**INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT**
*We Protect Hoosiers and Our Environment.*

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

*Thomas W. Easterly*
**Commissioner**

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

TO: Interested Parties / Applicant

DATE: April 6, 2009

RE: Southern Indiana Biodiesel LLC / 173-26785-00109

FROM: Matthew Stuckey, Branch Chief
Permits Branch
Office of Air Quality

# Notice of Decision: Approval - Registration

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 4-21.5-3-4(d) this order is effective when it is served. When served by U.S. mail, the order is effective three (3) calendar days from the mailing of this notice pursuant to IC 4-21.5-3-2(e).

If you wish to challenge this decision, IC 4-21.5-3-7 requires 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, Suite N 501E, 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
FN-REGIS.dot 1/2/08

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# REGISTRATION
# OFFICE OF AIR QUALITY

## Southern Indiana Biodiesel LLC
## 5700 Prospect Drive
## Newburgh, Indiana 47630

Pursuant to 326 IAC 2-5.1 (Construction of New Sources: Registrations) and 326 IAC 2-5.5 (Registrations), (herein known as the Registrant) is hereby authorized to construct and operate subject to the conditions contained herein, the source described in Section A (Source Summary) of this registration.

| Registration No. 173-26785-00109 | |
|---|---|
| Issued by:<br><br>Iryn Calilung, Section Chief<br>Permits Branch<br>Office of Air Quality | Issuance Date:<br><br>April 6, 2009 |

## SECTION A SOURCE SUMMARY

This registration 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 and A.2 is descriptive information and does not constitute enforceable conditions. However, the Registrant 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 Registrant to obtain additional permits pursuant to 326 IAC 2.

### A.1 General Information

The Registrant owns and operates a stationary batch biodiesel refining production plant.

| | |
|---|---|
| Source Address: | 5700 Prospect Drive, Newburgh, Indiana 47630 |
| Mailing Address: | 311 South Morgan Street, Morganfield, Kentucky 42437 |
| General Source Phone Number: | (812) 284-2960 |
| SIC Code: | 2869 |
| County Location: | Warrick County |
| Source Location Status: | Nonattainment for PM 2.5 standard<br>Attainment for all other criteria pollutants |
| Source Status: | Registration<br>1 of 28 Source Categories |

### A.2 Emission Units and Pollution Control Equipment Summary

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

(a) Three (3) feedstock storage tanks, identified as T1, T2, and T3, approved for construction in 2009, with a maximum capacity of 30,000 gallons each, and storing material with a maximum true vapor pressure less than 15.0 kPa.

(b) One pre-treatment process, approved for construction in 2009, and consisting of the following units:

(1) One (1) acetic acid and water solution tote tank, identified as T7, with a maximum capacity of 250 gallons.

(2) One (1) pre-treatment reaction tank, identified as T8, with a maximum capacity of 3,000 gallons.

(3) One (1) pre-treatment settling tank, identified at T9, with a maximum capacity of 3,000 gallons.

(4) One (1) pre-treatment water collection tank, identified as T10, with a maximum capacity of 1,900 gallons.

(5) One (1) pre-treatment oil collection tank, identified as T11, with a maximum capacity of 1,900 gallons.

(6) One (1) pre-treatment oil mixer and storage tank, identified as T12, with a maximum capacity of 30,000 gallons, and storing material with a maximum true vapor pressure less than 15.0 kPa.

(c) One (1) process alcohol storage area, approved for construction in 2009, and consisting of the following units:

(1) One (1) methanol storage tank, identified as T4, with a maximum capacity of 15,000 gallons, and equipped with a pressure relief valve, rupture disk, and integral in-line

condenser.

(2) One (1) isopropanol storage tank, identified as T5, with a maximum capacity of 8,800 gallons and equipped with a pressure relief valve and rupture disk.

(3) One (1) sodium methylate storage tank, identified as T6, with a maximum capacity of 8,800 gallons and equipped with a pressure relief valve and rupture disk.

(d) One (1) batch biodiesel production process, approved for construction in 2009, with a maximum capacity of 19 MMgal per year, and consisting of the following units:

(1) One (1) biodiesel reactor, identified as BR1, with a maximum capacity of 25,000 gallons.

(2) One (1) caustic addition process, identified as EU1, with a maximum capacity of 725 tons of caustic per year.

(3) One (1) alkaline water solution storage tank, identified as T13, with a maximum capacity of 3,000 gallons.

(e) One (1) methanol vacuum recovery operation, approved for construction in 2009, with waste gases from the biodiesel reactor routed to the methanol vacuum recovery operation, and consisting of the following units:

(1) One (1) integral methanol vacuum recovery system, identified as MVR, with a maximum capacity of 3,000 gallons, using a vacuum condenser to recover methanol, which is routed to the methanol recovery storage tank, and exhausting unrecoverable vapors to the water wash storage tank.

(2) One (1) water wash storage tank, identified as T14, with a maximum capacity of 10,000 gallons.

(f) One (1) raw biodiesel and glycerin settling tank, identified as T15, approved for construction in 2009, with a maximum capacity of 30,000 gallons, and storing material with a maximum true vapor pressure less than 15.0 kPa.

(g) One (1) glycerin collection and storage area, approved for construction in 2009, and consisting of the following units:

(1) One (1) glycerin collection tank, identified as T16, with a maximum capacity of 1,900 gallons.

(2) Three (3) glycerin storage tanks, identified as T17, T18, and T19, with a maximum capacity of 8,800 gallons, each.

(h) One (1) biodiesel collection and storage area, approved for construction in 2009, and consisting of the following units:

(1) One (1) biodiesel collection tank, identified as T20, with a maximum capacity of 1,900 gallons.

(2) Two (2) ionic resin tanks, identified as T21 and T22, with a maximum capacity of 1,500 gallons, each.

(3) Three (3) large biodiesel storage tanks, identified as T23, T24, and T25, with a maximum capacity of 15,000 gallons, each,

(4) Four (4) small biodiesel storage tanks, identified as T26, T27, T28, and T29, with a maximum capacity of 8,800 gallons, each.

(i) One (1) biodiesel and glycerin truck loadout process, identified as EU2, approved for construction in 2009, with a maximum capacity of 19 MMgal of biodiesel per year. All products are shipped offsite by trucks and will be filled by a submerged fill pipe loading process.

(j) One (1) natural gas-fired boiler, identified as B01, approved for construction in 2009, with a heat input capacity of 6.3 MMBtu/hr, and exhausting to Stack S1.

(k) Equipment leak losses of VOC from pumps in light liquid service, compressors, pressure relief devices in gas/vapor, sampling connection systems, open-ended valves or lines, valves in gas/vapor service and in light liquid service, pumps and valves in heavy liquid service, pressure relief devices in light liquid or heavy liquid service and connectors, closed vent systems and control devices. Under 40 CFR 60, Subpart VVa, equipment leak losses are affected facilities in VOC service.

(l) One (1) noncontact forced and induced draft cooling tower system not regulated under a NESHAP.

(m) Paved and unpaved roads and parking lots with public access.

## SECTION B GENERAL CONDITIONS

### B.1 Definitions [326 IAC 2-1.1-1]

Terms in this registration 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 2-1.1-1) shall prevail.

### B.2 Effective Date of Registration [IC 13-15-5-3]

Pursuant to IC 13-15-5-3, this registration 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.

### B.3 Registration Revocation [326 IAC 2-1.1-9]

Pursuant to 326 IAC 2-1.1-9 (Revocation), this registration to operate may be revoked for any of the following causes:

(a) Violation of any conditions of this registration.

(b) Failure to disclose all the relevant facts, or misrepresentation in obtaining this registration.

(c) Changes in regulatory requirements that mandate either a temporary or permanent reduction of discharge of contaminants. However, the amendment of appropriate sections of this registration shall not require revocation of this registration.

(d) For any cause which establishes in the judgment of IDEM the fact that continuance of this registration is not consistent with purposes of this article.

### B.4 Prior Permits Superseded [326 IAC 2-1.1-9.5]

(a) All terms and conditions of permits established prior to Registration No. 173-26785-00109 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 registration.

### B.5 Annual Notification [326 IAC 2-5.1-2(f)(3)] [326 IAC 2-5.5-4(a)(3)]

Pursuant to 326 IAC 2-5.1-2(f)(3) and 326 IAC 2-5.5-4(a)(3):

(a) An annual notification shall be submitted by an authorized individual to the Office of Air Quality stating whether or not the source is in operation and in compliance with the terms and conditions contained in this registration.

(b) The annual notice shall be submitted in the format attached no later than March 1 of each year to:

Indiana Department of Environmental Management
Compliance and Enforcement Branch, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, IN 46204-2251

(c) The notification 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.

B.6 Source Modification Requirement [326 IAC 2-5.5-6(a)]

Pursuant to 326 IAC 2-5.5-6(a), an application or notification shall be submitted in accordance with 326 IAC 2 to the Office of Air Quality (OAQ) if the source proposes to construct new emission units, modify existing emission units, or otherwise modify the source.

B.7 Registrations [326 IAC 2-5.1-2(i)]

Pursuant to 326 IAC 2-5.1-2(i), this registration does not limit the source's potential to emit.

## SECTION C SOURCE OPERATION CONDITIONS

Entire Source

**Emission Limitations and Standards [326 IAC 2-5.1-2(g)] [326 IAC 2-5.5-4(b)]**

C.1 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 registration:

(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.2 Fugitive Dust Emissions [326 IAC 6-4]

The Registrant 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).

## SECTION D.1 OPERATION CONDITIONS

Facility Description [326 IAC 2-5.1-2(f)(2)] [326 IAC 2-5.5-4(a)(2)]:

(a) Three (3) feedstock storage tanks, identified as T1, T2, and T3, approved for construction in 2009, with a maximum capacity of 30,000 gallons each, and storing material with a maximum true vapor pressure less than 15.0 kPa.

(b) One pre-treatment process, approved for construction in 2009, and consisting of the following units:

(1) One (1) acetic acid and water solution tote tank, identified as T7, with a maximum capacity of 250 gallons.

(2) One (1) pre-treatment reaction tank, identified as T8, with a maximum capacity of 3,000 gallons.

(3) One (1) pre-treatment settling tank, identified at T9, with a maximum capacity of 3,000 gallons.

(4) One (1) pre-treatment water collection tank, identified as T10, with a maximum capacity of 1,900 gallons.

(5) One (1) pre-treatment oil collection tank, identified as T11, with a maximum capacity of 1,900 gallons.

(6) One (1) pre-treatment oil mixer and storage tank, identified as T12, with a maximum capacity of 30,000 gallons, and storing material with a maximum true vapor pressure less than 15.0 kPa.

(c) One (1) process alcohol storage area, approved for construction in 2009, and consisting of the following units:

(1) One (1) methanol storage tank, identified as T4, with a maximum capacity of 15,000 gallons, and equipped with a pressure relief valve, rupture disk, and integral in-line condenser.

(2) One (1) isopropanol storage tank, identified as T5, with a maximum capacity of 8,800 gallons and equipped with a pressure relief valve and rupture disk.

(3) One (1) sodium methylate storage tank, identified as T6, with a maximum capacity of 8,800 gallons and equipped with a pressure relief valve and rupture disk.

(d) One (1) batch biodiesel production process, approved for construction in 2009, with a maximum capacity of 19 MMgal per year, and consisting of the following units:

(1) One (1) biodiesel reactor, identified as BR1, with a maximum capacity of 25,000 gallons.

(2) One (1) caustic addition process, identified as EU1, with a maximum capacity of 725 tons of caustic per year.

(3) One (1) alkaline water solution storage tank, identified as T13, with a maximum capacity of 3,000 gallons.

(e) One (1) methanol vacuum recovery operation, approved for construction in 2009, with waste gases from the biodiesel reactor routed to the methanol vacuum recovery operation, and consisting of the following units:

(1) One (1) integral methanol vacuum recovery system, identified as MVR, with a maximum capacity of 3,000 gallons, using a vacuum condenser to recover methanol, which is routed to the methanol recovery storage tank, and exhausting unrecoverable vapors to the water wash storage tank.

(2) One (1) water wash storage tank, identified as T14, with a maximum capacity of 10,000 gallons.

(f) One (1) raw biodiesel and glycerin settling tank, identified as T15, approved for construction in 2009, with a maximum capacity of 30,000 gallons, and storing material with a maximum true vapor pressure less than 15.0 kPa.

(g) One (1) glycerin collection and storage area, approved for construction in 2009, and consisting of the following units:

(1) One (1) glycerin collection tank, identified as T16, with a maximum capacity of 1,900 gallons.

(2) Three (3) glycerin storage tanks, identified as T17, T18, and T19, with a maximum capacity of 8,800 gallons, each.

(h) One (1) biodiesel collection and storage area, approved for construction in 2009, and consisting of the following units:

(1) One (1) biodiesel collection tank, identified as T20, with a maximum capacity of 1,900 gallons.

(2) Two (2) ionic resin tanks, identified as T21 and T22, with a maximum capacity of 1,500 gallons, each.

(3) Three (3) large biodiesel storage tanks, identified as T23, T24, and T25, with a maximum capacity of 15,000 gallons, each,

(4) Four (4) small biodiesel storage tanks, identified as T26, T27, T28, and T29, with a maximum capacity of 8,800 gallons, each.

(i) One (1) biodiesel and glycerin truck loadout process, identified as EU2, approved for construction in 2009, with a maximum capacity of 19 MMgal of biodiesel per year. All products are shipped offsite by trucks and will be filled by a submerged fill pipe loading process.

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

**Emission Limitations and Standards [326 IAC 2-5.1-2(f)(1)] [326 IAC 2-5.5-4(a)(1)]**

D.1.1 Particulate [326 IAC 6-3-2]

Pursuant to 326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes), the particulate emission rate from caustic addition shall not exceed 0.77 pounds per hour when operating at a process weight rate of 0.083 tons per hour.

The pound per hour limitation was calculated with the following equation:
Interpolation of the data for the process weight rate up to 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.1.2 Registrations [326 IAC 2-5.1-2]

Pursuant to 326 IAC 2-5.1-2, the Registrant shall comply with the following:

(a) VOC emissions from the biodiesel reactor shall be controlled by the methanol vacuum recovery system at all times when the biodiesel reactor is in operation.

(b) The incoming cooling water temperature to the vacuum condenser shall not exceed 85°F when the methanol vacuum recovery system is in operation.

(c) VOC emissions from the methanol storage tank shall be controlled by the in-line condenser at all times.

(d) The incoming cooling water temperature to the in-line condenser shall not exceed 85°F at all times.

Compliance with these limits shall ensure compliance with 326 IAC 2-5.1-2 (Registrations).

**Compliance Monitoring Requirements [326 IAC 2-5.1-2(g)] [326 IAC 2-5.5-4(b)]**

D.1.3 Vacuum Condenser Temperature

(a) The Registrant shall monitor and record the incoming cooling water temperature to the vacuum condenser when the methanol vacuum recovery system is in operation at least once per day.

(b) The Registrant shall monitor and record the incoming cooling water temperature to the in-line condenser at least once per day.

**Record Keeping and Reporting Requirements [326 IAC 2-5.1-2(g)] [326 IAC 2-5.5-4(b)]**

D.1.4 Record Keeping Requirements

(a) To document compliance with Conditions D.1.2(b) and D.1.3(a), the Registrant shall maintain daily records of the incoming cooling water temperature to the vacuum condenser during normal operation. The Permittee shall include in its daily record when a temperature reading is not taken and the reason for the lack of temperature reading (e.g., the process did not operate that day).

(b) To document compliance with Conditions D.1.2(d) and D.1.3(b), the Registrant shall maintain daily records of the incoming cooling water temperature to the in-line condenser during normal operation. The Permittee shall include in its daily record when a

temperature reading is not taken and the reason for the lack of temperature reading (e.g., the process did not operate that day).

**SECTION D.2 OPERATION CONDITIONS**

Facility Description [326 IAC 2-5.1-2(f)(2)] [326 IAC 2-5.5-4(a)(2)]:

(j) One (1) natural gas-fired boiler, identified as B01, approved for construction in 2009, with a heat input capacity of 6.3 MMBtu/hr, and exhausting to Stack S1.

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

**Emission Limitations and Standards [326 IAC 2-5.1-2(f)(1)] [326 IAC 2-5.5-4(a)(1)]**

D.2.1 Particulate [326 IAC 6-2-4]

Pursuant to 326 IAC 6-2-4 (Particulate Matter Emission Limitations for Sources of Indirect Heating), the particulate emissions from the boiler (B01) shall in no case exceed 0.6 pounds of particulate matter per million British thermal units heat input.

**SECTION E.1 OPERATION CONDITIONS**

Facility Description [326 IAC 2-5.1-2(f)(2)] [326 IAC 2-5.5-4(a)(2)]:

(k) Equipment leak losses of VOC from pumps in light liquid service, compressors, pressure relief devices in gas/vapor, sampling connection systems, open-ended valves or lines, valves in gas/vapor service and in light liquid service, pumps and valves in heavy liquid service, pressure relief devices in light liquid or heavy liquid service and connectors, closed vent systems and control devices. Under 40 CFR 60, Subpart VVa, equipment leak losses are affected facilities in VOC service.

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

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

(a) Pursuant to 40 CFR 60.1, the Registrant 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 60, Subpart VVa.

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

Indiana Department of Environmental Management
Compliance and Enforcement Branch, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

E.1.2 New Source Performance Standards (NSPS) for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for Which Construction, Reconstruction, or Modification Commenced After November 7, 2006 [40 CFR Part 60, Subpart VVa] [326 IAC 12-1]

The Registrant, which engages in synthetic organic chemical manufacturing, shall comply with the following provisions of 40 CFR Part 60, Subpart VVa (included as Attachment A of this permit), within 180 days of initial startup:

(1) 40 CFR 60.480a
(2) 40 CFR 60.481a
(3) 40 CFR 60.482-1a
(4) 40 CFR 60.482-2a
(5) 40 CFR 60.482-3a
(6) 40 CFR 60.482-4a
(7) 40 CFR 60.482-5a
(8) 40 CFR 60.482-6a
(9) 40 CFR 60.482-7a
(10) 40 CFR 60.482-8a
(11) 40 CFR 60.482-9a
(12) 40 CFR 60.482-10a
(13) 40 CFR 60.482.11a
(14) 40 CFR 60.483-1a
(15) 40 CFR 60.483-2a
(16) 40 CFR 60.484a
(17) 40 CFR 60.485a
(18) 40 CFR 60.486a
(19) 40 CFR 60.487a
(20) 40 CFR 60.489a

**INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT**
**OFFICE OF AIR QUALITY**
**COMPLIANCE AND ENFORCEMENT BRANCH**

**REGISTRATION**
**ANNUAL NOTIFICATION**

This form should be used to comply with the notification requirements under 326 IAC 2-5.1-2(f)(3) and 326 IAC 2-5.5-4(a)(3).

| | |
|---|---|
| **Company Name:** | Southern Indiana Biodiesel LLC |
| **Address:** | 5700 Prospect Drive |
| **City:** | Newburgh, Indiana 47630 |
| **Phone Number:** | (812) 284-2960 |
| **Registration No.:** | 173-26785-00109 |

I hereby certify that Southern Indiana Biodiesel LLC is :
- ☐ still in operation.
- ☐ no longer in operation.

I hereby certify that Southern Indiana Biodiesel LLC is :
- ☐ in compliance with the requirements of Registration No. 173-26785-00109.
- ☐ not in compliance with the requirements of Registration No. 173-26785-00109.

| |
|---|
| **Authorized Individual (typed):** |
| **Title:** |
| **Signature:** |
| **Phone Number:** |
| **Date:** |

If there are any conditions or requirements for which the source is not in compliance, provide a narrative description of how the source did or will achieve compliance and the date compliance was, or will be achieved.

| |
|---|
| **Noncompliance:** |
| |
| |
| |
| |

**Indiana Department of Environmental Management**
**Office of Air Quality**

**Attachment A**

## Title 40: Protection of Environment

## Subpart VVa—Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for Which Construction, Reconstruction, or Modification Commenced After November 7, 2006

**Source: 72 FR 64883, Nov. 16, 2007, unless otherwise noted.**

### § 60.480a 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 §60.481a) within a process unit is an affected facility.

(b) Any affected facility under paragraph (a) of this section that commences construction, reconstruction, or modification after November 7, 2006, shall be subject to the requirements of this subpart.

(c) Addition or replacement of equipment for the purpose of process improvement which is accomplished without a capital expenditure shall not by itself be considered a modification under this subpart.

(d)(1) If an owner or operator applies for one or more of the exemptions in this paragraph, then the owner or operator shall maintain records as required in §60.486a(i).

(2) Any affected facility that has the design capacity to produce less than 1,000 Mg/yr (1,102 ton/yr) of a chemical listed in §60.489 is exempt from §§60.482–1a through 60.482–11a.

(3) If an affected facility produces heavy liquid chemicals only from heavy liquid feed or raw materials, then it is exempt from §§60.482–1a through 60.482–11a.

(4) Any affected facility that produces beverage alcohol is exempt from §§60.482–1a through 60.482–11a.

(5) Any affected facility that has no equipment in volatile organic compounds (VOC) service is exempt from §§60.482–1a through 60.482–11a.

(e) *Alternative means of compliance* —(1) *Option to comply with part 65.* (i) Owners or operators may choose to comply with the provisions of 40 CFR part 65, subpart F, to satisfy the requirements of §§60.482–1a through 60.487a for an affected facility. When choosing to comply with 40 CFR part 65, subpart F, the requirements of §§60.485a(d), (e), and (f), and 60.486a(i) and (j) still apply. Other provisions applying to an owner or operator who chooses to comply with 40 CFR part 65 are provided in 40 CFR 65.1.

(ii) *Part 60, subpart A.* Owners or operators who choose to comply with 40 CFR part 65, subpart F must also comply with §§60.1, 60.2, 60.5, 60.6, 60.7(a)(1) and (4), 60.14, 60.15, and 60.16 for that equipment. All sections and paragraphs of subpart A of this part that are not mentioned in this paragraph (e)(1)(ii) do not apply to owners or operators of equipment subject to this subpart complying with 40 CFR part 65, subpart F, except that provisions required to be met prior to implementing 40 CFR part 65 still apply. Owners and operators who choose to comply with 40 CFR part 65, subpart F, must comply with 40 CFR part 65, subpart A.

(2) *Part 63, subpart H.* (i) Owners or operators may choose to comply with the provisions of 40 CFR part 63, subpart H, to satisfy the requirements of §§60.482–1a through 60.487a for an affected facility. When choosing to comply with 40 CFR part 63, subpart H, the requirements of §60.485a(d), (e), and (f), and §60.486a(i) and (j) still apply.

(ii) *Part 60, subpart A.* Owners or operators who choose to comply with 40 CFR part 63, subpart H must also comply with §§60.1, 60.2, 60.5, 60.6, 60.7(a)(1) and (4), 60.14, 60.15, and 60.16 for that equipment. All sections and paragraphs of subpart A of this part that are not mentioned in this paragraph (e)(2)(ii) do not apply to owners or operators of equipment subject to this subpart complying with 40 CFR part 63, subpart H, except that provisions required to be met prior to implementing 40 CFR part 63 still apply. Owners and operators who choose to comply with 40 CFR part 63, subpart H, must comply with 40 CFR part 63, subpart A.

(f) *Stay of standards.* (1) Owners or operators that start a new, reconstructed, or modified affected source prior to November 16, 2007 are not required to comply with the requirements in this paragraph until EPA takes final action to require compliance and publishes a document in theFederal Register.

(i) The definition of “capital expenditure” in §60.481a of this subpart. While the definition of “capital expenditure” is stayed, owners or operators should use the definition found in §60.481 of subpart VV of this part.

(ii) [Reserved]

(2) Owners or operators are not required to comply with the requirements in this paragraph until EPA takes final action to require compliance and publishes a document in theFederal Register.

(i) The definition of “process unit” in §60.481a of this subpart. While the definition of “process unit” is stayed, owners or operators should use the following definition:

*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.

(ii) The method of allocation of shared storage vessels in §60.482–1a(g) of this subpart.

(iii) The standards for connectors in gas/vapor service and in light liquid service in §60.482–11a of this subpart.

[72 FR 64883, Nov. 16, 2007, as amended at 73 FR 31375, June 2, 2008]

## § 60.481a Definitions.

As used in this subpart, all terms not defined herein shall have the meaning given them in the Clean Air Act (CAA) 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: $P = R \times A$, 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:

$A = Y \times (B \div 100)$;

(2) The percent Y is determined from the following equation: $Y = 1.0 - 0.575 \log X$, where X is 2006 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 Value for B**

| Subpart applicable to facility | Value of B to be used in equation |
|---|---|
| VVa | 12.5 |
| GGGa | 7.0 |

*Closed-loop system* means an enclosed system that returns process fluid to the process.

*Closed-purge system* means a system or combination of systems and portable containers to capture purged liquids. Containers for purged liquids must be covered or closed when not being filled or emptied.

*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, or other joined fittings used to connect two pipe lines or a pipe line and a piece of process equipment or that close an opening in a pipe that could be connected to another pipe. Joined fittings welded completely around the circumference of the interface are not considered connectors for the purpose of this regulation.

*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 action for the purpose of stopping or reducing leakage of organic material to the 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, P.O. Box 2300, Fairfield, NJ 07007–2300).

*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 §60.485a(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 §60.485a(d) specify how to determine that a piece of equipment is not in VOC service.)

*Initial calibration value* means the concentration measured during the initial calibration at the beginning of each day required in §60.485a(b)(1), or the most recent calibration if the instrument is recalibrated during the day (i.e., the calibration is adjusted) after a calibration drift assessment.

*Liquids dripping* means 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 the components assembled and connected by pipes or ducts to process raw materials and to produce, as intermediate or final products, one or more of the chemicals listed in §60.489. A process unit can operate independently if supplied with sufficient feed or raw materials and sufficient storage facilities for the product. For the purpose of this subpart, process unit includes any feed, intermediate and final product storage vessels (except as specified in §60.482–1a(g)), product transfer racks, and connected ducts and piping. A process unit includes all equipment as defined in this subpart.

*Process unit shutdown* means a work practice or operational procedure that stops production from a process unit or part of a process unit during which it is technically feasible to clear process material from a process unit or part of a process unit consistent with safety constraints and during which repairs can be accomplished. The following are not considered process unit shutdowns:

(1) 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.

(2) An unscheduled work practice or operational procedure that would stop production from a process unit or part of a process unit for a shorter period of time than would be required to clear the process unit or part of the process unit of materials and start up the unit, and would result in greater emissions than delay of repair of leaking components until the next scheduled process unit shutdown.

(3) The use of spare equipment and technically feasible bypassing of equipment without stopping production.

*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 defined in the applicable sections of this subpart and, except for leaks identified in accordance with §§60.482–2a(b)(2)(ii) and

(d)(6)(ii) and (d)(6)(iii), 60.482–3a(f), and 60.482–10a(f)(1)(ii), is re-monitored as specified in §60.485a(b) to verify that emissions from the equipment are below the applicable leak definition.

*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.

*Storage vessel* means a tank or other vessel that is used to store organic liquids that are used in the process as raw material feedstocks, produced as intermediates or final products, or generated as wastes. Storage vessel does not include vessels permanently attached to motor vehicles, such as trucks, railcars, barges or ships.

*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.

*Transfer rack* means the collection of loading arms and loading hoses, at a single loading rack, that are used to fill tank trucks and/or railcars with organic liquids.

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

**Effective Date Note:** At 73 FR 31376, June 2, 2008, in §60.481a, the definitions of “capital expenditure” and “process unit” were stayed until further notice.

## § 60.482-1a Standards: General.

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

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

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

(2) If the Administrator makes a determination that a means of emission limitation is at least equivalent to the requirements of §§60.482–2a, 60.482–3a, 60.482–5a, 60.482–6a, 60.482–7a, 60.482–8a, or 60.482–10a, 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 §§60.482–2a through 60.482–10a if it is identified as required in §60.486a(e)(5).

(e) Equipment that an owner or operator designates as being in VOC service less than 300 hr/yr is excluded from the requirements of §§60.482–2a through 60.482–11a if it is identified as required in §60.486a(e)(6) and it meets any of the conditions specified in paragraphs (e)(1) through (3) of this section.

(1) The equipment is in VOC service only during startup and shutdown, excluding startup and shutdown between batches of the same campaign for a batch process.

(2) The equipment is in VOC service only during process malfunctions or other emergencies.

(3) The equipment is backup equipment that is in VOC service only when the primary equipment is out of service.

(f)(1) If a dedicated batch process unit operates less than 365 days during a year, an owner or operator may monitor to detect leaks from pumps, valves, and open-ended valves or lines at the frequency specified in the following table instead of monitoring as specified in §§60.482–2a, 60.482–7a, and 60.483.2a:

| Operating time (percent of hours during year) | Equivalent monitoring frequency time in use | | |
|---|---|---|---|
| | Monthly | Quarterly | Semiannually |
| 0 to <25 | Quarterly | Annually | Annually. |
| 25 to <50 | Quarterly | Semiannually | Annually. |
| 50 to <75 | Bimonthly | Three quarters | Semiannually. |
| 75 to 100 | Monthly | Quarterly | Semiannually. |

(2) Pumps and valves that are shared among two or more batch process units that are subject to this subpart may be monitored at the frequencies specified in paragraph (f)(1) of this section, provided the operating time of all such process units is considered.

(3) The monitoring frequencies specified in paragraph (f)(1) of this section are not requirements for monitoring at specific intervals and can be adjusted to accommodate process operations. An owner or operator may monitor at any time during the specified monitoring period (e.g., month, quarter, year), provided the monitoring is conducted at a reasonable interval after completion of the last monitoring campaign. Reasonable intervals are defined in paragraphs (f)(3)(i) through (iv) of this section.

(i) When monitoring is conducted quarterly, monitoring events must be separated by at least 30 calendar days.

(ii) When monitoring is conducted semiannually ( *i.e.* , once every 2 quarters), monitoring events must be separated by at least 60 calendar days.

(iii) When monitoring is conducted in 3 quarters per year, monitoring events must be separated by at least 90 calendar days.

(iv) When monitoring is conducted annually, monitoring events must be separated by at least 120 calendar days.

(g) If the storage vessel is shared with multiple process units, the process unit with the greatest annual amount of stored materials (predominant use) is the process unit the storage vessel is assigned to. If the storage vessel is shared equally among process units, and one of the process units has equipment subject to this subpart, the storage vessel is assigned to that process unit. If the storage vessel is shared equally among process units, none of which have equipment subject to this subpart of this part, the storage vessel is assigned to any process unit subject to subpart VV of this part. If the predominant use of the storage vessel varies from year to year, then the owner or operator must estimate the predominant use initially and reassess every 3 years. The owner or operator must keep records of the information and supporting calculations that show how predominant use is determined. All equipment on the storage vessel must be monitored when in VOC service.

**Effective Date Note:** At 73 FR 31376, June 2, 2008, in §60.482–1a, paragraph (g) was stayed until further notice.

## § 60.482-2a 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 §60.485a(b), except as provided in §60.482–1a(c) and (f) and paragraphs (d), (e), and (f) of this section. A pump that begins operation in light liquid service after the initial startup date for the process unit must be monitored for the first time within 30 days after the end of its startup period, except for a pump that replaces a leaking pump and except as provided in §60.482–1a(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, except as provided in §60.482–1a(f).

(b)(1) The instrument reading that defines a leak is specified in paragraphs (b)(1)(i) and (ii) of this section.

(i) 5,000 parts per million (ppm) or greater for pumps handling polymerizing monomers;

(ii) 2,000 ppm or greater for all other pumps.

(2) If there are indications of liquids dripping from the pump seal, the owner or operator shall follow the procedure specified in either paragraph (b)(2)(i) or (ii) of this section. This requirement does not apply to a pump that was monitored after a previous weekly inspection and the instrument reading was less than the concentration specified in paragraph (b)(1)(i) or (ii) of this section, whichever is applicable.

(i) Monitor the pump within 5 days as specified in §60.485a(b). A leak is detected if the instrument reading measured during monitoring indicates a leak as specified in paragraph (b)(1)(i) or (ii) of this section, whichever is applicable. The leak shall be repaired using the procedures in paragraph (c) of this section.

(ii) Designate the visual indications of liquids dripping as a leak, and repair the leak using either the procedures in paragraph (c) of this section or by eliminating the visual indications of liquids dripping.

(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 §60.482–9a.

(2) A first attempt at repair shall be made no later than 5 calendar days after each leak is detected. First attempts at repair include, but are not limited to, the practices described in paragraphs (c)(2)(i) and (ii) of this section, where practicable.

(i) Tightening the packing gland nuts;

(ii) Ensuring that the seal flush is operating at design pressure and temperature.

(d) Each pump equipped with a dual mechanical seal system that includes a barrier fluid system is exempt from the requirements of paragraph (a) of this section, provided the requirements specified in paragraphs (d)(1) through (6) of this section 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) Equipped 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 §60.482–10a; 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)(i) Each pump is checked by visual inspection, each calendar week, for indications of liquids dripping from the pump seals.

(ii) If there are indications of liquids dripping from the pump seal at the time of the weekly inspection, the owner or operator shall follow the procedure specified in either paragraph (d)(4)(ii)(A) or (B) of this section prior to the next required inspection.

(A) Monitor the pump within 5 days as specified in §60.485a(b) to determine if there is a leak of VOC in the barrier fluid. If an instrument reading of 2,000 ppm or greater is measured, a leak is detected.

(B) Designate the visual indications of liquids dripping as a leak.

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

(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.

(iii) If the sensor indicates failure of the seal system, the barrier fluid system, or both, based on the criterion established in paragraph (d)(5)(ii) of this section, a leak is detected.

(6)(i) When a leak is detected pursuant to paragraph (d)(4)(ii)(A) of this section, it shall be repaired as specified in paragraph (c) of this section.

(ii) A leak detected pursuant to paragraph (d)(5)(iii) of this section shall be repaired within 15 days of detection by eliminating the conditions that activated the sensor.

(iii) A designated leak pursuant to paragraph (d)(4)(ii)(B) of this section shall be repaired within 15 days of detection by eliminating visual indications of liquids dripping.

(e) Any pump that is designated, as described in §60.486a(e)(1) and (2), for no detectable emissions, 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 §60.485a(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 §60.482–10a, it is exempt from paragraphs (a) through (e) of this section.

(g) Any pump that is designated, as described in §60.486a(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.

## § 60.482-3a Standards: Compressors.

(a) Each compressor shall be equipped with a seal system that includes a barrier fluid system and that prevents leakage of VOC to the atmosphere, except as provided in §60.482–1a(c) and paragraphs (h), (i), and (j) of this section.

(b) Each compressor seal system as required in paragraph (a) of this section shall be:

(1) Operated with the barrier fluid at a pressure that is greater than the compressor stuffing box pressure; or

(2) Equipped with a barrier fluid system 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 §60.482–10a; or

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

(c) The barrier fluid system shall be in heavy liquid service or shall not be in VOC service.

(d) Each barrier fluid system as described in paragraph (a) shall be equipped with a sensor that will detect failure of the seal system, barrier fluid system, or both.

(e)(1) Each sensor as required in paragraph (d) of this section shall be checked daily or shall be equipped with an audible alarm.

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

(f) If the sensor indicates failure of the seal system, the barrier system, or both based on the criterion determined under paragraph (e)(2) of this section, a leak is detected.

(g)(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 §60.482–9a.

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

(h) A compressor is exempt from the requirements of paragraphs (a) and (b) of this section, if it is equipped with a closed vent system to capture and transport leakage from the compressor drive shaft back to a process or fuel gas system or to a control device that complies with the requirements of §60.482–10a, except as provided in paragraph (i) of this section.

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

(1) 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 §60.485a(c); and

(2) Is tested for compliance with paragraph (i)(1) of this section initially upon designation, annually, and at other times requested by the Administrator.

(j) Any existing reciprocating compressor in a process unit which becomes an affected facility under provisions of §60.14 or §60.15 is exempt from paragraphs (a) through (e) and (h) of this section, provided the owner or operator demonstrates that recasting the distance piece or replacing the compressor are the only options available to bring the compressor into compliance with the provisions of paragraphs (a) through (e) and (h) of this section.

## § 60.482-4a 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 §60.485a(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 §60.482–9a.

(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 §60.485a(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 §60.482–10a 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 §60.482–9a.

## § 60.482-5a Standards: Sampling connection systems.

(a) Each sampling connection system shall be equipped with a closed-purge, closed-loop, or closed-vent system, except as provided in §60.482–1a(c) and paragraph (c) of this section.

(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) Gases displaced during filling of the sample container are not required to be collected or captured.

(2) Containers that are part of a closed-purge system must be covered or closed when not being filled or emptied.

(3) Gases remaining in the tubing or piping between the closed-purge system valve(s) and sample container valve(s) after the valves are closed and the sample container is disconnected are not required to be collected or captured.

(4) Each closed-purge, closed-loop, or closed-vent system shall be designed and operated to meet requirements in either paragraph (b)(4)(i), (ii), (iii), or (iv) of this section.

(i) Return the purged process fluid directly to the process line.

(ii) Collect and recycle the purged process fluid to a process.

(iii) Capture and transport all the purged process fluid to a control device that complies with the requirements of §60.482–10a.

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

(A) 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;

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

(C) 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;

(D) A waste management unit subject to and operated in compliance with the treatment requirements of 40 CFR 61.348(a), provided all waste management units that collect, store, or transport the purged process fluid to the treatment unit are subject to and operated in compliance with the management requirements of 40 CFR 61.343 through 40 CFR 61.347; or

(E) A device used to burn off-specification used oil for energy recovery in accordance with 40 CFR part 279, subpart G, provided the purged process fluid is 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.

## § 60.482-6a 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 §60.482–1a(c) and paragraphs (d) and (e) of this section.

(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) of this section 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.

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

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

(2) A valve that begins operation in gas/vapor service or light liquid service after the initial startup date for the process unit must be monitored according to paragraphs (a)(2)(i) or (ii), except for a valve that replaces a leaking valve and except as provided in paragraphs (f), (g), and (h) of this section, §60.482–1a(c), and §§60.483–1a and 60.483–2a.

(i) Monitor the valve as in paragraph (a)(1) of this section. The valve must be monitored for the first time within 30 days after the end of its startup period to ensure proper installation.

(ii) If the existing valves in the process unit are monitored in accordance with §60.483–1a or §60.483–2a, count the new valve as leaking when calculating the percentage of valves leaking as described in §60.483–2a(b)(5). If less than 2.0 percent of the valves are leaking for that process unit, the valve must be monitored for the first time during the next scheduled monitoring event for existing valves in the process unit or within 90 days, whichever comes first.

(b) If an instrument reading of 500 ppm or greater is measured, a leak is detected.

(c)(1)(i) 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.

(ii) As an alternative to monitoring all of the valves in the first month of a quarter, an owner or operator may elect to subdivide the process unit into two or three subgroups of valves and monitor each subgroup in a different month during the quarter, provided each subgroup is monitored every 3 months. The owner or operator must keep records of the valves assigned to each subgroup.

(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 §60.482–9a.

(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 §60.486a(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) of this section 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 §60.485a(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 §60.486a(f)(1), as an unsafe-to-monitor valve is exempt from the requirements of paragraph (a) of this section 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) of this section, 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 §60.486a(f)(2), as a difficult-to-monitor valve is exempt from the requirements of paragraph (a) of this section 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:

(i) Becomes an affected facility through §60.14 or §60.15 and was constructed on or before January 5, 1981; or

(ii) Has less than 3.0 percent of its total number of valves designated as difficult-to-monitor by the owner or operator.

(3) The owner or operator of the valve follows a written plan that requires monitoring of the valve at least once per calendar year.

### § 60.482-8a Standards: Pumps, valves, and connectors in heavy liquid service and pressure relief devices in light liquid or heavy liquid service.

(a) If evidence of a potential leak is found by visual, audible, olfactory, or any other detection method at pumps, valves, and connectors in heavy liquid service and pressure relief devices in light liquid or heavy liquid service, 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 §60.485a(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 within 5 calendar days of detection.

(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 §60.482–9a.

(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 §§60.482–2a(c)(2) and 60.482–7a(e).

### § 60.482-9a 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. Monitoring to verify repair must occur within 15 days after startup of the process unit.

(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 and connectors 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 §60.482–10a.

(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.

(f) When delay of repair is allowed for a leaking pump, valve, or connector that remains in service, the pump, valve, or connector may be considered to be repaired and no longer subject to delay of repair requirements if two consecutive monthly monitoring instrument readings are below the leak definition.

### § 60.482-10a 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 (ppmv), 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 ppmv, 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 (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 (ii) of this section:

(i) Conduct an initial inspection according to the procedures in §60.485a(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 §60.485a(b); and

(ii) Conduct annual inspections according to the procedures in §60.485a(b).

(g) Leaks, as indicated by an instrument reading greater than 500 ppmv 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 (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 (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 (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 §60.486a(c).

(4) For each inspection conducted in accordance with §60.485a(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.

## § 60.482-11a Standards: Connectors in gas/vapor service and in light liquid service.

(a) The owner or operator shall initially monitor all connectors in the process unit for leaks by the later of either 12 months after the compliance date or 12 months after initial startup. If all connectors in the process unit have been monitored for leaks prior to the compliance date, no initial monitoring is required provided either no process changes have been made since the monitoring or the owner or operator can determine that the results of the monitoring, with or without adjustments, reliably demonstrate compliance despite process changes. If required to monitor because of a process change, the owner or operator is required to monitor only those connectors involved in the process change.

(b) Except as allowed in §60.482–1a(c), §60.482–10a, or as specified in paragraph (e) of this section, the owner or operator shall monitor all connectors in gas and vapor and light liquid service as specified in paragraphs (a) and (b)(3) of this section.

(1) The connectors shall be monitored to detect leaks by the method specified in §60.485a(b) and, as applicable, §60.485a(c).

(2) If an instrument reading greater than or equal to 500 ppm is measured, a leak is detected.

(3) The owner or operator shall perform monitoring, subsequent to the initial monitoring required in paragraph (a) of this section, as specified in paragraphs (b)(3)(i) through (iii) of this section, and shall comply with the requirements of paragraphs (b)(3)(iv) and (v) of this section. The required period in which monitoring must be conducted shall be determined from paragraphs (b)(3)(i) through (iii) of this section using the monitoring results from the preceding monitoring period. The percent leaking connectors shall be calculated as specified in paragraph (c) of this section.

(i) If the percent leaking connectors in the process unit was greater than or equal to 0.5 percent, then monitor within 12 months (1 year).

(ii) If the percent leaking connectors in the process unit was greater than or equal to 0.25 percent but less than 0.5 percent, then monitor within 4 years. An owner or operator may comply with the requirements of this paragraph by monitoring at least 40 percent of the connectors within 2 years of the start of the monitoring period, provided all connectors have been monitored by the end of the 4-year monitoring period.

(iii) If the percent leaking connectors in the process unit was less than 0.25 percent, then monitor as provided in paragraph (b)(3)(iii)(A) of this section and either paragraph (b)(3)(iii)(B) or (b)(3)(iii)(C) of this section, as appropriate.

(A) An owner or operator shall monitor at least 50 percent of the connectors within 4 years of the start of the monitoring period.

(B) If the percent of leaking connectors calculated from the monitoring results in paragraph (b)(3)(iii)(A) of this section is greater than or equal to 0.35 percent of the monitored connectors, the owner or operator shall monitor as soon as practical, but within the next 6 months, all connectors that have not yet been monitored during the monitoring period. At the conclusion of monitoring, a new monitoring period shall be started pursuant to paragraph (b)(3) of this section, based on the percent of leaking connectors within the total monitored connectors.

(C) If the percent of leaking connectors calculated from the monitoring results in paragraph (b)(3)(iii)(A) of this section is less than 0.35 percent of the monitored connectors, the owner or operator shall monitor all connectors that have not yet been monitored within 8 years of the start of the monitoring period.

(iv) If, during the monitoring conducted pursuant to paragraphs (b)(3)(i) through (iii) of this section, a connector is found to be leaking, it shall be re-monitored once within 90 days after repair to confirm that it is not leaking.

(v) The owner or operator shall keep a record of the start date and end date of each monitoring period under this section for each process unit.

(c) For use in determining the monitoring frequency, as specified in paragraphs (a) and (b)(3) of this section, the percent leaking connectors as used in paragraphs (a) and (b)(3) of this section shall be calculated by using the following equation:

$\%C_L = C_L / C_t * 100$

Where:

$\%C_L$= Percent of leaking connectors as determined through periodic monitoring required in paragraphs (a) and (b)(3)(i) through (iii) of this section.

$C_L$= Number of connectors measured at 500 ppm or greater, by the method specified in §60.485a(b).

$C_t$= Total number of monitored connectors in the process unit or affected facility.

(d) When a leak is detected pursuant to paragraphs (a) and (b) of this section, it shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in §60.482–9a. A first attempt at repair as defined in this subpart shall be made no later than 5 calendar days after the leak is detected.

(e) Any connector that is designated, as described in §60.486a(f)(1), as an unsafe-to-monitor connector is exempt from the requirements of paragraphs (a) and (b) of this section if:

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

(2) The owner or operator of the connector has a written plan that requires monitoring of the connector 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 (d) of this section if a leak is detected.

(f) *Inaccessible, ceramic, or ceramic-lined connectors* . (1) Any connector that is inaccessible or that is ceramic or ceramic-lined (e.g., porcelain, glass, or glass-lined), is exempt from the monitoring requirements of paragraphs (a) and (b) of this section, from the leak repair requirements of paragraph (d) of this section, and from the recordkeeping and reporting requirements of §§63.1038 and 63.1039. An inaccessible connector is one that meets any of the provisions specified in paragraphs (f)(1)(i) through (vi) of this section, as applicable:

(i) Buried;

(ii) Insulated in a manner that prevents access to the connector by a monitor probe;

(iii) Obstructed by equipment or piping that prevents access to the connector by a monitor probe;

(iv) Unable to be reached from a wheeled scissor-lift or hydraulic-type scaffold that would allow access to connectors up to 7.6 meters (25 feet) above the ground;

(v) Inaccessible because it would require elevating the monitoring personnel more than 2 meters (7 feet) above a permanent support surface or would require the erection of scaffold; or

(vi) Not able to be accessed at any time in a safe manner to perform monitoring. Unsafe access includes, but is not limited to, the use of a wheeled scissor-lift on unstable or uneven terrain, the use of a motorized man-lift basket in

areas where an ignition potential exists, or access would require near proximity to hazards such as electrical lines, or would risk damage to equipment.

(2) If any inaccessible, ceramic, or ceramic-lined connector is observed by visual, audible, olfactory, or other means to be leaking, the visual, audible, olfactory, or other indications of a leak to the atmosphere shall be eliminated as soon as practical.

(g) Except for instrumentation systems and inaccessible, ceramic, or ceramic-lined connectors meeting the provisions of paragraph (f) of this section, identify the connectors subject to the requirements of this subpart. Connectors need not be individually identified if all connectors in a designated area or length of pipe subject to the provisions of this subpart are identified as a group, and the number of connectors subject is indicated.

**Effective Date Note:** At 73 FR 31376, June 2, 2008, §60.482–11a was stayed until further notice.

## § 60.483-1a 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 §60.487a(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 §60.482–7a(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 §60.485a(b).

(2) If an instrument reading of 500 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, determined as described in §60.485a(h).

## § 60.483-2a 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)a.

(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 §60.482–7a.

(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 §60.482–7a but can again elect to use this section.

(5) The percent of valves leaking shall be determined as described in §60.485a(h).

(6) An owner or operator must keep a record of the percent of valves found leaking during each leak detection period.

(7) A valve that begins operation in gas/vapor service or light liquid service after the initial startup date for a process unit following one of the alternative standards in this section must be monitored in accordance with §60.482–7a(a)(2)(i) or (ii) before the provisions of this section can be applied to that valve.

## § 60.484a 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 demonstrating equivalence of 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) of this section.

(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 theFederal Registerand 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 theFederal 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 CAA.

(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.

## § 60.485a 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 §§60.482–1a through 60.482–11a, 60.483a, and 60.484a 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 of appendix A–7 of this part. 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 no more than 2,000 ppm greater than the leak definition concentration of the equipment monitored. If the monitoring instrument's design allows for multiple calibration scales, then the lower scale shall be calibrated with a calibration gas that is no higher than 2,000 ppm above the concentration specified as a leak, and the highest scale shall be calibrated with a calibration gas that is approximately equal to 10,000 ppm. If only one scale on an instrument will be used during monitoring, the owner or operator need not calibrate the scales that will not be used during that day's monitoring.

(2) A calibration drift assessment shall be performed, at a minimum, at the end of each monitoring day. Check the instrument using the same calibration gas(es) that were used to calibrate the instrument before use. Follow the procedures specified in Method 21 of appendix A–7 of this part, Section 10.1, except do not adjust the meter readout to correspond to the calibration gas value. Record the instrument reading for each scale used as specified in §60.486a(e)(7). Calculate the average algebraic difference between the three meter readings and the most recent calibration value. Divide this algebraic difference by the initial calibration value and multiply by 100 to express the calibration drift as a percentage. If any calibration drift assessment shows a negative drift of more than 10 percent from the initial calibration value, then all equipment monitored since the last calibration with instrument readings below the appropriate leak definition and above the leak definition multiplied by (100 minus the percent of negative

drift/divided by 100) must be re-monitored. If any calibration drift assessment shows a positive drift of more than 10 percent from the initial calibration value, then, at the owner/operator's discretion, all equipment since the last calibration with instrument readings above the appropriate leak definition and below the leak definition multiplied by (100 plus the percent of positive drift/divided by 100) may be re-monitored.

(c) The owner or operator shall determine compliance with the no-detectable-emission standards in §§60.482–2a(e), 60.482–3a(i), 60.482–4a, 60.482–7a(f), and 60.482–10a(e) as follows:

(1) The requirements of paragraph (b) shall apply.

(2) Method 21 of appendix A–7 of this part 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 a piece of equipment is in light liquid service by showing that all the following conditions apply:

(1) The vapor pressure of one or more of the organic 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 organic 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 of appendix A–7 of this part 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, $1.740 \times 10^{-7}$ (g-mole)(MJ)/(ppm-scm-kcal) (metric units) = $4.674 \times 10^{-6}$ [(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 of appendix A–6 of this part or ASTM D6420–99 (2004) (where the target compound(s) are those listed in Section 1.1 of ASTM D6420–99, and the target concentration is between 150 parts per billion by volume and 100 ppmv) 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 of appendix A–7 of this part, 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.

(h) The owner or operator shall determine compliance with §60.483–1a or §60.483–2a as follows:

(1) The percent of valves leaking shall be determined using the following equation:

$\%V_L = (V_L / V_T) * 100$

Where:

$\%V_L$= Percent leaking valves.

$V_L$= Number of valves found leaking.

$V_T$= The sum of the total number of valves monitored.

(2) The total number of valves monitored shall include difficult-to-monitor and unsafe-to-monitor valves only during the monitoring period in which those valves are monitored.

(3) The number of valves leaking shall include valves for which repair has been delayed.

(4) Any new valve that is not monitored within 30 days of being placed in service shall be included in the number of valves leaking and the total number of valves monitored for the monitoring period in which the valve is placed in service.

(5) If the process unit has been subdivided in accordance with §60.482–7a(c)(1)(ii), the sum of valves found leaking during a monitoring period includes all subgroups.

(6) The total number of valves monitored does not include a valve monitored to verify repair.

## § 60.486a 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.

(3) The owner or operator shall record the information specified in paragraphs (a)(3)(i) through (v) of this section for each monitoring event required by §§60.482–2a, 60.482–3a, 60.482–7a, 60.482–8a, 60.482–11a, and 60.483–2a.

(i) Monitoring instrument identification.

(ii) Operator identification.

(iii) Equipment identification.

(iv) Date of monitoring.

(v) Instrument reading.

(b) When each leak is detected as specified in §§60.482–2a, 60.482–3a, 60.482–7a, 60.482–8a, 60.482–11a, and 60.483–2a, 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 §60.482–7a(c) and no leak has been detected during those 2 months.

(3) The identification on a connector may be removed after it has been monitored as specified in §60.482–11a(b)(3)(iv) and no leak has been detected during that monitoring.

(4) The identification on equipment, except on a valve or connector, may be removed after it has been repaired.

(c) When each leak is detected as specified in §§60.482–2a, 60.482–3a, 60.482–7a, 60.482–8a, 60.482–11a, and 60.483–2a, 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, except when indications of liquids dripping from a pump are designated as a leak.

(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) Maximum instrument reading measured by Method 21 of appendix A–7 of this part at the time the leak is successfully repaired or determined to be nonrepairable, except when a pump is repaired by eliminating indications of liquids dripping.

(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 §60.482–10a 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 §60.482–10a(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 §§60.482–2a, 60.482–3a, 60.482–4a, and 60.482–5a 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 §§60.482–2a, 60.482–3a, 60.482–4a, and 60.482–5a.

(e) The following information pertaining to all equipment subject to the requirements in §§60.482–1a to 60.482–11a 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 §§60.482–2a(e), 60.482–3a(i), and 60.482–7a(f).

(ii) The designation of equipment as subject to the requirements of §60.482–2a(e), §60.482–3a(i), or §60.482–7a(f) shall be signed by the owner or operator. Alternatively, the owner or operator may establish a mechanism with their permitting authority that satisfies this requirement.

(3) A list of equipment identification numbers for pressure relief devices required to comply with §60.482–4a.

(4)(i) The dates of each compliance test as required in §§60.482–2a(e), 60.482–3a(i), 60.482–4a, and 60.482–7a(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.

(6) A list of identification numbers for equipment that the owner or operator designates as operating in VOC service less than 300 hr/yr in accordance with §60.482–1a(e), a description of the conditions under which the equipment is in VOC service, and rationale supporting the designation that it is in VOC service less than 300 hr/yr.

(7) The date and results of the weekly visual inspection for indications of liquids dripping from pumps in light liquid service.

(8) Records of the information specified in paragraphs (e)(8)(i) through (vi) of this section for monitoring instrument calibrations conducted according to sections 8.1.2 and 10 of Method 21 of appendix A–7 of this part and §60.485a(b).

(i) Date of calibration and initials of operator performing the calibration.

(ii) Calibration gas cylinder identification, certification date, and certified concentration.

(iii) Instrument scale(s) used.

(iv) A description of any corrective action taken if the meter readout could not be adjusted to correspond to the calibration gas value in accordance with section 10.1 of Method 21 of appendix A–7 of this part.

(v) Results of each calibration drift assessment required by §60.485a(b)(2) (i.e., instrument reading for calibration at end of monitoring day and the calculated percent difference from the initial calibration value).

(vi) If an owner or operator makes their own calibration gas, a description of the procedure used.

(9) The connector monitoring schedule for each process unit as specified in §60.482–11a(b)(3)(v).

(10) Records of each release from a pressure relief device subject to §60.482–4a.

(f) The following information pertaining to all valves subject to the requirements of §60.482–7a(g) and (h), all pumps subject to the requirements of §60.482–2a(g), and all connectors subject to the requirements of §60.482–11a(e) shall be recorded in a log that is kept in a readily accessible location:

(1) A list of identification numbers for valves, pumps, and connectors that are designated as unsafe-to-monitor, an explanation for each valve, pump, or connector stating why the valve, pump, or connector is unsafe-to-monitor, and the plan for monitoring each valve, pump, or connector.

(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 §60.483–2a:

(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 §§60.482–2a(d)(5) and 60.482–3a(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 §60.480a(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.

## § 60.487a Reporting requirements.

(a) Each owner or operator subject to the provisions of this subpart shall submit semiannual reports to the Administrator beginning 6 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 §60.482–7a, excluding those valves designated for no detectable emissions under the provisions of §60.482–7a(f).

(3) Number of pumps subject to the requirements of §60.482–2a, excluding those pumps designated for no detectable emissions under the provisions of §60.482–2a(e) and those pumps complying with §60.482–2a(f).

(4) Number of compressors subject to the requirements of §60.482–3a, excluding those compressors designated for no detectable emissions under the provisions of §60.482–3a(i) and those compressors complying with §60.482–3a(h).

(5) Number of connectors subject to the requirements of §60.482–11a.

(c) All semiannual reports to the Administrator shall include the following information, summarized from the information in §60.486a:

(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 §60.482–7a(b) or §60.483–2a,

(ii) Number of valves for which leaks were not repaired as required in §60.482–7a(d)(1),

(iii) Number of pumps for which leaks were detected as described in §60.482–2a(b), (d)(4)(ii)(A) or (B), or (d)(5)(iii),

(iv) Number of pumps for which leaks were not repaired as required in §60.482–2a(c)(1) and (d)(6),

(v) Number of compressors for which leaks were detected as described in §60.482–3a(f),

(vi) Number of compressors for which leaks were not repaired as required in §60.482–3a(g)(1),

(vii) Number of connectors for which leaks were detected as described in §60.482–11a(b)

(viii) Number of connectors for which leaks were not repaired as required in §60.482–11a(d), and

(ix)–(x) [Reserved]

(xi) 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) of this section 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 §§60.483–1a or 60.483–2a 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 CAA, 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.

## § 60.488a Reconstruction.

For the purposes of this subpart:

(a) The cost of the following frequently replaced components of the facility shall not be considered in calculating either the “fixed capital cost of the new components” or the “fixed capital costs that would be required to construct a comparable new facility” under §60.15: Pump seals, nuts and bolts, rupture disks, and packings.

(b) Under §60.15, the “fixed capital cost of new components” includes the fixed capital cost of all depreciable components (except components specified in §60.488a(a)) which are or will be replaced pursuant to all continuous programs of component replacement which are commenced within any 2-year period following the applicability date for the appropriate subpart. (See the “Applicability and designation of affected facility” section of the appropriate subpart.) For purposes of this paragraph, “commenced” means that an owner or operator has undertaken a continuous program of component replacement or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of component replacement.

## § 60.489a List of chemicals produced by affected facilities.

Process units that produce, as intermediates or final products, chemicals listed in §60.489 are covered under this subpart. The applicability date for process units producing one or more of these chemicals is November 8, 2006.

# Indiana Department of Environmental Management
# Office of Air Quality

## Technical Support Document (TSD) for a Registration

### Source Description and Location

| | |
|---|---|
| **Source Name:** | **Southern Indiana Biodiesel LLC** |
| **Source Location:** | **5700 Prospect Drive, Newburgh, Indiana 47630** |
| **County:** | **Warrick** |
| **SIC Code:** | **2869** |
| **Registration No.:** | **173-26785-00109** |
| **Permit Reviewer:** | **Brian Williams** |

On July 18, 2008, the Office of Air Quality (OAQ) received an application from Southern Indiana Biodiesel LLC related to the construction and operation of a new batch biodiesel refining production plant.

### Existing Approvals

There have been no previous approvals issued to this source.

### County Attainment Status

The source is located in Warrick County.

| Pollutant | Designation |
|---|---|
| $SO_2$ | Cannot be classified. |
| CO | Unclassifiable or attainment effective November 15, 1990. |
| $O_3$ | Attainment effective January 30, 2006, for the Evansville area, including Warrick County, for the 8-hour ozone standard.[1] |
| $PM_{10}$ | Unclassifiable effective November 15, 1990. |
| $NO_2$ | Cannot be classified or better than national standards. |
| Pb | Not designated. |
| [1]Unclassifiable or attainment effective October 18, 2000, for the 1-hour ozone standard which was revoked effective June 15, 2005.<br>Basic nonattainment designation effective federally April 5, 2005, for PM2.5. | |

(a) Ozone Standards

Volatile organic compounds (VOC) and nitrogen oxides (NOx) are regulated under the Clean Air Act (CAA) for the purposes of attaining and maintaining the National Ambient Air Quality Standards (NAAQS) for ozone. Therefore, VOC and NOx emissions are considered when evaluating the rule applicability relating to ozone. Warrick 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.

(b) PM2.5

U.S. EPA, in the Federal Register Notice 70 FR 943 dated January 5, 2005, has designated Warrick County as nonattainment for PM2.5. On March 7, 2005 the Indiana Attorney General's Office, on behalf of IDEM, filed a lawsuit with the Court of Appeals for the District of Columbia Circuit challenging U.S. EPA's designation of nonattainment areas without sufficient data. However, in order to ensure that sources are not potentially liable for a violation of the Clean Air Act, the OAQ is following the U.S. EPA's New Source Review Rule for PM2.5 promulgated on

May 8th, 2008, and effective on July 15th 2008. Therefore, direct PM2.5 and SO2 emissions were reviewed pursuant to the requirements of Nonattainment New Source Review, 326 IAC 2-1.1-5. See the State Rule Applicability – Entire Source section.

(c) Other Criteria Pollutants
Warrick 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.

## Fugitive Emissions

(a) The fugitive emissions of criteria pollutants and hazardous air pollutants are counted toward the determination of 326 IAC 2-5.1-2 (Registrations) applicability.

(b) Since this source is classified as a chemical process plant it is considered one of the twenty-eight (28) listed source categories, as specified in 326 IAC 2-2, 326 IAC 2-3, or 326 IAC 2-7. Therefore, fugitive emissions are counted toward the determination of PSD, Emission Offset, and Part 70 Permit applicability.

## Background and Description of New Source Construction

The Office of Air Quality (OAQ) has reviewed an application, submitted by Southern Indiana Biodiesel LLC on July 18, 2008, relating to the construction and operation of a new batch biodiesel refining production plant. Southern Indiana Biodiesel LLC plans to produce biodiesel through a chemical process called trans-esterification, whereby glycerin is separated from fat or vegetable oil. This process generates the primary product, biodiesel (methyl esters). In addition, this process generates a by-product, glycerin, which the company plans to sell.

The following is a list of the new emission unit(s) and pollution control device(s):

(a) Three (3) feedstock storage tanks, identified as T1, T2, and T3, approved for construction in 2009, with a maximum capacity of 30,000 gallons each, and storing material with a maximum true vapor pressure less than 15.0 kPa.

(b) One pre-treatment process, approved for construction in 2009, and consisting of the following units:

(1) One (1) acetic acid and water solution tote tank, identified as T7, with a maximum capacity of 250 gallons.

(2) One (1) pre-treatment reaction tank, identified as T8, with a maximum capacity of 3,000 gallons.

(3) One (1) pre-treatment settling tank, identified at T9, with a maximum capacity of 3,000 gallons.

(4) One (1) pre-treatment water collection tank, identified as T10, with a maximum capacity of 1,900 gallons.

(5) One (1) pre-treatment oil collection tank, identified as T11, with a maximum capacity of 1,900 gallons.

(6) One (1) pre-treatment oil mixer and storage tank, identified as T12, with a maximum capacity of 30,000 gallons, and storing material with a maximum true vapor pressure less than 15.0 kPa.

(c) One (1) process alcohol storage area, approved for construction in 2009, and consisting of the following units:

(1) One (1) methanol storage tank, identified as T4, with a maximum capacity of 15,000 gallons, and equipped with a pressure relief valve, rupture disk, and integral in-line condenser.

(2) One (1) isopropanol storage tank, identified as T5, with a maximum capacity of 8,800 gallons and equipped with a pressure relief valve and rupture disk.

(3) One (1) sodium methylate storage tank, identified as T6, with a maximum capacity of 8,800 gallons and equipped with a pressure relief valve and rupture disk.

(d) One (1) batch biodiesel production process, approved for construction in 2009, with a maximum capacity of 19 MMgal per year, and consisting of the following units:

(1) One (1) biodiesel reactor, identified as BR1, with a maximum capacity of 25,000 gallons.

(2) One (1) caustic addition process, identified as EU1, with a maximum capacity of 725 tons of caustic per year.

(3) One (1) alkaline water solution storage tank, identified as T13, with a maximum capacity of 3,000 gallons.

(e) One (1) methanol vacuum recovery operation, approved for construction in 2009, with waste gases from the biodiesel reactor routed to the methanol vacuum recovery operation, and consisting of the following units:

(1) One (1) integral methanol vacuum recovery system, identified as MVR, with a maximum capacity of 3,000 gallons, using a vacuum condenser to recover methanol, which is routed to the methanol recovery storage tank, and exhausting unrecoverable vapors to the water wash storage tank.

(2) One (1) water wash storage tank, identified as T14, with a maximum capacity of 10,000 gallons.

(f) One (1) raw biodiesel and glycerin settling tank, identified as T15, approved for construction in 2009, with a maximum capacity of 30,000 gallons, and storing material with a maximum true vapor pressure less than 15.0 kPa.

(g) One (1) glycerin collection and storage area, approved for construction in 2009, and consisting of the following units:

(1) One (1) glycerin collection tank, identified as T16, with a maximum capacity of 1,900 gallons.

(2) Three (3) glycerin storage tanks, identified as T17, T18, and T19, with a maximum capacity of 8,800 gallons, each.

(h) One (1) biodiesel collection and storage area, approved for construction in 2009, and consisting of the following units:

(1) One (1) biodiesel collection tank, identified as T20, with a maximum capacity of 1,900 gallons.

(2) Two (2) ionic resin tanks, identified as T21 and T22, with a maximum capacity of 1,500

gallons, each.

(3) Three (3) large biodiesel storage tanks, identified as T23, T24, and T25, with a maximum capacity of 15,000 gallons, each,

(4) Four (4) small biodiesel storage tanks, identified as T26, T27, T28, and T29, with a maximum capacity of 8,800 gallons, each.

(i) One (1) biodiesel and glycerin truck loadout process, identified as EU2, approved for construction in 2009, with a maximum capacity of 19 MMgal of biodiesel per year. All products are shipped offsite by trucks and will be filled by a submerged fill pipe loading process.

(j) One (1) natural gas-fired boiler, identified as B01, approved for construction in 2009, with a heat input capacity of 6.3 MMBtu/hr, and exhausting to Stack S1.

(k) Equipment leak losses of VOC from pumps in light liquid service, compressors, pressure relief devices in gas/vapor, sampling connection systems, open-ended valves or lines, valves in gas/vapor service and in light liquid service, pumps and valves in heavy liquid service, pressure relief devices in light liquid or heavy liquid service and connectors, closed vent systems and control devices. Under 40 CFR 60, Subpart VVa, equipment leak losses are affected facilities in VOC service.

(l) One (1) noncontact forced and induced draft cooling tower system not regulated under a NESHAP.

(m) Paved and unpaved roads and parking lots with public access.

**“Integral Part of the Process” Determination**

The applicant has submitted the following information to justify why the in-line condenser and methanol vacuum recovery system should be considered an integral part of the biodiesel production process:

> Southern Indiana Biodiesel LLC will produce fuel-grade biodiesel to meet strict industry and United States specifications. The ASTM D6751-02 standard specifies that biodiesel contain no more than 0.2% methanol. The waste gases associated with the facility's biodiesel reactor, will be vented to the methanol vacuum recovery system, which utilizes a vacuum condenser to maximize methanol recovery, to reduce methanol concentrations, and collect it for re-use in the process. Without the methanol recovery system it is not possible to achieve a methanol content of 0.2% to comply with the ASTM standard utilizing this production process. In addition, the methanol storage tank will be equipped with an in-line condenser on the tank vent to maximize methanol recovery.
>
> The methanol vacuum recovery system operates under vacuum to recover and reduce the methanol concentration to 0.2% by weight. Because the methanol recovery system collects methanol that is discharged to a tank under vacuum, there are no stack emissions. Moreover, it is not possible to operate the plant without the methanol recovery system.
>
> Methanol content also affects the production of glycerin which is also produced during the production of biodiesel. During the production process, methanol, the catalyst, and raw oil are combined in a reactor. Following the reaction, the glycerin is separated from the biodiesel. Because excess methanol tends to act as a solubilizer and can slow down the separation process, it is necessary to remove the methanol. If excess methanol is contained in the glycerin stream, the glycerin has little value and disposal may be difficult. Additionally, excess methanol content in the glycerin potentially could require that the material be handled as a hazardous waste. Excess methanol content in the biodiesel and glycerin streams directly impact the market price and potential customer base. The high quality, ASTM specification fuel is sold at a price premium.

Southern Indiana Biodiesel LLC has provided the vendor specifications for the methanol vacuum recovery system to IDEM as part of the application.

IDEM, OAQ has evaluated the information submitted and agrees that the in-line condenser and methanol vacuum recovery system should be considered integral parts of the biodiesel production process. This determination is based on the fact that the in-line condenser and methanol vacuum recovery system serve a function other than pollution control (i.e. solvent collection). Therefore, the permitting level will be determined using the potential to emit after the in-line condenser and methanol vacuum recovery system. Operating conditions in the proposed permit will specify that the in-line condenser shall operate at all times. In addition, operating conditions in the proposed permit will specify that the methanol vacuum recovery system shall operate at all times when the biodiesel reactor is in operation.

## Enforcement Issues

There are no pending enforcement actions related to this source.

## Emission Calculations

See Appendix A of this TSD for detailed emission calculations.

## Permit Level Determination – Registration

The following table reflects the unlimited potential to emit (PTE) of the entire source before controls. Control equipment is not considered federally enforceable until it has been required in a federally enforceable permit.

| Process/ Emission Unit | Potential To Emit of the Entire Source (tons/year) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | PM | PM10 * | PM2.5 | $SO_2$ | NOx | VOC | CO | Total HAPs | Worst Single HAP |
| Storage Tanks | 0 | 0 | 0 | 0 | 0 | 2.48 | 0 | 0.20 | 0.20 Methanol |
| Caustic Addition | 14.5 | 14.5 | 14.5 | 0 | 0 | 0 | 0 | 0 | 0 |
| Raw Material Unloading | 0 | 0 | 0 | 0 | 0 | 3.12 | 0 | 0 | 0 |
| Biodiesel and Glycerin Loadout | 0 | 0 | 0 | 0 | 0 | 0.46 | 0 | 0 | 0 |
| Equipment Leaks | 0 | 0 | 0 | 0 | 0 | 18.38 | 0 | 4.29 | 2.49 Methanol |
| Natural Gas-Fired Boiler | 0.05 | 0.21 | 0.21 | 0.02 | 2.76 | 0.15 | 2.32 | 0.05 | 0.05 Hexane |
| Cooling Tower | 1.75 | 1.12 | 1.12 | 0 | 0 | 0 | 0 | 0 | 0 |
| Paved Roads | 0.35 | 0.07 | 0.01 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unpaved Roads | 1.02 | 0.27 | 0.03 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total PTE of Entire Source** | **17.67** | **16.17** | **15.87** | **0.02** | **2.76** | **24.59** | **2.32** | **4.54** | **2.69** |
| Registration Levels | 25 | 25 | 25 | 25 | 25 | 25 | 100 | 25 | 10 |

| Process/ Emission Unit | Potential To Emit of the Entire Source (tons/year) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | PM | PM10 * | PM2.5 | $SO_2$ | NOx | VOC | CO | Total HAPs | Worst Single HAP |

negl. = negligible
* Under the Part 70 Permit program (40 CFR 70), particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM10), not particulate matter (PM), is considered as a "regulated air pollutant".

(a) The potential to emit (PTE) (as defined in 326 IAC 2-1.1-1(16)) of PM, PM10, PM2.5, and VOC are within the ranges listed in 326 IAC 2-5.1-2(a)(1). The PTE of all other regulated criteria pollutants are less than the ranges listed in 326 IAC 2-5.1-2(a)(1). Therefore, the source is subject to the provisions of 326 IAC 2-5.1-2 (Registrations). A Registration will be issued.

(b) The potential to emit (PTE) (as defined in 326 IAC 2-1.1-1(16)) of any single HAP is less than ten (10) tons per year and the PTE of a combination of HAPs is less than twenty-five (25) tons per year. Therefore, this source is an area source under Section 112 of the Clean Air Act (CAA) and not subject to the provisions of 326 IAC 2-7.

## Federal Rule Applicability Determination

New Source Performance Standards (NSPS)

(a) The requirements of the New Source Performance Standard for Small Industrial-Commercial-Institutional Steam Generating Units, 40 CFR 60, Subpart Dc (326 IAC 12), are not included in the registration, for the natural gas-fired boiler because this boiler has a maximum heat input capacity less than 10 MMBtu per hour and is therefore not subject to Subpart Dc.

(b) The requirements of the New Source Performance Standard (NSPS) for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984 (40 CFR Part 60, Subpart Kb) (326 IAC 12) are not included in the permit for the three (3) feedstock storage tanks, one (1) pre-treatment oil mixer and storage tank, and one (1) settling tank. The construction of the storage tanks will commence after July 23, 1984 and they each have a capacity greater than 75 cubic meters (19,813 gallons) and less than 151 cubic meters (39,890 gallons). However, they will not store liquids with a maximum true vapor pressure greater than 15.0 kPa.

(c) The requirements of the New Source Performance Standard (NSPS) for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for Which Construction, Reconstruction, or Modification Commenced After November 7, 2006 (40 CFR Part 60, Subpart VVa) are included in the registration for pumps and valves, pressure relief devices, sampling connection systems, open-ended valves or lines, closed vent systems and control devices associated with the synthetic organic chemicals manufacturing and the construction of this equipment will commence after November 7, 2006. The biodiesel facility is a synthetic organic chemical manufacturing industry, because it produces glycerol, which is listed in 40 CFR 60.489a.

Applicable portions of the NSPS are the following:

(1) 40 CFR 60.480a
(2) 40 CFR 60.481a
(3) 40 CFR 60.482-1a
(4) 40 CFR 60.482-2a
(5) 40 CFR 60.482-3a
(6) 40 CFR 60.482-4a
(7) 40 CFR 60.482-5a
(8) 40 CFR 60.482-6a

(9) 40 CFR 60.482-7a
(10) 40 CFR 60.482-8a
(11) 40 CFR 60.482-9a
(12) 40 CFR 60.482-10a
(13) 40 CFR 60.482.11a
(14) 40 CFR 60.483-1a
(15) 40 CFR 60.483-2a
(16) 40 CFR 60.484a
(17) 40 CFR 60.485a
(18) 40 CFR 60.486a
(19) 40 CFR 60.487a
(20) 40 CFR 60.489a

Nonapplicable portions of the NSPS will not be included in the registration.

The requirements of 40 CFR Part 60, Subpart A – General Provisions, which are incorporated as 326 IAC 12-1, apply to the source except as otherwise specified in 40 CFR 60, Subpart VVa.

(d) The requirements of the New Source Performance Standard (NSPS) for Volatile Organic Compound (VOC) Emissions From Synthetic Organic Chemical Manufacturing Industry (SOCMI) Distillation Operations (40 CFR Part 60, Subpart NNN), which are incorporated by reference as 326 IAC 12, are not included in this registration for the distillation operations. Glycerin is a listed chemical under 40 CFR 60.667. Pursuant to 40 CFR 60.660(c)(3), the facility is not an affected facility because glycerin is produced from a batch operation, as defined in 40 CFR 60.661.

(e) The requirements of the New Source Performance Standard for Volatile Organic Compound (VOC) Emissions From Synthetic Organic Chemical Manufacturing Industry (SOCMI) Reactor Processes (40 CFR Part 60, Subpart RRR), which are incorporated by reference as 326 IAC 12, are not included in this registration. Pursuant to 40 CFR 60.700(c)(1), the facility is not an affected facility because glycerin is produced from a batch operation, as defined by 40 CFR 60.701.

(f) There are no other New Source Performance Standards (NSPS)(40 CFR Part 60) included in the registration.

National Emission Standards for Hazardous Air Pollutants (NESHAP)

(g) The requirements of the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Source Categories: Organic Hazardous Air Pollutants From the Synthetic Organic Chemical Manufacturing Industry (SOCMI) and Other Processes Subject to the Negotiated Regulation for Equipment Leaks (40 CFR 63, Subpart F, G, H and I), are not included in the registration for this source because this source is a minor source of hazardous air pollutants.

(h) The requirements of the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Organic Liquids Distribution (Non-Gasoline), (40 CFR 63, Subpart EEEE) (326 IAC 20-83-1) are not included in the registration for this source because this source is a minor source of hazardous air pollutants.

(i) The requirements of the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Solvent Extraction for Vegetable Oil Production (40 CFR 63, Subpart GGGG), are not included in the registration for this source because the proposed facility will not produce vegetable oil as defined in the rule. In addition, this source is a minor source of hazardous air pollutants.

(j) There are no National Emission Standards for Hazardous Air Pollutants (NESHAPs) (326 IAC 14, 326 IAC 20 and 40 CFR Part 63) included in the registration.

Compliance Assurance Monitoring (CAM)

(k) Pursuant to 40 CFR 64.2, Compliance Assurance Monitoring (CAM) is not included in the registration, because the unlimited potential to emit of the source is less than applicable Title V major source thresholds and the source is not required to obtain a Part 70 or Part 71 permit.

## State Rule Applicability Determination

The following state rules are applicable to the source:

(a) 326 IAC 2-5.1-2 (Registrations)
Registration applicability is discussed under the Permit Level Determination – Registration section above.

(b) 326 IAC 2-2 (Prevention of Significant Deterioration(PSD))
This source is not a major stationary source, under PSD (326 IAC 2-2), because the potential to emit of all attainment regulated pollutants are less than 100 tons per year, and this source is one of the twenty-eight (28) listed source categories, as specified in 326 IAC 2-2-1(gg)(1). Therefore, pursuant to 326 IAC 2-2, the PSD requirements do not apply.

(c) 326 IAC 2-1.1-5 (Nonattainment New Source Review)
This new source is not a major stationary source, under 326 IAC 2-1.1-5, because the potential to emit particulate matter with a diameter less than ten (10) micrometers (PM10), which is regulated as a surrogate for PM2.5, is less than 100 tons per year. Therefore, pursuant to 326 IAC 2-1.1-5, the Nonattainment New Source Review requirements do not apply.

(d) 326 IAC 2-4.1 (Major Sources of Hazardous Air Pollutants (HAP))
The potential to emit of any single HAP is less than ten (10) tons per year and the potential to emit of a combination of HAPs is less than twenty-five (25) tons per year. Therefore, this source is an area source under Section 112 of the Clean Air Act (CAA) and not subject to the provisions of 326 IAC 2-4.1.

(e) 326 IAC 2-6 (Emission Reporting)
Pursuant to 326 IAC 2-6-1, this source is not subject to this rule, because it is not required to have an operating permit under 326 IAC 2-7 (Part 70), it is not located in Lake, Porter, or LaPorte County, and it does not emit lead into the ambient air at levels equal to or greater than 5 tons per year. Therefore, 326 IAC 2-6 does not apply.

(f) 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 shall meet the following, unless otherwise stated in this permit:

(1) 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.

(2) 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.

(g) 326 IAC 6-4 (Fugitive Dust Emissions Limitations)
The source is subject to the requirements of 326 IAC 6-4, because the source maintains paved and unpaved roads and parking lots with public access that have the potential to emit fugitive particulate emissions. Pursuant to 326 IAC 6-4 (Fugitive Dust Emissions Limitations), the source 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.

(h) 326 IAC 6-5 (Fugitive Particulate Matter Emission Limitations)
The source is not subject to the requirements of 326 IAC 6-5, because the source does not have

potential fugitive particulate emissions greater than 25 tons per year. Therefore, 326 IAC 6-5 does not apply.

(i) 326 IAC 8-1-6 (VOC Rules: General Reduction Requirements for New Facilities)
Each of the emission units at this source is not subject to the requirements of 326 IAC 8-1-6, since the unlimited VOC potential emissions from each emission unit is less than twenty-five (25) tons per year.

Storage Tanks

(a) 326 IAC 2-5.1-2 (Registrations)
Pursuant to 326 IAC 2-5.1-2, the Registrant shall comply with the following:

(a) VOC emissions from the methanol storage tank shall be controlled by the in-line condenser at all times.

(b) The incoming cooling water temperature to the in-line condenser shall not exceed 85°F at all times.

Compliance with these limits shall ensure compliance with 326 IAC 2-5.1-2 (Registrations).

(b) 326 IAC 8-9-1 (Volatile Organic Storage Vessels)
The source is not subject to the requirements of 326 IAC 8-9-1 because it is not located in Clark, Floyd, Lake, or Porter County. This source will be located in Warrick County.

(c) 326 IAC 12 (New Source Performance Standards)
See Federal Rule Applicability Section of this TSD.

(d) 326 IAC 20 (Hazardous Air Pollutants)
See Federal Rule Applicability Section of this TSD.

Biodiesel Production Process, Methanol Vacuum Recovery Operation, and Loadout Process

(a) 326 IAC 2-5.1-2 (Registrations)
Pursuant to 326 IAC 2-5.1-2, the Registrant shall comply with the following:

(a) VOC emissions from the biodiesel reactor shall be controlled by the methanol vacuum recovery system at all times when the biodiesel reactor is in operation.

(b) The incoming cooling water temperature to the vacuum condenser shall not exceed 85°F when the methanol vacuum recovery system is in operation.

Compliance with these limits shall ensure compliance with 326 IAC 2-5.1-2 (Registrations).

(b) 326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes)
Pursuant to 326 IAC 6-3-2, the particulate matter (PM) from the caustic addition shall not exceed 0.77 pounds per hour when operating at a process weight rate of 0.083 tons per hour. The pound per hour limitation was calculated with 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

(c) 326 IAC 8-6-1 (Organic Solvent Emission Limitations)
Southern Indiana Biodiesel LLC is not subject to the requirements of 326 IAC 8-6-1, because this source will be constructed after January 1, 1980 and it does not have potential VOC emissions equal to or greater than 100 tons per year.

(d) 326 IAC 8-7 (Specific VOC Requirements for Lake, Porter, Clark, and Floyd Counties)
Southern Indiana Biodiesel LLC is not subject to the requirements of 326 IAC 8-7, because this source will not be located in Lake, Porter, Clark, or Floyd Counties.

Boiler

(a) 326 IAC 6-2 (Particulate Emission Limitations for Sources of Indirect Heating)
The natural gas-fired boiler (B01) is subject to 326 IAC 6-2-4 because it will be constructed after September 21, 1983. Pursuant to 326 IAC 6-2-4 (a) (Particulate emission limitations for sources of indirect heating: emission limitations for facilities specified in 326 IAC 6-2-1(d)), particulate emissions from this boiler must be calculated using the following equation:

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

Where:

$P_t$ = pounds of particulate matter emitted per million Btu heat input (lb/MMBtu).
Q = total source operating capacity (6.3 MMBtu/hr).

$$P_t = \frac{1.09}{6.3^{0.26}}$$

$P_t$ = 0.675 lb/MMBtu

Pursuant to 326 IAC 6-2-4, particulate emissions from indirect heating facilities, which were constructed after September 21, 1983, with a total source operating capacity less than 10 MMBtu/hr, shall not exceed 0.6 lb/MMBtu heat input. Based on the calculations below, B01 can comply with this limit.

When burning natural gas:
PM Emissions = 1.9 lb PM/MMSCF * MMSCF/1,020 MMBtu = 0.0019 lbs/MMBtu

(b) 326 IAC 6-3 (Particulate Emission Limitations for Manufacturing Processes)
The boiler (B01) is exempt from the requirements of 326 IAC 6-3, because, pursuant to 326 IAC 1-2-59, liquid and gaseous fuels and combustion air are not considered as part of the process weight.

(c) 326 IAC 7-1.1-1 (Sulfur Dioxide Emission Limitations)
This source is not subject to 326 IAC 7-1.1-1 (Sulfur Dioxide Emission Limitations) because the potential to emit sulfur dioxide from the boiler (B01) is less than twenty-five (25) tons per year and ten (10) pounds per hour.

(d) 326 IAC 9-1-1 (Carbon Monoxide Emission Limits)
The boiler (B01), is not subject to 326 IAC 9-1-1 (Carbon Monoxide Emission Limits) because there are no applicable emission limits for the source under 326 IAC 9-1-2.

(e) 326 IAC 10-1-1 (Nitrogen Oxides Control)
The boiler (B01), is not subject to 326 IAC 10-1-1 (Nitrogen Oxides Control) because the source is not located in Clark or Floyd counties.

Cooling Tower

(a) 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.

## Compliance Determination, Monitoring and Testing Requirements

(a) The compliance determination and monitoring requirements applicable to this source are as follows:

| Emission Unit/Control | Operating Parameters | Frequency |
|---|---|---|
| Methanol Storage Tank/In-line Condenser | Incoming Cooling Water Temperature | Once per day |
| Methanol Vacuum Recovery System/Vacuum Condenser | Incoming Cooling Water Temperature | Once per day |

(b) There are no testing requirements applicable to this source.

## Conclusion and Recommendation

Unless otherwise stated, information used in this review was derived from the application and additional information submitted by the applicant. An application for the purposes of this review was received on July 18, 2008.

The construction and operation of this source shall be subject to the conditions of the attached proposed Registration No. 173-26785-00109. The staff recommends to the Commissioner that this Registration be approved.

## IDEM Contact

(a) Questions regarding this proposed permit can be directed to Brian Williams at the Indiana Department Environmental Management, Office of Air Quality, Permits Branch, 100 North Senate Avenue, MC 61-53 IGCN 1003, Indianapolis, Indiana 46204-2251 or by telephone at (317) (234-5375) or toll free at 1-800-451-6027 extension (4-5375).

(b) A copy of the findings is available on the Internet at: http://www.in.gov/ai/appfiles/idem-caats/

(c) For additional information about air permits and how the public and interested parties can participate, refer to the IDEM's Guide for Citizen Participation and Permit Guide on the Internet at: www.idem.in.gov

**Appendix A: Emission Calculations**
**Storage Tank Emissions**

**Company Name:** Southern Indiana Biodiesel LLC
**Address City IN Zip:** 5700 Prospect Drive, Newburgh, Indiana 47630
**Permit Number:** 173-26785-00109
**Reviewer:** Brian Williams

| Tank ID | Description | Capacity (gallons) | PTE of VOC (tons/yr) | PTE of Methanol (tons/yr) | PTE of Propylene Oxide (tons/yr) | PTE of Combined HAPs (tons/yr) |
|---|---|---|---|---|---|---|
| T1 | Feedstock Storage Tank | 6,300,000 | 0.021 | 0.0 | 0.0 | 0.00 |
| T2 | Feedstock Storage Tank | 6,300,000 | 0.021 | 0.0 | 0.0 | 0.00 |
| T3 | Feedstock Storage Tank | 6,300,000 | 0.021 | 0.0 | 0.0 | 0.00 |
| T4 | Methanol Storage Tank* | 4,550,000 | 0.04 | 0.04 | 0.0 | 0.04 |
| T5 | IPA Storage Tank | 2,110,000 | 0.20 | 0.0 | 0.0 | 0.00 |
| T6 | Sodium Methylate Storage Tank | 210,000 | 0.09 | 0.09 | 0.0 | 0.09 |
| T7 | Water/Acetic Acid Tote | 500,000 | 3.00E-05 | 0.0 | 0.0 | 0.00 |
| T8 | Pre-Treatment Reactor | 19,400,000 | 2.13E-03 | 0.0 | 0.0 | 0.00 |
| T9 | Pre-Treatment Settling | 19,400,000 | 2.13E-03 | 0.0 | 0.0 | 0.00 |
| T10 | Pre-Treatment Water Collection | 500,000 | 5.50E-05 | 0.0 | 0.0 | 0.00 |
| T11 | Pre-Treatment Oil Collection | 18,900,000 | 0.030 | 0.0 | 0.0 | 0.00 |
| T12 | Pre-Treatment Mixer/Storage | 18,900,000 | 1.07 | 0.0 | 0.0 | 0.00 |
| T13 | Alkaline Water Solution | 21,340,000 | 5.85E-04 | 0.0 | 5.50E-04 | 5.50E-04 |
| T14 | Water Wash Storage** | 20,300,000 | 5.54E-02 | 5.54E-02 | 0.0 | 5.54E-02 |
| T15 | Settling Tank | 20,380,000 | 0.848 | 1.51E-02 | 0.0 | 1.51E-02 |
| T16 | Glycerine Collection | 1,370,000 | 1.00E-04 | 1.00E-04 | 0.0 | 1.00E-04 |
| T17 | Glycerine Storage | 456,667 | 6.10E-04 | 6.10E-04 | 0.0 | 6.10E-04 |
| T18 | Glycerine Storage | 456,667 | 6.10E-04 | 6.10E-04 | 0.0 | 6.10E-04 |
| T19 | Glycerine Storage | 456,667 | 6.10E-04 | 6.10E-04 | 0.0 | 6.10E-04 |
| T20 | Biodiesel Collection | 19,000,000 | 2.02E-03 | 0.0 | 0.0 | 0.00 |
| T21 | Ionic Resin | 950,000 | 1.95E-04 | 0.0 | 0.0 | 0.00 |
| T22 | Ionic Resin | 950,000 | 1.95E-04 | 0.0 | 0.0 | 0.00 |
| T23 | Large Biodiesel Storage | 6,333,333 | 0.015 | 0.0 | 0.0 | 0.00 |
| T24 | Large Biodiesel Storage | 6,333,333 | 0.015 | 0.0 | 0.0 | 0.00 |
| T25 | Large Biodiesel Storage | 6,333,333 | 0.015 | 0.0 | 0.0 | 0.00 |
| T26 | Small Biodiesel Storage | 4,750,000 | 0.011 | 0.0 | 0.0 | 0.00 |
| T27 | Small Biodiesel Storage | 4,750,000 | 0.011 | 0.0 | 0.0 | 0.00 |
| T28 | Small Biodiesel Storage | 4,750,000 | 0.011 | 0.0 | 0.0 | 0.00 |
| T29 | Small Biodiesel Storage | 4,750,000 | 0.011 | 0.0 | 0.0 | 0.00 |
| **Total** | | | **2.48** | **0.20** | **0.001** | **0.198** |

**Methodology**
Emissions were calculated by the Source using EPA's Tanks 4.09(d) and have been verified by IDEM.
All throughputs based on maximum annual production listed and stoichiometric relationships as provided by the source.
*The methanol storage tank is controlled by an integral condenser. Therefore, the potential to emit VOC from the methanol storage tank has been determined after the condenser (95% control efficiency).
The methanol vacuum recovery system has been determined an integral part of the biodiesel reactor. Therefore, the potential to emit VOC for the biodiesel reactor has been deterimined after the methanol vacuum recovery system.

**Assumes 95% control efficiency (i.e. 5% of methanol not recovered and emitted via the water wash storage tank) by the integral methanol vacuum recovery system.

**Appendix A: Emission Calculations**
**Unloading Emission Estimates**

**Company Name:** Southern Indiana Biodiesel LLC
**Address City IN Zip:** 5700 Prospect Drive, Newburgh, Indiana 47630
**Permit Number:** 173-26785-00109
**Reviewer:** Brian Williams

**1. Emission Factors: AP-42**

The biodiesel production processes requires feedstock (vegetable oils or animal fats) and alcohols (methanol and isopropanol). All products are shipped onsite by truck. Trucks will be filled by a submerged fill pipe loading process. Emissions from the receiving of raw materials are uncontrolled.

Raw Materials:
1) Feedstock (vegetable oils or animal fats) will be shipped onsite by truck. Calculations assume that trucks these trucks are in dedicated service (i.e., the type of cargo previously transported was also feedstock).

2) Alcohols (methanol isopropanol) will be shipped offsite by truck. Calculations assume that these trucks are in dedicated service (i.e., the type of cargo previously transported was also alcohol).

According to AP-42, Chapter 5.2 - Transportation and Marketing of Petroleum Liquids (01/95), the VOC emission factors for the truck loading rack 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) (see AP-42, Table 7.1-2)
M = molecular weight of vapors
T = temperature of the bulk liquid loaded (degree R)

| | S | P (psia) | M (lbs/mole lbs) | T (degree R) | L (lbs/kgal) |
|---|---|---|---|---|---|
| **Liquid Outputs** | | | | | |
| Feedstock | 0.6 | 0.011 | 300 | 530 | 0.047 |
| Methanol | 0.6 | 1.953 | 32 | 530 | 0.882 |
| Isopropanol | 0.6 | 0.68 | 60.0 | 530 | 0.576 |

**2. Potential to Emit VOC:**

| | Max. Throughput (kgals/yr) | PTE of VOC (lbs/yr) | PTE of VOC (tons/yr) |
|---|---|---|---|
| **Liquid Outputs** | | | |
| Feedstock | 18,900 | 880 | 0.44 |
| Methanol | 4,697 | 4,141 | 2.07 |
| Isopropanol | 2,110 | 1214.33 | 0.61 |
| **Total** | | **6,235** | **3.12** |

**Methodology**
PTE of VOC (tons/yr) = loading loss (lbs/kgal) x Max. Throughput (kgals/yr) x 1 ton/ 2,000 lbs

**Appendix A: Emission Calculations**
**Loadout Emission Estimates**

**Company Name:** **Southern Indiana Biodiesel LLC**
**Address City IN Zip:** **5700 Prospect Drive, Newburgh, Indiana 47630**
**Permit Number:** **173-26785-00109**
**Reviewer:** **Brian Williams**

**1. Emission Factors: AP-42**

The biodiesel production processes produces bio-diesel and glycerin. All products are shipped offsite by truck. Trucks will be filled by a submerged fill pipe loading process. Resulting loadout emissions are uncontrolled.

Final Products:
1) Biodiesel will be shipped offsite by truck. Calculations assume that trucks are in dedicated service (i.e., the type of cargo previously transported was also biodiesel).

2) Glycerin will be shipped offsite by truck. Calculations assume that these trucks are in dedicated service (i.e., the type of cargo previously transported was also glycerin)

According to AP-42, Chapter 5.2 - Transportation and Marketing of Petroleum Liquids (01/95), the VOC emission factors for the truck loading rack 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) (see AP-42, Table 7.1-2)
M = molecular weight of vapors
T = temperature of the bulk liquid loaded (degree R)

| | S | P (psia) | M (lbs/mole lbs) | T (degree R) | L (lbs/kgal) |
|---|---|---|---|---|---|
| **Liquid Outputs** | | | | | |
| Biodiesel | 0.6 | 0.011 | 300 | 530 | 0.047 |
| Glycerin | 0.6 | 0.019 | 92.1 | 530 | 0.03 |

**2. Potential to Emit VOC:**

| | Max. Throughput (kgals/yr) | PTE of VOC (lbs/yr) | PTE of VOC (tons/yr) |
|---|---|---|---|
| **Liquid Outputs** | | | |
| Biodiesel | 19,000 | 884 | 0.44 |
| Glycerin | 1,370 | 34.41 | 1.72E-02 |
| **Total** | | **919** | **0.46** |

**Methodology**
PTE of VOC (tons/yr) = loading loss (lbs/kgal) x Max. Throughput (kgals/yr) x 1 ton/ 2,000 lbs

**Appendix A: Emission Calculations**
**Caustic Addition Emissions**

**Company Name:** **Southern Indiana Biodiesel LLC**
**Address City IN Zip:** **5700 Prospect Drive, Newburgh, Indiana 47630**
**Permit Number:** **173-26785-00109**
**Reviewer:** **Brian Williams**

| Annual Caustic Usage Rate (tons/yr) | Transfer Loss (lbs/ton) | Potential PM Emissions (lbs/hr) | **Potential PM Emissions (tons/yr)** |
|---|---|---|---|
| 725 | 40.0 | 3.31 | **14.5** |

**Methodology**
Transfer loss (2% or 40 lbs/ton) provided by source and is a conservative estimate of handling loss of dry caustic
Potential PM/PM10 Emissions (lbs/hr) = Annual Usage Rate (tons/yr) * Transfer Loss (lbs/ton) * 1/8760 (yr/hrs)
Potential PM/PM10 Emissions (tons/yr) = Potential PM/PM10 Emissions (lbs/hr) * 1/2000 (ton/lbs) * 8760 (hrs/yr)
PM10, PM2.5 = PM

**Appendix A: Emissions Calculations**
**Natural Gas Combustion Only**
**MM BTU/HR <100**

**Company Name:** **Southern Indiana Biodiesel LLC**
**Address City IN Zip:** **5700 Prospect Drive, Newburgh, Indiana 47630**
**Permit Number:** **173-26785-00109**
**Reviewer:** **Brian Williams**

| Heat Input Capacity MMBtu/hr | Potential Throughput MMCF/yr |
|---|---|
| 6.30 | 55.2 |

| | Pollutant | | | | | |
|---|---|---|---|---|---|---|
| | PM* | PM10* | SO2 | NOx | VOC | CO |
| Emission Factor in lb/MMCF | 1.9 | 7.6 | 0.6 | 100.0<br>**see below | 5.5 | 84.0 |
| Potential Emission in tons/yr | 0.052 | 0.210 | 0.02 | 2.76 | 0.15 | 2.32 |

*PM emission factor is filterable PM only. PM10 emission factor is filterable and condensable PM10 combined. PM10 = PM2.5
**Emission Factors for NOx: Uncontrolled = 100, Low NOx Burner = 50, Low NOx Burners/Flue gas recirculation = 32

| | HAPs - Organics | | | | |
|---|---|---|---|---|---|
| | Benzene | Dichlorobenzene | Formaldehyde | Hexane | Toluene |
| Emission Factor in lb/MMcf | 2.1E-03 | 1.2E-03 | 7.5E-02 | 1.8E+00 | 3.4E-03 |
| Potential Emission in tons/yr | 5.795E-05 | 3.311E-05 | 2.070E-03 | 4.967E-02 | 9.382E-05 |

| | HAPs - Metals | | | | |
|---|---|---|---|---|---|
| | Lead | Cadmium | Chromium | Manganese | Nickel |
| Emission Factor in lb/MMcf | 5.0E-04 | 1.1E-03 | 1.4E-03 | 3.8E-04 | 2.1E-03 |
| Potential Emission in tons/yr | 1.380E-05 | 3.035E-05 | 3.863E-05 | 1.049E-05 | 5.795E-05 |

**Methodology**
All emission factors are based on normal firing.
MMBtu = 1,000,000 Btu
MMCF = 1,000,000 Cubic Feet of Ga
Potential Throughput (MMCF) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1 MMCF/1,000 MMBtu
Emission Factors are from AP 42, Chapter 1.4, Tables 1.4-1, 1.4-2, 1.4-3, SCC #1-02-006-02, 1-01-006-02, 1-03-006-02, and 1-03-006-03 (SUPPLEMENT D 3/98)
Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton
The five highest organic and metal HAPs emission factors are provided above.
Additional HAPs emission factors are available in AP-42, Chapter 1.4.

**Appendix A: Emissions Calculations**
**Cooling Tower Emissions**

**Company Name:** **Southern Indiana Biodiesel LLC**
**Address City IN Zip:** **5700 Prospect Drive, Newburgh, Indiana 47630**
**Permit Number:** **173-26785-00109**
**Reviewer:** **Brian Williams**

| Emission Unit | Recirculation Rate (gal/min)* | Drift Loss (%) | Drift Loss Rate (gal/min)* | Water Density (lbs/gal) | Total Dissolved Solids (ppm) | Total Solids Lost (lbs/min) | Total Solids Lost (tons/yr) | PM10 Portion of Solids Lost (%)** | PM10 Emissions (tons/yr) |
|---|---|---|---|---|---|---|---|---|---|
| Cooling Tower | 2000 | 0.01% | 0.2 | 8.34 | 4000 | 0.00667 | 1.75 | 64.10% | **1.12** |

**Methodology**
*Recirculation Rate and Drift Loss provided by the source
** PM10 portion based on Environmental Progress, July 2002, "Calculating Realistic PM10 Emissions from Cooling Towers."
Drift Loss Rate (gal/min) = Recirculation Rate (ga/min) * Drift Loss (%)
Total Solids Lost (lbs/min) = Drift Loss Rate (gal/min) * Water Density (lbs/gal) * [Total Dissolved Solids (ppm) * 10^6]
Total Solids Lost (tons/yr) = Total Solids Lost (lbs/min) * 60 (min/hr) * 8,760 (hrs/yr) * 1/2000 (ton/lbs)
PM10 Emissions (tons/yr) = Total Solids Lost (tons/yr) * PM10 Portion of Solids Lost (%)

**Appendix A: Emission Calculations**
**Fugitive Equipment Leak VOC Emission Estimates**

**Company Name:** **Southern Indiana Biodiesel LLC**
**Address City IN Zip:** **5700 Prospect Drive, Newburgh, Indiana 47630**
**Permit Number:** **173-26785-00109**
**Reviewer:** **Brian Williams**

| Equipment Type | Service | VOC Emission Factor (kg/hr/source) | Weight Fraction of VOC % | Number of pieces | PTE of VOC (kg/hr) | PTE of VOC (lb/hr) | PTE of VOC Before Control (tons/yr) | Control Effectiveness % | *PTE of VOC After Control (tons/yr) |
|---|---|---|---|---|---|---|---|---|---|
| Pump | heavy liquid | 0.00862 | 100.00% | 19 | 0.16 | 0.36 | 1.58 | 0.00% | 1.58 |
| Pump | light liquid | 0.0199 | 100.00% | 2 | 0.04 | 0.09 | 0.38 | 0.00% | 0.38 |
| Pump | gas | 0.0199 | 100.00% | 2 | 3.98E-02 | 0.09 | 0.38 | 0.00% | 0.38 |
| Valves | gas | 0.00597 | 100.00% | 10 | 0.06 | 0.13 | 0.58 | 0.00% | 0.58 |
| Valves | heavy liquid | 0.00023 | 100.00% | 143 | 3.29E-02 | 0.07 | 0.32 | 0.00% | 0.32 |
| Valves | light liquid | 0.00403 | 100.00% | 23 | 9.27E-02 | 0.20 | 0.89 | 0.00% | 0.89 |
| Pressure Relief Device with Rupture Disk* | gas | 0.104 | 100.00% | 3 | 3.12E-01 | 0.69 | 3.01 | 100.00% | 0.0 |
| Connectors | all | 0.00183 | 100.00% | 808 | 1.48E+00 | 3.25 | 14.25 | 0.00% | 14.25 |
| | | | | **TOTAL** | **2.22** | **4.88** | **21.39** | | **18.38** |

**Methodology**
PTE of VOC (kg/hr) = Emission Factor (kg/hr/source) x Weight Fraction of VOC (%) x Number of pieces
PTE of VOC (tons/yr) = PTE of VOC (kg/hr) x 8,760 hrs/1 yr x 1,000 g/1 kg x 1 lb/453 g x 1 ton/ 2,000 lbs
Emission estimates and Control Effectiveness are based upon EPA emission factors originally contained in Protocol for Equipment Leak Emission Estimates (EPA-453/R-95-017), SOCMI Average Emission Factors (Table 2-1) and Table 5-1.

*Unlimited PTE is based on the design of the storage tanks. According to Protocol for Equipment Leak Emission Estimates pressure relief devices with rupture disks have a 100% control efficiency.

**Appendix A: Emission Calculations**
**Fugitive Equipment Leak HAP Emission Estimates**

**Company Name:** Southern Indiana Biodiesel LLC
**Address City IN Zip:** 5700 Prospect Drive, Newburgh, Indiana 47630
**Permit Number:** 173-26785-00109
**Reviewer:** Brian Williams

| Process | Equipment Type | Service | VOC Emission Factor (kg/hr/source) | Weight Fraction of Methanol % | Weight Fraction of Propylene Oxide % | Number of Pieces | PTE of Methanol (kg/hr) | PTE of Methanol (lb/hr) | PTE of Methanol (tons/yr) | PTE of Propylene Oxide (kg/hr) | PTE of Propylene Oxide (lb/hr) | PTE of Propylene Oxide (tons/yr) | Control Effectiveness % | *Total HAPs PTE (tons/yr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bulk Storage - Glycerine | Pump | heavy liquid | 0.00862 | 0.16% | 0.0% | 1 | 1.38E-05 | 3.03E-05 | 1.33E-04 | 0.0 | 0.0 | 0.0 | 0.0% | 1.33E-04 |
| | Valves | heavy liquid | 0.00023 | 0.16% | 0.0% | 12 | 4.42E-06 | 9.72E-06 | 4.26E-05 | 0.0 | 0.0 | 0.0 | 0.0% | 4.26E-05 |
| | Connectors | all | 0.00183 | 0.16% | 0.0% | 52 | 1.52E-04 | 3.35E-04 | 1.47E-03 | 0.0 | 0.0 | 0.0 | 0.0% | 1.47E-03 |
| Reaction - Feedstock and alcohols | Valves | light liquid | 0.00403 | 16.80% | 0.0% | 2 | 1.35E-03 | 2.98E-03 | 0.013 | 0.0 | 0.0 | 0.0 | 0.0% | 0.013 |
| | Connectors | all | 0.00183 | 16.80% | 0.0% | 8 | 2.46E-03 | 0.005 | 0.024 | 0.0 | 0.0 | 0.0 | 0.0% | 0.024 |
| Reaction - Mixed alcohols | Pump | light liquid | 0.0199 | 68.60% | 0.0% | 1 | 0.014 | 0.03 | 0.13 | 0.0 | 0.0 | 0.0 | 0.0% | 0.13 |
| | Valves | light liquid | 0.00403 | 68.60% | 0.0% | 3 | 8.29E-03 | 0.018 | 0.08 | 0.0 | 0.0 | 0.0 | 0.0% | 0.08 |
| | Connectors | all | 0.00183 | 68.60% | 0.0% | 16 | 2.01E-02 | 0.044 | 0.194 | 0.0 | 0.0 | 0.0 | 0.0% | 0.194 |
| Reaction - Methanol only | Pump | light liquid | 0.0199 | 100.00% | 0.0% | 1 | 1.99E-02 | 0.044 | 0.192 | 0.0 | 0.0 | 0.0 | 0.0% | 0.192 |
| | Valves | light liquid | 0.00403 | 100.00% | 0.0% | 15 | 6.05E-02 | 0.13 | 0.58 | 0.0 | 0.0 | 0.0 | 0.0% | 0.58 |
| | Pressure Relief with rupture disk* | gas | 0.104 | 100.00% | 0.0% | 2 | 2.08E-01 | 0.46 | 2.00 | 0.0 | 0.0 | 0.0 | 100.00% | 0.00 |
| | Connectors | all | 0.00183 | 100.00% | 0.0% | 72 | 0.13 | 0.29 | 1.27 | 0.0 | 0.0 | 0.0 | 0.0% | 1.27 |
| Settling - Glycerine split | Pump | heavy liquid | 0.00862 | 0.16% | 0.0% | 2 | 2.76E-05 | 6.07E-05 | 2.66E-04 | 0.0 | 0.0 | 0.0 | 0.0% | 2.66E-04 |
| | Valves | heavy liquid | 0.00023 | 0.16% | 0.0% | 11 | 4.05E-06 | 8.91E-06 | 3.90E-05 | 0.0 | 0.0 | 0.0 | 0.0% | 3.90E-05 |
| | Connectors | all | 0.00183 | 0.16% | 0.0% | 52 | 1.52E-04 | 3.35E-04 | 1.47E-03 | 0.0 | 0.0 | 0.0 | 0.0% | 1.47E-03 |
| Reaction - Propylene Oxide Only | Pumps | gas | 0.0199 | 0.0% | 100.00% | 2 | 0.0 | 0.0 | 0.0 | 0.04 | 0.09 | 0.38 | 0.0% | 0.38 |
| | Valves | gas | 0.00597 | 0.0% | 100.00% | 10 | 0.0 | 0.0 | 0.0 | 0.06 | 0.13 | 0.58 | 0.0% | 0.58 |
| | Connectors | all | 0.00183 | 0.0% | 100.00% | 48 | 0.0 | 0.0 | 0.0 | 0.09 | 0.19 | 0.85 | 0.0% | 0.85 |
| **Total Emissions** | | | | | | | | | **4.49** | | | **1.81** | | **4.29** |

**Methodology**
PTE HAP (kg/hr) = VOC EF (kg/hr/source) * Weight Fraction HAP (%) * Number of Pieces
PTE of HAP (lb/hr) = PTE of HAP (kg/hr) * 1,000 g/1 kg * 1 lb/453 g
PTE of HAP (tons/yr) = PTE of HAP (lb/hr) * 8,760 hrs/1 yr * 1 ton/ 2,000 lbs
Emission estimates and Control Effectiveness are based upon EPA emission factors originally contained in Protocol for Equipment Leak Emission Estimates (EPA-453/R-95-017), SOCMI Average Emission Factors (Table 2-1) and Table 5-1.
*Unlimited PTE is based on the design of the storage tanks. According to Protocol for Equipment Leak Emission Estimates pressure relief devices with rupture disks have a 100% control efficiency.

**Appendix A: Emission Calculations**
**Fugitive Dust Emissions - Paved Roads**

**Company Name:** **Southern Indiana Biodiesel LLC**
**Address City IN Zip:** **5700 Prospect Drive, Newburgh, Indiana 47630**
**Permit Number:** **173-26785-00109**
**Reviewer:** **Brian Williams**

**Paved Roads at Industrial Site**
The following calculations determine the amount of emissions created by paved roads, based on 8,760 hours of use and AP-42, Ch 13.2.1 (12/2003).

Vehicle Informtation (provided by source)

| Type | Maximum round trips per year (trip/year) | Maximum Weight Loaded (tons/trip) | Total Weight driven per year (ton/year) | Maximum one way distance (feet/trip) | Maximum one way distance (mi/trip) | Maximum round trip miles (miles/year) |
|---|---|---|---|---|---|---|
| Feedstock Tanker | 2520.0 | 34.0 | 85680.0 | 315 | 0.060 | 150.3 |
| Methanol Tanker | 607.0 | 34.0 | 20638.0 | 315 | 0.060 | 36.2 |
| Sodium Methylate Tanker | 28.0 | 34.0 | 952.0 | 315 | 0.060 | 1.7 |
| IPA Tanker | 281.0 | 34.0 | 9554.0 | 315 | 0.060 | 16.8 |
| Propylene Oxide Tanker | 133.0 | 34.0 | 4522.0 | 315 | 0.060 | 7.9 |
| Caustic Tanker | 28.0 | 34.0 | 952.0 | 315 | 0.060 | 1.7 |
| Nitrogen Tanker | 52.0 | 34.0 | 1768.0 | 315 | 0.060 | 3.1 |
| Biodiesel Tanker (shipments) | 2533.0 | 34.0 | 86122.0 | 315 | 0.060 | 151.1 |
| Glycerin Tanker (shipments) | 183.0 | 34.0 | 6222.0 | 315 | 0.060 | 10.9 |
| Employees/Vendors | 14600.0 | 2.0 | 29200.0 | 50 | 0.009 | 138.3 |
| **Total** | **20965.0** | | **245610.0** | | | **518.0** |

Average Vehicle Weight Per Trip = 25.46 tons/trip
Average Miles Per Trip = 0.02 miles/trip

Unmitigated Emission Factor, Ef = [k * (sL/2)^0.65 * (W/3)^1.5 - C] (Equation 1 from AP-42 13.2.1)

| | PM | PM10 | PM2.5 | |
|---|---|---|---|---|
| where k = | 0.082 | 0.016 | 0.0024 | lb/mi = particle size multiplier (AP-42 Table 13.2.1-1) |
| W = | 25.5 | 25.5 | 25.5 | tons = average vehicle weight (provided by source) |
| C = | 0.00047 | 0.00047 | 0.00036 | lb/mi = emission factor for vehicle exhaust, brake wear, and tire wear (AP-42 Table 13.2.1-2) |
| sL = | 1.2 | 1.2 | 1.2 | g/m^2 = Ubitiguous Baseline Silt Loading Values of paved roads (Table 13.2.1-3 for summer months) |

Taking natural mitigation due to precipitation into consideration, Mitigated Emission Factor, Eext = E * [1 - (p/4N)]
Mitigated Emission Factor, Eext = Ef * [1 - (p/4N)]
where p = 115 days of rain greater than or equal to 0.01 inches (see Fig. 13.2.1-2)
N = 365 days per year

| | PM | PM10 | PM2.5 | |
|---|---|---|---|---|
| Unmitigated Emission Factor, Ef = | 1.45 | 0.28 | 0.04 | lb/mile |
| Mitigated Emission Factor, Eext = | 1.34 | 0.26 | 0.04 | lb/mile |
| Dust Control Efficiency = | 50% | 50% | 50% | (pursuant to control measures outlined in fugitive dust control plan) |

| Process | Unmitigated PTE of PM (tons/yr) | Unmitigated PTE of PM10 (tons/yr) | Unmitigated PTE of PM2.5 (tons/yr) | Mitigated PTE of PM (tons/yr) | Mitigated PTE of PM10 (tons/yr) | Mitigated PTE of PM2.5 (tons/yr) | Controlled PTE of PM (tons/yr) | Controlled PTE of PM10 (tons/yr) | Controlled PTE of PM2.5 (tons/yr) |
|---|---|---|---|---|---|---|---|---|---|
| Feedstock Tanker | 1.09E-01 | 2.13E-02 | 3.17E-03 | 1.01E-01 | 1.96E-02 | 2.92E-03 | 5.03E-02 | 9.81E-03 | 1.46E-03 |
| Methanol Tanker | 2.63E-02 | 5.13E-03 | 7.64E-04 | 2.43E-02 | 4.73E-03 | 7.04E-04 | 1.21E-02 | 2.36E-03 | 3.52E-04 |
| Sodium Methylate Tanker | 1.21E-03 | 2.37E-04 | 3.53E-05 | 1.12E-03 | 2.18E-04 | 3.25E-05 | 5.59E-04 | 1.09E-04 | 1.62E-05 |
| IPA Tanker | 1.22E-02 | 2.37E-03 | 3.54E-04 | 1.12E-02 | 2.19E-03 | 3.26E-04 | 5.61E-03 | 1.09E-03 | 1.63E-04 |
| Propylene Oxide Tanker | 5.77E-03 | 1.12E-03 | 1.67E-04 | 5.31E-03 | 1.04E-03 | 1.54E-04 | 2.66E-03 | 5.18E-04 | 7.71E-05 |
| Caustic Tanker | 1.21E-03 | 2.37E-04 | 3.53E-05 | 1.12E-03 | 2.18E-04 | 3.25E-05 | 5.59E-04 | 1.09E-04 | 1.62E-05 |
| Nitrogen Tanker | 2.26E-03 | 4.39E-04 | 6.55E-05 | 2.08E-03 | 4.05E-04 | 6.03E-05 | 1.04E-03 | 2.02E-04 | 3.02E-05 |
| Biodiesel Tanker (shipments) | 1.10E-01 | 2.14E-02 | 3.19E-03 | 1.01E-01 | 1.97E-02 | 2.94E-03 | 5.06E-02 | 9.86E-03 | 1.47E-03 |
| Glycerin Tanker (shipments) | 7.94E-03 | 1.55E-03 | 2.30E-04 | 7.31E-03 | 1.42E-03 | 2.12E-04 | 3.66E-03 | 7.12E-04 | 1.06E-04 |
| Employees/Vendors | 1.01E-01 | 1.96E-02 | 2.92E-03 | 9.26E-02 | 1.80E-02 | 2.69E-03 | 4.63E-02 | 9.02E-03 | 1.34E-03 |
| | **0.38** | **0.07** | **0.01** | **0.35** | **0.07** | **0.01** | **0.17** | **0.03** | **0.01** |

**Methodology**
Total Weight driven per day (ton/day) = [Maximum Weight Loaded (tons/trip)] * [Maximum trips per day (trip/day)]
Maximum one-way distance (mi/trip) = [Maximum one-way distance (feet/trip) / [5280 ft/mile]
Maximum one-way miles (miles/day) = [Maximum trips per year (trip/day)] * [Maximum one-way distance (mi/trip)]
Average Vehicle Weight Per Trip (ton/trip) = [SUM max round trip tanker miles (mi/yr) / SUM max round trip miles (mi/yr) * 34 (tons/trip)] + [SUM max round trip employee miles (mi/yr) / SUM max round trip miles (mi/yr) * 2 (tons/trip)]
Average Miles Per Trip (miles/trip) = SUM[Maximum one-way miles (miles/day)] / SUM[Maximum trips per year (trip/day)]
Unmitigated PTE (tons/yr) = [Maximum one-way miles (miles/yr)] * [Unmitigated Emission Factor (lb/mile)] * (ton/2000 lbs)
Mitigated PTE (tons/yr) = [Maximum one-way miles (miles/yr)] * [Mitigated Emission Factor (lb/mile)] * (ton/2000 lbs)
Controlled PTE (tons/yr) = [Mitigated PTE (tons/yr)] * [1 - Dust Control Efficiency]

**Abbreviations**
PM = Particulate Matter
PM10 = Particulate Matter (≤10 um)
PM2.5 = Particulate Matter (≤2.5 um)
PTE = Potential to Emit

**Appendix A: Emission Calculations**
**Fugitive Dust Emissions - Unpaved Roads**

**Company Name:** **Southern Indiana Biodiesel LLC**
**Address City IN Zip:** **5700 Prospect Drive, Newburgh, Indiana 47630**
**Permit Number:** **173-26785-00109**
**Reviewer:** **Brian Williams**

**Unpaved Roads at Industrial Site**
The following calculations determine the amount of emissions created by unpaved roads, based on 8,760 hours of use and AP-42, Ch 13.2.2 (12/2003).

Vehicle Informtation (provided by source)

| Type | Maximum trips per year (trip/yr) | Maximum Weight Loaded (tons/trip) | Total Weight driven per year (ton/yr) | Maximum one-way distance (feet/trip) | Maximum one-way distance (mi/trip) | Maximum one-way miles (miles/yr) |
|---|---|---|---|---|---|---|
| Feedstock Tanker | 2520.0 | 34.0 | 85680.0 | 275.0 | 0.052 | 131.3 |
| Methanol Tanker | 607.0 | 34.0 | 20638.0 | 275.0 | 0.052 | 31.6 |
| Sodium Methylate Tanker | 28.0 | 34.0 | 952.0 | 275.0 | 0.052 | 1.5 |
| IPA Tanker | 281.0 | 34.0 | 9554.0 | 275.0 | 0.052 | 14.6 |
| Propylene Oxide Tanker | 133.0 | 34.0 | 4522.0 | 275.0 | 0.052 | 6.9 |
| Caustic Tanker | 28.0 | 34.0 | 952.0 | 275.0 | 0.052 | 1.5 |
| Nitrogen Tanker | 52.0 | 34.0 | 1768.0 | 275.0 | 0.052 | 2.7 |
| Biodiesel Tanker (shipments) | 2533.0 | 34.0 | 86122.0 | 275.0 | 0.052 | 131.9 |
| Glycerin Tanker (shipments) | 183.0 | 34.0 | 6222.0 | 275.0 | 0.052 | 9.5 |
| **Total** | **6365.0** | | **216410.0** | | | **331.5** |

Average Vehicle Weight Per Trip = 34.0 tons/trip
Average Miles Per Trip = 0.05 miles/trip

Unmitigated Emission Factor, Ef = k*[(s/12)^a]*[(W/3)^b] (Equation 1a from AP-42 13.2.2)

| | PM | PM10 | PM2.5 | |
|---|---|---|---|---|
| where k = | 4.9 | 1.5 | 0.15 | lb/mi = particle size multiplier (AP-42 Table 13.2.2-2 for Industrial Roads) |
| s = | 6 | 6 | 6 | % = mean % silt content of unpaved roads (AP-42 Table 13.2.2-3 Sand/Gravel Processing Plant Road) |
| a = | 0.7 | 0.9 | 0.9 | = constant (AP-42 Table 13.2.2-2) |
| W = | 34.0 | 34.0 | 34.0 | tons = average vehicle weight (provided by source) |
| b = | 0.45 | 0.45 | 0.45 | = constant (AP-42 Table 13.2.2-2) |

Taking natural mitigation due to precipitation into consideration, Mitigated Emission Factor, Eext = E * [(365 - P)/365]
Mitigated Emission Factor, Eext = E * (365 - P)/365]
where P = 115 days of rain greater than or equal to 0.01 inches (see Fig. 13.2.2-1)

| | PM | PM10 | PM2.5 | |
|---|---|---|---|---|
| Unmitigated Emission Factor, Ef = | 8.99 | 2.40 | 0.24 | lb/mile |
| Mitigated Emission Factor, Eext = | 6.16 | 1.64 | 0.16 | lb/mile |
| Dust Control Efficiency = | 50% | 50% | 50% | (pursuant to control measures outlined in fugitive dust control plan) |

| Process | Unmitigated PTE of PM (tons/yr) | Unmitigated PTE of PM10 (tons/yr) | Unmitigated PTE of PM2.5 (tons/yr) | Mitigated PTE of PM (tons/yr) | Mitigated PTE of PM10 (tons/yr) | Mitigated PTE of PM2.5 (tons/yr) | Controlled PTE of PM (tons/yr) | Controlled PTE of PM10 (tons/yr) | Controlled PTE of PM2.5 (tons/yr) |
|---|---|---|---|---|---|---|---|---|---|
| Feedstock Tanker | 0.59 | 0.16 | 1.57E-02 | 0.40 | 0.11 | 1.08E-02 | 0.20 | 5.39E-02 | 5.39E-03 |
| Methanol Tanker | 0.14 | 0.04 | 3.79E-03 | 0.10 | 2.59E-02 | 2.59E-03 | 4.87E-02 | 1.30E-02 | 1.30E-03 |
| Sodium Methylate Tanker | 0.01 | 1.75E-03 | 1.75E-04 | 4.49E-03 | 1.20E-03 | 1.20E-04 | 2.25E-03 | 5.99E-04 | 5.99E-05 |
| IPA Tanker | 0.07 | 0.02 | 1.75E-03 | 0.05 | 1.20E-02 | 1.20E-03 | 2.25E-02 | 6.01E-03 | 6.01E-04 |
| Propylene Oxide Tanker | 0.03 | 0.01 | 8.30E-04 | 0.02 | 5.69E-03 | 5.69E-04 | 1.07E-02 | 2.84E-03 | 2.84E-04 |
| Caustic Tanker | 0.01 | 1.75E-03 | 1.75E-04 | 4.49E-03 | 1.20E-03 | 1.20E-04 | 2.25E-03 | 5.99E-04 | 5.99E-05 |
| Nitrogen Tanker | 0.01 | 3.25E-03 | 3.25E-04 | 0.01 | 2.22E-03 | 2.22E-04 | 4.17E-03 | 1.11E-03 | 1.11E-04 |
| Biodiesel Tanker (shipments) | 0.59 | 0.16 | 1.58E-02 | 0.41 | 0.11 | 1.08E-02 | 0.20 | 5.41E-02 | 5.41E-03 |
| Glycerin Tanker (shipments) | 0.04 | 0.01 | 1.14E-03 | 0.03 | 7.82E-03 | 7.82E-04 | 1.47E-02 | 3.91E-03 | 3.91E-04 |
| | **1.49** | **0.40** | **0.04** | **1.02** | **0.27** | **0.03** | **0.51** | **0.14** | **0.01** |

**Methodology**

| | |
|---|---|
| Total Weight driven per day (ton/day) | = [Maximum Weight Loaded (tons/trip)] * [Maximum trips per day (trip/day)] |
| Maximum one-way distance (mi/trip) | = [Maximum one-way distance (feet/trip) / [5280 ft/mile] |
| Maximum one-way miles (miles/day) | = [Maximum trips per year (trip/day)] * [Maximum one-way distance (mi/trip)] |
| Average Vehicle Weight Per Trip (ton/trip) | = SUM[Total Weight driven per day (ton/day)] / SUM[Maximum trips per day (trip/day)] |
| Average Miles Per Trip (miles/trip) | = SUM[Maximum one-way miles (miles/day)] / SUM[Maximum trips per year (trip/day)] |
| Unmitigated PTE (tons/yr) | = (Maximum one-way miles (miles/yr)) * (Unmitigated Emission Factor (lb/mile)) * (ton/2000 lbs) |
| Mitigated PTE (tons/yr) | = (Maximum one-way miles (miles/yr)) * (Mitigated Emission Factor (lb/mile)) * (ton/2000 lbs) |
| Controlled PTE (tons/yr) | = (Mitigated PTE (tons/yr)) * (1 - Dust Control Efficiency) |

**Abbreviations**
PM = Particulate Matter
PM10 = Particulate Matter (<10 um)
PTE = Potential to Emit

**Appendix A: Emission Calculations**
**Summary of Emissions**

**Company Name:** Southern Indiana Biodiesel LLC
**Address City IN Zip:** 5700 Prospect Drive, Newburgh, Indiana 47630
**Permit Number:** 173-26785-00109
**Reviewer:** Brian Williams

| Uncontrolled Potential to Emit (tons/yr) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Process/Emission Unit** | **PM** | **PM10** | **PM2.5** | **$SO_2$** | **NOx** | **VOC** | **CO** | **Total HAPs** | **Single HAP** | |
| Storage Tanks | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.48 | 0.0 | 0.20 | 0.20 | Methanol |
| Raw Material Unloading | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.12 | 0.0 | 0.0 | 0.0 | |
| Product Truck Loadout | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.46 | 0.0 | 0.0 | 0.0 | |
| Caustic Addition | 14.5 | 14.5 | 14.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Natural Gas-Fired Boiler | 0.05 | 0.21 | 0.21 | 0.02 | 2.76 | 0.15 | 2.32 | 0.05 | 0.05 | Hexane |
| Cooling Tower | 1.75 | 1.12 | 1.12 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Fugitive Equipment Leaks | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 18.38 | 0.0 | 4.29 | 2.49 | Methanol |
| Fugitive Paved Roads | 0.35 | 0.07 | 0.01 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Fugitive Unpaved Roads | 1.02 | 0.27 | 0.03 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| **Total** | **17.67** | **16.17** | **15.87** | **0.02** | **2.76** | **24.59** | **2.32** | **4.54** | **2.69** | **Methanol** |