INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
*We make Indiana a cleaner, healthier place to live.*

*Mitchell E. Daniels, Jr.*
*Governor*

*Thomas W. Easterly*
*Commissioner*

100 North Senate Avenue
Indianapolis, Indiana 46204
(317) 232-8603
(800) 451-6027
www.IN.gov/idem

TO: Interested Parties / Applicant

DATE: January 26, 2007

RE: Cardinal Ethanol, LLC / 135-23226-00033

FROM: Nisha Sizemore
Chief, Permits Branch
Office of Air Quality

## Notice of Decision: Approval - Effective Immediately

Please be advised that on behalf of the Commissioner of the Department of Environmental Management, I have issued a decision regarding the enclosed matter. Pursuant to IC 13-15-5-3, this permit is effective immediately, unless a petition for stay of effectiveness is filed and granted according to IC 13-15-6-3, and may be revoked or modified in accordance with the provisions of IC 13-15-7-1.

If you wish to challenge this decision, IC 4-21.5-3 and IC 13-15-6-1 require that you file a petition for administrative review. This petition may include a request for stay of effectiveness and must be submitted to the Office of Environmental Adjudication, 100 North Senate Avenue, Government Center North, Room 1049, Indianapolis, IN 46204, **within eighteen (18) calendar days of the mailing of this notice**. The filing of a petition for administrative review is complete on the earliest of the following dates that apply to the filing:

(1) the date the document is delivered to the Office of Environmental Adjudication (OEA);
(2) the date of the postmark on the envelope containing the document, if the document is mailed to OEA by U.S. mail; or
(3) The date on which the document is deposited with a private carrier, as shown by receipt issued by the carrier, if the document is sent to the OEA by private carrier.

The petition must include facts demonstrating that you are either the applicant, a person aggrieved or adversely affected by the decision or otherwise entitled to review by law. Please identify the permit, decision, or other order for which you seek review by permit number, name of the applicant, location, date of this notice and all of the following:

(1) the name and address of the person making the request;
(2) the interest of the person making the request;
(3) identification of any persons represented by the person making the request;
(4) the reasons, with particularity, for the request;
(5) the issues, with particularity, proposed for considerations at any hearing; and
(6) identification of the terms and conditions which, in the judgment of the person making the request, would be appropriate in the case in question to satisfy the requirements of the law governing documents of the type issued by the Commissioner.

If you have technical questions regarding the enclosed documents, please contact the Office of Air Quality, Permits Branch at (317) 233-0178. Callers from within Indiana may call toll-free at 1-800-451-6027, ext. 3-0178.

Enclosures
FNPER.dot 03/23/06

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
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# NEW SOURCE REVIEW AND FEDERALLY ENFORCEABLE STATE OPERATING PERMIT OFFICE OF AIR QUALITY

## Cardinal Ethanol, LLC
## 1554 North County Road 600 East
## Union City, Indiana 47390

(herein known as the Permittee) is hereby authorized to construct and operate subject to the conditions contained herein, the source described in Section A (Source Summary) of this permit.

**The Permittee must comply with all conditions of this permit. Noncompliance with any provisions of this permit is grounds for enforcement action; permit termination, revocation and reissuance, or modification; or denial of a permit renewal application. It shall not be a defense for the Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. An emergency does constitute an affirmative defense in an enforcement action provided the Permittee complies with the applicable requirements set forth in Section B, Emergency Provisions.**

Indiana statutes from IC 13 and rules from 326 IAC, quoted in conditions in this permit, are those applicable at the time the permit was issued. The issuance or possession of this permit shall not alone constitute a defense against an alleged violation of any law, regulation or standard, except for the requirement to obtain a FESOP under 326 IAC 2-8.

This permit is issued in accordance with 326 IAC 2 and 40 CFR Part 70 Appendix A and contains the conditions and provisions specified in 326 IAC 2-8 as required by 42 U.S.C. 7401, et. seq. (Clean Air Act as amended by the 1990 Clean Air Act Amendments), 40 CFR Part 70.6, IC 13-15 and IC 13-17.

| Operation Permit No.: 135-23226-00033 | |
|---|---|
| Original signed by:<br><br>Nisha Sizemore, Chief<br>Permits Branch<br>Office of Air Quality | Issuance Date: January 26, 2007<br><br>Expiration Date: January 25, 2007 |

## TABLE OF CONTENTS

E.3.3 One Time Deadlines Relating to the Standard of Performance for Volatile Organic Liquid Storage Vessels for which Construction, Reconstruction, or Modification Commenced after July 23, 1984 [40 CFR 60, Subpart Kb]

## SECTION A SOURCE SUMMARY

This permit is based on information requested by the Indiana Department of Environmental Management (IDEM), Office of Air Quality (OAQ). The information describing the source contained in conditions A.1 through A.4 is descriptive information and does not constitute enforceable conditions. However, the Permittee should be aware that a physical change or a change in the method of operation that may render this descriptive information obsolete or inaccurate may trigger requirements for the Permittee to obtain additional permits or seek modification of this permit pursuant to 326 IAC 2, or change other applicable requirements presented in the permit application.

### A.1 General Information [326 IAC 2-8-3(b)]

The Permittee owns and operates stationary an ethanol production plant

| | |
|---|---|
| Authorized Individual: | Director |
| Source Address: | 1554 North County Road 600 East, Union City, Indiana 47390 |
| Mailing Address: | 2 OMCO Square, Suite 201, P.O. Box 501<br>Winchester, Indiana 47394 |
| General Source Phone Number: | (765) 584-2209 |
| SIC Code: | 2869 |
| County Location: | Randolph |
| Source Location Status: | Attainment for all criteria pollutants |
| Source Status: | Federally Enforceable State Operating Permit Program<br>Minor Source, under PSD<br>Minor Source, Section 112 of the Clean Air Act<br>1 of 28 Source Categories |

### A.2 Emission Units and Pollution Control Equipment Summary [326 IAC 2-8-3(c)(3)]

This stationary source consists of the following emission units and pollution control devices:

(a) Two (2) grain receiving operations, identified as P06 and P07, approved for construction in 2007, each with a maximum throughput rate of 420 tons per hour, controlled by baghouse C20 and choke flow systems, and exhausting through stack S20. This consists of one (1) truck receiving and one (1) truck and railcar receiving operations.

(b) One (1) grain handling operation, approved for construction in 2007, controlled by baghouse C20 and choked flow systems, exhausting through stack S20, and consisting of the following:

(1) One (1) grain conveyor, identified as P08, with a maximum throughput rate of 280 tons per hour.

(2) One (1) grain elevator, identified as P09, with a maximum throughput rate of 560 tons per hour.

(3) Two (2) grain storage silos, identified as P10 and P11, each with a maximum capacity of 40,000 bushels and a maximum throughput rate of 118 tons per hour.

(4) One (1) emptying conveyor, identified as P12, with a maximum throughput rate of 2,100 tons per hour.

(5) One (1) grain elevator, identified as P13, with a maximum throughput rate of 280 tons per hour.

(6) Two (2) grain day bins, identified as P14 and P15, each with a maximum capacity of 18,000 bushels and a maximum throughput rate of 118 tons per hour.

(7) Two (2) grain scalpers, identified as P71 and P72, each with a maximum throughput rate of 168 tons per hour.

(c) One (1) grain milling operation, approved for construction in 2007, controlled by baghouse C30, exhausting through stack S30, and consisting of the following:

(1) One (1) hammermill feed conveyor, identified as P16, with a maximum throughput rate of 280 tons per hour.

(2) Four (4) hammermills, identified as P17 through P20, each with a maximum throughput rate of 168 tons per hour.

(d) One (1) fermentation process, approved for construction in 2007, with a maximum throughput rate of 84,300 gallons of ethanol per hour, controlled by scrubber C40, exhausting through stack S40, and consisting of the following:

(1) Seven (7) fermenters, identified as P21 through P27.

(2) One (1) beer well, identified as P28.

Under NSPS, Subpart VV, the pumps, compressors, pressure relief devices in gas/vapor service, sampling connection systems, open-ended valves or lines, and valves of this process are considered to be affected facilities.

(e) Two (2) thermal oxidizers with heat recovery steam generator (TO/HRSG) systems, identified as C10 and C11, approved for construction in 2007, each with a maximum heat input capacity of 122 MMBtu/hr, using natural gas and process waste gases from the DDGS dryers as fuels, and with emissions exhausted through stack S10. Under NSPS, Subpart Db, TO/HRSG systems C10 and C11 are considered Industrial-Commercial-Institutional Steam Generating Units.

(f) One (1) distillation process, approved for construction in 2007, with a maximum throughput rate of 13,719 gallons of ethanol per hour, controlled by TO/HRSG systems C10 and C11, exhausting through stack S10, and consisting of the following:

(1) One (1) mixer, identified as P29.

(2) Two (2) slurry tanks, identified as P30 and P31.

(3) One (1) cook tube, identified as P32.

(4) One (1) flash tank, identified as P33.

(5) One (1) receiving tank, identified as P34.

(6) Four (4) liquefaction tanks, identified as P35 through P38.

(7) Two (2) yeast tanks, identified as P39 and P40.

(8) One (1) beer column, identified as P41.

(9) One (1) side stripper, identified as P42.

(10) One (1) rectifier column, identified as P43.

(11) One (1) 190 proof condenser, identified as P44.

(12) Molecular sieves, identified as P45.

(13) One (1) 200 proof condenser, identified as P46.

(14) Six (6) centrifuges, identified as P47 through P52.

(15) Eight (8) evaporators, identified as P53 through P60.

Under NSPS, Subpart VV, the pumps, compressors, pressure relief devices in gas/vapor service, sampling connection systems, open-ended valves or lines, and valves of this process are considered to be affected facilities.

(g) Four (4) natural gas fired DDGS dryers, identified as P01 through P04, approved for construction in 2007, each with a maximum heat input rate of 45 MMBtu/hr and a maximum throughput rate of 21 tons of DDGS per hour, controlled by TO/HRSG systems C10 and C11, and exhausting to stack S10. The combined DDGS throughput rate for all the dryers is 45 tons per hour.

(h) One (1) DDGS cooling drum, identified as P65, approved for construction in 2007, with a maximum throughput rate of 45 tons/hr of DDGS. 35,000 acfm of the exhaust from this unit is controlled by TO/HRSG systems which vents to Stack S10, and the remaining air stream (15,000 acfm) is controlled by baghouse C70 which vents to stack S70.

(i) One (1) DDGS handling and loadout operation, approved for construction in 2007, with a maximum throughput rate of 204 tons per hour, controlled by baghouse C90, exhausting to stack S90, and consisting of the following:

(1) Two (2) DDGS storage silos, identified as P67 and P68.

(2) One (1) DDGS dump pit, identified as P69.

(3) One (1) DDGS loadout spout, identified as P70, controlled by a choked flow system.

(j) One (1) ethanol loading rack for trucks or railcars, identified as P66, approved for construction in 2007, with a maximum throughput rate of 36,000 gallons per hour for truck loading and a maximum throughput rate of 72,000 gallons per hour for railcar loading, controlled by open flare C50, which is fueled by natural gas and has a maximum heat input capacity of 12.4 MMBtu/hr, and exhausts through stack S50. Under NSPS, Subpart VV, the pumps, compressors, pressure relief devices in gas/vapor service, sampling connection systems, open-ended valves or lines, and valves of this rack are considered to be affected facilities.

A.3 Insignificant Activities [326 IAC 2-7-1(21)][326 IAC 2-8-3(c)(3)(I)]

This stationary source also includes the following insignificant activities:

(a) Vessels storing lubricating oils, hydraulic oils, machining oils, and machining fluids.

(b) Machining where an aqueous cutting coolant continuously floods the machining interface.

(c) The following equipment related to manufacturing activities not resulting in the emission of HAPs: brazing equipment, cutting torches, soldering equipment, welding equipment.

(d) Activities associated with the transportation and treatment of sanitary sewage, provided discharge to the treatment plant is under the control of the owner/operator, that is, an on-site sewage treatment facility.

(e) Forced and induced draft cooling tower system not regulated under a NESHAP, identified as F80, approved for construction in 2007. [326 IAC 2-8-4]

(f) Replacement or repair of electrostatic precipitators, bags in baghouses and filters in other air filtration equipment.

(g) Heat exchanger cleaning and repair.

(h) Paved roads and parking lots with public access. [326 IAC 6-4]

(i) Purging of gas lines and vessels that is related to routine maintenance and repair of buildings, structures, or vehicles at the source where air emissions from those activities would not be associated with any production process.

(j) Equipment used to collect any material that might be released during a malfunction, process upset, or spill cleanup, including catch tanks, temporary liquid separators, tanks, and fluid handling equipment.

(k) Blowdown for any of the following: sight glass; boiler; compressors; pumps; and cooling tower.

(l) Stationary fire pumps, including one (1) diesel fire pump, identified as P110, approved for construction in 2007, with a maximum power output rate of 300 horsepower, and exhausting to stack S110. [326 IAC 2-8-4]

(m) A laboratory as defined in 326 IAC 2-7-1(20) (D).

(n) Other emission units, not regulated by a NESHAP, with PM10, NOx, and $SO_2$ emissions less than five (5) pounds per hour or twenty-five (25) pounds per day, CO emissions less than twenty-five (25) pounds per day, VOC emissions less than three (3) pounds per hour or fifteen (15) pounds per day, lead emissions less than six-tenths (0.6) tons per year or three and twenty-nine hundredths (3.29) pounds per day, and emitting greater than one (1) pound per day but less than five (5) pounds per day or one (1) ton per year of a single HAP, or emitting greater than one (1) pound per day but less than twelve and five tenths (12.5) pounds per day or two and five tenths (2.5) tons per year of any combination of HAPs:

(1) One (1) 190 proof tank, identified as T01, approved for construction in 2007, with a maximum capacity of 200,000 gallons. Under NSPS, Subpart Kb, this tank is considered a volatile organic liquid storage vessel.

(2) One (1) 200 proof tank, identified as T02, approved for construction in 2007, with a maximum capacity of 200,000 gallons. Under NSPS, Subpart Kb, this tank is considered a volatile organic liquid storage vessel.

(3) One (1) corrosion inhibitor storage tank, identified as T03, approved for construction in 2007, with a maximum capacity of 3000 gallons.

(4) Three (3) denatured ethanol tanks, identified as T04, T05, and T06, approved for construction in 2007, each with a maximum capacity of 1,500,000 gallons. Under NSPS, Subpart Kb, these tanks are considered volatile organic liquid storage vessels.

(5) One (1) denaturant storage tank, identified as T07, approved for construction in 2007, with a maximum capacity of 200,000 gallons. Under NSPS, Subpart Kb, this tank is considered a volatile organic liquid storage vessel. [326 IAC 8-4-3]

(6) One (1) diesel storage tank, identified as T08, approved for construction in 2007, with a maximum storage capacity of 400 gallons.

(7) Four (4) biomethanators, identified as P61 through P64, approved for construction in 2007, controlled by 6.40 MMBtu/hr biomethanator flare C60, and exhausting to stack S60. [326 IAC 2-8-4]

## A.4 FESOP Applicability [326 IAC 2-8-2]

This stationary source, otherwise required to have a Part 70 permit as described in 326 IAC 2-7-2(a), has applied to the Indiana Department of Environmental Management (IDEM), Office of Air Quality (OAQ) for a Federally Enforceable State Operating Permit (FESOP).

## SECTION B GENERAL CONDITIONS

B.1 Definitions [326 IAC 2-8-1]

Terms in this permit shall have the definition assigned to such terms in the referenced regulation. In the absence of definitions in the referenced regulation, the applicable definitions found in the statutes or regulations (IC 13-11, 326 IAC 1-2 and 326 IAC 2-7) shall prevail.

B.2 Revocation of Permits [326 IAC 2-1.1-9(5)]

Pursuant to 326 IAC 2-1.1-9(5)(Revocation of Permits), the Commissioner may revoke this permit if construction is not commenced within eighteen (18) months after receipt of this approval or if construction is suspended for a continuous period of one (1) year or more.

B.3 Affidavit of Construction [326 IAC 2-5.1-3(h)][326 IAC 2-5.1-4][326 IAC 2-8]

This document shall also become the approval to operate pursuant to 326 IAC 2-5.1-4 and [326 IAC 2-8] when prior to the start of operation, the following requirements are met:

(a) The attached Affidavit of Construction shall be submitted to the Office of Air Quality (OAQ), verifying that the emission units were constructed as proposed in the application or the permit. The emission units covered in this permit may begin operating on the date the Affidavit of Construction is postmarked or hand delivered to IDEM if constructed as proposed.

(b) If actual construction of the emission units differs from the construction proposed in the application, the source may not begin operation until the permit has been revised pursuant to 326 IAC 2 and an Operation Permit Validation Letter is issued.

(c) The Permittee shall attach the Operation Permit Validation Letter received from the Office of Air Quality (OAQ) to this permit.

B.4 Permit Term [326 IAC 2-8-4(2)][326 IAC 2-1.1-9.5][IC 13-15-3-6(a)]

(a) This permit, 135-23226-00033, is issued for a fixed term of five (5) years from the issuance date of this permit, as determined in accordance with IC 4-21.5-3-5(f) and IC 13-15-5-3. Subsequent revisions, modifications, or amendments of this permit do not affect the expiration date of this permit.

(b) If IDEM, OAQ, upon receiving a timely and complete renewal permit application, fails to issue or deny the permit renewal prior to the expiration date of this permit, this existing permit shall not expire and all terms and conditions shall continue in effect, until the renewal permit has been issued or denied.

B.5 Term of Conditions [326 IAC 2-1.1-9.5]

Notwithstanding the permit term of a permit to construct, a permit to operate, or a permit modification, any condition established in a permit issued pursuant to a permitting program approved in the state implementation plan shall remain in effect until:

(a) the condition is modified in a subsequent permit action pursuant to Title I of the Clean Air Act; or

(b) the emission unit to which the condition pertains permanently ceases operation.

B.6 Enforceability [326 IAC 2-8-6]

(a) Unless otherwise stated, all terms and conditions in this permit, including any provisions designed to limit the source's potential to emit, are enforceable by IDEM, the United States Environmental Protection Agency (U.S. EPA) and by citizens in accordance with the Clean Air Act.

(b) Unless otherwise stated, all terms and conditions in this permit that are local requirements, including any provisions designed to limit the source's

potential to emit, are enforceable by .

B.7 Severability [326 IAC 2-8-4(4)]

The provisions of this permit are severable; a determination that any portion of this permit is invalid shall not affect the validity of the remainder of the permit.

B.8 Property Rights or Exclusive Privilege [326 IAC 2-8-4(5)(D)]

This permit does not convey any property rights of any sort or any exclusive privilege.

B.9 Duty to Provide Information [326 IAC 2-8-4(5)(E)]

(a) The Permittee shall furnish to IDEM, OAQ , within a reasonable time, any information that IDEM, OAQ may request in writing to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The submittal by the Permittee does require the certification by an "authorized individual" as defined by 326 IAC 2-1.1-1(1). Upon request, the Permittee shall also furnish to IDEM, OAQ copies of records required to be kept by this permit.

(b) For information furnished by the Permittee to IDEM, OAQ, the Permittee may include a claim of confidentiality in accordance with 326 IAC 17.1. When furnishing copies of requested records directly to U. S. EPA, the Permittee may assert a claim of confidentiality in accordance with 40 CFR 2, Subpart B.

B.10 Compliance Order Issuance [326 IAC 2-8-5(b)]

IDEM, OAQ may issue a compliance order to this Permittee upon discovery that this permit is in nonconformance with an applicable requirement. The order may require immediate compliance or contain a schedule for expeditious compliance with the applicable requirement.

B.11 Certification [326 IAC 2-8-3(d)][326 IAC 2-8-4(3)(C)(i)][326 IAC 2-8-5(1)]

(a) Where specifically designated by this permit or required by an applicable requirement, any application form, report, or compliance certification submitted shall contain certification by an "authorized individual" of truth, accuracy, and completeness. This certification shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

(b) One (1) certification shall be included, using the attached Certification Form, with each submittal requiring certification. One (1) certification may cover multiple forms in one (1) submittal.

(c) An "authorized individual" is defined at 326 IAC 2-1.1-1(1)

B.12 Annual Compliance Certification [326 IAC 2-8-5(a)(1)]

(a) The Permittee shall annually submit a compliance certification report which addresses the status of the source's compliance with the terms and conditions contained in this permit, including emission limitations, standards, or work practices. The initial certification shall cover the time period from the date of final permit issuance through December 31 of the same year. All subsequent certifications shall cover the time period from January 1 to December 31 of the previous year, and shall be submitted no later than July 1 of each year to:

Indiana Department of Environmental Management
Compliance Branch, Office of Air Quality
100 North Senate Avenue
Indianapolis, Indiana 46204-2251

(b) The annual compliance certification report required by this permit shall be considered timely if the date postmarked on the envelope or certified mail receipt, or affixed by the shipper on the private shipping receipt, is on or before the date it is due. If the document

is submitted by any other means, it shall be considered timely if received by IDEM, OAQ , on or before the date it is due.

(c) The annual compliance certification report shall include the following:

(1) The appropriate identification of each term or condition of this permit that is the basis of the certification;

(2) The compliance status;

(3) Whether compliance was continuous or intermittent;

(4) The methods used for determining the compliance status of the source, currently and over the reporting period consistent with 326 IAC 2-8-4(3); and

(5) Such other facts, as specified in Sections D of this permit, as IDEM, OAQ may require to determine the compliance status of the source.

The notification which shall be submitted by the Permittee does require the certification by an "authorized individual" as defined by 326 IAC 2-1.1-1(1).

B.13 Compliance Order Issuance [326 IAC 2-8-5(b)]

IDEM, OAQ may issue a compliance order to this Permittee upon discovery that this permit is in nonconformance with an applicable requirement. The order may require immediate compliance or contain a schedule for expeditious compliance with the applicable requirement.

B.14 Preventive Maintenance Plan [326 IAC 1-6-3][326 IAC 2-8-4(9)][326 IAC 2-8-5(a)(1)]

(a) If required by specific condition(s) in Section D of this permit, the Permittee shall prepare and maintain Preventive Maintenance Plans (PMPs) within ninety (90) days after issuance of this permit, including the following information on each facility:

(1) Identification of the individual(s) responsible for inspecting, maintaining, and repairing emission control devices;

(2) A description of the items or conditions that will be inspected and the inspection schedule for said items or conditions; and

(3) Identification and quantification of the replacement parts that will be maintained in inventory for quick replacement.

If, due to circumstances beyond the Permittee's control, the PMPs cannot be prepared and maintained within the above time frame, the Permittee may extend the date an additional ninety (90) days provided the Permittee notifies:

Indiana Department of Environmental Management
Compliance Branch, Office of Air Quality
100 North Senate Avenue
Indianapolis, Indiana 46204-2251

The PMP extension notification does not require the certification by an "authorized individual" as defined by 326 IAC 2-1.1-1(1).

(b) A copy of the PMPs shall be submitted to IDEM, OAQ upon request and within a reasonable time, and shall be subject to review and approval by IDEM, OAQ. IDEM, OAQ may require the Permittee to revise its PMPs whenever lack of proper maintenance causes or is the primary contributor to an exceedance of any limitation on emissions or potential to emit. The PMPs do not require the certification by an "authorized individual" as defined by 326 IAC 2-1.1-1(1).

(c) To the extent the Permittee is required by 40 CFR Part 60/63 to have an Operation Maintenance, and Monitoring (OMM) Plan for a unit, such Plan is deemed to satisfy the PMP requirements of 326 IAC 1-6-3 for that unit.

B.15 Emergency Provisions [326 IAC 2-8-12]

(a) An emergency, as defined in 326 IAC 2-7-1(12), is not an affirmative defense for an action brought for noncompliance with a federal or state health-based emission limitation except as provided in 326 IAC 2-8-12.

(b) An emergency, as defined in 326 IAC 2-7-1(12), constitutes an affirmative defense to an action brought for noncompliance with a health-based or technology-based emission limitation if the affirmative defense of an emergency is demonstrated through properly signed, contemporaneous operating logs or other relevant evidence that describe the following:

(1) An emergency occurred and the Permittee can, to the extent possible, identify the causes of the emergency;

(2) The permitted facility was at the time being properly operated;

(3) During the period of an emergency, the Permittee took all reasonable steps to minimize levels of emissions that exceeded the emission standards or other requirements in this permit;

(4) For each emergency lasting one (1) hour or more, the Permittee notified IDEM, OAQ, within four (4) daytime business hours after the beginning of the emergency, or after the emergency was discovered or reasonably should have been discovered;

Telephone Number: 1-800-451-6027 (ask for Office of Air Quality, Compliance Section), or
Telephone Number: 317-233-0178 (ask for Compliance Section)
Facsimile Number: 317-233-6865

(5) For each emergency lasting one (1) hour or more, the Permittee submitted the attached Emergency Occurrence Report Form or its equivalent, either by mail or facsimile to:

Indiana Department of Environmental Management
Compliance Branch, Office of Air Quality
100 North Senate Avenue
Indianapolis, Indiana 46204-2251

within two (2) working days of the time when emission limitations were exceeded due to the emergency.

The notice fulfills the requirement of 326 IAC 2-8-4(3)(C)(ii) and must contain the following:

(A) A description of the emergency;

(B) Any steps taken to mitigate the emissions; and

(C) Corrective actions taken.

The notification which shall be submitted by the Permittee does not require the certification by an "authorized individual" as defined by 326 IAC 2-1.1-1(1).

(6) The Permittee immediately took all reasonable steps to correct the emergency.

(c) In any enforcement proceeding, the Permittee seeking to establish the occurrence of an emergency has the burden of proof.

(d) This emergency provision supersedes 326 IAC 1-6 (Malfunctions). This permit condition is in addition to any emergency or upset provision contained in any applicable requirement.

(e) The Permittee seeking to establish the occurrence of an emergency shall make records available upon request to ensure that failure to implement a PMP did not cause or contribute to an exceedance of any limitations on emissions. However, IDEM, OAQ may require that the Preventive Maintenance Plans required under 326 IAC 2-8-3(c)(6) be revised in response to an emergency.

(f) Failure to notify IDEM, OAQ by telephone or facsimile of an emergency lasting more than one (1) hour in accordance with (b)(4) and (5) of this condition shall constitute a violation of 326 IAC 2-8 and any other applicable rules.

(g) Operations may continue during an emergency only if the following conditions are met:

(1) If the emergency situation causes a deviation from a technology-based limit, the Permittee may continue to operate the affected emitting facilities during the emergency provided the Permittee immediately takes all reasonable steps to correct the emergency and minimize emissions.

(2) If an emergency situation causes a deviation from a health-based limit, the Permittee may not continue to operate the affected emissions facilities unless:

(A) The Permittee immediately takes all reasonable steps to correct the emergency situation and to minimize emissions; and

(B) Continued operation of the facilities is necessary to prevent imminent injury to persons, severe damage to equipment, substantial loss of capital investment, or loss of product or raw material of substantial economic value.

Any operations shall continue no longer than the minimum time required to prevent the situations identified in (g)(2)(B) of this condition.

(h) The Permittee shall include all emergencies in the Quarterly Deviation and Compliance Monitoring Report.

B.16 Prior Permits Superseded [326 IAC 2-1.1-9.5]

(a) All terms and conditions of permits established prior to 135-23226-00033 and issued pursuant to permitting programs approved into the state implementation plan have been either:

(1) incorporated as originally stated,

(2) revised, or

(3) deleted.

(b) All previous registrations and permits are superseded by this permit.

B.17 Termination of Right to Operate [326 IAC 2-8-9][326 IAC 2-8-3(h)]

The Permittee's right to operate this source terminates with the expiration of this permit unless a timely and complete renewal application is submitted at least nine (9) months prior to the date of expiration of the source's existing permit, consistent with 326 IAC 2-8-3(h) and 326 IAC 2-8-9.

B.18 Deviations from Permit Requirements and Conditions [326 IAC 2-8-4(3)(C)(ii)]

(a) Deviations from any permit requirements (for emergencies see Section B - Emergency Provisions), the probable cause of such deviations, and any response steps or preventive measures taken shall be reported to:

Indiana Department of Environmental Management
Compliance Data Section, Office of Air Quality
100 North Senate Avenue
Indianapolis, Indiana 46204-2251

using the attached Quarterly Deviation and Compliance Monitoring Report, or its equivalent. A deviation required to be reported pursuant to an applicable requirement that exists independent of this permit, shall be reported according to the schedule stated in the applicable requirement and does not need to be included in this report.

The Quarterly Deviation and Compliance Monitoring Report do require the certification by an "authorized individual" as defined by 326 IAC 2-1.1-1(1).

(b) A deviation is an exceedance of a permit limitation or a failure to comply with a requirement of the permit.

B.19 Permit Modification, Reopening, Revocation and Reissuance, or Termination [326 IAC 2-8-4(5)(C)][326 IAC 2-8-7(a)][326 IAC 2-8-8]

(a) This permit may be modified, reopened, revoked and reissued, or terminated for cause. The filing of a request by the Permittee for a Federally Enforceable State Operating Permit modification, revocation and reissuance, or termination, or of a notification of planned changes or anticipated noncompliance does not stay any condition of this permit. [326 IAC 2-8-4(5)(C)] The notification by the Permittee does require the certification by an "authorized individual" as defined by 326 IAC 2-1.1-1(1).

(b) This permit shall be reopened and revised under any of the circumstances listed in IC 13-15-7-2 or if IDEM, OAQ, determines any of the following:

(1) That this permit contains a material mistake.

(2) That inaccurate statements were made in establishing the emissions standards or other terms or conditions.

(3) That this permit must be revised or revoked to assure compliance with an applicable requirement. [326 IAC 2-8-8(a)]

(c) Proceedings by IDEM, OAQ, to reopen and revise this permit shall follow the same procedures as apply to initial permit issuance and shall affect only those parts of this permit for which cause to reopen exists. Such reopening and revision shall be made as expeditiously as practicable. [326 IAC 2-8-8(b)]

(d) The reopening and revision of this permit, under 326 IAC 2-8-8(a), shall not be initiated before notice of such intent is provided to the Permittee by IDEM, OAQ, at least thirty (30) days in advance of the date this permit is to be reopened, except that IDEM, OAQ, may provide a shorter time period in the case of an emergency. [326 IAC 2-8-8(c)]

B.20 Permit Renewal [326 IAC 2-8-3(h)]

(a) The application for renewal shall be submitted using the application form or forms prescribed by IDEM, OAQ, and shall include the information specified in 326 IAC 2-8-3. Such information shall be included in the application for each emission unit at this source, except those emission units included on the trivial or insignificant activities list contained

in 326 IAC 2-7-1(21) and 326 IAC 2-7-1(40). The renewal application does require the certification by an "authorized individual" as defined by 326 IAC 2-1.1-1(1).

Request for renewal shall be submitted to:

Indiana Department of Environmental Management
Permits Branch, Office of Air Quality
100 North Senate Avenue
Indianapolis, Indiana 46204-2251

(b) A timely renewal application is one that is:

(1) Submitted at least nine (9) months prior to the date of the expiration of this permit; and

(2) If the date postmarked on the envelope or certified mail receipt, or affixed by the shipper on the private shipping receipt, is on or before the date it is due. If the document is submitted by any other means, it shall be considered timely if received by IDEM, OAQ, on or before the date it is due.

(c) If the Permittee submits a timely and complete application for renewal of this permit, the source's failure to have a permit is not a violation of 326 IAC 2-8 until IDEM, OAQ takes final action on the renewal application, except that this protection shall cease to apply if, subsequent to the completeness determination, the Permittee fails to submit by the deadline specified in writing by IDEM, OAQ any additional information identified as being needed to process the application.

B.21 Permit Amendment or Revision [326 IAC 2-8-10][326 IAC 2-8-11.1]

(a) Permit amendments and revisions are governed by the requirements of 326 IAC 2-8-10 or 326 IAC 2-8-11.1 whenever the Permittee seeks to amend or modify this permit.

(b) Any application requesting an amendment or modification of this permit shall be submitted to:

Indiana Department of Environmental Management
Permits Branch, Office of Air Quality
100 North Senate Avenue
Indianapolis, Indiana 46204-2251

Any such application shall be certified by an "authorized individual" as defined by 326 IAC 2-1.1-1(1).

(c) The Permittee may implement administrative amendment changes addressed in the request for an administrative amendment immediately upon submittal of the request. [326 IAC 2-8-10(b)(3)]

B.22 Operational Flexibility [326 IAC 2-8-15][326 IAC 2-8-11.1]

(a) The Permittee may make any change or changes at the source that are described in 326 IAC 2-8-15(b) through (d) without a prior permit revision, if each of the following conditions is met:

(1) The changes are not modifications under any provision of Title I of the Clean Air Act;

(2) Any approval required by 326 IAC 2-8-11.1 has been obtained;

(3) The changes do not result in emissions which exceed the limitations provided in this permit (whether expressed herein as a rate of emissions or in terms of total emissions);

(4) The Permittee notifies the:

Indiana Department of Environmental Management
Permits Branch, Office of Air Quality
100 North Senate Avenue
Indianapolis, Indiana 46204-2251

and

United States Environmental Protection Agency, Region V
Air and Radiation Division, Regulation Development Branch - Indiana (AR-18J)
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

in advance of the change by written notification at least ten (10) days in advance of the proposed change. The Permittee shall attach every such notice to the Permittee's copy of this permit; and

(5) The Permittee maintains records on-site, on a rolling five (5) year basis, which document all such changes and emission trades that are subject to 326 IAC 2-8-15(b) through (d). The Permittee shall make such records available, upon reasonable request, for public review.

Such records shall consist of all information required to be submitted to IDEM, OAQ in the notices specified in 326 IAC 2-8-15(b)(2), (c)(1), and (d).

(b) Emission Trades [326 IAC 2-8-15(c)]
The Permittee may trade emissions increases and decreases at in the source, where the applicable SIP provides for such emission trades without requiring a permit revision, subject to the constraints of Section (a) of this condition and those in 326 IAC 2-8-15(c).

(c) Alternative Operating Scenarios Federally Enforceable State Operating Permit
The Permittee may make changes at the source within the range of alternative operating scenarios that are described in the terms and conditions of this permit in accordance with 326 IAC 2-8-4(7). No prior notification of IDEM, OAQ, or U.S. EPA is required.

(d) Backup fuel switches specifically addressed in, and limited under, Section D of this permit shall not be considered alternative operating scenarios. Therefore, the notification requirements of part (a) of this condition do not apply.

B.23 Source Modification Requirement [326 IAC 2-8-11.1]

A modification, construction, or reconstruction is governed by the requirements of 326 IAC 2326 IAC 2-8-11.1.

B.24 Inspection and Entry [326 IAC 2-8-5(a)(2)][IC 13-14-2-2][IC 13-17-3-2][IC13-30-3-1]

Upon presentation of proper identification cards, credentials, and other documents as may be required by law, and subject to the Permittee's right under all applicable laws and regulations to assert that the information collected by the agency is confidential and entitled to be treated as such, the Permittee shall allow IDEM, OAQ, U.S. EPA, or an authorized representative to perform the following:

(a) Enter upon the Permittee's premises where a FESOP source is located, or emissions related activity is conducted, or where records must be kept under the conditions of this permit;

(b) As authorized by the Clean Air Act, IC 13-14-2-2, IC 13-17-3-2, and IC 13-30-3-1, have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

(c) As authorized by the Clean Air Act, IC 13-14-2-2, IC 13-17-3-2, and IC 13-30-3-1, inspect, at reasonable times, any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under this permit;

(d) As authorized by the Clean Air Act, IC 13-14-2-2, IC 13-17-3-2, and IC 13-30-3-1, sample or monitor, at reasonable times, substances or parameters for the purpose of assuring compliance with this permit or applicable requirements; and

(e) As authorized by the Clean Air Act, IC 13-14-2-2, IC 13-17-3-2, and IC 13-30-3-1, utilize any photographic, recording, testing, monitoring, or other equipment for the purpose of assuring compliance with this permit or applicable requirements.

B.25 Transfer of Ownership or Operational Control [326 IAC 2-8-10]

(a) The Permittee must comply with the requirements of 326 IAC 2-8-10 whenever the Permittee seeks to change the ownership or operational control of the source and no other change in the permit is necessary.

(b) Any application requesting a change in the ownership or operational control of the source shall contain a written agreement containing a specific date for transfer of permit responsibility, coverage and liability between the current and new Permittee. The application shall be submitted to:

Indiana Department of Environmental Management
Permits Branch, Office of Air Quality
100 North Senate Avenue
Indianapolis, Indiana 46204-2251

The application which shall be submitted by the Permittee does require the certification by an "authorized individual" as defined by 326 IAC 2-1.1-1(1).

(c) The Permittee may implement administrative amendment changes addressed in the request for an administrative amendment immediately upon submittal of the request. [326 IAC 2-8-10(b)(3)]

B.26 Annual Fee Payment [326 IAC 2-7-19] [326 IAC 2-8-4(6)] [326 IAC 2-8-16][326 IAC 2-1.1-7]

(a) The Permittee shall pay annual fees to IDEM, OAQ, within thirty (30) calendar days of receipt of a billing. Pursuant to 326 IAC 2-7-19(b), if the Permittee does not receive a bill from IDEM, OAQ, the applicable fee is due April 1 of each year.

(b) Failure to pay may result in administrative enforcement action or revocation of this permit.

(c) The Permittee may call the following telephone numbers: 1-800-451-6027 or 317-233-4230 (ask for OAQ, Billing, Licensing, and Training Section), to determine the appropriate permit fee.

B.27 Credible Evidence [326 IAC 2-8-4(3)][326 IAC 2-8-5][62 FR 8314] [326 IAC 1-1-6]

For the purpose of submitting compliance certifications or establishing whether or not the Permittee has violated or is in violation of any condition of this permit, nothing in this permit shall preclude the use, including the exclusive use, of any credible evidence or information relevant to whether the Permittee would have been in compliance with the condition of this permit if the appropriate performance or compliance test or procedure had been performed.

**SECTION C SOURCE OPERATION CONDITIONS**

Entire Source

**Emission Limitations and Standards [326 IAC 2-8-4(1)]**

C.1 Particulate Emission Limitations For Processes with Process Weight Rates Less Than One Hundred (100) Pounds per Hour [326 IAC 6-3-2]

Pursuant to 326 IAC 6-3-2(e)(2), particulate emissions from any process not exempt under 326 IAC 6-3-1(b) or (c) which has a maximum process weight rate less than 100 pounds per hour and the methods in 326 IAC 6-3-2(b) through (d) do not apply shall not exceed 0.551 pounds per hour.

C.2 Overall Source Limit [326 IAC 2-8]

The purpose of this permit is to limit this source's potential to emit to less than major source levels for the purpose of Section 502(a) of the Clean Air Act.

(a) Pursuant to 326 IAC 2-8:

(1) The potential to emit any regulated pollutant, except particulate matter (PM), from the entire source shall be limited to less than one-hundred (100) tons per twelve (12) consecutive month period. This limitation shall also make the requirements of 326 IAC 2-2 (Prevention of Significant Deterioration (PSD)) not applicable;

(2) The potential to emit any individual hazardous air pollutant (HAP) from the entire source shall be limited to less than ten (10) tons per twelve (12) consecutive month period; and

(3) The potential to emit any combination of HAPs from the entire source shall be limited to less than twenty-five (25) tons per twelve (12) consecutive month period.

(b) The potential to emit particulate matter (PM) from the entire source shall be limited to less than one-hundred (100) tons per twelve (12) consecutive month period. This limitation shall make the requirements of 326 IAC 2-2 (Prevention of Significant Deterioration (PSD) not applicable.

(c) This condition shall include all emission points at this source including those that are insignificant as defined in 326 IAC 2-7-1(21). The source shall be allowed to add insignificant activities not already listed in this permit, provided that the source's potential to emit does not exceed the above specified limits.

(d) Section D of this permit contains independently enforceable provisions to satisfy this requirement.

C.3 Opacity [326 IAC 5-1]

Pursuant to 326 IAC 5-1-2 (Opacity Limitations), except as provided in 326 IAC 5-1-3 (Temporary Alternative Opacity Limitations), opacity shall meet the following, unless otherwise stated in this permit:

(a) Opacity shall not exceed an average of forty percent (40%) in any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.

(b) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of fifteen (15) minutes (sixty (60) readings as measured according to 40 CFR 60, Appendix A,

Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a continuous opacity monitor) in a six (6) hour period.

C.4 Open Burning [326 IAC 4-1] [IC 13-17-9]

The Permittee shall not open burn any material except as provided in 326 IAC 4-1-3, 326 IAC 4-1-4 or 326 IAC 4-1-6. The previous sentence notwithstanding, the Permittee may open burn in accordance with an open burning approval issued by the Commissioner under 326 IAC 4-1-4.1.

C.5 Incineration [326 IAC 4-2] [326 IAC 9-1-2]

The Permittee shall not operate an incinerator or incinerate any waste or refuse except as provided in 326 IAC 4-2 and 326 IAC 9-1-2.

C.6 Fugitive Dust Emissions [326 IAC 6-4]

The Permittee shall not allow fugitive dust to escape beyond the property line or boundaries of the property, right-of-way, or easement on which the source is located, in a manner that would violate 326 IAC 6-4 (Fugitive Dust Emissions).

C.7 Fugitive Particulate Matter Emission Limitations [326 IAC 6-5]

Pursuant to 326 IAC 6-5 (Fugitive Particulate Matter Emission Limitations), fugitive particulate matter emissions shall be controlled according to the plan submitted on August 8, 2006. The plan is included as Attachment A.

C.8 Stack Height [326 IAC 1-7]

The Permittee shall comply with the applicable provisions of 326 IAC 1-7 (Stack Height Provisions), for all exhaust stacks through which a potential (before controls) of twenty-five (25) tons per year or more of particulate matter or sulfur dioxide is emitted.

C.9 Asbestos Abatement Projects [326 IAC 14-10] [326 IAC 18] [40 CFR 61, Subpart M]

(a) Notification requirements apply to each owner or operator. If the combined amount of regulated asbestos containing material (RACM) to be stripped, removed or disturbed is at least 260 linear feet on pipes or 160 square feet on other facility components, or at least thirty-five (35) cubic feet on all facility components, then the notification requirements of 326 IAC 14-10-3 are mandatory. All demolition projects require notification whether or not asbestos is present.

(b) The Permittee shall ensure that a written notification is sent on a form provided by the Commissioner at least ten (10) working days before asbestos stripping or removal work or before demolition begins, per 326 IAC 14-10-3, and shall update such notice as necessary, including, but not limited to the following:

(1) When the amount of affected asbestos containing material increases or decreases by at least twenty percent (20%); or

(2) If there is a change in the following:

(A) Asbestos removal or demolitions start date;

(B) Removal or demolition contractor; or

(C) Waste disposal site.

(c) The Permittee shall ensure that the notice is postmarked or delivered according to the guidelines set forth in 326 IAC 14-10-3(2).

(d) The notice to be submitted shall include the information enumerated in 326 IAC 14-10-3(3).

All required notifications shall be submitted to:

Indiana Department of Environmental Management
Asbestos Section, Office of Air Quality
100 North Senate Avenue
Indianapolis, Indiana 46204-2251

The notice shall include a signed certification from the owner or operator that the information provided in this notification is correct and that only Indiana licensed workers and project supervisors will be used to implement the asbestos removal project. The notifications do not require a certification by an "authorized individual" as defined by 326 IAC 2-1.1-1(1).

(e) Procedures for Asbestos Emission Control
The Permittee shall comply with the applicable emission control procedures in 326 IAC 14-10-4 and 40 CFR 61.145(c). Per 326 IAC 14-10-1, emission control requirements are applicable for any removal or disturbance of RACM greater than three (3) linear feet on pipes or three (3) square feet on any other facility components or a total of at least 0.75 cubic feet on all facility components.

(f) Demolition and Renovation
The Permittee shall thoroughly inspect the affected facility or part of the facility where the demolition or renovation will occur for the presence of asbestos pursuant to 40 CFR 61.145(a).

(g) Indiana Accredited Asbestos Inspector
The Permittee shall comply with 326 IAC 14-10-1(a) that requires the owner or operator, prior to a renovation/demolition, to use an Indiana Accredited Asbestos Inspector to thoroughly inspect the affected portion of the facility for the presence of asbestos. The requirement to use an Indiana Accredited Asbestos inspector is not federally enforceable.

**Testing Requirements [326 IAC 2-8-4(3)]**

C.10 Performance Testing [326 IAC 3-6]

(a) Compliance testing on new emissions units shall be conducted within 60 days after achieving maximum production rate, but no later than180 days after initial start-up, if specified in Section D of this approval. All testing shall be performed according to the provisions of 326 IAC 3-6 (Source Sampling Procedures), except as provided elsewhere in this permit, utilizing any applicable procedures and analysis methods specified in 40 CFR 51, 40 CFR 60, 40 CFR 61, 40 CFR 63, 40 CFR 75, or other procedures approved by IDEM, OAQ.

A test protocol, except as provided elsewhere in this permit, shall be submitted to:

Indiana Department of Environmental Management
Compliance Data Section, Office of Air Quality
100 North Senate Avenue
Indianapolis, Indiana 46204-2251

no later than thirty-five (35) days prior to the intended test date. The protocol submitted by the Permittee does not require certification by an "authorized individual" as defined by 326 IAC 2-1.1-1(1).

(b) The Permittee shall notify IDEM, OAQ of the actual test date at least fourteen (14) days prior to the actual test date. The notification submitted by the Permittee does not require certification by an "authorized individual" as defined by 326 IAC 2-1.1-1(1).

(c) Pursuant to 326 IAC 3-6-4(b), all test reports must be received by IDEM, OAQ not later than forty-five (45) days after the completion of the testing. An extension may be granted

by IDEM, OAQ, if the Permittee submits to IDEM, OAQ, a reasonable written explanation not later than five (5) days prior to the end of the initial forty-five (45) day period.

**Compliance Requirements [326 IAC 2-1.1-11]**

C.11 Compliance Requirements [326 IAC 2-1.1-11]

The commissioner may require stack testing, monitoring, or reporting at any time to assure compliance with all applicable requirements by issuing an order under 326 IAC 2-1.1-11. Any monitoring or testing shall be performed in accordance with 326 IAC 3 or other methods approved by the commissioner or the U. S. EPA.

**Compliance Monitoring Requirements [326 IAC 2-8-4][326 IAC 2-8-5(a)(1)]**

C.12 Compliance Monitoring [326 IAC 2-8-4(3)][326 IAC 2-8-5(a)(1)]

Unless otherwise specified in this permit, all monitoring and record keeping requirements not already legally required shall be implemented within ninety (90) days of permit issuance. If required by Section D, the Permittee shall be responsible for installing any necessary equipment and initiating any required monitoring related to that equipment. If due to circumstances beyond its control, that equipment cannot be installed and operated within ninety (90) days, the Permittee may extend the compliance schedule related to the equipment for an additional ninety (90) days provided the Permittee notifies:

Indiana Department of Environmental Management
Compliance Branch, Office of Air Quality
100 North Senate Avenue
Indianapolis, Indiana 46204-2251

in writing, prior to the end of the initial ninety (90) day compliance schedule, with full justification of the reasons for the inability to meet this date.

The notification which shall be submitted by the Permittee does require the certification by an "authorized individual" as defined by 326 IAC 2-1.1-1(1).

Unless otherwise specified in the approval for the new emission unit(s), compliance monitoring for new emission units or emission units added through a permit revision shall be implemented when operation begins.

C.13 Maintenance of Continuous Emission Monitoring Equipment [326 IAC 2-7-5(3)(A)(iii)]

(a) The Permittee shall install, calibrate, maintain, and operate all necessary continuous emission monitoring systems (CEMS) and related equipment.

(b) In the event that a breakdown of a continuous emission monitoring system occurs, a record shall be made of the times and reasons of the breakdown and efforts made to correct the problem.

(c) Whenever a continuous emission monitor other than an opacity monitor is malfunctioning or will be down for calibration, maintenance, or repairs for a period of four (4) hours or more, a calibrated backup CEMS shall be brought online within four (4) hours of shutdown of the primary CEMS, and shall be operated until such time as the primary CEMS is back in operation.

(d) Nothing in this permit shall excuse the Permittee from complying with the requirements to operate a continuous emission monitoring system pursuant to 40 CFR 60, Subpart Db.

C.14 Monitoring Methods [326 IAC 3] [40 CFR 60] [40 CFR 63]

Any monitoring or testing required by Section D of this permit shall be performed according to the provisions of 326 IAC 3, 40 CFR 60, Appendix A, 40 CFR 60 Appendix B, 40 CFR 63, or other approved methods as specified in this permit.

C.15 Instrument Specifications [326 IAC 2-1.1-11] [326 IAC 2-8-4(3)][326 IAC 2-8-5(1)]

(a) When required by any condition of this permit, an analog instrument used to measure a parameter related to the operation of an air pollution control device shall have a scale such that the expected maximum reading for the normal range shall be no less than twenty percent (20%) of full scale.

(b) The Permittee may request that the IDEM, OAQ approve the use of an instrument that does not meet the above specifications provided the Permittee can demonstrate that an alternative [326 IAC 2-8-4][326 IAC 2-8-5] or other instrument specification will adequately ensure compliance with permit conditions requiring the measurement of the parameters.

**Corrective Actions and Response Steps [326 IAC 2-8-4][326 IAC 2-8-5(a)(1)]**

C.16 Risk Management Plan [326 IAC 2-8-4] [40 CFR 68]

If a regulated substance, as defined in 40 CFR 68, is present at a source in more than a threshold quantity, the Permittee must comply with the applicable requirements of 40 CFR 68.

C.17 Response to Excursions or Exceedances [326 IAC 2-8-4] [326 IAC 2-8-5]

(a) Upon detecting an excursion or exceedance, the Permittee shall restore operation of the emissions unit (including any control device and associated capture system) to its normal or usual manner of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing emissions.

(b) The response shall include minimizing the period of any startup, shutdown or malfunction and taking any necessary corrective actions to restore normal operation and prevent the likely recurrence of the cause of an excursion or exceedance (other than those caused by excused startup or shutdown conditions). Corrective actions may include, but are not limited to, the following:

(1) initial inspection and evaluation

(2) recording that operations returned to normal without operator action (such as through response by a computerized distribution control system); or

(3) any necessary follow-up actions to return operation to within the indicator range, designated condition, or below the applicable emission limitation or standard, as applicable.

(c) A determination of whether the Permittee has used acceptable procedures in response to an excursion or exceedance will be based on information available, which may include, but is not limited to, the following:

(1) monitoring results;

(2) review of operation and maintenance procedures and records;

(3) inspection of the control device, associated capture system, and the process.

(d) Failure to take reasonable response steps shall be considered a deviation from the permit.

(e) The Permittee shall maintain the following records:

(1) monitoring data;

(2) monitor performance data, if applicable; and

(3) corrective actions taken.

C.18 Actions Related to Noncompliance Demonstrated by a Stack Test [326 IAC 2-8-4][326 IAC 2-8-5]

(a) When the results of a stack test performed in conformance with Section C - Performance Testing, of this permit exceed the level specified in any condition of this permit, the Permittee shall take appropriate response actions. The Permittee shall submit a description of these response actions to IDEM, OAQ, within thirty (30) days of receipt of the test results. The Permittee shall take appropriate action to minimize excess emissions from the affected facility while the response actions are being implemented.

(b) A retest to demonstrate compliance shall be performed within one hundred twenty (120) days of receipt of the original test results. Should the Permittee demonstrate to IDEM, OAQ that retesting in one-hundred and twenty (120) days is not practicable, IDEM, OAQ may extend the retesting deadline.

(c) IDEM, OAQ reserves the authority to take any actions allowed under law in response to noncompliant stack tests.

The response action documents submitted pursuant to this condition do require the certification by an "authorized individual" as defined by 326 IAC 2-1.1-1(1).

**Record Keeping and Reporting Requirements [326 IAC 2-8-4(3)]**

C.19 General Record Keeping Requirements [326 IAC 2-8-4(3)] [326 IAC 2-8-5]

(a) Records of all required monitoring data, reports and support information required by this permit shall be retained for a period of at least five (5) years from the date of monitoring sample, measurement, report, or application. These records shall be physically present or electronically accessible at the source location for a minimum of three (3) years. The records may be stored elsewhere for the remaining two (2) years as long as they are available upon request. If the Commissioner makes a request for records to the Permittee, the Permittee shall furnish the records to the Commissioner within a reasonable time.

(b) Unless otherwise specified in this permit, all record keeping requirements not already legally required shall be implemented within ninety (90) days of permit issuance.

C.20 General Reporting Requirements [326 IAC 2-8-4(3)(C)] [326 IAC 2-1.1-11]

(a) The Permittee shall submit the attached Quarterly Deviation and Compliance Monitoring Report or its equivalent. Any deviation from permit requirements, the date(s) of each deviation, the cause of the deviation, and the response steps taken must be reported. This report shall be submitted within thirty (30) days of the end of the reporting period. The Quarterly Deviation and Compliance Monitoring Report shall include the certification by an "authorized individual" as defined by 326 IAC 2-1.1-1(1).

(b) The report required in (a) of this condition and reports required by conditions in Section D of this permit shall be submitted to:

Indiana Department of Environmental Management
Compliance Data Section, Office of Air Quality
100 North Senate Avenue
Indianapolis, Indiana 46204-2251

(c) Unless otherwise specified in this permit, any notice, report, or other submission required by this permit shall be considered timely if the date postmarked on the envelope or certified mail receipt, or affixed by the shipper on the private shipping receipt, is on or before the date it is due. If the document is submitted by any other means, it shall be considered timely if received by IDEM, OAQ, on or before the date it is due.

(d) Unless otherwise specified in this permit, all reports required in Section D of this permit shall be submitted within thirty (30) days of the end of the reporting period. All reports do require the certification by an "authorized individual" as defined by 326 IAC 2-1.1-1(1).

(e) The first report shall cover the period commencing on the date of issuance of this permit and ending on the last day of the reporting period. Reporting periods are based on calendar years, unless otherwise specified in this permit. For the purpose of this permit "calendar year" means the twelve (12) month period from January 1 to December 31 inclusive.

(f) The Permittee shall make the information required to be documented and maintained in accordance with (c) in Section C- General Record Keeping Requirements available for review upon a request for inspection by IDEM, OAQ. The general public may request this information from the IDEM, OAQ under 326 IAC 17.1.

**Stratospheric Ozone Protection**

C.21 Compliance with 40 CFR 82 and 326 IAC 22-1

Pursuant to 40 CFR 82 (Protection of Stratospheric Ozone), Subpart F, except as provided for motor vehicle air conditioners in Subpart B, the Permittee shall comply with the standards for recycling and emissions reduction:

(a) Persons opening appliances for maintenance, service, repair, or disposal must comply with the required practices pursuant to 40 CFR 82.156.

(b) Equipment used during the maintenance, service, repair, or disposal of appliances must comply with the standards for recycling and recovery equipment pursuant to 40 CFR 82.158.

(c) Persons performing maintenance, service, repair, or disposal of appliances must be certified by an approved technician certification program pursuant to 40 CFR 82.161.

**SECTION D.1 FACILITY OPERATION CONDITIONS – Grain Receiving and Handling, and DDGS Handling and Loadout Operations**

**Facility Description [326 IAC 2-8-4(10)] – Grain Receiving and Handling Processes:**

(a) Two (2) grain receiving operations, identified as P06 and P07, approved for construction in 2007, each with a maximum throughput rate of 420 tons per hour, controlled by baghouse C20 and choke flow systems, and exhausting through stack S20. This consists of one (1) truck receiving and one (1) truck and railcar receiving operations.

(b) One (1) grain handling operation, approved for construction in 2007, controlled by baghouse C20 and choked flow systems, exhausting through stack S20, and consisting of the following:

(1) One (1) grain conveyor, identified as P08, with a maximum throughput rate of 280 tons per hour.

(2) One (1) grain elevator, identified as P09, with a maximum throughput rate of 560 tons per hour.

(3) Two (2) grain storage silos, identified as P10 and P11, each with a maximum capacity of 40,000 bushels and a maximum throughput rate of 118 tons per hour.

(4) One (1) emptying conveyor, identified as P12, with a maximum throughput rate of 2,100 tons per hour.

(5) One (1) grain elevator, identified as P13, with a maximum throughput rate of 280 tons per hour.

(6) Two (2) grain day bins, identified as P14 and P15, each with a maximum capacity of 18,000 bushels and a maximum throughput rate of 118 tons per hour.

(7) Two (2) grain scalpers, identified as P71 and P72, each with a maximum throughput rate of 168 tons per hour.

(c) One (1) grain milling operation, approved for construction in 2007, controlled by baghouse C30, exhausting through stack S30, and consisting of the following:

(1) One (1) hammermill feed conveyor, identified as P16, with a maximum throughput rate of 280 tons per hour.

(2) Four (4)hammermills, identified as P17 through P20, each with a maximum throughput rate of 168 tons per hour.

(i) One (1) DDGS handling and loadout operation, approved for construction in 2007, with a maximum throughput rate of 204 tons per hour, controlled by baghouse C90, exhausting to stack S90, and consisting of the following:

(1) Two (2) DDGS storage silos, identified as P67 and P68.

(2) One (1) DDGS dump pit, identified as P69.

(3) One (1) DDGS loadout spout, identified as P70, controlled by a choked flow system.

**Insignificant Activity:**

(h) Paved roads and parking lots with public access. [326 IAC 6-4]

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

THIS SECTION OF THE PERMIT IS BEING ISSUED UNDER THE PROVISIONS OF 326 IAC 2 AND 326 IAC 2-8-11.1, WITH CONDITIONS LISTED BELOW.

### *Construction Conditions*

**General Construction Conditions**

D.1.1 Permit No Defense

This permit to construct does not relieve the Permittee of the responsibility to comply with the provisions of the Indiana Environmental Management Law (IC 13-11 through 13-20; 13-22 through 13-25; and 13-30), the Air Pollution Control Law (IC 13-17) and the rules promulgated there under, as well as other applicable local, state, and federal requirements.

**Effective Date of the Permit**

D.1.2 Effective Date of the Permit [IC13-15-5-3]

Pursuant to IC 13-15-5-3, this section of this permit becomes effective upon its issuance.

D.1.3 Modification to Construction Conditions [326 IAC 2]

All requirements of these construction conditions shall remain in effect unless modified in a manner consistent with procedures established for revisions pursuant to 326 IAC 2.

### *Operation Conditions*

**Emission Limitations and Standards [326 IAC 2-8-4(1)]**

D.1.4 PM and PM10 Emissions [326 IAC 2-2] [326 IAC 2-8-4]

(a) The PM and PM10 emissions from the following units shall not exceed the emission limits listed in the table below.

| Unit ID | Unit Description | Baghouse ID | PM/PM10 Emission Limit (lbs/hr) |
|---|---|---|---|
| P06 through P15, P71 and P72 | Grain Receiving and Handling Operations | C20 | 2.06 |
| P16 through P20 | Grain Milling Operations | C30 | 1.20 |
| P67 through P70 | DDGS Handling and Loadout Operations | C90 | 0.39 |

(b) The total grain received shall not exceed 1,100,000 tons per twelve (12) consecutive month period with compliance determined at the end of each month.

(c) The total DDGS produced shall not exceed 356,800 tons per twelve (12) consecutive month period with compliance determined at the end of each month.

(d) The Permittee shall use periodic sweeping to control PM/PM10 emissions from the paved roads. The sweeping shall be applied in a manner and at a frequency sufficient to ensure compliance with 326 IAC 2-2.

(e) For truck receiving operation, the Permittee shall use only hopper trucks.

(f) The Permittee shall use choked flow systems for the grain receiving and handling operations, and the DDGS loadout spout.

Combined with the PM/PM10 emissions from other emission units, the PM/PM10 emissions from the entire source are limited to less than 100 tons/yr. Therefore, the requirements of 326 IAC 2-7 (Part 70 Program) and 326 IAC 2-2 (PSD) are not applicable.

D.1.5 Particulate Emission Limitations [326 IAC 6-3-2]

Pursuant to 326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes), particulate emissions from each of following operations shall not exceed the pound per hour limits listed in the table below:

| Unit ID | Unit Description | Max. Throughput Rate (tons/hr) | Particulate Emission Limit (lbs/hr) |
|---|---|---|---|
| P06 and P07 | Each of the Grain Receiving Operations | 420 | 66.9 |
| P08 | Grain Conveyor | 280 | 62.2 |
| P09 | Grain Elevator | 560 | 70.3 |
| P10 and P11 | Each Grain Storage Silo | 118 | 53.0 |
| P12 | Emptying Conveyor | 2,100 | 87.6 |
| P13 | Grain Elevator | 280 | 62.2 |
| P14 and P15 | Each Grain Day Bin | 118 | 53.0 |
| P71 and P72 | Each Grain Scalper | 168 | 56.6 |
| P16 | Hammermill Feed Conveyor | 280 | 62.2 |
| P17 through P20 | Each Hammermill | 168 | 56.6 |
| P67 and P68 | DDGS Storage Silo | 204 | 58.7 |
| P69 | DDGS Dump Pit | 204 | 58.7 |
| P70 | DDGS Loadout Spout | 204 | 58.7 |

The pounds per hour limitations were calculated using the following equation:

Interpolation and extrapolation of the data for the process weight rate in excess of sixty thousand (60,000) pounds per hour shall be accomplished by use of the equation:

$E = 55.0\ P^{0.11} - 40$ where E = rate of emission in pounds per hour; and
P = process weight rate in tons per hour

Pursuant to 326 IAC 6-3-2(e)(3), when the process weight exceeds 200 tons per hour, the maximum allowable emissions may exceed the emission limits shown in the table above, provided the concentration of particulate matter in the gas discharged to the atmosphere is less than 0.10 pounds per 1,000 pounds of gases.

D.1.6 Preventive Maintenance Plan [326 IAC 2-8-4(9)]

A Preventive Maintenance Plan, in accordance with Section B - Preventive Maintenance Plan, of this permit, is required for these facilities and any control devices.

**Compliance Determination Requirements**

D.1.7 Particulate Control

(a) In order to comply with Conditions D.1.4(a) and D.1.5, each of the following emission units shall be controlled by the associated baghouse, as listed in the table below, when these units are in operation:

| Unit ID | Unit Description | Baghouse ID |
|---|---|---|
| P06 through P15, P71 and P72 | Grain Receiving and Handling Operations | C20 |
| P16 through P20 | Grain Milling Operations | C30 |
| P67 through P70 | DDGS Handling and Loadout Operations | C90 |

(b) In the event that bag failure is observed in a multi-compartment baghouse, if operations will continue for ten (10) days or more after the failure is observed before the failed units will be repaired or replaced, the Permittee shall promptly notify the IDEM, OAQ of the expected date the failed units will be repaired or replaced. The notification shall also include the status of the applicable compliance monitoring parameters with respect to normal, and the results of any response actions taken up to the time of notification.

D.1.8 Testing Requirements [326 IAC 2-8-5(a)(1), (4)] [326 IAC 2-1.1-11]

In order to demonstrate compliance with Conditions D.1.4(a) and D.1.5, the Permittee shall perform PM and PM10 testing for baghouses C20, C30, and C90 within 60 days after achieving the maximum capacity, but not later than 180 days after initial startup, utilizing methods as approved by the Commissioner. These tests shall be repeated at least once every five (5) years from the date of this valid compliance demonstration. PM-10 includes filterable and condensible PM-10. Testing shall be conducted in accordance with Section C - Performance Testing.

**Compliance Monitoring Requirements [326 IAC 2-8-4] [326 IAC 2-8-5(a)(1)]**

D.1.9 Visible Emissions Notations

(a) Visible emission notations of the baghouse stack exhausts (S20, S30, and S90) shall be performed once per day during normal daylight operations. A trained employee shall record whether emissions are normal or abnormal.

(b) For processes operated continuously, "normal" means those conditions prevailing, or expected to prevail, eighty percent (80%) of the time the process is in operation, not counting startup or shut down time.

(c) In the case of batch or discontinuous operations, readings shall be taken during that part of the operation that would normally be expected to cause the greatest emissions.

(d) A trained employee is an employee who has worked at the plant at least one (1) month and has been trained in the appearance and characteristics of normal visible emissions for that specific process.

(e) If abnormal emissions are observed, the Permittee shall take reasonable response steps in accordance with Section C- Response to Excursions or Exceedances. Failure to take response steps in accordance with Section C - Response to Excursions or Exceedances shall be considered a deviation from this permit.

D.1.10 Parametric Monitoring

The Permittee shall record the pressure drop across the baghouses used in conjunction with the grain receiving and handling operations (P06 through P15, P71 and P72), the grain milling operations (P16 through P20), and the DDGS handling and loadout operations (P67 through P70), at least once per day when these units are in operation. When for any one reading, the pressure drop across the baghouse is outside the normal range of 1.0 to 6.0 inches of water or a range established during the latest stack test, the Permittee shall take reasonable response steps in accordance with Section C - Response to Excursions or Exceedances. A pressure reading that is outside the above mentioned range is not a deviation from this permit. Failure to take response steps in accordance with Section C - Response to Excursions or Exceedances shall be considered a deviation from this permit.

The instrument used for determining the pressure shall comply with Section C - Instrument Specifications, of this permit, shall be subject to approval by IDEM, OAQ and shall be calibrated at least once every six (6) months.

D.1.11 Broken or Failed Bag Detection

(a) For a single compartment baghouse controlling emissions from a process operated continuously, a failed unit and the associated process shall be shut down immediately until the failed unit has been repaired or replaced. Operations may continue only if the event qualifies as an emergency and the Permittee satisfies the requirements of the emergency provisions of this permit (Section B - Emergency Provisions).

(b) For a single compartment baghouse controlling emissions from a batch process, the feed to the process shall be shut down immediately until the failed unit has been repaired or replaced. The emissions unit shall be shut down no later than the completion of the processing of the material in the line. Operations may continue only if the event qualifies

as an emergency and the Permittee satisfies the requirements of the emergency provisions of this permit (Section B - Emergency Provisions).

Bag failure can be indicated by a significant drop in the baghouse=s pressure reading with abnormal visible emissions, by an opacity violation, or by other means such as gas temperature, flow rate, air infiltration, leaks, dust traces or triboflows.

**Record Keeping and Reporting Requirement [326 IAC 2-8-4(3)] [326 IAC 2-8-16]**

D.1.12 Record Keeping Requirements

(a) To document compliance with Condition D.1.4(b), the Permittee shall maintain monthly records of the total amount of grain received.

(b) To document compliance with Condition D.1.4(c), the Permittee shall maintain monthly records of the amount of DDGS produced.

(c) To document compliance with Condition D.1.4(d), the Permittee shall maintain records of the dates and times that sweeping is performed on the paved roads.

(d) To document compliance with Condition D.1.9, the Permittee shall maintain records of daily visible emission notations of the baghouse stack exhausts.

(e) To document compliance with Condition D.1.10, the Permittee shall maintain daily records of the pressure drop during normal operation.

(f) All records shall be maintained in accordance with Section C - General Record Keeping Requirements, of this permit.

D.1.13 Reporting Requirements

A quarterly summary of the information to document compliance with Conditions D.1.4(b) and D.1.4(c) shall be submitted to the address listed in Section C - General Reporting Requirements, of this permit, using the reporting forms located at the end of this permit, or their equivalent, within thirty (30) days after the end of the quarter being reported. The report submitted by the Permittee does require the certification by the “authorized individual” as defined by 326 IAC 2-1.1-1(1).

## SECTION D.2 FACILITY OPERATION CONDITIONS – Fermentation Process

**Facility Description [326 IAC 2-8-4(10)]:**

(d) One (1) fermentation process, approved for construction in 2007, with a maximum throughput rate of 84,300 gallons of ethanol per hour, controlled by scrubber C40, exhausting through stack S40, and consisting of the following:

(1) Seven (7) fermenters, identified as P21 through P27.

(2) One (1) beer well, identified as P28.

Under NSPS, Subpart VV, the pumps, compressors, pressure relief devices in gas/vapor service, sampling connection systems, open-ended valves or lines, and valves of this process are considered to be affected facilities.

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

THIS SECTION OF THE PERMIT IS BEING ISSUED UNDER THE PROVISIONS OF 326 IAC 2 AND 326 IAC 2-8-11.1, WITH CONDITIONS LISTED BELOW.

### *Construction Conditions*

**General Construction Conditions**

D.2.1 Permit No Defense

This permit to construct does not relieve the Permittee of the responsibility to comply with the provisions of the Indiana Environmental Management Law (IC 13-11 through 13-20; 13-22 through 13-25; and 13-30), the Air Pollution Control Law (IC 13-17) and the rules promulgated there under, as well as other applicable local, state, and federal requirements.

**Effective Date of the Permit**

D.2.2 Effective Date of the Permit [IC13-15-5-3]

Pursuant to IC 13-15-5-3, this section of this permit becomes effective upon its issuance.

D.2.3 Modification to Construction Conditions [326 IAC 2]

All requirements of these construction conditions shall remain in effect unless modified in a manner consistent with procedures established for revisions pursuant to 326 IAC 2.

### *Operation Conditions*

**Emission Limitations and Standards [326 IAC 2-8-4(1)]**

D.2.4 VOC and HAP Emissions [326 IAC 2-2] [326 IAC 2-8-4] [326 IAC 2-4.1]

Pursuant to 326 IAC 2-8-4 (FESOP), emissions from wet scrubber C40, which is used to control the emissions from the fermentation process shall comply with the following:

(a) VOC emissions shall not exceed 11.4 pounds per hour.

(b) Acetaldehyde emissions shall not exceed 1.45 pounds per hour.

Combined with the VOC and HAP emissions from other units, the VOC emissions from the entire source are limited to less than 100 tons/yr, and the HAP emissions from the entire source are limited to less than 10 tons/yr for a single HAP and less than 25 tons/yr for total HAPs. Therefore,

the requirements of 326 IAC 2-7 (Part 70 Program), 326 IAC 2-2 (PSD), and 326 IAC 2-4.1 (MACT) are not applicable.

D.2.5 VOC Emissions [326 IAC 8-1-6]

Pursuant to 326 IAC 8-1-6 (BACT), the Permittee shall control the VOC emissions from the fermentation process with a Best Available Control Technology (BACT), which has been determined to be the following:

(a) The VOC emissions from the fermentation process shall be controlled by wet scrubber C40.

(b) The overall VOC control efficiency for the wet scrubber C40 (including the capture efficiency and absorption efficiency) shall be at least 98%, or the VOC outlet concentration shall not exceed 20 ppmv.

(c) The VOC emissions from wet scrubber C40 shall not exceed 11.4 pounds per hour.

D.2.6 Standard of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry [40 CFR Part 60, Subpart VV] [326 IAC 12]

Pursuant to 40 CFR 60, Subpart VV, the Permittee shall comply with the requirement of Section E.1 for pumps; pressure relief devices in gas/vapor service; sampling connection systems; open-ended valves or lines; and valves.

D.2.7 Preventive Maintenance Plan [326 IAC 2-8-4(9)]

A Preventive Maintenance Plan, in accordance with Section B - Preventive Maintenance Plan, of this permit, is required for these facilities and any control devices.

**Compliance Determination Requirements**

D.2.8 VOC and HAP Control

In order to comply with Conditions D.2.4 and D.2.5, wet scrubber C40 shall be in operation and control emissions from the fermentation process at all times that this process is in operation.

D.2.9 Testing Requirements [326 IAC 2-8-5(a)(1), (4)] [326 IAC 2-1.1-11]

In order to verify compliance with Conditions D.2.4 and D.2.5, the Permittee shall perform VOC (including emission rate, adsorption efficiency, and capture efficiency) and acetaldehyde testing for scrubber C40 within 60 days after achieving the maximum capacity, but not later than 180 days after initial startup, utilizing methods as approved by the Commissioner. These tests shall be repeated at least once every five (5) years from the date of this valid compliance demonstration. Testing shall be conducted in accordance with Section C - Performance Testing.

**Compliance Monitoring Requirements [326 IAC 2-8-4] [326 IAC 2-8-5(a)(1)]**

D.2.10 Parametric Monitoring

The Permittee shall monitor and record the pressure drop and flow rate of scrubber C40, at least once per day when the associated fermentation process is in operation. When for any one reading, the pressure drop across the scrubber is outside the normal range of 4.0 and 8.0 inches of water, or a range established during the latest stack test, the Permittee shall take reasonable response steps in accordance with Section C - Response to Excursions or Exceedances. When for any one reading, the flow rate of any of the scrubbers is less than the minimum of 55 gallons per minute, or a minimum established during the latest stack test, the Permittee shall take reasonable response steps in accordance with Section C - Response to Excursions or Exceedances. A pressure reading that is outside the above mention range or a flow rate that is below the above mentioned minimum is not a deviation from this permit. Failure to take response steps in accordance with Section C - Response to Excursions or Exceedances shall be considered a deviation from this permit.

The instruments used for determining the pressure drop and flow rate shall comply with Section C - Instrument Specifications, of this permit, shall be subject to approval by IDEM, OAQ, and shall be calibrated at least once every six (6) months.

D.2.11 Scrubber Detection

In the event that a scrubber malfunction has been observed:

Failed units and the associated process will be shut down immediately until the failed units have been repaired or replaced. Operations may continue only if the event qualifies as an emergency and the Permittee satisfies the requirements of the emergency provisions of this permit (Section B - Emergency Provisions). Failure to take response steps in accordance with Section C - Response to Excursions or Exceedances shall be considered a deviation from this permit.

**Record Keeping and Reporting Requirement [326 IAC 2-8-4(3)] [326 IAC 2-8-16]**

D.2.12 Record Keeping Requirements

(a) To document compliance with Condition D.2.10, the Permittee shall maintain daily records of pressure drop and flow rate for scrubber C40 during normal operation.

(b) All records shall be maintained in accordance with Section C - General Record Keeping Requirements, of this permit.

**SECTION D.3 FACILITY OPERATION CONDITIONS – TO/HRSG Systems, Distillation Process, and DDGS Dryers**

**Facility Description [326 IAC 2-8-4(10)]:**

(e) Two (2) thermal oxidizers with heat recovery steam generator (TO/HRSG) systems, identified as C10 and C11, approved for construction in 2007, each with a maximum heat input capacity of 122 MMBtu/hr, using natural gas and process waste gases from the DDGS dryers as fuels, with emissions exhausted through stack S10. Under NSPS, Subpart Db, TO/HRSG systems C10 and C11 are considered Industrial-Commercial-Institutional Steam Generating Units.

(f) One (1) distillation process, approved for construction in 2007, with a maximum throughput rate of 13,719 gallons of ethanol per hour, controlled by TO/HRSG systems C10 and C11, exhausting through stack S10, and consisting of the following:

(1) One (1) mixer, identified as P29.

(2) Two (2) slurry tanks, identified as P30 and P31.

(3) One (1) cook tube, identified as P32.

(4) One (1) flash tank, identified as P33.

(5) One (1) receiving tank, identified as P34.

(6) Four (4) liquefaction tanks, identified as P35 through P38.

(7) Two (2) yeast tanks, identified as P39 and P40.

(8) One (1) beer column, identified as P41.

(9) One (1) side stripper, identified as P42.

(10) One (1) rectifier column, identified as P43.

(11) One (1) 190 proof condenser, identified as P44.

(12) Molecular sieves, identified as P45.

(13) One (1) 200 proof condenser, identified as P46.

(14) Six (6) centrifuges, identified as P47 through P52.

(15) Eight (8) evaporators, identified as P53 through P60.

Under NSPS, Subpart VV, the pumps, compressors, pressure relief devices in gas/vapor service, sampling connection systems, open-ended valves or lines, and valves of this process are considered to be affected facilities.

(g) Four (4) natural gas fired DDGS dryers, identified as P01 through P04, approved for construction in 2007, each with a maximum heat input rate of 45 MMBtu/hr and a maximum throughput rate of 21 tons of DDGS per hour, controlled by TO/HRSG systems C10 and C11, and exhausting to stack S10. The combined DDGS throughput rate for all the dryers is 45 tons per hour.

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

THIS SECTION OF THE PERMIT IS BEING ISSUED UNDER THE PROVISIONS OF 326 IAC 2 AND 326 IAC 2-8-11.1, WITH CONDITIONS LISTED BELOW.

### *Construction Conditions*

**General Construction Conditions**

D.3.1 Permit No Defense

This permit to construct does not relieve the Permittee of the responsibility to comply with the provisions of the Indiana Environmental Management Law (IC 13-11 through 13-20; 13-22 through 13-25; and 13-30), the Air Pollution Control Law (IC 13-17) and the rules promulgated there under, as well as other applicable local, state, and federal requirements.

**Effective Date of the Permit**

D.3.2 Effective Date of the Permit [IC13-15-5-3]

Pursuant to IC 13-15-5-3, this section of this permit becomes effective upon its issuance.

D.3.3 Modification to Construction Conditions [326 IAC 2]

All requirements of these construction conditions shall remain in effect unless modified in a manner consistent with procedures established for revisions pursuant to 326 IAC 2.

### *Operation Conditions*

**Emission Limitations and Standards [326 IAC 2-8-4(1)]**

D.3.4 FESOP Limits [326 IAC 2-2] [326 IAC 2-8-4] [326 IAC 2-4.1]

The TO/HRSG systems are used to control the emissions from the distillation process, the DDGS dryers (P01 through P04), and part of the emissions from the DDGS cooling drum (P65). Both the TO/HRSG systems vent to a single stack (Stack S10). Pursuant to 326 IAC 2-8-4 (FESOP) and in order to make the requirements of 326 IAC 2-2 (PSD) not applicable, emissions from stack S10 shall not exceed the following:

(a) PM/PM10 emissions shall not exceed 6.11 lbs/hr.

(b) VOC emissions shall not exceed 5.30 lbs/hr.

(c) CO emissions shall not exceed 19.0 lbs/hr.

(d) $SO_2$ emissions shall not exceed 18.6 lbs/hr.

(e) NOx emissions shall not exceed 21.2 lbs/hr.

(f) Acetaldehyde emissions shall not exceed 0.0084 pounds per ton of DDGS produced.

Combined with the PM/PM10, VOC, $SO_2$, CO, NOx, and HAP emissions from other units, the PM/PM10, $SO_2$, VOC, CO, NOx emissions from the entire source are each limited to less than 100 tons/yr and the HAP emissions from the entire source are limited to less than 10 tons/yr for a single HAP and less than 25 tons/yr for total HAPs. Therefore, the requirements of 326 IAC 2-7 (Part 70 Program), 326 IAC 2-2 (PSD), and 326 IAC 2-4.1 (MACT) are not applicable.

D.3.5 VOC Emissions [326 IAC 8-1-6]

Pursuant to 326 IAC 8-1-6 (BACT), the Permittee shall control the VOC emissions from the DDGS dryers (P01 through P04) and the distillation process with a Best Available Control Technology (BACT), which has been determined to be the following:

(a) The VOC emissions from the DDGS dryers (P01 through P04) and the distillation process shall be controlled by TO/HRSG system C10 or C11.

(b) The overall efficiency for each of the TO/HRSG systems C10 and C11 (including the capture efficiency and destruction efficiency) shall be at least 98% or the maximum outlet VOC concentration shall not exceed 10 ppmv.

(c) The total VOC emissions from the TO/HRSG system stack (S10) shall not exceed 5.3 lbs/hr.

D.3.6 Particulate Emissions [326 IAC 6-2-4]

Pursuant to 326 IAC 6-2-4 (Particulate Emission Limitations for Sources of Indirect Heating), particulate emissions from each of the 122 MMBtu/hr TO/HRSG systems (C10 and C11) shall be limited to 0.26 pounds per MMBtu heat input.

The limit was calculated using the following equation:

$$Pt = \frac{1.09}{Q^{0.26}}$$

Where Pt = emission rate limit (lbs/MMBtu)
Q = total source heat input capacity (MMBtu/hr)

D.3.7 Particulate Emission Limitations [326 IAC 6-3-2]

Pursuant to 326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes), particulate emissions from each of the DDGS dryers shall not exceed 31.5 pounds per hour when operating at a maximum throughput rate of 21 tons per hour.

The pounds per hour limitations were calculated using the following equations:

Interpolation of the data for the process weight rate up to sixty thousand (60,000) pounds per hour shall be accomplished by use of the equation:

$E = 4.10\ P^{0.67}$ where E = rate of emission in pounds per hour; and
P = process weight rate in tons per hour

D.3.8 Standard of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry [40 CFR Part 60, Subpart VV] [326 IAC 12]

Pursuant to 40 CFR 60, Subpart VV, the Permittee shall comply with the requirement of Section E.1 for pumps; pressure relief devices in gas/vapor service; sampling connection systems; open-ended valves or lines; and valves.

D.3.9 Standard of Performance for Industrial-Commercial-Institutional Steam Generating Units [40 CFR Part 60, Subpart Db] [326 IAC 12]

Pursuant to 40 CFR Part 60, Subpart Db, the Permittee shall the requirement of Section E.2 for TO/HRSG systems C10 and C11.

D.3.10 Preventive Maintenance Plan [326 IAC 2-8-4(9)]

A Preventive Maintenance Plan, in accordance with Section B - Preventive Maintenance Plan, of this permit, is required for these facilities and any control devices.

**Compliance Determination Requirements**

D.3.11 VOC and HAP Control

In order to comply with Conditions D.3.4 and D.3.5, at least one of the TO/HRSG systems (C10 and C11) shall be in operation and control emissions from the DDGS dryers (P01 through P04) and the distillation process at all times that these units are in operation.

D.3.12 Testing Requirements [326 IAC 2-8-5(a)(1), (4)] [326 IAC 2-1.1-11 [326 IAC 2-2]

In order to demonstrate compliance with Conditions D.3.4, D.3.5, D.3.6, and D.3.7, the Permittee shall perform PM, PM10, VOC (including emission rate, destruction efficiency, and capture

efficiency), $SO_2$, CO, NOx, and Acetaldehyde testing for the TO/HRSG system stack (S10) within 60 days after achieving the maximum capacity, but not later than 180 days after initial startup, utilizing methods as approved by the Commissioner. PM-10 includes filterable and condensible PM-10. These tests shall be repeated at least once every five (5) years from the date of this valid compliance demonstration. Testing shall be conducted in accordance with Section C - Performance Testing.

**Compliance Monitoring Requirements [326 IAC 2-8-4] [326 IAC 2-8-5(a)(1)]**

D.3.13 Visible Emissions Notations

(a) Visible emission notations of the stack exhaust from the TO/HRSG system stack (S10) shall be performed once per day during normal daylight operations. A trained employee shall record whether emissions are normal or abnormal.

(b) For processes operated continuously, "normal" means those conditions prevailing, or expected to prevail, eighty percent (80%) of the time the process is in operation, not counting startup or shut down time.

(c) In the case of batch or discontinuous operations, readings shall be taken during that part of the operation that would normally be expected to cause the greatest emissions.

(d) A trained employee is an employee who has worked at the plant at least one (1) month and has been trained in the appearance and characteristics of normal visible emissions for that specific process.

(e) If abnormal emissions are observed, the Permittee shall take reasonable response steps in accordance with Section C- Response to Excursions or Exceedances. Failure to take response steps in accordance with Section C - Response to Excursions or Exceedances shall be considered a deviation from this permit.

D.3.14 Thermal Oxidizer Temperature

(a) A continuous monitoring system shall be calibrated, maintained, and operated on each of the TO/HRSG systems (C10 and C11) for measuring operating temperature. For the purpose of this condition, continuous means no less than once per minute. The output of this system shall be recorded as a 3-hour average. From the date of issuance of this permit until the approved stack test results are available, the Permittee shall operate the thermal oxidizer at or above the 3-hour average temperature of 1,400°F.

(b) The Permittee shall determine the 3-hour average temperature from the most recent valid stack test that demonstrates compliance with limits in Conditions D.3.5 and D.3.6, as approved by IDEM.

(c) On and after the date the approved stack test results are available, the Permittee shall operate the thermal oxidizer at or above the 3-hour average temperature as observed during the compliant stack test.

D.3.15 Parametric Monitoring

(a) The Permittee shall determine the appropriate duct pressure or fan amperage from the most recent valid stack test that demonstrates compliance with limits in Conditions D.3.4 and D.3.5, as approved by IDEM.

(b) The duct pressure or fan amperage shall be observed at least once per day when the TO/HRSG systems are in operation. On and after the date the approved stack test results are available, the duct pressure or fan amperage shall be maintained within the normal range as established in most recent compliant stack test.

**Record Keeping and Reporting Requirement [326 IAC 2-8-4(3)] [326 IAC 2-8-16]**

D.3.16 Record Keeping Requirements

(a) To document compliance with Condition D.3.13, the Permittee shall maintain records of daily visible emission notations of the stack S10.

(b) To document compliance with Condition D.3.14, the Permittee shall maintain continuous temperature records for the thermal oxidizer and the 3-hour average temperature used to demonstrate compliance during the most recent compliant stack test.

(c) To document compliance with Condition D.3.15, the Permittee shall maintain daily records of the duct pressure or fan amperage for the TO/HRSG systems (C10 and C11).

(d) All records shall be maintained in accordance with Section C - General Record Keeping Requirements, of this permit.

## SECTION D.4 FACILITY OPERATION CONDITIONS – DDGS Cooling Drum

**Facility Description [326 IAC 2-8-4(10)] :**

(h) One (1) DDGS cooling drum, identified as P65, approved for construction in 2007, with a maximum throughput rate of 45 tons/hr of DDGS. 35,000 acfm of the exhaust from this unit is controlled by TO/HRSG systems which vents to Stack S10, and the remaining air stream (15,000 acfm) is controlled by baghouse C70 which vents to stack S70.

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

THIS SECTION OF THE PERMIT IS BEING ISSUED UNDER THE PROVISIONS OF 326 IAC 2 AND 326 IAC 2-8-11.1, WITH CONDITIONS LISTED BELOW.

### *Construction Conditions*

**General Construction Conditions**

D.4.1 Permit No Defense

This permit to construct does not relieve the Permittee of the responsibility to comply with the provisions of the Indiana Environmental Management Law (IC 13-11 through 13-20; 13-22 through 13-25; and 13-30), the Air Pollution Control Law (IC 13-17) and the rules promulgated there under, as well as other applicable local, state, and federal requirements.

**Effective Date of the Permit**

D.4.2 Effective Date of the Permit [IC13-15-5-3]

Pursuant to IC 13-15-5-3, this section of this permit becomes effective upon its issuance.

D.4.3 Modification to Construction Conditions [326 IAC 2]

All requirements of these construction conditions shall remain in effect unless modified in a manner consistent with procedures established for revisions pursuant to 326 IAC 2.

### Operation Conditions

**Emission Limitations and Standards [326 IAC 2-8-4(1)]**

D.4.4 FESOP Limits [326 IAC 2-2] [326 IAC 2-8-4]

Pursuant to 326 IAC 2-8-4 (FESOP) and in order to render the requirements of 326 IAC 2-2 (PSD) not applicable, the Permittee shall comply with the following for the DDGS cooling drum (P65):

(a) The PM/PM10 emissions from baghouse C70 (stack S70), which is used to control part of the emissions from the DDGS cooling drum (P65), shall not exceed the 0.64 lbs/hr.

(b) The total DDGS produced shall not exceed 356,800 tons per twelve (12) consecutive month period with compliance determined at the end of each month.

(c) The VOC emissions from baghouse stack S70 shall not exceed 0.04 pounds per ton of DDGS produced in the DDGS cooling drum (P65).

Combined with the PM/PM10 and VOC emissions from other emission units, the PM/PM10 and VOC emissions from the entire source are limited to less than 100 tons/yr. Therefore, the requirements of 326 IAC 2-7 (Part 70 Program) and 326 IAC 2-2 (PSD) are not applicable.

D.4.5 Particulate Emission Limitations [326 IAC 6-3-2]

Pursuant to 326 IAC 6-3-2, particulate emissions from the DDGS cooling drum (P65) shall not exceed 43.6 pounds per hour when operating at the maximum process throughput rate of 45 tons per hour.

The pound per hour limitation was calculated using the following equation:

Interpolation and extrapolation of the data for the process weight rate in excess of sixty thousand (60,000) pounds per hour shall be accomplished by use of the equation:

$E = 55.0\ P^{0.11} - 40$ where E = rate of emission in pounds per hour; and
P = process weight rate in tons per hour

D.4.6 Preventive Maintenance Plan [326 IAC 2-8-4(9)]

A Preventive Maintenance Plan, in accordance with Section B - Preventive Maintenance Plan, of this permit, is required for this facility and any control device.

**Compliance Determination Requirements**

D.4.7 Particulate Control

(a) In order to comply with Conditions D.4.4(a) and D.4.5, Baghouse C70 shall be in operation and control emissions from the DDGS cooling drum (P65) at all times that this unit is in operation.

(b) In the event that bag failure is observed in a multi-compartment baghouse, if operations will continue for ten (10) days or more after the failure is observed before the failed units will be repaired or replaced, the Permittee shall promptly notify the IDEM, OAQ of the expected date the failed units will be repaired or replaced. The notification shall also include the status of the applicable compliance monitoring parameters with respect to normal, and the results of any response actions taken up to the time of notification.

D.4.8 Testing Requirements [326 IAC 2-8-5(a)(1), (4)] [326 IAC 2-1.1-11]

In order to demonstrate compliance with Conditions D.4.4(a), D.4.4(c), and D.4.5, the Permittee shall perform PM, PM10, and VOC testing for baghouse C70 within 60 days after achieving the maximum capacity, but not later than 180 days after initial startup, utilizing methods as approved by the Commissioner. These tests shall be repeated at least once every five (5) years from the date of this valid compliance demonstration. Testing shall be conducted in accordance with Section C - Performance Testing. PM10 includes filterable and condensible PM10.

**Compliance Monitoring Requirements [326 IAC 2-8-4] [326 IAC 2-8-5(a)(1)]**

D.4.9 Visible Emissions Notations

(a) Visible emission notations of the baghouse stack exhaust (stack S70) shall be performed once per day during normal daylight operations. A trained employee or a trained contractor shall record whether emissions are normal or abnormal.

(b) For processes operated continuously, "normal" means those conditions prevailing, or expected to prevail, eighty percent (80%) of the time the process is in operation, not counting startup or shut down time.

(c) In the case of batch or discontinuous operations, readings shall be taken during that part of the operation that would normally be expected to cause the greatest emissions.

(d) A trained employee or contractor is a person who has worked or trained at the plant at least one (1) month and has been trained in the appearance and characteristics of normal visible emissions for that specific process.

(e) If abnormal emissions are observed, the Permittee shall take reasonable response steps in accordance with Section C- Response to Excursions or Exceedances. Failure to take response steps in accordance with Section C - Response to Excursions or Exceedances shall be considered a deviation from this permit.

D.4.10 Parametric Monitoring

The Permittee shall record the pressure drop across baghouse C70, which is used in conjunction with the DDGS cooling drum (P65), at least once per day when this unit is in operation. When for any one reading, the pressure drop across the baghouse is outside the normal range of 1.0 to 6.0 inches of water or a range established during the latest stack test, the Permittee shall take reasonable response steps in accordance with Section C - Response to Excursions or Exceedances. A pressure reading that is outside the above mentioned range is not a deviation from this permit. Failure to take response steps in accordance with Section C - Response to Excursions or Exceedances shall be considered a deviation from this permit.

The instrument used for determining the pressure shall comply with Section C - Instrument Specifications, of this permit, shall be subject to approval by IDEM, OAQ and shall be calibrated at least once every six (6) months.

D.4.11 Broken or Failed Bag Detection

(a) For a single compartment baghouse controlling emissions from a process operated continuously, a failed unit and the associated process shall be shut down immediately until the failed unit has been repaired or replaced. Operations may continue only if the event qualifies as an emergency and the Permittee satisfies the requirements of the emergency provisions of this permit (Section B - Emergency Provisions).

(b) For a single compartment baghouse controlling emissions from a batch process, the feed to the process shall be shut down immediately until the failed unit has been repaired or replaced. The emissions unit shall be shut down no later than the completion of the processing of the material in the line. Operations may continue only if the event qualifies as an emergency and the Permittee satisfies the requirements of the emergency provisions of this permit (Section B - Emergency Provisions).

Bag failure can be indicated by a significant drop in the baghouse=s pressure reading with abnormal visible emissions, by an opacity violation, or by other means such as gas temperature, flow rate, air infiltration, leaks, dust traces or triboflows.

**Record Keeping and Reporting Requirement [326 IAC 2-8-4(3)] [326 IAC 2-8-16]**

D.4.12 Record Keeping Requirements

(a) To document compliance with Condition D.4.4(b), the Permittee shall maintain monthly records of the amount of DDGS produced.

(b) To document compliance with Condition D.4.9, the Permittee shall maintain records of daily visible emission notations of the baghouse stack exhaust.

(c) To document compliance with Condition D.4.10, the Permittee shall maintain daily records of pressure drop for the baghouse during normal operation.

(d) All records shall be maintained in accordance with Section C - General Record Keeping Requirements, of this permit.

D.4.13 Reporting Requirements

A quarterly summary of the information to document compliance with Condition D.4.4(b) shall be submitted to the address listed in Section C - General Reporting Requirements, of this permit, using the reporting forms located at the end of this permit, or their equivalent, within thirty (30) days after the end of the quarter being reported. The report submitted by the Permittee does require the certification by the “authorized individual” as defined by 326 IAC 2-1.1-1(1).

## SECTION D.5 FACILITY OPERATION CONDITIONS – Ethanol Loading Racks

**Facility Description [326 IAC 2-8-4(10)]:**

(j) One (1) ethanol loading rack for trucks or railcars, identified as P66, approved for construction in 2007, with a maximum throughput rate of 36,000 gallons per hour for truck loading and a maximum throughput rate of 72,000 gallons per hour for railcar loading, controlled by open flare C50, which is fueled by natural gas and has a maximum heat input capacity of 12.4 MMBtu/hr, and exhausts through stack S50. Under NSPS, Subpart VV, the pumps, compressors, pressure relief devices in gas/vapor service, sampling connection systems, open-ended valves or lines, and valves of this rack are considered to be affected facilities.

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

THIS SECTION OF THE PERMIT IS BEING ISSUED UNDER THE PROVISIONS OF 326 IAC 2 AND 326 IAC 2-8-11.1, WITH CONDITIONS LISTED BELOW.

### *Construction Conditions*

**General Construction Conditions**

D.5.1 Permit No Defense

This permit to construct does not relieve the Permittee of the responsibility to comply with the provisions of the Indiana Environmental Management Law (IC 13-11 through 13-20; 13-22 through 13-25; and 13-30), the Air Pollution Control Law (IC 13-17) and the rules promulgated there under, as well as other applicable local, state, and federal requirements.

**Effective Date of the Permit**

D.5.2 Effective Date of the Permit [IC13-15-5-3]

Pursuant to IC 13-15-5-3, this section of this permit becomes effective upon its issuance.

D.5.3 Modification to Construction Conditions [326 IAC 2]

All requirements of these construction conditions shall remain in effect unless modified in a manner consistent with procedures established for revisions pursuant to 326 IAC 2.

### *Operation Conditions*

**Emission Limitations and Standards [326 IAC 2-8-4(1)]**

D.5.4 FESOP Limits [326 IAC 2-2] [326 IAC 2-8-4] [326 IAC 2-4.1]

Pursuant to 326 IAC 2-8-4 (FESOP), the Permittee shall comply with the following:

(a) The Permittee shall use flare C50 to control the emissions from the ethanol loading rack (P66).

(b) The total denatured ethanol loaded shall not exceed 110,000,000 gallons per twelve (12) consecutive month period with compliance determined at the end of each month.

(c) The total denatured ethanol loaded into trucks shall not exceed 38,500,000 gallons per twelve (12) consecutive month period with compliance determined at the end of each month.

(d) The operating hours of the flare C50 shall not exceed 4,380 hours per twelve (12) consecutive month period with compliance determined at the end of each month.

(e) The ethanol loading rack (P66) shall utilize the submerged loading method.

(f) The railcars and trucks shall not use vapor balance services.

(g) Flare C50 shall be designed as a smokeless flare.

Combined with the VOC, CO, NOx, and HAP emissions from other units, the VOC, NOx and CO emissions from the entire source are limited to less than 100 tons/yr, and total HAP emissions from the entire source are limited to less than 10 tons/yr for a single HAP and less than 25 tons/yr for total HAPs. Therefore, the requirements of 326 IAC 2-7 (Part 70 Program), 326 IAC 2-2 (PSD), and 326 IAC 2-4.1 (MACT) are not applicable.

D.5.5 VOC Emissions [326 IAC 8-1-6]

Pursuant to 326 IAC 8-1-6 (BACT), the Permittee shall collect and control the VOC emissions from the ethanol loading rack (P66) with a Best Available Control Technology (BACT). The BACT for this unit has been determined to be the following:

(a) The VOC emissions from the ethanol loading rack (P66) shall be collected and controlled by flare C50 when this unit is in operation.

(b) The overall efficiency for flare C50 (including the capture efficiency and destruction efficiency) shall be at least 98%.

(c) The VOC emissions from flare C50 shall not exceed 0.78 lbs/hr.

D.5.6 Standard of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry [40 CFR Part 60, Subpart VV] [326 IAC 12]

Pursuant to 40 CFR 60, Subpart VV, the Permittee shall comply with the requirement of Section E.1 for pumps; pressure relief devices in gas/vapor service; sampling connection systems; open-ended valves or lines; and valves.

D.5.7 Preventive Maintenance Plan [326 IAC 2-8-4(9)]

A Preventive Maintenance Plan, in accordance with Section B - Preventive Maintenance Plan, of this permit, is required for this facility and any control device.

**Compliance Determination Requirements**

D.5.8 VOC and HAP Control

In order to comply with Conditions D.5.5 and D.5.6, open flare C50 shall be in operation and control emissions from the ethanol loading rack (P66) at all times when this rack is in operation.

**Compliance Monitoring Requirements [326 IAC 2-8-4] [326 IAC 2-8-5(a)(1)]**

D.5.9 Flare Pilot Flame

In order to comply with Conditions D.5.5 and D.5.6, the Permittee shall monitor the presence of a flare pilot flame using a thermocouple or other equivalent device to detect the presence of a flame when ethanol loading rack P66 is in operation.

**Record Keeping and Reporting Requirement [326 IAC 2-8-4(3)] [326 IAC 2-8-16]**

D.5.10 Record Keeping Requirements

(a) To document compliance with Condition D.5.4 (b), the Permittee shall maintain monthly records of the total amount of denatured ethanol loaded out.

(b) To document compliance with Condition D.5.4 (c), the Permittee shall maintain monthly records of the amount of denatured ethanol loaded into trucks.

(c) To document compliance with Condition D.5.4 (d), the Permittee shall maintain monthly records of the operating hours for the ethanol loading rack (P66).

(b) To document compliance with Condition D.5.10, the Permittee shall maintain records of temperature or other parameters sufficient to demonstrate the presence of a pilot flame when loading rack P66 is in operation.

(e) All records shall be maintained in accordance with Section C - General Record Keeping Requirements, of this permit.

D.5.11 Reporting Requirements

A quarterly summary of the information to document compliance with Conditions D.5.4(b), D.5.5(c), and D.5.5(d) shall be submitted to the address listed in Section C - General Reporting Requirements, of this permit, using the reporting forms located at the end of this permit, or their equivalent, within thirty (30) days after the end of the quarter being reported. The report submitted by the Permittee does require the certification by the "authorized individual" as defined by 326 IAC 2-1.1-1(1).

## SECTION D.6 FACILITY OPERATION CONDITIONS – Fire Pump and Biomethanator

**Facility Description [326 IAC 2-8-4(10)]: Insignificant Activities**

(l) Stationary fire pumps, including one (1) diesel fire pump, identified as P110, approved for construction in 2007, with a maximum power output rate of 300 horsepower, and exhausting to stack S110. [326 IAC 2-8-4]

(n) Other emission units, not regulated by a NESHAP, with PM10, NOx, and $SO_2$ emissions less than five (5) pounds per hour or twenty-five (25) pounds per day, CO emissions less than twenty-five (25) pounds per day, VOC emissions less than three (3) pounds per hour or fifteen (15) pounds per day, lead emissions less than six-tenths (0.6) tons per year or three and twenty-nine hundredths (3.29) pounds per day, and emitting greater than one (1) pound per day but less than five (5) pounds per day or one (1) ton per year of a single HAP, or emitting greater than one (1) pound per day but less than twelve and five tenths (12.5) pounds per day or two and five tenths (2.5) tons per year of any combination of HAPs:

(7) Four (4) biomethanators, identified as P61 through P64, approved for construction in 2007, controlled by 6.40 MMBtu/hr biomethanator flare C60, and exhausting to stack S60. [326 IAC 2-8-4]

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

**Emission Limitations and Standards [326 IAC 2-8-4(1)]**

D.6.1 FESOP Limits [326 IAC 2-2] [326 IAC 2-8-4] [326 IAC 2-4.1]

Pursuant to 326 IAC 2-8-4 (FESOP), the Permittee shall comply with the following:

(a) The operating hours for the diesel fire pump (P110) shall not exceed 500 hours per twelve (12) consecutive month period with compliance determined at the end of each month.

(b) The biomethanator flare (C60) shall not operate when any of the DDGS dryers (P01 through P04) are in operation.

(c) CO emissions from diesel fire pump P110 shall not exceed 6.68E-03 lbs/hp-hr.

(d) Biomethanator flare C60 shall be designed as a smokeless flare.

Combined with the CO and NOx emissions from other emission units, the CO and NOx emissions from the entire source are each limited to less than 100 tons/yr. Therefore, the requirements of 326 IAC 2-7 (Part 70 Program) and 326 IAC 2-2 (PSD) are not applicable.

**Record Keeping and Reporting Requirement [326 IAC 2-8-4(3)] [326 IAC 2-8-16]**

D.6.2 Record Keeping Requirements

(a) To document compliance with Condition D.6.1 (a), the Permittee shall maintain monthly records of the operating hours for the diesel fire pump (P110).

(b) To document compliance with Condition D.6.1 (b), the Permittee shall maintain records of the time periods while DDGS are not in operation and the time period while biomethanator flare C60 is in operation.

(c) All records shall be maintained in accordance with Section C - General Record Keeping Requirements, of this permit.

### D.6.3 Reporting Requirements

A quarterly summary of the information to document compliance with Condition D.6.1(a) shall be submitted to the address listed in Section C - General Reporting Requirements, of this permit, using the reporting forms located at the end of this permit, or their equivalent, within thirty (30) days after the end of the quarter being reported. The report submitted by the Permittee does require the certification by the "authorized individual" as defined by 326 IAC 2-1.1-1(1).

## SECTION D.7 FACILITY OPERATION CONDITIONS – Storage Tanks

**Facility Description [326 IAC 2-8-4(10)]:**

**Insignificant Activities**

(n) Other emission units, not regulated by a NESHAP, with PM10, NOx, and $SO_2$ emissions less than five (5) pounds per hour or twenty-five (25) pounds per day, CO emissions less than twenty-five (25) pounds per day, VOC emissions less than three (3) pounds per hour or fifteen (15) pounds per day, lead emissions less than six-tenths (0.6) tons per year or three and twenty-nine hundredths (3.29) pounds per day, and emitting greater than one (1) pound per day but less than five (5) pounds per day or one (1) ton per year of a single HAP, or emitting greater than one (1) pound per day but less than twelve and five tenths (12.5) pounds per day or two and five tenths (2.5) tons per year of any combination of HAPs:

(1) One (1) 190 proof tank, identified as T01, approved for construction in 2007, with a maximum capacity of 200,000 gallons. Under NSPS, Subpart Kb, this tank is considered a volatile organic liquid storage vessel.

(2) One (1) 200 proof tank, identified as T02, approved for construction in 2007, with a maximum capacity of 200,000 gallons. Under NSPS, Subpart Kb, this tank is considered a volatile organic liquid storage vessel.

(4) Three (3) denatured ethanol tanks, identified as T04, T05, and T06, approved for construction in 2007, each with a maximum capacity of 1,500,000 gallons. Under NSPS, Subpart Kb, these tanks are considered volatile organic liquid storage vessels.

(5) One (1) denaturant storage tank, identified as T07, approved for construction in 2007, with a maximum capacity of 200,000 gallons. Under NSPS, Subpart Kb, this tank is considered a volatile organic liquid storage vessel. [326 IAC 8-4-3]

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

**Emission Limitations and Standards [326 IAC 2-8-4(1)]**

D.7.1 Volatile Organic Compounds (VOC) [326 IAC 8-4-3]

Pursuant to 326 IAC 8-4-3, the Permittee shall comply with the following for Tank T07:

(a) Pursuant to 326 IAC 8-4-3(b)(1)(B), Tank T07 shall be maintained such that there are no visible holes, tears, or other openings in the seal or any seal fabric or materials.

(b) Pursuant to 326 IAC 8-4-3(b)(1)(C), all openings, except stub drains, shall be equipped with covers, lids, or seals such that:

(1) the cover, lid, or seal is in the closed position at all times except when in actual use;

(2) automatic bleeder vents are closed at all times except when the roof is floated off or landed on the roof leg supports; and

(3) rim vents, if provided, are set to open when the roof is being floated off the roof leg supports or at the manufacturer's recommended setting.

(c) Pursuant to 326 IAC 8-4-3(d), the Permittee shall maintain the following records for a period of two (2) years for tank T07:

(1) The types of volatile petroleum liquid stored;

(2) The maximum true vapor pressure of the liquids as stored; and

(3) The results of the inspections performed on the storage vessels.

The above records shall be made available to the IDEM, OAQ upon written request.

D.7.2 Standard of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) [40 CFR Part 60, Subpart Kb] [326 IAC 12]

Pursuant to 40 CFR Part 60, Subpart Kb, the Permittee shall the requirement of Section E.3 for Tanks T01, T02, and T04 through T07.

D.7.3 Preventive Maintenance Plan [326 IAC 2-8-4(9)]

A Preventive Maintenance Plan, in accordance with Section B - Preventive Maintenance Plan, of this permit, is required for these facilities and any control devices.

**Record Keeping and Reporting Requirement [326 IAC 2-8-4(3)] [326 IAC 2-8-16]**

D.7.4 Record Keeping Requirements

(a) To document compliance with Condition D.7.1(c), the Permittee shall maintain the following records for tank T07:

(1) The types of volatile petroleum liquid stored;

(2) The maximum true vapor pressure of the liquids as stored; and

(3) The results of the inspections performed on the storage vessels.

(b) All records shall be maintained in accordance with Section C - General Record Keeping Requirements, of this permit.

**SECTION E.1 40 CFR 60, Subpart VV - Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry**

**Facility Description [326 IAC 2-8-4(10)]:**

(d) One (1) fermentation process, approved for construction in 2007, with a maximum throughput rate of 84,300 gallons of ethanol per hour, controlled by scrubber C40, exhausting through stack S40, and consisting of the following:

(1) Seven (7) fermenters, identified as P21 through P27.

(2) One (1) beer well, identified as P28.

Under NSPS, Subpart VV, the pumps, compressors, pressure relief devices in gas/vapor service, sampling connection systems, open-ended valves or lines, and valves of this process are considered to be affected facilities.

(f) One (1) distillation process, approved for construction in 2007, with a maximum throughput rate of 13,719 gallons of ethanol per hour, controlled by TO/HRSG systems C10 and C11, exhausting through stack S10, and consisting of the following:

(1) One (1) mixer, identified as P29.

(2) Two (2) slurry tanks, identified as P30 and P31.

(3) One (1) cook tube, identified as P32.

(4) One (1) flash tank, identified as P33.

(5) One (1) receiving tank, identified as P34.

(6) Four (4) liquefaction tanks, identified as P35 through P38.

(7) Two (2) yeast tanks, identified as P39 and P40.

(8) One (1) beer column, identified as P41.

(9) One (1) side stripper, identified as P42.

(10) One (1) rectifier column, identified as P43.

(11) One (1) 190 proof condenser, identified as P44.

(12) Molecular sieves, identified as P45.

(13) One (1) 200 proof condenser, identified as P46.

(14) Six (6) centrifuges, identified as P47 through P52.

(15) Eight (8) evaporators, identified as P53 through P60.

Under NSPS, Subpart VV, the pumps, compressors, pressure relief devices in gas/vapor service, sampling connection systems, open-ended valves or lines, and valves of this process are considered to be affected facilities.

(j) One (1) ethanol loading rack for trucks or railcars, identified as P66, approved for construction in 2007, with a maximum throughput rate of 36,000 gallons per hour for truck loading and a

maximum throughput rate of 72,000 gallons per hour for railcar loading, controlled by open flare C50, which is fueled by natural gas and has a maximum heat input capacity of 12.4 MMBtu/hr, and exhausts through stack S50. Under NSPS, Subpart VV, the pumps, compressors, pressure relief devices in gas/vapor service, sampling connection systems, open-ended valves or lines, and valves of this rack are considered to be affected facilities.

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

**New Source Performance Standards (NSPS) Requirements [326 IAC 2-7-5(1)]**

E.1.1 General Provisions Relating to New Source Performance Standards [326 IAC 12-1] [40 CFR Part 60, Subpart A]

(a) Pursuant to 40 CFR 60.1, the Permittee shall comply with the provisions of 40 CFR Part 60 Subpart A – General Provisions, which are incorporated by reference as 326 IAC 12-1, except as otherwise specified in 40 CFR Part 60, Subpart VV.

(b) Pursuant to 40 CFR 60.19, the Permittee shall submit all required notifications and reports to:

Indiana Department of Environmental Management
Compliance Branch, Office of Air Quality
100 North Senate Avenue,
Indianapolis, Indiana 46204-2251

E.1.2 Standard of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry [40 CFR Part 60, Subpart VV] [326 IAC 12]

Pursuant to 40 CFR Part 60, Subpart VV, the Permittee shall comply with the provisions of Standard of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry, which are incorporated by reference as 326 IAC 12, as specified as follows:

**Subpart VV—Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry**

**Source:** 48 FR 48335, Oct. 18, 1983, unless otherwise noted.

**§ 60.480 Applicability and designation of affected facility.**

(a)(1) The provisions of this subpart apply to affected facilities in the synthetic organic chemicals manufacturing industry.

(2) The group of all equipment (defined in §60.481) within a process unit is an affected facility.

(b) Any affected facility under paragraph (a) of this section that commences construction or modification after January 5, 1981, shall be subject to the requirements of this subpart.

[48 FR 48335, Oct. 18, 1983, as amended at 49 FR 22607, May 30, 1984; 65 FR 61762, Oct. 17, 2000; 65 FR 78276, Dec. 14, 2000]

**§ 60.481 Definitions.**

As used in this subpart, all terms not defined herein shall have the meaning given them in the Act or in subpart A of part 60, and the following terms shall have the specific meanings given them.

*Capital expenditure* means, in addition to the definition in 40 CFR 60.2, an expenditure for a physical or

operational change to an existing facility that:

(a) Exceeds P, the product of the facility's replacement cost, R, and an adjusted annual asset guideline repair allowance, A, as reflected by the following equation: P = R × A, where

(1) The adjusted annual asset guideline repair allowance, A, is the product of the percent of the replacement cost, Y, and the applicable basic annual asset guideline repair allowance, B, divided by 100 as reflected by the following equation:

A = Y × (B ÷ 100);

(2) The percent Y is determined from the following equation: Y = 1.0 − 0.575 log X, where X is 1982 minus the year of construction; and

(3) The applicable basic annual asset guideline repair allowance, B, is selected from the following table consistent with the applicable subpart:

Table for Determining Applicable for B

| Subpart applicable to facility | Value of B to be used in equation |
|---|---|
| VV | 12.5 |
| DDD | 12.5 |
| GGG | 7.0 |
| KKK | 4.5 |

*Closed vent system* means a system that is not open to the atmosphere and that is composed of hard-piping, ductwork, connections, and, if necessary, flow-inducing devices that transport gas or vapor from a piece or pieces of equipment to a control device or back to a process.

*Connector* means flanged, screwed, welded, or other joined fittings used to connect two pipe lines or a pipe line and a piece of process equipment.

*Control device* means an enclosed combustion device, vapor recovery system, or flare.

*Distance piece* means an open or enclosed casing through which the piston rod travels, separating the compressor cylinder from the crankcase.

*Double block and bleed system* means two block valves connected in series with a bleed valve or line that can vent the line between the two block valves.

*Duct work* means a conveyance system such as those commonly used for heating and ventilation systems. It is often made of sheet metal and often has sections connected by screws or crimping. Hard-piping is not ductwork.

*Equipment* means each pump, compressor, pressure relief device, sampling connection system, open-ended valve or line, valve, and flange or other connector in VOC service and any devices or systems required by this subpart.

*First attempt at repair* means to take rapid action for the purpose of stopping or reducing leakage of organic material to atmosphere using best practices.

*Fuel gas* means gases that are combusted to derive useful work or heat.

*Fuel gas system* means the offsite and onsite piping and flow and pressure control system that gathers gaseous stream(s) generated by onsite operations, may blend them with other sources of gas, and transports the gaseous stream for use as fuel gas in combustion devices or in-process combustion equipment, such as furnaces and gas turbines, either singly or in combination.

*Hard-piping* means pipe or tubing that is manufactured and properly installed using good engineering judgment and standards such as ASME B31.3, Process Piping (available from the American Society of Mechanical Engineers, PO Box 2900, Fairfield, NJ 07007–2900).

*In gas/vapor service* means that the piece of equipment contains process fluid that is in the gaseous state at operating conditions.

*In heavy liquid service* means that the piece of equipment is not in gas/vapor service or in light liquid service.

*In light liquid service* means that the piece of equipment contains a liquid that meets the conditions specified in §60.485(e).

*In-situ sampling systems* means nonextractive samplers or in-line samplers.

*In vacuum service* means that equipment is operating at an internal pressure which is at least 5 kilopascals (kPa)(0.7 psia) below ambient pressure.

*In VOC service* means that the piece of equipment contains or contacts a process fluid that is at least 10 percent VOC by weight. (The provisions of §60.485(d) specify how to determine that a piece of equipment is not in VOC service.)

*Liquids dripping* mean any visible leakage from the seal including spraying, misting, clouding, and ice formation.

*Open-ended valve or line* means any valve, except safety relief valves, having one side of the valve seat in contact with process fluid and one side open to the atmosphere, either directly or through open piping.

*Pressure release* means the emission of materials resulting from system pressure being greater than set pressure of the pressure relief device.

*Process improvement* means routine changes made for safety and occupational health requirements, for energy savings, for better utility, for ease of maintenance and operation, for correction of design deficiencies, for bottleneck removal, for changing product requirements, or for environmental control.

*Process unit* means components assembled to produce, as intermediate or final products, one or more of the chemicals listed in §60.489 of this part. A process unit can operate independently if supplied with sufficient feed or raw materials and sufficient storage facilities for the product.

*Process unit shutdown* means a work practice or operational procedure that stops production from a process unit or part of a process unit. An unscheduled work practice or operational procedure that stops production from a process unit or part of a process unit for less than 24 hours is not a process unit shutdown. The use of spare equipment and technically feasible bypassing of equipment without stopping production are not process unit shutdowns.

*Quarter* means a 3-month period; the first quarter concludes on the last day of the last full month during the 180 days following initial startup.

*Repaired* means that equipment is adjusted, or otherwise altered, in order to eliminate a leak as indicated by one of the following: an instrument reading of 10,000 ppm or greater, indication of liquids dripping, or indication by a sensor that a seal or barrier fluid system has failed.

*Replacement cost* means the capital needed to purchase all the depreciable components in a facility.

*Sampling connection system* means an assembly of equipment within a process unit used during periods of representative operation to take samples of the process fluid. Equipment used to take nonroutine grab samples is not considered a sampling connection system.

*Sensor* means a device that measures a physical quantity or the change in a physical quantity such as temperature, pressure, flow rate, pH, or liquid level.

*Synthetic organic chemicals manufacturing industry* means the industry that produces, as intermediates or final products, one or more of the chemicals listed in §60.489.

*Volatile organic compounds* or VOC means, for the purposes of this subpart, any reactive organic compounds as defined in §60.2 Definitions.

[48 FR 48335, Oct. 18, 1983, as amended at 49 FR 22607, May 30, 1984; 49 FR 26738, June 29, 1984; 60 FR 43258, Aug. 18, 1995; 65 FR 61762, Oct. 17, 2000; 65 FR 78276, Dec. 14, 2000]

**§ 60.482-1 Standards: General.**

(a) Each owner or operator subject to the provisions of this subpart shall demonstrate compliance with the requirements of §§60.482–1 through 60.482–10 or §60.480(e) for all equipment within 180 days of initial startup.

(b) Compliance with §§60.482–1 to 60.482–10 will be determined by review of records and reports, review of performance test results, and inspection using the methods and procedures specified in §60.485.

(c)(1) An owner or operator may request a determination of equivalence of a means of emission limitation to the requirements of §§60.482–2, 60.482–3, 60.482–5, 60.482–6, 60.482–7, 60.482–8, and 60.482–10 as provided in §60.484.

(2) If the Administrator makes a determination that a means of emission limitation is at least equivalent to the requirements of §§60.482–2, 60.482–3, 60.482–5, 60.482–6, 60.482–7, 60.482–8, or 60.482–10, an owner or operator shall comply with the requirements of that determination.

(d) Equipment that is in vacuum service is excluded from the requirements of §§60.482–2 to 60.482–10 if it is identified as required in §60.486(e)(5).

[48 FR 48335, Oct. 18, 1983, as amended at 49 FR 22608, May 30, 1984; 65 FR 78276, Dec. 14, 2000]

**§ 60.482-2 Standards: Pumps in light liquid service.**

(a)(1) Each pump in light liquid service shall be monitored monthly to detect leaks by the methods specified in §60.485(b), except as provided in §60.482–1(c) and paragraphs (d), (e), and (f) of this section.

(2) Each pump in light liquid service shall be checked by visual inspection each calendar week for indications of liquids dripping from the pump seal.

(b)(1) If an instrument reading of 10,000 ppm or greater is measured, a leak is detected.

(2) If there are indications of liquids dripping from the pump seal, a leak is detected.

(c)(1) When a leak is detected, it shall be repaired as soon as practicable, but not later than 15 calendar

days after it is detected, except as provided in §60.482–9.

(2) A first attempt at repair shall be made no later than 5 calendar days after each leak is detected.

(d) Each pump equipped with a dual mechanical seal system that includes a barrier fluid system is exempt from the requirements of paragraph (a), *Provided* the following requirements are met:

(1) Each dual mechanical seal system is—

(i) Operated with the barrier fluid at a pressure that is at all times greater than the pump stuffing box pressure; or

(ii) Equipment with a barrier fluid degassing reservoir that is routed to a process or fuel gas system or connected by a closed vent system to a control device that complies with the requirements of §60.482–10; or

(iii) Equipped with a system that purges the barrier fluid into a process stream with zero VOC emissions to the atmosphere.

(2) The barrier fluid system is in heavy liquid service or is not in VOC service.

(3) Each barrier fluid system is equipped with a sensor that will detect failure of the seal system, the barrier fluid system, or both.

(4) Each pump is checked by visual inspection, each calendar week, for indications of liquids dripping from the pump seals.

(5)(i) Each sensor as described in paragraph (d)(3) is checked daily or is equipped with an audible alarm, and

(ii) The owner or operator determines, based on design considerations and operating experience, a criterion that indicates failure of the seal system, the barrier fluid system, or both.

(6)(i) If there are indications of liquids dripping from the pump seal or the sensor indicates failure of the seal system, the barrier fluid system, or both based on the criterion determined in paragraph (d)(5)(ii), a leak is detected.

(ii) When a leak is detected, it shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in §60.482–9.

(iii) A first attempt at repair shall be made no later than 5 calendar days after each leak is detected.

(e) Any pump that is designated, as described in §60.486(e)(1) and (2), for no detectable emission, as indicated by an instrument reading of less than 500 ppm above background, is exempt from the requirements of paragraphs (a), (c), and (d) of this section if the pump:

(1) Has no externally actuated shaft penetrating the pump housing,

(2) Is demonstrated to be operating with no detectable emissions as indicated by an instrument reading of less than 500 ppm above background as measured by the methods specified in §60.485(c), and

(3) Is tested for compliance with paragraph (e) (2) of this section initially upon designation, annually, and at other times requested by the Administrator.

(f) If any pump is equipped with a closed vent system capable of capturing and transporting any leakage

from the seal or seals to a process or to a fuel gas system or to a control device that complies with the requirements of §60.482–10, it is exempt from paragraphs (a) through (e) of this section.

(g) Any pump that is designated, as described in §60.486(f)(1), as an unsafe-to-monitor pump is exempt from the monitoring and inspection requirements of paragraphs (a) and (d)(4) through (6) of this section if:

(1) The owner or operator of the pump demonstrates that the pump is unsafe-to-monitor because monitoring personnel would be exposed to an immediate danger as a consequence of complying with paragraph (a) of this section; and

(2) The owner or operator of the pump has a written plan that requires monitoring of the pump as frequently as practicable during safe-to-monitor times but not more frequently than the periodic monitoring schedule otherwise applicable, and repair of the equipment according to the procedures in paragraph (c) of this section if a leak is detected.

(h) Any pump that is located within the boundary of an unmanned plant site is exempt from the weekly visual inspection requirement of paragraphs (a)(2) and (d)(4) of this section, and the daily requirements of paragraph (d)(5) of this section, provided that each pump is visually inspected as often as practicable and at least monthly.

[48 FR 48335, Oct. 18, 1983, as amended at 65 FR 61762, Oct. 17, 2000; 65 FR 78276, Dec. 14, 2000]

**§ 60.482-4 Standards: Pressure relief devices in gas/vapor service.**

(a) Except during pressure releases, each pressure relief device in gas/vapor service shall be operated with no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, as determined by the methods specified in §60.485(c).

(b)(1) After each pressure release, the pressure relief device shall be returned to a condition of no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, as soon as practicable, but no later than 5 calendar days after the pressure release, except as provided in §60.482–9.

(2) No later than 5 calendar days after the pressure release, the pressure relief device shall be monitored to confirm the conditions of no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, by the methods specified in §60.485(c).

(c) Any pressure relief device that is routed to a process or fuel gas system or equipped with a closed vent system capable of capturing and transporting leakage through the pressure relief device to a control device as described in §60.482–10 is exempted from the requirements of paragraphs (a) and (b) of this section.

(d)(1) Any pressure relief device that is equipped with a rupture disk upstream of the pressure relief device is exempt from the requirements of paragraphs (a) and (b) of this section, provided the owner or operator complies with the requirements in paragraph (d)(2) of this section.

(2) After each pressure release, a new rupture disk shall be installed upstream of the pressure relief device as soon as practicable, but no later than 5 calendar days after each pressure release, except as provided in §60.482–9.

[48 FR 48335, Oct. 18, 1983, as amended at 65 FR 61762, Oct. 17, 2000; 65 FR 78277, Dec. 14, 2000]

**§ 60.482-5 Standards: Sampling connection systems.**

(a) Each sampling connection system shall be equipped with a closed-purged, closed-loop, or closed-vent system, except as provided in §60.482–1(c). Gases displaced during filling of the sample container are

not required to be collected or captured.

(b) Each closed-purge, closed-loop, or closed-vent system as required in paragraph (a) of this section shall comply with the requirements specified in paragraphs (b)(1) through (4) of this section:

(1) Return the purged process fluid directly to the process line; or

(2) Collect and recycle the purged process fluid to a process; or

(3) Be designed and operated to capture and transport all the purged process fluid to a control device that complies with the requirements of §60.482–10; or

(4) Collect, store, and transport the purged process fluid to any of the following systems or facilities:

(i) A waste management unit as defined in 40 CFR 63.111, if the waste management unit is subject to, and operated in compliance with the provisions of 40 CFR part 63, subpart G, applicable to Group 1 wastewater streams;

(ii) A treatment, storage, or disposal facility subject to regulation under 40 CFR part 262, 264, 265, or 266; or

(iii) A facility permitted, licensed, or registered by a State to manage municipal or industrial solid waste, if the process fluids are not hazardous waste as defined in 40 CFR part 261.

(c) In situ sampling systems and sampling systems without purges are exempt from the requirements of paragraphs (a) and (b) of this section.

[60 FR 43258, Aug. 18, 1995, as amended at 65 FR 61762, Oct. 17, 2000; 65 FR 78277, Dec. 14, 2000]

**§ 60.482-6 Standards: Open-ended valves or lines.**

(a)(1) Each open-ended valve or line shall be equipped with a cap, blind flange, plug, or a second valve, except as provided in §60.482–1(c).

(2) The cap, blind flange, plug, or second valve shall seal the open end at all times except during operations requiring process fluid flow through the open-ended valve or line.

(b) Each open-ended valve or line equipped with a second valve shall be operated in a manner such that the valve on the process fluid end is closed before the second valve is closed.

(c) When a double block-and-bleed system is being used, the bleed valve or line may remain open during operations that require venting the line between the block valves but shall comply with paragraph (a) at all other times.

(d) Open-ended valves or lines in an emergency shutdown system which are designed to open automatically in the event of a process upset are exempt from the requirements of paragraphs (a), (b) and (c) of this section.

(e) Open-ended valves or lines containing materials which would autocatalytically polymerize or would present an explosion, serious overpressure, or other safety hazard if capped or equipped with a double block and bleed system as specified in paragraphs (a) through (c) of this section are exempt from the requirements of paragraphs (a) through (c) of this section.

[48 FR 48335, Oct. 18, 1983, as amended at 49 FR 22607, May 30, 1984; 65 FR 78277, Dec. 14, 2000]

**§ 60.482-7 Standards: Valves in gas/vapor service and in light liquid service.**

(a) Each valve shall be monitored monthly to detect leaks by the methods specified in §60.485(b) and shall comply with paragraphs (b) through (e), except as provided in paragraphs (f), (g), and (h), §60.483–1, 2, and §60.482–1(c).

(b) If an instrument reading of 10,000 ppm or greater is measured, a leak is detected.

(c)(1) Any valve for which a leak is not detected for 2 successive months may be monitored the first month of every quarter, beginning with the next quarter, until a leak is detected.

(2) If a leak is detected, the valve shall be monitored monthly until a leak is not detected for 2 successive months.

(d)(1) When a leak is detected, it shall be repaired as soon as practicable, but no later than 15 calendar days after the leak is detected, except as provided in §60.482–9.

(2) A first attempt at repair shall be made no later than 5 calendar days after each leak is detected.

(e) First attempts at repair include, but are not limited to, the following best practices where practicable:

(1) Tightening of bonnet bolts;

(2) Replacement of bonnet bolts;

(3) Tightening of packing gland nuts;

(4) Injection of lubricant into lubricated packing.

(f) Any valve that is designated, as described in §60.486(e)(2), for no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, is exempt from the requirements of paragraph (a) if the valve:

(1) Has no external actuating mechanism in contact with the process fluid,

(2) Is operated with emissions less than 500 ppm above background as determined by the method specified in §60.485(c), and

(3) Is tested for compliance with paragraph (f)(2) of this section initially upon designation, annually, and at other times requested by the Administrator.

(g) Any valve that is designated, as described in §60.486(f)(1), as an unsafe-to-monitor valve is exempt from the requirements of paragraph (a) if:

(1) The owner or operator of the valve demonstrates that the valve is unsafe to monitor because monitoring personnel would be exposed to an immediate danger as a consequence of complying with paragraph (a), and

(2) The owner or operator of the valve adheres to a written plan that requires monitoring of the valve as frequently as practicable during safe-to-monitor times.

(h) Any valve that is designated, as described in §60.486(f)(2), as a difficult-to-monitor valve is exempt from the requirements of paragraph (a) if:

(1) The owner or operator of the valve demonstrates that the valve cannot be monitored without elevating the monitoring personnel more than 2 meters above a support surface.

(2) The process unit within which the valve is located either becomes an affected facility through §60.14 or §60.15 or the owner or operator designates less than 3.0 percent of the total number of valves as difficult-to-monitor, and

(3) The owner or operator of the valve follows a written plan that requires monitoring of the valve at least once per calendar year.

[48 FR 48335, Oct. 18, 1983, as amended at 49 FR 22608, May 30, 1984; 65 FR 61762, Oct. 17, 2000]

**§ 60.482-8 Standards: Pumps and valves in heavy liquid service, pressure relief devices in light liquid or heavy liquid service, and connectors.**

(a) If evidence of a potential leak is found by visual, audible, olfactory, or any other detection method at pumps and valves in heavy liquid service, pressure relief devices in light liquid or heavy liquid service, and connectors, the owner or operator shall follow either one of the following procedures:

(1) The owner or operator shall monitor the equipment within 5 days by the method specified in §60.485(b) and shall comply with the requirements of paragraphs (b) through (d) of this section.

(2) The owner or operator shall eliminate the visual, audible, olfactory, or other indication of a potential leak.

(b) If an instrument reading of 10,000 ppm or greater is measured, a leak is detected.

(c)(1) When a leak is detected, it shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in §60.482–9.

(2) The first attempt at repair shall be made no later than 5 calendar days after each leak is detected.

(d) First attempts at repair include, but are not limited to, the best practices described under §60.482–7(e).

[48 CFR 48335, Oct. 18, 1983, as amended at 65 FR 78277, Dec. 14, 2000]

**§ 60.482-9 Standards: Delay of repair.**

(a) Delay of repair of equipment for which leaks have been detected will be allowed if repair within 15 days is technically infeasible without a process unit shutdown. Repair of this equipment shall occur before the end of the next process unit shutdown.

(b) Delay of repair of equipment will be allowed for equipment which is isolated from the process and which does not remain in VOC service.

(c) Delay of repair for valves will be allowed if:

(1) The owner or operator demonstrates that emissions of purged material resulting from immediate repair are greater than the fugitive emissions likely to result from delay of repair, and

(2) When repair procedures are effected, the purged material is collected and destroyed or recovered in a control device complying with §60.482–10.

(d) Delay of repair for pumps will be allowed if:

(1) Repair requires the use of a dual mechanical seal system that includes a barrier fluid system, and

(2) Repair is completed as soon as practicable, but not later than 6 months after the leak was detected.

(e) Delay of repair beyond a process unit shutdown will be allowed for a valve, if valve assembly replacement is necessary during the process unit shutdown, valve assembly supplies have been depleted, and valve assembly supplies had been sufficiently stocked before the supplies were depleted. Delay of repair beyond the next process unit shutdown will not be allowed unless the next process unit shutdown occurs sooner than 6 months after the first process unit shutdown.

[48 FR 48335, Oct. 18, 1983, as amended at 65 FR 78277, Dec. 14, 2000]

**§ 60.482-10 Standards: Closed vent systems and control devices.**

(a) Owners or operators of closed vent systems and control devices used to comply with provisions of this subpart shall comply with the provisions of this section.

(b) Vapor recovery systems (for example, condensers and absorbers) shall be designed and operated to recover the VOC emissions vented to them with an efficiency of 95 percent or greater, or to an exit concentration of 20 parts per million by volume, whichever is less stringent.

(c) Enclosed combustion devices shall be designed and operated to reduce the VOC emissions vented to them with an efficiency of 95 percent or greater, or to an exit concentration of 20 parts per million by volume, on a dry basis, corrected to 3 percent oxygen, whichever is less stringent or to provide a minimum residence time of 0.75 seconds at a minimum temperature of 816 °C.

(d) Flares used to comply with this subpart shall comply with the requirements of §60.18.

(e) Owners or operators of control devices used to comply with the provisions of this subpart shall monitor these control devices to ensure that they are operated and maintained in conformance with their designs.

(f) Except as provided in paragraphs (i) through (k) of this section, each closed vent system shall be inspected according to the procedures and schedule specified in paragraphs (f)(1) and (f)(2) of this section.

(1) If the vapor collection system or closed vent system is constructed of hard-piping, the owner or operator shall comply with the requirements specified in paragraphs (f)(1)(i) and (f)(1)(ii) of this section:

(i) Conduct an initial inspection according to the procedures in §60.485(b); and

(ii) Conduct annual visual inspections for visible, audible, or olfactory indications of leaks.

(2) If the vapor collection system or closed vent system is constructed of ductwork, the owner or operator shall:

(i) Conduct an initial inspection according to the procedures in §60.485(b); and

(ii) Conduct annual inspections according to the procedures in §60.485(b).

(g) Leaks, as indicated by an instrument reading greater than 500 parts per million by volume above background or by visual inspections, shall be repaired as soon as practicable except as provided in paragraph (h) of this section.

(1) A first attempt at repair shall be made no later than 5 calendar days after the leak is detected.

(2) Repair shall be completed no later than 15 calendar days after the leak is detected.

(h) Delay of repair of a closed vent system for which leaks have been detected is allowed if the repair is technically infeasible without a process unit shutdown or if the owner or operator determines that emissions resulting from immediate repair would be greater than the fugitive emissions likely to result from delay of repair. Repair of such equipment shall be complete by the end of the next process unit shutdown.

(i) If a vapor collection system or closed vent system is operated under a vacuum, it is exempt from the inspection requirements of paragraphs (f)(1)(i) and (f)(2) of this section.

(j) Any parts of the closed vent system that are designated, as described in paragraph (l)(1) of this section, as unsafe to inspect are exempt from the inspection requirements of paragraphs (f)(1)(i) and (f)(2) of this section if they comply with the requirements specified in paragraphs (j)(1) and (j)(2) of this section:

(1) The owner or operator determines that the equipment is unsafe to inspect because inspecting personnel would be exposed to an imminent or potential danger as a consequence of complying with paragraphs (f)(1)(i) or (f)(2) of this section; and

(2) The owner or operator has a written plan that requires inspection of the equipment as frequently as practicable during safe-to-inspect times.

(k) Any parts of the closed vent system that are designated, as described in paragraph (l)(2) of this section, as difficult to inspect are exempt from the inspection requirements of paragraphs (f)(1)(i) and (f)(2) of this section if they comply with the requirements specified in paragraphs (k)(1) through (k)(3) of this section:

(1) The owner or operator determines that the equipment cannot be inspected without elevating the inspecting personnel more than 2 meters above a support surface; and

(2) The process unit within which the closed vent system is located becomes an affected facility through §§60.14 or 60.15, or the owner or operator designates less than 3.0 percent of the total number of closed vent system equipment as difficult to inspect; and

(3) The owner or operator has a written plan that requires inspection of the equipment at least once every 5 years. A closed vent system is exempt from inspection if it is operated under a vacuum.

(l) The owner or operator shall record the information specified in paragraphs (l)(1) through (l)(5) of this section.

(1) Identification of all parts of the closed vent system that are designated as unsafe to inspect, an explanation of why the equipment is unsafe to inspect, and the plan for inspecting the equipment.

(2) Identification of all parts of the closed vent system that are designated as difficult to inspect, an explanation of why the equipment is difficult to inspect, and the plan for inspecting the equipment.

(3) For each inspection during which a leak is detected, a record of the information specified in §60.486(c).

(4) For each inspection conducted in accordance with §60.485(b) during which no leaks are detected, a record that the inspection was performed, the date of the inspection, and a statement that no leaks were detected.

(5) For each visual inspection conducted in accordance with paragraph (f)(1)(ii) of this section during which no leaks are detected, a record that the inspection was performed, the date of the inspection, and a

statement that no leaks were detected.

(m) Closed vent systems and control devices used to comply with provisions of this subpart shall be operated at all times when emissions may be vented to them.

[48 FR 48335, Oct. 18, 1983, as amended at 51 FR 2702, Jan. 21, 1986; 60 FR 43258, Aug. 18, 1995; 61 FR 29878, June 12, 1996; 65 FR 78277, Dec. 14, 2000]

**§ 60.483-1 Alternative standards for valves—allowable percentage of valves leaking.**

(a) An owner or operator may elect to comply with an allowable percentage of valves leaking of equal to or less than 2.0 percent.

(b) The following requirements shall be met if an owner or operator wishes to comply with an allowable percentage of valves leaking:

(1) An owner or operator must notify the Administrator that the owner or operator has elected to comply with the allowable percentage of valves leaking before implementing this alternative standard, as specified in §60.487(d).

(2) A performance test as specified in paragraph (c) of this section shall be conducted initially upon designation, annually, and at other times requested by the Administrator.

(3) If a valve leak is detected, it shall be repaired in accordance with §60.482–7(d) and (e).

(c) Performance tests shall be conducted in the following manner:

(1) All valves in gas/vapor and light liquid service within the affected facility shall be monitored within 1 week by the methods specified in §60.485(b).

(2) If an instrument reading of 10,000 ppm or greater is measured, a leak is detected.

(3) The leak percentage shall be determined by dividing the number of valves for which leaks are detected by the number of valves in gas/vapor and light liquid service within the affected facility.

(d) Owners and operators who elect to comply with this alternative standard shall not have an affected facility with a leak percentage greater than 2.0 percent.

[48 FR 48335, Oct. 18, 1983, as amended at 65 FR 61762, Oct. 17, 2000; 65 FR 78278, Dec. 14, 2000]

**§ 60.483-2 Alternative standards for valves—skip period leak detection and repair.**

(a)(1) An owner or operator may elect to comply with one of the alternative work practices specified in paragraphs (b)(2) and (3) of this section.

(2) An owner or operator must notify the Administrator before implementing one of the alternative work practices, as specified in §60.487(d).

(b)(1) An owner or operator shall comply initially with the requirements for valves in gas/vapor service and valves in light liquid service, as described in §60.482–7.

(2) After 2 consecutive quarterly leak detection periods with the percent of valves leaking equal to or less than 2.0, an owner or operator may begin to skip 1 of the quarterly leak detection periods for the valves in gas/vapor and light liquid service.

(3) After 5 consecutive quarterly leak detection periods with the percent of valves leaking equal to or less than 2.0, an owner or operator may begin to skip 3 of the quarterly leak detection periods for the valves in gas/vapor and light liquid service.

(4) If the percent of valves leaking is greater than 2.0, the owner or operator shall comply with the requirements as described in §60.482–7 but can again elect to use this section.

(5) The percent of valves leaking shall be determined by dividing the sum of valves found leaking during current monitoring and valves for which repair has been delayed by the total number of valves subject to the requirements of this section.

(6) An owner or operator must keep a record of the percent of valves found leaking during each leak detection period.

[48 FR 48335, Oct. 18, 1983, as amended at 65 FR 61762, Oct. 17, 2000; 65 FR 78278, Dec. 14, 2000]

**§ 60.484 Equivalence of means of emission limitation.**

(a) Each owner or operator subject to the provisions of this subpart may apply to the Administrator for determination of equivalence for any means of emission limitation that achieves a reduction in emissions of VOC at least equivalent to the reduction in emissions of VOC achieved by the controls required in this subpart.

(b) Determination of equivalence to the equipment, design, and operational requirements of this subpart will be evaluated by the following guidelines:

(1) Each owner or operator applying for an equivalence determination shall be responsible for collecting and verifying test data to demonstrate equivalence of means of emission limitation.

(2) The Administrator will compare test data for the means of emission limitation to test data for the equipment, design, and operational requirements.

(3) The Administrator may condition the approval of equivalence on requirements that may be necessary to assure operation and maintenance to achieve the same emission reduction as the equipment, design, and operational requirements.

(c) Determination of equivalence to the required work practices in this subpart will be evaluated by the following guidelines:

(1) Each owner or operator applying for a determination of equivalence shall be responsible for collecting and verifying test data to demonstrate equivalence of an equivalent means of emission limitation.

(2) For each affected facility for which a determination of equivalence is requested, the emission reduction achieved by the required work practice shall be demonstrated.

(3) For each affected facility, for which a determination of equivalence is requested, the emission reduction achieved by the equivalent means of emission limitation shall be demonstrated.

(4) Each owner or operator applying for a determination of equivalence shall commit in writing to work practice(s) that provide for emission reductions equal to or greater than the emission reductions achieved by the required work practice.

(5) The Administrator will compare the demonstrated emission reduction for the equivalent means of emission limitation to the demonstrated emission reduction for the required work practices and will consider the commitment in paragraph (c)(4).

(6) The Administrator may condition the approval of equivalence on requirements that may be necessary to assure operation and maintenance to achieve the same emission reduction as the required work practice.

(d) An owner or operator may offer a unique approach to demonstrate the equivalence of any equivalent means of emission limitation.

(e)(1) After a request for determination of equivalence is received, the Administrator will publish a notice in the Federal Register and provide the opportunity for public hearing if the Administrator judges that the request may be approved.

(2) After notice and opportunity for public hearing, the Administrator will determine the equivalence of a means of emission limitation and will publish the determination in the Federal Register.

(3) Any equivalent means of emission limitations approved under this section shall constitute a required work practice, equipment, design, or operational standard within the meaning of section 111(h)(1) of the Clean Air Act.

(f)(1) Manufacturers of equipment used to control equipment leaks of VOC may apply to the Administrator for determination of equivalence for any equivalent means of emission limitation that achieves a reduction in emissions of VOC achieved by the equipment, design, and operational requirements of this subpart.

(2) The Administrator will make an equivalence determination according to the provisions of paragraphs (b), (c), (d), and (e) of this section.

[48 FR 48335, Oct. 18, 1983, as amended at 65 FR 61762, Oct. 17, 2000]

**§ 60.485 Test methods and procedures.**

(a) In conducting the performance tests required in §60.8, the owner or operator shall use as reference methods and procedures the test methods in appendix A of this part or other methods and procedures as specified in this section, except as provided in §60.8(b).

(b) The owner or operator shall determine compliance with the standards in §§60.482, 60.483, and 60.484 as follows:

(1) Method 21 shall be used to determine the presence of leaking sources. The instrument shall be calibrated before use each day of its use by the procedures specified in Method 21. The following calibration gases shall be used:

(i) Zero air (less than 10 ppm of hydrocarbon in air); and

(ii) A mixture of methane or n-hexane and air at a concentration of about, but less than, 10,000 ppm methane or n-hexane.

(c) The owner or operator shall determine compliance with the no detectable emission standards in §§60.482–2(e), 60.482–3(i), 60.482–4, 60.482–7(f), and 60.482–10(e) as follows:

(1) The requirements of paragraph (b) shall apply.

(2) Method 21 shall be used to determine the background level. All potential leak interfaces shall be traversed as close to the interface as possible. The arithmetic difference between the maximum concentration indicated by the instrument and the background level is compared with 500 ppm for determining compliance.

(d) The owner or operator shall test each piece of equipment unless he demonstrates that a process unit is not in VOC service, i.e., that the VOC content would never be reasonably expected to exceed 10 percent by weight. For purposes of this demonstration, the following methods and procedures shall be used:

(1) Procedures that conform to the general methods in ASTM E260–73, 91, or 96, E168–67, 77, or 92, E169–63, 77, or 93 (incorporated by reference—see §60.17) shall be used to determine the percent VOC content in the process fluid that is contained in or contacts a piece of equipment.

(2) Organic compounds that are considered by the Administrator to have negligible photochemical reactivity may be excluded from the total quantity of organic compounds in determining the VOC content of the process fluid.

(3) Engineering judgment may be used to estimate the VOC content, if a piece of equipment had not been shown previously to be in service. If the Administrator disagrees with the judgment, paragraphs (d) (1) and (2) of this section shall be used to resolve the disagreement.

(e) The owner or operator shall demonstrate that an equipment is in light liquid service by showing that all the following conditions apply:

(1) The vapor pressure of one or more of the components is greater than 0.3 kPa at 20 °C (1.2 in. $H_2O$ at 68 °F). Standard reference texts or ASTM D2879–83, 96, or 97 (incorporated by reference—see §60.17) shall be used to determine the vapor pressures.

(2) The total concentration of the pure components having a vapor pressure greater than 0.3 kPa at 20 °C (1.2 in. $H_2O$ at 68 °F) is equal to or greater than 20 percent by weight.

(3) The fluid is a liquid at operating conditions.

(f) Samples used in conjunction with paragraphs (d), (e), and (g) of this section shall be representative of the process fluid that is contained in or contacts the equipment or the gas being combusted in the flare.

(g) The owner or operator shall determine compliance with the standards of flares as follows:

(1) Method 22 shall be used to determine visible emissions.

(2) A thermocouple or any other equivalent device shall be used to monitor the presence of a pilot flame in the flare.

(3) The maximum permitted velocity for air assisted flares shall be computed using the following equation:

$$V_{max} = K_1 + K_2 H_T$$

Where:

$V_{max}$ = Maximum permitted velocity, m/sec (ft/sec)

$H_T$ = Net heating value of the gas being combusted, MJ/scm (Btu/scf).

$K_1$ = 8.706 m/sec (metric units)

= 28.56 ft/sec (English units)

$K_2$ = 0.7084 $m^4$ /(MJ-sec) (metric units)

= 0.087 ft $^4$ /(Btu-sec) (English units)

(4) The net heating value (HT) of the gas being combusted in a flare shall be computed using the following equation:

$$H_T = K\sum_{i=1}^{n} C_i H_i$$

Where:

K = Conversion constant, 1.740 × 10 $^7$ (g-mole)(MJ)/ (ppm-scm-kcal) (metric units)

= 4.674 × 10 $^8$ [(g-mole)(Btu)/(ppm-scf-kcal)] (English units)

$C_i$ = Concentration of sample component "i," ppm

$H_i$ = net heat of combustion of sample component "i" at 25 °C and 760 mm Hg (77 °F and 14.7 psi), kcal/g-mole

(5) Method 18 and ASTM D2504–67, 77, or 88 (Reapproved 1993) (incorporated by reference—see §60.17) shall be used to determine the concentration of sample component "i."

(6) ASTM D2382–76 or 88 or D4809–95 (incorporated by reference—see §60.17) shall be used to determine the net heat of combustion of component "i" if published values are not available or cannot be calculated.

(7) Method 2, 2A, 2C, or 2D, as appropriate, shall be used to determine the actual exit velocity of a flare. If needed, the unobstructed (free) cross-sectional area of the flare tip shall be used.

[54 FR 6678, Feb. 14, 1989, as amended at 54 FR 27016, June 27, 1989; 65 FR 61763, Oct. 17, 2000]

**§ 60.486 Recordkeeping requirements.**

(a)(1) Each owner or operator subject to the provisions of this subpart shall comply with the recordkeeping requirements of this section.

(2) An owner or operator of more than one affected facility subject to the provisions of this subpart may comply with the recordkeeping requirements for these facilities in one recordkeeping system if the system identifies each record by each facility.

(b) When each leak is detected as specified in §§60.482–2, 60.482–3, 60.482–7, 60.482–8, and 60.483–2, the following requirements apply:

(1) A weatherproof and readily visible identification, marked with the equipment identification number, shall be attached to the leaking equipment.

(2) The identification on a valve may be removed after it has been monitored for 2 successive months as specified in §60.482–7(c) and no leak has been detected during those 2 months.

(3) The identification on equipment except on a valve, may be removed after it has been repaired.

(c) When each leak is detected as specified in §§60.482–2, 60.482–3, 60.482–7, 60.482–8, and 60.483–2, the following information shall be recorded in a log and shall be kept for 2 years in a readily accessible location:

(1) The instrument and operator identification numbers and the equipment identification number.

(2) The date the leak was detected and the dates of each attempt to repair the leak.

(3) Repair methods applied in each attempt to repair the leak.

(4) “Above 10,000” if the maximum instrument reading measured by the methods specified in §60.485(a) after each repair attempt is equal to or greater than 10,000 ppm.

(5) “Repair delayed” and the reason for the delay if a leak is not repaired within 15 calendar days after discovery of the leak.

(6) The signature of the owner or operator (or designate) whose decision it was that repair could not be effected without a process shutdown.

(7) The expected date of successful repair of the leak if a leak is not repaired within 15 days.

(8) Dates of process unit shutdowns that occur while the equipment is unrepaired.

(9) The date of successful repair of the leak.

(d) The following information pertaining to the design requirements for closed vent systems and control devices described in §60.482–10 shall be recorded and kept in a readily accessible location:

(1) Detailed schematics, design specifications, and piping and instrumentation diagrams.

(2) The dates and descriptions of any changes in the design specifications.

(3) A description of the parameter or parameters monitored, as required in §60.482–10(e), to ensure that control devices are operated and maintained in conformance with their design and an explanation of why that parameter (or parameters) was selected for the monitoring.

(4) Periods when the closed vent systems and control devices required in §§60.482–2, 60.482–3, 60.482–4, and 60.482–5 are not operated as designed, including periods when a flare pilot light does not have a flame.

(5) Dates of startups and shutdowns of the closed vent systems and control devices required in §§60.482–2, 60.482–3, 60.482–4, and 60.482–5.

(e) The following information pertaining to all equipment subject to the requirements in §§60.482–1 to 60.482–10 shall be recorded in a log that is kept in a readily accessible location:

(1) A list of identification numbers for equipment subject to the requirements of this subpart.

(2)(i) A list of identification numbers for equipment that are designated for no detectable emissions under the provisions of §§60.482–2(e), 60.482–3(i) and 60.482–7(f).

(ii) The designation of equipment as subject to the requirements of §60.482–2(e), §60.482–3(i), or §60.482–7(f) shall be signed by the owner or operator.

(3) A list of equipment identification numbers for pressure relief devices required to comply with §60.482–4.

(4)(i) The dates of each compliance test as required in §§60.482–2(e), 60.482–3(i), 60.482–4, and

60.482–7(f).

(ii) The background level measured during each compliance test.

(iii) The maximum instrument reading measured at the equipment during each compliance test.

(5) A list of identification numbers for equipment in vacuum service.

(f) The following information pertaining to all valves subject to the requirements of §60.482–7(g) and (h) and to all pumps subject to the requirements of §60.482–2(g) shall be recorded in a log that is kept in a readily accessible location:

(1) A list of identification numbers for valves and pumps that are designated as unsafe-to-monitor, an explanation for each valve or pump stating why the valve or pump is unsafe-to-monitor, and the plan for monitoring each valve or pump.

(2) A list of identification numbers for valves that are designated as difficult-to-monitor, an explanation for each valve stating why the valve is difficult-to-monitor, and the schedule for monitoring each valve.

(g) The following information shall be recorded for valves complying with §60.483–2:

(1) A schedule of monitoring.

(2) The percent of valves found leaking during each monitoring period.

(h) The following information shall be recorded in a log that is kept in a readily accessible location:

(1) Design criterion required in §§60.482–2(d)(5) and 60.482–3(e)(2) and explanation of the design criterion; and

(2) Any changes to this criterion and the reasons for the changes.

(i) The following information shall be recorded in a log that is kept in a readily accessible location for use in determining exemptions as provided in §60.480(d):

(1) An analysis demonstrating the design capacity of the affected facility,

(2) A statement listing the feed or raw materials and products from the affected facilities and an analysis demonstrating whether these chemicals are heavy liquids or beverage alcohol, and

(3) An analysis demonstrating that equipment is not in VOC service.

(j) Information and data used to demonstrate that a piece of equipment is not in VOC service shall be recorded in a log that is kept in a readily accessible location.

(k) The provisions of §60.7 (b) and (d) do not apply to affected facilities subject to this subpart.

[48 FR 48335, Oct. 18, 1983, as amended at 65 FR 61763, Oct. 17, 2000; 65 FR 78278, Dec. 14, 2000]

**§ 60.487 Reporting requirements.**

(a) Each owner or operator subject to the provisions of this subpart shall submit semiannual reports to the Administrator beginning six months after the initial startup date.

(b) The initial semiannual report to the Administrator shall include the following information:

(1) Process unit identification.

(2) Number of valves subject to the requirements of §60.482–7, excluding those valves designated for no detectable emissions under the provisions of §60.482–7(f).

(3) Number of pumps subject to the requirements of §60.482–2, excluding those pumps designated for no detectable emissions under the provisions of §60.482–2(e) and those pumps complying with §60.482–2(f).

(4) Number of compressors subject to the requirements of §60.482–3, excluding those compressors designated for no detectable emissions under the provisions of §60.482–3(i) and those compressors complying with §60.482–3(h).

(c) All semiannual reports to the Administrator shall include the following information, summarized from the information in §60.486:

(1) Process unit identification.

(2) For each month during the semiannual reporting period,

(i) Number of valves for which leaks were detected as described in §60.482(7)(b) or §60.483–2,

(ii) Number of valves for which leaks were not repaired as required in §60.482–7(d)(1),

(iii) Number of pumps for which leaks were detected as described in §60.482–2(b) and (d)(6)(i),

(iv) Number of pumps for which leaks were not repaired as required in §60.482–2(c)(1) and (d)(6)(ii),

(v) Number of compressors for which leaks were detected as described in §60.482–3(f),

(vi) Number of compressors for which leaks were not repaired as required in §60.482–3(g)(1), and

(vii) The facts that explain each delay of repair and, where appropriate, why a process unit shutdown was technically infeasible.

(3) Dates of process unit shutdowns which occurred within the semiannual reporting period.

(4) Revisions to items reported according to paragraph (b) if changes have occurred since the initial report or subsequent revisions to the initial report.

(d) An owner or operator electing to comply with the provisions of §§60.483–1 or 60.483–2 shall notify the Administrator of the alternative standard selected 90 days before implementing either of the provisions.

(e) An owner or operator shall report the results of all performance tests in accordance with §60.8 of the General Provisions. The provisions of §60.8(d) do not apply to affected facilities subject to the provisions of this subpart except that an owner or operator must notify the Administrator of the schedule for the initial performance tests at least 30 days before the initial performance tests.

(f) The requirements of paragraphs (a) through (c) of this section remain in force until and unless EPA, in delegating enforcement authority to a State under section 111(c) of the Act, approves reporting requirements or an alternative means of compliance surveillance adopted by such State. In that event, affected sources within the State will be relieved of the obligation to comply with the requirements of paragraphs (a) through (c) of this section, provided that they comply with the requirements established by

the State.

[48 FR 48335, Oct. 18, 1983, as amended at 49 FR 22608, May 30, 1984; 65 FR 61763, Oct. 17, 2000]

**§ 60.489 List of chemicals produced by affected facilities.**

The following chemicals are produced, as intermediates or final products, by process units covered under this subpart. The applicability date for process units producing one or more of these chemicals is January 5, 1981.

| CAS No. a | Chemical |
|---|---|
| 64-17-5 | Ethanol. |

a CAS numbers refer to the Chemical Abstracts Registry numbers assigned to specific chemicals, isomers, or mixtures of chemicals. Some isomers or mixtures that are covered by the standards do not have CAS numbers assigned to them. The standards apply to all of the chemicals listed, whether CAS numbers have been assigned or not.

[48 FR 48335, Oct. 18, 1983, as amended at 65 FR 61763, Oct. 17, 2000]

E.1.3 One Time Deadlines Relating to the Standard of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry [40 CFR 60, Subpart VV]

| Requirement | Rule Cite | Affected Facility | Deadline |
|---|---|---|---|
| Notification of the Date of Construction | 40 CFR 60.7(a)(1) | pumps; compressors; pressure relief devices in gas/vapor service; sampling connection systems; open-ended valves or lines. | Within 30 days after construction was commenced. |
| Notification of the Date of Initial Startup | 40 CFR 60.7(a)(3) | pumps; compressors; pressure relief devices in gas/vapor service; sampling connection systems; open-ended valves or lines. | Within 15 days after initial startup. |
| Initial Performance Test | 40 CFR 60.8(a) and 40 CFR 60.485(a) | pumps; compressors; pressure relief devices in gas/vapor service; sampling connection systems; open-ended valves or lines. | Within 60 days after achieving the maximum production rate, but not later than 180 days after initial startup. |

## SECTION E.2 Subpart Db—Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units

**Facility Description [326 IAC 2-8-4(10)]:**

(e) Two (2) thermal oxidizers with heat recovery steam generator (TO/HRSG) systems, identified as C10 and C11, approved for construction in 2007, each with a maximum heat input capacity of 122 MMBtu/hr, using natural gas and process waste gases from the DDGS dryers as fuels, with emissions exhausted through stack S10. Under NSPS, Subpart Db, TO/HRSG systems C10 and C11 are considered Industrial-Commercial-Institutional Steam Generating Units.

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

**New Source Performance Standards (NSPS) Requirements [326 IAC 2-7-5(1)]**

E.2.1 General Provisions Relating to New Source Performance Standards [326 IAC 12-1] [40 CFR Part 60, Subpart A]

(a) Pursuant to 40 CFR 60.1, the Permittee shall comply with the provisions of 40 CFR Part 60 Subpart A – General Provisions, which are incorporated by reference as 326 IAC 12-1 for TO/HRSG systems C10 and C11, except as otherwise specified in 40 CFR Part 60, Subpart Db.

(b) Pursuant to 40 CFR 60.19, the Permittee shall submit all required notifications and reports to:

Indiana Department of Environmental Management
Compliance Branch, Office of Air Quality
100 North Senate Avenue,
Indianapolis, Indiana 46204-2251

E.2.2 Standard of Performance for Industrial-Commercial-Institutional Steam Generating Units Requirements [40 CFR Part 60, Subpart Db] [326 IAC 12]

Pursuant to 40 CFR Part 60, Subpart Db, the Permittee shall comply with the provisions of Standard of Performance for Industrial-Commercial-Institutional Steam Generating Units, which are incorporated by reference as 326 IAC 12, for TO/HRSG systems C10 and C11 as specified as follows:

**Subpart Db—Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units**

**§ 60.40b Applicability and delegation of authority.**

(a) The affected facility to which this subpart applies is each steam generating unit that commences construction, modification, or reconstruction after June 19, 1984, and that has a heat input capacity from fuels combusted in the steam generating unit of greater than 29 MW (100 million Btu/hour).

(g) In delegating implementation and enforcement authority to a State under section 111(c) of the Act, the following authorities shall be retained by the Administrator and not transferred to a State.

(1) Section 60.44b(f).

(2) Section 60.44b(g).

(3) Section 60.49b(a)(4).

(j) Any affected facility meeting the applicability requirements under paragraph (a) of this section and commencing construction, modification, or reconstruction after June 19, 1986 is not subject to Subpart D (Standards of Performance for Fossil-Fuel-Fired Steam Generators, §60.40).

[52 FR 47842, Dec. 16, 1987, as amended at 63 FR 49454, Sept. 16, 1998; 65 FR 61752, Oct. 17, 2000; 71 FR 9881, Feb. 27, 2006; 71 FR 33400, June 9, 2006]

**§ 60.41b Definitions.**

As used in this subpart, all terms not defined herein shall have the meaning given them in the Act and in subpart A of this part.

*Annual capacity factor* means the ratio between the actual heat input to a steam generating unit from the fuels listed in §60.42b(a), §60.43b(a), or §60.44b(a), as applicable, during a calendar year and the potential heat input to the steam generating unit had it been operated for 8,760 hours during a calendar year at the maximum steady state design heat input capacity. In the case of steam generating units that are rented or leased, the actual heat input shall be determined based on the combined heat input from all operations of the affected facility in a calendar year.

*Byproduct/waste* means any liquid or gaseous substance produced at chemical manufacturing plants, petroleum refineries, or pulp and paper mills (except natural gas, distillate oil, or residual oil) and combusted in a steam generating unit for heat recovery or for disposal. Gaseous substances with carbon dioxide levels greater than 50 percent or carbon monoxide levels greater than 10 percent are not byproduct/waste for the purpose of this subpart.

*Chemical manufacturing plants* means industrial plants which are classified by the Department of Commerce under Standard Industrial Classification (SIC) Code 28.

*Coal* means all solid fuels classified as anthracite, bituminous, subbituminous, or lignite by the American Society of Testing and Materials in ASTM D388–77, 90, 91, 95, or 98a, Standard Specification for Classification of Coals by Rank (IBR—see §60.17), coal refuse, and petroleum coke. Coal-derived synthetic fuels, including but not limited to solvent refined coal, gasified coal, coal-oil mixtures, and coal-water mixtures, are also included in this definition for the purposes of this subpart.

*Coal refuse* means any byproduct of coal mining or coal cleaning operations with an ash content greater than 50 percent, by weight, and a heating value less than 13,900 kJ/kg (6,000 Btu/lb) on a dry basis.

*Cogeneration,* also known as combined heat and power, means a facility that simultaneously produces both electric (or mechanical) and useful thermal energy from the same primary energy source.

*Combined cycle system* means a system in which a separate source, such as a gas turbine, internal combustion engine, kiln, etc., provides exhaust gas to a heat recovery steam generating unit.

*Conventional technology* means wet flue gas desulfurization (FGD) technology, dry FGD technology, atmospheric fluidized bed combustion technology, and oil hydrodesulfurization technology.

*Distillate oil* means fuel oils that contain 0.05 weight percent nitrogen or less and comply with the specifications for fuel oil numbers 1 and 2, as defined by the American Society of Testing and Materials in ASTM D396–78, 89, 90, 92, 96, or 98, Standard Specifications for Fuel Oils (incorporated by reference—see §60.17).

*Dry flue gas desulfurization technology* means a sulfur dioxide control system that is located downstream of the steam generating unit and removes sulfur oxides from the combustion gases of the steam generating unit by contacting the combustion gases with an alkaline slurry or solution and forming a dry powder material. This definition includes devices where the dry powder material is subsequently converted to another form. Alkaline slurries or solutions used in dry flue gas desulfurization technology include but are not limited to lime and sodium.

*Duct burner* means a device that combusts fuel and that is placed in the exhaust duct from another source, such as a stationary gas turbine, internal combustion engine, kiln, etc., to allow the firing of

additional fuel to heat the exhaust gases before the exhaust gases enter a heat recovery steam generating unit.

*Emerging technology* means any sulfur dioxide control system that is not defined as a conventional technology under this section, and for which the owner or operator of the facility has applied to the Administrator and received approval to operate as an emerging technology under §60.49b(a)(4).

*Federally enforceable* means all limitations and conditions that are enforceable by the Administrator, including the requirements of 40 CFR parts 60 and 61, requirements within any applicable State Implementation Plan, and any permit requirements established under 40 CFR 52.21 or under 40 CFR 51.18 and 40 CFR 51.24.

*Fluidized bed combustion technology* means combustion of fuel in a bed or series of beds (including but not limited to bubbling bed units and circulating bed units) of limestone aggregate (or other sorbent materials) in which these materials are forced upward by the flow of combustion air and the gaseous products of combustion.

*Fuel pretreatment* means a process that removes a portion of the sulfur in a fuel before combustion of the fuel in a steam generating unit.

*Full capacity* means operation of the steam generating unit at 90 percent or more of the maximum steady-state design heat input capacity.

*Heat input* means heat derived from combustion of fuel in a steam generating unit and does not include the heat input from preheated combustion air, recirculated flue gases, or exhaust gases from other sources, such as gas turbines, internal combustion engines, kilns, etc.

*Heat release rate* means the steam generating unit design heat input capacity (in MW or Btu/hour) divided by the furnace volume (in cubic meters or cubic feet); the furnace volume is that volume bounded by the front furnace wall where the burner is located, the furnace side waterwall, and extending to the level just below or in front of the first row of convection pass tubes.

*Heat transfer medium* means any material that is used to transfer heat from one point to another point.

*High heat release rate* means a heat release rate greater than 730,000 J/sec-m $^3$ (70,000 Btu/hour-ft $^3$ ).

*Lignite* means a type of coal classified as lignite A or lignite B by the American Society of Testing and Materials in ASTM D388–77, 90, 91, 95, or 98a, Standard Specification for Classification of Coals by Rank (IBR—see §60.17).

*Low heat release rate* means a heat release rate of 730,000 J/sec-m $^3$ (70,000 Btu/hour-ft $^3$ ) or less.

*Mass-feed stoker steam generating unit* means a steam generating unit where solid fuel is introduced directly into a retort or is fed directly onto a grate where it is combusted.

*Maximum heat input capacity* means the ability of a steam generating unit to combust a stated maximum amount of fuel on a steady state basis, as determined by the physical design and characteristics of the steam generating unit.

*Municipal-type solid waste* means refuse, more than 50 percent of which is waste consisting of a mixture of paper, wood, yard wastes, food wastes, plastics, leather, rubber, and other combustible materials, and noncombustible materials such as glass and rock.

*Natural gas* means (1) a naturally occurring mixture of hydrocarbon and nonhydrocarbon gases found in geologic formations beneath the earth's surface, of which the principal constituent is methane; or (2) liquid petroleum gas, as defined by the American Society for Testing and Materials in ASTM D1835–82, 86, 87, 91, or 97, “Standard Specification for Liquid Petroleum Gases” (IBR—see §60.17).

*Noncontinental area* means the State of Hawaii, the Virgin Islands, Guam, American Samoa, the Commonwealth of Puerto Rico, or the Northern Mariana Islands.

*Oil* means crude oil or petroleum or a liquid fuel derived from crude oil or petroleum, including distillate and residual oil.

*Petroleum refinery* means industrial plants as classified by the Department of Commerce under Standard Industrial Classification (SIC) Code 29.

*Potential sulfur dioxide emission rate* means the theoretical sulfur dioxide emissions (ng/J, lb/million Btu heat input) that would result from combusting fuel in an uncleaned state and without using emission control systems.

*Process heater* means a device that is primarily used to heat a material to initiate or promote a chemical reaction in which the material participates as a reactant or catalyst.

*Pulp and paper mills* means industrial plants which are classified by the Department of Commerce under North American Industry Classification System (NAICS) Code 322 or Standard Industrial Classification (SIC) Code 26.

*Pulverized coal-fired steam generating unit* means a steam generating unit in which pulverized coal is introduced into an air stream that carries the coal to the combustion chamber of the steam generating unit where it is fired in suspension. This includes both conventional pulverized coal-fired and micropulverized coal-fired steam generating units.

*Residual oil* means crude oil, fuel oil numbers 1 and 2 that have a nitrogen content greater than 0.05 weight percent, and all fuel oil numbers 4, 5 and 6, as defined by the American Society of Testing and Materials in ASTM D396–78, Standard Specifications for Fuel Oils (IBR—see §60.17).

*Spreader stoker steam generating unit* means a steam generating unit in which solid fuel is introduced to the combustion zone by a mechanism that throws the fuel onto a grate from above. Combustion takes place both in suspension and on the grate.

*Steam generating unit* means a device that combusts any fuel or byproduct/waste to produce steam or to heat water or any other heat transfer medium. This term includes any municipal-type solid waste incinerator with a heat recovery steam generating unit or any steam generating unit that combusts fuel and is part of a cogeneration system or a combined cycle system. This term does not include process heaters as they are defined in this subpart.

*Steam generating unit operating day* means a 24-hour period between 12:00 midnight and the following midnight during which any fuel is combusted at any time in the steam generating unit. It is not necessary for fuel to be combusted continuously for the entire 24-hour period.

*Very low sulfur oil* for units constructed, reconstructed, or modified on or before February 28, 2005, means an oil that contains no more than 0.5 weight percent sulfur or that, when combusted without sulfur dioxide emission control, has a sulfur dioxide emission rate equal to or less than 215 ng/J (0.5 lb/MMBtu) heat input. For units constructed, reconstructed, or modified after February 28, 2005, *very low sulfur oil* means an oil that contains no more than 0.3 weight percent sulfur or that, when combusted without sulfur dioxide emission control, has a sulfur dioxide emission rate equal to or less than 140 ng/J (0.32 lb/MMBtu) heat input.

*Wet flue gas desulfurization technology* means a sulfur dioxide control system that is located downstream of the steam generating unit and removes sulfur oxides from the combustion gases of the steam generating unit by contacting the combustion gas with an alkaline slurry or solution and forming a liquid material. This definition applies to devices where the aqueous liquid material product of this contact is subsequently converted to other forms. Alkaline reagents used in wet flue gas desulfurization technology include, but are not limited to, lime, limestone, and sodium.

*Wet scrubber system* means any emission control device that mixes an aqueous stream or slurry with the exhaust gases from a steam generating unit to control emissions of particulate matter or sulfur dioxide.

*Wood* means wood, wood residue, bark, or any derivative fuel or residue thereof, in any form, including, but not limited to, sawdust, sanderdust, wood chips, scraps, slabs, millings, shavings, and processed pellets made from wood or other forest residues.

[52 FR 47842, Dec. 16, 1987, as amended at 54 FR 51819, Dec. 18, 1989; 65 FR 61752, Oct. 17, 2000; 66 FR 49834, Oct. 1, 2001; 71 FR 9881, Feb. 27, 2006]

**§ 60.42b Standard for sulfur dioxide.**

(e) Except as provided in paragraph (f) of this section, compliance with the emission limits, fuel oil sulfur limits, and/or percent reduction requirements under this section are determined on a 30-day rolling average basis.

(g) Except as provided in paragraph (i) of this section, the sulfur dioxide emission limits and percent reduction requirements under this section apply at all times, including periods of startup, shutdown, and malfunction.

(i) An affected facility subject to paragraph (a), (b), or (c) of this section may combust very low sulfur oil or natural gas when the sulfur dioxide control system is not being operated because of malfunction or maintenance of the sulfur dioxide control system.

(k) On or after the date on which the initial performance test is completed or is required to be completed under §60.8, whichever date comes first, no owner or operator of an affected facility that commences construction or reconstruction after February 28, 2005, and that combusts coal, oil, gas, a mixture of these fuels, or a mixture of these fuels with any other fuels shall cause to be discharged into the atmosphere any gases that contain sulfur dioxide in excess of 87 ng/J (0.20 lb/MMBtu) heat input or 8 percent (0.08) of the potential sulfur dioxide emission rate (92 percent reduction) and 520 ng/J (1.2 lb/MMBtu) heat input, except as provided in paragraphs (k)(1) or (k)(2). Affected facilities subject to this paragraph are also subject to paragraphs (e) through (g) of this section.

[52 FR 47842, Dec. 16, 1987, as amended at 54 FR 51819, Dec. 18, 1989; 65 FR 61752, Oct. 17, 2000; 71 FR 9881, Feb. 27, 2006]

**§ 60.44b Standard for nitrogen oxides.**

(a) Except as provided under paragraphs (k) and (l) of this section, on and after the date on which the initial performance test is completed or is required to be completed under §60.8 of this part, whichever date comes first, no owner or operator of an affected facility that is subject to the provisions of this section and that combusts only coal, oil, or natural gas shall cause to be discharged into the atmosphere from that affected facility any gases that contain nitrogen oxides (expressed as $NO_2$) in excess of the following emission limits:

| Fuel/Steam generating unit type | Nitrogen oxide emission limits ng/J (lb/million Btu) (expressed as NO2) heat input |
|---|---|
| (1) Natural gas and distillate oil, except (4): | |
| (i) Low heat release rate | 43 (0.10) |
| (ii) High heat release rate | 86 (0.20) |

(f) Any owner or operator of an affected facility that combusts byproduct/waste with either natural gas or oil may petition the Administrator within 180 days of the initial startup of the affected facility to establish a nitrogen oxides emission limit which shall apply specifically to that affected facility when the byproduct/waste is combusted. The petition shall include sufficient and appropriate data, as determined by the Administrator, such as nitrogen oxides emissions from the affected facility, waste composition (including nitrogen content), and combustion conditions to allow the Administrator to confirm that the

affected facility is unable to comply with the emission limits in paragraph (e) of this section and to determine the appropriate emission limit for the affected facility.

(1) Any owner or operator of an affected facility petitioning for a facility-specific nitrogen oxides emission limit under this section shall:

(i) Demonstrate compliance with the emission limits for natural gas and distillate oil in paragraph (a)(1) of this section or for residual oil in paragraph (a)(2) of this section, as appropriate, by conducting a 30-day performance test as provided in §60.46b(e). During the performance test only natural gas, distillate oil, or residual oil shall be combusted in the affected facility; and

(ii) Demonstrate that the affected facility is unable to comply with the emission limits for natural gas and distillate oil in paragraph (a)(1) of this section or for residual oil in paragraph (a)(2) of this section, as appropriate, when gaseous or liquid byproduct/waste is combusted in the affected facility under the same conditions and using the same technological system of emission reduction applied when demonstrating compliance under paragraph (f)(1)(i) of this section.

(2) The nitrogen oxides emission limits for natural gas or distillate oil in paragraph (a)(1) of this section or for residual oil in paragraph (a)(2) of this section, as appropriate, shall be applicable to the affected facility until and unless the petition is approved by the Administrator. If the petition is approved by the Administrator, a facility-specific nitrogen oxides emission limit will be established at the nitrogen oxides emission level achievable when the affected facility is combusting oil or natural gas and byproduct/waste in a manner that the Administrator determines to be consistent with minimizing nitrogen oxides emissions.

(h) For purposes of paragraph (i) of this section, the nitrogen oxide standards under this section apply at all times including periods of startup, shutdown, or malfunction.

(i) Except as provided under paragraph (j) of this section, compliance with the emission limits under this section is determined on a 30-day rolling average basis.

(l) On and after the date on which the initial performance test is completed or is required to be completed under §60.8, whichever date comes first, no owner or operator of an affected facility which commenced construction or reconstruction after July 9, 1997 shall cause to be discharged into the atmosphere from that affected facility any gases that contain nitrogen oxides (expressed as $NO_2$) in excess of the following limits:

(1) If the affected facility combusts coal, oil, or natural gas, or a mixture of these fuels, or with any other fuels: A limit of 86 ng/$J_l$ (0.20 lb/million Btu) heat input unless the affected facility has an annual capacity factor for coal, oil, and natural gas of 10 percent (0.10) or less and is subject to a federally enforceable requirement that limits operation of the facility to an annual capacity factor of 10 percent (0.10) or less for coal, oil, and natural gas; or

(2) If the affected facility has a low heat release rate and combusts natural gas or distillate oil in excess of 30 percent of the heat input from the combustion of all fuels, a limit determined by use of the following formula:

$E_n = [(0.10 * H_{go}) + (0.20 * H_r)]/(H_{go} + H_r)$

Where:

$E_n$ is the $NO_X$ emission limit, (lb/million Btu),

$H_{go}$ is the heat input from combustion of natural gas or distillate oil, and

$H_r$ is the heat input from combustion of any other fuel.

[52 FR 47842, Dec. 16, 1987, as amended at 54 FR 51825, Dec. 18, 1989; 63 FR 49454, Sept. 16, 1998; 66 FR 42610, Aug. 14, 2001; 71 FR 9882, Feb. 27, 2006]

**§ 60.45b Compliance and performance test methods and procedures for sulfur dioxide.**

(a) The sulfur dioxide emission standards under §60.42b apply at all times.

(b) In conducting the performance tests required under §60.8, the owner or operator shall use the methods and procedures in appendix A of this part or the methods and procedures as specified in this section, except as provided in §60.8(b). Section 60.8(f) does not apply to this section. The 30-day notice required in §60.8(d) applies only to the initial performance test unless otherwise specified by the Administrator.

(c) The owner or operator of an affected facility shall conduct performance tests to determine compliance with the percent of potential sulfur dioxide emission rate (% $P_s$) and the sulfur dioxide emission rate ($E_s$) pursuant to §60.42b following the procedures listed below, except as provided under paragraph (d) and (k) of this section.

(1) The initial performance test shall be conducted over the first 30 consecutive operating days of the steam generating unit. Compliance with the sulfur dioxide standards shall be determined using a 30-day average. The first operating day included in the initial performance test shall be scheduled within 30 days after achieving the maximum production rate at which the affected facility will be operated, but not later than 180 days after initial startup of the facility.

(f) For the initial performance test required under §60.8, compliance with the sulfur dioxide emission limits and percent reduction requirements under §60.42b is based on the average emission rates and the average percent reduction for sulfur dioxide for the first 30 consecutive steam generating unit operating days, except as provided under paragraph (d) of this section. The initial performance test is the only test for which at least 30 days prior notice is required unless otherwise specified by the Administrator. The initial performance test is to be scheduled so that the first steam generating unit operating day of the 30 successive steam generating unit operating days is completed within 30 days after achieving the maximum production rate at which the affected facility will be operated, but not later than 180 days after initial startup of the facility. The boiler load during the 30-day period does not have to be the maximum design load, but must be representative of future operating conditions and include at least one 24-hour period at full load.

(g) After the initial performance test required under §60.8, compliance with the sulfur dioxide emission limits and percent reduction requirements under §60.42b is based on the average emission rates and the average percent reduction for sulfur dioxide for 30 successive steam generating unit operating days, except as provided under paragraph (d). A separate performance test is completed at the end of each steam generating unit operating day after the initial performance test, and a new 30-day average emission rate and percent reduction for sulfur dioxide are calculated to show compliance with the standard.

(h) Except as provided under paragraph (i) of this section, the owner or operator of an affected facility shall use all valid sulfur dioxide emissions data in calculating % $P_s$ and $E_{ho}$ under paragraph (c), of this section whether or not the minimum emissions data requirements under §60.46b are achieved. All valid emissions data, including valid sulfur dioxides emission data collected during periods of startup, shutdown and malfunction, shall be used in calculating % $P_s$ and $E_{ho}$ pursuant to paragraph (c) of this section.

[52 FR 47842, Dec. 16, 1987, as amended at 54 FR 51820, 51825, Dec. 18, 1989; 71 FR 9883, Feb. 27, 2006]

**§ 60.46b Compliance and performance test methods and procedures for particulate matter and nitrogen oxides.**

(c) Compliance with the nitrogen oxides emission standards under §60.44b shall be determined through performance testing under paragraph (e) or (f), or under paragraphs (g) and (h) of this section, as applicable.

(e) To determine compliance with the emission limits for nitrogen oxides required under §60.44b, the owner or operator of an affected facility shall conduct the performance test as required under §60.8 using the continuous system for monitoring nitrogen oxides under §60.48(b).

(1) For the initial compliance test, nitrogen oxides from the steam generating unit are monitored for 30 successive steam generating unit operating days and the 30-day average emission rate is used to determine compliance with the nitrogen oxides emission standards under §60.44b. The 30-day average emission rate is calculated as the average of all hourly emissions data recorded by the monitoring system during the 30-day test period.

(4) Following the date on which the initial performance test is completed or required to be completed under §60.8 of this part, whichever date comes first, the owner or operator of an affected facility which has a heat input capacity of 73 MW (250 million Btu/hour) or less and which combusts natural gas, distillate oil, or residual oil having a nitrogen content of 0.30 weight percent or less shall upon request determine compliance with the nitrogen oxides standards under §60.44b through the use of a 30-day performance test. During periods when performance tests are not requested, nitrogen oxides emissions data collected pursuant to §60.48b(g)(1) or §60.48b(g)(2) are used to calculate a 30-day rolling average emission rate on a daily basis and used to prepare excess emission reports, but will not be used to determine compliance with the nitrogen oxides emission standards. A new 30-day rolling average emission rate is calculated each steam generating unit operating day as the average of all of the hourly nitrogen oxides emission data for the preceding 30 steam generating unit operating days.

[52 FR 47842, Dec. 16, 1987, as amended at 54 FR 51820, 51825, Dec. 18, 1989; 55 FR 18876, May 7, 1990; 65 FR 61752, Oct. 17, 2000; 66 FR 18553, Apr. 10, 2001; 71 FR 9883, Feb. 27, 2006]

**§ 60.47b Emission monitoring for sulfur dioxide.**

(g) Units burning any fuel with a potential sulfur dioxide emission rate of 140 ng/J (0.32 lb/MMBtu) heat input or less are not required to conduct emissions monitoring if they maintain fuel supplier certifications of the sulfur content of the fuels burned.

[52 FR 47842, Dec. 16, 1987, as amended at 54 FR 51820, Dec. 18, 1989; 55 FR 5212, Feb. 14, 1990; 55 FR 18876, May 7, 1990; 71 FR 9883, Feb. 27, 2006]

**§ 60.48b Emission monitoring for particulate matter and nitrogen oxides.**

(b) Except as provided under paragraphs (g), (h), and (i) of this section, the owner or operator of an affected facility subject to a nitrogen oxides standard under §60.44b shall comply with either paragraphs (b)(1) or (b)(2) of this section.

(1) Install, calibrate, maintain, and operate a continuous monitoring system, and record the output of the system, for measuring nitrogen oxides emissions discharged to the atmosphere; or

(2) If the owner or operator has installed a nitrogen oxides emission rate continuous emission monitoring system (CEMS) to meet the requirements of part 75 of this chapter and is continuing to meet the ongoing requirements of part 75 of this chapter, that CEMS may be used to meet the requirements of this section, except that the owner or operator shall also meet the requirements of §60.49b. Data reported to meet the requirements of §60.49b shall not include data substituted using the missing data procedures in subpart D of part 75 of this chapter, nor shall the data have been bias adjusted according to the procedures of part 75 of this chapter.

(c) The continuous monitoring systems required under paragraph (b) of this section shall be operated and data recorded during all periods of operation of the affected facility except for continuous monitoring system breakdowns and repairs. Data is recorded during calibration checks, and zero and span adjustments.

(d) The 1-hour average nitrogen oxides emission rates measured by the continuous nitrogen oxides monitor required by paragraph (b) of this section and required under §60.13(h) shall be expressed in ng/J or lb/MMBtu heat input and shall be used to calculate the average emission rates under §60.44b. The 1-hour averages shall be calculated using the data points required under §60.13(h)(2).

(e) The procedures under §60.13 shall be followed for installation, evaluation, and operation of the continuous monitoring systems.

(2) For affected facilities combusting coal, oil, or natural gas, the span value for nitrogen oxides is determined as follows:

| Fuel | Span values for nitrogen oxides (PPM) |
|---|---|
| Natural gas | 500 |

where:

x is the fraction of total heat input derived from natural gas,

y is the fraction of total heat input derived from oil, and

z is the fraction of total heat input derived from coal.

(f) When nitrogen oxides emission data are not obtained because of continuous monitoring system breakdowns, repairs, calibration checks and zero and span adjustments, emission data will be obtained by using standby monitoring systems, Method 7, Method 7A, or other approved reference methods to provide emission data for a minimum of 75 percent of the operating hours in each steam generating unit operating day, in at least 22 out of 30 successive steam generating unit operating days.

[52 FR 47842, Dec. 16, 1987, as amended at 54 FR 51825, Dec. 18, 1989; 63 FR 49455, Sept. 16, 1998; 66 FR 18553, Apr. 10, 2001; 71 FR 9884, Feb. 27, 2006]

**§ 60.49b Reporting and recordkeeping requirements.**

(a) The owner or operator of each affected facility shall submit notification of the date of initial startup, as provided by §60.7. This notification shall include:

(1) The design heat input capacity of the affected facility and identification of the fuels to be combusted in the affected facility,

(2) If applicable, a copy of any Federally enforceable requirement that limits the annual capacity factor for any fuel or mixture of fuels under §§60.42b(d)(1), 60.43b(a)(2), (a)(3)(iii), (c)(2)(ii), (d)(2)(iii), 60.44b(c), (d), (e), (i), (j), (k), 60.45b(d), (g), 60.46b(h), or 60.48b(i),

(3) The annual capacity factor at which the owner or operator anticipates operating the facility based on all fuels fired and based on each individual fuel fired, and,

(4) Notification that an emerging technology will be used for controlling emissions of sulfur dioxide. The Administrator will examine the description of the emerging technology and will determine whether the technology qualifies as an emerging technology. In making this determination, the Administrator may require the owner or operator of the affected facility to submit additional information concerning the control device. The affected facility is subject to the provisions of §60.42b(a) unless and until this determination is made by the Administrator.

(b) The owner or operator of each affected facility subject to the sulfur dioxide, particulate matter, and/or nitrogen oxides emission limits under §§60.42b, 60.43b, and 60.44b shall submit to the Administrator the performance test data from the initial performance test and the performance evaluation of the CEMS using the applicable performance specifications in appendix B. The owner or operator of each affected facility described in §60.44b(j) or §60.44b(k) shall submit to the Administrator the maximum heat input capacity data from the demonstration of the maximum heat input capacity of the affected facility.

(c) The owner or operator of each affected facility subject to the nitrogen oxides standard of §60.44b who seeks to demonstrate compliance with those standards through the monitoring of steam generating unit operating conditions under the provisions of §60.48b(g)(2) shall submit to the Administrator for approval a plan that identifies the operating conditions to be monitored under §60.48b(g)(2) and the records to be

maintained under §60.49b(j). This plan shall be submitted to the Administrator for approval within 360 days of the initial startup of the affected facility. The plan shall:

(1) Identify the specific operating conditions to be monitored and the relationship between these operating conditions and nitrogen oxides emission rates (i.e., ng/J or lbs/million Btu heat input). Steam generating unit operating conditions include, but are not limited to, the degree of staged combustion (i.e., the ratio of primary air to secondary and/or tertiary air) and the level of excess air (i.e., flue gas oxygen level);

(2) Include the data and information that the owner or operator used to identify the relationship between nitrogen oxides emission rates and these operating conditions;

(3) Identify how these operating conditions, including steam generating unit load, will be monitored under §60.48b(g) on an hourly basis by the owner or operator during the period of operation of the affected facility; the quality assurance procedures or practices that will be employed to ensure that the data generated by monitoring these operating conditions will be representative and accurate; and the type and format of the records of these operating conditions, including steam generating unit load, that will be maintained by the owner or operator under §60.49b(j).

If the plan is approved, the owner or operator shall maintain records of predicted nitrogen oxide emission rates and the monitored operating conditions, including steam generating unit load, identified in the plan.

(d) The owner or operator of an affected facility shall record and maintain records of the amounts of each fuel combusted during each day and calculate the annual capacity factor individually for coal, distillate oil, residual oil, natural gas, wood, and municipal-type solid waste for the reporting period. The annual capacity factor is determined on a 12-month rolling average basis with a new annual capacity factor calculated at the end of each calendar month.

(g) Except as provided under paragraph (p) of this section, the owner or operator of an affected facility subject to the nitrogen oxides standards under §60.44b shall maintain records of the following information for each steam generating unit operating day:

(1) Calendar date.

(2) The average hourly nitrogen oxides emission rates (expressed as $NO_2$) (ng/J or lb/million Btu heat input) measured or predicted.

(3) The 30-day average nitrogen oxides emission rates (ng/J or lb/million Btu heat input) calculated at the end of each steam generating unit operating day from the measured or predicted hourly nitrogen oxide emission rates for the preceding 30 steam generating unit operating days.

(4) Identification of the steam generating unit operating days when the calculated 30-day average nitrogen oxides emission rates are in excess of the nitrogen oxides emissions standards under §60.44b, with the reasons for such excess emissions as well as a description of corrective actions taken.

(5) Identification of the steam generating unit operating days for which pollutant data have not been obtained, including reasons for not obtaining sufficient data and a description of corrective actions taken.

(6) Identification of the times when emission data have been excluded from the calculation of average emission rates and the reasons for excluding data.

(7) Identification of “F” factor used for calculations, method of determination, and type of fuel combusted.

(8) Identification of the times when the pollutant concentration exceeded full span of the continuous monitoring system.

(9) Description of any modifications to the continuous monitoring system that could affect the ability of the continuous monitoring system to comply with Performance Specification 2 or 3.

(10) Results of daily CEMS drift tests and quarterly accuracy assessments as required under appendix F, Procedure 1.

(h) The owner or operator of any affected facility in any category listed in paragraphs (h) (1) or (2) of this section is required to submit excess emission reports for any excess emissions which occurred during the reporting period.

(2) Any affected facility that is subject to the nitrogen oxides standard of §60.44b, and that

(i) Combusts natural gas, distillate oil, or residual oil with a nitrogen content of 0.3 weight percent or less, or

(ii) Has a heat input capacity of 73 MW (250 million Btu/hour) or less and is required to monitor nitrogen oxides emissions on a continuous basis under §60.48b(g)(1) or steam generating unit operating conditions under §60.48b(g)(2).

(4) For purposes of §60.48b(g)(1), excess emissions are defined as any calculated 30-day rolling average nitrogen oxides emission rate, as determined under §60.46b(e), which exceeds the applicable emission limits in §60.44b.

(i) The owner or operator of any affected facility subject to the continuous monitoring requirements for nitrogen oxides under §60.48(b) shall submit reports containing the information recorded under paragraph (g) of this section.

(j) The owner or operator of any affected facility subject to the sulfur dioxide standards under §60.42b shall submit reports.

(k) For each affected facility subject to the compliance and performance testing requirements of §60.45b and the reporting requirement in paragraph (j) of this section, the following information shall be reported to the Administrator:

(1) Calendar dates covered in the reporting period.

(2) Each 30-day average sulfur dioxide emission rate (ng/J or 1b/million Btu heat input) measured during the reporting period, ending with the last 30-day period; reasons for noncompliance with the emission standards; and a description of corrective actions taken.

(3) Each 30-day average percent reduction in sulfur dioxide emissions calculated during the reporting period, ending with the last 30-day period; reasons for noncompliance with the emission standards; and a description of corrective actions taken.

(5) Identification of the times when emissions data have been excluded from the calculation of average emission rates; justification for excluding data; and description of corrective action taken if data have been excluded for periods other than those during which coal or oil were not combusted in the steam generating unit.

(6) Identification of “F” factor used for calculations, method of determination, and type of fuel combusted.

(7) Identification of times when hourly averages have been obtained based on manual sampling methods.

(o) All records required under this section shall be maintained by the owner or operator of the affected facility for a period of 2 years following the date of such record.

(v) The owner or operator of an affected facility may submit electronic quarterly reports for $SO_2$ and/or $NO_X$ and/or opacity in lieu of submitting the written reports required under paragraphs (h), (i), (j), (k) or (l) of this section. The format of each quarterly electronic report shall be coordinated with the permitting authority. The electronic report(s) shall be submitted no later than 30 days after the end of the calendar quarter and shall be accompanied by a certification statement from the owner or operator, indicating whether compliance with the applicable emission standards and minimum data requirements of this subpart was achieved during the reporting period. Before submitting reports in the electronic format, the owner or operator shall coordinate with the permitting authority to obtain their agreement to submit reports in this alternative format.

(w) The reporting period for the reports required under this subpart is each 6 month period. All reports shall be submitted to the Administrator and shall be postmarked by the 30th day following the end of the reporting period.

[52 FR 47842, Dec. 16, 1987, as amended at 54 FR 51820, 51825, Dec. 18, 1989; 60 FR 28062, May 30, 1995; 61 FR 14031, Mar. 29, 1996; 62 FR 52641, Oct. 8, 1997; 63 FR 49455, Sept. 16, 1998; 64 FR 7464, Feb. 12, 1999; 65 FR 13243, Mar. 13, 2000; 69 FR 40773, July 7, 2004]

E.2.3 One Time Deadlines Relating to the Standard of Performance for Industrial-Commercial-Institutional Steam Generating Units [40 CFR 60, Subpart Db]

| Requirement | Rule Cite | Affected Facility | Deadline |
|---|---|---|---|
| Notification of the Date of Construction | 40 CFR 60.7(a)(1) | TO/HRSG Systems C10 and C11 | Within 30 days after construction was commenced. |
| Notification of the Date of Initial Startup | 40 CFR 60.7(a)(3) | TO/HRSG Systems C10 and C11 | Within 15 days after initial startup. |
| Initial Performance Test | 40 CFR 60.8(a)<br>40 CFR 60.45b(c)(1)<br>40 CFR 60.46b(e)(1) | TO/HRSG Systems C10 and C11 | First 30 consecutive operating days of the steam generating unit. The first operating day included in the initial performance test shall be scheduled within 30 days after achieving the maximum production rate, but not later than 180 days after initial startup. |

## SECTION E.3 Subpart Kb—Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984

**Facility Description [326 IAC 2-8-4(10)]:**

**Insignificant Activities**

(n) Other emission units, not regulated by a NESHAP, with PM10, NOx, and $SO_2$ emissions less than five (5) pounds per hour or twenty-five (25) pounds per day, CO emissions less than twenty-five (25) pounds per day, VOC emissions less than three (3) pounds per hour or fifteen (15) pounds per day, lead emissions less than six-tenths (0.6) tons per year or three and twenty-nine hundredths (3.29) pounds per day, and emitting greater than one (1) pound per day but less than five (5) pounds per day or one (1) ton per year of a single HAP, or emitting greater than one (1) pound per day but less than twelve and five tenths (12.5) pounds per day or two and five tenths (2.5) tons per year of any combination of HAPs:

(1) One (1) 190 proof tank, identified as T01, approved for construction in 2007, with a maximum capacity of 200,000 gallons. Under NSPS, Subpart Kb, this tank is considered a volatile organic liquid storage vessel.

(2) One (1) 200 proof tank, identified as T02, approved for construction in 2007, with a maximum capacity of 200,000 gallons. Under NSPS, Subpart Kb, this tank is considered a volatile organic liquid storage vessel.

(4) Three (3) denatured ethanol tanks, identified as T04, T05, and T06, approved for construction in 2007, each with a maximum capacity of 1,500,000 gallons. Under NSPS, Subpart Kb, these tanks are considered volatile organic liquid storage vessels.

(5) One (1) denaturant storage tank, identified as T07, approved for construction in 2007, with a maximum capacity of 200,000 gallons. Under NSPS, Subpart Kb, this tank is considered a volatile organic liquid storage vessel. [326 IAC 8-4-3]

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

**New Source Performance Standards (NSPS) Requirements [326 IAC 2-7-5(1)]**

E.3.1 General Provisions Relating to New Source Performance Standards [326 IAC 12-1] [40 CFR Part 60, Subpart A]

(a) Pursuant to 40 CFR 60.1, the Permittee shall comply with the provisions of 40 CFR Part 60 Subpart A – General Provisions, which are incorporated by reference as 326 IAC 12-1 for tanks T01, T02, and T04 through T07, except as otherwise specified in 40 CFR Part 60, Subpart Kb.

(b) Pursuant to 40 CFR 60.19, the Permittee shall submit all required notifications and reports to:

Indiana Department of Environmental Management
Compliance Branch, Office of Air Quality
100 North Senate Avenue,
Indianapolis, Indiana 46204-2251

E.3.2 Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) [40 CFR Part 60, Subpart Kb] [326 IAC 12]

Pursuant to 40 CFR Part 60, Subpart Kb, the Permittee shall comply with the provisions of Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum

Liquid Storage Vessels), which are incorporated by reference as 326 IAC 12, for tanks T01, T02, and T04 through T07 as follows:

**Subpart Kb—Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984**

**Source:** 52 FR 11429, Apr. 8, 1987, unless otherwise noted.

**§ 60.110b Applicability and designation of affected facility.**

(a) Except as provided in paragraph (b) of this section, the affected facility to which this subpart applies is each storage vessel with a capacity greater than or equal to 75 cubic meters ($m^3$) that is used to store volatile organic liquids (VOL) for which construction, reconstruction, or modification is commenced after July 23, 1984.

(b) This subpart does not apply to storage vessels with a capacity greater than or equal to 151 $m^3$ storing a liquid with a maximum true vapor pressure less than 3.5 kilopascals (kPa) or with a capacity greater than or equal to 75 $m^3$ but less than 151 $m^3$ storing a liquid with a maximum true vapor pressure less than 15.0 kPa.

**§ 60.111b Definitions.**

Terms used in this subpart are defined in the Act, in subpart A of this part, or in this subpart as follows:

*Bulk gasoline plant* means any gasoline distribution facility that has a gasoline throughput less than or equal to 75,700 liters per day. Gasoline throughput shall be the maximum calculated design throughput as may be limited by compliance with an enforceable condition under Federal requirement or Federal, State or local law, and discoverable by the Administrator and any other person.

*Condensate* means hydrocarbon liquid separated from natural gas that condenses due to changes in the temperature or pressure, or both, and remains liquid at standard conditions.

*Custody transfer* means the transfer of produced petroleum and/or condensate, after processing and/or treatment in the producing operations, from storage vessels or automatic transfer facilities to pipelines or any other forms of transportation.

*Fill* means the introduction of VOL into a storage vessel but not necessarily to complete capacity.

*Gasoline service station* means any site where gasoline is dispensed to motor vehicle fuel tanks from stationary storage tanks.

*Maximum true vapor pressure* means the equilibrium partial pressure exerted by the volatile organic compounds (as defined in 40 CFR 51.100) in the stored VOL at the temperature equal to the highest calendar-month average of the VOL storage temperature for VOL's stored above or below the ambient temperature or at the local maximum monthly average temperature as reported by the National Weather Service for VOL's stored at the ambient temperature, as determined:

(1) In accordance with methods described in American Petroleum institute Bulletin 2517, Evaporation Loss From External Floating Roof Tanks, (incorporated by reference—see §60.17); or

(2) As obtained from standard reference texts; or

(3) As determined by ASTM D2879–83, 96, or 97 (incorporated by reference—see §60.17);

(4) Any other method approved by the Administrator.

*Petroleum* means the crude oil removed from the earth and the oils derived from tar sands, shale, and coal.

*Petroleum liquids* means petroleum, condensate, and any finished or intermediate products manufactured in a petroleum refinery.

*Process tank* means a tank that is used within a process (including a solvent or raw material recovery process) to collect material discharged from a feedstock storage vessel or equipment within the process before the material is transferred to other equipment within the process, to a product or by-product storage vessel, or to a vessel used to store recovered solvent or raw material. In many process tanks, unit operations such as reactions and blending are conducted. Other process tanks, such as surge control vessels and bottoms receivers, however, may not involve unit operations.

*Reid vapor pressure* means the absolute vapor pressure of volatile crude oil and volatile nonviscous petroleum liquids except liquified petroleum gases, as determined by ASTM D323–82 or 94 (incorporated by reference—see §60.17).

*Storage vessel* means each tank, reservoir, or container used for the storage of volatile organic liquids but does not include:

(1) Frames, housing, auxiliary supports, or other components that are not directly involved in the containment of liquids or vapors;

(2) Subsurface caverns or porous rock reservoirs; or

(3) Process tanks.

*Volatile organic liquid (VOL)* means any organic liquid which can emit volatile organic compounds (as defined in 40 CFR 51.100) into the atmosphere.

*Waste* means any liquid resulting from industrial, commercial, mining or agricultural operations, or from community activities that is discarded or is being accumulated, stored, or physically, chemically, or biologically treated prior to being discarded or recycled.

[52 FR 11429, Apr. 8, 1987, as amended at 54 FR 32973, Aug. 11, 1989; 65 FR 61756, Oct. 17, 2000; 68 FR 59333, Oct. 15, 2003]

**§ 60.112b Standard for volatile organic compounds (VOC)**

(a) The owner or operator of each storage vessel either with a design capacity greater than or equal to 151 $m^3$ containing a VOL that, as stored, has a maximum true vapor pressure equal to or greater than 5.2 kPa but less than 76.6 kPa or with a design capacity greater than or equal to 75 $m^3$ but less than 151 $m^3$ containing a VOL that, as stored, has a maximum true vapor pressure equal to or greater than 27.6 kPa but less than 76.6 kPa, shall equip each storage vessel with one of the following:

(1) A fixed roof in combination with an internal floating roof meeting the following specifications:

(i) The internal floating roof shall rest or float on the liquid surface (but not necessarily in complete contact with it) inside a storage vessel that has a fixed roof. The internal floating roof shall be floating on the liquid surface at all times, except during initial fill and during those intervals when the storage vessel is completely emptied or subsequently emptied and refilled. When the roof is resting on the leg supports, the process of filling, emptying, or refilling shall be continuous and shall be accomplished as rapidly as possible.

(ii) Each internal floating roof shall be equipped with one of the following closure devices between the wall of the storage vessel and the edge of the internal floating roof:

(A) A foam- or liquid-filled seal mounted in contact with the liquid (liquid-mounted seal). A liquid-mounted seal means a foam- or liquid-filled seal mounted in contact with the liquid between the wall of the storage vessel and the floating roof continuously around the circumference of the tank.

(B) Two seals mounted one above the other so that each forms a continuous closure that completely covers the space between the wall of the storage vessel and the edge of the internal floating roof. The lower seal may be vapor-mounted, but both must be continuous.

(C) A mechanical shoe seal. A mechanical shoe seal is a metal sheet held vertically against the wall of the storage vessel by springs or weighted levers and is connected by braces to the floating roof. A flexible coated fabric (envelope) spans the annular space between the metal sheet and the floating roof.

(iii) Each opening in a noncontact internal floating roof except for automatic bleeder vents (vacuum breaker vents) and the rim space vents is to provide a projection below the liquid surface.

(iv) Each opening in the internal floating roof except for leg sleeves, automatic bleeder vents, rim space vents, column wells, ladder wells, sample wells, and stub drains is to be equipped with a cover or lid which is to be maintained in a closed position at all times (i.e., no visible gap) except when the device is in actual use. The cover or lid shall be equipped with a gasket. Covers on each access hatch and automatic gauge float well shall be bolted except when they are in use.

(v) Automatic bleeder vents shall be equipped with a gasket and are to be closed at all times when the roof is floating except when the roof is being floated off or is being landed on the roof leg supports.

(vi) Rim space vents shall be equipped with a gasket and are to be set to open only when the internal floating roof is not floating or at the manufacturer's recommended setting.

(vii) Each penetration of the internal floating roof for the purpose of sampling shall be a sample well. The sample well shall have a slit fabric cover that covers at least 90 percent of the opening.

(viii) Each penetration of the internal floating roof that allows for passage of a column supporting the fixed roof shall have a flexible fabric sleeve seal or a gasketed sliding cover.

(ix) Each penetration of the internal floating roof that allows for passage of a ladder shall have a gasketed sliding cover.

**§ 60.113b Testing and procedures.**

The owner or operator of each storage vessel as specified in §60.112b(a) shall meet the requirements of paragraph (a), (b), or (c) of this section. The applicable paragraph for a particular storage vessel depends on the control equipment installed to meet the requirements of §60.112b.

(a) After installing the control equipment required to meet §60.112b(a)(1) (permanently affixed roof and internal floating roof), each owner or operator shall:

(1) Visually inspect the internal floating roof, the primary seal, and the secondary seal (if one is in service), prior to filling the storage vessel with VOL. If there are holes, tears, or other openings in the primary seal, the secondary seal, or the seal fabric or defects in the internal floating roof, or both, the owner or operator shall repair the items before filling the storage vessel.

(2) For Vessels equipped with a liquid-mounted or mechanical shoe primary seal, visually inspect the internal floating roof and the primary seal or the secondary seal (if one is in service) through manholes and roof hatches on the fixed roof at least once every 12 months after initial fill. If the internal floating roof is not resting on the surface of the VOL inside the storage vessel, or there is liquid accumulated on the roof, or the seal is detached, or there are holes or tears in the seal fabric, the owner or operator shall repair the items or empty and remove the storage vessel from service within 45 days. If a failure that is detected during inspections required in this paragraph cannot be repaired within 45 days and if the vessel cannot be emptied within 45 days, a 30-day extension may be requested from the Administrator in the inspection report required in §60.115b(a)(3). Such a request for an extension must document that alternate storage capacity is unavailable and specify a schedule of actions the company will take that will assure that the control equipment will be repaired or the vessel will be emptied as soon as possible.

(3) For vessels equipped with a double-seal system as specified in §60.112b(a)(1)(ii)(B):

(i) Visually inspect the vessel as specified in paragraph (a)(4) of this section at least every 5 years; or

(ii) Visually inspect the vessel as specified in paragraph (a)(2) of this section.

(4) Visually inspect the internal floating roof, the primary seal, the secondary seal (if one is in service), gaskets, slotted membranes and sleeve seals (if any) each time the storage vessel is emptied and degassed. If the internal floating roof has defects, the primary seal has holes, tears, or other openings in the seal or the seal fabric, or the secondary seal has holes, tears, or other openings in the seal or the seal fabric, or the gaskets no longer close off the liquid surfaces from the atmosphere, or the slotted membrane has more than 10 percent open area, the owner or operator shall repair the items as necessary so that none of the conditions specified in this paragraph exist before refilling the storage vessel with VOL. In no event shall inspections conducted in accordance with this provision occur at intervals greater than 10 years in the case of vessels conducting the annual visual inspection as specified in paragraphs (a)(2) and (a)(3)(ii) of this section and at intervals no greater than 5 years in the case of vessels specified in paragraph (a)(3)(i) of this section.

(5) Notify the Administrator in writing at least 30 days prior to the filling or refilling of each storage vessel for which an inspection is required by paragraphs (a)(1) and (a)(4) of this section to afford the Administrator the opportunity to have an observer present. If the inspection required by paragraph (a)(4) of this section is not planned and the owner or operator could not have known about the inspection 30 days in advance or refilling the tank, the owner or operator shall notify the Administrator at least 7 days prior to the refilling of the storage vessel. Notification shall be made by telephone immediately followed by written documentation demonstrating why the inspection was unplanned. Alternatively, this notification including the written documentation may be made in writing and sent by express mail so that it is received by the Administrator at least 7 days prior to the refilling.

**§ 60.115b Reporting and recordkeeping requirements.**

The owner or operator of each storage vessel as specified in §60.112b(a) shall keep records and furnish reports as required by paragraphs (a), (b), or (c) of this section depending upon the control equipment installed to meet the requirements of §60.112b. The owner or operator shall keep copies of all reports and records required by this section, except for the record required by (c)(1), for at least 2 years. The record required by (c)(1) will be kept for the life of the control equipment.

(a) After installing control equipment in accordance with §60.112b(a)(1) (fixed roof and internal floating roof), the owner or operator shall meet the following requirements.

(1) Furnish the Administrator with a report that describes the control equipment and certifies that the control equipment meets the specifications of §60.112b(a)(1) and §60.113b(a)(1). This report shall be an attachment to the notification required by §60.7(a)(3).

(2) Keep a record of each inspection performed as required by §60.113b (a)(1), (a)(2), (a)(3), and (a)(4). Each record shall identify the storage vessel on which the inspection was performed and shall contain the date the vessel was inspected and the observed condition of each component of the control equipment (seals, internal floating roof, and fittings).

(3) If any of the conditions described in §60.113b(a)(2) are detected during the annual visual inspection required by §60.113b(a)(2), a report shall be furnished to the Administrator within 30 days of the inspection. Each report shall identify the storage vessel, the nature of the defects, and the date the storage vessel was emptied or the nature of and date the repair was made.

(4) After each inspection required by §60.113b(a)(3) that finds holes or tears in the seal or seal fabric, or defects in the internal floating roof, or other control equipment defects listed in §60.113b(a)(3)(ii), a report shall be furnished to the Administrator within 30 days of the inspection. The report shall identify the storage vessel and the reason it did not meet the specifications of §61.112b(a)(1) or §60.113b(a)(3) and list each repair made.

**§ 60.116b Monitoring of operations.**

(a) The owner or operator shall keep copies of all records required by this section, except for the record required by paragraph (b) of this section, for at least 2 years. The record required by paragraph (b) of this section will be kept for the life of the source.

(b) The owner or operator of each storage vessel as specified in §60.110b(a) shall keep readily accessible records showing the dimension of the storage vessel and an analysis showing the capacity of the storage vessel.

(c) Except as provided in paragraphs (f) and (g) of this section, the owner or operator of each storage vessel either with a design capacity greater than or equal to 151 $m^3$ storing a liquid with a maximum true vapor pressure greater than or equal to 3.5 kPa or with a design capacity greater than or equal to 75 $m^3$ but less than 151 $m^3$ storing a liquid with a maximum true vapor pressure greater than or equal to 15.0 kPa shall maintain a record of the VOL stored, the period of storage, and the maximum true vapor pressure of that VOL during the respective storage period.

(d) Except as provided in paragraph (g) of this section, the owner or operator of each storage vessel either with a design capacity greater than or equal to 151 $m^3$ storing a liquid with a maximum true vapor pressure that is normally less than 5.2 kPa or with a design capacity greater than or equal to 75 $m^3$ but less than 151 $m^3$ 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 respective maximum true vapor vapor pressure values for each volume range.

(e) Available data on the storage temperature may be used to determine the maximum true vapor pressure as determined below.

(1) 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.

(2) For crude oil or refined petroleum products the vapor pressure may be obtained by the following:

(i) Available data on the Reid vapor pressure and the maximum expected storage temperature based on the highest expected calendar-month average temperature of the stored product may be used to determine the maximum true vapor pressure from nomographs contained in API Bulletin 2517 (incorporated by reference—see §60.17), unless the Administrator specifically requests that the liquid be sampled, the actual storage temperature determined, and the Reid vapor pressure determined from the sample(s).

(ii) The true vapor pressure of each type of crude oil with a Reid vapor pressure less than 13.8 kPa or with physical properties that preclude determination by the recommended method is to be determined from available data and recorded if the estimated maximum true vapor pressure is greater than 3.5 kPa.

(3) For other liquids, the vapor pressure:

(i) May be obtained from standard reference texts, or

(ii) Determined by ASTM D2879–83, 96, or 97 (incorporated by reference—see §60.17); or

(iii) Measured by an appropriate method approved by the Administrator; or

(iv) Calculated by an appropriate method approved by the Administrator.

[52 FR 11429, Apr. 8, 1987, as amended at 65 FR 61756, Oct. 17, 2000; 65 FR 78276, Dec. 14, 2000; 68 FR 59333, Oct. 15, 2003]

**§ 60.117b Delegation of authority.**

(a) In delegating implementation and enforcement authority to a State under section 111(c) of the Act, the authorities contained in paragraph (b) of this section shall be retained by the Administrator and not transferred to a State.

(b) Authorities which will not be delegated to States: §§60.111b(f)(4), 60.114b, 60.116b(e)(3)(iii), 60.116b(e)(3)(iv), and 60.116b(f)(2)(iii).

[52 FR 11429, Apr. 8, 1987, as amended at 52 FR 22780, June 16, 1987]

E.3.3 One Time Deadlines Relating to the Standard of Performance for Volatile Organic Liquid Storage Vessels for which Construction, Reconstruction, or Modification Commenced after July 23, 1984 [40 CFR 60, Subpart Kb]

| Requirement | Rule Cite | Affected Facility | Deadline |
|---|---|---|---|
| Notification of the Date of Construction | 40 CFR 60.7(a)(1) | Tanks T01, T02, and T04 through T07 | Within 30 days after construction was commenced. |
| Notification of the Date of Initial Startup | 40 CFR 60.7(a)(3) | Tanks T01, T02, and T04 through T07 | Within 15 days after initial startup. |
| First Visual Inspection | 40 CFR 60.113b(a)(1) | Tanks T01, T02, and T04 through T07 | Prior to filling the storage tanks. |
| Notify Administrator of Initial Filling of Storage Tanks | 40 CFR 60.113b(a)(5) | Tanks T01, T02, and T04 through T07 | At least 30 days prior to initial filling. |

# INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
# OFFICE OF AIR QUALITY

## FEDERALLY ENFORCEABLE STATE OPERATING PERMIT (FESOP) CERTIFICATION

Source Name: Cardinal Ethanol, LLC
Source Address: 1554 North County Road 600 East, Union City, Indiana 47390
Mailing Address: 2 OMCO Square, Suite 201, P.O. Box 501, Winchester, Indiana 47394
FESOP No.: 135-23226-00033

**This certification shall be included when submitting monitoring, testing reports/results or other documents as required by this permit.**

Please check what document is being certified:

☐ Annual Compliance Certification Letter

☐ Test Result (specify)_____

☐ Report (specify)_____

☐ Notification (specify)_____

☐ Affidavit (specify)_____

☐ Other (specify)_____

I certify that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

Signature:

Printed Name:

Title/Position:

Date:

**INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT**
**OFFICE OF AIR QUALITY**
**COMPLIANCE BRANCH**
**100 North Senate Avenue**
**Indianapolis, Indiana 46204-2251**
**Phone: 317-233-0178**
**Fax: 317-233-6865**

**FEDERALLY ENFORCEABLE STATE OPERATING PERMIT (FESOP)**
**EMERGENCY OCCURRENCE REPORT**

Source Name: Cardinal Ethanol, LLC
Source Address: 1554 North County Road 600 East, Union City, Indiana 47390
Mailing Address: 2 OMCO Square, Suite 201, P.O. Box 501, Winchester, Indiana 47394
FESOP No.: 135-23226-00033

**This form consists of 2 pages** **Page 1 of 2**

□ This is an emergency as defined in 326 IAC 2-7-1(12)
- The Permittee must notify the Office of Air Quality (OAQ), within four (**4**) business hours (1-800-451-6027 or 317-233-0178, ask for Compliance Section); and
- The Permittee must submit notice in writing or by facsimile within two (**2**) working days (Facsimile Number: 317-233-6865), and follow the other requirements of 326 IAC 2-7-16

If any of the following are not applicable, mark N/A

| |
|---|
| Facility/Equipment/Operation: |
| Control Equipment: |
| Permit Condition or Operation Limitation in Permit: |
| Description of the Emergency: |
| Describe the cause of the Emergency: |

If any of the following are not applicable, mark N/A **Page 2 of 2**

| |
|---|
| Date/Time Emergency started: |
| Date/Time Emergency was corrected: |
| Was the facility being properly operated at the time of the emergency? Y N<br>Describe: |
| Type of Pollutants Emitted: TSP, PM-10, $SO_2$, VOC, $NO_X$, CO, Pb, other: |
| Estimated amount of pollutant(s) emitted during emergency: |
| Describe the steps taken to mitigate the problem: |
| Describe the corrective actions/response steps taken: |
| Describe the measures taken to minimize emissions: |
| If applicable, describe the reasons why continued operation of the facilities are necessary to prevent imminent injury to persons, severe damage to equipment, substantial loss of capital investment, or loss of product or raw materials of substantial economic value: |

Form Completed by:_____

Title / Position:_____

Date:_____

Phone: _____

A certification is not required for this report.

# INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
# OFFICE OF AIR QUALITY
# COMPLIANCE DATA SECTION

## FESOP Quarterly Report

Source Name: Cardinal Ethanol, LLC
Source Address: 1554 North County Road 600 East, Union City, Indiana 47390
Mailing Address: 2 OMCO Square, Suite 201, P.O. Box 501, Winchester, Indiana 47394
FESOP No.: 135-23226-00033
Facility: Grain Receiving Operations (P06 and P07)
Parameter: The amount of grain received
Limit: Less than 1,100,000 tons per twelve (12) consecutive month period with compliance determined at the end of each month

YEAR:_____

| Month | Column 1 | Column 2 | Column 1 + Column 2 |
|---|---|---|---|
| | This Month | Previous 11 Months | 12 Month Total |
| Month 1 | | | |
| Month 2 | | | |
| Month 3 | | | |

☐ No deviation occurred in this quarter.

☐ Deviation/s occurred in this quarter.
Deviation has been reported on:_____

Submitted by: _____
Title / Position: _____
Signature: _____
Date: _____
Phone: _____

Attach a signed certification to complete this report.

# INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
# OFFICE OF AIR QUALITY
# COMPLIANCE DATA SECTION

## FESOP Quarterly Report

Source Name: Cardinal Ethanol, LLC
Source Address: 1554 North County Road 600 East, Union City, Indiana 47390
Mailing Address: 2 OMCO Square, Suite 201, P.O. Box 501, Winchester, Indiana 47394
EFSOP No.: 135-23226-00033
Facility: DDGS Cooling Drum; DDGS Handling and Loadout Operations
Parameter: DDGS Production Rate
Limit: Less than 356,800 tons per twelve (12) consecutive month period with compliance determined at the end of each month

YEAR:_____

| Month | Column 1 | Column 2 | Column 1 + Column 2 |
|---|---|---|---|
| | This Month | Previous 11 Months | 12 Month Total |
| Month 1 | | | |
| Month 2 | | | |
| Month 3 | | | |

☐ No deviation occurred in this quarter.

☐ Deviation/s occurred in this quarter.
Deviation has been reported on:_____

Submitted by: _____
Title / Position: _____
Signature: _____
Date: _____
Phone: _____

Attach a signed certification to complete this report.

# INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
# OFFICE OF AIR QUALITY
# COMPLIANCE DATA SECTION

## FESOP Quarterly Report

Source Name: Cardinal Ethanol, LLC
Source Address: 1554 North County Road 600 East, Union City, Indiana 47390
Mailing Address: 2 OMCO Square, Suite 201, P.O. Box 501, Winchester, Indiana 47394
FESOP No.: 135-23226-00033
Facility: Ethanol Loading Rack (P66)
Parameter: Total Denatured Ethanol Loaded Out
Limit: Less than 110,000,000 gallons per twelve (12) consecutive month period with compliance determined at the end of each month

YEAR:_____

| Month | Column 1 | Column 2 | Column 1 + Column 2 |
|---|---|---|---|
| | This Month | Previous 11 Months | 12 Month Total |
| Month 1 | | | |
| Month 2 | | | |
| Month 3 | | | |

☐ No deviation occurred in this quarter.

☐ Deviation/s occurred in this quarter.
Deviation has been reported on:_____

Submitted by: _____
Title / Position: _____
Signature: _____
Date: _____
Phone: _____

Attach a signed certification to complete this report.

# INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
# OFFICE OF AIR QUALITY
# COMPLIANCE DATA SECTION

## FESOP Quarterly Report

Source Name: Cardinal Ethanol, LLC
Source Address: 1554 North County Road 600 East, Union City, Indiana 47390
Mailing Address: 2 OMCO Square, Suite 201, P.O. Box 501, Winchester, Indiana 47394
FESOP No.: 135-23226-00033
Facility: Total Denatured Ethanol
Parameter: Loaded into trucks
Limit: Less than 38,500,000 gallons per twelve (12) consecutive month period with compliance determined at the end of each month

YEAR:_____

| Month | Column 1 | Column 2 | Column 1 + Column 2 |
|---|---|---|---|
| | This Month | Previous 11 Months | 12 Month Total |
| Month 1 | | | |
| Month 2 | | | |
| Month 3 | | | |

☐ No deviation occurred in this quarter.

☐ Deviation/s occurred in this quarter.
Deviation has been reported on:_____

Submitted by: _____
Title / Position: _____
Signature: _____
Date: _____
Phone: _____

Attach a signed certification to complete this report.

# INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
# OFFICE OF AIR QUALITY
# COMPLIANCE DATA SECTION

## FESOP Quarterly Report

Source Name: Cardinal Ethanol, LLC
Source Address: 1554 North County Road 600 East, Union City, Indiana 47390
Mailing Address: 2 OMCO Square, Suite 201, P.O. Box 501, Winchester, Indiana 47394
FESOP No.: 135-23226-00033
Facility: Flare C50
Parameter: Operating Hours
Limit: Less than 4,380 hours per twelve (12) consecutive month period with compliance determined at the end of each month

YEAR:_____

| Month | Column 1 | Column 2 | Column 1 + Column 2 |
|---|---|---|---|
| | This Month | Previous 11 Months | 12 Month Total |
| Month 1 | | | |
| Month 2 | | | |
| Month 3 | | | |

☐ No deviation occurred in this quarter.

☐ Deviation/s occurred in this quarter.
Deviation has been reported on:_____

Submitted by: _____
Title / Position: _____
Signature: _____
Date: _____
Phone: _____

Attach a signed certification to complete this report.

# INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
# OFFICE OF AIR QUALITY
# COMPLIANCE DATA SECTION

## FESOP Quarterly Report

Source Name: Cardinal Ethanol, LLC
Source Address: 1554 North County Road 600 East, Union City, Indiana 47390
Mailing Address: 2 OMCO Square, Suite 201, P.O. Box 501, Winchester, Indiana 47394
FESOP No.: 135-23226-00033
Facility: Diesel Fire Pump (P110)
Parameter: Operating Hours
Limit: Less than 500 hours per twelve (12) consecutive month period with compliance determined at the end of each month

YEAR:_____

| Month | Column 1 | Column 2 | Column 1 + Column 2 |
|---|---|---|---|
| | This Month | Previous 11 Months | 12 Month Total |
| Month 1 | | | |
| Month 2 | | | |
| Month 3 | | | |

☐ No deviation occurred in this quarter.

☐ Deviation/s occurred in this quarter.
Deviation has been reported on:_____

Submitted by: _____
Title / Position: _____
Signature: _____
Date: _____
Phone: _____

Attach a signed certification to complete this report.

# INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
# OFFICE OF AIR QUALITY
# COMPLIANCE DATA SECTION
## FEDERALLY ENFORCEABLE STATE OPERATING PERMIT (FESOP)
## QUARTERLY DEVIATION AND COMPLIANCE MONITORING REPORT

Source Name: Cardinal Ethanol, LLC
Source Address: 1554 North County Road 600 East, Union City, Indiana 47390
Mailing Address: 2 OMCO Square, Suite 201, P.O. Box 501, Winchester, Indiana 47394
FESOP No.: 135-23226-00033

**Months:** _____ **to** _____ **Year:** _____



This report shall be submitted quarterly based on a calendar year. Any deviation from the requirements, the date(s) of each deviation, the probable cause of the deviation, and the response steps taken must be reported. A deviation required to be reported pursuant to an applicable requirement that exists independent of the permit, shall be reported according to the schedule stated in the applicable requirement and does not need to be included in this report. Additional pages may be attached if necessary. If no deviations occurred, please specify in the box marked "No deviations occurred this reporting period".

□ NO DEVIATIONS OCCURRED THIS REPORTING PERIOD.

□ THE FOLLOWING DEVIATIONS OCCURRED THIS REPORTING PERIOD

| | |
|---|---|
| **Permit Requirement** (specify permit condition #) | |
| **Date of Deviation:** | **Duration of Deviation:** |
| **Number of Deviations:** | |
| **Probable Cause of Deviation:** | |
| **Response Steps Taken:** | |

| | |
|---|---|
| **Permit Requirement** (specify permit condition #) | |
| **Date of Deviation:** | **Duration of Deviation:** |
| **Number of Deviations:** | |
| **Probable Cause of Deviation:** | |
| **Response Steps Taken:** | |

| | |
|---|---|
| **Permit Requirement** (specify permit condition #) | |
| **Date of Deviation:** | **Duration of Deviation:** |
| **Number of Deviations:** | |
| **Probable Cause of Deviation:** | |
| **Response Steps Taken:** | |
| **Permit Requirement** (specify permit condition #) | |
| **Date of Deviation:** | **Duration of Deviation:** |
| **Number of Deviations:** | |
| **Probable Cause of Deviation:** | |
| **Response Steps Taken:** | |
| **Permit Requirement** (specify permit condition #) | |
| **Date of Deviation:** | **Duration of Deviation:** |
| **Number of Deviations:** | |
| **Probable Cause of Deviation:** | |
| **Response Steps Taken:** | |

Form Completed by:_____

Title / Position:_____

Date:_____

Phone: _____

Attach a signed certification to complete this report.

**ATTACHMENT A**

**Fugitive Dust Control Plan**
**Cardinal Ethanol, LLC**
**1554 North County Road 600 East**
**Union City, Indiana 47390**

## 1.0 INTRODUCTION AND BACKGROUND

Cardinal Ethanol, LLC (Cardinal) is proposing to construct a fuel ethanol production facility near Union City, Indiana. The plant will manufacture fuel grade ethanol at a rate of 110 million gallons per year. Pursuant to Title 326 of the Indiana Administrative Code (IAC) Article 6 Rule 5, this Fugitive Dust Control Plan has been prepared to identify all potential particulate matter (PM) fugitive emission sources and to summarize proposed control measures for each source. The Fugitive Dust Control Plan is considered a supplemental document to the Air Construction Permit Application originally submitted on June 1, 2006.

There will be several potential sources of fugitive PM emissions associated with the operation of the Cardinal Ethanol plant. Emission sources may include the transport, unloading, handling and storage of grain; the scalping and milling of grain; the transport, handling, storage and loading of dried distiller's grain and solubles (DDGS); and vehicular traffic on paved haul roads. Plant design will incorporate state-of-the-art air emission control equipment to reduce facility-wide air emissions, including fugitive PM emissions. A site plan map showing potential fugitive PM emission sources will be provided once available.

## 2.0 IDENTIFICATION OF FUGITIVE PM EMISSION SOURCES

Identification of potential fugitive PM emission sources at the Cardinal ethanol plant can be summarized into the following three (3) groups:

1. Grain Processing

Grain, typically corn, is delivered to the facility via truck and railcar. The grain is dumped in an unloading area where it will be mechanically conveyed to silos and bins for storage. The grain is then mechanically conveyed to a scalping/milling area where four (4) hammermills will be used to mill the grain into a fine powder, which will be used as feedstock for ethanol production. Potential fugitive PM emission sources associated with grain processing include:

- Grain transporting (truck and rail);
- Grain unloading;
- Grain conveying;
- Grain storage; and
- Grain milling.

2. DDGS Processing

The facility's distillation process removes the non-fermentable corn solids and water from the process stream. The residue mash leaving distillation, called whole stillage, is transferred from the base of the distillation column to the stillage processing area. The whole stillage passes through a centrifuge to remove the majority of the water. The underflow from the centrifuge is called wet distillers grain with solubles (WDGS) or wet cake. The facility will have the option to handle WDGS in three ways, at this point in the process:

1. The WDGS is high quality feed (about 65% moisture) and can be loaded directly to trucks and transported to customers. The WDGS can be stored on a pad, typically for 2 to 3 days until transport.

2. The WDGS can be partially dried to create a product known as modified wet distillers grain with solubles (MWDGS) or modified wet cake. The product is approximately 50% moisture. One benefit of modified wet cake is a slightly longer shelf life in storage.

3. The WDGS can be further dried to create a product known as dried distillers grains with solubles (DDGS). The DDGS are about 10% moisture and can be stored for long periods of time. Upon leaving the drying system, the DDGS must be cooled prior to storage or loadout. The DDGS storage and loadout system is ventilated to a high efficiency baghouse or the thermal oxidizers emissions control.

Potential fugitive PM emission sources associated with DDGS processing include:

- DDGS conveying;
- DDGS dump pit;
- DDGS storage;
- DDGS loading; and
- DDGS transport.

3. Paved Haul Roads

Fugitive PM emissions from the paved haul roads are associated with truck traffic hauling grain, denaturant, denatured ethanol, WDGS and DDGS onto and off of the site. Other vehicular traffic from employees and visitors will also generate fugitive PM emissions from the paved haul roads.

## 3.0 FUGITIVE PM CONTROL MEASURES

Fugitive PM control measures at the Cardinal facility vary from the installation of control equipment to good housekeeping practices. Each potential fugitive PM emission source, as identified above, has been listed with the control measure(s) that Cardinal Ethanol, LLC will implement during plant operation.

Grain Processing

- **Grain Transporting** – fugitive PM emissions are only associated with the transport of grain via truck since there will be no emissions associated with an enclosed railcar. Grain is expected to be delivered by hopper trucks. All trucks will be covered by a tarp or similar cover from their point of site entry until they reach the unloading area.

- **Grain Unloading –** Grain is unloaded from truck or railcar within an enclosed building. PM emissions from the building are controlled with an aspirated ventilation system coupled with a high efficiency fabric filter baghouse (Grain Unloading Baghouse (C20)).

- **Grain Conveying –** All grain conveyors are enclosed and are vented to a high efficiency fabric filter baghouse (C20).

- **Grain Storage –** Grain is stored in two (2) large storage silos and two (2) day bins. All silos and bins are vented to a high efficiency fabric filter baghouse (C20).

- **Grain Milling –** Grain is milled by four (4) hammermilling units which turn the grain to powder. PM emissions from the Hammermilling operations are controlled with an aspirated ventilation system coupled with a high efficiency fabric filter baghouse (Hammermilling Baghouse (C30)).

DDGS Processing

- **DDGS Conveying -** All DDGS conveyors are enclosed and are vented to a high efficiency fabric filter baghouse (DDGS Loading Baghouse (C90)).

- **DDGS Dump Pit –** PM emissions from the DDGS dump pit/auger are controlled with an aspirated ventilation system coupled with a high efficiency fabric filter baghouse (C90).

- **DDGS Storage –** DDGSs are stored in two (2) storage silos and in an enclosed DDGS storage building. PM emissions from the silos are controlled with an aspirated ventilation system coupled with a high efficiency fabric filter baghouse (C90).

- **DDGS Loading –** DDGS's are loaded into trucks and railcars in the same enclosed building as grain is received, and therefore, PM emissions are controlled by the same control system as the grain receiving operations.

- **DDGS Transport –** Similar to grain transport, trucks transporting DDGS will be covered by a tarp or similar cover from the loading area to site egress.

Paved Roads - Paved road control measures are as follows:

- Maximum vehicle speeds along the roadways will be limited to 10 mph; and

- Mud, dirt and other debris will be removed from roadways by using brooms as necessary. If needed, roadways may also be cleaned by mechanical sweeper.

This Fugitive Dust Control Plan will be implemented once construction of the facility has been completed. The plan will be kept onsite and updated as needed to prevent fugitive PM emissions from the operation of the Cardinal Ethanol plant.

# Indiana Department of Environmental Management
# Office of Air Quality

## Addendum to the Technical Support Document
## for a New Source Review and Federally Enforceable State Operating Permit (FESOP)

**Source Background and Description**

| | |
|---|---|
| Source Name: | Cardinal Ethanol, LLC |
| Source Location: | 1554 North County Road 600 East, Union City, Indiana 47390 |
| County: | Randolph |
| SIC Code: | 2869 |
| Operation Permit No.: | F135-23226-00033 |
| Permit Reviewer: | ERG/YC |

On November 27, 2006, the Office of Air Quality (OAQ) had a notice published in the Journal Review, Crawfordsville, Indiana, stating that Cardinal Ethanol, LLC had applied for a New Source Review and Federally Enforceable State Operating Permit (FESOP) to construct and operate an ethanol production plan with control. The notice also stated that OAQ proposed to issue a permit for this operation and provided information on how the public could review the proposed permit and other documentation. Finally, the notice informed interested parties that there was a period of thirty (30) days to provide comments on whether or not this permit should be issued as proposed.

On December 28, 2006, Charles L. Berger of Berger and Berger, LLP (referred to as the "Commenter"); on behalf of Kenneth A. Lewis, John W. Parrett and Jerry A. Mills (residents of Randolph County) submitted comments on the proposed FESOP. The summary of the comments is as follows. **Bold** language has been added, and language shown in ~~strikeout~~ has been deleted. The Table of Contents has been updated as necessary.

**Comment 1:**

The commenter stated that particulate matter emissions may exceed the major source threshold for the following reasons regarding grain receiving emissions:

(a) The PM10 emissions calculations from the grain receiving and handling baghouses must include a safety factor and can not be solely based on emission rates determined for proper functioning baghouses because they frequently malfunction and/or the bags become torn, which allows excess emissions from the control device outlet. The commenter provides references[1] of industry personnel, environmental control officials, and equipment vendors that indicate

[1] D. Wallace and V. Ramananthan, Review of Compliance Monitoring Programs with Respect to Grain Elevators, U.S. Environmental Protection Agency Contract No. 68-01-4139, WA 14, US. Environmental Protection Agency, Research Triangle Park, NC, 1980, pp. 15-16; in: A. Buonicore and W. Davis (eds.), Air Pollution Control Manual, Grain Handling and Processing, Van Nostrand Reynold, New York, NY, 1992, pp. 517-528.

there is evidence that operating problems may result in significant periods during which the control equipment is shut down or operating inefficiently. Absent a demonstration that the 99% control from the grain receiving and handling baghouses is achievable and enforceable at all times, the potential to emit calculations should be based on the maximum potential emissions, i.e., or the Permit should be appropriately restricted.

(b) The draft Permit is based upon an incorrect calculation of grain receiving, handling and grain scalping fugitive emissions. These fugitive particulate matter emissions are uncaptured dust that does not pass through a stack or other controllable point source. These fugitive emissions were estimated using emission factors from AP-42, Chapter 9.9.1 - Grain Elevators, Tables 9.9.1-1 and 9.9.1-2. TSD, App. A, p. 1. AP-42 is EPA's emission estimating guidance and has been incorporated by reference into Indiana regulations. 326 IAC 1-1-3.5. As explained below, the calculations in the TSD underestimate these emissions.

(1) The TSD estimated grain receiving fugitive PM and PM10 emissions using emission factors for hopper trucks (0.035 lb/ton of PM and 0.0078 lb/ton of PM10). AP-42, Table 9.9.1-1. Grain can be received by either straight truck or hopper truck. The PM and PM10 emissions would be over five times larger if straight trucks were used (0.18 lb/ton of PM and 0.059 lb/ton of PM10). Id. The Permit contains a PM/PM10 emission limit for all PM and PM10 emissions from grain receiving and handling operations (2.06 lbs/hr, draft Permit, p. 30), but this limit is unenforceable because the uncontrolled nature of fugitive emissions makes it impossible to determine the lb/hr emission rates from the source. Therefore, the control of fugitives depends upon the amount of grain received and the transport/unloading method. The permit does not restrict grain receiving trucks to only hopper trucks. Potential to emit calculations should be based on the highest potential emissions, i.e., straight trucks, or the Permit should be appropriately restricted. If straight trucks were used, the PM emissions would increase from 0.96 tpy to 4.95 tpy and the PM10 emissions would increase from 0.21 tpy to 1.62 tpy.[2] These increases coupled with others in this comment would cause PM and PM10 emissions to exceed the major source threshold of 100 ton/yr.

(2) The draft Permit assumes that the grain receiving fugitive PM and PM10 will be reduced by 95%. TSD, Appx. A, p. 1 This is not consistent with AP-42. Grain receiving fugitive PM and PM10 emissions are basically uncaptured dust and thus by definition are uncontrolled. No control efficiency applies to these emissions, as they are not vented through a point source that can be controlled. The TSD reports that Cardinal will use "choked flow systems" that will control fugitive emissions, but the draft Permit does not require the use of such a system, and the TSD does not supply any support for the proposition that such a system can and will achieve 95% reduction of fugitives from grain receiving. Absent a demonstration that 95% control is achievable and enforceable, the potential to emit calculations should be based on the maximum potential emissions, i.e., uncontrolled, or the Permit should be appropriately restricted. If uncontrolled emissions based on straight trucks are used, the PM emissions increase from 4.95 tpy to 99 tpy and PM10 emissions

[2] Potential to emit PM = 1,100,000 tons/yr grain x 0.18 x (1-95%) x lton/2000 lbs = 4.95 tpy
Potential to emit PM10 =1,100,000 tons/yr grain x 0.059 x (1-95%) x lton/2000 lbs = 1.62 tpy

increase from 1.62 tpy to 32.45 tpy.[3]

**Response to Comment 1:**

In regards to the commenter's concern that the grain receiving and handling emission calculations must include a safety factor, IDEM, OAQ feels that the specific monitoring requirements in the permit regarding baghouses ensures that baghouse malfunctions are minimized. IDEM, OAQ believes that monitoring the pressure drop across the baghouses is important for determining the proper operation of the control equipment. The Permittee is required to take reasonable response steps when a compliance monitoring parameter is determined to be out of range or abnormal under Condition C.18 - Response to Excursions or Exceedances. This condition ensures that the control equipment is returned to proper operation as soon as practicable, while still allowing the Permittee the flexibility to respond to situations that were not anticipated. In addition, visible emission notations are also used as a trigger that the source perform some corrective action on the facility if visible emissions are abnormal, which helps ensure continuous compliance with emission limitations (see Response to Comment 7 for further detail).

IDEM, OAQ does agree that the permit should require Cardinal Ethanol to use hopper trucks for the grain receiving operations and to use a choked flow system during grain unloading because the process is used as a type of control method for fugitive PM and PM10 emissions during grain receiving. Furthermore, the capture efficiencies for the baghouses and the choked flow systems are based on manufacturer design specifications of the baghouse system.

With regard to the expected emission reductions for the grain receiving fugitive PM and PM10, IDEM, OAQ believes that the permit does effectively limit fugitive PM and PM10 emissions from the grain receiving area by means of a grain throughput limit. The fugitive emissions are directly correlated to the throughput which is limited in the permit, and the Permittee is required to keep monthly records of this throughput. Provided the source complies with the throughput limit and uses the choked flow system, it is expected that baghouse C20 will capture 95% of the PM and PM10 emissions from the grain receiving and handling processes. Therefore, only 5% of the PM and PM10 emissions from the grain receiving and handling operations are considered fugitive emissions.

The following changes have been made to the permit as a result of this comment:

D.1.4 PM and PM10 Emissions [326 IAC 2-2] [326 IAC 2-8-4]

...

**(e) For the truck receiving operation, the Permittee shall use only hopper trucks.**

**(f) The Permittee shall use choked flow systems for the grain receiving and handling operations, and the DDGS loadout spout.**

...

**Comment 2:**

The commenter stated that particulate matter emissions exceed the major source threshold for the following reasons regarding fugitive dust from roads:

[3] 1,100,000 tpy throughput x Uncontrolled PM Emission Factor 0.180 lbs/ton x lton/2000 lbs = 99 tpy
1,100,000 tpy throughput x Uncontrolled PM10 Emission Factor 0.0590 lbs/ton x lton/2000 lbs = 32.45 tpy

(a) The silt loading value used in the emission calculations for paved roads was not appropriate and results in an underestimate of the fugitive PM/PM10 emissions. The commenter provides the following arguments:

(1) Dust emissions from paved roads vary with the amount of silt on the road surface, referred to as "silt loading." The value used in the draft technical support document is the default silt loading for typical urban roadways. However, the paved roads of interest here are within the boundary of an industrial site and thus are industrial roadways. Silt loading values of industrial roads are much higher and are reported elsewhere in the same chapter of AP-42. These higher silt loading values for industrial roadways, which range from 7.4 to 292 $g/m^2$, would result in much higher PM and PM10 emissions from haul roads than assumed in the TSD (see AP-42 Sec. 13.2.1, Table 13.2.1-4).

(2) Minnesota, which has a long history with ethanol plants, has investigated this issue. Measurements made at the ADM-Marshall ethanol facility in the summer of 2001 found silt loadings ranging from 0.76 to 2.93 $g/m^2$ with no road cleaning. Measurements made at the same facility in the summer of 2003 with road cleaning found silt loadings of 0.70 to 0.72 $g/m^2$. The cleaning methods used at this ADM facility include daily road sweeping, vacuuming and washing, and truck speeds limited to 5 miles per hour, none of which are required in the draft permit.[4]

In spite of these measurements, the Minnesota Pollution Control Agency (MPCA) requires the use of 10.0 $g/m^2$ as the default silt loading for Title V permits. MPCA also requires "good documentation for proposed silt loading values" and expects companies to do "extensive" on-site testing/cleaning or to use the silt loadings for industrial facilities in AP-42, Table 13.2.1-4, as noted above. Minnesota permits require sweeping, vacuuming or washing and testing for silt loading.

(3) Similarly, Nebraska, another state with a long history of permitting ethanol plants, requires the use of a silt loading of 3 $g/m^2$, unless site-specific test data is provided.[5]

Using the Nebraska default silt content of 3 $g/m^2$, the controlled PM emissions from Cardinal haul roads increase from 22.0 tpy to 62.54 tpy and the controlled PM10 emissions increase from 4.27 tpy to 12.19 tpy. This correction plus the grain receiving fugitive corrections discussed above in Comment 1 increase facility-wide PM 10 emissions from 69.5 tpy to 108.25 tpy. These corrections also increase facility-wide PM emissions from 88.6 tpy to 223.19 tpy. Thus, PM10 and PM emissions exceed the major source thresholds of 100 tpy and the facility is a major source. The increases reported here would be even greater if Cardinal used the MPCA Title V default of 10 $g/m^2$. We believe this higher default is appropriate as Cardinal has failed to supply any documented site-specific silt loadings.

(b) The commenter states that the draft permit must be modified to include emission limits and methods to assure that the claimed emission reduction from periodic sweeping of paved roads is achieved. These should include limits on, and monitoring and reporting of all factors assumed in the emission calculations:

[4] Air Modeling - Training, Minnesota Air, Water, and Waste Environmental Conference, February 14, 2006.
[5] ADM Corn Processing, Columbus, Nebraska, Truck Traffic Fugitive Control Strategy and Monitoring Plan, ADM Haul Roads, January 10, 2006.

number of trucks, weight of trucks, distance trucks travel, and silt content. The Permit also should require controls sufficient to assure that Cardinal achieves a 50% reduction in PM/PM10, including speed limits and daily cleaning of all roads. The commenter states that IDEM can not assume that emissions will be reduced by 50% by "periodic sweeping" because:

(1) The condition that reads: "The Permittee shall use periodic sweeping to control PM and PM10 emissions from the paved roads. The sweeping shall be performed in a manner and at a frequency sufficient to ensure compliance with 326 IAC 2-2" does not assure that sweeping will be sufficient to reduce PM and PM10 emissions by 50%. The condition only requires that "sweeping be performed in a manner and at a frequency sufficient to ensure compliance with 326 IAC 2-2." The cite to 326 IAC 2-2 is ambiguous and unenforceable because this regulation has many subparts, none of which relate to sweeping of paved roads at industrial facilities or achieving a 50% control efficiency from any type of facility.

(2) The term "periodic" is ambiguous and thus unenforceable. The plain meaning of "periodic" simply means that the event occurs at regular intervals. This draft Permit does not define the interval. Does periodic mean daily? Weekly? Monthly? Something in between? The frequency of sweeping determines the amount of control achieved. Studies done in Minnesota and elsewhere indicate that daily road sweeping, vacuuming and washing (weather permitting) plus speed limit controls (5 mph) are required to achieve 50% control of fugitive PM and PM10 emissions. Permits for ethanol plants in other states require daily sweeping and periodic silt testing to confirm emissions, unless the emissions are based on a high default silt loading, e.g., 3 to 10 $g/m^2$. Therefore, Cardinal cannot rely on this condition to reduce the potential to emit of the haul roads.

(3) In order for a permit to be enforceable as a practical matter, a permitting agency must include specific legal obligations in the permit so that sources will observe the permit constraints and compliance can be determined. National Min. Ass'n v. U.S. EPA, 59 F.3d 1351, 1363 (D.C. Cir. 1995). Conditions that are vague, contradictory, or confusing are unenforceable. Vague and subjective terms like "periodic" are unenforceable. The purpose of a permit is to individualize a regulation to site-specific conditions. The subject condition, notwithstanding the incomplete cite to 326 IAC 2-2, fails to do that. No site-specific conditions are included in the Permit to add detail to the term "periodic" or to assure 50% PM/PM10 control. This ambiguous language allows unlimited enforcement discretion in the determination of whether a violation has occurred, and thus is unenforceable. In re: Indeck-Elwood, LLC, EAB Slip Opinion, PSD Appeal No. 03-04 (Sept. 27, 2006) at 72 n. 101. A permit may not reserve agency discretion to determine whether a violation has actually occurred. A condition that only requires "periodic" sweeping, when the underlying potential to emit calculations assumes 50% control, reserves enforcement discretion to IDEM and prevents citizen enforcement of the permit without a decision by IDEM, thus allowing the source to negotiate the condition "off-permit." As a result, reserving enforcement and violation decisions as to haul roads for the agency renders the Permit unenforceable by citizens.

**Response to Comment 2:**

IDEM, OAQ has evaluated the silt loading value used in the emission calculations and investigated the claims made by the commenter with regard to the calculations included in the permit. IDEM, OAQ agrees with the commenter that there is a range of silt loading values presented in AP-42 Chapter 13. Public paved road silt loadings are dependent upon: traffic characteristics (speed, ADT, and fraction of heavy vehicles); road characteristics (curbs, number of lanes, parking lanes); local land use (agriculture, new residential construction) and regional/seasonal factors (snow/ice controls, wind blown dust). However, based on IDEM's evaluation, the default silt loading number of 0.6 grams per square meter value is consistent with the ranges prescribed in AP-42 for paved roads at this type of industrial facility. According to AP-42, Table 13.2.1-3, the default silt loading number is 0.6 $g/m^2$ for sites that have average daily traffic less than 500 vehicles per day. The averaged traffic at the proposed ethanol production plant will be about 168 vehicles per day. Furthermore, the types of trucks traveling onto Cardinal Ethanol's property are not expected to be carrying in mud and dirt from unpaved roads because these trucks are traveling onto Cardinal Ethanol's site location from paved roads. Nevertheless, IDEM, OAQ reserves the right to collect site-specific silt loading data if IDEM determines that there is a problem with heavy silt.

IDEM, OAQ is aware that the term "periodic" bears a certain amount of discretion; however, IDEM, OAQ believes it is unnecessary to define "periodic". It is unreasonable to require sweeping at a predetermined interval because each facility has different geographical surroundings and will experience different weather patterns. To define "periodic" as daily, monthly, or weekly would present unnecessary requirements; especially, during events such as a snow storm or rain event. IDEM, OAQ believes it is more practical for facility owners to assess their fugitive dust generation and implement control measures (sweeping) as needed. Therefore, IDEM, OAQ has included a requirement for the source to keep records of their sweeping activities and at anytime, IDEM, OAQ reserves the right to require more frequent sweeping if IDEM identifies a problem.

The following change has been made to the permit as the result of this comment.

D.1.12 Record Keeping Requirements

...

**(c) To document compliance with Condition D.1.4(d), the Permittee shall maintain records of the dates and times that sweeping is performed on the paved roads.**

~~(c)~~**(d)** To document compliance with Condition D.1.9, the Permittee shall maintain records of daily visible emission notations of the baghouse stack exhausts.

~~(d)~~**(e)** To document compliance with Condition D.1.10, the Permittee shall maintain daily records of the pressure drop during normal operation.

~~(e)~~**(f)** All records shall be maintained in accordance with Section C - General Record Keeping Requirements, of this permit.

**Comment 3:**

The commenter stated that VOC emissions exceed the major source threshold for the following reasons:

(a) The draft permit and TSD inappropriately calculate loading losses from ethanol loading. To show that VOC emissions from loading losses will remain under major source thresholds, the draft Permit depends upon the TSD calculations for trucks and railcars which are based on AP-42, Chapter 5.2. In AP-42, EPA clearly states that the formula used in the TSD, App. A, p. 9, has a probable error rate of +/- 30%. Potential to emit must be based on the maximum emissions. Thus, the TSD should account for the 30% error rate by assuming that the emission factor is 30% higher than the factor resulting from the AP-42 equation. Using an emission factor of 1.45 lbs/kgal[6], potential to emit VOC after the given throughput limit of 38,500 kgal/yr and 98% control is 0.56 tpy[7].

This revised calculation reduces VOC loading losses by a 98% control efficiency, consistent with the TSD calculation. EPA clearly states that this control efficiency is too high in AP-42.

> Control efficiencies for the recovery units range from 90 to over 99 percent, depending on both the nature of the vapors and the type of control equipment used. However, only 70 to 90 percent of the displaced vapors reach the control device, because of leakage from both the tank truck and collection system. The collection efficiency should be assumed to be 90 percent for tanker trucks required to pass an annual leak test. Otherwise, 70 percent should be assumed.

The draft Permit does not require the trucks that will be used at the Cardinal facility to pass an annual leak test so a 70% control efficiency should be used. Even if the Permit required truck testing, however, the control efficiency should be no greater than 90%. The flare itself may be able to reduce by 98% the VOCs that reach it, but 100% of VOC emissions from loading losses will not reach the flare. Using a 90% control efficiency increases controlled VOC emissions from truck loading five fold, to 8.37 tpy, and increase VOC emissions from the facility to well beyond the major source thresholds.[8] This change in potential to emit also increases HAP emissions from the ethanol loading racks, because potential to emit HAPs is keyed to the HAP fraction of the estimated VOC emissions.

(b) The draft Permit and TSD also incorrectly calculate VOCs from equipment leaks. VOCs from equipment leaks comprise over 9% of the total VOC emissions estimated by IDEM. TSD, p. 7. The permit limits VOC emissions from these components using the New Source Performance Standards leak detection and repair provisions in 40 CFR § 60, Subpart VV. Compliance with 40 CFR § 60, Subpart VV relies in part on measuring VOC leaks using EPA Method 21 using a portable hydrocarbon detection instrument. The most commonly used instruments, a flame ionization detector ("FID") or a photoionization detector ("PID") significantly underestimate the types of oxygenated organics that are present in VOC emissions from ethanol plants.[9] Thus the Permit does not effectively limit VOC emissions from equipment leaks.

(c) The application and TSD also completely ignore VOC emissions during disconnection spillages. Other permits reviews for ethanol facilities include VOC

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[6] The reported emission factor is 1.09 lbs/kgal, TSD, App. A, p. 9. Increasing this rate by 1/3 yields a factor of 1.45 lbs/kgal (1.09 x 1.33 = 1.45).

[7] PTE of VOC = 1.45 lbs/kgal x 38,500 kgallyr * lton/2000 lbs x (1-98%) = 0.56 tpy

[8] 94.1+(8.37-.74)=101.73tpy

[9] U.S. Environmental Protection Agency, Response Factors of VOC Calibrated with Methane for Selected Organic Chemicals, Report P881-13619, January .1981.

emissions during disconnection spillages in their PTE calculations. See e.g. San Joaquin Valley Air Pollution Control District, Authority to Construct - Application Review, 60,000,000 Gallon/Year Ethanol Production Facility, Pacific Ethanol Stockton, LLC, Application Nos. N-7365-1-0 through N-7365-28-0, Project No. 1054197, October 10, 2006. IDEM and the applicant have provided no justification for ignoring this source of VOCs for the Cardinal facility.

**Response to Comment 3:**

The trucks receiving ethanol from Cardinal are managed and owned by different companies. These trucks are conservatively assumed to have carried gasoline prior to filling with denatured ethanol; therefore, pursuant to 326 IAC 8-4-9, the trucks dispensing gasoline and being loaded with ethanol are required to have an annual pressure decay or leak test. Additionally, the loadout flares are required to operate when the loading racks are in operation; and there is a requirement in the permit that prohibits the use of vapor balancing services. Furthermore, according to manufacturing specifications, the flares are expected to achieve 100% capture efficiency.

IDEM, OAQ disagrees with the commenter that the VOCs from equipment leaks were calculated incorrectly. EPA has established a Leak, Detection and Repair program (LDAR) pursuant to 40 CFR 60, Subpart VV to control VOC emissions and IDEM, OAQ believes the rule provides a reasonable approach to estimate VOC emissions from leaks.

As shown in the summary of Appendix A, IDEM, OAQ provides for a safety factor of 1 ton per year of VOC emissions (listed under "other insignificant activities"). IDEM, OAQ feels it is reasonable to consider VOC emissions from evaporation of disconnection spillages from the ethanol loading rack as part of these "other insignificant activities"; therefore, these emissions are accounted for in the source wide potential to emit.

Therefore, no change has been made as a result of this comment.

**Comment 4:**

The commenter stated that HAP emissions may exceed the major source threshold for the following reasons:

(a) The estimate excludes several important sources of HAP emissions including the cooling tower, and the diesel fire pump.

(b) The HAP emissions from the boilers and DDGS dryers do not include all HAPs that are emitted during natural gas firing listed in AP-42, Table 1.4-3 and 1.4-4. Thus, DDGS dryer HAP emissions are underestimated and should be revisited.

(c) The HAP control efficiencies assumed for the thermal oxidizer serving the DDGS dryers (97%) is very high. The Nebraska Department of Environmental Quality, which has permitted 24 ethanol plants, has reservations about these high control efficiencies based on their experience. None of the two dozen ethanol plants in Nebraska was able to meet even a 96% removal efficiency or 20 ppmvd for acetaldehyde.[10]

In response to a similar comment on Premier Ethanol, IDEM argued that HAP emissions in that case were based on lower control efficiencies, only 50% for the dryers and cooling. Premier Addendum to the TSD, p. 7. If only 50% control was

[10] Letter from Shelley Kaderly, Air Quality Division Administrator, Nebraska Department of Environmental Quality, to U.S. EPA, May 8, 2006, Docket EPA-HQ-OAR-2006-0089.

assumed for the DDGS dryers and proposed for Cardinal (TSD, App. A, p. 4), the acetaldehyde emissions would be 24.98 tpy[11] exceeding the major source threshold if considered in combination with the other issues discussed in this section.

(d) The HAP emissions from ethanol loading losses are underestimated. Because the HAP PTE is factored from the VOC emissions from those processes, which are significantly underestimated, HAP emissions are much higher as well.

**Response to Comment 4:**

IDEM, OAQ believes that HAP estimates for the cooling tower and fire pump are minimal. The fire pump is limited to 500 hours of operation per year; and therefore HAP emissions from the fire pump will be negligible.

Cardinal Ethanol did not propose to install boilers. The HAP emissions from the natural gas combustion for the TO/HRSG systems and DDGS dryers are based on the five highest organic and metal HAPs emission factors identified in AP-42. HAP emissions from the remaining HAPs in AP-42 are expected to be minimal. The HAP emissions for the DDGS dryers are based on specific HAPs identified by the applicant; these estimates are consistent with other similarly designed ethanol plants. Acetaldehyde emissions at this facility come primarily from the distillation process and the DDGS drying process. The source is required to test Acetaldehyde emitted from the TO/HRSG systems and DDGS dryers (Stack S10) to demonstrate compliance with the Acetaldehyde emission limit for Stack 10.

IDEM, OAQ believes that the 97% level of control from the DDGS dryers and cooling system proposed for Cardinal Ethanol is not unreasonable because of the thermal oxidation that takes place within the TO/HRSG systems. The dryers located at the Premier facility are controlled by a thermal oxidizer. Acetaldehyde emissions from the dryers at the Premier facility were conservatively assumed to be controlled at a 90% level by a thermal oxidizer (and not 50% as stated by the commenter above). Although the uncontrolled emission factors for HAPs and the control efficiency of 97% were provided by the source, the Permittee is required to perform stack tests to verify the HAP emission limits, which are based on the after control emissions. Therefore, the actual HAP control efficiencies for the TO/HRSG systems are irrelevant.

The response to the comment concerning the VOC and HAP emissions from the loading racks is included in the response to Comment 3. No change has been made as a result of this comment.

**Comment 5:**

The commenter stated that the proposed limits in the permit should not be considered BACT for the fermentation process, the distillation process, and the DDGS dryers because of the following reasons:

(a) 98% is not BACT for the fermentation process. 99% VOC control is BACT for these processes. Premier Ethanol, LLC., was issued a permit in September, 2006, requiring 99% control efficiency as BACT. Permit No. F075-22858-00032. IDEM seeks to backpedal in the permit, but BACT is the maximum reduction achievable, and the Premier Ethanol permit demonstrates that 99% control of

[11] After control emission factor = Before control emission factor (0.28 lbs/ton) x control efficiency (1-50%) = 0.14 lbs/ton. PTE after control ° Production limit (356,880 tpy) x after control emission factor (0.14 lbs/ton) x 1 ton12000 lbs = 24.98 tpy.

VOCs from fermentation are achievable. The draft Permit must be revised to include 99% VOC control as BACT.

(b) The language in Condition D.2.5(b) for the fermentation operation, following the "or", gives the source the option of achieving either 98% VOC control "or" a VOC outlet concentration of 20 ppmv. This effectively guts the 98% requirement because wet scrubbers can achieve VOC concentrations less than 20 ppmv.[12] The phrase "or the VOC outlet concentration shall not exceed 20 ppmv" should be removed or changed to read "or the lowest emission rate in ppmv based on the maximum degree of reduction that is achievable" to comply with BACT, which is an emission limit based on the maximum degree of reduction that is achievable.

(c) The TSD does not explain why the proposed wet scrubber cannot be designed to achieve 99% (or greater) control when VOC inlet concentrations are low. IDEM has claimed in other ethanol plant cases that a control efficiency of 99% may not be achievable in practice at extremely low VOC concentrations. However, no support has ever been offered for this claim. Further, the stack tests that we have reviewed indicate that outlet VOC concentrations are routinely less than 10 ppmv when achieving 99% VOC control.

(d) The TSD does not explain how the 20 ppmv value was determined and whether 20 ppmv represents the lowest VOC concentration that is achievable using any wet scrubber or whether this is just the limit for one particular vendor's wet scrubber, based on the applicant's specific request in a request for proposal based on financial considerations.

(e) The VOC concentration limit is not enforceable as a practical matter because the permit does not disclose the conditions under which the VOC concentration is stipulated. The Commentor stated that the permit must be revised to state the following additional information if a concentration limit is retained: (1) oxygen content; (2) temperature and pressure; (3) averaging time; (4) test methods; and (5) molecular basis.

(f) 98% control is not BACT for the distillation process. 99% VOC control is BACT for this process. As discussed above, Premier Ethanol, LLC., was issued a permit in September, 2006, requiring 99% control efficiency as BACT for the distillation process. Permit No. F075-22858-00032. BACT is the maximum reduction achievable, and if Premier Ethanol is required to achieve 99% control of VOCs from distillation, so must Cardinal because IDEM has offered no basis for this difference. The draft permit must be revised to include 99% VOC control as BACT. IDEM must also remove the language from the permit limit that allows Cardinal to emit up to 10 ppmv VOC. As discussed above, this language negates the effect of the control efficiency requirement.

(g) 98% control is not BACT for DDGS dryers. The TSD for the Cardinal plant identifies one permit limit (Premier Ethanol - 99%), and two facilities with a higher achieved VOC control efficiencies for DDGS dryers using thermal oxidizers: Michigan Ethanol (99.6%), and New Energy Corp (98.8%, 99.2%). Cardinal, TSD, App. B, p. 8. Other recent ethanol plant BACT analyses have also identified Agri-Energy, MN (99.59%). DRS Ventures TSD, App. B, p. 8; ASA Linden TSD, App. B, p. 10.

[12] Interpoll Laboratories, Results of the March 3, 2006 Air Emission Compliance Testing at the Verasun Fort Dodge Facility in Fort Dodge, Iowa, April 13, 2006 (2.838 ppmw and 4.583 ppmd). See also other recent stack tests including the July 2006 source test at Horizon Ethanol, Jewell, Iowa (3.8 ppmvd).

**Response to Comment 5:**

BACT limitations do not necessarily reflect the highest possible control efficiency achievable by the technology on which the emission limitation is based. The permitting authority has discretion to base the emission limitation on a control efficiency that is somewhat lower than the optimal level. There are several reasons why the permitting authority might choose to do this. One reason is that the control efficiency achievable through the use of the technology may fluctuate, so that it would not always achieve its optimal control efficiency. In that case, setting the emission limitation to reflect the highest control efficiency would make violations of the permit unavoidable. To account for this possibility, a permitting authority must be allowed a certain degree of discretion to set the emission limitation at a level that does not necessarily reflect the highest possible control efficiency, but will allow the Permittee to achieve compliance consistently. While we recognize that 99% may be achievable as an average during testing, IDEM allows for sources to include a safety factor, or margin of error, to allow for minor variations in the operation of the emission units and the control device. This practice has been upheld by the EPA Environmental Appeals Board. See In re Pennsauken County, New Jersey Resource Recovery Facility, PSD Appeal No. 88-8, at 5 (Adm'r, Apr. 20, 1989) (Order Denying Review). Also see In re Masonite Corporation, PSD Appeal No. 94-1, at 560 (Adm'r, Nov. 1, 1994) (Order Denying Review in Part and Remanding in Part).

The requirement to achieve an overall control efficiency of no less than 98% for the fermentation scrubber or the TO/HRSG systems is consistent with BACT determinations made in Indiana and in other States. In addition, the establishment of a VOC concentration limitation in conjunction with a control efficiency requirement is consistent with the compliance requirements established by the US EPA as part of its national ethanol settlements and as part of the recently promulgated NESHAPs. The concentration requirement was established because at extremely low VOC concentrations, a control efficiency of 98% may not be achievable in practice. Many vendors and manufactures will not guarantee their control equipment to efficiencies of 98% at extremely low VOC concentrations. BACT must be achievable on a consistent basis under normal operational conditions.

No change has been made as a result of this comment.

**Comment 6:**

The commenter states that the permit does not contain practically enforceable emission restrictions, production and operating conditions, monitoring, and recordkeeping to assure that emissions remain below the major source thresholds because of the following reasons:

(a) The FESOP does not limit all sources to ensure the potential to emit remains below major source thresholds, as it is required to do by law.

(b) The permit also does not contain limits for all pollutants and sources as set out in the summary of emissions in the TSD. The permit does not contain restrictions that limit emissions to those that were assumed in the TSD nor does it require that the emissions from each emission point be continuously monitored, summed, and compared to the major source thresholds. The permit contains no emission limits for at least the following sources that were included in the potential to emit calculations: (1) criteria pollutant and HAP emissions from the diesel fire pump; (2) PM, PM10, VOC and HAPs from ethanol loading racks; (3) PM emissions from grain receiving; (4) PM and PM10 fugitives from grain receiving and DDGS loadout; (5) PM and PM10 fugitives from haul and

maintenance roads; (6) HAP, PM, and PM10 emissions from the cooling tower; (7) VOC and HAP emissions from leaks from valves and flanges. The Permit must be modified to include emission and other limits on these sources to verify the assumptions used to calculate potential to emit. Further, the permit should be modified to include testing, recordkeeping and reporting to ensure that these limits are achieved. The Permit should also require that the measurements of emissions from each emission point be summed and compared to major source thresholds.

(c) The draft permit does not appropriately limit CO emissions from the diesel fire pump. The draft Permit contains only one operational limit on the diesel fire pump as a surrogate to control all emissions from that source. Draft Permit, p. 49. The calculations in the TSD that support the use of a 500 hour operating limit to control criteria pollutants are based on AP-42 emission factors. Calculations in the TSD are not enforceable, and cannot be used to support a FESOP. In addition, the AP-42 emission factor is not an appropriate factor. In AP-42, EPA states, "[d]ata from source-specific emission tests or continuous emission monitors are usually preferred for estimating a source's emissions because those data provide the best representation of the tested source's emissions." AP-42, Introduction at 1. The AP-42 factors represent only an average range of emission rates, and are limited by the data available from all facilities in a source category. In the Matter of Cargill, Inc. Petition IV-2003-7 (Amended Order) at 7 n.3 (Oct. 19, 2004). The emission factors used to determine CO emissions from the diesel fire pump are rated D - indicating reason to suspect that the facilities tested are not representative, or that variability exists within the source category. AP-42, Introduction at 9. Thus, the draft Permit must contain sufficient support to establish the correlation between hours of operation and total emissions. Absent this, the Permit must address emissions directly with short term, specific limits. Such limits are particularly significant for CO emissions. The facility wide CO PTE, based in part on the calculation of CO emissions from the diesel fire pump through AP-42 emission factors, is very near the 100 tpy major source threshold at 93.8 tpy. The AP-42 emission factors for diesel engines are inappropriate to rely on for PTE in a FESOP because the factors are aggregations of sources across all industrial engines, rather than specific to an individual engine or model. EPA cautions that "emission factors in these tables [including Table 3.3-1], because of their aggregate nature, are most appropriately applied to a population of industrial engines rather than to an individual power plant." AP-42, p. 3.3-5. Without a sufficient showing, beyond AP-42, that hours of operation correlate to specific CO emission levels, or inclusion of short term, specific limits on CO from the diesel fire pump, the FESOP does not ensure that CO emissions will remain below the major source threshold and the Permit must be revised.

(d) Combustion of ethanol vapors in the flare will generate VOC, NOx, CO, PM, PM10, and HAP emissions. The permit restricts NOx, and CO emissions and VOC and HAP by the amount of ethanol that can be loaded, but does not limit PM or PM10 emissions. There are two major problems with the limits on the ethanol loading rack:

(1) The pollutants PM and PM10 are combustion byproducts. The magnitude of these emissions depends upon the design of the flares. The emission calculations did not include PM and PM10 emissions from the flares. Thus, these emissions should be calculated, included in potential to emit, and a limit included in the Permit.

(2) The operational limits on loadout throughput and hours of operation are measured on a yearly basis, and the source will not directly monitor

VOCs. Thus, the permit limits on the ethanol loading rack are unenforceable. IDEM , EPA, and citizens will be unable to determine compliance at any time. For the first 11 months of operation, compliance or non-compliance with the operational limits will be impossible to establish. Thereafter, compliance or non-compliance will be measurable only on a monthly basis. Additionally, compliance with this permit limit does not necessarily ensure that VOC and HAP emissions will remain below major source thresholds because VOC and HAP emissions themselves will not be monitored. Rather, the annual production limit is used as a surrogate to determine VOC and HAP emissions through calculations based on assumptions from AP-42. The VOC mass emission limit for the flare is unenforceable because emissions will not be measured.

**Response to Comment 6:**

An emission source which qualifies as a major source under Part 70 rules, and hence needs a Title V permit, may voluntarily accept federally enforceable limits on air pollutant emissions to obtain a FESOP rather than the Title V permit. The federally enforceable limits in a FESOP are derived from sourcewide emissions calculations that account for the maximum potential emissions from each emission unit at the source. Certain operations have minimal PTE; therefore, it is sometimes unnecessary to limit these operations. However, any emissions from an unlimited emission unit are still counted in their entirety towards the source wide emissions when determining the permitting level. Therefore, IDEM, OAQ believes it is unnecessary to limit emission units where source wide emissions are already below major source thresholds due to limitations imposed on other emission units at the source. When a PTE is limited, the Permittee is subject to record keeping and reporting requirements in order to demonstrate compliance with those limits. Collectively, the limited PTE of certain activities along with the unlimited PTE of the remaining activities located at the source must be below major thresholds to be considered a FESOP.

IDEM, OAQ agrees that the facility wide CO potential to emit is very near the 100 tpy major source threshold; therefore, a short term CO limit has been added to the permit to make the CO emissions from the diesel fire pump more practically enforceable.

IDEM, OAQ has determined that it is appropriate to require the flares to have smokeless designs if the applicant indicates there are no particulate emissions from the flares as these types of flares will emit negligible PM/PM10 emissions. The annual loadout limit of ethanol loaded out is an appropriate surrogate to limit VOC and HAP emissions from the loading racks. The source is required to maintain monthly records of the combined total amount of denatured ethanol loaded out from the ethanol loading racks. The VOC and HAP calculations are based a worst case assumption that all denatured ethanol is loaded to trucks. Please see Response to Comment 8 regarding the commenter's concern about showing compliance for the first 11 months of operation.

The following changes have been made as a result of this comment:

D.5.4 FESOP Limits [326 IAC 2-2] [326 IAC 2-8-4] [326 IAC 2-4.1]

Pursuant to 326 IAC 2-8-4 (FESOP), the Permittee shall comply with the following:

. . .

**(g) Flare C50 shall be designed as a smokeless flare.**

. . .

D.6.1 FESOP Limits [326 IAC 2-2] [326 IAC 2-8-4] [326 IAC 2-4.1]

Pursuant to 326 IAC 2-8-4 (FESOP), the Permittee shall comply with the following:

. . .

**(c) CO emissions from diesel fire pump P110 shall not exceed 6.68E-03 lbs/hp-hr.**

**(d) Biomethanator flare C60 shall be designed as a smokeless flare.**

. . .

**Comment 7:**

The draft Permit requires that Cardinal control PM and PM10 with baghouses. The emissions from baghouses are controlled by a mass emission limit measured over an hour and a grain received limit measured over 12 months. Direct monitoring of PM and PM10 from these processes is not required, however. Rather, the draft Permit depends on testing by an undisclosed method every five (5) years for the grain receiving baghouse to ensure compliance with the permit limits. Testing every five (5) years is clearly insufficient to ensure continuous compliance (See Comment 11 below). The draft Permit also requires vague visible emission readings, parametric monitoring, and broken or failed bag detection. These methods also fail to assure compliance with the PM and PM10 emission limits, however, rendering the limits unenforceable because of the following:

(a) The opacity readings are taken only once a day, during daylight, and are only classified as to "normal" or "abnormal." "Abnormal" is defined with reference to prevailing conditions 80% of the time the process is in operation. If an exceedance of this subjective standard is observed, Cardinal must undertake the vague abatement procedures in Permit Condition C.15. This standard simply does not assure compliance with the mass emission limits in the permits.

(b) The proposed differential pressure monitoring of individual baghouses has been shown not to be an adequate indicator of bag leaks. The proposed method would not detect individual bag leaks, which could cause exceedances of the hourly emission limit. Further, the draft Permit does not specify where pressure would be measured, but appears to only require differential pressure measurements across the entire baghouse, rather than individual baghouse compartments. This would not help isolate bag leaks.

(c) The draft permit does not require that any specific actions be taken if the differential pressure falls outside of the range allowed. The draft permit should be revised to indicate that operation outside of the established differential pressure range constitutes a per se violation of the hourly emission limits. Further, the draft permit should be revised to require that any excursion be investigated and corrected within 24 hours of discovery.

In addition, the TSD also claims that the facility will generate 5.94 tpy of PM and 4.45 tpy of PM10 from grain receiving and handling fugitives, and 0.03 tpy of PM and 0.01 tpy of PM10 from DDGS loadout fugitives. The source maintains that grain scalping and DDGS handling will have no fugitive emissions because those emissions will be 100% captured. IDEM required no support for that contention. At any rate, there are no meaningful

restrictions on the potential to emit fugitive PM and PM10 emissions from any of these processes, and the draft Permit does not require any testing, recordkeeping, or reporting to assure that these assumed emission rates and corresponding control efficiencies are achieved.

The fugitive emissions from grain receiving and DDGS loadout operations were estimated from emission factors expressed in pounds of PM and PM10 per ton of material loaded and a capture efficiency of 95%. The draft Permit should be revised to require the following to confirm the TSD's calculations:

(a) A restriction on the potential to emit PM and PM10 from these sources by including both emission limits and production limits consistent with those assumed in the calculations. As discussed in Comment 1, the source should be restricted to the use of a choked flow system during grain unloading, consistent with assumptions made in the calculations. The Permit also should require monitoring and reporting to assure these restrictions are complied with.

(b) Testing to confirm the PM and PM10 emission factors and capture efficiency that were assumed in the potential to emit calculations.

(c) A permit condition that requires testing to demonstrate that the assumed control efficiencies for PM and PM10 during grain receipt and handling and DDGS loadout are achieved.

The commenter also stated that the Permit does not limit emissions from roads or contain any monitoring (e.g., of silt content, number and type of trucks, type and frequency of dust control measures), recordkeeping, and reporting to assure that PM/PM10 emissions remain below the levels calculated in the TSD, as required by many states with a long history of regulating ethanol plants, e.g., Minnesota, Nebraska.

**Response to Comment 7:**

The visible emission notations are used as a surrogate to ensure compliance with 326 IAC 5-1 and 326 IAC 6, without the requirement to have a person on site trained in opacity measurement. This requirement is designed as a trigger that the source performs some corrective action on the facility if visible emissions are abnormal, which helps ensure continuous compliance with emission limitations. As the visible emissions condition states, a trained employee is an employee who has worked at the plant at least one (1) month and has been trained in the appearance and characteristics of normal visible emissions for that specific process. This training does not need to include the training to become a certified opacity reader, nor does the training need to be done by a certified opacity reader. The purpose of specifying that a trained employee perform the visible emissions notations is to make sure that the employee would know the difference between "normal" and "abnormal" visible emissions from the particular process.

As stated in Response to Comment 1, the Permittee is required to take reasonable response steps when a compliance monitoring parameter is determined to be out of range or abnormal under Condition C.18 - Response to Excursions or Exceedances. This condition ensures that the control equipment is returned to proper operation as soon as practicable, while still allowing the Permittee the flexibility to respond to situations that were not anticipated.

IDEM, OAQ feels that limits on the annual amount of grain received and the annual DDGS loadout are appropriate surrogates to limit PM/PM10 emissions from the grain receiving and handling fugitives, and DDGS loadout fugitives. The source is required to maintain monthly records of the amount of grain received at this plant and the amount of

DDGS loadout. The PM/PM10 emissions were based on conservative calculations where it is assumed that there is 0% capture efficiency of the DDGS handling and loadout activities. See Response to Comment 1 for further information regarding grain receiving and handling fugitives.

Response to the comments regarding to the emissions from haul roads can be found in the response to Comment 2. No changes were made as a result of this comment.

**Comment 8:**

Several operational limits are expressed in terms of units of input or output measured "per twelve (12) consecutive month period with compliance determined at the end of each month." The commenter states that the supporting compliance calculation sheets indicate that the intent of this language is to add the current month's input or output to that of the previous 11 months. This does not properly limit emissions during the first 11 months of operation. A separate limit, based on a monthly average, should be set for the first 12 months of operation. The overall source limits are expressed in output measured "per twelve (12) consecutive month period," without an indication of when compliance will be determined. Thus, the source-wide limits do not properly limit emissions during the first 11 months of operation, and a separate limit based on a monthly average should be set for the first 12 months of operation.

**Response to Comment 8:**

Since FESOP limits are based on annual limits, if the source emitted its entire allowed amount of emissions in the first six months, then the source would not be able to operate for the following six months because the source would exceed the allowable emissions based on a rolling twelve month total. Therefore, no separate limits are needed for the first year of operation. No changes have been made as a result of this comment.

**Comment 9:**

The commenter stated that miscellaneous fugitive VOC emission sources are not limited. An ethanol facility has many sources of fugitive VOC emissions. These include the wet cake storage pile, the DDGS storage pile, the mash screen vent, the boiler feedwater tank vent, the process building exhaust fan, and various tank vents. The VOC emissions from some of these sources are high and require venting to the thermal oxidizer at other facilities. The application and permit are silent as to these emission sources. The permit should be remanded to require VOC testing of all potential fugitive sources, any significant VOC sources should be controlled by venting to the thermal oxidizer, and fugitive VOC emissions should be included in the source-wide inventory to demonstrate that emission remain below major source thresholds.

**Response to Comment 9:**

IDEM, OAQ agrees that wet cake storage is a source of VOC emissions. However, as noted in the response to comment 3, the drying of WDGS represents worst-case emissions. Emissions from the DDGS storage pile are expected to be minimal given that VOC's in the WDGS will be driven off in the dryers. IDEM, OAQ agrees that there may be other sources of very minimal VOC emissions, and has included a one (1) ton per year emission estimate for “Insignificant Activities” in the facility-wide emission estimate in order to be conservative with respect to these types of activities.

No changes have been made to the permit as a result of this comment.

**Comment 10:**

The permit does not recognize startup, shutdown, and emergency bypass emissions. The TSD and application do not disclose any analysis or design to minimize the frequency of such events and to minimize such excess emissions.

The potential to emit calculations do not appear to have included startup and shutdown emissions, which by themselves could be high enough to exceed the major source threshold. Nothing in the permit indicates that the potential to emit calculation or permit limits account for excess emissions that occur during periods of startup, shutdown or malfunction, nor explains how those periods affect emissions at the plant.

For example, as with many large pieces of equipment, the Cardinal facility contains equipment that will produce more of certain pollutants when they are starting up or shutting down than when they are operating at a steady state. The combustion equipment, including the DDGS dryers, the diesel fire pump, and thermal oxidizers with heat recovery steam generator systems will generate more CO and VOC emissions during startup and shutdown because CO will not be fully oxidized and the VOCs will not be completely combusted until the equipment reaches steady state of operation. This equipment operates intermittently and may frequently operate at low loads that generate more CO and VOC emissions than at other times.

The Permit fails to place any limits on the increased CO and VOC emission levels that may result during periods of startup and shutdown and does not appear to consider those excess emissions in calculating the potential to emit. Without limits on increased emissions during startup and shutdown, the Cardinal facility may emit pollutants in an amount over the major source threshold.

Thus, the Permit should be revised to address the startup and shutdown emissions. Without such revision, it is likely that CO and VOC emissions will exceed both the individual unit Permit limits and major source thresholds.

**Response to Comment 10:**

IDEM, OAQ does not feel that it is necessary to limit emissions from startup, shutdown, and emergency bypasses. The combustion equipment for Cardinal is much smaller than a typical large utility boiler, and the emissions during startup and shutdown are expected to be minimal. The duration of startup and shutdown are also expected to be minimal. Furthermore, the controls are required at all times the emission units are in operation and emission calculations for the boilers are based on continuous operation (8,760 hours per year); therefore, the calculations do not account for times of shutdown (when the boilers are not operating) and may overestimate emissions. Nevertheless, the source wide emissions are still calculated to be below FESOP thresholds even with these conservative assumptions.

No changes have been made as a result of this comment.

**Comment 11:**

The commenter states that the proposed testing is not adequate because of the following reasons:

(a) Permit limits can only be enforced through appropriate monitoring, testing and reporting of emissions. An appropriate hierarchy for specifying monitoring to determine compliance is: (1) continuous direct measurement where feasible; (2) initial and periodic direct measurement where continuous monitoring is not feasible; (3) use of indirect monitoring, e.g. surrogate monitoring, where direct

monitoring is not feasible; and (4) equipment and work practice standards where direct and indirect monitoring are not feasible. NSR Manual, p 1.3. The Permit does not comport with this guidance, and in some instances does not require any testing to demonstrate that the emission limits will be complied with when the source is operating.

The method of demonstrating compliance with the source-specific emission limits is by an initial stack test, repeated once every 5 years, and various parametric testing through indicator operating parameters (e.g., baghouse pressure drop, scrubber pressure drop and flow rate, thermal oxidizer temperature, and duct pressure or fan amperage). The Permit does not require the demonstration of any relationship between the various parametric indicators and the subject emission limits, nor does it state that a violation of the indicator constitutes a per se violation of the pollutant of interest. No testing at all is required for some emission sources, including grain receiving fugitives, DDGS loadout fugitives, cooling tower, diesel fire water pump and paved roads.

This missing, or minimal and infrequent testing does not satisfy the obligation for testing sufficient to "evaluate continuous compliance" nor does it allow IDEM, U.S. EPA or the public to ensure compliance with the Permit limits. It is feasible to directly and continuously monitor emissions from the thermal oxidizers with heat recovery steam generators, and the wet scrubbers. The draft Permit does not require any continuous emission monitors. It is also feasible to conduct more frequent stack tests. Annual or more frequent testing is feasible, is commonly required for similar facilities, and should be required here. Finally, annual fugitive emission inventories for PM/PM10 and VOCs are required elsewhere and should be required here. Thus, the draft Permit should be modified to require more frequent direct emission testing.

(b) The draft Permit limits only a single HAP, acetaldehyde, from only two sources, the fermentation process and the distillation, DDGS dryer and thermal oxidizer/heat recovery steam generation systems. Also, the draft Permit only requires testing for acetaldehyde from these sources. Acetaldehyde is not necessarily the major HAP. Further, the facility will emit other HAPs, including methanol, formaldehyde, acrolein, and propionaldehyde.[13] Also, other emission units will emit HAPs, including the boilers, the ethanol loading rack flares, equipment leaks, and other fugitive sources. Id. Control and testing of only a single HAP at only two of nine emission points renders the total HAPs cap of 25 tpy unenforceable as a practical matter and in violation of 326 IAC 2-8-4, §. 4(3).

(c) The permit does not identify any of the test methods that will be used to determine compliance with emission limits. Instead, such identification is deferred to a future protocol that will not be subject to public review. All test methods must be disclosed in the permit to qualify for a FESOP.

(d) The method that will be used to measure VOCs and HAPs is critical to disclose during public comments to assure that the compliance test method is consistent with the test method used to develop the VOC and HAP emission limits in the first place and to assure that the method is properly applied. Compliance, for example, would not be demonstrated if the VOC limit were developed based on testing using Method 25a reported as carbon, and compliance was determined

[13] D. Brady and G.C. Pratt, Volatile Organic Compound Emissions from Dry Mill Ethanol Production, Minnesota Pollution Control Agency, Environmental Bulletin, no. 8, August 2006. http://www.pca.state.mn.us/publications/environmentalbulletin/tdreb0608.pdf#search=%22midwest%20scaiing%20protocol%22.

with Method 18. The method used to scale measurements to the permit limit basis is critical in determining compliance and should be disclosed.

**Response to Comment 11:**

IDEM, OAQ requires testing for the major emission points located at the source. The testing conditions in the permit specify that the Permittee will use test methods approved by the Commissioner. The specific test methods and testing environment will be specified in the test protocol submitted by the Permittee as required in Condition C.10 (Performance Testing) and will be evaluated by IDEM, OAQ prior to the stack test. The most up to date EPA approved test method will be required to be used; therefore, the test method is not specified in the permit. Under the requirements of the NSPS, Subpart Db, the source has elected to install a continuous emissions monitor system on the TO/HRSG systems to monitor NOx emissions.

Furthermore, IDEM believes that testing every five (5) years is sufficient for this source considering the stability of the operation and control devices. There are other types of operations that are not associated with an ethanol production plant that do require more frequent testing such as municipal waste combustors, sulfuric acid plants, and secondary lead smelters. However for the types of operations this source is proposing to construct, five (5) year testing along with frequent monitoring of the control equipment (to ensure the controls are operating correctly) is sufficient. IDEM also has the authority to require additional testing at any time if monitoring or other information indicates that a change may have occurred in the operation of the process and/or control device.

As stated in the permit, a parameter reading that is outside the determined range is not a deviation from the permit. Failure to take response steps in accordance with Section C - Response to Excursions or Exceedances would be considered a deviation from the permit. The parameter reading does not indicate a violation; however, monitoring the parameter ensures the equipment is operating normally. Please see response to comment number 2 for further details regarding parametric monitoring.

The source has provided emissions estimates consistent with other ethanol plants that show Acetaldehyde as the major HAP emitted, and IDEM, OAQ believes that Acetaldehyde is the HAP that is emitted at the highest rate at dry-mill ethanol plants. Additionally, IDEM, OAQ believes that the current required HAP testing for this source is adequate because the vast majority of Acetaldehyde is emitted from the fermentation and distillation processes, and the dryer and cooling systems, all of which require stack testing. IDEM, OAQ acknowledges that certain operations will emit other types of HAPs; yet, it is unnecessary to limit these operations because HAP emissions from an unlimited emission unit are counted in their entirety towards the sourcewide emissions when determining the permitting level. Therefore, IDEM, OAQ believes it is unnecessary to limit or test other HAPs, including methanol, formaldehyde, acrolein, and propionaldehyde at this source.

Furthermore, IDEM, OAQ feels that it is only necessary to test for Acetaldehyde at the major emission points. IDEM, OAQ requires testing for the major emission points located at the source. The testing requirement conditions in the permit specify that the Permittee will use test methods approved by the Commissioner. The specific test methods and testing environment will be specified in the test protocol submitted by the Permittee as required in Condition C.10 (Performance Testing) and will be evaluated by IDEM, OAQ prior to the stack test. The most up to date EPA approved test method will be required to be used; therefore, the test method is not specified in the permit.

No changes have been made as a result of this comment.

**Comment 12:**

NSPS Subpart DD applies to facilities with a grain elevator which has a permanent storage capacity of more than 88,100 $m^3$. 40 C.F.R. § 60.301(c). The application states that the facility will have two grain storage bins or silos with a "capacity of 270 million cubic feet each". 270 million cubic feet equals 7,645,549 cubic meters. As 7,645,549 cubic meters is more than 88,100 cubic meters, NSPS Subpart DD is an applicable requirement which must be included in the permit.

**Response to Comment 12:**

This new ethanol plant will include two (2) 40,000 bushels grain storage silos and two (2) 18,000 bushels day bins. The total grain storage capacity of this plant is 2 x 40,000 bushels + 2 x 18,000 bushels = 116,000 bushels, which is equivalent to 4,088 $m^3$. The total grain storage capacity of this new source does not exceed the NSPS applicability threshold of 88,100 $m^3$. Therefore, NSPS, Subpart DD does not apply to this source. No changes have been made as a result of this comment.

Upon further review, the OAQ has decided to make the following revisions to the permit (Bolded language has been added while language with a line through it has been deleted):

1. The Permittee has submitted the street address for this new ethanol plant. The source location information has been revised as follows throughout the whole permit:

~~S. of the CXS Rail Line, N. of State Road 32, and W. of Route~~ **1554 North County Road** 600 East
~~Harrisville~~ **Union City**, Indiana 47390

# Indiana Department of Environmental Management
# Office of Air Quality

Technical Support Document (TSD) for a New Source Review and
a Federally Enforceable State Operating Permit

**Source Background and Description**

| | |
|---|---|
| Source Name: | Cardinal Ethanol, LLC |
| Source Location: | S. of the CXS Rail Line, N. of State Road 32, and W. of Route 600 East, Harrisville, Indiana 47390 |
| County: | Randolph |
| SIC Code: | 2869 |
| Operation Permit No.: | F135-23226-00033 |
| Permit Reviewer: | ERG/YC |

The Office of Air Quality (OAQ) has reviewed a FESOP application from Cardinal Ethanol, LLC relating to the construction and operation of an ethanol production plant.

**Permitted Emission Units and Pollution Control Equipment**

There are no permitted emission units operating at this source.

**Unpermitted Emission Units and Pollution Control Equipment**

There are no unpermitted emission units operating at this source.

**New and Modified Emission Units and Pollution Control Equipment**

The application includes information relating to the prior approval for the modification and operation of the following equipment pursuant to 326 IAC 2-8-4(11).

(a) Two (2) grain receiving operations, identified as P06 and P07, approved for construction in 2007, each with a maximum throughput rate of 420 tons per hour, controlled by baghouse C20 and choke flow systems, and exhausting through stack S20. This consists of one (1) truck receiving and one (1) truck and railcar receiving operations.

(b) One (1) grain handling operation, approved for construction in 2007, controlled by baghouse C20 and choked flow systems, exhausting through stack S20, and consisting of the following:

(1) One (1) grain conveyor, identified as P08, with a maximum throughput rate of 280 tons per hour.

(2) One (1) grain elevator, identified as P09, with a maximum throughput rate of 560 tons per hour.

(3) Two (2) grain storage silos, identified as P10 and P11, each with a maximum capacity of 40,000 bushels and a maximum throughput rate of 118 tons per hour.

(4) One (1) emptying conveyor, identified as P12, with a maximum throughput rate of 2,100 tons per hour.

(5) One (1) grain elevator, identified as P13, with a maximum throughput rate of 280 tons per hour.

(6) Two (2) grain day bins, identified as P14 and P15, each with a maximum capacity of 18,000 bushels and a maximum throughput rate of 118 tons per hour.

(7) Two (2) grain scalpers, identified as P71 and P72, each with a maximum throughput rate of 168 tons per hour.

(c) One (1) grain milling operation, approved for construction in 2007, controlled by baghouse C30, exhausting through stack S30, and consisting of the following:

(1) One (1) hammermill feed conveyor, identified as P16, with a maximum throughput rate of 280 tons per hour.

(2) Four (4)hammermills, identified as P17 through P20, each with a maximum throughput rate of 168 tons per hour.

(d) One (1) fermentation process, approved for construction in 2007, with a maximum throughput rate of 84,300 gallons of ethanol per hour, controlled by scrubber C40, exhausting through stack S40, and consisting of the following:

(1) Seven (7) fermenters, identified as P21 through P27.

(2) One (1) beer well, identified as P28.

Under NSPS, Subpart VV, the pumps, compressors, pressure relief devices in gas/vapor service, sampling connection systems, open-ended valves or lines, and valves of this process are considered to be affected facilities.

(e) Two (2) thermal oxidizers with heat recovery steam generator (TO/HRSG) systems, identified as C10 and C11, approved for construction in 2007, each with a maximum heat input capacity of 122 MMBtu/hr, using natural gas and process waste gases from the DDGS dryers as fuels, with emissions exhausted through stack S10. Under NSPS, Subpart Db, TO/HRSG systems C10 and C11 are considered Industrial-Commercial-Institutional Steam Generating Units.

(f) One (1) distillation process, approved for construction in 2007, with a maximum throughput rate of 13,719 gallons of ethanol per hour, controlled by TO/HRSG systems C10 and C11, exhausting through stack S10, and consisting of the following:

(1) One (1) mixer, identified as P29.

(2) Two (2) slurry tanks, identified as P30 and P31.

(3) One (1) cook tube, identified as P32.

(4) One (1) flash tank, identified as P33.

(5) One (1) receiving tank, identified as P34.

(6) Four (4) liquefaction tanks, identified as P35 through P38.

(7) Two (2) yeast tanks, identified as P39 and P40.

(8) One (1) beer column, identified as P41.

(9) One (1) side stripper, identified as P42.

(10) One (1) rectifier column, identified as P43.

(11) One (1) 190 proof condenser, identified as P44.

(12) Molecular sieves, identified as P45.

(13) One (1) 200 proof condenser, identified as P46.

(14) Six (6) centrifuges, identified as P47 through P52.

(15) Eight (8) evaporators, identified as P53 through P60.

Under NSPS, Subpart VV, the pumps, compressors, pressure relief devices in gas/vapor service, sampling connection systems, open-ended valves or lines, and valves of this process are considered to be affected facilities.

(g) Four (4) natural gas fired DDGS dryers, identified as P01 through P04, approved for construction in 2007, each with a maximum heat input rate of 45 MMBtu/hr and a maximum throughput rate of 21 tons of DDGS per hour, controlled by TO/HRSG systems C10 and C11, and exhausting to stack S10. The combined DDGS throughput rate for all the dryers is 45 tons per hour.

(h) One (1) DDGS cooling drum, identified as P65, approved for construction in 2007, with a maximum throughput rate of 45 tons/hr of DDGS. 35,000 acfm of the exhaust from this unit is controlled by TO/HRSG systems which vents to Stack S10, and the remaining air stream (15,000 acfm) is controlled by baghouse C70 which vents to stack S70.

(i) One (1) DDGS handling and loadout operation, approved for construction in 2007, with a maximum throughput rate of 204 tons per hour, controlled by baghouse C90, exhausting to stack S90, and consisting of the following:

(1) Two (2) DDGS storage silos, identified as P67 and P68.

(2) One (1) DDGS dump pit, identified as P69.

(3) One (1) DDGS loadout spout, identified as P70, controlled by a choked flow system.

(j) One (1) ethanol loading rack for trucks or railcars, identified as P66, approved for construction in 2007, with a maximum throughput rate of 36,000 gallons per hour for truck loading and a maximum throughput rate of 72,000 gallons per hour for railcar loading, controlled by open flare C50, which is fueled by natural gas and has a maximum heat input capacity of 12.4 MMBtu/hr, and exhausts through stack S50. Under NSPS, Subpart VV, the pumps, compressors, pressure relief devices in gas/vapor service, sampling connection systems, open-ended valves or lines, and valves of this rack are considered to be affected facilities.

**Insignificant Activities**

The source also consists of the following insignificant activities, as defined in 326 IAC 2-7-1(21):

(a) Vessels storing lubricating oils, hydraulic oils, machining oils, and machining fluids.

(b) Machining where an aqueous cutting coolant continuously floods the machining interface.

(c) The following equipment related to manufacturing activities not resulting in the emission of HAPs: brazing equipment, cutting torches, soldering equipment, welding equipment.

(d) Activities associated with the transportation and treatment of sanitary sewage, provided discharge to the treatment plant is under the control of the owner/operator, that is, an on-site sewage treatment facility.

(e) Forced and induced draft cooling tower system not regulated under a NESHAP, identified as F80, approved for construction in 2007. [326 IAC 2-8-4]

(f) Replacement or repair of electrostatic precipitators, bags in baghouses and filters in other air filtration equipment.

(g) Heat exchanger cleaning and repair.

(h) Paved roads and parking lots with public access. [326 IAC 6-4]

(i) Purging of gas lines and vessels that is related to routine maintenance and repair of buildings, structures, or vehicles at the source where air emissions from those activities would not be associated with any production process.

(j) Equipment used to collect any material that might be released during a malfunction, process upset, or spill cleanup, including catch tanks, temporary liquid separators, tanks, and fluid handling equipment.

(k) Blowdown for any of the following: sight glass; boiler; compressors; pumps; and cooling tower.

(l) Stationary fire pumps, including one (1) diesel fire pump, identified as P110, approved for construction in 2007, with a maximum power output rate of 300 horsepower, and exhausting to stack S110. [326 IAC 2-8-4]

(m) A laboratory as defined in 326 IAC 2-7-1(20)(D).

(n) Other emission units, not regulated by a NESHAP, with PM10, NOx, and $SO_2$ emissions less than five (5) pounds per hour or twenty-five (25) pounds per day, CO emissions less than twenty-five (25) pounds per day, VOC emissions less than three (3) pounds per hour or fifteen (15) pounds per day, lead emissions less than six-tenths (0.6) tons per year or three and twenty-nine hundredths (3.29) pounds per day, and emitting greater than one (1) pound per day but less than five (5) pounds per day or one (1) ton per year of a single HAP, or emitting greater than one (1) pound per day but less than twelve and five tenths (12.5) pounds per day or two and five tenths (2.5) tons per year of any combination of HAPs:

(1) One (1) 190 proof tank, identified as T01, approved for construction in 2007, with a maximum capacity of 200,000 gallons. Under NSPS, Subpart Kb, this tank is considered a volatile organic liquid storage vessel.

(2) One (1) 200 proof tank, identified as T02, approved for construction in 2007, with a maximum capacity of 200,000 gallons. Under NSPS, Subpart Kb, this tank is considered a volatile organic liquid storage vessel.

(3) One (1) corrosion inhibitor storage tank, identified as T03, approved for construction in 2007, with a maximum capacity of 3000 gallons.

(4) Three (3) denatured ethanol tanks, identified as T04, T05, and T06, approved for construction in 2007, each with a maximum capacity of 1,500,000 gallons. Under NSPS, Subpart Kb, these tanks are considered volatile organic liquid storage vessels.

(5) One (1) denaturant storage tank, identified as T07, approved for construction in 2007, with a maximum capacity of 200,000 gallons. Under NSPS, Subpart Kb, this tank is considered a volatile organic liquid storage vessel. [326 IAC 8-4-3]

(6) One (1) diesel storage tank, identified as T08, approved for construction in 2007, with a maximum storage capacity of 400 gallons.

(7) Four (4) biomethanators, identified as P61 through P64, approved for construction in 2007, controlled by 6.40 MMBtu/hr biomethanator flare C60, and exhausting to stack S60. [326 IAC 2-8-4]

**Existing Approvals**

There are no previous air approvals issued to this source.

**Enforcement Issue**

There are no enforcement actions pending for this source.

**Stack Summary**

| Stack ID | Operation | Height (ft) | Diameter (ft) | Flow Rate (acfm) | Temperature ($^{o}$F) |
|---|---|---|---|---|---|
| S10 | TO/HRSG Systems | 125 | 10.1 | 220,000 | 300 |
| S20 | Baghouse C20 | 160 | 4.00 | 48,000 | 68 |
| S30 | Baghouse C30 | 160 | 3.33 | 28,000 | 68 |
| S40 | Scrubber C40 | 75 | 2.25 | 11,000 | 65 |
| S50 | Flare C50 | 30 | 5.00 | 34,000 | 1,800 |
| S60 | Biomethanators | 34 | 2.00 | 6,400 | 1,800 |
| S70 | Baghouse C70 | 48 | 4.00 | 15,000 | 110 |
| S80 | Cooling Towers | 40 | 25.33 | 780,000 | 85 |
| S90 | Baghouse C90 | 40 | 2.17 | 9,100 | 68 |
| S110 | Diesel Fire Pump | 8 | 0.25 | 1,740 | 770 |

**Recommendation**

The staff recommends to the Commissioner that the FESOP be approved. This recommendation is based on the following facts and conditions:

Unless otherwise stated, information used in this review was derived from the application and additional information submitted by the applicant.

An administratively complete FESOP application for the purposes of this review was received on June 1, 2006. Additional information was received on July 7, 2006, July 19, 2007, August 2, 2006, August 8, 2006, and August 17, 2006.

There was no notice of completeness letter mailed to the source.

**Emission Calculations**

See Appendix A of this document for detailed emission calculations (pages 1 through 16).

**Potential to Emit**

Pursuant to 326 IAC 2-1.1-1(16), Potential to Emit is defined as “the maximum capacity of a stationary source or emissions unit to emit any air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of a source to emit an air pollutant, inclulding air pollution control equipment and restrictions on hours of operation or type or amount of material combusted, stored, or processed shall be treated as part of its design if the limitation is enforceable by the U.S. EPA, the department, or the appropriate local air pollution control agency.”

This table reflects the PTE before controls. Control equipment is not considered federally enforceable until it has been required in a federally enforceable permit.

| Pollutant | Potential To Emit (tons/year) |
|---|---|
| PM | 26.3 |
| PM10 | 26.3 |
| $SO_2$ | 83.9 |
| VOC | 8.86 |
| CO | 185 |
| $NO_x$ | 1,774 |

Note: For the purpose of determining Title V applicability for particulates, PM10, not PM, is the regulated pollutant in consideration.

| HAPs | Potential to Emit (tons/yr) |
|---|---|
| Acetaldehyde | 14.4 |
| Acrolein | 0.48 |
| Formaldehyde | 1.89 |
| Methanol | 0.68 |
| Benzene | 5.61 |
| Ethyl Benzene | 4.58 |
| Cumene | 2.29 |
| Xylene | 27.5 |
| Toluene | 34.3 |
| MTBE | 17.2 |
| Other HAPs | Negligible |
| Total | Greater than 25 |

(a) The potential to emit (as defined in 326 IAC 2-7-1(29)) of CO and NOx are equal to or greater than 100 tons per year. This source, which would otherwise be subject to the provisions of 326 IAC 2-7.

(b) The potential to emit (as defined in 326 IAC 2-7-1(29)) of any single HAP is greater than ten (10) tons per year and the potential to emit (as defined in 326 IAC 2-7-1(29)) of a combination of HAPs is greater than twenty-five (25) tons per year. This source, which would otherwise be subject to the provisions of 326 IAC 2-7, will be issued a FESOP because the source has agreed to limit its emissions below the Title V levels.

(c) Fugitive Emissions
Since this type of operation is in one of the twenty-eight (28) listed source categories under 326 IAC 2-2, the fugitive particulate matter (PM) and volatile organic compound (VOC) emissions are counted toward determination of PSD applicability.

**Potential to Emit After Issuance**

The source has applied for a FESOP. The table below summarizes the potential to emit, reflecting all limits of the emission units. Any control equipment is considered enforceable only after issuance of this FESOP and only to the extent that the effect of the control equipment is made practically enforceable in the permit.

| | Potential To Emit (tons/year) | | | | | | |
|---|---|---|---|---|---|---|---|
| Process/Emission Unit | PM | PM10 | $SO_2$ | VOC | CO | $NO_x$ | HAPs |
| Grain Receiving and Handling Operations | Less than 9.01 | Less than 9.01 | - | - | - | - | - |
| Grain Milling Operations | Less than 5.26 | Less than 5.26 | - | - | - | - | - |
| Grain Receiving – Fugitive | Less than 5.94 | Less than 4.45 | - | - | - | - | - |
| Fermentation Process and Distillation Process | Less than 0.27 | Less than 0.31 | - | Less than 50.0 | - | - | Less than 6.47 |
| Distillation, DDGS Dryers, DDGS Cooling Drum, and TO/HRSG Systems | Less than 26.8 | Less than 26.8 | Less than 81.5 | Less than 23.2 | Less than 83.2 | Less than 92.9 | Less than 7.60 |
| DDGS Cooling Drum – Baghouse C70 | Less than 2.82 | Less than 2.82 | - | Less than 7.14 | - | - | 0.36 |
| DDGS Handling and Loadout Operations | Less than 1.71 | Less than 1.71 | - | - | - | - | - |
| DDGS Loadout - Fugitive | Less than 0.03 | Less than 0.01 | - | - | - | - | - |
| Wet Cake Storage* | - | - | - | See Note | - | - | See Note |
| Ethanol Loading Rack | Negligible | Negligible | Negligible | Less than 0.74 | Less than 10.0 | Less than 1.85 | Less than 0.17 |
| Paved Roads (Fugitive) | Less than 22.0 | Less than 4.27 | - | - | - | - | - |
| Cooling Tower (Insignificant) | 13.7 | 13.7 | - | - | - | - | - |
| Diesel Fire Pump (Insignificant) | 0.17 | 0.17 | 0.15 | 0.19 | 0.50 | 2.33 | Negligible |
| Storage Tanks (Insignificant) | - | - | - | 2.98 | - | - | 0.10 |
| Equipment Leaks (Fugitive) | - | - | - | 8.83 | - | - | 0.51 |
| Biomethanator Flare** (Insignigicant) | - | - | - | See Note | See Note | See Note | - |
| Other Insignificant Activities | Less than 1.0 | Less than 1.0 | - | Less than 1.0 | - | - | - |
| Total PTE of the Entire Source | Less than 88.6 | Less than 69.5 | Less than 81.6 | Less than 94.1 | Less than 93.8 | Less than 97.0 | Less than 8.02 for a single HAP and 15.2 for total HAPs |
| PSD/TV Major Thresholds | 100 | 100 | 100 | 100 | 100 | 100 | 10 for a single HAP and 25 for total HAPs |

Note: PTE listed in the table above is based on the emission calculations in Appendix A and the proposed emission limits in the permit.
"-" pollutant not emitted by the facility.
* This plant is capable of producing both DDGS and MDGS. The emissions from DDGS production is the worst case scenario. Therefore, the PTE of wet cake storage is not included in the PTE for the entire source.
** The Biomethanator flare will not operate when any of the DDGS dryers are in operation. The emissions from the DDGS dryers are the worst case scenario. Therefore, the PTE of the biomethanator flare is not included in the PTE for the entire source.

**County Attainment Status**

The source is located in Randolph County.

| Pollutant | Status |
|---|---|
| PM10 | Attainment |
| PM2.5 | Attainment or Unclassifiable |
| $SO_2$ | Attainment |
| $NO_2$ | Attainment |
| 8-hour Ozone | Attainment |
| CO | Attainment |
| Lead | Attainment |

Note: On October 25, 2006, the Indiana Air Pollution Control Board finalized a rule revision to 326 IAC 1-4-1 revoking the one-hour ozone standard in Indiana.

(a) Randolph County has been classified as unclassifiable or attainment for PM 2.5. U.S. EPA has not yet established the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2 for PM 2.5 emissions. Therefore, until the U.S. EPA adopts specific provisions for PSD review for PM 2.5 emissions, it has directed states to regulate PM10 emissions as surrogate for PM 2.5 emissions.

(b) Volatile organic compounds (VOC) and Nitrogen Oxides are regulated under the Clean Air Act (CAA) for the purposes of attaining and maintaining the National Ambient Air Quality Standards (NAAQS) for the 8-hour ozone standard. Therefore, VOC and NOx emissions are considered when evaluating the rule applicability relating to the ozone standard. Randolph County has been designated as attainment or unclassifiable for ozone. Therefore, VOC and NOx emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2.

(c) Randolph County has been classified as attainment or unclassifiable in Indiana for all other criteria pollutants. Therefore, these emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2.

**Source Status**

New Source PSD Definition (emissions after controls, based on 8760 hours of operation per year at rated capacity and/or as otherwise limited):

| Pollutant | Emissions (tons/year) |
|---|---|
| PM | Less than 100 |
| PM-10 | Less than 100 |
| $SO_2$ | Less than 100 |
| VOC | Less than 100 |
| CO | Less than 100 |
| $NO_x$ | Less than 100 |
| A Single HAP | Less than 10 |
| Combination HAPs | Less than 25 |

This new source is not a PSD major stationary source because no regulated pollutant is emitted at a rate of 100 tons per year or greater and it is in one of the 28 listed source categories.

**Federal Rule Applicability**

(a) This source does not have a grain elevator with a permanent storage capacity greater than 2.5 million bushels. Therefore, the requirements of the New Source Performance Standards for Grain Elevators (326 IAC 12, 40 CFR 60.300-304, Subpart DD) are not included in this permit.

(b) The thermal oxidizer/heat recovery steam generator (TO/HRSG) systems (C10 and C11) are also used to produce steam and each of them has a maximum heat input capacity greater than 100 MMBtu/hr. These units will be constructed after June 19, 1984. Therefore, the TO/HRSG systems (C10 and C11) are subject to the New Source

Performance Standards for Industrial-Commercial-Institutional Steam Generating Units (326 IAC 12, 40 CFR 60.40b-49b, Subpart Db), which is incorporated by reference as 326 IAC 12.

Non applicable portions of the NSPS will not be included in the permit. The proposed TO/HRSG systems (C10 and C11) are subject to the following portions of 40 CFR 60, Subpart Db:

(1) 40 CFR 60.40b(a), (g), (j)
(2) 40 CFR 60.41b
(3) 40 CFR 60.42b(e), (g), (k)
(4) 40 CFR 60.44b(a), (f), (h), (i), (l)
(5) 40 CFR 60.45b(a), (b), (c)(1), (f), (g), (h)
(6) 40 CFR 60.46b(c), (e)(1), (e)(4)
(7) 40 CFR 60.47b(g)
(8) 40 CFR 60.48b(b), (c), (d), (e)(2), (f)
(9) 40 CFR 60.49b(a) – (d), (g), (h)(2), (h)(4), (i), (j), (k)(1)-(k)(3), (k)(5) through (k)(7), (o), (v), (w)

The provisions of 40 CFR 60, Subpart A – General Provisions, which are incorporated as 326 IAC 12-1-1, apply to the TO/HRSG systems (C10 and C11) except when otherwise specified in 40 CFR 60, Subpart Db.

(c) Tanks T01, T02, and T04 through T07 have capacities greater than 75 cubic meters (19,813 gallons) and will be used to store volatile organic liquids. Therefore, these tanks are subject to the New Source Performance Standards for Volatile Organic Liquid Storage Vessels for which Construction, Reconstruction, or Modification Commenced after July 23, 1984 (326 IAC 12, 40 CFR 60.110b - 117b, Subpart Kb). Tanks T03 and T08 have maximum capacities less than 75 cubic meters (19,813 gallons) and therefore are not subject to this NSPS.

Tanks T01, T02, and T04 through T07 have capacities greater than 151 cubic meters (39,890 gallons) and the stored liquids have vapor pressures greater than 5.2 kPa and less than 76.6 kPa. Non applicable portions of the NSPS will not be included in the permit. Tanks T01, T02, and T04 through T07 are subject to the following portions of 40 CFR 60, Subpart Kb:

(1) 40 CFR 60.110b(a), (b)
(2) 40 CFR 60.111b
(3) 40 CFR 60.112b(a)(1)
(4) 40 CFR 60.113b(a)
(5) 40 CFR 60.115b(a)
(6) 40 CFR 60.116b(a) – (e)
(7) 40 CFR 60.117b

The provisions of 40 CFR 60, Subpart A – General Provisions, which are incorporated as 326 IAC 12-1-1, apply to Tanks T01, T02, and T04 through T07 except when otherwise specified in 40 CFR 60, Subpart Kb.

(d) Ethanol is one of the chemicals listed in 40 CFR 60.489. Therefore, this ethanol production plant is subject to the requirements of New Source Performance Standards for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry (326 IAC 12, 40 CFR 60.480 - 489, Subpart VV).

Affected facilities under this NSPS include leaks from the various components assembled to produce ethanol (as intermediate or final products). Non applicable portions of the NSPS will not be included in the permit. The following portions of 40 CFR 60, Subpart VV have been included in the permit:

(1) 40 CFR 60.480(a), (b)
(2) 40 CFR 60.481
(3) 40 CFR 60.482-1
(4) 40 CFR 60.482-2
(5) 40 CFR 60.482-4
(6) 40 CFR 60.482-5
(7) 40 CFR 60.482-6
(8) 40 CFR 60.482-7
(9) 40 CFR 60.482-8
(10) 40 CFR 60.482-9
(11) 40 CFR 60.482-10
(12) 40 CFR 60.483-1
(13) 40 CFR 60.483-2
(14) 40 CFR 60.484
(15) 40 CFR 60.485
(16) 40 CFR 60.486
(17) 40 CFR 60.487
(18) 40 CFR 60.489

The provisions of 40 CFR 60, Subpart A – General Provisions, which are incorporated as 326 IAC 12-1-1, apply to the equipment leaks from components of the ethanol plant, except when otherwise specified in 40 CFR 60, Subpart VV.

(e) Ethanol is one of the chemicals listed in 40 CFR 60.667. However, according to the EPA memorandum from Mr. George T. Czerniak dated December 6, 2002, the manufacture of ethanol using a fermentation process (biological synthesis) was excluded from the scope of NSPS, Subpart NNN. Therefore, the distillation unit at this new ethanol production plant is not subject to the requirements of New Source Performance Standards for VOC Emissions From Synthetic Organic Chemical Manufacturing Industry (SOCMI) Distillation Operations (326 IAC 12, 40 CFR 60.660 - 667, Subpart NNN).

(f) There are no National Emission Standards for Hazardous Air Pollutants (NESHAPs) (326 IAC 14 and 20, and 40 CFR Part 61 and 63) included in this permit.

(g) This source will comply with the FESOP limits to limit the HAP emissions from the entire source to less than 10 tons/yr for a single HAP and less than 25 tons/yr for total HAPs. Therefore, the requirements of the NESHAP for Reciprocating Internal Combustion Engines (40 CFR 63, Subpart ZZZZ) are not included in this permit.

(h) The requirements of 40 CFR Part 63, Subpart F (National Emission Standards for Organic Hazardous Air Pollutants From Synthetic Organic Chemical Manufacturing Industry), 40 CFR Part 63, Subpart G (National Emission Standards for Organic Hazardous Air Pollutants from Synthetic Organic Chemical Manufacturing Industry for Process Vents, Storage Vessels, Transfer Operations, and Wastewater), and 40 CFR Part 63, Subpart H (National Emission Standards for Organic Hazardous Air Pollutants for Equipment Leaks), are not included in this permit because (1) this source has accepted limits that make it a minor source of hazardous air pollutants; (2) the source does not manufacture as a primary product any of the chemicals listed in Table 1 of 40 CFR 63, Subpart F, Tetrahydro-benzaldehyde, or Crotonaldehyde; and (3) the source does not use as a reactant, manufacture as a product or co-product any of the chemicals listed in Table 2 of 40 CFR 63, Subpart F.

(i) The requirements of 40 CFR 63, Subpart I – National Emission Standards for Organic Hazardous Air Pollutants for Certain Processes Subject to the Negotiated Regulation for Equipment Leaks are not included in this permit. The source does not operate any of the processes specified in 40 CFR 63.190(b).

(j) This new source is a minor source of HAPs. Therefore, the cooling towers at this source are not subject to the NESHAP for Industrial Process Cooling Towers (40 CFR 63,

Subpart Q).

(k) This new source is a minor source of HAPs. Therefore, this source is not subject to the requirements of the NESHAP for Organic Liquids Distribution (non-gasoline) (40 CFR 63, Subpart EEEE).

(l) This new source is a minor source of HAPs. Therefore, this source is not subject to the requirements of the NESHAP for Miscellaneous Organic Chemical Manufacturing (40 CFR 63, Subpart FFFF).

**State Rule Applicability – Entire Source**

326 IAC 2-2 (Prevention of Significant Deterioration (PSD)), 326 IAC 2-4.1 (New Sources of Hazardous Air Pollutants), and 326 IAC 2-8-4 (FESOP)

This source will be constructed in 2007. The source belongs to the chemical plant source categories defined in 326 IAC 2-2-1(gg)(1) and the potential to emit PM, PM10, VOC, CO, and NOx from the entire source before control is greater than 100 tons/yr. In addition, fugitive emissions are counted into the total potential to emit from the source. In order to make the requirements of 326 IAC 2-2 (PSD) not applicable, the Permittee shall comply with the following emission limitations:

(a) The PM/PM10 emissions from the grain receiving and handling operations, the grain milling operation, and the DDGS handling and loadout operation shall not exceed the emission limits listed in the table below:

| Unit ID | Unit Description | Baghouse ID | PM/PM10 Emission Limit (lbs/hr) |
|---|---|---|---|
| P06 through P15, P71 and P72 | Grain Receiving and Handling Operations | C20 | 2.06 |
| P16 through P20 | Grain Milling Operations | C30 | 1.20 |
| P67 through P70 | DDGS Handling and Loadout Operations | C90 | 0.39 |

The use of baghouses C20, C30, and C90 are necessary to demonstrate compliance with the PM/PM10 limits above.

(b) The total grain received shall not exceed 1,100,000 tons per twelve (12) consecutive month period with compliance determined at the end of each month. This condition was proposed by the Permittee and is necessary to limit the fugitive PM/PM10 emissions from the grain receiving and handling operations.

(c) The total DDGS produced shall not exceed 356,800 tons per twelve (12) consecutive month period with compliance determined at the end of each month. This condition was proposed by the Permittee and is necessary to limit the fugitive PM/PM10 emissions from the DDGS loadout operations and the VOC emissions from baghouse C70 associated with the DDGS cooling drum (P65).

(d) The Permittee shall use periodic sweeping to control PM/PM10 emissions from the paved roads. The sweeping shall be applied in a manner and at a frequency sufficient to ensure compliance with 326 IAC 2-2.

(e) The emissions from wet scrubber C40, which is used to control the emissions from the fermentation process, shall comply with the following:

(1) VOC emissions shall not exceed 11.4 pounds per hour. This is equivalent to 50.0 tons per year of VOC emissions.

(2) Acetaldehyde emissions shall 1.45 pounds per hour. This is equivalent to 6.33 tons per year of acetaldehyde emissions.

(f) The TO/HRSG systems (C10 and C11) will be used to control the emissions from the distillation process, the DDGS dryers (P01 through P04), and part of the emissions from DDGS cooling drum (P65). Both the TO/HRSG systems and all the DDGS dryers vent to a single stack (Stack S10). The emissions from Stack S10 shall comply with the following:

(1) PM/PM10 emissions shall not exceed 6.11 lbs/hr.

(2) VOC emissions shall not exceed 5.30 lbs/hr.

(3) CO emissions shall not exceed 19.0 lbs/hr.

(4) $SO_2$ emissions shall not exceed 18.6 lbs/hr.

(5) NOx emissions shall not exceed 21.2 lbs/hr.

(6) Acetaldehyde emissions shall not exceed 0.0084 pounds per ton of DDGS produced.

(g) The emissions from the baghouse (C70) associated with the DDGS cooling drum (P65) shall comply with the following:

(1) PM/PM10 emissions shall not exceed 0.64 lbs/hr. The use of baghouse C70 is necessary to demonstrate compliance with this limit.

(2) The total DDGS produced shall not exceed 356,800 tons per twelve (12) consecutive month period with compliance determined at the end of each month.

(3) The VOC emissions from baghouse stack S70 shall not exceed 0.04 pounds per ton of DDGS produced in the DDGS cooling drum (P65). This is equivalent to 7.14 tons per year of VOC emissions.

(h) The Permittee shall comply with the following requirements for the ethanol loading rack (P66):

(1) The Permittee shall use flare C50 to control the emissions from the ethanol loading rack (P66).

(2) The total denatured ethanol loaded shall not exceed 110,000,000 gallons per twelve (12) consecutive month period with compliance determined at the end of each month.

(3) The total denatured ethanol loaded into trucks shall not exceed 38,500,000 gallons per twelve (12) consecutive month period with compliance determined at the end of each month.

(4) The operating hours of the flare C50 shall not exceed 4,380 hours per twelve (12) consecutive month period with compliance determined at the end of each month.

(5) The ethanol loading rack (P66) shall utilize the submerged loading method.

(6) The railcars and trucks shall not use vapor balance services.

Note that the potential to emit NOx and CO of flare C50 was calculated using the emission factors in AP-42, Table 13.5-1 for industrial flare. Therefore, no specific CO and NOx emission limits will be included in the permit for this flare.

(i) The operating hours for the diesel fire pump (P110) shall not exceed 500 hours per

twelve (12) consecutive month period with compliance determined at the end of each month.

(j) The biomethanator flare (C60) shall not operate when any of the DDGS dryers (P01 through P04) are in operation. This condition is necessary because the potential to emit of the biomethanator flare (C60) is not included in the potential to emit of the entire source. Emissions from the operation of the DDGS dryers are the worst case scenario. Flare C60 and the DDGS dryers cannot operate at the same time because the potential to emit CO and NOx from this source will exceed 100 tons per year.

Combined with the PM, PM10, VOC, NOx, CO, and HAP emissions from other emission units, the emissions from the entire source are limited to less than 100 tons/yr for PM, PM10, VOC, NOx, and CO, less than 10 tons/yr for a single HAP, and less than 25 tons/yr for total HAPs. Therefore, the requirements of 326 IAC 2-7 (Part 70 Program) and 326 IAC 2-2 (PSD) are not applicable. The HAP limits shall render the requirements of 326 IAC 2-4.1 (MACT) not applicable.

326 IAC 2-6 (Emission Reporting)

This source is located in Randalph County, not required to operate under a Part 70 permit, and has potential lead emissions that are less than five (5) tons per year. Therefore, pursuant to 326 IAC 2-6-1(b), the source is only subject to additional information requests as provided in 326 IAC 2-6-5.

326 IAC 5-1 (Opacity Limitations)

Pursuant to 326 IAC 5-1-2 (Opacity Limitations), except as provided in 326 IAC 5-1-3 (Temporary Alternative Opacity Limitations), opacity for sources shall meet the following, unless otherwise stated in the permit:

(a) Opacity shall not exceed an average of forty percent (40%) in any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.

(b) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of fifteen (15) minutes (sixty (60) readings as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a continuous opacity monitor) in a six (6) hour period.

**State Rule Applicability - Grain Receiving and Handling Operations**

326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes)

Pursuant to 326 IAC 6-3-2, particulate emissions from each of the following operations shall not exceed the pound per hour limits listed in the table below:

| Unit ID | Unit Description | Max. Throughput Rate (tons/hr) | Particulate Emission Limit (lbs/hr) |
|---|---|---|---|
| P06 and P07 | Each of the Grain Receiving Operations | 420 | 66.9 |
| P08 | Grain Conveyor | 280 | 62.2 |
| P09 | Grain Elevator | 560 | 70.3 |
| P10 and P11 | Each Grain Storage Silo | 118 | 53.0 |
| P12 | Emptying Conveyor | 2,100 | 87.6 |
| P13 | Grain Elevator | 280 | 62.2 |
| P14 and P15 | Each Grain Day Bin | 118 | 53.0 |
| P71 and P72 | Each Grain Scalper | 168 | 56.6 |
| P16 | Hammermill Feed Conveyor | 280 | 62.2 |
| P17 through P20 | Each Hammermill | 168 | 56.6 |

The pounds per hour limitations were calculated using the following equation:

Interpolation and extrapolation of the data for the process weight rate in excess of sixty thousand (60,000) pounds per hour shall be accomplished by use of the equation:

$E = 55.0\ P^{0.11} - 40$ where E = rate of emission in pounds per hour; and
P = process weight rate in tons per hour

Pursuant to 326 IAC 6-3-2(e)(3), when the process weight exceeds 200 tons per hour, the maximum allowable emissions may exceed the emission limits shown in the table above, provided the concentration of particulate matter in the gas discharged to the atmosphere is less than 0.10 pounds per 1,000 pounds of gases.

As shown in the calculations in Appendix A, the potential to emit PM after control from the grain receiving and handling operations is less than the emission limits above. Therefore, these operations are capable of complying with 326 IAC 6-3-2. The use of the baghouses C20 and C30 is necessary to comply with the limits above.

**State Rule Applicability – Fermentation Process**

326 IAC 8-1-6 (General Reduction Requirements for VOC Emissions)

The fermentation process will be constructed after January 1, 1980 and has potential VOC emissions greater than 25 tons per year. There are no other rules in 326 IAC 8 applicable to this process. Therefore, this fermentation process is subject to 326 IAC 8-1-6 and the Permittee is required to control VOC emissions from this process using the Best Available Control Technology (BACT). Based on the information in Appendix B, BACT for the fermentation process has been determined to be the following:

(a) The VOC emissions from the fermentation process shall be controlled by wet scrubber C40.

(b) The overall VOC control efficiency for the wet scrubber C40 (including the capture efficiency and absorption efficiency) shall be at least 98%, or the VOC outlet concentration shall not exceed 20 ppmv.

(c) The VOC emissions from wet scrubber C40 shall not exceed 11.4 pounds per hour.

**State Rule Applicability – Thermal Oxidizer/Heat Recovery Steam Generator (TO/HRSG) Systems (C10 and C11)**

326 IAC 6-2-4 (PM Emissions for Sources of Indirect Heating)

Pursuant to 326 IAC 6-2-4(a), indirect heating facilities constructed after September 12, 1983, shall be limited by the following equation:

$$Pt = \frac{1.09}{Q^{0.26}}$$

Where Pt = emission rate limit (lbs/MMBtu)
Q = total source heat input capacity (MMBtu/hr)

The total source heat input capacity for the TO/HRSG systems is 122 x 2 = 244 MMBtu/hr. Therefore, the PM emission limit for the TO/HRSG system is:

$$Pt = \frac{1.09}{244^{0.26}} = 0.26 \text{ lbs/MMBtu.}$$

The above PM emission limit of 0.26 lbs/MMBtu is equivalent to 63.4 lbs/hr (0.26 lbs/MMBtu x 122 MMBtu/hr/unit x 2 unit = 63.4 lbs/hr) of PM emissions. According to the emission calculations in Appendix A, the total PM emissions from the TO/HRSG systems (Stack S10) are 6.11 lbs/hr. Therefore, these units are capable of complying with the PM requirements in 326 IAC 6-2-4.

**State Rule Applicability – Distillation Process**

326 IAC 8-1-6 (General Reduction Requirements for VOC Emissions)

The distillation process will be constructed after January 1, 1980 and has potential VOC emissions greater than 25 tons per year. There are no other rules in 326 IAC 8 applicable to this process. Therefore, this process is subject to 326 IAC 8-1-6 and the Permittee is required to control VOC emissions from this process using the Best Available Control Technology (BACT). Based on the information in Appendix B, BACT for the distillation process has been determined to be the following:

(a) The VOC emissions from the distillation process shall be controlled by TO/HRSG system C10 or C11.

(b) The overall VOC control efficiency for each of the TO/HRSG systems C10 and C11 (including the capture efficiency and destruction efficiency) shall be at least 98%, or the VOC outlet concentration shall not exceed 10 ppmv.

(c) The total VOC emissions from the TO/HRSG system stack (S10) shall not exceed 5.3 lbs/hr.

**State Rule Applicability – DDGS Dryers**

326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes)

Pursuant to 326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes), particulate emissions from each of the DDGS dryers (P01 through P04) shall not exceed 31.5 pounds per hour when operating at a maximum throughput rate of 21 tons per hour.

The pounds per hour limitations were calculated using the following equation:

Interpolation of the data for the process weight rate up to sixty thousand (60,000) pounds per hour shall be accomplished by use of the equation:

$E = 4.10\ P^{0.67}$ where E = rate of emission in pounds per hour; and
P = process weight rate in tons per hour

The use of TO/HRSG systems C10 and C11 for the DDGS dryers (P01 through P04) is necessary to comply with the emission limits above.

326 IAC 8-1-6 (General Reduction Requirements for VOC Emissions)

The DDGS dryers (P01 through P04) will be constructed after January 1, 1980 and each of them has potential VOC emissions greater than 25 tons per year. There are no other rules in 326 IAC 8 applicable to these dryers. Therefore, these dryers are subject to 326 IAC 8-1-6 and the Permittee is required to control VOC emissions using the Best Available Control Technology (BACT). Based on the information in Appendix B, BACT for the DDGS dryers has been determined to be the following:

(a) The VOC emissions from the DDGS dryers (P01 through P04) shall be controlled by TO/HRSG system C10 or C11.

(b) The overall VOC control efficiency for each of the TO/HRSG systems C10 and C11 (including the capture efficiency and destruction efficiency) shall be at least 98%, or the VOC outlet concentration shall not exceed 10 ppmv.

(c) The total VOC emissions from the TO/HRSG system stack (S10) shall not exceed 5.3 lbs/hr.

**State Rule Applicability – DDGS Cooling Drum (P65)**

326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes)

Pursuant to 326 IAC 6-3-2, particulate emissions from the DDGS cooling drum (P65) shall not exceed 43.6 pounds per hour when operating at the maximum process throughput rate of 45 tons per hour.

The pound per hour limitation was calculated using the following equation:

Interpolation and extrapolation of the data for the process weight rate in excess of sixty thousand (60,000) pounds per hour shall be accomplished by use of the equation:

$E = 55.0 P^{0.11} - 40$ where E = rate of emission in pounds per hour; and
P = process weight rate in tons per hour

The use of baghouse C70 for the DDGS cooling drum (P65) is necessary to comply with the emission limit above.

326 IAC 8-1-6 (General Reduction Requirements for VOC Emissions)

The potential VOC emissions from the DDGS cooling drum (P65) are less than 25 tons/yr. Therefore, the DDGS cooler is not subject to the requirements of 326 IAC 8-1-6 (BACT).

**State Rule Applicability - DDGS Handling and Loadout Operation**

326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes)

Pursuant to 326 IAC 6-3-2, particulate emissions from each of the following operations shall not exceed the pound per hour limits listed in the table below:

| Unit ID | Unit Description | Max. Throughput Rate (tons/hr) | Particulate Emission Limit (lbs/hr) |
|---|---|---|---|
| P67 and P68 | DDGS Storage Silo | 204 | 58.7 |
| P69 | DDGS Dump Pit | 204 | 58.7 |
| P70 | DDGS Loadout Spout | 204 | 58.7 |

The pounds per hour limitations were calculated using the following equation:

Interpolation and extrapolation of the data for the process weight rate in excess of sixty thousand (60,000) pounds per hour shall be accomplished by use of the equation:

$E = 55.0 P^{0.11} - 40$ where E = rate of emission in pounds per hour; and
P = process weight rate in tons per hour

Pursuant to 326 IAC 6-3-2(e)(3), when the process weight exceeds 200 tons per hour, the maximum allowable emission may exceed the emission limits shown in the table above, provided the concentration of particulate matter in the gas discharged to the atmosphere is less than 0.10 pounds per 1,000 pounds of gases.

As shown in the calculations in Appendix A, the potential to emit PM after control from the DDGS handling and loadout operations is less than the emission limits above. Therefore, these operations are capable of complying with 326 IAC 6-3-2. The use of the baghouse C90 is necessary to comply with the limits above.

326 IAC 8-1-6 (General Reduction Requirements for VOC Emissions)

The potential VOC emissions from the each of the DDGS storage and handling operations are less than 25 tons/yr. Therefore, the requirements of 326 IAC 8-1-6 (BACT) are not applicable to these units.

**State Rule Applicability – Ethanol Loading Rack (P66)**

326 IAC 8-1-6 (General Reduction Requirements for VOC Emissions)

The ethanol loading rack (P66) at this source will be constructed after January 1, 1980 and has potential VOC emissions greater than 25 tons per year. There are no other rules in 326 IAC 8 applicable to this unit. Therefore, this unit is subject to 326 IAC 8-1-6 and the Permittee is required to control VOC emissions with the Best Available Control Technology (BACT). Based on the information provided in Appendix B, BACT for the ethanol loading rack (P66) has been determined to be the following:

(a) The VOC emissions from the ethanol loading rack (P66) shall be collected and controlled by flare C50 when this unit is in operation.

(b) The overall efficiency for flare C50 (including the capture efficiency and destruction efficiency) shall be at least 98%.

(c) The VOC emissions from flare C50 shall not exceed 0.78 lbs/hr. Since the ethanol loading rack can load denatured ethanol to either railcars or trucks and truck loading is the worst case scenario for VOC emissions, the hourly VOC limit was calculated based on the VOC emission factor of 1.09 lbs/kgal, the maximum truck loadout rate of 36 kgal/hr, and the flare control efficiency of 98% (1.09 lbs/kgal x 36 kgal/hr x (1-98%) = 0.78 lbs/hr). The VOC emission factor of 1.09 lbs/kgal was calculated using the equation in AP-42, Chapter 5.2 (see the emission calculations in Appendix A). VOC emissions from truck loading is the worst case scenario because the trucks may be used to carry gasoline prior to filling with denatured ethanol and the loading rack has a higher hourly throughput rate when loading denatured ethanol to trucks than to railcars.

**State Rule Applicability - Cooling Tower (Insignificant Activity)**

326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes)

Pursuant to 326 IAC 6-3-1(b)(11), particulate emissions from the noncontact cooling tower systems are exempt from the requirements of 326 IAC 6-3.

**State Rule Applicability – Paved Roads (Insignificant Activities)**

326 IAC 6-4 (Fugitive Dust Emissions)

Pursuant to 326 IAC 6-4, the source shall not generate fugitive dust to the extent that some portion of the material escapes beyond the property line or boundaries of the property, right-of-way, or easement on which the source is located.

326 IAC 6-5 (Fugitive Particulate Emissions Limitations)

The proposed grain handling operations and the storage piles are subject to 326 IAC 6-5, pursuant to 326 IAC 6-5-1(b). A Fugitive Dust Control Plan was submitted on August 8, 2006 and has been included in the permit as Attachment A.

**State Rule Applicability – Storage Tanks T01 through T08 (Insignificant Activities)**

326 IAC 8-4-3 (Petroleum Liquid Storage Facilities)

The denaturant storage tank (T07) has a maximum capacity greater than 39,000 gallons and will be used to store gasoline which has a vapor pressure greater than 1.52 psi. Therefore, tank T07 is subject to the requirements of 326 IAC 8-4-3. Tank T07 will be equipped with an internal floating roof and shall comply with the following requirements in 326 IAC 8-4-3:

(a) Pursuant to 326 IAC 8-4-3(b)(1)(B), Tank T07 shall be maintained such that there are no visible holes, tears, or other openings in the seal or any seal fabric or materials.

(b) Pursuant to 326 IAC 8-4-3(b)(1)(C), all openings, except stub drains, shall be equipped with covers, lids, or seals such that:

(1) the cover, lid, or seal is in the closed position at all times except when in actual use;

(2) automatic bleeder vents are closed at all times except when the roof is floated off or landed on the roof leg supports; and

(3) rim vents, if provided, are set to open when the roof is being floated off the roof leg supports or at the manufacturer's recommended setting.

(c) Pursuant to 326 IAC 8-4-3(d), the Permittee shall maintain the following records for a period of two (2) years for tank T07:

(1) The types of volatile petroleum liquid stored;

(2) The maximum true vapor pressure of the liquids as stored; and

(3) The results of the inspections performed on the storage vessels.

The above records shall be made available to the IDEM, OAQ upon written request.

Tanks T01 through T06 will not be used to store petroleum. Tank T08 has a capacity less than 39,000 gallons. Therefore, these tanks are not subject to requirements of 326 IAC 8-4-3.

326 IAC 8-9 (Volatile Organic Liquid Storage Vessels)

The source is not located in Clark, Floyd, Lake, or Porter County. Therefore, the requirements of 326 IAC 8-9-1 are not applicable to the tanks at this source.

**State Rule Applicability – Diesel Fire Pump (Insignificant Activity)**

326 IAC 9-1-2 (Carbon Monoxide Emission Requirements)

This source is not among the listed source categories in 326 IAC 9-1-2. Therefore, the diesel fire pump (P110) is not subject to the requirements of 326 IAC 9-1-2.

326 IAC 10-1 (Nitrogen Oxide Emission Requirements)

This source is not located in Clark or Floyd County. Therefore, the diesel fire pump (P110) is not subject to the requirements of 326 IAC 10-1.

**Testing Requirements**

In order to demonstrate compliance with the FESOP, PSD minor limits, and 40 CFR 60, Subpart Db, the Permittee shall perform the following tests within 60 days after achieving the maximum capacity but not later than 180 days after initial startup of the proposed plant:

(a) PM and PM10 tests for baghouses C20, C30, and C90 which are used to control the particulate emissions from the grain receiving and handling operations (P06 through P15), the grain milling operations (P16 through P20), and the DDGS handling and loadout operations (P67 through P70).

(b) VOC and Acetaldehyde tests for scrubber C40, which is used to control the fermentation process. Acetaldehyde is the major HAP emitted from this process.

(c) PM, PM10, VOC, NOx, CO, $SO_2$, and Acetaldehyde tests for the TO/HRSG system stack S10. The TO/HRSG systems (C10 and C11) are used to control the emissions from the distillation process, the DDGS dryers (P01 through P04), and part of the emissions from the DDGS cooling drum (P65). Both the TO/HRSG systems vent through a single stack (S10). Acetaldehyde is the major HAP emitted from these units.

(d) PM, PM10, and VOC for baghouse C70, which is used to control the emissions from the DDGS cooling drum (P65).

These tests shall be repeated at least once every five (5) years from the date of the last valid compliance demonstration. Flare C50 is an open flare so no stack testing is required for this unit.

**Compliance Requirements**

Permits issued under 326 IAC 2-8 are required to ensure that sources can demonstrate compliance with applicable state and federal rules on a more or less continuous basis. All state and federal rules contain compliance provisions, however, these provisions do not always fulfill the requirement for a more or less continuous demonstration. When this occurs IDEM, OAQ in conjunction with the source, must develop specific conditions to satisfy 326 IAC 2-8-4. As a result, compliance requirements are divided into two sections: Compliance Determination Requirements and Compliance Monitoring Requirements.

Compliance Determination Requirements in Section D of the permit are those conditions that are found more or less directly within state and federal rules and the violation of which serves as grounds for enforcement action. If these conditions are not sufficient to demonstrate continuous compliance, they will be supplemented with Compliance Monitoring Requirements, also in Section D of the permit. Unlike Compliance Determination Requirements, failure to meet Compliance Monitoring conditions would serve as a trigger for corrective actions and not grounds for enforcement action. However, a violation in relation to a compliance monitoring condition will arise through a source's failure to take the approporiate corrective actions within a specific time period.

The compliance monitoring requirements applicable to this source are as follows:

1. The grain receiving and handling operations (P06 through P15, P71 and P72), the grain milling operations (P16 through P20), the DDGS cooling drum (P65), and the DDGS handling and loadout operations (P67 through P70) have applicable compliance monitoring conditions as specified below. These units are controlled by baghouses C20, C30, C70, and C90.

   (a) Visible emission notations of the baghouse stack exhausts (stacks S20, S30, S70, and S90) shall be performed once per day during normal daylight operations. A trained employee shall record whether emissions are normal or abnormal. For processes operated continuously "normal" means those conditions prevailing, or expected to prevail, eighty percent (80%) of the time the process is in operation, not counting startup or shut down time. In the case of batch or discontinuous operations, readings shall be taken during that part of the operation that would normally be expected to cause the greatest emissions. A trained employee or contractor is a person who has worked or trained at the plant at least one (1) month and has been trained in the appearance and characteristics of normal visible emissions for that specific process. Section C - Response to Excursions or Exceedances for this unit shall contain troubleshooting contingency and response steps for when an abnormal emission is observed. Failure to take response steps in accordance with Section C - Response to Excursions or Exceedances, shall be considered a deviation from this permit.

   (b) The Permittee shall record the pressure drop across baghouses C20, C30, C70, and C90 used in conjunction with the grain receiving and handling operations (P06 through P15, P71 and P72), the grain milling operations (P16 through P20), the DDGS cooling drum (P65), and the DDGS handling and loadout operations (P67 through P70), at least once per day. When for any one reading, the pressure drop across baghouses C20, C30, C70, or C90 is outside the normal range of 1.0 and 6.0 inches of water or a range established during the latest stack test, the Permittee shall take reasonable response steps in accordance with Section C - Response to Excursions or Exceedances. A pressure reading that is outside the above mentioned range is not a deviation from this permit. Failure to take response steps in accordance with Section C - Response to

Excursions or Exceedances, shall be considered a deviation from this permit.

(c) In the event that bag failure has been observed:

(1) For a single compartment baghouse controlling emissions from a process operated continuously, a failed unit and the associated process shall be shut down immediately until the failed unit has been repaired or replaced. Operations may continue only if the event qualifies as an emergency and the Permittee satisfies the requirements of the emergency provisions of this permit (Section B - Emergency Provisions).

(2) For a single compartment baghouse controlling emissions from a batch process, the feed to the process shall be shut down immediately until the failed unit has been repaired or replaced. The emissions unit shall be shut down no later than the completion of the processing of the material in the line. Operations may continue only if the event qualifies as an emergency and the Permittee satisfies the requirements of the emergency provisions of this permit (Section B - Emergency Provisions).

Bag failure can be indicated by a significant drop in the baghouse's pressure reading with abnormal visible emissions, by an opacity violation, or by other means such as gas temperature, flow rate, air infiltration, leaks, dust traces or triboflows.

These monitoring conditions are necessary because the grain receiving and handling operations (P06 through P15, P71 and P72), the grain milling operations (P16 through P20), the DDGS cooling drum (P65), and the DDGS handling and loadout operations (P67 through P70) must operate properly to ensure compliance with 326 IAC 2-2 (PSD), 326 IAC 2-8 (FESOP), and 326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes).

2. The wet scrubber C40, which is used to control the fermentation process, has applicable compliance monitoring conditions as specified below:

The Permittee shall monitor and record the pressure drop and flow rate of scrubber C40, at least once per day when the associated fermentation process is in operation. When for any one reading, the pressure drop across the scrubber is outside the normal range of 4.0 and 8.0 inches of water, or a range established during the latest stack test, the Permittee shall take reasonable response steps in accordance with Section C - Response to Excursions or Exceedances. When for any one reading, the flow rate of the scrubber is less than the minimum of 55 gallons per minute, or a minimum established during the latest stack test, the Permittee shall take reasonable response steps in accordance with Section C - Response to Excursions or Exceedances. A pressure reading that is outside the above mention range or a flow rate that is below the above mentioned minimum is not a deviation from this permit. Failure to take response steps in accordance with Section C - Response to Excursions or Exceedances shall be considered a deviation from this permit.

[Note: PM/PM10 emissions from the fermentation process are negligible. Therefore, visible emissions notations are not required for this process.]

These monitoring conditions are necessary because scrubber C40 for the fermentation process must operate properly to ensure compliance with 326 IAC 2-2 (PSD), 326 IAC 2-8-4 (FESOP), and 326 IAC 8-1-6 (BACT).

3. The distillation process and the DDGS dryers (P01 through P04), which are controlled by the TO/HRSG systems (C10 and C11), have applicable compliance monitoring conditions as specified below:

(a) Visible emission notations of the exhaust from the TO/HRSG system stack (S10) shall be performed once per day during normal daylight operations. A trained employee shall record whether emissions are normal or abnormal. For processes operated continuously "normal" means those conditions prevailing, or expected to prevail, eighty percent (80%) of the time the process is in operation, not counting startup or shut down time. In the case of batch or discontinuous operations, readings shall be taken during that part of the operation that would normally be expected to cause the greatest emissions. A trained employee or contractor is a person who has worked or trained at the plant at least one (1) month and has been trained in the appearance and characteristics of normal visible emissions for that specific process. Section C - Response to Excursions or Exceedances for this unit shall contain troubleshooting contingency and response steps for when an abnormal emission is observed. Failure to take response steps in accordance with Section C - Response to Excursions or Exceedances, shall be considered a deviation from this permit.

(b) A continuous monitoring system shall be calibrated, maintained, and operated on the TO/HRSG systems (C10 and C11) for measuring operating temperature. For the purpose of this condition, continuous means no less than once per minute. The output of these systems shall be recorded as a 3-hour average. From the date of issuance of this permit until the approved stack test results are available, the Permittee shall operate the thermal oxidizer at or above the 3-hour average temperature of 1,400°F.

(c) The Permittee shall determine the 3-hour average temperature from the most recent valid stack test that demonstrates compliance with limits in this permit, as approved by IDEM.

(d) On and after the date the approved stack test results are available, the Permittee shall operate the thermal oxidizer at or above the 3-hour average temperature as observed during the compliant stack test.

(e) The Permittee shall determine fan amperage or duct pressure from the most recent valid stack test that demonstrates compliance with limits in this permit, as approved by IDEM, OAQ.

(f) The duct pressure or fan amperage shall be observed at least once per day when the TO/HRSG system is in operation. On and after the date the approved stack test results are available, the duct pressure or fan amperage shall be maintained within the normal range as established in most recent compliant stack test.

These monitoring conditions are necessary because the TO/HRSG systems (C10 and C11) must operate properly at all times the distillation process and the DDGS dryers (P01 through P04) are in operation to ensure compliance with 326 IAC 2-2 (PSD), 326 IAC 2-8-4 (FESOP), 326 IAC 8-1-6 (BACT), and 326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes).

4. The ethanol loading rack (P66), which is controlled by open flare C50, has applicable compliance monitoring conditions as specified below:

The presence of a flare flame shall be monitored using a thermocouple or other equivalent device to detect the presence of a flame.

These monitoring conditions are necessary because flare C50 must operate properly at all times that the ethanol loading rack is in operation to ensure compliance with 326 IAC 2-2 (PSD), 326 IAC 2-8-4 (FESOP), and 326 IAC 8-1-6 (BACT).

## Conclusion

The construction and operation of this ethanol production plant shall be subject to the conditions of FESOP 135-23226-00033**.**

Mail to: Permit Administration & Development Section
Office of Air Quality
100 North Senate Avenue
Indianapolis, Indiana 46204-2251

Cardinal Ethanol, LLC
2 OMCO Square, Suite 201, P.O. Box 501
Winchester, Indiana 47394

Affidavit of Construction

I, _____, being duly sworn upon my oath, depose and say:
(Name of the Authorized Representative)

1. I live in _____ County, Indiana and being of sound mind and over twenty-one (21) years of age, I am competent to give this affidavit.

2. I hold the position of _____ for _____.
(Title) (Company Name)

3. By virtue of my position with _____,I have personal
(Company Name)

knowledge of the representations contained in this affidavit and am authorized to make

these representations on behalf of _____ .
(Company Name)

4. I hereby certify that Cardinal Ethanol, LLC, S. of the CXS Rail Line, N. of State Road 32, and W. of Routh 600 East, Harrisville, Indiana 47390,completed construction of the an ethanol production plant on _____ in conformity with the requirements and intent of the construction permit application received by the Office of Air Quality on June 1, 2006 and as permitted pursuant to New Source Review and Federally Enforceable State Operating Permit No. 135-23226-00033, issued on _____.

Further Affiant said not.
I affirm under penalties of perjury that the representations contained in this affidavit are true, to the best of my information and belief.

Signature_____

Date_____

STATE OF INDIANA)
)SS

COUNTY OF _____ )

Subscribed and sworn to me, a notary public in and for _____ County and State of Indiana on this _____ day of _____, 20 _____ .

My Commission expires:

Signature_____

_____
Name (typed or printed)

# Appendix B
# Best Available Control Technology (BACT) Determinations

**Source Background and Description**

| | |
|---|---|
| Source Name: | Cardinal Ethanol, LLC |
| Source Location: | S. of the CXS Rail Line, N. of SR 32, and W. of Route 600 East Harrisville, Indiana 47390 |
| County: | Randolph |
| SIC Code: | 2869 |
| Operating Permit No.: | F135-23226-00033 |
| Permit Reviewer: | ERG/YC |

The Indiana Department of Environmental Management (IDEM), Office of Air Quality (OAQ) has performed the following Best Available Control Technology (BACT) reviews for a new ethanol production plant. Pursuant to 326 IAC 8-1-6 (New Facilities; General Reduction Requirements), BACT is required for all facilities constructed after January 1, 1980 that have potential VOC emissions of equal to or greater than twenty-five (25) tons per year and are not regulated by other rules in 326 IAC 8. Based on the calculations (see Appendix A) and the analysis of applicable state regulations (see State Rule Applicability section of TSD), the following facilities are subject to the requirements of 326 IAC 8-1-6:

- Fermentation Process;
- Distillation Process;
- DDGS Dryers (P01 through P04); and
- Ethanol Loading Rack (P66).

IDEM, OAQ conducts BACT analyses in accordance with the *"Top-Down" Best Available Control Technology Guidance Document* outlined in the 1990 draft US EPA *New Source Review Workshop Manual*, which outlines the steps for conducting a top-down BACT analysis. Those steps are listed below:

(a) Identify all potentially available control options;
(b) Eliminate technically infeasible control options;
(c) Rank remaining control technologies by control effectiveness;
(d) Evaluate the most effective controls and document the results as necessary; and
(e) Select BACT.

In accordance with EPA guidance, the BACT analysis should take into account the energy, environmental, and economic impacts. Emission reductions may be achieved through the application of available control techniques, changes in process design, and/or operational limitations.

A summary of the BACT review for the fermentation process is provided in Section B.1, the BACT review for the distillation process is provided in Section B.2, the BACT review for the DDGS dryers is provided in Section B.3, and the BACT review for the ethanol loading rack is provided in Section B.4. These BACT determinations are based on the following information:

(a) The EPA RACT/BACT/LAER (RBLC) Clearinghouse; and
(b) State and local air quality permits.

**Appendix B.1**
**Best Available Control Technology (BACT) Determination**
**For the Fermentation Process**

**Introduction:**

Cardinal Ethanol, LLC will use a fermentation process to produce ethanol from grain. The potential VOC emissions from this activity are estimated to be greater than 25 tons per year. Since this facility will be constructed after the January 1, 1980 applicability date and there are no other 326 IAC 8 rules applicable to this process, Cardinal Ethanol, LLC is required to control the VOC emissions from the fermentation process using BACT, pursuant to 326 IAC 8-1-6.

**Step 1 – Identify Control Options**

The following available technologies were identified and evaluated to control VOC emissions from the fermentation process at an ethanol production plant:

(a) IDEM, OAQ reviewed the following six control technologies:

1. Carbon Adsorption:

   Carbon adsorption is a process by which VOC is retained on a granular carbon surface, which is highly porous and has a very large surface-to-volume ratio. Organic vapors retained on the adsorbent are thereafter desorbed and both the adsorbate and absorbent are recovered.

   Carbon adsorption systems operate in two phases: adsorption and desorption. Adsorption is rapid and removes most of the VOC in the stream. Eventually, the adsorbent becomes saturated with the vapors and the system's efficiency drops. Regulatory considerations dictate that the adsorbent be regenerated or replaced soon after efficiency begins to decline. In regenerative systems, the adsorbent is reactivated with steam or hot air and the absorbate (solvent) is recovered for reuse or disposal. Non-regenerative systems require the removal of the adsorbent and replacement with fresh or previously regenerated carbon.

2. Wet Scrubbers:

   A wet scrubber is an absorption system in which the waste stream is dissolved in a solvent by passing it through a medium containing the solvent. Water is the most commonly used solvent. However, other solvents may be used dependent upon the components of the waste stream.

3. Thermal Oxidation:

   An efficient thermal oxidizer design must provide adequate residence time for complete combustion, sufficiently high temperatures for VOC destruction, and adequate velocities to ensure proper mixing without quenching combustion. The type of burners and their arrangement affect combustion rates and residence time. The more thorough the contact between the flame and VOC, the shorter the time required for complete combustion. Natural gas is required to ignite the flue gas mixtures and maintain combustion temperatures. Typically, a heat exchanger upstream of the oxidizer uses the heat content of the oxidizer flue gas to preheat the incoming VOC-laden stream to improve the efficiency of the oxidizer.

   Of all the VOC control technologies evaluated, thermal oxidization is the one whose VOC reduction efficiency is least affected by waste stream characteristics. A properly designed thermal oxidizer can handle almost all solvent mixtures (except for fluorinated or chlorinated solvents) and VOC concentrations. In addition to the energy penalty

associated with thermal oxidization, NOx emissions will be generated from the combustion of natural gas used to fuel the oxidizer. A thermal oxidizer normally provides a VOC destruction efficiency of at least 98%.

4. Catalytic Oxidation:

In a catalytic oxidizer, a catalyst is used to lower the activation energy for oxidation. When a preheated gas stream is passed through a catalytic oxidizer, the catalyst bed initiates and promotes the oxidation of the VOC without being permanently altered itself. In catalytic oxidization, combustion occurs at significantly lower temperatures than that of direct flame units and can also achieve a destruction efficiency of 98%. However, steps must be taken to ensure complete combustion. The types of catalysts used include platinum, platinum alloys, copper chromate, copper oxide, chromium, manganese, and nickel. These catalysts are deposited in thin layers on an inert substrate, usually a honeycomb shaped ceramic.

5. Flare:

Flares can be used to control almost any VOC stream and can handle fluctuations in VOC concentration, flow rate, heat content, and inert content. Flaring is appropriate for continuous, batch, and variable flow vent stream application. Some streams, such as those containing halogenated or sulfur-containing compounds, are usually not flared because they corrode the flare tip or cause formation of secondary pollutants (such as acid gases or sulfur dioxide). A flare normally provides a VOC destruction efficiency greater than 98%.

6. Refrigeration Condenser:

Condensation is the process by which the temperature of the waste stream is lowered to below the boiling points of the waste constituents. A refrigeration condenser normally provides a VOC control efficiency of greater than 90%.

(b) A search of EPA's RACT/BACT/LAER Clearinghouse (RBLC) and Indiana Air Permits for the fermentation processes identified the following:

| Plant | PBLD ID or Permit # | Date Issued and State | Facility | Control Technology and Permit Date | Stack Test Results and Dates |
|---|---|---|---|---|---|
| Premier Ethanol, LLC | F075-22858-00032 | 09/18/06 (IN) | Fermentation/ Distillation | A wet scrubber and a RTO. Control efficiency > 99% or VOC < 10 ppmv. VOC < 10.5 lbs/hr. | Under Construction. |
| Central Indiana Ethanol, LLC | SPR 053-22564-00062 | 07/20/06 (IN) | Fermentation | Wet scrubber with a control efficiency of 98% or VOC < 20 ppmv. VOC emissions < 7.62 lbs/hr. | Under Construction. |
| Putnam Ethanol, LLC | SPR 133-22480-00003 | 03/23/06 (IN) | Fermentation | Wet scrubber with a control efficiency of 98% or VOC < 20 ppmv. VOC emissions < 5.85 lbs/hr. | Under Construction. |
| Andersons Clymers Terminal | F017-21536 00023 | 02/15/06 (IN) | Fermentation | Wet scrubber with a control efficiency of 98% or VOC < 20 ppmv. VOC emissions < 7.5 lbs/hr. | Under Construction. |
| ASA Linden, LLC | F107-21453-00061 | 02/08/06 (IN) | Fermentation | Wet scrubber with a control efficiency of 98% or VOC < 20 ppmv. VOC emissions < 10.2 lbs/hr. | Under Construction. |
| Hartford Energy, LLC | F009-21592 00024 | 01/31/06 (IN) | Fermentation | Wet scrubber with a control efficiency of 98%. VOC emissions < 2.22 lbs/hr. | Under Construction. |
| Iroquois Bio-Energy | 073-20945 00037 | 07/22/05 (IN) | Fermentation | Wet scrubber with a control efficiency of 98% or VOC < 20 ppmv. VOC emissions < 1.8 lbs/1,000 gal ethanol | Not Available |
| United Wisconsin Grain Producers | WI-0204 | 8/14/03 (WI) | Fermentation | Wet scrubber (packed tower). VOC Emissions < 7.4 lbs/hr. | Not Available. |
| Michigan Ethanol | MI-0359 | 11/04/02 (MI) | Fermentation | BACT determined to be a scrubber with 97% control efficiency and VOC emissions < 6.0 lbs/hr | 97.4% (03/19/03) |
| Grain Processing Corporation | IN-0075 | 06/10/97 (IN) | Fermentation | Scrubber with 95% control efficiency. | Not Available. |
| Cargill, Inc. | NE-0016 | 04/25/96 (NE) | Fermentation | BACT determined to be a wet scrubber with a VOC emission limit of 11.8 lbs/hr. | Not Available. |

**Step 2 – Eliminate Technically Infeasible Control Options**

After reviewing the above technologies, IDEM, OAQ eliminated carbon adsorption as not technically feasible for this type of operation. The reasons for eliminating carbon adsorption are as follows:

**Carbon Adsorption:** Carbon adsorption uses intermolecular forces to accumulate organic material at the surface of an adsorbent (typically activated carbon). These intermolecular forces include the small momentary dipoles that result from the movement of electrons within molecular bonds (van der Waals interactions). The incidence of van der Waals interactions increases with larger molecules because there are more bonds within each molecule. For this reason, carbon adsorption is most effective for larger molecules. The VOC compounds emitted from the fermentation system include several small molecules, such as ethanol (MW = 46), acetaldehyde (MW = 44), and formaldehyde (MW = 30). Due to the small size of these molecules, the van der Waals interactions are weak. Since carbon adsorption typically requires a VOC concentration of at least 200 to 1,000 ppmv and average VOC molecular weights of at least 50 to 60 atomic units, this technology is considered infeasible for controlling the VOC emissions from the fermentation system.

**Step 3 – Rank Remaining Control Technologies by Control Effectiveness**

Using the control efficiencies reported for similar sources, IDEM, OAQ has ranked the remaining control technologies as follows:

| Control Technology | Control Efficiency (%) |
|---|---|
| Wet Scrubber and Thermal Oxidizer Combined | > 99% or 10 ppmv |
| Thermal Oxidizer | > 99% |
| Catalytic Oxidizer | > 98% |
| Flare | > 98% |
| Wet Scrubber | > 99% or 10 ppmv |
| Refrigeration Condenser | 90% |

**Step 4 – Evaluate the Most Effective Controls and Document Results**

All of the following control methods provide a VOC control efficiency of at least 98%:

1. A thermal oxidizer;
2. A catalytic oxidizer;
3. A flare; and
4. A wet scrubber.

IDEM is aware that some vendors have guaranteed control efficiencies of 99% to control similar processes for other proposed ethanol plants. However, BACT limitations do not necessarily need to reflect the highest possible control efficiency achievable by the technology on which the emission limitation is based. The permitting authority has discretion to base the emission limitation on a control efficiency that is somewhat lower than the optimal level.

**Step 5 – Select BACT**

The Permittee proposes using a wet scrubber (identified as C40) with a control efficiency of 98% or with VOC emissions less than 20 ppmv as the BACT for the fermentation process. Pursuant to 326 IAC 8-1-6, IDEM, OAQ has determined that the following requirements represent BACT for the fermentation process at this source:

(a) The VOC emissions from the fermentation process shall be controlled by wet scrubber C40.

(b) The overall VOC control efficiency for the wet scrubber C40 (including the capture efficiency and absorption efficiency) shall be at least 98%, or the VOC outlet concentration shall not exceed 20 ppmv.

(c) The VOC emissions from wet scrubber C40 shall not exceed 11.4 pounds per hour.

**Appendix B.2**
**Best Available Control Technology (BACT) Determination**
**For Distillation Process**

**Introduction:**

Cardinal Ethanol, LLC will use distillation to concentrate the ethanol produced in the fermentation process. The potential VOC emissions from the distillation process are estimated to be greater than 25 tons per year. Since this facility will be constructed after the January 1, 1980 applicability date and there are no other rules in 326 IAC 8 applicable to this process, Cardinal Ethanol, LLC is required to implement BACT to comply with 326 IAC 8-1-6.

**Step 1 – Identify Control Options**

The following available technologies were identified and evaluated to control VOC emissions from the distillation process at ethanol production plants:

(a) IDEM, OAQ reviewed the following six (6) control technologies. The detail description of each control technology can be found in Step 1 of Appendix B.1.

1. Carbon Adsorption;
2. Wet Scrubbers (packed tower);
3. Thermal Oxidation;
4. Catalytic Oxidation;
5. Flare; and
6. Refrigeration Condenser.

(b) A search of EPA's RACT/BACT/LAER Clearinghouse (RBLC) and Indiana Air Permits for the distillation processes identified the following:

| Plant | PBLD ID or Permit # | Date Issued and State | Facility | Control Technology and Permit Date | Stack Test Results and Dates |
|---|---|---|---|---|---|
| Premier Ethanol, LLC | F075-22858-00032 | 09/18/06 (IN) | Fermentation/ Distillation | A wet scrubber and a RTO. Control efficiency > 99% or VOC < 10 ppmv. VOC < 10.5 lbs/hr. | Under Construction. |
| Central Indiana Ethanol, LLC | SPR 053-22564-00062 | 07/20/06 (IN) | Distillation/Dryers | RTOs with a control efficiency of 98% or VOC < 10 ppmv. VOC emissions < 7.5 lbs/hr. | Under Construction. |
| Putnam Ethanol, LLC | SPR 133-22480-00003 | 03/23/06 (IN) | Distillation/Dryers | RTOs with a control efficiency of 98% or VOC < 10 ppmv. VOC emissions < 10.5 lbs/hr. | Under Construction. |
| Andersons Clymers Terminal | F017-21536 00023 | 02/15/06 (IN) | Distillation/Dryers | RTOs with a control efficiency of 98% or VOC < 10 ppmv. VOC emissions < 8.15 lbs/hr. | Under Construction. |
| ASA Linden, LLC | F107-21453-00061 | 02/08/06 (IN) | Distillation/Dryers | RTO with a control efficiency of 98% or VOC < 10 ppmv. VOC emissions < 8.5 lbs/hr. | Under Construction. |
| Hartford Energy, LLC | F009-21592 00024 | 01/31/06 (IN) | Distillation/Dryers | RTO with a control efficiency of 98%. VOC emissions < 10.56 lbs/hr. | Under Construction. |
| Iroquois Bio-Energy | 073-20945 00037 | 07/22/05 (IN) | Distillation/Dryers | RTO with a control efficiency of 98%. VOC emissions < 5.55 lbs/hr. | Not Available |
| United Wisconsin Grain Producers | WI-0204 | 8/14/03 (WI) | Distillation/Dryers | RTO with a control efficiency of 98% | Not Available. |
| Michigan Ethanol | MI-0359 | 11/04/02 (MI) | Distillation | Wet scrubber with a control efficiency of 98%. VOC emissions < 0.46 lbs/hr | 94.0% (03/19/03) |
| Grain Processing Corp. | IN-0075 | 06/10/97 (IN) | Distillation | Wet scrubber with a control efficiency of 95%. | Not Available. |
| Cargill, Inc. | NE-0016 | 04/25/96 (NE) | Distillation | Wet scrubber and a VOC emission limit of 2.22 lbs/hr. | Not Available. |

**Step 2 – Eliminate Technically Infeasible Control Options**

IDEM, OAQ believes that carbon adsorption is not technically feasible for the control of VOC emissions from the distillation process. The primary VOC constituents emitted from this process are ethanol and acetaldehyde. Carbon adsorption is only technically feasible for VOC concentrations of 200 to 1,000 ppmv and an average VOC molecular weight of 50 to 60 atomic units.

**Step 3 – Rank Remaining Control Technologies by Control Effectiveness**

Using the control efficiencies reported for similar sources, IDEM, OAQ has ranked the remaining control technologies as follows:

| Control Technology | Control Efficiency (%) |
|---|---|
| Wet Scrubber and Thermal Oxidizer Combined | > 99% or 10 ppmv |
| Thermal Oxidizer | > 99% or 10 ppmv |
| Catalytic Oxidizer | > 98% |
| Flare | > 98% |
| Wet Scrubber | > 99% or 10 ppmv |
| Refrigeration Condenser | 90% |

**Step 4 – Evaluate the Most Effective Controls and Document Results**

All of the following control methods provide a VOC control efficiency of at least 98%:

1. A thermal oxidizer;
2. A catalytic oxidizer;
3. A flare; and
4. A wet scrubber.

IDEM is aware that some vendors have guaranteed control efficiencies of 99% to control similar processes for other proposed ethanol plants. However, BACT limitations do not necessarily need to reflect the highest possible control efficiency achievable by the technology on which the emission limitation is based. The permitting authority has discretion to base the emission limitation on a control efficiency that is somewhat lower than the optimal level.

**Step 5 – Select BACT**

Cardinal Ethanol, LLC proposes to use thermal oxidizers with heat recovery steam generator (TO/HRSG) systems (C10 and C11), which will provide a control efficiency of 98% for VOC, as the BACT for the distillation process. Both TO/HRSG systems C10 and C11 vent through a single stack (S10). Pursuant to 326 IAC 8-1-6, IDEM, OAQ has determined that the following requirements represent BACT for the distillation process:

(a) The VOC emissions from the distillation process shall be controlled by TO/HRSG system C10 or C11.

(b) The overall VOC control efficiency for each of the TO/HRSG systems C10 and C11 (including the capture efficiency and destruction efficiency) shall be at least 98%, or the VOC outlet concentration shall not exceed 10 ppmv.

(c) The total VOC emissions from the TO/HRSG system stack (S10) shall not exceed 5.3 lbs/hr.

**Appendix B.3**
**Best Available Control Technology (BACT) Determination**
**For the DDGS Dryers (P01 through P04)**

**Introduction:**

VOC will be emitted from the DDGS drying process as trace quantities of alcohol from the fermentation process are evaporated. Other sources of VOC emissions result from the combustion of fuel in the dryers and the partial oxidation of organic material during the drying process. The potential VOC emissions from each of the DDGS dryers (P01 through P04) are greater than 25 tons per year and there are no other rules in 326 IAC 8 applicable to DDGS dryers; therefore, the Permittee is required to control the VOC emissions from the DDGS dryers using BACT.

**Step 1 – Identify Control Options**

The following available technologies were identified and evaluated to control VOC emissions from the dryers at ethanol production plants:

(a) IDEM, OAQ reviewed the following six (6) control technologies. The detail description of each control technology can be found in Step 1 of Appendix B.1.

1. Carbon Adsorption;
2. Wet Scrubbers;
3. Thermal Oxidation;
4. Catalytic Oxidation;
5. Flare; and
6. Refrigeration Condenser.

(b) A search of EPA's RACT/BACT/LAER Clearinghouse (RBLC) and Indiana Air Permits for DDGS dryers identified the following:

| Plant | PBLD ID or Permit # | Date Issued and State | Facility | Control Technology and Permit Date | Stack Test Results and Dates |
|---|---|---|---|---|---|
| Premier Ethanol, LLC | F075-22858-00032 | 09/18/06 (IN) | Dryers | RTO with Control efficiency of 99% or VOC < 10 ppmv. VOC < 10.5 lbs/hr. | Under Construction. |
| Central Indiana Ethanol, LLC | SPR 053-22564-00062 | 07/20/06 (IN) | Distillation/Dryers | RTOs with a control efficiency of 98% or VOC < 10 ppmv. VOC emissions < 7.5 lbs/hr. | Under Construction. |
| Putnam Ethanol, LLC | SPR 133-22480-00003 | 03/23/06 (IN) | Distillation/Dryers | RTOs with a control efficiency of 98% or VOC < 10 ppmv. VOC emissions < 10.5 lbs/hr. | Under Construction. |
| Andersons Clymers Terminal | F017-21536 00023 | 02/15/06 (IN) | Distillation/Dryers | RTOs with a control efficiency of 98% or VOC < 10 ppmv. VOC emissions < 8.15 lbs/hr. | Under Construction. |
| ASA Linden, LLC | F107-21453-00061 | 02/08/06 (IN) | Distillation/Dryers | RTO with a control efficiency of 98% or VOC < 10 ppmv. VOC emissions < 8.5 lbs/hr. | Under Construction. |
| Hartford Energy, LLC | F009-21592 00024 | 01/31/06 (IN) | Distillation/Dryers | RTO with a control efficiency of 98%. VOC emissions < 10.56 lbs/hr. | Under Construction. |
| Iroquois Bio-Energy | 073-20945 00037 | 07/22/05 (IN) | Fermentation | RTO with a control efficiency of 98%. VOC emissions < 5.55 lbs/hr. | Not Available |
| United Wisconsin Grain Producers | WI-0204 | 8/14/03 (WI) | Distillation/Dryers | RTO with a control efficiency of 98% | Not Available. |
| Michigan Ethanol | MI-0359 | 11/04/02 (MI) | Dryer | RTO with a control efficiency of 95% | 99.6% (03/19/03) |
| Archer Daniels Midland Co. | IL-0087 | 12/27/02 (IL) | Feed Dryer | RTO with a control efficiency of 95% and VOC < 10 ppm. | Not Available. |
| New Energy Corp. | T141-6956-00033 | Draft (IN) | DDGS Dryers | RTO with a control efficiency of 95% | 98.8% (RTO1) 99.2% (RTO2) (06/30/04) |

**Step 2 – Eliminate Technically Infeasible Control Options**

After reviewing the above technologies, IDEM, OAQ eliminated carbon adsorption, catalytic oxidation, flares, and refrigeration condensers as not technically feasible for this type of operation. The reasons for eliminating these control technologies are as follows:

**Carbon Adsorption:** Carbon adsorption typically requires a VOC concentration of at least 200 to 1,000 ppm and an average VOC molecular weight of at least 50 to 60 atomic units. Therefore, IDEM, OAQ concludes that carbon adsorption is not an effective control for the dryers due to the characteristics of the dryer exhaust gasses.

**Catalytic Oxidizer:** Catalytic oxidizers use a catalyst to lower the operating temperature of the oxidation unit. The catalyst must remain effective during operation in order for the control efficiency of the device be maintained. Fouling of the catalyst will rapidly decrease the control efficiency. The catalyst material used for catalytic oxidation has small channels for the waste gas stream to flow through. As a result, particulate matter in the dryer exhaust streams is likely to accumulate in the catalyst material, thereby fouling the catalyst and reducing the control efficiency. For this reason, OAQ has concluded that catalytic oxidation is an unreliable control technology for the dryers because of the presence of particulates in the exhaust gasses.

**Flares:** Since flares do not maintain a constant combustion zone temperature, they require supplemental natural gas to enrich the waste gas stream if the VOC concentration is low. In order to increase the heat value of the dryer exhaust gases, natural gas must be added to the exhaust gasses prior to the flare.

**Refrigeration Condensers:** OAQ believes that condensers would be technically infeasible because the dryer exhaust characteristics of low VOC concentration and high volumetric flow rate would make condensers ineffective.

**Step 3 – Rank Remaining Control Technologies by Control Effectiveness**

IDEM, OAQ has ranked the remaining control technologies by control efficiency as follows:

| Control Technology | Control Efficiency (%) |
|---|---|
| Thermal Oxidation | 99% or 10 ppmv |
| Wet Scrubber | Less than 96%* |

* A wet scrubber applied to this type of operation will not achieve the level of control that a thermal oxidizer will because of the high flow rate and dilute VOC concentration. Mass transfer in a contact scrubber is driven by concentration. Elevated temperature and particulate matter are also negative properties of this gas stream that make wet scrubbing a less appropriate control technology than the alternatives. The control efficiency is based on a wet scrubber that was applied to a spent grain dryer at an ethanol plant in Luverne, MN.

**Step 4 – Evaluate the Most Effective Controls and Document Results**

According to the analysis above, the most effective control is a thermal oxidizer. IDEM is aware that some vendors have guaranteed control efficiencies of 99% to control similar processes for other proposed ethanol plants. However, BACT limitations do not necessarily need to reflect the highest possible control efficiency achievable by the technology on which the emission limitation is based. The permitting authority has discretion to base the emission limitation on a control efficiency that is somewhat lower than the optimal level.

**Step 5 – Select BACT**

Cardinal Ethanol, LLC proposed to use TO/HRSG systems C10 and C11 with control efficiencies of 98% to control the VOC emissions from the DDGS dryers (P01 through P04). The TO/HRSG systems C10 and C11 are also used to control the VOC emissions from the distillation process and part of the DDGS cooling drum (P65). Both TO/HRSG systems C10 and C11 vent through a single stack (S10). Pursuant to

326 IAC 8-1-6, IDEM, OAQ has determined that the following requirements represent BACT for the DDGS dryers (P01 through P04) at this source:

(a) The VOC emissions from the DDGS dryers (P01 through P04) shall be controlled by TO/HRSG system C10 or C11.

(b) The overall VOC control efficiency for each of the TO/HRSG systems C10 and C11 (including the capture efficiency and destruction efficiency) shall be at least 98%, or the VOC outlet concentration shall not exceed 10 ppmv.

(c) The total VOC emissions from the TO/HRSG system stack (S10) shall not exceed 5.3 lbs/hr.

**Appendix B.4**
**Best Available Control Technology (BACT) Determination**
**For the Ethanol Loading Rack (P66)**

**Introduction:**

Cardinal Ethanol, LLC will ship denatured ethanol using either tank trucks or railcars. During the loading of the truck and rail tanks, VOC will be emitted as ethanol vapors and gases present in the tanks from previous cargos are displaced by liquid ethanol. The railcars are dedicated tanks but the trucks may carry gasoline before filling with ethanol. The potential VOC emissions from this activity were calculated using the methodology in AP-42, Section 5.2, Transportation and Loading of Petroleum Liquids (1/95).

The potential VOC emissions from the ethanol loading rack (P66) are greater than 25 tons per year. Since this unit will be constructed after the January 1, 1980 applicability date and there are no other rules in 326 IAC 8 applicable to this unit, the Permittee is required to control the VOC emissions from the ethanol loading rack (P66) using BACT.

**Step 1 – Identify Control Options**

The following available technologies were identified and evaluated to control VOC emissions from the ethanol loading racks:

(a) IDEM, OAQ reviewed the following six (6) control technologies. The detailed description of each control technology can be found in Step 1 of Appendix B.1.

1. Carbon Adsorption;
2. Wet Scrubbers;
3. Thermal Oxidation;
4. Flare; and
5. Refrigeration Condenser.

(b) A search of EPA's RACT/BACT/LAER Clearinghouse (RBLC) and Indiana Air Permits for similar loading racks identified the following:

| Plant | PBLD ID or Permit # | Date Issued and State | Facility | Control Technology and Permit Date | Stack Test Results and Dates |
|---|---|---|---|---|---|
| Premier Ethanol, LLC | F075-22858-00032 | 09/18/06 (IN) | Ethanol Loading Rack | Flare with a control efficiency of 98%. VOC < 2.81 lbs/hr. | Under Construction. |
| Central Indiana Ethanol, LLC | SPR 053-22564-00062 | 07/20/06 (IN) | Ethanol Loading Rack | Flare with a control efficiency of 98%. VOC < 0.92 lbs/hr. | Under Construction. |
| Putnam Ethanol, LLC | SPR 133-22480-00003 | 03/23/06 (IN) | Ethanol Loading Rack | Flare with a control efficiency of 98%. VOC < 0.92 lbs/hr. | Under Construction. |
| Andersons Clymers Terminal | F017-21536 00023 | 02/15/06 (IN) | Ethanol Loading Rack | Flare with a control efficiency of 98%. VOC < 2.03 lbs/hr. | Under Construction. |
| ASA Linden, LLC | F107-21453-00061 | 02/08/06 (IN) | Ethanol Loading Rack | Flare with a control efficiency of 98% | Under Construction. |
| Hartford Energy, LLC | F009-21592 00024 | 01/31/06 (IN) | Ethanol Loading Rack for Trucks | Flare with a control efficiency of 98%. VOC < 0.0224 lbs/1,000 gallons of denatured ethanol | Under Construction. |
| Iroquois Bio-Energy | 073-20945 00037 | 07/22/05 (IN) | Ethanol Loading Rack | Flare with a control efficiency of 98%. VOC < 0.69 lbs/hr. | Not Available |
| Motiva Enterprises, L.L.C. | CT-0149 | 10/22/03 (CT) | Fuel Loading Rack | Vapor recovery unit with carbon absorption unit | Not Available. |
| United Wisconsin Grain Producers | WI-0204 | 8/14/03 (WI) | Ethanol Loading Rack | Flare with a control efficiency of 94%. | Not Available. |
| Archer Daniels Midland Co. | IL-0090 | 03/28/03 (IL) | Ethanol Loading Rack | Flare with a control efficiency of 95%. | Not Available. |
| Van Waters & Rogers | CA-0894 | 09/01/99 (CA) | Truck Loading Stations | Thermal oxidizer with a control efficiency of 95%. | Not Available. |

**Step 2 – Eliminate Technically Infeasible Control Options**

After reviewing the above technologies, IDEM, OAQ eliminated carbon adsorption and wet scrubbers as technically infeasible for this type of operation. The reasons for eliminating these technologies are as follows:

**Carbon Adsorption:** Carbon adsorption is effective when there is sufficient VOC concentration and adequate van der Waals interactions. Because the primary VOC being emitted is ethanol, the van der Waals interactions would be minimal. Therefore, carbon adsorption is not typically used in this type of application. According to Calgon Carbon Industries, carbon adsorption is actually used in some applications to purify ethanol. This means that carbon adsorption is so ineffective at capturing ethanol that it is used to remove contaminants from ethanol. Therefore, carbon adsorption is considered technologically infeasible for controlling the VOC emissions from the ethanol loading facility.

**Wet Scrubbers:** Wet scrubbers are reasonably effective for controlling VOC emissions when the VOCs are easily absorbed in water. Several characteristics control the effectiveness of wet scrubbers for VOC removal. The one parameter that can be easily analyzed to determine if wet scrubbing is effective is the solubility of the pollutants in the absorbent (water). The constituents in gasoline include many different organic compounds. Some of these compounds have limited solubility in water; therefore, potentially affect the control efficiency of the scrubber. A significant amount of VOC emissions emitted during the loading of tank trucks arises from the displacement of petroleum or gasoline vapors present in the tank from the previous cargo. While the emissions from the ethanol would be effectively controlled by a wet scrubber, the VOC emissions resulting from the displacement of gasoline or petroleum vapors would not be effectively controlled by a wet scrubber.

**Step 3 – Rank Remaining Control Technologies by Control Effectiveness**

A condenser, thermal oxidizer, and flare are the only technically feasible control options for the ethanol loading facility. IDEM, OAQ reviewed industry data to determine the VOC control efficiency of each of these remaining control technologies. The results of this review are summarized in the following table.

| Control Technology | VOC Control Efficiency (%) |
|---|---|
| Flare | 98% |
| Thermal Oxidizer | 98% |
| Refrigeration Condenser | Greater than 90% |

**Step 4 – Evaluate the Most Effective Controls and Document Results**

The thermal oxidizers and flares have the highest control efficiency (98%) during normal operation.

**Step 5 – Select BACT**

Since flares achieve the highest control efficiency and have been used to control VOC emissions from the ethanol loading racks at other ethanol production plants, Cardinal Ethanol, LLC proposed to use an enclosed flare C50 with a control efficiency of 98% to control the VOC emissions from the ethanol loading rack (P66). Pursuant to 326 IAC 8-1-6, IDEM, OAQ has determined that the following requirements represent BACT for the ethanol loading rack (P66) at this source:

(a) The VOC emissions from the ethanol loading rack (P66) shall be collected and controlled by flare C50 when this unit is in operation.

(b) The overall efficiency for flare C50 (including the capture efficiency and destruction efficiency) shall be at least 98%.

(c) The VOC emissions from flare C50 shall not exceed 0.78 lbs/hr. Since the ethanol loading rack can either load denatured ethanol to railcars or trucks and truck loading is the worst case scenario for VOC emissions, the hourly VOC limit was calculated based on the VOC emission factor of 1.09 lbs/kgal, the maximum truck loadout rate of 36 kgal/hr, and the flare control efficiency of 98% (1.09 lbs/kgal x 36 kgal/hr x (1-98%) = 0.78 lbs/hr). The VOC emission factor of

1.09 lbs/kgal was calculated using the equation in AP-42, Chapter 5.2 (see the emission calculations in Appendix A).

**Appendix A: Emission Calculations**
**PM and PM10 Emissions**
**From the Grain Receiving and Handling Operations**

**Company Name: Cardinal Ethanol, LLC**
**Address: S. of the CXS Rail Line, N. of State Rd. 32, and W. of Route 600 E**
**Harrisville, IN 47390**
**FESOP: 135-23226-00033**
**Reviewer: ERG/YC**
**Date: November 7, 2006**

## 1. Potential to Emit PM/PM10 - Captured Emissions:

| Baghouse ID | Process Description | Control Device | Outlet Grain Loading (gr/dscf) | Maximum Air Flow Rate (scfm) | PTE of PM/PM10 after Control (lbs/hr) | PTE of PM/PM10 after Control (tons/yr) | Control Efficiency (%) | PTE of PM/PM10 before Control (tons/yr) |
|---|---|---|---|---|---|---|---|---|
| C20 | Grain Receiving and Handling | Baghouse | 0.005 | 48,000 | 2.06 | 9.01 | 99% | 901 |
| C30 | Grain Milling | Baghouse | 0.005 | 28,000 | 1.20 | 5.26 | 99% | 526 |
| Total | | | | | | 14.3 | | 1,427 |

Assume all PM emissions equal PM10 emissions.

**Methodology**

PTE of PM/PM10 after Control (lbs/hr) = Grain Loading (gr/dscf) x Max. Air Flow Rate (scfm) x 60 mins/hr x 1/7000 lb/gr
PTE of PM/PM10 after Control (tons/yr) = Grain Loading (gr/dscf) x Max. Air Flow Rate (scfm) x 60 mins/hr x 1/7000 lb/gr x 8760 hr/yr x 1 ton/2000 lbs
PTE of PM/PM10 before Control (tons/yr) = PTE of PM/PM10 after Control (tons/yr) / (1-Control Efficiency)

## 2. Potential to Emit PM/PM10 - Fugitive Emissions:

| Unit ID | Unit Description | Annual Throughput Limit (tons/yr) | Uncontrolled PM Emission Factor (lbs/ton) | Uncontrolled PM10 Emission Factor (lbs/ton) | Baghouse ID | Capture Efficiency* (%) | Fugitive PM Emissions (tons/yr) | Fugitive PM10 Emissions (tons/yr) |
|---|---|---|---|---|---|---|---|---|
| P06 and P07 | Grain Receiving | 1,100,000 | 0.035 | 0.0078 | C20 | 95% | 0.96 | 0.21 |
| P08 through P15 | Grain Handling | 1,100,000 | 0.061 | 0.0340 | C20 | 95% | 1.68 | 0.94 |
| P71 and P72 | Grain Scalping | 1,100,000 | 0.120 | 0.1200 | C20 | 95% | 3.30 | 3.30 |
| **Total** | | | | | | | **5.94** | **4.45** |

Note: Emission factors for grain receiving and handling are from AP-42, Chapter 9.9.1 - Grain Elevators, Table 9.9.1-1 (04/03). Assume all the grain receiving and loadout is by truck, which is the worst case scenario. The emission factor for grain scalping is from Table 9.9.1-2 for separators. The uncontrolled emission factor = controlled emission factor / (1-90% Cyclone Control Efficiency). The Permittee stated that there are no fugitive emissions from the grain milling operation because the emissions from this operation are 100% captured.
*These units are controlled by choked flow systems and the capture efficiency is provided by the source.

**Methodology**

Fugitive PM/PM10 (tons/yr) = Annual Throughput Limit (tons/yr) x Uncontrolled Emission Factor (lbs/ton) x (1-Capture Efficiency%) x 1 ton/2000 lbs

**Appendix A: Emission Calculations**
**VOC and HAP Emissions**
**From the Fermentation Process**

**Company Name: Cardinal Ethanol, LLC**
**Address: S. of the CXS Rail Line, N. of State Rd. 32, and W. of Route 600 E**
**Harrisville, IN 47390**
**FESOP: 135-23226-00033**
**Reviewer: ERG/YC**
**Date: November 7, 2006**

## 1. Process Description:

Max. Throughput Limit: 110 MM gal/yr of ethanol
Control Equipment: Wet Scrubber C40

## 2. Potential to Emit (PTE) of VOC and HAP:

| Pollutant | Emission Factor* (lbs/MM gal) | PTE after Control (tons/yr) | **Control Efficiency (%) | PTE before Control (tons/yr) |
|---|---|---|---|---|
| PM | 4.96 | **0.27** | 98% | **13.6** |
| PM10 | 5.55 | **0.31** | 98% | **15.3** |
| VOC | 909 | **50.0** | 98% | **2,500** |
| HAP | | | | |
| Acetaldehyde | 115 | **6.33** | 50% | **12.7** |
| Acrolein | 0.9 | **0.05** | 0% | **0.05** |
| Formaldehyde | 0.9 | **0.05** | 0% | **0.05** |
| Methanol | 0.9 | **0.05** | 0% | **0.05** |
| **Total HAPs** | | **6.47** | | **12.8** |

* The emission factors are provided by the source based on multiple ethanol facilities' stack test results and includes a moderate margin of safety. The emission factors for VOC and acetaldehyde will be verified by stack testing.
** The control efficiency information is based on the information from other similar plants.

**Methodology**

PTE after Control (tons/yr) =Max. Throughput Limit (MM gal/yr) x Emission Factor (lbs/MM gal) x 1 ton/2000 lbs
PTE before Control (tons/yr) = PTE after Control (tons/yr) / (1- Control Efficiency)

**Appendix A: Emission Calculations**
**Criteria Pollutants**
**From Two (2) 122 MMBtu/hr TO/HRSG Systems and Four (4) 45 MMBtu/hr DDGS Dryers**

**Company Name: Cardinal Ethanol, LLC**
**Address: S. of the CXS Rail Line, N. of State Rd. 32, and W. of Route 600 E**
**Harrisville, IN 47390**
**FESOP: 135-23226-00033**
**Reviewer: ERG/YC**
**Date: November 7, 2006**

| | Pollutant | | | | | |
|---|---|---|---|---|---|---|
| | PM* | PM10* | $SO_2$* | NOx* | VOC* | CO* |
| Emission Factor | 6.11 (lbs/hr) | 6.11 (lbs/hr) | 18.6 (lbs/hr) | 21.2 (lbs/hr) | 5.30 (lbs/hr) | 19.0 (lbs/hr) |
| **Potential to Emit in tons/yr** | **26.8** | **26.8** | **81.5** | **92.9** | **23.2** | **83.2** |

*Emission rates were estimated by the source based on the stack testing results from similar sources. These emission rates are the proposed emission limits in this permit and will be verified by stack testing.

**Methodology**

PTE (tons/yr) = Emission Factor (lbs/hr) x 8760 hr/yr x 1 ton/2000 lbs

**Appendix A: Emission Calculations**
**HAP Emissions**
**From Two (2) 122 MMBtu/hr TO/HRSG Systems and Four (4) 45 MMBtu/hr DDGS Dryers**

**Company Name: Cardinal Ethanol, LLC**
**Address: S. of the CXS Rail Line, N. of State Rd. 32, and W. of Route 600 E**
**Harrisville, IN 47390**
**FESOP: 135-23226-00033**
**Reviewer: ERG/YC**
**Date: November 7, 2006**

## 1. Process Description:

DDGS Production Limit: 356,880 tons/yr
Control Equipment: TO/HRSG Systems C10 and C11
HAP Control Efficiency: 97% (provided by the source)

## 2. Potential to Emit After Control:

| | Pollutant | | | | |
|---|---|---|---|---|---|
| | Acetaldehyde | Acrolein | Formaldehyde | Methanol | Total |
| Before Control Emission Factor (lbs/ton)* | 0.28 | 0.066 | 0.31 | 0.11 | |
| After Control Emission Factor (lbs/ton) | 8.40E-03 | 1.98E-03 | 9.30E-03 | 3.30E-03 | |
| **PTE after Control in tons/yr** | **1.50** | **0.35** | **1.66** | **0.59** | **4.10** |

*HAP emission factors were provided by the source based on stack testing of similar equipment at other ethanol production facilities. The emission factor for acetaldehyde will be verified by stack testing.

**Methodology**

After Control Emission Factor (lbs/ton) = Before Control Emission Factor (lbs/ton) x (1-Control Efficiency)
PTE after Control (tons/yr) = DDGS Production Limit (tons/yr) x After Control Emission Factor (lbs/ton) x 1 ton/2000 lbs

**Appendix A: Emission Calculations**
**HAP Emissions from Natural Gas Combustion**
**From Two (2) 122 MMBtu/hr TO/HRSG Systems and Four (4) 45 MMBtu/hr DDGS Dryers**

**Company Name: Cardinal Ethanol, LLC**
**Address: S. of the CXS Rail Line, N. of State Rd. 32, and W. of Route 600 E**
**Harrisville, IN 47390**
**FESOP: 135-23226-00033**
**Reviewer: ERG/YC**
**Date: November 7, 2006**

| Heat Input Capacity MMBtu/hr | | Potential Throughput MMCF/yr |
|---|---|---|
| 424 | (6 units combined) | 3,714 |

| | Pollutant | | | | | |
|---|---|---|---|---|---|---|
| | Hexane | Formaldehyde | Toluene | Benzene | Nickel | **Total HAPs** |
| Emission Factor in lbs/MMCF | 1.8E+00 | 7.5E-02 | 3.4E-03 | 2.1E-03 | 2.1E-03 | |
| **Potential to Emit in tons/yr** | 3.34 | 0.14 | 6.31E-03 | 3.90E-03 | 3.90E-03 | **3.50** |

Emission factors are from AP-42, Chapter 1.4, Tables 1.4-3 and 1.4-4 (AP-42, 03/98).
MMBtu = 1,000,000 Btu
MMCF = 1,000,000 Cubic Feet of Gas

**Methodology**

Potential Throughput (MMCF) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1 MMCF/1,000 MMBtu
PTE (tons/yr) = Potential Throughput (MMCF/yr) x Emission Factor (lbs/MMCF) x 1 ton/2000 lbs

**Appendix A: Emission Calculations**
**PM/PM10 and VOC Emissions**
**From the Baghouse C70 Associated with the DDGS Cooling Drum (P65)**

**Company Name: Cardinal Ethanol, LLC**
**Address: S. of the CXS Rail Line, N. of State Rd. 32, and W. of Route 600 E**
**Harrisville, IN 47390**
**FESOP: 135-23226-00033**
**Reviewer: ERG/YC**
**Date: November 7, 2006**

Note: 35,000 acfm of the DDGS cooling drum exhaust vents to the TO/HRSG systems, and the rest of the exhaust (15,000 acfm) vents to baghouse C70.

**1. Potential to Emit PM/PM10 from Baghouse C70:**

| Baghouse ID | Process Description | Control Device | Outlet Grain Loading (gr/dscf) | Maximum Air Flow Rate (scfm) | PTE of PM/PM10 after Control (lbs/hr) | PTE of PM/PM10 after Control (tons/yr) | Control Efficiency (%) | PTE of PM/PM10 before Control (tons/yr) |
|---|---|---|---|---|---|---|---|---|
| C70 | DDGS Cooling Drum | Baghouse | 0.005 | 15,000 | 0.64 | 2.82 | 99% | 282 |
| Total | | | | | | 2.82 | | 282 |

Assume all PM emissions equal PM10 emissions.

**Methodology**

PTE of PM/PM10 after Control (lbs/hr) = Grain Loading (gr/dscf) x Max. Air Flow Rate (scfm) x 60 mins/hr x 1/7000 lb/gr
PTE of PM/PM10 after Control (tons/yr) = Grain Loading (gr/dscf) x Max. Air Flow Rate (scfm) x 60 mins/hr x 1/7000 lb/gr x 8760 hr/yr x 1 ton/2000 lbs
PTE of PM/PM10 before Control (tons/yr) = PTE of PM/PM10 after Control (tons/yr) / (1-Control Efficiency)

**2. Potential to Emit VOC from Baghouse C70:**

Max. DDGS Production Rate: 45 tons/hr
Annual DDGS Production Limit: 356,800 tons/yr
Uncontroll VOC Emission Factor: 0.133 lbs/ton of DDGS (provided by the source and is based on the test results from a similar plant plus a 90% margin. This factor will be verified by stack testing.)

Uncontrolled PTE of VOC for the Cooling Drum (tons/yr)
= 356,800 tons/yr x 0.133 lbs/ton x 1 ton/2000 lbs = **23.7 tons/yr**

PTE of VOC from Baghouse 70 (tons/yr)
= 23.7 tons/yr x (15,000 cfm)/ (15,000 cfm + 35,000 cfm) = **7.12 tons/yr**

**3. Potential to Emit HAPs from Baghouse C70:**

| | Pollutant | | | | |
|---|---|---|---|---|---|
| Emission Factor after Control (lbs/ton) * | Acetaldehyde 1.05E-03 | Acrolein 4.55E-04 | Formaldehyde 2.45E-04 | Methanol 2.45E-04 | Total |
| **PTE after Control in tons/yr** | **0.19** | **0.08** | **0.04** | **0.04** | **0.36** |

*HAP emission rates were estimated by the source based on the stack testing results from similar ethanol production facilities.

**Methodology**

PTE after Control (tons/yr) = Annual DDGS Production Limit (tons/yr) x Emission Factor (lbs/ton) x 1 ton/2000 lbs

**Appendix A: Emission Calculations**
**PM and PM10 Emissions**
**From the DDGS Handling and Loadout Operation**

**Company Name: Cardinal Ethanol, LLC**
**Address: S. of the CXS Rail Line, N. of State Rd. 32, and W. of Route 600 E**
**Harrisville, IN 47390**
**FESOP: 135-23226-00033**
**Reviewer: ERG/YC**
**Date: November 7, 2006**

## 1. Potential to Emit PM/PM10 - Captured Emissions:

| Baghouse ID | Process Description | Control Device | Outlet Grain Loading (gr/dscf) | Maximum Air Flow Rate (scfm) | PTE of PM/PM10 after Control (lbs/hr) | PTE of PM/PM10 after Control (tons/yr) | Control Efficiency (%) | PTE of PM/PM10 before Control (tons/yr) |
|---|---|---|---|---|---|---|---|---|
| C90 | DDGS Handling and Loadout | Baghouse | 0.005 | 9,100 | 0.39 | 1.71 | 99% | 171 |
| Total | | | | | | 1.71 | | 171 |

Assume all PM emissions equal PM10 emissions.

**Methodology**

PTE of PM/PM10 after Control (lbs/hr) = Grain Loading (gr/dscf) x Max. Air Flow Rate (scfm) x 60 mins/hr x 1/7000 lb/gr
PTE of PM/PM10 after Control (tons/yr) = Grain Loading (gr/dscf) x Max. Air Flow Rate (scfm) x 60 mins/hr x 1/7000 lb/gr x 8760 hr/yr x 1 ton/2000 lbs
PTE of PM/PM10 before Control (tons/yr) = PTE of PM/PM10 after Control (tons/yr) / (1-Control Efficiency)

## 2. Potential to Emit PM/PM10 - Fugitive Emissions:

| Unit ID | Unit Description | Annual Throughput Limit (tons/yr) | Uncontrolled PM Emission Factor (lbs/ton) | Uncontrolled PM10 Emission Factor (lbs/ton) | Capture Efficiency* (%) | Fugitive PM Emissions (tons/yr) | Fugitive PM10 Emissions (tons/yr) |
|---|---|---|---|---|---|---|---|
| P70 | DDGS Loadout Operation | 356,800 | 0.0033 | 0.0008 | 95% | 0.03 | 0.01 |
| **Total** | | | | | | **0.03** | **0.01** |

Note: Emission factors are from AP-42, Chapter 9.9.1 - Grain Elevators, Table 9.9.1-2 (03/03).
The Permittee stated that there are no fugitive emissions from the DDGS handling operations because the emissions from these units are 100% captured.
*This unit is controlled by a choked flow system and the capture efficiency is provided by the source.

**Methodology**

Fugitive PM/PM10 (tons/yr) = Annual Throughput Limit (tons/yr) x Uncontrolled Emission Factor (lbs/ton) x (1-Capture Efficiency%) x 1 ton/2000 lbs

**Appendix A: Emission Calculations**
**VOC and HAP Emissions**
**From the Wetcake Storage**

**Company Name: Cardinal Ethanol, LLC**
**Address: S. of the CXS Rail Line, N. of State Rd. 32, and W. of Route 600 E**
**Harrisville, IN 47390**
**FESOP: 135-23226-00033**
**Reviewer: ERG/YC**
**Date: November 7, 2006**

## 1. Process Description:

Max. Throughput Rate: 914,350 tons/yr of wetcake (provided by the source)

## 2. Potential to Emit (PTE) of VOC and HAP:

| Pollutant | *Emission Factor (lbs/ton) | PTE (tons/yr) |
|---|---|---|
| VOC | 8.13E-03 | **3.71** |
| HAP | | |
| Acetaldehyde | 1.23E-04 | **0.06** |
| Acrolein | 1.83E-05 | **0.01** |
| Formaldehyde | 7.33E-04 | **0.33** |
| Methanol | 1.53E-04 | **0.07** |
| **Total HAP** | | **0.47** |

* This is provided by the source based on the stack test results for DENCO, LLC in Morris, MN.

**Methodology**

PTE (tons/yr) = Max. Throughput Rate (tons/yr) x Emission Factor (lbs/ton) x 1 ton/2000 lbs

**Appendix A: Emission Calculations**
**VOC and HAP Emissions from Ethanol Loading Rack (P66)**

**Company Name: Cardinal Ethanol, LLC**
**Address: S. of the CXS Rail Line, N. of State Rd. 32, and W. of Route 600 E**
**Harrisville, IN 47390**
**FESOP: 135-23226-00033**
**Reviewer: ERG/YC**
**Date: November 7, 2006**

**1. Emission Factors: AP-42**

Denatured ethanol will be shipped by trucks or railcars. Railcars will be dedicated fleets, but the trucks may be used to carry gasoline prior to filling with ethanol. Both railcars and trucks will be filled by submerged loading process. This loading rack is controlled by flare C50 which has a control efficiency of 98% for VOC and HAPs.

According to AP-42, Chapter 5.2 - Transportation and Marketing of Petroleum Liquids (01/95), the VOC emission factors for the truck and rail loading racks can be estimated from the following equation:

$$L = 12.46 \times (SPM)/T$$

where:

L = loading loss (lbs/kgal)
S = a saturation factor (see AP-42, Table 5.2-1)
P = true vapor pressure of the liquid loaded (psia)
M = molecular weight of vapors
T = temperature of the bulk liquid loaded (degree R)

| Previous Stored Liquid | *S | P (psia) | M (lbs/mole lbs) | T (degree R) | L (lbs/kgal) |
|---|---|---|---|---|---|
| Gasoline (normal) | 0.6 | 4.48 | 66 | 512 | 4.32 |
| Gasoline (clean cargo) | 0.5 | 4.48 | 66 | 512 | 3.60 |
| Denatured Ethanol (normal) | 0.6 | 0.61 | 49.7 | 512 | 0.44 |
| Denatured Ethanol (clean cargo) | 0.5 | 0.61 | 49.7 | 512 | 0.37 |

Therefore, the emission factor for loading denatured ethanol to the trucks which stored gasoline previously
= L (gasoline, normal) - L (gasoline, clean cargo) + L (denatured ethanol, clean cargo) = 1.09 (lbs/kgal)

**2. Potential to Emit VOC Before Control:**

Max. Loading Rate: 36 kgal/hr for truck loading (worst case)

PTE of VOC before Control (tons/yr) = 36 kgal/hr x 1.09 lbs/gal x 8760 hr/yr x 1 ton/2000 lbs = **172 tons/yr**

**3. Limited Potential to Emit:**

Annual Production Limit: 110,000 kgal/yr for both truck railcar loading
38,500 kgal/yr for truck loading
Flare Control Efficiency: 98% (only for truck loadout operation EU40A)

The truck loading process has a higher emission factor and is the worst case scenario:

PTE of VOC (tons/yr) for Railcar Loading= (110,000 - 38,500) kgal/yr x 0.44 lbs/kgal x 1 ton/2000 lbs x (1-98%) = **0.32 tons/yr**

PTE of VOC (tons/yr) for Truck Loading= 38,500 kgal/yr x 1.09 lbs/kgal x 1 ton/2000 lbs x (1-98%) = **0.42 tons/yr**

Total PTE of VOC (tons/yr) = 0.32 tons/yr + 0.42 tons/yr = **0.74 tons/yr**

**4. Potential to Emit HAPs:**

HAP emissions are mainly from the unloading process for trucks, which may have been used to ship gasoline previously.

| HAP | HAP Fraction* | PTE of HAP before Control (tons/yr) | Limited PTE of HAP after Control (tons/yr) |
|---|---|---|---|
| Benzene | 2.45% | 4.20 | 1.03E-02 |
| Ethyl benzene | 2.00% | 3.43 | 8.38E-03 |
| Cumene | 1.00% | 1.72 | 4.19E-03 |
| Xylenes | 12.0% | 20.6 | 5.03E-02 |
| Toluene | 15.0% | 25.7 | 6.29E-02 |
| MTBE | 7.50% | 12.9 | 3.14E-02 |
| **Total** | **40.0%** | 68.6 | 0.17 |

* This is the HAP fraction for unleaded gasoline.

**Methodology**

PTE of HAP before Control (tons/yr) = PTE of VOC before Control (tons/yr) x HAP %
Limited PTE of HAP after Control (tons/yr) = PTE of VOC for Truck Loading (tons/yr) x HAP %

**Appendix A: Emission Calculations**
**Combustion Emissions**
**From Flare C50 for Ethanol Loading Rack**

**Company Name: Cardinal Ethanol, LLC**
**Address: S. of the CXS Rail Line, N. of State Rd. 32, and W. of Route 600 E**
**Harrisville, IN 47390**
**FESOP: 135-23226-00033**
**Reviewer: ERG/YC**
**Date: November 7, 2006**

| Heat Input Capacity MMBtu/hr | Operating Hour Limit (hour/yr) |
|---|---|
| 12.4 | 4,380 |

| | Pollutant | | | | | |
|---|---|---|---|---|---|---|
| | *PM | *PM10 | *$SO_2$ | **$NO_x$ | ***VOC | **CO |
| Emission Factor (lbs/MMBtu) | NA | NA | NA | 0.068 | | 0.370 |
| **Unlimited Potential to Emit in tons/yr** | **NA** | **NA** | **NA** | **3.69** | **172** | **20.1** |
| **Limited Potential to Emit in tons/yr** | **NA** | **NA** | **NA** | **1.85** | **0.74** | **10.0** |

*PM, PM10, and $SO_2$ emission factors are negligible due to the smokeless design and minimal $H_2S$ levels.
** NOx and CO emission factors are from AP-42, Table 13.5-1 (AP-42, 01/95)
*** VOC emission calculations can be found in page 9 of this appendix.

**Methodology**

Unlimited PTE of NOx and CO (tons/yr) = Heat Input Capactiy x Emission Factor (lbs/MMBtu) x 8760 hr/yr x 1 ton/2000 lbs
Limited PTE of NOx and CO (tons/yr) = Heat Input Capacity (MMBtu/hr) x Emission Factor (lbs/MMBtu) x Operating Hour Limit (hr/yr) x 1 ton/2000 lbs

**Appendix A: Emission Calculations**
**Fugitive Emissions From Paved Roads**

**Company Name: Cardinal Ethanol, LLC**
**Address: S. of the CXS Rail Line, N. of State Rd. 32, and W. of Route 600 E**
**Harrisville, IN 47390**
**FESOP: 135-23226-00033**
**Reviewer: ERG/YC**
**Date: November 7, 2006**

**1. Emission Factors: AP-42**

According to AP-42, Chapter 13.2.1 - Paved Roads (12/03), the PM/PM10 emission factors for paved roads can be estimated from the following equation:

$$E = (k \times (sL/2)^a \times (w/3)^b - C) \times (1 - p/(4 \times 365))$$

where:

| | | | |
|---|---|---|---|
| E = | emission factor (lb/vehicle mile traveled) | | |
| sL = | road surface silt loading ($g/m^2$) = | 0.6 | ($g/m^2$) (AP-42, Table 13.2.1-3) |
| w = | mean vehicle weight (tons) = | 27.5 | tons |
| k = | empirical constant = | 0.082 for PM and 0.016 for PM10 | |
| a = | empirical constant = | 0.65 | |
| b = | empirical constant = | 1.5 | |
| C = | emission factor for exhaust, brake and tire wear | 0.00047 for PM and PM10 | |
| p = | number of days per year with 0.01 inches precipitation | 120 | |

PM Emission Factor = $(0.082 \times (0.6/2)^{0.65} \times (27.5/3)^{1.5} - 0.00047) \times (1 - 120/1460)$ = **0.95** lbs/mile

PM10 Emission Factor = $(0.016 \times (0.6/2)^{0.65} \times (27.5/3)^{1.5} - 0.00047) \times (1 - 120/1460)$ = **0.19** lbs/mile

**2. Potential to Emit (PTE) of PM/PM10 Before Control from Paved Roads:**

| Vehicle Type | *Ave Weight of Vehicles (tons) | *Trip Number (trips/yr) | * Round Trip Distance (mile/trip) | Vehicle Mile Traveled (VMT) (miles/yr) | Traffic Component (%) | Component Vehicle Weight (tons) | PTE of PM before Control (tons/yr) | PTE of PM10 before Control (tons/yr) |
|---|---|---|---|---|---|---|---|---|
| Grain Receiving | 27.5 | 41,800 | 1.50 | 62,700 | 68.2% | 18.7 | 29.9 | 5.83 |
| DDGS Load Out | 27.5 | 14,275 | 1.50 | 21,413 | 23.3% | 6.40 | 10.2 | 1.99 |
| Ethanol Load Out | 27.5 | 5,133 | 1.50 | 7,700 | 8.4% | 2.30 | 3.67 | 0.72 |
| Denaturant Delivery | 27.5 | 110 | 1.50 | 165 | 0.18% | 0.05 | 0.08 | 0.02 |
| **Total** | | **61,318** | | **91,977** | **100%** | **27.5** | **43.9** | **8.55** |

* This information is provided by the source.

**Methodology**

Vehicle Mile Traveled (miles/yr) = Trip Number (trips/yr) x Round-Trip Distance (mile/trip)
Traffic Component (%) = VMT / Total VMT
Component Vehicle Weight = Ave. Weight of Vehicles (ton) x Traffic Component (%)
PTE of PM/PM10 before Control (tons/yr) = VMT (miles/yr) x PM/PM10 Emission Factors x 1 ton/2000 lbs

**3. Potential to Emit (PTE) of PM/PM10 after Control from Paved Roads:**

The source proposed to use periodic sweeping to control the fugitive dust emissions.
The control efficiency from sweeping is assumed to be 50%.

PTE of PM after Control = 43.9 tons/yr x (1-50%) = **22.0 tons/yr**

PTE of PM10 after Control = 8.55 tons/yr x (1-50%) = **4.27 tons/yr**

**Appendix A: Emission Calculations**
**PM/PM10 Emissions**
**From the the Cooling Tower**

**Company Name:** **Cardinal Ethanol, LLC**
**Address:** **S. of the CXS Rail Line, N. of State Rd. 32, and W. of Route 600 E**
**Harrisville, IN 47390**
**FESOP:** **135-23226-00033**
**Reviewer:** **ERG/YC**
**Date:** **November 7, 2006**

**1. Process Description:**

| | | |
|---|---|---|
| Type of Cooling Tower: | Induced Draft | |
| Circulation Flow Rate: | 3,000,000 | gal/hr |
| Total Drift: | 0.005% | of the circulating flow |
| Total Dissolved Solids: | 2,500 | ppm |
| Density: | 8.345 | lbs/gal |

Note: The information above was provided by the cooling tower manufacturer for the same units located at a similar source.

**2. Potential to Emit PM/PM10:**

Assume all the dissolved solids become PM10 emissions and assume PM emissions are equal to PM10 emissions.

PTE of PM/PM10 (lbs/hr) = 3,000,000 gal/hr x 0.005% x 8.345 lbs/gal x 2,500 ppm x 1/1,000,000 ppm = **3.13 lbs/hr**

PTE of PM/PM10 (tons/yr) = 2.82 lbs/hr x 8760 hr/yr x 1 ton/2000 lbs = **13.7 tons/yr**

**Appendix A: Emission Calculations**
**Criteria Pollutants**
**From the Diesel Fire Pump (P110)**

**Company Name: Cardinal Ethanol, LLC**
**Address: S. of the CXS Rail Line, N. of State Rd. 32, and W. of Route 600 E**
**Harrisville, IN 47390**
**FESOP: 135-23226-00033**
**Reviewer: ERG/YC**
**Date: November 7, 2006**

| Power Output Horse Power (HP) | Operation Limit hr/yr |
|---|---|
| 300 | 500 |

| | Pollutant | | | | | |
|---|---|---|---|---|---|---|
| | PM* | PM10* | $SO_2$ | $NO_x$ | **VOC | CO |
| Emission Factor in lb/HP-hr | 2.20E-03 | 2.20E-03 | 2.05E-03 | 3.10E-02 | 2.47E-03 | 6.68E-03 |
| **Potential to Emit in tons/yr** | **0.17** | **0.17** | **0.15** | **2.33** | **0.19** | **0.50** |

*Assume PM10 emissions are equal to PM emissions.
** Assume TOC (total organic compounds) emissions are equal to VOC emissions.
Emission factors are from AP-42, Chapter 3.3, Table 3.3-1, SCC #2-02-001-02 and 2-03-001-01 (AP-42 Supplement B, 10/96).

**Methodology**

PTE (tons/yr) = Power Output (HP) x Emission Factor (lb/HP-hr) x Operation Limit (hr/yr) x 1 ton/2000 lbs

**Appendix A: Emission Calculations**
**VOC and HAP Emissions**
**From Equipment Leaks**

**Company Name: Cardinal Ethanol, LLC**
**Address: S. of the CXS Rail Line, N. of State Rd. 32, and W. of Route 600 E**
**Harrisville, IN 47390**
**FESOP: 135-23226-00033**
**Reviewer: ERG/YC**
**Date: November 7, 2006**

## 1. Fugitive VOC Emissions:

| Equipment Component Source | Product | Component Count* | Emission Factor** (lbs/comp-hr) | Subpart VV Control Effectiveness*** (%) | Fugitive VOC Emissions (tons/yr) |
|---|---|---|---|---|---|
| Valves | Gas/Vapor | 91 | 0.013134 | 87% | 0.68 |
| Valves | Light Liquid | 545 | 0.008866 | 84% | 3.39 |
| Pumps | Light Liquid | 45 | 0.04378 | 69% | 2.68 |
| Flanges | All | 910 | 0.004026 | 87% | 2.09 |
| **Total** | | | | | **8.83** |

* Component count estimated based on similar ethanol plants.

** Emission factors are from Protocol for Equipment Leak Emission Estimates, EPA-453/R-95-017.

*** Control Effectiveness is from Protocol for Equipment Leak Emission Estimates, EPA-453/R-95-017, Table 5-2.

**Methodology**

Fugitive VOC Emissions (tons/yr) = Component Count x Emission Factor (lbs/hr) x 8760 hr/yr x 1 ton/2000 lbs x (1-Control Effectiveness %)

## 2. Fugitive HAP Emissions:

| HAP | HAP Fraction* | Fugitive HAP Emissions (tons/yr) |
|---|---|---|
| Acetaldehyde | 2.00E-04 | 1.77E-03 |
| Methanol | 2.00E-04 | 1.77E-03 |
| Benzene | 2.50E-03 | 2.21E-02 |
| Carbon Disulfide | 2.00E-05 | 1.77E-04 |
| Cumene | 1.00E-04 | 8.83E-04 |
| Ethylbenzene | 5.00E-05 | 4.41E-04 |
| n-Hexane | 5.00E-02 | 4.41E-01 |
| Toluene | 5.00E-03 | 4.41E-02 |
| Xylenes | 5.00E-04 | 4.41E-03 |
| **Total** | | **0.51** |

* This is the HAP fraction for gasoline vapors or from test results.

**Methodology**

Fugitive HAP Emissions (tons/yr) = Fugitive VOC Emissions (tons/yr) x HAP Fraction

**Appendix A: Emission Calculations**
**Combustion Emissions**
**From Biomethanator Flare C60**

**Company Name: Cardinal Ethanol, LLC**
**Address: S. of the CXS Rail Line, N. of State Rd. 32, and W. of Route 600 E**
**Harrisville, IN 47390**
**FESOP: 135-23226-00033**
**Reviewer: ERG/YC**
**Date: November 7, 2006**

NOTE: This methanator flare only operates when the DDGS dryers are down.

Max. Heat Input
MMBtu/hr

6.40

Pollutant

| | PM[b] | PM10[b] | $SO_2$[b] | NOx[a] | CO[a] | VOC[a] | HAP[b] |
|---|---|---|---|---|---|---|---|
| Emission Factor in lb/MMBtu | - | - | - | 0.068 | 0.37 | 0.052 | - |
| **PTE (tons/yr)** | Negligible | Negligible | Negligible | **1.91** | **10.4** | **1.46** | Negligible |

[a] Emission factors are from AP-42, Tables 13.5-1 and 13.5-2 (AP-42, 01/95).

[b] The Permitttee stated that PM/PM10 emissions from this flare are negligible due to the smokeless design. The PTE of $SO_2$ and HAP are negligible due to negligible sulfur and HAP presence in the gas stream.

**Methodology**

PTE (tons/yr) = Max. Heat Input (MMBtu/hr) x Emission Factor (lbs/MMBtu) x 8760 hrs/yr x 1 ton/2000 lbs

**Appendix A: Emission Calculations**
**PTE Summary**

**Company Name: Cardinal Ethanol, LLC**
**Address: S. of the CXS Rail Line, N. of State Rd. 32, and W. of Route 600 E**
**Harrisville, IN 47390**
**FESOP: 135-23226-00033**
**Reviewer: ERG/YC**
**Date: November 7, 2006**

**Limited Potential To Emit after Control**

| **Emission Units** | PM | PM10 | $SO_2$ | *$NO_x$ | VOC | CO | Total HAPs |
|---|---|---|---|---|---|---|---|
| Grain Receiving and Handling | 14.3 | 14.3 | - | - | - | - | - |
| Grain Receiving - Fugitive | 5.94 | 4.45 | - | - | - | - | - |
| Fermentation | 0.27 | 0.31 | - | - | 50.0 | - | 6.47 |
| Dryers and RT/HRSG Sytems | 26.8 | 26.8 | 81.5 | 92.9 | 23.2 | 83.2 | 7.60 |
| DDGS Cooling Drum (baghouse C70) | 2.82 | 2.82 | - | - | 7.12 | - | 0.36 |
| DDGS Handling and Loadout | 1.71 | 1.71 | - | - | - | - | - |
| DDGS Loadout - Fugitive | 0.03 | 0.01 | - | - | - | - | - |
| Wet Cake Storage* | - | - | - | - | See Note | - | See Note |
| Ethanol Loadout and Flare | - | - | - | 1.85 | 0.74 | 10.0 | 0.17 |
| Paved Roads (Fugitive) | 22.0 | 4.27 | - | - | - | - | - |
| Cooling Tower | 13.7 | 13.7 | - | - | - | - | - |
| Diesel Fire Pump | 0.17 | 0.17 | 0.15 | 2.33 | 0.19 | 0.50 | Negligible |
| Storage Tanks** | - | - | - | - | 2.98 | - | 0.10 |
| Leaks | - | - | - | - | 8.83 | - | 0.51 |
| Biomethanator Flare*** | - | - | - | See Note | See Note | See Note | See Note |
| Other Insignificant Activities | 1.00 | 1.00 | - | - | 1.00 | - | - |
| **Total PTE** | **88.6** | **69.5** | **81.6** | **97.0** | **94.1** | **93.8** | **15.2** |

Note:
* This plant is capable to produce both DDGS and MDGS. The emissions from the DDGS production is the worst case scenario. Therefore, the PTE of the wet cake storage is not included in the PTE for the entire source.
** Emissions from the storage tanks were calculated by the Permittee using EPA TANKS software (version 4.09d) and have been verified.
*** Biomethanator flare only operates when the DDGS dryers are down. The operation of the DDGS dryers is the worst case senario for emissions and the emissions from the DDGS dryers have been included in the total PTE.