

Air Permit Review

Permit Issue Date: **December 15, 2009**

Region: Raleigh Regional Office
County: Wake
NC Facility ID: 9200208
Inspector's Name: Brain Bland
Date of Last Inspection: 08/24/2009
Compliance Code: 3/In Compliance – Insp.

Facility Data			Permit Applicability	
Applicant (Facility's Name): Cargill Inc - Raleigh 1400 South Blount Street Raleigh, NC 27603 SIC: 2075 / Soybean Oil Mills NAICS: 311222 / Soybean Processing Facility Classification: Before: Title V After: Title V Fee Classification: Before: Title V After: Title V			SIP: 2D .0503, .0515, .0516, .0521, .0614 and .0958 NSPS: Subpart DD NESHAP: Subparts GGGG and ZZZZ PSD: 2D .0530 (pursuant to Consent Decree 05-2037-JRM-FLN) PSD Avoid.: 2Q .0317 for VOC, NO _x and SO ₂ NC Toxics: D .1100 and 2Q .0705/.0711 112(r): N/A Other: 2D .1806	
Contact Data			Application Data	
Facility Contact	Authorized Contact	Technical Contact	Application Number: 9200208.08A Date Received: 02/14/2008 Application Type: Renewal Application Schedule: TV-Renewal Existing Permit Data Existing Permit Number: 03840/T32 Existing Permit Issue Date: 07/31/2007 Existing Permit Expiration Date: 11/30/2008	
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Review Engineer: David Putney Review Engineer's Signature: _____ Date: _____			Comments / Recommendations: Issue 03840/T33 Permit Issue Date: December 15, 2009 Permit Expiration Date: November 30, 2014	

I Reason for Application:

Facility Description: Cargill Incorporated (Cargill) operates oilseed (i.e. soybean) processing operations at the Raleigh facility including: raw soybean storage and handling; raw soybean processing; vegetable (i.e. soybean) oil extraction; meal drying and cooling; meal and hull handling, storage, and loadout; crude oil storage and loadout; and miscellaneous support sources (e.g. boilers).

Soybeans are delivered via rail or truck and processed through several steps [drying, cracking (dehulling), heat conditioning, and pressing (into flakes to increase surface area)]. These flakes are mixed with n-hexane to extract the soybean oil. The soybean oil/hexane mixture is decanted from the water and subsequently separated via a four-step distillation process. The hexane is recovered and reused while the soybean oil is sent to other facilities for further refining and subsequent sale to vegetable oil producers (e.g. Wesson and Crisco). The soybean meal is sold as cattle feed and the hulls are sold for processing as boiler fuel.

Requested Permit Modifications: The Permittee submitted permit application 9200208.08A to renew Permit No. 03840T32. This application also addresses Compliance Assurance Monitoring (CAM) requirements for the control devices installed on the soybean aspiration system (ES-5), the soybean conditioning and flaking process (ES-8), the hexane solvent, soybean oil extraction process (ES-9), the soybean meal screening and grinding process (ES-13), the secondary dehulling system (ES-22) and the soybean meal dryer/cooler (ES-25). The associated CAM requirements have been added into Permit No. 03840T33. The Permittee also submitted application 9200208.08B (which was subsequently consolidated into 9200208.08A) as their last MACT toxics demonstration.

II Regulatory review for rules that apply to emissions from individual source categories:

A. Soybean storage, transfer, and processing operations, consisting of:

- Truck grain receiving hopper (ID No. ES-1) with one associated bagfilter (1,160 square feet of filter area; ID No. BF-1160);**
- Soybean aspiration system (ID No. ES-5) with one associated bagfilter (5,918 square feet of filter area; ID No. 821);**
- Ground pod transfer system (ID No. ES-6) with one associated bagfilter (160 square feet of filter area; ID No. 15);**
- Hull transfer and storage system (ID No. ES-7) with one associated bagfilter (160 square feet of filter area; ID No. 15);**
- One soybean conditioning and flaking process (ID No. ES-8) with one associated simple cyclone (96 inches in diameter; ID No. 825);**
- Whole soybean cleaning aspiration system (ID No. ES-10-1) and whole soybean pod grinding system (ID No. ES-10-2) associated with one simple cyclone (56 inches in diameter; ID No. 820) in series with one simple cyclone (48 inches in diameter; ID No. 819) in series with one bagfilter (2,820 square feet of filter area; ID No. 818A);**
- Soybean meal screening and grinding process (ID No. ES-13) with one associated bagfilter (1,462 square feet of filter area; ID No. 831);**
- Railcar meal loading system (ID No. ES-14) and one associated bagfilter (510 square feet of filter area; ID No. BF-320);**
- Meal storage system (ID No. ES-15A) and clay storage tank (ID No. ES-24) with one associated bagfilter (208 square feet of filter area; ID No. 15A-C);**
- Meal storage tank (ID No. ES-15B) with one associated bagfilter (85 square feet of filter area; ID No. 15B-C);**
- Truck and rail meal and hull loadout enclosure (ID No. ES-16) with one associated bagfilter (1,750 square feet of filter area; ID No. BF-1750);**
- Railroad soybean receiving hopper/dust tank (ID No. ES-19) with one associated simple cyclone (96 inches in diameter; ID No. CK-96) in series with one bagfilter (2,960 square feet of filter area; ID No. S232RF10);**
- Auxiliary truck soybean receiving and loadout enclosure (ID No. ES-20) with one associated bagfilter (448 square feet of filter area; ID No. BF-448);**
- Secondary dehulling system (ID No. ES-22) with associated bagfilter (2,437 square feet of filter area; ID No. BF-1987);**
- Steam-heated soybean meal dryer/cooler (ID No. ES-25) with four associated simple cyclones installed in parallel (96 inches in diameter, each; ID Nos. 25-A, 25-B, 25-C and 25-D); and**
- Nine soybean storage bins (seven with 211,000 bushels capacity, each; ID Nos. ES-SSB1 through ES-SSB7, and two with 508,000 bushels capacity, each; ID Nos. ES-SSB8 and ES-SSB9) each with one associated bagfilter (67 square feet of filter area, each; ID Nos. C-SSB1 through C-SSB9)**

The Permittee utilizes the above-listed sources to perform: raw soybean unloading, cleaning, storage and handling; raw soybean processing (“cracking” and “flaking”); meal drying and cooling; and meal/hull separation, handling, storage and loadout. The above descriptions are modified to add “steam-heated” for ES-25 and correct the storage capacities for SSB1 – SSB9.

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

This rule applies to emission sources ID Nos. ES-1, ES-5 through ES-8, ES-10-1, ES-10-2, ES-13, ES-14, ES-15A, ES-15B, ES-16, ES-19, ES-20, ES-22, ES-24, ES-25 and SSB1 through SSB9 and limits the allowable PM emissions (E) from these sources to those described in the following two equations:

$$E \leq 4.10(P)^{0.67} \quad \text{If } P \leq 30 \text{ (ton/hr), or}$$

$$E \leq 55.0(P)^{0.11} - 40 \quad \text{If } P > 30 \text{ (ton/hr)}$$

Where: P = the process weight rate (ton/hr), and
E = allowable emissions (lb PM/hr)

The table below summarizes the process weight rates, allowable PM emission rates, and potential PM emission rates of these sources:

Source ID No.	Process Weight Rate (ton/hour)	Allowable Emissions (lb PM/hour)	Potential Emissions (lb PM/hour)	
			No Control	Control
ES-1	24.5	35.0	3.68	1.37
ES-5	103.6	51.6	85.47	3.50
ES-6 & 7	6.69	14.6	5.52	0.12
ES-8	100.0	51.3	92.48	3.86
ES-10-1 & ES-10-2	1.06	4.26	5.31	2.57
ES-13	76.9	48.7	653.86	0.74
ES-14	20.4	30.9	5.51	0.39
ES-15A	51.4	44.8	2.57	0.02
ES-24	0.40	2.22	7.59	0.02
ES-15B	25.6	36.0	1.28	0.02
ES-16	63.5	46.8	17.16	0.94
ES-19	73.5	48.2	11.03	2.54
ES-20	8.29	16.9	1.24	0.34
ES-22	7.23	15.4	65.03	1.37
ES-25	83.1	49.4	373.89	15.43
SSB1 – SSB9	106.3 (each)	51.9 (each)	5.31 (each)	0.13 (each)

The permit writer obtained the data in the above table from Table 6-3 and Appendix C of application 9200208.08A. These data are based on maximum throughput of the facility [930,750 tons of soybeans per year (106.3 tons per hour)] and the percentage of those soybeans that could flow through each individual operation. Uncontrolled emissions calculations are based on AP-42 emission factors. Controlled emissions calculations are based on maximum ACFM air flow rates through the control devices and PM emission loadings of 0.01 grains per ACF for bagfilters and 0.03 grains per ACF for cyclones.

Note that these process weight rates, allowable emissions and potential emissions differ from those in the technical review associated with Permit No. 03840T27 (i.e. the initial Title V permit for this facility). The technical review for Permit No. 03840T27 utilized process

weight rate values based on the theoretical maximum rated throughputs of each individual operation with PM emission calculations based on AP-42 emission factors and applied bagfilter and cyclone PM control efficiencies of 99.9% and 96%, respectively. Both analyses show compliance with 2D .0515 for these operations.

Note that although only sources ES-5, ES-8, ES-10-1, ES-10-2, ES-13, ES-24, ES-22 and ES-25 require controls to comply with 2D .0515, DAQ believes that all of the listed emission sources require controls to comply with 2D .0521. Therefore, for the emission sources listed in the above table, Permit No. 03840T33 (as does Permit No. 03840T32) will include:

- The standard language for the emission limits of 2D .0515 and the methods of testing for compliance (if/when required by DAQ) but will not require any additional testing (since compliance with this rule by a comfortable margin is expected after control);
- A requirement to utilize the listed control device to control emissions whenever the associated emission source is in use and monitoring/recordkeeping requirements to conduct monthly external inspections of the associated ductwork/material collection units and annual internal inspections of the associated bagfilters; and
- Reporting requirements to submit semiannual monitoring, recordkeeping, and reporting (MRR) summary reports to NC DAQ and submit results of control device maintenance performed within 30 days of a written request by DAQ.

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

Each of the emission sources listed in Section II A, above, was manufactured after 07/01/71. Therefore, except for those visible emissions (VEs) occurring during startup, shutdown and malfunctions that are regulated under Rule 2D .0535, paragraph (d) of this rule requires that the 6-minute average VEs from these sources be less than or equal to 20% opacity with the following exceptions:

- One six-minute average VE per hour may exceed 20% opacity as long as that VE does not also exceed 87% opacity; and
- Up to four six-minute average VEs per 24-hour period may exceed 20% opacity as long as those VEs do not also exceed 87% opacity.

For these sources, Permit No. 03840T33 will include the standard language for the emission limits of, and the prescribed methods of testing for compliance (if/when required by DAQ) with, 2D .0521. Further, Permit No. 03840T33 will require monthly VE monitoring and recordkeeping for each of these sources and semiannual summary reporting to DAQ.

iii. 2D .0614 “Compliance Assurance Monitoring”

Applicability [§64.2]: This rule applies to the sources ES-5, ES-8, ES-13, ES-22 and ES-25 (see Attachment A to this document) due to the applicability of 40 CFR Part 64 “Compliance Assurance Monitoring.” This regulation applies to the listed sources since they:

- (1) Are subject to emission standards that are not exempt under §64.2(b)(1) for a regulated pollutant (i.e. the 2D .0515/2D .0521 limits for PM/PM₁₀);
- (2) Use control devices to comply with those emission standards; and
- (3) Have before-control potential emissions of the regulated pollutant(s) in excess of the threshold for being considered major for Title V.

Monitoring [§64.3, §64.6 and §64.7]:

- (1) **Indicators:** The Permittee submitted a CAM plan with application 9200208.08A. That CAM plan states that the Permittee will use the following as indicators for these sources:

- Pressure drop (dP) across the associated bagfilters for ES-5, ES-13 and ES-22; and
 - Visible emissions (VEs) from the associated cyclones for ES-8 and ES-25.
- (2) **Frequency:** According to application 9200208.08A, the after-control potential PM/PM₁₀ emissions from sources ES-5, ES-8, ES-13, ES-22 and ES-25 are each less than the respective thresholds for being considered major for Title V. Therefore, Permit No. 03840T33 will require the Permittee to monitor the cyclones' and bagfilters' indicators daily in accordance with §64.3(b)(4).
- (3) **Bypass:** These sources are permitted such that bypass of the associated control devices is not allowed. Therefore, monitoring of indicators of bypass described in §64.3(a)(2) does not apply to these emission sources.
- (4) **Indicator Range:** The submitted CAM plan lists the following indicator ranges as indicative of proper operation of the associated control devices:
- VE ranges from 0% to “normal” opacity (as determined via the monitoring required pursuant to 2D .0521) for the cyclones; and
 - dP ranges of 0.5 (within 120 operational hours to build up dust cake) to 10 inches of water pressure for the bagfilters (see letter from Permittee dated 01/30/09).

An excursion is defined as operation of these control devices outside the cited indicator ranges and triggers inspection, corrective action and recordkeeping requirements.

- (5) **QA/QC Practices:** The Permittee must:
- Conduct monthly external inspections of the material collection units (for leaks);
 - Conduct annual internal inspections (for structural integrity) of the bagfilters; and
 - Maintain, operate, and calibrate the bagfilters' differential pressure gauges according to the equipment manufacturer's recommendations.

Recordkeeping [§64.9(b)]: The Permittee is required to maintain records of the monitoring of the indicators cited above, the performance of the QA/QC practices cited above, and any corrective actions taken.

Reporting [§64.9(a)]: The Permittee must submit semiannual summary reports of the monitoring to NC DAQ. The report must clearly identify any excursions (if applicable) and identify their duration and cause (including unknown cause).

Quality Improvement Plan (QIP) [§64.8]: The operation of a control device under conditions qualifying as an excursion for more than 5% of the associated source's operational time during a consecutive six-month period will trigger the requirement for the Permittee to develop a QIP for that control device and the associated source.

- B. Natural gas/No. 2 fuel oil-fired Berico column-type grain dryer system (27.1 million Btu per hour maximum heat input rate, 120 tons per hour maximum soybean processing rate; ID No. ES-3) equipped with mesh screens with perforations that are 0.094 inches or less in diameter in series with one associated simple cyclone (54 inches in diameter, for recycle air only (approximately 4% of air throughput); ID No. C-3); and**

Natural gas/No. 2 fuel oil-fired Shanzer column-type grain dryer system (24.0 million Btu per hour maximum heat input rate, 90 tons per hour maximum soybean processing rate; ID No. ES-4) equipped with mesh screens with perforations that are 0.094 inches or less in diameter

The Permittee utilizes these two dryer systems to remove about 2% of the raw soybean moisture content and any excess moisture added during cleaning of the raw soybeans in ES-10-1. These

dryers are column dryers, defined at 40 CFR §60.301(m) [i.e. NSPS Subpart DD] as “equipment used to reduce the moisture content of grain in which the grain flows from the top to the bottom in one or more continuous packed columns between two perforated metal sheets.” Therefore, the descriptions of these sources is modified to reflect that the mesh screens are part of the sources and not actually add-on controls.

Note that rule 2D .0503 “Particulates from Fuel Burning Indirect Heat Exchangers” does not apply to these sources since they do not qualify as indirect heat exchangers.

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

The Berico dryer system is subject to NSPS Subpart DD. However, NSPS Subpart DD does not include an applicable PM emission standard for the Berico dryer (see the discussion of 2D .0524 in Section II.B.iv, below). Therefore, 2D .0515 applies to both grain dryer systems (ID Nos. ES-3 and ES-4) and limits the allowable PM emissions (E) from these sources to those described in the following two equations:

$$E \leq 4.10(P)^{0.67} \quad \text{If } P \leq 30 \text{ (ton/hr), or}$$

$$E \leq 55.0(P)^{0.11} - 40 \quad \text{If } P > 30 \text{ (ton/hr)}$$

Where: P = the process weight rate (ton/hr), and
E = allowable emissions (lb PM/hr)

These dryers comply with this rule by use of the associated mesh screens. The table below (with information from application 9200208.08A) summarizes the applicable information:

Source ID No.	Process Weight Rate (ton/hour)	Allowable Emissions (lb PM/hour)	Potential Emissions (lb PM/hour)
ES-3	120	53.1	23.4
ES-4	90	50.2	19.8

The permit writer calculated the uncontrolled potential PM emissions in the above table using the AP-42 emission factor for column dryers in Table 9.9.1-1 and the maximum process weight rate for each device [note that this rate is “clipped off” at 106.3 tons per hour (i.e. the facility-wide maximum process weight rate) for ES-3]. The mesh screens associated with these column dryers are integral to the operation and not considered control devices.

For the two grain dryer systems (ID Nos. ES-3 and ES-4), Permit No. 03840T33 (as does Permit No. 03840T32) will include:

- The standard language for the emission limits of 2D .0515 and the methods of testing for compliance (if/when required by DAQ) but will not require any additional testing (since compliance with this rule by a comfortable margin is predicted);
- Monitoring and recordkeeping requirements associated with (1) cleaning the mesh screens as frequently as needed to ensure design performance and integrity of the source and (2) performing monthly visual cyclone, mesh screen, and ductwork inspections; and
- Reporting requirements to (1) submit semiannual MRR summary reports to NC DAQ and (2) submit results of cyclone or mesh screen maintenance performed within 30 days of a written request by DAQ.

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

This rule applies to the two grain dryer systems (ID Nos. ES-3 and ES-4) and limits the SO₂ emissions from these sources to 2.3 (lb/10⁶ Btu).

Note that paragraph 2D .0516(b) exempts sources that are subject to an emission standard for sulfur dioxide pursuant to a NSPS from the sulfur dioxide limits in 2D .0516. Although the Berico dryer (ID No. ES-3) is subject to a NSPS (refer to the discussion of rule 2D .0524 below), that standard does not include a sulfur dioxide emission limit for this source. Therefore, 2D .0516 does apply to both dryers (ID Nos. ES-3 and ES-4). Each of these devices can burn natural gas and/or No. 2 fuel oil as fuel.

Natural Gas: Table 1.4-2 of Supplement D to the 5th edition of the AP-42 document predicts SO₂ emissions of 0.6 (lb SO₂/10⁶ ft³) from combustion of natural gas. Assuming a heat value of 1,020 (Btu/ft³), we can calculate SO₂ emissions while burning natural gas as:

$$[0.6 \text{ (lb SO}_2\text{/10}^6 \text{ ft}^3\text{)}]/[1,020 \text{ (Btu/ft}^3\text{)}] = 0.00059 \text{ (lb SO}_2\text{/10}^6 \text{ Btu)}$$

No. 2 Fuel Oil: Table 1.3-1 of Supplement E to the 5th edition of the AP-42 document predicts SO₂ emissions of 142(S) (lb/10³ gallons) from the combustion of No. 2 fuel oil, where S is the sulfur content of the fuel oil in weight percent. If we assume a heat value of 141,000 (Btu/gallon) and a sulfur content of 0.5% by weight for No. 2 fuel oil we can calculate SO₂ emissions while burning No. 2 fuel oil as:

$$[(142)(0.5) \text{ (lb SO}_2\text{/10}^3 \text{ gallon)}][10^3 \text{ (gallon)/141 (10}^6 \text{ Btu)}] = 0.504 \text{ (lb SO}_2\text{/10}^6 \text{ Btu)}$$

For the two grain dryer systems, Permit No. 03840T33 will include the standard language for the emission limits of 2D .0516 and the methods of testing for compliance (if required by DAQ) but will not (since the permitted fuels are inherently compliant) require any additional testing or any MRR to demonstrate compliance with 2D .0516.

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

The two grain dryer systems were manufactured after 07/01/71. Therefore, except for those visible emissions (VEs) occurring during startup, shutdown and malfunctions that are regulated under Rule 2D .0535, paragraph (d) of this rule requires that the 6-minute average VEs from these boilers be less than or equal to 20% opacity with the following exceptions:

- One six-minute average VE per hour may exceed 20% opacity as long as that VE does not also exceed 87% opacity; and
- Up to four six-minute average VEs per 24-hour period may exceed 20% opacity as long as those VEs do not also exceed 87% opacity.

Note that paragraph 2D .0521(b) exempts sources that are subject to an opacity limit pursuant to a NSPS from the opacity limits in 2D .0521. Although the Berico dryer (ID No. ES-3) is subject to a NSPS (refer to the discussion of 2D .0524 below), the opacity limit in that NSPS does not apply to the Berico dryer. Therefore, rule 2D .0521 applies to both of the two grain dryer systems (ID Nos. ES-3 and ES-4).

For these sources, Permit No. 03840T33 will include the standard language for the emission limits of, and the prescribed methods of testing for compliance (if/when required by DAQ) with, 2D .0521. Further, Permit No. 03840T33 will require monthly VE monitoring and recordkeeping for each of these sources and semiannual summary reporting to DAQ.

iv. 2D .0524 “New Source Performance Standards”

Applicability: The two column-type grain dryers are potentially subject to this rule based on the applicability of 40 CFR Part 60, Subpart DD “Standards of Performance for Grain Elevators.” Subpart DD applies to dryers, truck/railcar/ship unloading stations and railcar loading stations at grain terminal elevators and grain storage elevators (as defined at 40 CFR §60.301) for which construction, modification or re-construction commenced after 08/03/78. According to application 9200208.08A the Shanzer column-type grain dryer (ID No. ES-4)

pre-dates Subpart DD and is not subject to the associated requirements. However, the Berico column-type grain dryer (ID No. ES-3) was constructed in 1980 and is subject to the requirements of Subpart DD. [§60.300]

Emission Standard: Subpart DD includes PM emission standards for affected sources. The emission standard for column dryers (such as dryer ES-3) is 0% opacity. However, that standard only applies to column dryers with column plate perforations exceeding 2.4 mm (0.094 inches) in diameter. According to application 9200208.08A, the column plate perforations on the Berico dryer are only 0.083 inches in diameter. Therefore, the PM emission standard **does not apply** to ES-3. [§60.302(a)(1)]

Monitoring/Recordkeeping/Reporting Requirements: Subpart DD does not include any of its own MRR requirements. Therefore, the Subpart A (i.e. §60.7 “Notification and record keeping”) MRR requirements are included current Permit No. 03840T32 and are carried over into Permit No. 03840T33. These requirements include recordkeeping of the occurrence and duration of any startup, shutdown, or malfunction of the affected source. [§60.7(b)]

C. Two diesel-fired emergency water pumps (230 hp maximum rated power output, each; ID Nos. ES-P1 and ES-P2)

These diesel-fired emergency water pumps would be utilized in the event of a fire to provide water for fire suppression. These sources are added to Permit No. 03840T33 as a result of the information provided by the Permittee in the 12/30/08 additional information response letter.

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

This rule applies to the diesel-fired emergency water pumps (ID Nos. ES-P1 and ES-P2) and limits the associated SO₂ emissions to 2.3 (lb/10⁶ Btu).

Table 3.3-1 of the 5th edition of the AP-42 document predicts SO_x emissions from diesel fuel combustion in small industrial engines (i.e. < 600 hp) of 0.29 (lb/10⁶ Btu).

Permit No. 03840T33 will include the standard language for the emission limits of, and the methods of testing (if/when required by DAQ) for compliance with, this rule. However, since the permitted fuel (i.e. diesel fuel) is inherently compliant with the emission limit, Permit No. 03840T33 will not include any MRR requirements associated with 2D .0516 for these sources.

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

This rule requires that the Permittee “prevent, abate and control emissions generated from fuel burning operations and industrial processes where an emission can reasonably be expected to occur...” Except for those visible emissions (VEs) occurring during startup, shutdown and malfunctions that are regulated under Rule 2D .0535, paragraph (d) of this rule requires that the 6-minute average VEs from the diesel-fired emergency water pumps (ID Nos. ES-P1 and ES-P2) be ≤ 20% opacity with the following exceptions:

- One six-minute average VE per hour may exceed 20% opacity as long as that VE does not also exceed 87%; and
- Up to four six-minute average VEs per 24-hour period may exceed 20% opacity as long as those VEs do not also exceed 87% opacity.

Since operation of these sources is infrequent and largely unpredictable, and since noncompliance with this rule is considered unlikely for these sources, Permit No. 03840T33 will include only the standard language for the emission limits of, and the methods of testing for compliance (if/when required by DAQ) with, this rule. That is, Permit No. 03840T33 will not include any 2D .0521 MRR requirements for these sources.

iii. 2D .0524 “New Source Performance Standards”

The NSPS for the stationary compression ignition internal combustion engines (CI ICE) source category found in 40 CFR Part 60, Subpart IIII apply to owners and operators of stationary CI ICE that: [§60.4200(a)]

- Commence construction after 07/11/05 where the stationary CI ICE are:
 - Manufactured after 04/01/06 and are not fire pump engines; or
 - Manufactured as a certified NFPA fire pump engine after 07/01/06.
- Modify or reconstruct their stationary CI ICE after 07/11/05.

The CI ICE at this facility include diesel-fired emergency water pumps (ID Nos. ES-P1 and ES-P2). However, the Permittee indicated (see letter dated 12/30/08) that these sources were installed before 07/11/05 and have not been modified or reconstructed since 07/11/05. Therefore, these sources **are not subject** to the NSPS requirements.

iv. 2D .1111 “Maximum Achievable Control Technology”

Diesel-fired emergency water pumps (ID Nos. ES-P1 and ES-P2) are subject to 2D .1111 due to the applicability of 40 CFR Part 63, Subpart ZZZZ (i.e. the MACT for reciprocating internal combustion engines - RICE).

In accordance with §63.6590(a)(1)(ii), since these diesel-fired emergency water pumps were constructed before 06/12/06 they are considered existing sources. Further, in accordance with §63.6590(b)(3), these diesel-fired emergency water pumps have no applicable requirements under Subparts ZZZZ or A (no initial notification is required). Therefore, Permit No. 03840T33 will indicate the applicability of Subpart ZZZZ to these sources and that there are **no associated applicable requirements**.

D. One hexane solvent, soybean oil extraction process (ID No. ES-9) with one associated solvent recovery system consisting of a packed column mineral oil scrubber (ceramic saddle, 10 gallons per minute minimum mineral oil injection rate; ID No. CD-9); and

Hexane Storage Tanks #1 and #2 (25,000 gallon storage capacity, each; ID Nos. ES-9A and ES-9B) with one associated packed column mineral oil scrubber (ceramic saddle, 10 gallon per minute minimum mineral oil injection rate; ID No. CD-9)

After the soybean meat has been dehulled and flaked it is sent through the oil extraction process where hexane is mixed with the meat flakes. The crude vegetable oil is then extracted from the meat flakes via ES-9 and stored in a crude oil storage tank until being loaded out for transport.

The Permittee utilizes Hexane Storage Tanks #1 and #2 to store hexane for subsequent use in the oil extraction process. According to application 9200208.08A these are underground storage tanks and these tanks were constructed in 1991.

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

Current Permit No. 03840T32 applies 2D .0521 to the hexane solvent, soybean oil extraction process (ID No. ES-9). However, the permit writer does not believe that visible emissions cannot “reasonably be expected to occur” from this source [as required for applicability – see 2D .0521(a)]. Therefore, 2D .0521 **does not apply** to this source and the associated requirements are not included in Permit No. 03840T33 for this source.

ii. 2D .0524 “New Source Performance Standards”

Applicability: Current Permit No. 03840T32 applies this rule to Hexane Storage Tanks #1 and #2 due to the applicability of 40 CFR Part 60, Subpart Kb [i.e. the NSPS for volatile organic liquid (VOL) storage vessels constructed, reconstructed, or modified after 07/23/84].

However, in accordance with 40 CFR §60.110b(d)(8), **these rules do not apply after 10/13/09** (i.e. the date that MACT GGGG first applies to this facility – refer to discussions of NSPS Subpart Kb and MACT GGGG in Section IV of this document, below). Therefore, the associated permit conditions are not included in Permit No. 03840T33.

iii. 2D .0614 “Compliance Assurance Monitoring”

This rule **does not apply** to ES-9. That is, although source ES-9 is subject to emission standards for VOC/HAP, uses a control device (i.e. CD-9) to comply with those standards, and has before-control potential emissions of VOC/HAP in excess of the threshold for major source classification, this rule does not apply because the emission standards are exempt. Specifically, the solvent loss and compliance ratio limits (for VOC/HAP pursuant to rules 2D .0530 and 2D .1111 – MACT GGGG) and the VOC emission limit (pursuant to 2Q .0317 to avoid 2D .0530) are exempt pursuant to 2D .0614(b)(1)(A) (i.e. a MACT promulgated by EPA after 11/15/90) and 2D .0614(b)(1)(E) (i.e. an emissions cap approved under Subchapter 2Q and issued under 2Q .0500).

iv. 2D .0949 “STORAGE OF MISCELLANEOUS VOLATILE ORGANIC COMPOUNDS”

Storage tanks ES-9A and ES-9B are **not subject** to this rule since their capacities are below the applicability threshold of 50,000 gallons, each [refer to 2D .0949(a)].

E. Natural gas/No. 6 fuel oil/Vegetable oil-fired boiler (46.5 million Btu per hour maximum heat input rate; ID No. ES-17); and

Natural gas/No. 2 fuel oil/No. 6 fuel oil/Vegetable oil-fired boiler (75.3 million Btu per hour maximum heat input rate; ID No. ES-26)

Boilers ES-17 and ES-26 are utilized to provide process heat and steam for use throughout the Cargill, Inc. – Raleigh facility.

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

This rule applies to boilers ES-17 and ES-26 and limits the allowable PM emissions (E) from these indirect heat exchangers to those described in the following equations:

$$E = \begin{cases} 0.10 & \text{If } Q \geq 10,000, \\ 0.60 & \text{If } Q \leq 10, \text{ and} \\ 1.090(Q)^{-0.2594} & \text{If } Q \text{ is any other value} \end{cases}$$

Where: E = allowable emissions (lb PM/10⁶ Btu), and
Q = maximum heat input (10⁶ Btu/hr)

According to the review associated with Permit No. 03840T27 (i.e. the initial Title V permit for this facility) the values of Q when ES-17 and ES-26 were installed were 87 x 10⁶ Btu/hr and 121.8 x 10⁶ Btu/hr, respectively. Therefore, in accordance with 2D .0503(e):

For ES-17: Q = 87 (10⁶ Btu/hr) and
E = 0.342 (lb PM/10⁶ Btu)

For ES-26: Q = 121.8 (10⁶ Btu/hr) [i.e. 46.5 + 75.3] and
E = 0.314 (lb PM/10⁶ Btu)

Note that current Permit No. 03840T32 includes a typo in that the allowable emissions from ES-17 under 2D .0503 are listed as 0.346 (lb PM/10⁶ Btu). The allowable emissions value is corrected to 0.342 (lb PM/10⁶ Btu) in Permit No. 03840T33. Compliance with this rule for each of the permitted fuels is addressed below.

Natural Gas: Table 1.4-2 of Supplement D to the 5th edition of the AP-42 document predicts total PM emissions of 7.6 (lb/10⁶ ft³) from natural gas combustion. If we assume a natural

gas heat value of 1,020 (Btu/ft³) then we can estimate PM emissions from natural gas combustion as:

$$[7.6 \text{ (lb PM/10}^6 \text{ ft}^3)]/[1,020 \text{ (Btu/ft}^3)] = 0.0075 \text{ (lb PM/10}^6 \text{ Btu)}$$

No. 2 Fuel Oil: Tables 1.3-1 and 1.3-2 of Supplement E to the 5th edition of the AP-42 document predict total PM emissions of 3.3 (lb/10³ gallons) from No. 2 fuel oil combustion. If we assume a No. 2 fuel oil heat value of 141,000 (Btu/gallon) then we can estimate PM emissions from No. 2 fuel oil combustion as:

$$[3.3 \text{ (lb/10}^3 \text{ gallons)}]/[141 \text{ (10}^6 \text{ Btu/10}^3 \text{ gallons)}] = 0.0234 \text{ (lb PM/10}^6 \text{ Btu)}$$

No. 6 Fuel Oil: Tables 1.3-1 and 1.3-2 of Supplement E to the 5th edition of the AP-42 document predict total PM emissions of 9.19(S) + 4.72 (lb/10³ gallons) from combustion of No. 6 fuel oil, where S is the fuel oil sulfur content in weight percent. If we assume a No. 6 fuel oil sulfur content of 2.1% and heat value of 150,000 (Btu/gallon) then we can calculate PM emissions from No. 6 fuel oil combustion as:

$$[(9.19)(2.1) + 4.72 \text{ (lb/10}^3 \text{ gallons)}]/[150 \text{ (10}^6 \text{ Btu/10}^3 \text{ gallons)}] = 0.16 \text{ (lb PM/10}^6 \text{ Btu)}$$

Vegetable Oil: According to the technical review associated with Permit No. 03840R23 (dated 11/16/01) vegetable oil combustion in these boilers will result in PM emissions of approximately 0.022 (lb PM/10⁶ Btu).

For boilers ES-17 and ES-26, Permit No. 03840T33 will include the standard language for the emission limits of 2D .0503 and the methods of testing for compliance (if/when required by DAQ) but will not (since the permitted fuels are inherently compliant with this rule) require any additional testing or any MRR to demonstrate compliance with 2D .0503.

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

This rule applies to boilers ES-17 and ES-26 and limits the SO₂ emissions from these combustion devices to 2.3 (lb/10⁶ Btu). Compliance with this rule for each of the permitted fuels is addressed below.

Natural Gas: Table 1.4-2 of Supplement D to the 5th edition of the AP-42 document predicts SO₂ emissions of 0.6 (lb SO₂/10⁶ ft³) from the combustion of natural gas. Assuming a natural gas heat value of 1,020 (Btu/ft³) we can estimate SO₂ emissions while burning natural gas as:

$$[0.6 \text{ (lb SO}_2\text{/10}^6 \text{ ft}^3)]/[1,020 \text{ (Btu/ft}^3)] = 0.00059 \text{ (lb SO}_2\text{/10}^6 \text{ Btu)}$$

No. 2 Fuel Oil: Table 1.3-1 of Supplement E to the 5th edition of the AP-42 document predicts SO₂ emissions of 142(S) (lb/10³ gallons) from the combustion of No. 2 fuel oil, where S is the sulfur content of the fuel oil in weight percent. If we assume a heat value of 141,000 (Btu/gallon) and a sulfur content of 0.5% by weight for No. 2 fuel oil we can calculate SO₂ emissions while burning No. 2 fuel oil as:

$$[(142)(0.5) \text{ (lb SO}_2\text{/10}^3 \text{ gallon)}]/[10^3 \text{ (gallon)/141 (10}^6 \text{ Btu)}] = 0.504 \text{ (lb SO}_2\text{/10}^6 \text{ Btu)}$$

No. 6 Fuel Oil: Tables 1.3-1 and 1.3-2 of Supplement E to the 5th edition of the AP-42 document predict SO₂ emissions of 157(S) (lb/10³ gallons) from combustion of No. 6 fuel oil, where S is the fuel oil sulfur content in weight percent. If we assume a No. 6 fuel oil sulfur content of 2.1% and heat value of 150,000 (Btu/gallon) then we can calculate PM emissions from No. 6 fuel oil combustion as:

$$[(157)(2.1) \text{ (lb SO}_2\text{/10}^3 \text{ gallons)}]/[150 \text{ (10}^6 \text{ Btu/10}^3 \text{ gallons)}] = 2.198 \text{ (lb SO}_2\text{/10}^6 \text{ Btu)}$$

Vegetable Oil: According to the technical review associated with Permit No. 03840R23 (dated 11/16/01) vegetable oil combustion will result in SO₂ emissions of approximately 0.110 (lb SO₂/10⁶ Btu).

To assure compliance with 2D .0516 for the two boilers (ID Nos. ES-17 and ES-26), Permit No. 03840T33 will include:

- The standard language for the emission limits of 2D .0516, the methods of testing for compliance (if/when required by DAQ), and a sulfur content limit of 2.1% by weight for the No. 6 fuel oil. Additional testing requirements are not included since vegetable oil, natural gas, and No. 2 fuel oil are inherently compliant and combustion of No. 6 fuel oil will not violate this standard if the sulfur content is maintained below 2.1%, by weight;
- A requirement to maintain records of fuel oil supplier certifications of the sulfur content of any No. 6 oil burned in these boilers; and
- A requirement to submit semiannual summary fuel oil supplier certification reports to NC DAQ for any No. 6 fuel oil burned in these boilers.

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

Boilers ES-17 and ES-26 were manufactured after 07/01/71. Therefore, except for those visible emissions (VEs) occurring during startup, shutdown and malfunctions that are regulated under Rule 2D .0535, paragraph (d) of this rule requires that the 6-minute average VEs from these boilers be less than or equal to 20% opacity with the following exceptions:

- One six-minute average VE per hour may exceed 20% opacity as long as that VE does not also exceed 87% opacity; and
- Up to four six-minute average VEs per 24-hour period may exceed 20% opacity as long as those VEs do not also exceed 87% opacity.

To assure compliance with 2D .0521 for the two boilers (ID Nos. ES-17 and ES-26), Permit No. 03840T33 will include:

- The standard language for the emission limits of 2D .0521 and the methods of testing for compliance (if/when required by DAQ) but will not require any additional testing (since the sources have a history of compliance with this rule);
- A requirement to conduct daily monitoring and recordkeeping of VEs whenever No. 6 oil is burned in these boilers; and
- A requirement to submit semiannual MRR summary reports to NC DAQ.

iv. 2D .0524 “New Source Performance Standards”

The boilers (ID Nos. ES-17 and ES-26) were reportedly installed before 06/09/89 and are, therefore, **not subject** to the relevant NSPS (i.e. 40 CFR Part 60, Subpart Dc).

**v. 2Q .0317 “Avoidance Conditions” to avoid:
2D .0530 “Prevention of Significant Deterioration”**

Current Permit No. 03840T32 includes two PSD avoidance conditions limiting SO₂ and NO_x emissions from boiler ES-26. One PSD avoidance condition limits SO₂ and NO_x emissions from ES-26 to less than 40 tons per consecutive 12-month period, each, while burning natural gas, No. 2 fuel oil, and/or No. 6 fuel oil.

The other PSD avoidance condition limits NO_x emissions from ES-26 to less than 40 tons per consecutive 12-month period while burning vegetable oil. The NO_x emission limit from vegetable oil combustion is achieved by limiting vegetable oil combustion to less than 3,253,800 gallons per consecutive 12-month period.

These avoidance conditions require monthly monitoring and recordkeeping of the amount of each fuel burned, and the sulfur content of the fuel oils burned, in ES-26. The Permittee is

also required to submit semiannual summary reports of this information to NC DAQ. These avoidance conditions are transferred into Permit No. 03840T33 with some rewording and modifications for clarity.

III Regulatory review for rules that apply to aggregate emissions from multiple source categories:

A. Facility-Wide Affected Sources:

i. 2D .0530 “Prevention of Significant Deterioration” pursuant to: Consent decree 05-2037-JRM-FLN

Current Permit No. 03840T32 includes conditions derived from consent decree 05-2037-JMR-FLN (the consent decree) which settles a complaint that the EPA filed against Cargill alleging that Cargill commenced construction of a major emitting facility and major modifications of a major emitting facility in violation of the New Source Review requirements at Part C and D of the Clean Air Act. Pursuant to the consent decree Cargill proposed a solvent loss ratio (SLR) limit of 0.19 gallons of solvent per ton of soybean processed on a 12-month rolling average for this facility.

The MRR requirements associated with the consent decree are transferred into Permit No. 03840T33 without modification except to remove the Permittee’s option of adjusting the solvent loss ratio (i.e. the solvent loss ratio is no longer “interim”) and to clarify that the amount of oilseeds “processed” (as used in the adjusted solvent loss ratio) refers to the amount of oilseeds processed *through ES-9*. Monitoring and recordkeeping requirements commence in March of 2009 and reporting requirements commence in July of 2010.

ii. 2D .0958 “Work Practices for Sources of Volatile Organic Compounds”

This rule applies to the operations in this facility that use VOCs as solvents, carriers, material processing media, etc. and requires the Permittee to follow certain procedures when using or storing the VOC-containing materials or cleaning or draining the equipment used to apply these materials. The Permittee does conduct the subject operations. Therefore, this rule is added to Permit No. 03840T33 which will include the standard language for work practice standards and MRR associated with this rule for the facility-wide affected sources.

iii. 2D .1100 “Control of Toxic Air Pollutants”

Current Permit No. 03840T32 requires the Permittee to submit the last MACT toxics demonstration for this facility when they submit their application to comply with the last MACT that applies to this facility (i.e. MACT GGGG) in accordance with 2Q .0705. The Permittee submitted that toxics demonstration (i.e. application 9200208.08B - subsequently consolidated into permit application 9200208.08A - this renewal) on 03/24/08. The 03/24/08 submittal was a technical infeasibility and economic hardship pursuant to 2Q .0709(b) and (c) for this facility (the modeling predicted that emissions from the facility would violate the AAL for n-hexane if operated at potential emission rates utilizing 100% n-hexane as solvent). The Permittee later amended the demonstration (see submittal dated 08/25/09) to show compliance with the AAL for n-hexane and hexane isomers other than n-hexane with the extraction solvent limited to no more than 20% n-hexane, by weight.

Modeling: The amended modeling demonstration included two demonstrations. First, the Permittee modeled the off-site impacts of unrestricted emissions of hexane isomers other than n-hexane. That is, the Permittee assumed 8,760 hours of operation at facility potential emission rates assuming that the extraction solvent is comprised of 100% hexane isomers other than n-hexane, by weight. Second, the Permittee modeled the off-site impacts of n-hexane assuming 8,760 hours of operation at facility potential emission rates and that the extraction solvent is comprised of 20% n-hexane, by weight. Both modeling demonstrations indicated compliance with the associated AALs and the modeling was reviewed and

approved by AQAB (see memo from Tom Anderson dated 09/24/09). The modeling predicted maximum off-site impacts, under the conditions described in this paragraph, of 87% of the AAL for n-hexane and 6% of the AAL for hexane isomers other than n-hexane.

MRR Requirements: As mentioned above, the submitted modeling assumed unrestricted hours of operations, unrestricted content of hexane isomers other than n-hexane in the extraction solvent, and a 20% limit on content of n-hexane in the extraction solvent. Therefore, Proposed Permit No. 03840T33 includes the following MRR requirements pursuant to 2D .1100:

- Monitoring and recordkeeping of the n-hexane content (weight percent) of each incoming delivery of extraction solvent; and
- Quarterly summary reporting of monitoring and recordkeeping activities.

iv. **2D .1111 “Maximum Achievable Control Technology”**
[40 CFR Part 63, Subpart GGGG]

The Permittee is subject to this rule pursuant to 40 CFR Part 63, Subpart GGGG (i.e. the NESHAP for solvent extraction for vegetable oil production - see 40 CFR §63.2832). However, this facility was an area source that became a major source (and therefore subject to this NESHAP) on 10/13/06. Detailed conditions for MACT GGGG are added to Permit No. 03840T33 with an applicability date of 10/13/09.

Emission Requirements:

MACT GGGG gives the Permittee the option of demonstrating compliance with the emission standards via either:

- (1) The compliance ratio method, wherein the Permittee demonstrates that the compliance ratio (i.e. the ratio of actual HAP loss over the previous 12 operating months to the allowable HAP loss over the previous 12 operating months) is ≤ 1.00 ; or
- (2) The low-HAP solvent method, wherein the Permittee must restrict the extraction solvent usage to low-HAP solvents (i.e. solvents in which each HAP is present in concentrations of no more than 1% by volume).

The Permittee may switch between the compliance options but must give the Regional DAQ Supervisor at least 60 days advance notice of the switch.

Compliance Requirements:

The compliance requirements under the low-HAP solvent option are a subset of those under the compliance ratio option and are not separately discussed herein. The associated notification, monitoring, recordkeeping, and reporting requirements may be found in conditions 2.2 A.4.c.ii(A) through (D) of Permit No. 03840T33.

Under the compliance ratio option the Permittee must develop and implement a written plan for compliance (Compliance Plan) and develop a written startup, shutdown and malfunction plan (SSM plan) for all affected sources. These plans must be maintained on site for as long as the affected sources are operational and made available for inspection by DAQ personnel.

During malfunction periods or initial startup periods the Permittee complies with MACT GGGG by minimizing HAP emissions to the extent practical and operating in accordance with the SSM plan. The Permittee shall not include gallons of extraction solvent used and tons of soybeans processed during malfunction periods or initial startup periods in the compliance ratio determinations. Note that, according to the 07/22/09 letter from Adam M. Kushner, Director of the Office of Civil Enforcement of the EPA (see Attachment B to this document), the exemption from the applicable requirements of 40 CFR Part 63, Subpart

GGGG during SSM periods is not affected by the recent US Court of Appeals decision [Sierra Club v. EPA, 551 F.3d 1019 (D.C. Cir. 2008)] because the language addressing SSM conditions in MACT GGGG [refer to §63.2850(e) and §63.2852] stands alone [i.e. it is specific and detailed and not simply a reference to §63.6(f)(1) and §63.6(h)(1)].

The applicable notification, monitoring, recordkeeping, and reporting requirements under the compliance ratio option during periods of normal operation are discussed below.

Notification Requirements:

The Permittee must submit initial and actual startup date notifications for new sources, reconstructed sources, and significant modifications to existing or new sources. Also, the Permittee must submit a notification of compliance status for any existing, new, or reconstructed source within 60 days of determining the associated initial compliance ratio.

Monitoring Requirements:

For any period during which the facility processes any soybeans, by the end of each calendar month following an operating month, the Permittee must monitor the following:

- The operating status (i.e. normal operating period, nonoperating period, initial startup period, malfunction period, or exempt period) of the affected source and the date of any change in the operating status;
- The facility extraction solvent inventory, including: gallons of solvent in the inventory at the beginning and end of each normal operating period, gallons of solvent received [purchased or recovered from vegetable oil brought to the facility from an offsite source] in each shipment during each calendar month, any solvent inventory adjustments (and the justification for the adjustment), total solvent lost during the calendar month regardless of operating status, and actual solvent loss for each operating month;
- The volume fraction of HAP in the extraction solvent, including: the gallons of extraction solvent received [purchased or recovered from vegetable oil brought to the facility from an offsite source], the volume fraction of each HAP present in excess of 1% by volume, and the weighted average volume fraction of HAP in the extraction solvent received [purchased or recovered from vegetable oil brought to the facility from an offsite source]; and
- The facility soybean inventory, including: tons of soybeans in the inventory at the beginning and end of each normal operating period, tons of soybeans received in each shipment, any soybean inventory adjustments (and the justification for the adjustment), and the tons of soybeans processed during normal operating periods.

After the facility has processed soybeans for 12 operating months and is not operating in either an initial startup period or malfunction period, by the end of each calendar month following an operating month, the Permittee must monitor the following:

- The 12 operating months rolling sum of actual solvent loss;
- The weighted average volume fraction of HAP in the extraction solvent for the previous 12 operating months;
- The 12 operating months rolling sum of soybeans processed; and
- The compliance ratio for the facility.

Recordkeeping Requirements:

The Permittee must maintain records of the monitoring described above on site and readily available for inspection by authorized personnel. The records for an operating month must be

generated by the end of the calendar month following that operating month. The Permittee must maintain each record for at least 5 years following its creation. The Permittee must maintain each record onsite for at least 2 years following its creation.

If the Permittee makes any revisions to the Compliance Plan, then the Permittee must keep all previous versions of the Compliance Plan onsite and readily available for inspection by authorized personnel for at least 5 years after each revision.

For each initial startup period or malfunction period, the Permittee must record a description of the SSM event (including date of occurrence, duration, and why it qualifies as an SSM), an estimate of extraction solvent loss during the initial startup period or malfunction period (with supporting documentation), and a checklist or other mechanism to indicate whether the Permittee followed the SSM plan during the initial startup period or malfunction period.

Reporting Requirements:

The Permittee must submit annual compliance certifications, deviation notification reports (for each compliance determination made in which the compliance ratio exceeds 1.00), periodic startup, shutdown, and malfunction reports and immediate SSM reports (if the Permittee chooses to operate under an initial startup period or a malfunction period), and semiannual summary reports.

v. 2D .1806 “Control and Prohibition of Odorous Emissions”

This rule requires the Permittee to prevent odorous emissions from the facility from causing or contributing to objectionable odors [as defined at 2D .1801(9)] beyond the facility’s boundary. The Permittee conducts operations that would reasonably be expected to create objectionable odors but does not have a history of violations of this rule. Therefore, this rule is added to Permit No. 03840T33, but with only the standard shell language.

**vi. 2Q .0317 “Avoidance Conditions” to avoid:
2D .0530 “Prevention of Significant Deterioration”**

Current Permit No. 03840T32 includes a PSD avoidance condition limiting facility-wide VOC emissions to less than 661 tons per consecutive 12-month period and facility-wide use of VOC-containing materials to less than 234,829 gallons per consecutive 12-month period. This avoidance condition requires monthly monitoring and recordkeeping of the amount of VOC-containing material used, facility-wide, and the resulting VOC emissions; and requires the submittal of semiannual summary reports of this information to NC DAQ. This condition is transferred into Permit No. 03840T33 after modification as follows:

- Rewording for clarity;
- Reduction of facility-wide allowable VOC emissions from 661 tons per 12-consecutive month period to 656 tons per 12-consecutive month period (to account for potential VOC emissions from combustion sources ES-17, ES-26, ES-P1, and ES-P2); and
- Removal of the 234,829 gallons per consecutive 12-month period limit. This limit is misleading (i.e. it is based on the assumption that only one type of VOC-containing material is used on site) and unnecessary (since the Permittee is required to calculate the actual facility-wide VOC emissions each month).

**vii. 2Q .0317 “Avoidance Conditions” to avoid 2Q .0700 “Toxic Air Pollutant Procedures”
2Q .0705 “Existing Facilities and SIC Calls” and
2Q .0711 “Emission Rates Requiring a Permit”**

Current Permit No. 03840T32 includes a state-enforceable only n-hexane usage limit of 4,696 pounds per day to avoid the applicability of Section 2Q .0700 “Toxic Air Pollutant

Procedures.” This limit is not included in Permit No. 03840T33 since the Permittee submitted their facility-wide toxics demonstration with permit application 9200208.08A (i.e. the toxics rules of Section 2Q .0700 have been triggered for this facility). Instead, the shell language for facilities that have made a facility-wide demonstration is included in Permit No. 03840T33 (see discussion of 2D .1100 in Section III A.iii, above).

IV NSPS/NESHAP/PSD/Toxics/112(r)/CAM/RACT Applicability:

NSPS: Several sources at this facility are subject to New Source Performance Standards pursuant to rule 2D .0524 and 40 CFR Part 60, as summarized below:

- **Subpart Dc** for Small Steam Generating Units: This regulation applies to steam generating units with heat input capacities from 10 million Btu per hour to 100 million Btu per hour, inclusive, for which construction, modification or re-construction is commenced after 06/09/89. The two boilers at this facility, ID Nos. ES-17 and ES-26, have heat input capacities of 46.5 and 75.3 million Btu per hour, respectively, but were manufactured prior to 1989. Therefore, Subpart Dc **does not apply** to these boilers (see the discussion in Section II E.iv of this document, above).
- **Subpart DD** for Grain Elevators: This regulation applies to dryers, truck/railcar/ship unloading stations and railcar loading stations at grain terminal elevators and grain storage elevators (as defined at 40 CFR §60.301) for which construction, modification or re-construction commenced after 08/03/78. According to application 9200208.08A only **the Berico dryer (ID No. ES-3) is subject to this rule** (see the discussion in Section II B.iv of this document, above).
- **Subpart Kb** for volatile organic liquid (VOL) storage vessels: This regulation applies to VOL storage tanks that were constructed, reconstructed or modified after 7/23/84 and have storage capacities greater than or equal to 75 m³ (i.e. 19,817 gallons). Hexane storage tanks **ES-9A and ES-9B are not subject** to NSPS Subpart Kb because paragraph §60.110b(d)(8) exempts storage vessels that are subject to 40 CFR Part 63, Subpart GGGG from NSPS Subpart Kb (see discussion of 2D .0524 in Section II D.ii, above).
- **Subpart IIII** for Compression Ignition Internal Combustion Engines (CI ICE): The diesel-fired emergency water pumps (ID Nos. ES-P1 and ES-P2) **are not subject** to this regulation (they pre-date the rule - refer to the discussion of rule 2D .0524 in Section II C.iii, above).

NESHAP: Several sources at this facility are subject to National Emission Standards for Hazardous Air Pollutants pursuant to rule 2D .1111 and 40 CFR Part 63, as summarized below:

- **Subpart ZZZZ** for Reciprocating Internal Combustion Engines (RICE): The diesel-fired emergency water pumps (ID Nos. **ES-P1 and ES-P2**) **are subject** to this regulation but with **no applicable requirements** (see discussion in Section II C.iv, above).
- **Subpart GGGG** for Solvent Extraction for Vegetable Oil Production: The requirements **apply to the vegetable oil production process** (as defined at 40 CFR §63.2872). Note that the review of Permit No. 03840T31 indicates that the compliance date for this MACT is 10/13/09 (see discussion in Section III A.iv, above).

PSD: This facility does not fall into one of the PSD categories listed at 40 CFR §51.166(b)(1)(i)(a) with a 100 ton per year threshold but does have the potential to emit > 250 tons of VOC per consecutive 12-month period before limits and is therefore classified as major for PSD purposes under 40 CFR §51.166(b)(1)(i)(b). The Permittee triggered PSD requirements for this facility via consent decree 05-2037-JRM-FLN (see discussion in Section III A.i, above).

To avoid PSD requirements for major sources and modifications the Permittee accepted, via a previous permit application, PSD avoidance conditions limiting NO_x and SO₂ emissions from boiler ES-26 and facility-wide VOC emissions (see discussions in Sections II E.v and III A.vi, above).

Application 9200208.08A is a renewal without modification and does not represent a major modification for PSD purposes – therefore a PSD review is not triggered.

Toxics: The Permittee has demonstrated compliance with the AALs in 2D .1104 for n-hexane and hexane isomers other than n-hexane via a modeling demonstration submitted pursuant to 2Q .0705 (see discussions in Sections III A.iii and III A.vii, above).

112(r): According to Section A3 of application 9200208.08A, this facility does not store any substances regulated under 112(r) in quantities above the associated thresholds and is therefore not subject to the requirements of Section 2D .2100 “Risk Management Program” or 40 CFR Part 68 “Chemical Accident Prevention Provisions.”

CAM: Several sources at this facility (i.e. ES-5, ES-8, ES-13, ES-22, and ES-25) are subject to the requirements of 40 CFR Part 64 “Compliance Assurance Monitoring” pursuant to 2D .0614 “Compliance Assurance Monitoring” [refer to the discussions in Section II A.iii of this document, above, and the CAM applicability table (Attachment A to this document) for more information].

RACT: The Director of NC DAQ has not yet issued a notice in North Carolina Register that RACT applies to facilities in Wake County pursuant to either paragraphs 2D .0902(g) and 2D .1402(f). Therefore, existing source RACT requirements are not applicable or discussed here.

V Permit Modifications/Changes:

The following table summarizes the changes to Permit No. 03840T33 resulting from Permit Application No. 9200208.08A:

Old Page(s)	New Page(s)	Condition/Item	Description of Change(s)
Global	Global	N/A	<ul style="list-style-type: none"> Update format to current shell version (e.g. remove Part II of the permit, change testing rule reference to 2D .2601, and update Section 3 General Conditions); Change the issuance/effective dates of the permit; Change the application number and complete date; Change permit revision number to T33; Modify source and control device descriptions to include capacities, filter areas and diameters; and Update the monitoring associated with 2D .0521 [i.e. add “(Method 9) for 12 minutes”]
3 - 4	3 - 4	Equipment List	<ul style="list-style-type: none"> Remove asterisk language for multiple sources pursuant to public comment/EPA review; Add emergency water pumps ES-P1 and ES-P2; Correct the storage capacities of soybean storage bins SSB1 - SSB9 and add the storage capacities of hexane tanks ES-9A and ES-9B; Add CAM designation to emission source ID No. column for sources subject to 2D .0614; and Correct/enhance the descriptions of ES-9A, ES-9B, ES-3/-4 (the screens are not controls), and CD-9 (the minimum required oil injection rate is increased from 8 gpm to 10 gpm)

Old Page(s)	New Page(s)	Condition/Item	Description of Change(s)
4 – 6; 8 – 10; 11 – 14; 16 – 18; 21 – 23; & 23 - 24	5 - 8	2.1 A	<ul style="list-style-type: none"> Modify this section to include sources ES-1, ES-5, ES-6, ES-7, ES-8, ES-10-1, ES-10-2, ES-13, ES-14, ES-15A/-15B, ES-16, ES-19, ES-20, ES-22, ES-24, ES-25, and SSB1 - SSB9 (i.e. combine Sections 2.1 A, C, E, G and I of Permit 03840T32); Correct storage capacities of SSB1 – SSB9; and Modify the limits/standards summary table to show the applicability of 2D .0614
13 & 17	7	2.1 A.2	Modify 2D .0521 MRR requirements for sources ES-16 and ES-20 to remove requirement to establish “normal” (i.e. in 2.1 E.2.c and 2.1 G.2.c of Permit No. 03840T32)
N/A	8	2.1 A.3	Add 2D .0614 MRR requirements for sources ES-5, ES-8, ES-13, ES-22, and ES-25
6 - 8	9 - 11	2.1 B	Reorder the rules within this subsection and modify source/control descriptions to show the mesh screens as part of the grain dryers (i.e. not separate “controls”)
8	11	2.1 B.4.b	Add a permit condition to specifically state that NSPS DD requires no monitoring or reporting for ES-3
8 - 10	12	2.1 C	Modify this section to include the MRR requirements for sources ES-P1 and ES-P2
10 – 11; 14 – 16 & 18 - 21	13 – 16	2.1 D	Modify this section to remove source ES-9 (since all applicable rules for that source are addressed in Section 2.2 A of 03840T33) and instead include sources ES-17 and ES-26 (i.e. addressed in 2.1 F and H of 03840T32)
14	13	2.1 D.1.a	Correct the PM allowable emission limit for ES-17 from 0.346 lb/10 ⁶ Btu to 0.342 lb/10 ⁶ Btu
14 & 18	13	2.1 D.2.c	Correct the regulatory basis by removing the reference to 2D .0501(c)(4)(A) (found in 2.1 F.2.c and H.2.c of 03840T32) since this rule no longer exists
15 & 19	14	2.1 D.2.d	Correct the regulatory basis by removing the reference to 2Q .0508(bb) (found in 2.1 F.2.d and H.2.d of 03840T32) since this rule no longer exists
20 - 21	15 – 16	2.1 D.4.a-f	<p>Modify this 2Q .0317 (PSD avoidance) section to:</p> <ul style="list-style-type: none"> Expand the descriptions of the equation variables in 2.1 D.4.c and d and correct the units cited therein; Remove the “extra” paragraph (i.e. the 1st paragraph 2.1 H.4.c of 03840T32); and Reword the MRR requirements for clarity and to remove the reporting requirements for fuel oil sulfur content and consumption rates
21	16	2.1 D.5.c	Add an equation for calculating NO _x emissions from combustion of vegetable oil
21	16	2.1 D.5.d + e	Reword the rule 2Q .0317 (PSD avoidance) MRR requirements for clarity

Old Page(s)	New Page(s)	Condition/Item	Description of Change(s)
11 - 24	N/A	2.1 E – J (03840T32)	Remove these permit sections since the associated sources are addressed in other sections of the permit
24 - 26	17 – 34	2.2 A	Reorganize and expand section to include requirements associated with rules 2D .0530, .0958, .1100, .1111, and .1806, and 2Q .0317, .0705, and .0711
24; & 27 - 28	17 - 28	2.2 A.1	Remove the requirements of 2D .1806 and add the requirements of consent decree 05-2037-JRM-FLN (found in 2.4 A.1 of Permit 03840T32)
27	17	2.2 A.1.a	Modify language to show that the solvent loss ratio is no longer “interim” and remove the Permittee’s option of adjusting the interim solvent loss ratio (found in 2.4 A.1.a.ii of Permit 03840T32)
27 - 28	17	2.2 A.1.b and 2.2 A.1.c.i	Clarify that the amount of oilseeds “processed” (as used in the adjusted solvent loss ratio) refers to the amount of oilseeds processed <i>through ES-9</i>
28	18	2.2 A.1.f	Reword the reporting requirements for clarity
24 – 25; & 25 - 26	18 – 19	2.2 A.2	Remove 2Q .0317 restriction on n-hexane use to avoid applicability of the NC toxics (since the facility is now subject to that program) and add the requirements of rule 2D .0958 (found in 2.2 B.1 of Permit 03840T32)
25	19 - 20	2.2 A.3	Add the requirements of 2D .1100 and remove the requirements of 2Q .0705
27	20 - 33	2.2 A.4	Add specific language for 2D .1111 (i.e. to replace the MACT GGGG placeholder language found in 2.3 A.1 of 03840T32) with applicability date of 10/13/09
24	34	2.2 A.5	Add the requirements of rule 2D .1806 (found in 2.2 A.1 of Permit 03840T32)
26	34	2.2 A.6	Add requirements of 2Q .0317 to avoid PSD (found in 2.2 C.1 of 03840T32) after modifying the language to: <ul style="list-style-type: none"> • Remove the 234,829 gallons per 12-consecutive month period limit for VOC-containing materials; • Clarify the MMR requirements of 2.1 A.6.b - d; and • Reduce the VOC emission limit from 661 to 656 tons per 12-consecutive month period (to account for potential VOC emissions from combustion sources)
25	34	2.2 A.7	Add a condition to reflect the fact that the last MACT toxics demonstration has been completed pursuant to 2Q .0705 and include the requirements of 2Q .0711
25 – 26	N/A	2.2 B (03840T32)	Remove this section since the requirements of 2D .0958 are now included in Section 2.2 A.2 of 03840T33
26	N/A	2.2 C (03840T32)	Remove this permit section since the requirements of 2Q .0317 (to avoid 2D .0530) are now included in Section 2.2 A.6 of Permit 03840T33

Old Page(s)	New Page(s)	Condition/Item	Description of Change(s)
27	N/A	2.3 A (03840T32)	Remove this permit section since the requirements of 2D .1111 (MACT GGGG) are now included in Section 2.2 A.4 of Permit 03840T33
27 - 28	N/A	2.4 A (03840T32)	Remove this permit section since the requirements of consent decree 05-2037-JRM-FLN are now included in Section 2.2 A.1 of Permit 03840T33
29 - 35	35 - 42	Section 3	Update general conditions to version 2.22.1

Note: Condition/Item numbers are as they appear in Permit No. 03840T33, unless otherwise noted.

VI Title V Permit History:

The following table provides a very brief summary of Title V permit revisions for this facility:

Permit No.	Issuance Date	Description of Revision
03840T27	12/11/03	Issue initial Title V permit (no modifications to facility but modify the PSD avoidance for boiler ES-26)
03840T28	03/02/04	Administrative amendment to: <ul style="list-style-type: none"> • Make MACT avoidance generic (instead of just Subpart GGGG) • Change the PSD avoidance condition associated with hexane to be more generically associated with VOCs • Require 17 months of monitoring data in the semiannual PSD reports
03840T29	08/02/04	Administrative amendment to change the existing state only air toxics reporting frequency from quarterly to a semi-annually
03840T30	08/20/04	Modify the existing auxiliary truck soybean receiving process (ID No. ES-20) to include a loadout enclosure
03840T31	10/13/06	<ul style="list-style-type: none"> • Remove MACT avoidance condition and add compliance schedule for 40 CFR Part 63, Subparts GGGG and DDDDD • Make administrative changes to permit text (update language, etc.)
03840T32	07/17/07	<ul style="list-style-type: none"> • Widen the existing auxiliary truck soybean receiving and loadout enclosure (ID No. ES-20) • Construct a new hull conveyor within the existing truck and rail meal and hull loadout enclosure (ID No. ES-16) • Add requirements of consent decree 05-2037-JMR-FLN [i.e. apply a solvent loss ratio (SLR) limit of 0.19 gallons of solvent per ton of soybean processed to the existing soybean oil/hexane solvent extraction process (ID No. ES-9)]
03840T33	12/15/09	<ul style="list-style-type: none"> • Renewal of Title V permit; and • Addition of requirements associated with 2D .0614, 2D .1100, and 2D .1111 (MACT Subparts GGGG and ZZZZ) and 2Q .0711

VII Application Fee/Zoning Consistency:

No fee or zoning consistency determination is required for the renewal without equipment modification/facility expansion requested via application 9200208.08A or for the facility-wide NC toxics demonstration requested via application 9200208.08B and consolidated therein.

VIII Compliance Status:

The facility was most recently inspected on 08/24/09 by Brian Bland of RRO and appeared to be operating in compliance with DAQ requirements during that inspection.

IX Miscellaneous:

Equipment List: Two diesel-fired emergency water pumps (ID Nos. ES-P1 and ES-P2) are added to the equipment list of Permit No. 03840T33. These are existing sources that DAQ was made aware of in a letter from the Permittee dated 12/30/08 (see discussion in Section II C, above).

Insignificant Activities List: Three soybean oil above ground storage tanks (ID Nos. IES-7, IES-8, and IES-9) are added to the list of insignificant activities attached to Permit No. 03840T33. These are existing sources that DAQ was made aware of in a letter from the Permittee dated 12/30/08. Tanks IES-7, IES-8, and IES-9 were constructed in 1958, 1959, and 1971 and have storage capacities of 134,000 gallons, 134,000 gallons, and 382,000 gallons, respectively. These sources are not subject to NSPS Subpart Kb (they pre-date the rule) or rules 2D .0948 and 2D .0949 [the stored and/or transferred liquid (i.e. soybean oil) has a vapor pressure of about 0.015 psi at 20 °C (i.e. less than the applicability threshold of 1.5 psi)].

Signature by Responsible Official: Mr. Joseph Peanasky (i.e. the responsible official for the Cargill–Raleigh facility) provided the required signatures on Form AA of application 9200208.08A.

X Permit Review:

Draft Permit: A draft version of Permit No. 03840T33 and the associated review were sent to the Permittee and the RRO for a review and comment period on 03/04/09. The Permittee subsequently informed DAQ that they intended to limit n-hexane content of the extraction solvent to comply with the AAL as opposed to making the technical infeasibility and economic hardship demonstration (see discussion in Section III A.3, above). Due to the changes made to the permit as a result of this later submittal (dated 08/25/09) the Permittee was given another opportunity, on 10/16/09, to review the permit before going to public notice.

Public Participation: In accordance with 2Q .0521, NC DAQ must provide the opportunity for public participation prior to the renewal of a Title V permit (such as that represented by application 9200208.08A). NC DAQ met this obligation with the public notice posted in “a newspaper of general circulation in the area where the facility is located” and “mailed to persons who are on the Division’s mailing list for air quality permit notices” on 10/28/09.

EPA & Affected States Review: In accordance with 2Q .0522, NC DAQ must provide EPA and any Affected States [as defined at 2Q .0503(1)] the opportunity to review a proposed renewal of this Title V permit. NC DAQ met this obligation by sending those agencies a copy of Proposed Permit No. 03840T33 and the associated review on 10/28/09.

XI Recommendation:

The Title V Permit renewal application for the Cargill, Inc. facility in Raleigh, Wake County, North Carolina has been reviewed by NC DAQ personnel to determine compliance with all applicable procedures and requirements. NC DAQ personnel have determined that this facility is complying or will achieve compliance with all applicable requirements as specified in Permit No. 03840T33.

Issuance of Permit No. 03840T33 is recommended.

Attachment A: CAM Applicability Summary Table

Emission Source(s)	Control Device(s)	Controlled TV Pollutant(s)	Pre-Control PTE of Controlled TV Pollutant(s) (tons per year)	CAM Disqualification(s)/Exemption(s)	CAM Applicable?
Soybean storage, transfer, and processing operations:					
ES-5, ES-8, ES-13, ES-22, and ES-25	Various cyclones and bagfilters	PM ₁₀	> 100	N/A	Yes
ES-1, ES-6, ES-7, ES-10-1, ES-10-2, ES-14, ES-15A, ES-15B, ES-16, ES-19, ES-20, ES-24, and SSB1 – SSB9	Various cyclones and bagfilters	PM ₁₀	< 100	Does not meet criteria of 15A NCAC 2D .0614(a) [Emission less than major source thresholds]	No
Column-type grain dryers: ES-3 and ES-4	N/A	PM ₁₀	N/A	Does not meet criteria of 15A NCAC 2D .0614(a) [No control device]	No
Soybean oil extraction process: ES-9	Scrubber (CD-9)	VOC/HAP	> 100	N/A [VOC/HAP emission limits are exempt pursuant to 2D .0614(b)(1)(A) and 2D .0614(b)(1)(E)]	No
Boilers: ES-17 and ES-26	N/A	N/A	N/A	Does not meet criteria of 15A NCAC 2D .0614(a) [No control device]	No
Storage tanks: ES-9A and ES-9B	Scrubber (CD-9)	VOC	< 100	Does not meet criteria of 15A NCAC 2D .0614(a) [Emission less than major source thresholds]	No
Emergency RICE: ES-P1 and ES-P2	N/A	N/A	N/A	Does not meet criteria of 15A NCAC 2D .0614(a) [No control device]	No

PROPOSED

Attachment B: Letter from Adam M. Kushner, Director of the Office of Civil Enforcement of the EPA, dated July 22, 2009.

RE: Sierra Club v. EPA, 551 F.3d 1019 (D.C. Cir. 2008)

Vacatur of Startup, Shutdown, and Malfunction (SSM) Exemption (40 C.F.R. 63.6(f)(1) and 63.6(h)(1))