPS, Subpart Dc.

2. Applicable Regulatory Requirements

The following provides a summary of limits and/or standards for the emission source(s) described above. A review of the information in the application was performed to ensure the appropriate limits and associated calculations used to show compliance were correct.

Regulated Pollutant	Limits/Standards	Applicable Regulation
particulate matter	0.314 pound per million Btu	15A NCAC 2D .0503
sulfur dioxide	2.3 pounds per million Btu	15A NCAC 2D .0516
visible emissions	20% opacity	15A NCAC 2D .0521
nitrogen oxides and sulfur dioxide	Less than 40 tons per year each from the firing of natural gas, No. 2 fuel oil, and No. 6 fuel oil	Avoidance of 15A NCAC 2D .0530
nitrogen oxides	Less than 40 tons per year from the firing of vegetable fuel oil	

a. **2D .0503 “Particulates from Fuel Burning Indirect Heat Exchangers”**

i. Regulatory Analysis

This boiler is subject to 2D .0503(a) since No. 6 fuel oil, vegetable oil, and natural gas can be burned for the primary purpose of producing heat by indirect heat transfer. Allowable emissions of particulate matter from fuel combustion shall be calculated as follows:

$$E = 1.09 Q^{-0.2594}$$

where E = allowable particulate emission rate in pounds per million Btu, and
Q = maximum permitted heat input rate in million Btu per hour

Allowable particulate emissions for Boiler (ID No. 26) are determined based on a total plant site heat input rate from the boilers at the facility of 121.8 million Btu per hour (Boiler 17: 46.5 million Btu/hour + Boiler 26: 75.3 million Btu/hour). Therefore allowable particulate emissions are:

$$E = 1.09 \times (121.8)^{-0.2594} = 0.314 \text{ pound per million Btu, or}$$

$$E = 0.314 \text{ lb/million Btu} \times 75.3 \text{ million Btu per hour} = 23.64 \text{ lbs/hour}$$

Natural Gas

The AP-42 emission factor for total particulate emissions from natural gas combustion is 7.6 pounds of particulate per million cubic feet combusted [ref: AP-42 Table 1.4-2; July 1998]. Assuming a heating value of 1,020 Btu per cubic foot, this equates to:

$$\frac{7.6 \text{ lb particulate}}{1,000,000 \text{ cubic ft}} \times \frac{1 \text{ cuft}}{1,020 \text{ Btu}} \times \frac{1,000,000 \text{ Btu}}{\text{million Btu}} = 0.007 \frac{\text{pounds particulate}}{\text{million Btu heat input}}$$

No. 2 Fuel Oil

The DAQ's "Fuel Oil Combustion Emissions Calculator" spreadsheet uses AP-42 emission factors to estimate worst case particulate emissions. This emission factor of 3.3 pounds per 1,000 gallons adds the 2.0 lbs./1000 gal filterable particulate matter and 1.3 lb./1000 gal condensible particulate matter. Thus, using the standard heat content of No. 2 fuel oil of 141,000 Btu per gallon, the worst case particulate emissions are estimated to be 0.023 pound of particulate matter per million Btu.

$$\frac{3.3 \text{ lbs. particulate}}{1,000 \text{ gallon}} \times \frac{141,000 \text{ Btu}}{\text{gallon}} \times \frac{1,000,000 \text{ Btu}}{\text{million Btu}} = 0.023 \frac{\text{pounds particulate}}{\text{million Btu}}$$

No. 6 Fuel Oil

The DAQ's "Fuel Oil Combustion Emissions Calculator" spreadsheet uses AP-42 emission factors to estimate worst case particulate emissions from the firing of No. 6 fuel oil. This emission factor of 24 pounds per 1,000 gallons adds the 22.5 lbs./1000 gal filterable particulate matter and 1.5 lbs./1000 gal condensible particulate matter. Thus, the total particulate emission rate from this boiler is calculated to be 4.9 pounds per hour. According to the applicant, the standard heat content of No. 6 fuel oil of 150,000 Btu per gallon, and the worst case particulate emissions are estimated to be 0.16 pound of particulate matter per million Btu.

$$\frac{24 \text{ lbs. particulate}}{1,000 \text{ gallon}} \times \frac{150,000 \text{ Btu}}{\text{gallon}} \times \frac{1,000,000 \text{ Btu}}{\text{million Btu}} = 0.16 \frac{\text{pounds particulate}}{\text{million Btu}}$$

Vegetable Fuel Oil

As per the permit review of November 16, 2001 by Jeff Twisdale, particulate matter emissions from the vegetable fuel oil-fired boiler are based on stack testing emission factors (filterable (front half)

Method 5). This resulted in particulate emissions of 0.022 lb./million Btu.

Compliance is indicated with the particulate emission standard, since estimated emissions are less than allowable for all of the fuels.

ii. Monitoring/Recordkeeping/Reporting Requirements

Since potential particulate emissions are less than allowable, no monitoring, recordkeeping, and reporting is required. Stack testing is not required to ensure compliance with this regulation. However, the test method condition will be put in the permit in the event that DAQ finds that, due to improper operation, violations, etc., source testing is required.

b. **2D .0516 “Sulfur Dioxide Emissions from Combustion Sources”**

i. Regulatory Analysis

This boiler is a source of combustion which discharges through a stack and therefore is subject to 2D .0516(a). Allowable emissions of sulfur dioxide from this source while firing No. 6 fuel oil or natural gas shall not exceed 2.3 pounds per million Btu.

The worst case sulfur dioxide emissions are estimated to be 2.2 pounds per million Btu while firing 2.1 wt.% sulfur No. 6 fuel oil and 0.5 lb./million Btu while firing 0.5 wt.% sulfur No. 2 fuel oil. Natural gas is an inherently low sulfur dioxide emitting fuel with a sulfur dioxide emission rate of 0.0006 lb./million Btu heat input, and vegetable oil firing was reported to result in an emission rate of 0.110 lb./million Btu in Jeff Twisdale’s November 16, 2001 permit review. Therefore, compliance is indicated with this regulation since the worst case estimated emissions are less than the allowable.

ii. Monitoring/Recordkeeping Requirements

The sulfur content of the No. 6 fuel oil received will be monitored using supplier certification to ensure compliance with the emission limit of 2.3 pounds of sulfur dioxide per million Btu. The maximum sulfur content in No. 6 fuel oil should not exceed 2.1 percent by weight to assure compliance. Stack testing is not required to ensure compliance with this regulation. However the test method condition will be put in the permit in the event that DAQ or EPA finds that due to improper operation violations, etc, source testing is required. Testing requirements are specified in 2D .0501(c). There are no monitoring/recordkeeping requirements for natural gas, vegetable fuel oil, and No. 2 fuel oil.

iii. Reporting Requirements

The Permittee will report by January 30 and July 30 of each year records of the supplier certification.

c. **2D .0521 “Control of Visible Emissions”**

i. Regulatory Analysis

This boiler was first operated after July 1, 1971 and is subject to 2D .0521(d). Per this regulation, visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period except that six-minute averaging not more than 87 percent opacity may occur not more than

once in any hour nor more than four times in any 24-hour period. Compliance is indicated with this regulation, because the latest inspection report did not cite any opacity exceedances.

ii. Monitoring Requirements

One daily visual observation of the emission stacks shall be performed with the requirement to reduce visible emissions to the greatest extent possible from No. 6 fuel oil. There are no monitoring requirements for natural gas or vegetable fuel oil.

iii. Recordkeeping Requirements

The recordkeeping requirements to ensure compliance with the particulate matter standard will be followed. In addition, a log will be kept of the daily visible emission stack observation.

iv. Reporting Requirements

A summary report of the daily visible emission stack observation results will be submitted by January 30 and July 30 of each year.

d. **15A NCAC 2D .0530 “Prevention of Significant Deterioration” - Limit on Nitrogen Oxide and Sulfur Dioxide Emissions from Natural Gas, No. 2 Fuel Oil, and No. 6 Fuel Oil Combustion in Boiler (ID No. 26).**

i. Regulatory Analysis

In the permit modification (Air Permit No. 03840R25) issued February 22, 2002, the PSD avoidance stipulation was modified to keep the 75.3 million Btu per hour boiler (ID No. 26) from exceeding the 40 tons per year increment for sulfur dioxide and nitrogen oxides. The state operating permit imposed limits on gallons per year of usage of No. 6 fuel oil, No. 2 fuel oil, and cubic feet per year of natural gas. Rather than imposing limits specifically for each fuel, a stipulation requiring the limiting the sulfur dioxide and nitrogen oxide emissions to less than 40 tons per year (by demonstrating compliance with calculations) will be included instead to give the facility more flexibility.

PSD Avoidance Limit for Sulfur Dioxide Emissions from Natural Gas, No. 2 Fuel Oil, and No. 6 Fuel Oil Combustion

To avoid the applicability of NCAC 2D .0530 “Prevention of Significant Deterioration,” sulfur dioxide emissions must be less than 40 tons per 12-month period. The use of fuel in boiler (ID No. ES-40) shall be limited such that sulfur dioxide emissions shall not exceed 40 tons for any consecutive 12-month period. Calculations shall be made monthly and recorded in a logbook (written or in electronic format), according to the following formula:

$$X + Y \times 0.6 \frac{\text{lbs sulfur dioxide}}{\text{million cubic feet}} \% Z1 \times \frac{142 \text{ lbs sulfur dioxide}}{1000 \text{ gallon fuel oil}} \times S1 \% Z2 \times \frac{157 \text{ lbs sulfur dioxide}}{1000 \text{ gallon fuel oil}} \times S2$$

Where: X is the total actual emissions of sulfur dioxide in pounds
 Y is the total amount of natural gas used in the boiler in cubic feet
 Z1 is the amount of No. 2 fuel oil used in the boiler in gallons

S1 is the percent sulfur in the No. 2 fuel oil
 Z2 is the amount of No. 6 fuel oil used in the boiler in gallons
 S2 is the percent sulfur in the No. 6 fuel oil

PSD Avoidance Limit for Nitrogen Oxide Emissions from Natural Gas, No. 2 Fuel Oil, and No. 6 Fuel Oil Combustion in Boiler (ID No. 26)

To avoid the applicability of NCAC 2D .0530 “Prevention of Significant Deterioration,” nitrogen oxide emissions must be less than 40 tons per 12-month period. The use of fuel in boiler (ID No. 26) shall be limited such that nitrogen oxide emissions shall not exceed 40 tons for any consecutive 12-month period. Calculations shall be made monthly and recorded in a logbook (written or in electronic format), according to the following formula:

$$A \div B \times 100 \frac{\text{lbs nitrogen oxides}}{\text{million cubic feet}} \% C1 \times \frac{24 \text{ lbs nitrogen oxides}}{1000 \text{ gallon fuel oil}} \% C2 \times \frac{47 \text{ lbs nitrogen oxides}}{1000 \text{ gallon fuel oil}}$$

Where: A is the total actual emissions of nitrogen oxides in pounds
 B is the total amount of natural gas in the boiler in cubic feet
 C1 is the amount of No. 2 fuel oil used in the boiler in gallons
 C2 is the amount of No. 6 fuel oil used in the boiler in gallons

ii. Monitoring / Recordkeeping Requirements

The Permittee shall keep monthly records of the amount of fuel used and the sulfur content, including certification of the fuel, in a log (written or in electronic format). The Permittee shall be deemed in noncompliance with 15A NCAC 2D .0530 if the sulfur content of the fuel is not monitored.

iii. Reporting Requirements

The Permittee shall submit quarterly summary reports, acceptable to the Regional Air Quality Supervisor of monitoring and recordkeeping activities. The report shall contain the following:

- A. The monthly sulfur dioxide and nitrogen oxide emissions for the previous 14 months. The emissions must be calculated for each of the 12-month periods over the previous 14 months;
- B. The monthly quantities of natural gas, No. 2 fuel oil, and No. 6 fuel oil consumed for the previous 14 months; and
- C. The average sulfur content for the No. 2 and No. 6 fuel oils.

e. **15A NCAC 2D .0530 “Prevention of Significant Deterioration - Limit on Nitrogen Oxide Emissions from Vegetable Fuel Oil Combustion”.**

i. Regulatory Analysis

In the permit modification (Air Permit No. 03840R23), the facility added the capability of burning vegetable oil in addition to No. 2 fuel oil, No. 6 fuel oil, and natural gas. The PSD avoidance stipulation was revised in the permit modification (Air Permit No. 03840R25). In this permit review, it was discovered that firing vegetable fuel oil exclusively in boiler (ID No. 26) would result in emissions of 62.6 tons per year of NOx which is greater than the PSD significance level of 40 tons per year of NOx. By using a similar approach to a policy memo dated April 3, 2000 from R. Douglas Neeley (EPA Region 4) to Donald van der Vaart (DAQ), only the emissions from the PSD

modification (firing vegetable oil in this case) are limited to less than the significance levels to avoid the applicability of PSD for Boiler (ID No. 26). Therefore, a separate vegetable oil usage limit (3,253,800 gallons per year) and associated monitoring/ recordkeeping/ reporting will be placed in the permit under a separate PSD avoidance limit. (Ref: Jeff Twisdale's Air Permit Modification AP03840R25 (dated February 21, 2002).)

Cargill bases their emission estimates from stack testing a boiler burning soybean oil at the Cargill, Inc. - Iowa Falls, Iowa plant on January 18, 2001. An analysis of soybean oil burned during stack testing dated December 29, 2000 provides a heat input of 16,900 Btu/lb, a density of 7.657 lb./gallon, and a NOx emission factor of 0.190 lb/million Btu

$$= \frac{3,253,800 \text{ gallons}}{\text{year}} \times \frac{0.190 \text{ lb}}{10^6 \text{ Btu}} \times \frac{16,900 \text{ Btu}}{\text{lb}} \times \frac{7.657 \text{ lb}}{\text{gallon}} \times \frac{\text{ton}}{2,000 \text{ lbs.}} = 39.9 \text{ tons/yr.}$$

PSD Avoidance Limit for Nitrogen Oxide Emissions from Vegetable Oil Combustion in Boiler (ID No. 26)

To avoid the applicability of NCAC 2D .0530 "Prevention of Significant Deterioration," nitrogen oxide emissions from the combustion of vegetable oil in boiler (ID No. 26) must be less than 40 tons per 12-month period. To ensure compliance with this limit, the use of vegetable fuel in boiler (ID No. 26) shall be limited to 3,253,800 gallons per year.

ii. Monitoring / Recordkeeping Requirements

The Permittee shall keep monthly records of the amount of vegetable fuel used . The Permittee shall be deemed in noncompliance with 15A NCAC 2D .0530 if the records of vegetable fuel usage are not kept.

iii. Reporting Requirements

The Permittee shall submit quarterly summary reports, acceptable to the Regional Air Quality Supervisor of monitoring and recordkeeping activities. The report shall contain the following:

- A. The monthly nitrogen oxide emissions for the previous 14 months. The emissions must be calculated for each of the 12-month periods over the previous 14 months; and
- B. The monthly quantities of vegetable fuel oil consumed for the previous 14 months.

I. Soybean storage bins (ID Nos. SSB1 through SSB9, seven at 200,000 bushels capacity and two at 500,000 bushels capacity) with nine associated bagfilters (ID Nos. C-SSB1 through C-SSB9, 67 square feet of filter area each)

1. Description

Soybeans received at the main truck dump are transferred to storage bins (ID Nos. SSB6 and SSB7) prior to cleaning and drying. Soybeans received at the rail and at the auxiliary truck dump are transferred to storage bins (ID Nos. SSB8 and SSB9) prior to cleaning. In storage bin (ID No. SSB2), wet soybeans are transferred to a dryer feed bin prior to cleaning and drying. After drying, the soybeans are transferred to storage bins (ID Nos. SSB1, SSB3, SSB4, and SSB5) for tempering prior to processing.

2. Applicable Regulatory Requirements

The following provides a summary of limits and/or standards for the emission source(s) described above. A review of the information in the application was performed to ensure the appropriate limits and associated calculations used to show compliance were correct.

Regulated Pollutant	Limits/Standards	Applicable Regulation
particulate matter	$E=55.0P^{0.11} - 40$ where E =allowable emission rate in pounds per hour P =process weight in tons per hour	15A NCAC 2D .0515
visible emissions	20 percent opacity	15A NCAC 2D .0521

a. 2D .0515 “Particulates from Miscellaneous Industrial Processes”

i. Regulatory Analysis

For process weights greater than 30 tons per hour:

$$E' 55.0P^{0.11} \& 40$$

where: E = allowable emission rate for particulate matter in pounds per hour, and
 P= process weight in tons per hour

Soybean Storage Bins (ID Nos. SSB1 through SSB9)

The maximum filling and unloading rate for each of these bins range from 146.1 to 771.4 tons per hour depending on the source. From these, the lowest allowable particulate emission rate is as follows:

$$E = 55.0 \times (146.1 \text{ tons/hour})^{0.11} - 40 = 55.2 \text{ lbs./hour.}$$

According to the applicant, each of the bagfilters (ID Nos. C-SSB1 through C-SSB9) have 67 square feet of filter area and an air flow rate of 350 cfm. According to the applicant, each of these bagfilters has a 99.9% control efficiency. The Bagfilter Evaluation spreadsheet confirms that these control efficiencies are reasonable with a 99.95% control efficiency predicted for each bagfilter. The before control and after control emission rate to the bagfilters (ID Nos. C-SSB1 through C-SSB7) is 0.29 lbs./hour and 0.00029 lbs./hour, respectively, and the before and after control emission rate to bagfilters (ID Nos. C-SSB8 and C-SSB9) are 0.72 and 0.00072 lbs./hour, respectively. Thus, compliance is expected with uncontrolled emissions less than allowable.

ii. Monitoring Requirements

To ensure that optimum control efficiency of particulate matter is obtained by the bagfilters, monthly inspections will be performed and maintenance will be performed as recommended by the manufacturer. As a minimum, the inspections will include a monthly external inspection of the bagfilters and ductwork and an annual internal inspection of the bagfilters to ensure structural integrity.

iii. Recordkeeping Requirements

The results of the inspection and maintenance will be kept in a log.

iv. Reporting Requirements

A summary report of the monitoring will be submitted by January 30 and July 30 of each year. The results of any maintenance to the control devices shall be reported within 30 days of a written request by DAQ.

b. **2D .0521 “Control of Visible Emissions”**

i. Regulatory Analysis

These sources were established or modified after July 1, 1971, and are subject to 2D .0521(d). Per this regulation, visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period except that six-minute averaging not more than 87 percent opacity may occur not more than once any hour nor more than four times in any 24-hour period. Compliance is indicated with this regulation, because the latest inspection report did not cite any opacity exceedances.

ii. Monitoring Requirements

The Permittee will either observe the emission points of the sources above once a month for visible emissions above normal or perform a Method 9. Monthly observations should provide reasonable assurance of compliance. The Permittee will establish what normal visible emissions are through recordkeeping.

iii. Recordkeeping Requirements

The results of the observations and tests along with any corrective actions taken to reduce visible emissions shall be recorded in a log.

iv. Reporting Requirements

A summary report of the observation results will be submitted by January 30 and July 30 of each year.

NSPS

J. NSPS Subpart Kb affected hexane storage tanks associated with the soybean oil extraction process consisting of:

C Hexane Storage Tank #1 (ID No. ES-9A) and Hexane Storage Tank #2 (ID No. ES-9B) with associated packed column mineral oil scrubber (ceramic saddle, ID No. CD-9)

1. Description

The hexane underground storage tanks were constructed after 1984 and are greater than 40 m³ (10,560 gallons) and are subject to the recordkeeping requirement of NSPS Subpart Kb.

The hexane storage tanks are not exempt from the provisions of subpart A and the provisions of this subpart, because they have a design capacity of greater than 75 m³ (19,600 gallons) per tank and they have a vapor pressure of greater than 15.0 kPa. The maximum vapor pressure of the liquid stored is 3.24 psi, which is greater than 2.2 psi (15.0 kPa). These tanks are not required to install extra control measures as specified by Section 60.112b or the testing and procedures in 60.113b, or the reporting and recordkeeping requirements in 60.115b, because their vapor pressure is less than 27.6 kPa (4.0 psi). Cargill will, however, be required to keep dimensions of the storage tanks on site and notify the Administrator within 30 days if the true vapor pressure ever exceeds 27.6 kPa (4.0 psi).

The following table provides a summary of limits and standards for the emission source(s) described above:

Regulated Pollutant	Limits/Standards	Applicable Regulation
NA	recordkeeping	15A NCAC 2D .0524 (40 CFR Part 60 Subpart Kb)

a. 15A NCAC 2D .0524: NEW SOURCE PERFORMANCE STANDARDS (40 CFR PART 60 SUBPART Kb)

- i. **Recordkeeping** [15A NCAC 2Q .0508(f)]
 The Permittee shall comply with the recordkeeping requirements of this standard by maintaining readily accessible records showing the dimension of the storage vessel and an analysis showing the capacity of the storage vessel. All records shall be kept for the life of the source. These sources are exempt from the General Provisions (40 CFR Part 60, Subpart A) and from any other provisions of Subpart Kb.
- ii. **Monitoring**
 The owner or operator of each storage vessel with a design capacity of greater than 75 m³ but less than 151 m³ storing a liquid with a maximum true vapor pressure that is normally less than 27.6 kPa shall notify the Administrator within 30 days when the maximum true vapor pressure of the liquid exceeds the maximum of 27.6 kPa. Available data on the storage temperature may be used to determine the maximum true vapor pressure determined below:
 - A. For vessels operated above or below ambient temperatures, the maximum true vapor pressure is calculated based upon the highest expected calendar-month average of the storage temperature. For vessels operated at ambient temperatures, the maximum true vapor pressure is calculated based upon the maximum local monthly average ambient temperature as reported by the National Weather Service.
 - B. For crude oil or refined petroleum products, the vapor pressure may be obtained by the following:
 - C. For other liquids the vapor pressure:
 - 1. May be obtained from standard reference tests, or
 - 2. Determined by ASTM D2879-83, 96, or 97; or
 - 3. Measured by an appropriate method approved by the Administrator. Or
 - 4. Calculated by an appropriate method approved by the Administrator.

NSPS

K. Two NSPS Subpart Kb affected 25,000 gallons capacity underground storage tanks, one containing No. 2 fuel oil and one containing No. 6 fuel oil (ID Nos. ES-2 and ES-2A, respectively)

1. Description

The fuel oil underground storage tanks were constructed after 1984 and are greater than 40 m³ (10,560 gallons) and are subject to the recordkeeping requirement of NSPS Subpart Kb.

The fuel oil storage tanks are not exempt from the provisions of subpart A and the provisions of this subpart, because they have a design capacity of greater than 75 m³ (19,600 gallons) per tank and they have a vapor pressure of greater than 15.0 kPa. The maximum vapor pressure of the liquid stored is 0.01 psi, which is less than 2.2 psi (15.0 kPa). Therefore, these fuel oil storage tanks are exempt from the

general provisions of Subpart A and this subpart, except as specified in paragraphs (a) and (b) of Section 60.116(b). These tanks are not required to install extra control measures as specified by Section 60.112b or the testing and procedures in 60.113b, or the reporting and recordkeeping requirements in 60.115b, because their vapor pressure is less than 27.6 kPa (4.0 psi). Cargill will, however, be required to keep dimensions of the storage tanks on site.

The following table provides a summary of limits and standards for the emission source(s) described above:

Regulated Pollutant	Limits/Standards	Applicable Regulation
NA	recordkeeping	15A NCAC 2D .0524 (40 CFR Part 60 Subpart Kb)

a. 15A NCAC 2D .0524: NEW SOURCE PERFORMANCE STANDARDS (40 CFR PART 60 SUBPART Kb)

Recordkeeping [15A NCAC 2Q .0508(f)]

The Permittee shall comply with the recordkeeping requirements of this standard by maintaining readily accessible records showing the dimension of the storage vessel and an analysis showing the capacity of the storage vessel. All records shall be kept for the life of the source. These sources are exempt from the General Provisions (40 CFR Part 60, Subpart A) and from any other provisions of Subpart Kb.

VII. Multiple Emission Source Limits

STATE-ONLY REQUIREMENTS

A. Facility-wide affected sources

The above emission sources are subject to this multiple emission source limit.

Regulated Pollutant	Limits/Standards	Applicable Regulation
odors	odorous emissions must be controlled; State enforceable only	15A NCAC 2D .1806
n-hexane	Less than 2.348 tons per day (4,696 pounds per day); State-enforceable only	Avoidance of 15A NCAC 2Q .0711

STATE-ENFORCEABLE ONLY

1. 15A NCAC 2D .1806: CONTROL AND PROHIBITION OF ODOROUS EMISSIONS

- a. The Permittee shall not operate the facility without implementing management practices or installing and operating odor control equipment sufficient to prevent odorous emissions from the facility from causing or contributing to objectionable odors beyond the facility’s boundary.

STATE-ENFORCEABLE ONLY

2. LIMITATION TO AVOID 15A NCAC 2Q .0711

i. Regulatory Analysis

To avoid the applicability of 15A NCAC 2Q .0711, the total daily n-hexane usage shall not exceed 2.348 tons (4,696 pounds) per day. Daily n-hexane usage shall be calculated by multiplying the daily soybean throughput (in tons) by the most recent 12-month rolling total n-hexane usage per ton of soybeans processed in the same period.

In 1991, the meal dryer was modified, and this triggered a look at the toxics regulation. In accordance with 15 NCAC 2Q .0700(b)(1)(A), a modification must result in a net increase in toxic pollutants to trigger permitting requirements. In order to avoid a toxics review for the 1991 modification to the meal dryer, Cargill took a federally enforceable emissions limitation for n-hexane usage from June 1987 through May 1989. The limitation on n-hexane emissions, consists of a daily cap limiting emissions to the levels at which they were being emitted (2.348 tons per day or 4,696 pounds per day prior to the modification.

ii. Monitoring / Recordkeeping Requirements

The Permittee shall keep monthly records of the amount of n-hexane used and soybeans processed (written or in electronic format). The Permittee shall be deemed in noncompliance with 15A NCAC 2D .0530 if records of n-hexane usage and soybean throughput is not monitored.

iii. Reporting Requirements

The Permittee shall submit quarterly summary reports, acceptable to the Regional Air Quality Supervisor of monitoring and recordkeeping activities. The report shall contain the following:

- A. The daily throughput of soybeans processed by the facility (in tons).
- B. The n-hexane usage (gallons).

B. Facility-wide affected sources

The above emission sources are subject to this multiple emission source limit.

Regulated Pollutant	Limits/Standards	Applicable Regulation
volatile organic compounds	Work Practice Standards	15A NCAC 2D .0958

1. 15A NCAC 2D .0958: WORK PRACTICES FOR SOURCES OF VOLATILE ORGANIC COMPOUNDS

a. Pursuant to 15A NCAC 2D .0958, for all sources that use volatile organic compounds (VOC) as solvents, carriers, material processing media, or industrial chemical reactants, or in similar uses that mix, blend, or manufacture volatile organic compounds, or emit volatile organic compounds as a product of chemical reactions, and whose emissions of VOC are greater than 15 pounds per day; the Permittee shall:

- (1) store all material, including waste material, containing volatile organic compounds in tanks or in containers covered with a tightly fitting lid that is free of cracks, holes, or other defects, when not in use,
- (2) clean up spills of volatile organic compounds as soon as possible following proper safety

- procedures,
- (3) store wipe rags containing volatile organic compounds in closed containers,
 - (4) not clean sponges, fabric, wood, paper products, and other absorbent materials with volatile organic compounds,
 - (5) transfer solvents containing volatile organic compounds used to clean supply lines and other coating equipment into closable containers and close such containers immediately after each use, or transfer such solvents to closed tanks, or to a treatment facility regulated under section 402 of the Clean Water Act,
 - (6) clean mixing, blending, and manufacturing vats and containers containing volatile organic compounds by adding cleaning solvent and close the vat or container before agitating the cleaning solvent. The spent cleaning solvent shall then be transferred into a closed container, a closed tank or a treatment facility regulated under section 402 of the Clean Water Act. [15A NCAC 2D .0958(c)]
- b. When cleaning parts with a solvent containing a volatile organic compound, the Permittee shall:
- (1) flush parts in the freeboard area,
 - (2) take precautions to reduce the pooling of solvent on and in the parts,
 - (3) tilt or rotate parts to drain solvent and allow a minimum of 15 seconds for drying or until all dripping has stopped, whichever is longer,
 - (4) not fill cleaning machines above the fill line,
 - (5) not agitate solvent to the point of causing splashing. [15A NCAC 2D .0958(d)]

Monitoring

- c. To assure compliance with paragraphs (a) and (b) above, the Permittee shall, at a minimum, perform a visual inspection once per month of all operations and processes utilizing volatile organic compounds. The inspections shall be conducted during normal operations. If the required inspections are not conducted the permittee shall be deemed to be in noncompliance with 15A NCAC 2D .0958.

Recordkeeping

- d. The results of the inspections shall be maintained in a log (written or electronic format) on-site and made available to an authorized representative upon request. The log shall record the following:
- i. the date and time of each inspection; and
 - ii. the results of each inspection noting whether or not noncompliant conditions were observed.
- If the required records are not maintained the permittee shall be deemed to be in noncompliance with 15A NCAC 2D .0958.

Reporting

- e. The Permittee shall submit a summary report of the observations by January 30 of each calendar year for the preceding six-month period between July and December and July 30 of each calendar year for the preceding six-month period between January and June. All instances of deviations from the requirements of this permit must be clearly identified.

C. Facility-wide affected sources

The above emission sources are subject to this multiple emission source limit.

Regulated Pollutant	Limits/Standards	Applicable Regulation
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n-hexane	Less than 661 tons (234,829 gallons) of n-hexane	Avoidance of 15A NCAC 2D .0530
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1. LIMITATION TO AVOID 15A NCAC 2Q .0530

i. Regulatory Analysis

To avoid the applicability of 15A NCAC 2D .0530, the total N-hexane usage shall not exceed 661 tons (234,839 gallons) as calculated on a 12-month rolling total basis.

ii. Monitoring / Recordkeeping Requirements

The Permittee shall keep monthly records of the amount of n-hexane used in a log (written or in electronic format). The Permittee shall be deemed in noncompliance with 15A NCAC 2D .0530 if records of n-hexane usage and soybean throughput is not monitored.

iii. Reporting Requirements

The Permittee shall submit quarterly summary reports, acceptable to the Regional Air Quality Supervisor of monitoring and recordkeeping activities. The report shall contain the following:

- A. The monthly N-hexane emissions for the previous 14 months. The emissions must be calculated for each of the 12-month periods over the previous 14 months.

D. Facility-wide affected sources

The above emission sources are subject to this multiple emission source limitation.

Regulated Pollutant	Limits/Standards	Applicable Regulations
Hazardous Air Pollutants (HAP)	Less than 10 tons per year of any individual HAP, and 25 tons per year of combined HAP emissions.	Avoidance of 15A NCAC 2D .1111

1. Limitation to Avoid 15A NCAC 2D .1111: MAXIMUM ACHIEVABLE CONTROL TECHNOLOGY

- a. In order to avoid applicability of this regulation, the facility shall discharge into the atmosphere less than 10 tons of any individual HAP or 25 tons of total HAPs per consecutive 12-month period.
- b. **Monitoring/Recordkeeping** [15A NCAC 2Q .0508 (f)]
Calculations of HAP emissions per month shall be made at the end of each month. HAP emissions shall be determined by multiplying the total amount of each type of HAP-containing material consumed during the month by the HAP content of the material. The Permittee shall be deemed in noncompliance with 15A NCAC 2D .1111 if the amounts of HAP containing materials or the HAP emissions are not monitored and recorded.
- c. Calculations and the total amount of HAP emissions and individual HAP emissions shall be recorded monthly in a log (written or electronic format). The Permittee shall be deemed in noncompliance with 15A NCAC 2D .1111 if the HAP emissions exceed these limits.
- d. **Reporting Requirements**
The Permittee shall submit a summary report of the monitoring and recordkeeping requirements by January

30 of each calendar year for the preceding six-month period between July and December, and July 30 of each calendar year for the preceding six-month period between January and June. All instances of deviations from the requirements of this permit must be clearly identified in report submitted to the Regional Air Quality Supervisor, DAQ. The report shall contain the following:

- i. Solvent usage and n-hexane emissions.
- ii. Individual HAP emissions during the six previous twelve-month periods.
- iii. Total HAP emissions during the six previous twelve-month periods.

VIII. MACT Applicability and Requirements

Cargill’s Raleigh facility has taken limits to avoid MACT applicability. Based on a review of the facility’s current operations and emission sources, the facility would be subject to the MACT for Solvent Extraction for Vegetable Oil Production, Subpart GGGG. This MACT was promulgated April 12, 2001.

IX. Permit Shield (including non-applicable requirements)

In accordance with 2Q .0512 the permit will contain a provision stating that compliance with the terms, conditions, and limitations of the Title V permit shall be deemed in compliance with applicable requirements specifically identified in the permit, as of the date of permit issuance. If the permit does not expressly state that a permit shield exists then it shall be presumed not to provide such a shield.

X. Other Applicable Requirements

None.

XI. General Conditions

The “General Conditions” section of the Title V Operating Permits lists additional applicable rule requirements that the permittee must adhere to, as with any other permit condition. These requirements in general are common to all Title V facilities. The general conditions include provisions such as annual fee payment, permit renewal and expiration, transfer of ownership or operation, property rights, submission of documents, inspections and entry procedures, reopen for cause, and severability.

XII. Insignificant Activities

The insignificant activities listed in the application have been reviewed and verified. Because an emission source or activity is insignificant does not mean that the emission source or activity is exempted from any applicable requirement or that the owner or operator of the source is exempted from demonstrating compliance with any applicable requirement.

Emission Source Description	Basis for Exemption
One 250 gallons capacity propane storage tank	NCAC 2D .0503(8)
Bench aspiration testing of grain products	NCAC 2D .0503(8)
Process condensers (totally enclosed)	NCAC 2D .0503(8)

XIII. Public Notice

Pursuant to 15A NCAC 2Q .0521, a notice of the draft Title V Operating Permit shall be placed in a newspaper of general circulation in the area where the facility is located. The notice will provide for a 30 day comment period, with an opportunity for a public hearing. Copies of the public notice shall be sent to persons on the Title V mailing list and EPA.

XIV. Recommendations

The initial Title V application for Cargill, Inc. has been reviewed by the DAQ to determine compliance with all procedures and requirements under 15A NCAC 2Q .0500 and 40 CFR Part 70. The DAQ has made a preliminary determination that the facility is complying or will achieve compliance as specified in the draft permit with all applicable requirements. Therefore, the DAQ is proposing to issue the Title V Operating Permit upon completion of the public comment period and the EPA review.