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: November 13, 2008

RE: Koch Nitrogen Company / 069-26780-00058

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

Notice of Decision: Approval - Effective Immediately

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

If you wish to challenge this decision, IC 4-21.5-3 and IC 13-15-6-1 require that you file a petition for administrative review. This petition may include a request for stay of effectiveness and must be submitted to the Office of Environmental Adjudication, 100 North Senate Avenue, Government Center North, 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
FNPER.dot12/03/07

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Minor Source Operating Permit
OFFICE OF AIR QUALITY

Koch Nitrogen Company
502 East Hosler Road
Huntington, Indiana 46750

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

This permit is issued to the above mentioned company under the provisions of 326 IAC 2-1.1, 326 IAC 2-6.1 and 40 CFR 52.780, with conditions listed on the attached pages.

Indiana statutes from IC 13 and rules from 326 IAC, quoted in conditions in this permit, are those applicable at the time the permit was issued. The issuance or possession of this permit shall not alone constitute a defense against an alleged violation of any law, regulation or standard, except for the requirement to obtain a MSOP under 326 IAC 2-6.1.

Operation Permit No.: M069-26780-00058	
Issued by/Original Signed By: Alfred C. Dumaual, Ph. D., Section Chief Permits Branch Office of Air Quality	Issuance Date: November 13, 2008 Expiration Date: November 13, 2013

TABLE OF CONTENTS

C.15 Actions Related to Noncompliance Demonstrated by a Stack Test

Record Keeping and Reporting Requirements [326 IAC 2-6.1-5(a)(2)]

C.16 Malfunctions Report [326 IAC 1-6-2]
C.17 General Record Keeping Requirements [326 IAC 2-6.1-5]
C.18 General Reporting Requirements [326 IAC 2-1.1-11] [326 IAC 2-6.1-2] [IC 13-14-1-13]

SECTION A SOURCE SUMMARY

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

A.1 General Information [326 IAC 2-5.1-3(c)][326 IAC 2-6.1-4(a)]

The Permittee owns and operates a stationary ammonia terminal.

Source Address:	502 East Hosler Road, Huntington, Indiana 46750
Mailing Address:	4111 East 37th Street North, Wichita, Kansas, 67220
General Source Phone Number:	260-356-7191
SIC Code:	5191
County Location:	Huntington
Source Location Status:	Attainment for all criteria pollutants
Source Status:	Minor Source Operating Permit Program Minor Source, under PSD and Emission Offset Rules Minor Source, Section 112 of the Clean Air Act Not 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) One (1) natural gas and propane fired ammonia flare, designated as Flare 1, installed in 1997, for controlling emissions from ammonia truck loading and during emergency and maintenance periods, with a maximum natural gas usage rate of 1.6 MMBtu/hr during flaring, and exhausting to stack F-1.

(b) One (1) natural gas fired maintenance flare, identified as MAINT, with a maximum capacity of 2.55 MMBtu/hr, and exhausting through stack MAINT, which is used during tank decommissioning and tank re-commissioning.

(c) One (1) 40 horsepower natural gas-and propane fired emergency generator; designated as G-1, installed in 1999, with a maximum capacity of 0.17MMBtu/hr, and exhausting to stack G-1.

(d) One (1) natural gas-fired ammonia heater, identified as H-1, installed in 1968, with a maximum capacity of 25.26 MMBtu/hr, and exhausting through stack H1.

(e) One (1) natural gas-fired ammonia heater, identified as H-2, installed in 1977, with a maximum capacity of 18.5 MMBtu/hr, and exhausting through stack H2.

(f) Two (2) Purgers, identified as PUR-1 and PUR-2, with a maximum capacity of 2 ft^3 per minute per purge.

(g) Propane tank loading.

(h) Ammonia truck loading, with residual ammonia in loading equipment and truck blowdown ammonia emissions controlled by Flare 1.

(i) Two (2) 30,000 ton cryogenic ammonia tanks, each equipped with an emergency relief valve that exhausts to Flare 1, one (1) 200 ton ammonia bullet tank, and one (1) 160 ton ammonia bullet tank.

(j) Fugitive ammonia emissions due to equipment leaks.

(k) Fugitive emissions from unpaved roads and parking lots.

SECTION B GENERAL CONDITIONS

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

Terms in this permit shall have the definition assigned to such terms in the referenced regulation. In the absence of definitions in the referenced regulation, the applicable definitions found in the statutes or regulations (IC 13-11, 326 IAC 1-2 and 326 IAC 2-1.1-1) shall prevail.

B.2 Permit Term [326 IAC 2-6.1-7(a)][326 IAC 2-1.1-9.5][IC 13-15-3-6(a)]

(a) This permit, M069-26780-00058, is issued for a fixed term of five (5) years from the issuance date of this permit, as determined in accordance with IC 4-21.5-3-5(f) and IC 13-15-5-3. Subsequent revisions, modifications, or amendments of this permit do not affect the expiration date of this permit.

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

B.3 Term of Conditions [326 IAC 2-1.1-9.5]

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

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

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

B.4 Enforceability

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

B.5 Severability

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

B.6 Property Rights or Exclusive Privilege

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

B.7 Duty to Provide Information

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

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

B.8 Certification

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

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

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

B.9 Annual Notification [326 IAC 2-6.1-5(a)(5)]

(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 permit.

(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 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.10 Preventive Maintenance Plan [326 IAC 1-6-3]

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

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

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

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

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

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

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

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

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

B.11 Prior Permits Superseded [326 IAC 2-1.1-9.5]

(a) All terms and conditions of permits established prior to M069-26780-00058 and issued pursuant to permitting programs approved into the state implementation plan have been either:

(1) incorporated as originally stated,

(2) revised, or

(3) deleted.

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

B.12 Termination of Right to Operate [326 IAC 2-6.1-7(a)]

The Permittee's right to operate this source terminates with the expiration of this permit unless a timely and complete renewal application is submitted at least ninety (90) days prior to the date of expiration of the source's existing permit, consistent with 326 IAC 2-6.1-7.

B.13 Permit Renewal [326 IAC 2-6.1-7]

(a) The application for renewal shall be submitted using the application form or forms prescribed by IDEM, OAQ and shall include the information specified in 326 IAC 2-6.1-7. Such information shall be included in the application for each emission unit at this source. The renewal application does require the certification by an "authorized individual" as defined by 326 IAC 2-1.1-1(1).

Request for renewal shall be submitted to:

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

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

(1) Submitted at least ninety (90) days prior to the date of the expiration of this permit; and

(2) If the date postmarked on the envelope or certified mail receipt, or affixed by the shipper on the private shipping receipt, is on or before the date it is due. If the

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

(c) If the Permittee submits a timely and complete application for renewal of this permit, the source's failure to have a permit is not a violation of 326 IAC 2-6.1 until IDEM, OAQ takes final action on the renewal application, except that this protection shall cease to apply if, subsequent to the completeness determination, the Permittee fails to submit by the deadline specified in writing by IDEM, OAQ any additional information identified as being needed to process the application.

B.14 Permit Amendment or Revision [326 IAC 2-5.1-3(e)(3)][326 IAC 2-6.1-6]

(a) Permit amendments and revisions are governed by the requirements of 326 IAC 2-6.1-6 whenever the Permittee seeks to amend or modify this permit.

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

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

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

(c) The Permittee shall notify the OAQ within thirty (30) calendar days of implementing a notice-only change. [326 IAC 2-6.1-6(d)]

B.15 Source Modification Requirement

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

B.16 Inspection and Entry
[326 IAC 2-5.1-3(e)(4)(B)][326 IAC 2-6.1-5(a)(4)][IC 13-14-2-2][IC 13-17-3-2][IC 13-30-3-1]

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

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

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

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

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

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

B.17 Transfer of Ownership or Operational Control [326 IAC 2-6.1-6]

(a) The Permittee must comply with the requirements of 326 IAC 2-6.1-6 whenever the Permittee seeks to change the ownership or operational control of the source and no other change in the permit is necessary.

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

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

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

(c) The Permittee may implement notice-only changes addressed in the request for a notice-only change immediately upon submittal of the request. [326 IAC 2-6.1-6(d)(3)]

B.18 Annual Fee Payment [326 IAC 2-1.1-7]

(a) The Permittee shall pay annual fees to IDEM, OAQ within thirty (30) calendar days of receipt of a billing.

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

B.19 Credible Evidence [326 IAC 1-1-6]

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

SECTION C SOURCE OPERATION CONDITIONS

Entire Source

Emission Limitations and Standards [326 IAC 2-6.1-5(a)(1)]

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

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

C.2 Permit Revocation [326 IAC 2-1.1-9]

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

(a) Violation of any conditions of this permit.

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

(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 permit shall not require revocation of this permit.

(d) Noncompliance with orders issued pursuant to 326 IAC 1-5 (Episode Alert Levels) to reduce emissions during an air pollution episode.

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

C.3 Opacity [326 IAC 5-1]

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

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

(b) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of fifteen (15) minutes (sixty (60) readings as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a continuous opacity monitor) in a six (6) hour period.

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

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

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

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

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

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

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

Pursuant to 326 IAC 6-5 (Fugitive Particulate Matter Emission Limitations), fugitive particulate matter emissions shall be controlled according to the plan submitted on July 17, 2008, or the most recent plan approved by the Commissioner. The plan is included as Attachment A.

C.8 Asbestos Abatement Projects [326 IAC 14-10] [326 IAC 18] [40 CFR 61, Subpart M]

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

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

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

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

(A) Asbestos removal or demolition start date;

(B) Removal or demolition contractor; or

(C) Waste disposal site.

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

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

All required notifications shall be submitted to:

Indiana Department of Environmental Management
Asbestos Section, Office of Air Quality
100 North Senate Avenue
MC 61-52 IGCN 1003
Indianapolis, Indiana 46204-2251

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

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

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

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

Testing Requirements [326 IAC 2-6.1-5(a)(2)]

C.9 Performance Testing [326 IAC 3-6]

(a) All testing shall be performed according to the provisions of 326 IAC 3-6 (Source Sampling Procedures), except as provided elsewhere in this permit, utilizing any applicable procedures and analysis methods specified in 40 CFR 51, 40 CFR 60, 40 CFR 61, 40 CFR 63, 40 CFR 75, or other procedures approved by IDEM, OAQ.

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

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

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

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

(c) Pursuant to 326 IAC 3-6-4(b), all test reports must be received by IDEM, OAQ not later than forty-five (45) days after the completion of the testing. An extension may be granted by IDEM, OAQ if the Permittee submits to IDEM, OAQ, a reasonable written explanation not later than five (5) days prior to the end of the initial forty-five (45) day period.

Compliance Requirements [326 IAC 2-1.1-11]

C.10 Compliance Requirements [326 IAC 2-1.1-11]

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

Compliance Monitoring Requirements [326 IAC 2-6.1-5(a)(2)]

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

Compliance with applicable requirements shall be documented as required by this permit. The Permittee shall be responsible for installing any necessary equipment and initiating any required monitoring related to that equipment. All monitoring and record keeping requirements not already legally required shall be implemented when operation begins.

C.12 Monitoring Methods [326 IAC 3] [40 CFR 60] [40 CFR 63]

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

C.13 Instrument Specifications [326 IAC 2-1.1-11]

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

(b) The Permittee may request that the IDEM, OAQ approve the use of an instrument that does not meet the above specifications provided the Permittee can demonstrate that an alternative instrument specification will adequately ensure compliance with permit conditions requiring the measurement of the parameters.

Corrective Actions and Response Steps

C.14 Response to Excursions or Exceedances

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

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

(1) initial inspection and evaluation;

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

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

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

(1) monitoring results;

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

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

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

(e) The Permittee shall maintain the following records:

(1) monitoring data;

(2) monitor performance data, if applicable; and

(3) corrective actions taken.

C.15 Actions Related to Noncompliance Demonstrated by a Stack Test

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

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

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

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

Record Keeping and Reporting Requirements [326 IAC 2-6.1-5(a)(2)]

C.16 Malfunctions Report [326 IAC 1-6-2]

Pursuant to 326 IAC 1-6-2 (Records; Notice of Malfunction):

(a) A record of all malfunctions, including startups or shutdowns of any facility or emission control equipment, which result in violations of applicable air pollution control regulations or applicable emission limitations shall be kept and retained for a period of three (3) years and shall be made available to the Indiana Department of Environmental Management (IDEM), Office of Air Quality (OAQ) or appointed representative upon request.

(b) When a malfunction of any facility or emission control equipment occurs which lasts more than one (1) hour, said condition shall be reported to OAQ, using the Malfunction Report Forms (2 pages). Notification shall be made by telephone or facsimile, as soon as practicable, but in no event later than four (4) daytime business hours after the beginning of said occurrence.

(c) Failure to report a malfunction of any emission control equipment shall constitute a violation of 326 IAC 1-6, and any other applicable rules. Information of the scope and expected duration of the malfunction shall be provided, including the items specified in 326 IAC 1-6-2(a)(1) through (6).

(d) Malfunction is defined as any sudden, unavoidable failure of any air pollution control equipment, process, or combustion or process equipment to operate in a normal and usual manner. [326 IAC 1-2-39]

C.17 General Record Keeping Requirements [326 IAC 2-6.1-5]

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

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

C.18 General Reporting Requirements [326 IAC 2-1.1-11] [326 IAC 2-6.1-2] [IC 13-14-1-13]

(a) Reports required by conditions in Section D of this permit shall be submitted to:

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

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

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

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

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY

MINOR SOURCE OPERATING PERMIT (MSOP) CERTIFICATION

Source Name: Koch Nitrogen Company
Source Address: 502 East Hosler Road, Huntington, Indiana 46750
Mailing Address: 4111 East 37th Street North, Wichita, Kansas, 67220
MSOP Permit No.: M069-26780-00058

This certification shall be included when submitting monitoring, testing reports/results or other documents as required by this permit.

Please check what document is being certified:

☐ Annual Compliance Certification Letter

☐ Test Result (specify)_____

☐ Report (specify)_____

☐ Notification (specify)_____

☐ Affidavit (specify)_____

☐ Other (specify)_____

I certify that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

Signature:

Printed Name:

Title/Position:

Date:

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY
COMPLIANCE BRANCH

MINOR SOURCE OPERATING PERMIT
ANNUAL NOTIFICATION

This form should be used to comply with the notification requirements under 326 IAC 2-6.1-5(a)(5).

Company Name:	Koch Nitrogen Company
Address:	502 East Hosler Road
City:	Huntington, Indiana 46750
Phone #:	260-356-7191
MSOP #:	M069-26780-00058

I hereby certify that Koch Nitrogen Company is :
- ☐ still in operation.
- ☐ no longer in operation.

I hereby certify that Koch Nitrogen Company is :
- ☐ in compliance with the requirements of MSOP M069-26780-00058.
- ☐ not in compliance with the requirements of MSOP M069-26780-00058.

Authorized Individual (typed):
Title:
Signature:
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:

MALFUNCTION REPORT

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY
FAX NUMBER - 317 233-6865

This form should only be used to report malfunctions applicable to Rule 326 IAC 1-6 and to qualify for the exemption under 326 IAC 1-6-4.

THIS FACILITY MEETS THE APPLICABILITY REQUIREMENTS BECAUSE IT HAS POTENTIAL TO EMIT 25 TONS/YEAR PARTICULATE MATTER ?_____, 25 TONS/YEAR SULFUR DIOXIDE ?_____, 25 TONS/YEAR NITROGEN OXIDES?_____, 25 TONS/YEAR VOC ?_____, 25 TONS/YEAR HYDROGEN SULFIDE ?_____, 25 TONS/YEAR TOTAL REDUCED SULFUR ?_____, 25 TONS/YEAR REDUCED SULFUR COMPOUNDS ?_____, 25 TONS/YEAR FLUORIDES ?_____, 100 TONS/YEAR CARBON MONOXIDE ?_____, 10 TONS/YEAR ANY SINGLE HAZARDOUS AIR POLLUTANT ?_____, 25 TONS/YEAR ANY COMBINATION HAZARDOUS AIR POLLUTANT ?_____, 1 TON/YEAR LEAD OR LEAD COMPOUNDS MEASURED AS ELEMENTAL LEAD ?_____, OR IS A SOURCE LISTED UNDER 326 IAC 2-5.1-3(2) ?_____. EMISSIONS FROM MALFUNCTIONING CONTROL EQUIPMENT OR PROCESS EQUIPMENT CAUSED EMISSIONS IN EXCESS OF APPLICABLE LIMITATION _____.

THIS MALFUNCTION RESULTED IN A VIOLATION OF: 326 IAC _____ OR, PERMIT CONDITION # _____ AND/OR PERMIT LIMIT OF _____

THIS INCIDENT MEETS THE DEFINITION OF "MALFUNCTION" AS LISTED ON REVERSE SIDE ? Y N

THIS MALFUNCTION IS OR WILL BE LONGER THAN THE ONE (1) HOUR REPORTING REQUIREMENT ? Y N

COMPANY:_____PHONE NO. ( )_____
LOCATION: (CITY AND COUNTY)_____
PERMIT NO. _____ AFS PLANT ID: _____ AFS POINT ID: _____ INSP:_____
CONTROL/PROCESS DEVICE WHICH MALFUNCTIONED AND REASON:_____
_____

DATE/TIME MALFUNCTION STARTED: _____/_____/ 20____ _____ AM / PM

ESTIMATED HOURS OF OPERATION WITH MALFUNCTION CONDITION: _____

DATE/TIME CONTROL EQUIPMENT BACK-IN SERVICE_____/_____/ 20____ _____ AM/PM

TYPE OF POLLUTANTS EMITTED: TSP, PM-10, SO2, VOC, OTHER:_____

ESTIMATED AMOUNT OF POLLUTANT EMITTED DURING MALFUNCTION: _____

_____

MEASURES TAKEN TO MINIMIZE EMISSIONS:_____

_____

REASONS WHY FACILITY CANNOT BE SHUTDOWN DURING REPAIRS:

CONTINUED OPERATION REQUIRED TO PROVIDE ESSENTIAL* SERVICES:_____
CONTINUED OPERATION NECESSARY TO PREVENT INJURY TO PERSONS:_____
CONTINUED OPERATION NECESSARY TO PREVENT SEVERE DAMAGE TO EQUIPMENT:_____
INTERIM CONTROL MEASURES: (IF APPLICABLE)_____
_____
_____

MALFUNCTION REPORTED BY:_____TITLE:_____
(SIGNATURE IF FAXED)

MALFUNCTION RECORDED BY:_____DATE:_____TIME:_____
*SEE PAGE 2

Please note - This form should only be used to report malfunctions applicable to Rule 326 IAC 1-6 and to qualify for the exemption under 326 IAC 1-6-4.

326 IAC 1-6-1 Applicability of rule

Sec. 1. This rule applies to the owner or operator of any facility required to obtain a permit under 326 IAC 2-5.1 or 326 IAC 2-6.1.

326 IAC 1-2-39 "Malfunction" definition

Sec. 39. Any sudden, unavoidable failure of any air pollution control equipment, process, or combustion or process equipment to operate in a normal and usual manner.

***Essential services** are interpreted to mean those operations, such as, the providing of electricity by power plants. Continued operation solely for the economic benefit of the owner or operator shall not be sufficient reason why a facility cannot be shutdown during a control equipment shutdown.

If this item is checked on the front, please explain rationale:

_____
_____

Attachment A

Fugitive Particulate Matter Control Plan
Koch Nitrogen Company Huntington Ammonia Terminal

326 IAC 6-5-5 Section 5 (a)	
1. Name and Address of the Source:	Koch Nitrogen Company Huntington Ammonia Terminal 502 East Hosler Road Huntington, Indiana 46750
2. Name and Address of the owner or operator responsible for execution of the plan:	Koch Nitrogen Company 4111 East 37th Street North Wichita, Kansas 67220
3. Identification of all processes, operations and areas which have the potential to emit fugitive particulate matter in accordance with 326 IAC 6-5-4:	Unpaved roads from property boundary at county road to truck loading area.
4. A map of the source showing aggregate pile areas, access areas around the aggregate pile, unpaved roads, paved roads, parking lots, and location of conveyor transfer points, etc.	Attached is a site plan with the unpaved roads identified.
5. The number and mix of vehicular activity occurring on paved roads, unpaved roads, and parking lots.	Vehicles on unpaved roads: 24170 maximum (approx. 95% ammonia trucks/ 5% pickups. Vehicle miles: 7976 miles maximum
6. Type and quantity of material handled.	Anhydrous ammonia; maximum of 454,200 tons/year
7. Equipment used to maintain aggregate piles.	Not applicable
8. A description of the measures to be implemented to control fugitive particulate matter emissions resulting from emission points identified in subdivision (3).	(E) Equivalent alternate measures: Vehicle restrictions have been implemented at the site. The enforced speed limit is 5 miles per hour.
9. A description of the dust suppressant material such as oil or chemical including the estimated frequency of application rates and concentrations.	Not applicable. Historical experience at the facility has demonstrated that fugitive dust emissions are effectively controlled with the existing vehicle restrictions.
10. A specification of the particulate matter collection equipment used as a fugitive particulate matter emission control measure.	Not applicable
11. A schedule of compliance with the provisions of the control plan. Such schedule shall specify the amount of time the source requires to award any necessary contracts, commence and complete construction, installation, or modification of the fugitive particulate matter control measures.	Vehicle Restrictions: The speed limit is currently in place and enforced through training of the drivers. Drivers violating this speed limit are stopped and informed they are speeding. If a driver continues to violate the speed limit, access to the site is denied.
12. Other relevant data that may be requested by the commissioner, to evaluate the effectiveness of the control plan.	To be determined

Records shall be kept and maintained that document the control measures under this plan. The records shall be available upon the request of the commissioner and shall be retained for three years.

Indiana Department of Environmental Management
Office of Air Quality

Addendum to the Technical Support Document (ATSD) for a Minor Source Operating Permit (MSOP)

Source Background and Description

Source Name:	**Koch Nitrogen Company**
Source Location:	**502 East Hosler Road, Huntington, IN 46750**
County:	**Huntington**
SIC Code:	**5191**
Operation Permit No.:	**M 069-26780-00058**
Permit Reviewer:	**Sarah Conner, Ph. D.**

On October 10, 2008, the Office of Air Quality (OAQ) had a notice published in the Herald Press, Huntington, Indiana, stating that Koch Nitrogen Company had applied for the transition of a Registration to an MSOP of an existing stationary ammonia terminal. The inclusion of unpaved road emissions in the PTE calculations increased the source-wide PTE for this existing stationary ammonia terminal such that an MSOP is required. The notice also stated that the OAQ proposed to issue a MSOP for this operation and provided information on how the public could review the proposed permit and other documentation. Finally, the notice informed interested parties that there was a period of thirty (30) days to provide comments on whether or not this permit should be issued as proposed.

Comments and Responses

On November 4, 2008, Koch Nitrogen Company submitted comments to IDEM, OAQ on the draft MSOP.

The Technical Support Document (TSD) is used by IDEM, OAQ for historical purposes. IDEM, OAQ does not make any changes to the original TSD, but the Permit will have the updated changes. The comments and revised permit language are provided below with deleted language as ~~strikeouts~~ and new language **bolded**.

Comment 1:

Koch Nitrogen Company noticed that the ammonia flare was not consistently identified in the TSD for permit 069-26780-00058. In the Background and Description of Permitted Emissions Units, the ammonia flare is designated as "Flare 1". In the Natural Gas Combustion Units the ammonia flare is described as "flare F-1". On the Summary of Potential Emissions in Appendices A and B, the ammonia flare is described as "Flare". In addition, the draft permit identifies the ammonia flare as "Flare 1". Koch Nitrogen Company recommends that the TSD use the same language for the ammonia flare as in the draft permit and to replace "flare F-1" with "Flare 1" and to replace "Flare" with "Flare 1".

Response to Comment 1:

IDEM, OAQ does not make changes to the original TSD and no changes to the language of the ammonia flare were requested in the draft permit; therefore, no changes were made as a result of this comment.

Comment 2:

In the TSD for permit 069-26780-00058, Koch Nitrogen Company realized that in Appendix A, page 1, Summary of Potential Emissions-For All Scenarios the row in the table showing the

Terminal Wide Totals for each pollutant did not include the addition of the pollutants listed in the row for Tank Decommissioning/Recommissioning. In addition, Koch Nitrogen Company realized that in Appendix B, page 1, Summary of Potential Emissions-Cold Terminal the row in the table showing the Terminal Wide Totals for each pollutant did not include the addition of the pollutants listed in the row for Tank Decommissioning/Recommissioning.

In addition, Koch Nitrogen Company realized that the Permit Level Determination-MSOP section of the TSD on page 3 also did not account for the Tank Decommissioning/Recommissioning, and requested that the table be revised to account for the Tank Decommissioning/Recommissioning. The requested changes to the table show deleted language as ~~strikeouts~~ and new language **bolded**.

Pollutant	Potential To Emit (tons/year)
PM	38.01
PM10[(1)]	12.01
PM2.5	1.48
SO_2	**0.103** ~~0.102~~
NO_x	**7.59** ~~5.21~~
VOC	**6.99** ~~6.81~~
CO	**6.53** ~~5.69~~
Anhydrous NH_3[(2)]	20.57

Response to Comment 2:

Because IDEM, OAQ does not make changes to the original TSD, no changes were made to the Summary of Potential Emissions-For All Scenarios, or the Summary of Potential Emissions-Cold Terminal sections of the TSD as a result of this comment.

IDEM agrees with the recommended changes. The Tank Decommissioning/Recommissioning should have been added to the total PTE for this stationary ammonia terminal. Therefore the updated PTE table in the Permit Level Determination-MSOP section on page 3 of the TDS is shown below:

Pollutant	Potential To Emit (tons/year)
PM	38.01
PM10[(1)]	12.01
PM2.5	1.48
SO_2	0.103
NO_x	7.59
VOC	6.99
CO	6.53
Anhydrous NH_3[(2)]	20.57

IDEM Contact

(a) Questions regarding this proposed MSOP can be directed to Sarah Conner, Ph. D. 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) 234-6555 or toll free at 1-800-451-6027 extension 4-6555.

(b) A copy of the permit 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

Indiana Department of Environmental Management
Office of Air Quality

Technical Support Document (TSD) for a Registration transitioning to a Minor Source Operating Permit (MSOP)

Source Description and Location

Source Name:	**Koch Nitrogen Company**
Source Location:	**502 East Hosler Road, Huntington, IN 46750**
County:	**Huntington**
SIC Code:	**5191**
Operation Permit No.:	**069-26780-00058**
Permit Reviewer:	**Sarah Conner, Ph. D.**

On July 17, 2008, the Office of Air Quality (OAQ) has received an application from Koch Nitrogen Company related to the transition of a Registration to an MSOP of an existing stationary ammonia terminal.

Existing Approvals

The source has been operating under previous approvals including, but not limited to, the following:

(a) Registration No. 069-16525-00058, issued on March 13, 2003.

(b) Registration Revision No. 069-17715-00058, issued on July 17, 2003.

(c) Registration Notice-Only Change No. 069-18326-00058, issues on January 12, 2004

Due to this application, the source is transitioning from a Registration to an MSOP.

County Attainment Status

The source is located in Huntington County.

Pollutant	Designation
SO_2	Better than national standards.
CO	Unclassifiable or attainment effective November 15, 1990.
O_3	Unclassifiable or attainment effective June 15, 2004, 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. Unclassifiable or attainment effective 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. Huntington 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.

Huntington County has been classified as attainment for PM2.5. On May 8, 2008 U.S. EPA promulgated the requirements for Prevention of Significant Deterioration (PSD) for PM2.5 emissions, and the effective date of these rules was July 15th, 2008. Indiana has three years from the publication of these rules to revise its PSD rules, 326 IAC 2-2, to include those requirements. The May 8, 2008 rule revisions require IDEM to regulate PM10 emissions as a surrogate for PM2.5 emissions until 326 IAC 2-2 is revised.

(c) Other Criteria Pollutants
Huntington 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 2-6.1 (Minor Source Operating Permits) applicability.

(b) Since this type of operation is not one of the twenty-eight (28) listed source categories under 326 IAC 2-2, 326 IAC 2-3, or 326 IAC 2-7, and there is no applicable New Source Performance Standard that was in effect on August 7, 1980, fugitive emissions are not counted toward the determination of PSD, Emission Offset, and Part 70 Permit applicability.

Background and Description of Permitted Emission Units

The Office of Air Quality (OAQ) has reviewed an application, submitted by Koch Nitrogen Company on July 17, 2008, relating to transitioning from a Registration to an MSOP due to the inclusion of unpaved road emissions in the PTE calculations.

The source consists of the following permitted emission units and pollution control devices:

(a) One (1) natural gas and propane fired ammonia flare, designated as Flare 1, installed in 1997, for controlling emissions from ammonia truck loading and during emergency and maintenance periods, with a maximum natural gas usage rate of 1.6 MMBtu/hr during flaring, and exhausting to stack F-1.

(b) One (1) natural gas fired maintenance flare, identified as MAINT, with a maximum capacity of 2.55 MMBtu/hr, and exhausting through stack MAINT, which is used during tank decommissioning and tank re-commissioning.

(c) One (1) 40 horsepower natural gas-and propane fired emergency generator; designated as G-1, installed in 1999, with a maximum capacity of 0.17 MMBtu/hr, and exhausting to stack G-1.

(d) One (1) natural gas-fired ammonia heater, identified as H-1, installed in 1968, with a maximum capacity of 25.26 MMBtu/hr, and exhausting through stack H1.

(e) One (1) natural gas-fired ammonia heater, identified as H-2, installed in 1977, with a maximum capacity of 18.5 MMBtu/hr, and exhausting through stack H2.

(f) Two (2) Purgers, identified as PUR-1 and PUR-2, with a maximum capacity of 2 ft^3 per minute per purge.

(g) Propane tank loading.

(h) Ammonia truck loading, with residual ammonia in loading equipment and truck blowdown ammonia emissions controlled by Flare 1.

(i) Two (2) 30,000 ton cryogenic ammonia tanks, each equipped with an emergency relief valve that exhausts to Flare 1, one (1) 200 ton ammonia bullet tank, and one (1) 160 ton ammonia bullet tank.

(j) Fugitive ammonia emissions due to equipment leaks.

(k) Fugitive emissions from unpaved roads and parking lots.

Enforcement Issues

There are no pending enforcement actions related to this source.

Emission Calculations

This facility can operate under three different scenarios. These scenarios are:

(1) Cold Terminal (Natural Gas Primary Fuel)
(2) Hot Terminal (Natural Gas Primary Fuel)
(3) Hot Terminal (Propane Primary Fuel)

However, the most significant operating difference in emissions depends on whether the facility is operating in "hot" or "cold" mode. The heaters cannot operate unless cold ammonia flows through them; therefore, the heaters only operate during cold terminal operations. During cold terminal operations, the heaters are used to heat cold ammonia and transfer it into truck tanks. During hot terminal operations, ammonia is sent to the flares and/or atmosphere instead of being loaded into trucks via the heaters. In addition to these two scenarios (hot or cold terminal), the heaters and flares can burn either natural gas or propane. However, Koch Nitrogen does not intent to operate the terminal with propane as the primary fuel under cold operations since propane vaporizers would have to be purchased and then included in the permit; therefore only three scenarios exist for this terminal.

See Appendix A through D of this document for detailed emission calculations that consist of the three possible operating scenarios for this source. Maximum emissions from all three operating scenarios (Appendices B-D) are shown in Appendix A.

Permit Level Determination – MSOP

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.

Pollutant	Potential To Emit (tons/year)
PM	38.01
PM10[(1)]	12.01
PM2.5	1.48
SO_2	0.102
NO_x	5.21

VOC	6.81
CO	5.69
Anhydrous NH_3 (2)	20.57

(1) 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".

2) Anhydrous NH_3 is a regulated pollutant under Section 112(r)(3) of the Clean Air Act.

HAPs	Potential To Emit (tons/year)
Formaldehyde	0.004
Hexane	0.103
All Other Single HAPs	negligible
TOTAL HAPs	0.108

(a) The potential to emit (PTE) (as defined in 326 IAC 2-1.1-1(16)) of PM are each less than one hundred (100) tons per year, but greater than or equal to twenty-five (25) tons per year. The PTE of all other regulated criteria pollutants are less than twenty-five (25) tons per year. Therefore, the source is subject to the provisions of 326 IAC 2-6.1. A Minor Source Operating Permit (MSOP) 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) There are no New Source Performance Standards (NSPS)(40 CFR Part 60) included in the permit.

(b) The requirements of the New Source Performance Standards for Standards of Performance for Stationary Spark Ignition Internal Combustion Engines (326 IAC 12, 40 CFR 60.4230 - 4248, Subpart JJJJ) are not included in this permit. The emergency generator commenced construction before June 12, 2006 and was manufactured before July 1, 2008.

National Emission Standards for Hazardous Air Pollutants (NESHAP)

(c) 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 permit.

(d) The requirements of the National Emission Standards for Hazardous Air Pollutants (NESHAPs) for Stationary Reciprocating Internal Combustion Engines, Subpart ZZZZ (40 CFR 63.6580 to 63.6675, 326 IAC 20-82), are not included in this permit, since this source is not a major source of HAPs.

Compliance Assurance Monitoring (CAM)

(e) Pursuant to 40 CFR 64.2, Compliance Assurance Monitoring (CAM) is not included in the permit, because the unlimited potential to emit of the source is less than the 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 2-2 (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 250 tons per year, and this source is not 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.

(b) 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.

(c) 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.

(d) 326 IAC 2-6.1 (Minor Source Operating Permits (MSOP))
MSOP applicability is discussed under the Permit Level Determination – MSOP section above.

(e) 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.

(f) 326 IAC 6-4 (Fugitive Dust Emissions Limitations)
The source is subject to the requirements of 326 IAC 6-4, because unpaved roads at the source 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

(g) 326 IAC 6-5 (Fugitive Particulate Matter Emission Limitations)
The source is subject to the requirements of 326 IAC 6-5, because the unpaved roads at the source have potential fugitive particulate emissions greater than 25 tons per year. Pursuant to 326 IAC 6-5, fugitive particulate matter emissions shall be controlled according to the Fugitive Dust Control Plan, submitted on July 17, 2008, which is included as Attachment A to the permit.

(h) 326 IAC 8-1-6 (VOC Rules: General Reduction Requirements for New Facilities)
The unlimited VOC potential emissions from each of the units at this source is less than twenty-

five (25) tons per year. Therefore, the requirements of 326 IAC 8-1-6 do not apply.

(i) 326 IAC 9-1-2 (Carbon Monoxide Emission Requirements)
This source is not among the listed source categories in 326 IAC 9-1-2. Therefore, this source is not subject to the requirements of 326 IAC 9-1-2.

(j) 326 IAC 10-1 (Nitrogen Oxide Emission Requirements)
This source is not located in Clark or Floyd County. Therefore, this source is not subject to the requirements of 326 IAC 10-1.

(k) There are no other 326 IAC 8 Rules that are applicable to the emission units at this source.

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

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

Natural Gas Combustion Units

(n) 326 IAC 6-3 (Particulate Emissions Limitations)
Pursuant to 326 IAC 6-3-1(b)(14), the emergency generator, heaters H-1 and H-2, flare F-1, and the maintenance flare are each exempt from the requirements of 326 IAC 6-3-2, because each unit has a potential to emit PM emissions less than five hundred fifty-one thousandths (0.551) pound per hour. In addition, each unit is exempt from the requirements of 326 IAC 6-3-2, because they each are not considered a "manufacturing process" as defined by 326 IAC 6-3-1.5(2).

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 operation of this source shall be subject to the conditions of the attached MSOP No. 069-26780-00058. The staff recommends to the Commissioner that this MSOP be approved.

IDEM Contact

(a) Questions regarding this proposed permit can be directed to Sarah Conner 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) 234-6555 or toll free at 1-800-451-6027 extension (4-6555).

(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

SUMMARY OF POTENTIAL EMISSIONS - For ALL SCENARIOS
KOCH NITROGEN COMPANY, HUNTINGTON AMMONIA TERMINAL

Company Name: Koch Nitrogen Company
Address: 502 East Hosler Road, Huntington, IN 46750
MSOP: 069-26780-00058
Reviewer: Calculations submitted by source and reviewed by Sarah Conner, Ph. D.
Date: 9/30/2008

	Ammonia (tons/yr)	*Nitrogen Oxides (tons/yr)*	*Carbon Monoxide (tons/yr)*	*VOC (tons/yr)*	*Sulfur Dioxide (tons/yr)*	*Particulate Matter (tons/yr)*	*PM10 (tons/yr)*	*PM2.5 (tons/yr)*
Flare	3.408	1.398	2.585	6.541	0.080	0.000	0.000	0.000
Heater 1 [c]	0.118	3.672	3.085	0.202	0.022	0.279	0.279	0.279
Heater 2		0.000	0.000	0.000	0.000	0.000	0.000	0.000
40 HP Emergency Generator	0.000	0.135	0.016	0.005	0.000	0.002	0.002	0.002
Propane Tank loading				0.001				
Propane Equipment Fugitives				0.060				
Road Fugitives (2006 Method)						37.7	11.7	1.2
NH3 Fugitives	1.950							
Tank Decommissioning/ Recommisioning	8.032	2.383	0.841	0.182	0.001	0.000	0.000	0.000
Purger Emissions (if vented to atmosphere)	7.008							
Truck loading (vented to tank)	0.058							
TERMINAL WIDE TOTALS	**20.573**	**5.205**	**5.686**	**6.809**	**0.102**	**38.007**	**12.005**	**1.477**
Maximum Individual HAP Emission		**0.103**	**tons/yr**					
Indiana Registration Threshold	NA	10	25	10[a] / 5 [b]	10	5	5	5
Indiana Minor Permit Threshold	NA	25	100	25	25	25	25	25
Federal Major Source Threshold	NA	100	100	100	100	100	100	100

TERMINAL HAPS SUMMARY for ALL SCENARIOS

Formaldehyde	0.004
Hexane	0.103
Total combined HAPs	0.108

*Koch Nitrogen does not intent to operate the terminal with propane as the primary fuel under cold operations since propane vaporizers would have to be purchased and then included in the permit; therefore only three scenarios exist for this terminal, Hot with Natural Gas, Hot with Propane, and Cold with Natural Gas

SUMMARY OF POTENTIAL EMISSIONS - COLD TERMINAL
KOCH NITROGEN COMPANY, HUNTINGTON AMMONIA TERMINAL
EXPANDED SCOPE - NATURAL GAS

Company Name: Koch Nitrogen Company
Address: 502 East Hosler Road, Huntington, IN 46750
MSOP: 069-26780-00058
Reviewer: Calculations submitted by source and reviewed by Sarah Conner, Ph. D.
Date: 9/30/2008

	Ammonia (tons/yr)	*Nitrogen Oxides (tons/yr)*	*Carbon Monoxide (tons/yr)*	*VOC (tons/yr)*	*Sulfur Dioxide (tons/yr)*	*Particulate Matter (tons/yr)*	*PM10 (tons/yr)*	*PM2.5 (tons/yr)*
Flare	2.515	0.698	0.076	0.016	0.000	0.000	0.000	0.000
Heater 1 [c]	0.118	3.672	3.085	0.202	0.022	0.279	0.279	0.279
Heater 2		0.000	0.000	0.000	0.000	0.000	0.000	0.000
40 HP Emergency Generator	0.000	0.135	0.016	0.005	0.000	0.002	0.002	0.002
Road Fugitives (2006 Method)						37.7	11.7	1.2
NH3 Fugitives	1.950							
Tank Decommissioning/Recommisioning	8.032	2.383	0.841	0.182	0.001	0.000	0.000	0.000
Purger Emissions (if vented to atmosphere)	7.008							
Truck loading (vented to tank)	0.058							
TERMINAL WIDE TOTALS	**19.680**	**4.505**	**3.176**	**0.223**	**0.022**	**38.007**	**12.005**	**1.477**
Maximum Individual HAP Emission		**0.103**	**tons/yr**					
Indiana Registration Threshold	NA	10	25	10[a] / 5 [b]	10	5	5	5
Indiana Minor Permit Threshold	NA	25	100	25	25	25	25	25
Federal Major Source Threshold	NA	100	100	100	100	100	100	100

Note:
(1) Indiana does not regulate ammonia.
a - for sources not required to operate VOC control equipment
b - for sources required to operate VOC control equipment
c - Maximum emissions occur if all ammonia leaving the facility is heated by Heater 1. Hence, Heater 2 emissions are not included.

POTENTIAL HAZARDOUS AIR POLLUTANT (HAP) EMISSION ESTIMATES - COLD TERMINAL
KOCH NITROGEN COMPANY, HUNTINGTON AMMONIA TERMINAL
EXPANDED SCOPE - NATURAL GAS

Company Name: Koch Nitrogen Company
Address: 502 East Hosler Road, Huntington, IN 46750
MSOP: 069-26780-00058
Reviewer: Calculations submitted by source and reviewed by Sarah Conner, Ph. D.
Date: 9/30/2008

Maximum Natual Gas Consumption 114,099,498 ft3/yr From Natural Gas usage spreadsheet

Combustion Products			*Emission Factor*		*Max Emission lb/yr*	*Max Emission lb/yr*	*Basis of Estimate*
	Lead		0.0005	$lb/10^6\ ft^3$	0.057	0.000	AP-42: Table 1.4-2 dated 7/98
91-57-6	2-Methylnaphthalene		2.40E-05	$lb/10^6\ ft^3$	0.003	0.000	AP-42: Table 1.4-3 dated 7/98
56-49-5	3-Methylchloranthrene	<	1.80E-06	$lb/10^6\ ft^3$	0.000	0.000	AP-42: Table 1.4-3 dated 7/98
	7,12-Dimethylbenz(a)anthracene	<	1.60E-05	$lb/10^6\ ft^3$	0.002	0.000	AP-42: Table 1.4-3 dated 7/98
83-32-9	Acenaphthene	<	1.80E-06	$lb/10^6\ ft^3$	0.000	0.000	AP-42: Table 1.4-3 dated 7/98
203-96-8	Acenaphthylene	<	1.80E-06	$lb/10^6\ ft^3$	0.000	0.000	AP-42: Table 1.4-3 dated 7/98
120-12-7	Anthracene	<	2.40E-06	$lb/10^6\ ft^3$	0.000	0.000	AP-42: Table 1.4-3 dated 7/98
56-55-3	Benz(a)anthracene	<	1.80E-06	$lb/10^6\ ft^3$	0.000	0.000	AP-42: Table 1.4-3 dated 7/98
71-43-2	Benzene		2.10E-03	$lb/10^6\ ft^3$	0.240	0.000	AP-42: Table 1.4-3 dated 7/98
50-32-8	Benzo(a)pyrene	<	1.20E-06	$lb/10^6\ ft^3$	0.000	0.000	AP-42: Table 1.4-3 dated 7/98
205-99-2	Benzo(b)fluoranthene	<	1.80E-06	$lb/10^6\ ft^3$	0.000	0.000	AP-42: Table 1.4-3 dated 7/98
191-24-2	Benzo(g,h,i)perylene	<	1.20E-06	$lb/10^6\ ft^3$	0.000	0.000	AP-42: Table 1.4-3 dated 7/98
205-82-3	Benzo(k)fluoranthene	<	1.80E-06	$lb/10^6\ ft^3$	0.000	0.000	AP-42: Table 1.4-3 dated 7/98
218-01-9	Chrysene	<	1.80E-06	$lb/10^6\ ft^3$	0.000	0.000	AP-42: Table 1.4-3 dated 7/98
53-70-3	Dibenzo(a,h)anthracene	<	1.20E-06	$lb/10^6\ ft^3$	0.000	0.000	AP-42: Table 1.4-3 dated 7/98
25321-22-6	Dichlorobenzene		1.20E-03	$lb/10^6\ ft^3$	0.137	0.000	AP-42: Table 1.4-3 dated 7/98
206-44-0	Fluoranthene		3.00E-06	$lb/10^6\ ft^3$	0.000	0.000	AP-42: Table 1.4-3 dated 7/98
86-73-7	Fluorene		2.80E-06	$lb/10^6\ ft^3$	0.000	0.000	AP-42: Table 1.4-3 dated 7/98
50-00-0	Formaldehyde		7.50E-02	$lb/10^6\ ft^3$	8.557	0.004	AP-42: Table 1.4-3 dated 7/98
110-54-3	Hexane		1.80E+00	$lb/10^6\ ft^3$	205.379	0.103	AP-42: Table 1.4-3 dated 7/98
193-39-5	Indeno(1,2,3-cd)pyrene	<	1.80E-06	$lb/10^6\ ft^3$	0.000	0.000	AP-42: Table 1.4-3 dated 7/98
91-20-3	Naphthalene		6.10E-04	$lb/10^6\ ft^3$	0.070	0.000	AP-42: Table 1.4-3 dated 7/98
85-01-8	Phenanathrene		1.70E-05	$lb/10^6\ ft^3$	0.002	0.000	AP-42: Table 1.4-3 dated 7/98
129-00-0	Pyrene		5.00E-06	$lb/10^6\ ft^3$	0.001	0.000	AP-42: Table 1.4-3 dated 7/98
108-88-3	Toluene		3.40E-03	$lb/10^6\ ft^3$	0.388	0.000	AP-42: Table 1.4-3 dated 7/98
7440-38-2	Arsenic		2.00E-04	$lb/10^6\ ft^3$	0.023	0.000	AP-42: Table 1.4-4 dated 7/98
7440-41-7	Beryllium	<	1.20E-05	$lb/10^6\ ft^3$	0.001	0.000	AP-42: Table 1.4-4 dated 7/98
7440-43-9	Cadmium		1.10E-03	$lb/10^6\ ft^3$	0.126	0.000	AP-42: Table 1.4-4 dated 7/98
7440-47-3	Chromium		1.40E-03	$lb/10^6\ ft^3$	0.160	0.000	AP-42: Table 1.4-4 dated 7/98
7440-48-4	Cobalt		8.40E-05	$lb/10^6\ ft^3$	0.010	0.000	AP-42: Table 1.4-4 dated 7/98
7439-96-5	Manganese		3.80E-04	$lb/10^6\ ft^3$	0.043	0.000	AP-42: Table 1.4-4 dated 7/98
7439-97-6	Mercury		2.60E-04	$lb/10^6\ ft^3$	0.030	0.000	AP-42: Table 1.4-4 dated 7/98
7440-02-0	Nickel		2.10E-03	$lb/10^6\ ft^3$	0.240	0.000	AP-42: Table 1.4-4 dated 7/98
7782-49-2	Selenium	<	2.40E-05	$lb/10^6\ ft^3$	0.003	0.000	AP-42: Table 1.4-4 dated 7/98

TOTAL HAP EMISSIONS (lb/yr)	215.415
TOTAL HAP EMISSIONS (tons/yr)	0.108
MAX INDIVIDUAL HAP EMISSION (lb/yr)	205.379
MAX INDIVIDUAL HAP EMISSION (ton/yr)	0.103

TOTAL POTENTIAL NATURAL GAS USAGE - COLD TERMINAL
KOCH NITROGEN COMPANY, HUNTINGTON AMMONIA TERMINAL

Company Name: **Koch Nitrogen Company**
Address: **502 East Hosler Road, Huntington, IN 46750**
MSOP: **069-26780-00058**
Reviewer: **Calculations submitted by source and reviewed by Sarah Conner, Ph. D.**
Date: **9/30/2008**

Usage for Flare	388,800	ft3	Calculated from flare spreadsheet
Usage for emergency generator	81,000	ft3	Calculated from generator spreadsheet
Usage for heater 1	73,441,646	ft3	Calculated from heater spreadsheet
Usage for heater 2	35,858,286	ft3	Calculated from Tank Decomissioing spreadsheet
Tank Decomissioning/Recomissioning	4,329,767	ft3	Calculated from heater spreadsheet
Total potential facility natural gas usage	**114,099,498**	**ft3**	**Total of above equipment usage**

MAXIMUM FACILITY CAPACITIES - COLD TERMINAL
KOCH NITROGEN COMPANY, HUNTINGTON AMMONIA TERMINAL

Company Name: Koch Nitrogen Company
Address: 502 East Hosler Road, Huntington, IN 46750
MSOP: 069-26780-00058
Reviewer: Calculations submitted by source and reviewed by Sarah Conner, Ph. D.
Date: 9/30/2008

Input				
	Maximum ammonia pipeline flow rate input	45	tons/ hr	Facility Data-Maximum the facility can receive via pipeline
	Maximum number of hours pipeline can operate	8760	hr	
	Maximum ammonia pipeline flow rate input	394200	tpy	This equals the maximum amount of ammonia that can possibly be entering the facility
Refrigeration				
	(Refrigeration is needed to put incoming ammonia into tanks)			
	Maximum Refrigeration system capability for incomming ammonia	245280	tpy	This equals the maximum amount of ammonia that be heated (28 tons/hr)
Storage				
	Total Tank Capacity for ammonia	60000	tons	
Output				
	Maximum theoretical ammonia for output	454200	tpy	pipeline rate plus storage capacity
	Maximum refrigerated ammonia for output	305280	tpy	Maximum refrigerated throughput through the facility (245,280 + 30,000)
	(Heaters are used to heat ammonia into truck tanks. Heaters cannot operate unless cold ammonia flows through the unit)			
	Maximum capabilty of Heater Line 1	100	tons/ hr	Smalling Heater Design Specifications
	Maximum capabilty of Heater Line 2	150	tons/ hr	Smalling Heater Design Specifications
	Maximum Heater 1 hours for refrigerated product	3052.80	hours /year	
	Maximum Heater 2 hours for refrigerated product	2035.20	hours/year	
	Maximum Heater 1 rate for refrigerated product	8.36	hours per day	calculated as 2752.80/365
	Maximum Heater 2 rate for refrigerated product	5.58	hours per day	calculated as 1835.20/365

POTENTIAL HEATER 1 EMISSIONS (Natural Gas Primary Fuel)- COLD TERMINAL
KOCH NITROGEN COMPANY, HUNTINGTON AMMONIA TERMINAL

Company Name: **Koch Nitrogen Company**
Address: **502 East Hosler Road, Huntington, IN 46750**
MSOP: **069-26780-00058**
Reviewer: **Calculations submitted by source and reviewed by Sarah Conner, Ph. D.**
Date: **9/30/2008**

Heater #1

Manufacturer	Smalling		
Heater Fuel Type	Natural Gas		
NG Fuel Heat Content	1050	Btu/ft^3	
Heat Duty of Heater	25.26	MMBtu/hr	BS&B Specification sheet
Hours of Operation	3052.80	Hours	Maximum number of hours that all facility ammonia can be heated for transport
Natural Gas Consumption	73,441,646	ft^3/yr	

Combustion Products	*Emission Factor*		*Total Emissions*				*Basis of Estimate*
Ammonia	0.0000032	lb/ft3	0.118	tpy	0.077	lb/hr	WebFIRE Database (4-2006)
Nitrogen Oxides	0.0001	lb/ft3	3.672	tpy	2.406	lb/hr	AP-42: Table 1.4-1 dated 7/98
Carbon Monoxide	0.000084	lb/ft3	3.085	tpy	2.021	lb/hr	AP-42: Table 1.4-1 dated 7/98
Particulate Matter	0.0000076	lb/ft3	0.279	tpy	0.183	lb/hr	WebFIRE Database (4-2006)
PM-10	0.0000076	lb/ft3	0.279	tpy	0.183	lb/hr	WebFIRE Database (4-2006)
PM-2.5	0.0000076	lb/ft3	0.279	tpy	0.183	lb/hr	WebFIRE Database (4-2006)
Non-methane VOC	0.0000055	lb/ft3	0.202	tpy	0.132	lb/hr	AP-42: Table 1.4-2 dated 7/98
Sulfur Dioxide	0.0000006	lb/ft3	0.022	tpy	0.014	lb/hr	AP-42: Table 1.4-2 dated 7/98

Explanation of Calculation Methodology

(1) Pollutant Emission Rate (tons/yr) = Emission Factor (lb/ft3) x Natural gas consumption (ft3/yr) x (1 ton / 2000 lbs)

POTENTIAL HEATER 2 EMISSIONS (Natural Gas Primary Fuel)- COLD TERMINAL
KOCH NITROGEN COMPANY, HUNTINGTON AMMONIA TERMINAL

Company Name: Koch Nitrogen Company
Address: 502 East Hosler Road, Huntington, IN 46750
MSOP: 069-26780-00058
Reviewer: Calculations submitted by source and reviewed by Sarah Conner, Ph. D.
Date: 9/30/2008

Heater #2

Manufacturer	Smalling		
Heater Fuel Type	Natural gas		
NG Fuel Heat Content	1050	Btu/ft^3	
Heat Duty of Heater	18.50	MMBtu/hr	Specification sheet
Hours of Operation	2035.20	Hours	Maximum number of hours that all facility ammonia can be heated for transport
Natural Gas Consumption	35,858,286	ft^3/yr	

Combustion Products	*Emission Factor*		*Total Emissions*				*Basis of Estimate*
Ammonia	0.0000032	lb/ft3	0.057	tpy	0.056	lb/hr	WebFIRE Database (4-2006)
Nitrogen Oxides	0.0001	lb/ft3	1.793	tpy	1.762	lb/hr	AP-42: Table 1.4-1 dated 7/98
Carbon Monoxide	0.000084	lb/ft3	1.506	tpy	1.480	lb/hr	AP-42: Table 1.4-1 dated 7/98
Particulate Matter	0.0000076	lb/ft3	0.136	tpy	0.134	lb/hr	WebFIRE Database (4-2006)
PM-10	0.0000076	lb/ft3	0.136	tpy	0.134	lb/hr	WebFIRE Database (4-2006)
PM-2.5	0.0000076	lb/ft3	0.136	tpy	0.134	lb/hr	WebFIRE Database (4-2006)
Non-methane VOC	0.0000055	lb/ft3	0.099	tpy	0.097	lb/hr	AP-42: Table 1.4-2 dated 7/98
Sulfur Dioxide	0.0000006	lb/ft3	0.011	tpy	0.011	lb/hr	AP-42: Table 1.4-2 dated 7/98

Explanation of Calculation Methodology

(1) Pollutant Emission Rate (tons/yr) = Emission Factor (lb/ft3) x Natural gas consumption (ft3/yr) x (1 ton / 2000 lbs)

POTENTIAL FLARE EMISSION ESTIMATES- COLD TERMINAL
KOCH NITROGEN COMPANY, HUNTINGTON AMMONIA TERMINAL
EXPANDED SCOPE - NATURAL GAS

Company Name: Koch Nitrogen Company
Address: 502 East Hosler Road, Huntington, IN 46750
MSOP: 069-26780-00058
Reviewer: Calculations submitted by source and reviewed by Sarah Conner, Ph. D.
Date: 9/30/2008

Note: Emergency Flare emissions are based on a reasonable worse case scenario of 240 hours of ammonia flaring per year with the remaining hours in an idling mode

Flare Name:	Stackmatch with Double Pilots		
Pilot Fuel Type:	Natural Gas		
Molecular Weight	16	lb/lb mole	
Fuel Heat Content	1,050	BTU/ft^3	AP-42: Supplement D, Section 1.4.1 (7-1998)

Assumptions			***Basis***	
Composition of Ammonia in Flare	95.453	Volume percent	Calculated (1)	
Composition of Natural Gas in Flare	4.547	Volume percent	Calculated	
Composition of Ammonia in Flare	95.709	Wt. percent	Calculated (2)	
Composition of Natural Gas in Flare	4.291	Wt. percent	Calculated	
Maximum Natural Gas Input Rating during pilot idling	0.02		MMBtu/hr	Calculated (3)
Maximum Natural Gas Input Rating during Flaring	1.10		MMBtu/hr	Calculated
Maximum Natural gas consumption rate during pilot idling	16.00	ft3/hr	Manufacturer's Literature @ 25 psig	
Maximum Natural gas consumption rate during flaring	1052.00	ft3/hr	Manufacturer's Literature @ 25 psig	
Fuel Heat Content during pilot idling	1,050	BTU/ft^3	Fuel heat content of natural gas	
Fuel Heat Content during Flaring	390	BTU/ft^3	Calculated (4)	
Annual Hours of Operation	8,760	hrs/yr		

During Pilot Idling (Natural Gas Combustion Only)

Annual Hours of operation during pilot idling	8,520	hr/yr	Maximum Annual hours
Natural Gas Consumption during pilot idling	136,320	ft3/yr	Calculated (5)

Combustion Products	***Emission Factor***		***Emission Rates***			***Basis of Estimate***
Ammonia	0.0000032	lb/ft3	0.000051	lb/hr	0.000 tpy	WebFIRE Database (4-2006)
Nitrogen Oxides	0.068	lb/MM BTU	0.0751128	lb/hr	0.005 tpy	AP-42: Table 13.5-1(9-1991) (6)
Carbon Monoxide	0.37	lb/MM BTU	0.408702	lb/hr	0.026 tpy	AP-42: Table 13.5-1(9-1991)
Particulate Matter	0	lb/MM BTU	0	lb/hr	0.000 tpy	AP-42: Table 13.5-1(9-1991) non-smoking flare
Non-methane VOC	2	% of VOC flared	0.001	lb/hr	0.006 tpy	AP-42: Chapter 13.5 (9-1991), assume 98% control efficiency (7)
Sulfur Dioxide	2	lb/lb S	0.00000	lb/hr	0.00004 tpy	Assumed all sulfur converted to SO2 (8)

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During Flaring (Ammonia only)

			Basis
Annual Flaring hours of operation	240.00	hours	Maximum Annual hours
Ammonia Flaring flow rate	22084	ft3/hr	Eng Estimate
Annual Ammonia Flare flow rate	5,300,160	ft^3/yr	Calculated (9)
Natural Gas Consumption During Flaring	252,480	ft^3/yr	Calculated (10)
Annual Fuel Consumption during Flaring	5,552,640	ft^3/yr	Calculated (11)
Assumed temperature	60	F	
Gas Constant	0.7302	$(atm*ft^3)/(lb\ mole*R)$	
Assumed Pressure	1	Atm	Standard atmospheric pressure
NOx flare emission factor (12)	11.1	lb NOx/ton ammonia	TNRCC Air Permit & Technical Guidance for Chemical Sources (Flares & Oxidizers)
Moles of ammonia sent to flare per yr	13,959		Calculated (13)
Pounds of ammonia sent to flare each year including purger and truck blowdown	251,429		Calculated (14)
Flare Efficiency	0.98		
Pounds of ammonia combusted each year	246,400		Calculated (15)
Tons of ammonia emitted each year	**2.514**		Calculated (16)
Maximum pounds of ammonia emitted per hour	**20.952**		Calculated (17)
Average daily ammonia emission over year (lb/day)	**14**		Calculated (18)
Pounds of NOx emitted per yr	1,367.52		Calculated (20)
Pounds of NOx emitted per hour	**5.698**		
Tons of NOx emitted per yr	**0.684**		

Combustion Products	*Emission Factor*		*Emission Rates*		*Basis of Estimate*
Ammonia	0.0000032	lb/ft3	0.0033664 lb/hr	0.000 tpy	WebFIRE Database (4-2006)
Nitrogen Oxides	0.068	lb/MM BTU	0.0751128 lb/hr	0.009 tpy	AP-42: Table 13.5-1(9-1991) (6) - Max occurs when flaring only NG
Carbon Monoxide	0.37	lb/MM BTU	0.408702 lb/hr	0.049 tpy	AP-42: Table 13.5-1(9-1991) - Max occurs when flaring only NG
Particulate Matter	0	lb/MM BTU	0 lb/hr	0.000 tpy	AP-42: Table 13.5-1(9-1991) non-smoking flare
Non-methane VOC	2	% of VOC flared	0.089 lb/hr	0.011 tpy	AP-42: Chapter 13.5 (9-1991), assume 98% control efficiency (7)
Sulfur Dioxide	2	lb/lb S	0.00000 lb/hr	0.000 tpy	Assumed all sulfur converted to SO2 (8)

Totals	*Emission Rates*		
Anhydrous Ammonia	**20.956 lb/hr**	**2.515 tpy**	**2.515 tpy**
Nitrogen Oxides	**5.773 lb/hr**	**0.698 tpy**	**0.698 tpy**
Carbon Monoxide	**0.409 lb/hr**	**0.076 tpy**	**0.076 tpy**
Particulate Matter	**- lb/hr**	**0.000 tpy**	**0.000 tpy**
Non-methane VOC	**0.089 lb/hr**	**0.016 tpy**	**0.016 tpy**
Sulfur Dioxide	**0.000 lb/hr**	**0.000 tpy**	**0.000 tpy**

Company Name: Koch Nitrogen Company
Address: 502 East Hosler Road, Huntington, IN 46750
MSOP: 069-26780-00058
Reviewer: Calculations submitted by source and reviewed by Sarah Conner, Ph. D.
Date: 9/30/2008

Explanation of Calculation Methodology

(1) Volume % of ammonia during flaring = ammonia flow rate during flaring (ft^3/hr)/total fuel consumption during flaring (ft^3/hr) * 100

(2) Weight % of ammonia during flaring = (volume % of ammonia during flaring x 17 lb/lb.mol) / [(volume % of ammonia during flaring) x 17 lb/ lb.mol) + (volume % of natural gas in flare) x 16 lb/lb.mol)] x 100

(3) Maximum Input Rating during Flaring = [natural gas consumption rate during flaring (ft3/hr)] x [fuel heat content (BTU/ft3)] / [1,000,000]

(4) Fuel heat content during flaring = [(volume % of ammonia during flaring/100) x 359 BTU/ft^3)]+[(volume % of natural gas during flaring/100) x 1050 BTU/ft^3)]

(5) Annual natural gas consumption during pilot idling = Maximum Natural gas consumption rate during pilot idling (ft3/hour) x Annual hours of pilot idling operation

(6) Emission rate for NOx, CO, or PM (tons/yr) = [emission factor (lb/MMBTU)] x [hours of pilot idling/yr] x [maximum natural gas input rating during pilot idling (MMBTU/hr)] / [2000 lb/ton]

(7) Emission rate for VOCs (tons/yr) = [natural gas consumption during pilot idling (ft^3/yr)] x [1 mole/380 ft^3] x [16 lb/mole natural gas] x [0.10 x (1-0.98)] x [1 ton/2000 lb]
For VOC emissions, a 98% destruction efficiency is assumed, and natural gas is assumed to have a 10% by weight VOC content

(8) Emission rate for SO_2 (tons/yr) = [Natural gas consumed during pilot idling (ft^3/yr)] x [2000 grains sulfur/1,000,000 ft^3 natural gas] x [1 lb sulfur/7,000 grains sulfur] x [64 lb SO2/32 lb sulfur] x [1 ton SO2/2,000 lb SO2]
Assumptions: 2000 grains of sulfur per 10^6 cubic feet natural gas (Footnote D of AP-42 Table 1.4-2 dated 7/98) and a ratio of 64 lb SO2 per 32 lb of S

(9) Annual ammonia flaring flow rate = [ammonia flaring flow rate (ft^3/hr)] x [annual hours of flare operation]

(10) Annual natural gas flaring flow rate (ft3/yr) = [maximum natural gas consumption rate during flaring (ft^3/hr)] x [annual hours of flaring operation]

(11) Total fuel consumption during flaring = [annual natural gas flaring flow rate (ft^3/yr)]+ [ammonia flaring flow rate (ft^3/yr)]

(12) The emission factor for converting Ammonia to NOx is based on an Air Permit Technical Guidance for Chemical Sources: Flares and Oxidizers from the Texas Natural Resource Conservation Commission (October 2000, RG-109 draft).

(13) Moles of ammonia sent to flare each year = [annual ammonia flaring flow rate (ft^3/yr) /0.7302 atm.ft^3/lb.mol.R]/[459 +60^{o}F] R

(14) Pounds of ammonia sent to flare each year = Moles of ammonia combusted per year x 17 lb ammonia/1 lb.mol ammonia + tons of ammonia from purgers and truck blowdown*2000

(15) Pounds of ammonia combusted each year = Pounds of ammonia sent to flare each year x Flare efficiency

(16) Tons of ammonia emitted each year = (Pounds of ammonia sent to flare each year - Pounds of ammonia combusted each year) x (1 ton/2000 pounds)

(17) Pounds of ammonia emitted per hour = (Pounds of ammonia sent to flare each year - Pounds of ammonia combusted each year) x (annual hours of flaring operation)

(18) Average daily ammonia emission over year (lb/day) = (Pounds of ammonia sent to flare each year - Pounds of ammonia combusted each year) x (1year/365 days)

(19) Pounds of ammonia emitted each flaring day = Ammonia flaring flow rate (lb/hr) x (24 hours/day) x (100% - Flaring Efficiency %)

(20) Pounds of NOx emitted per year = Pounds of ammonia combusted per year x (1ton/2000 lbs) x NOx emission factor (lb NOx/ton ammonia)

(21) The truck loading blow down is to the cold storage tank and not to the flare.

POTENTIAL AMMONIA EMISSIONS FROM TRUCK LOADING- COLD TERMINAL
KOCH NITROGEN COMPANY, HUNTINGTON AMMONIA TERMINAL

Company Name: **Koch Nitrogen Company**
Address: **502 East Hosler Road, Huntington, IN 46750**
MSOP: **069-26780-00058**
Reviewer: **Calculations submitted by source and reviewed by Sarah Conner, Ph. D.**
Date: **9/30/2008**

note: Cold terminal operations will send liquid ammonia in pipe to storage tank. Residual vapors are sent to flare and atmosphere.

Truck Blowdown			
Maximum Number of trucks loading ammonia	54.0	trucks per day	Max receipt through pipe 45 tph * 24 hrs/20 tons per truck
Pipe length	6	feet	
Pipe diameter	2	inches	
Volume of Pipe	0.13	ft3	
Volume of pipe	0.98	gallons	
Total volume in pipe during all unloading events	7.069	ft^3/day	
Total volume in pipe during all unloading events	2580	ft^3/yr	Calculated using volume of pipe and number of trucks per year

Determine pounds of NH3 vapor released to flare or atmosphere per year

Ideal Gas Law: pV = nRT

where:

p =	1	atm
V =	2580	ft^3/yr
T =	60	^{o}F
R =	0.7302	(atm*ft3)/(lb mole*R)

n = pV/RT = 6.8080 lb.mole/yr

Molecular weight of NH3 =	17	lb/lb.mole
Pounds of NH3 released to flare or atmosphere=	116	lb/yr
	0.32	**lb/day**
Federal Notification Level for NH3 =	100	lb/day
NH3 Vapor emitted per year to flare or atmosphere	**0.058**	**tons/yr**

POTENTIAL INERT EMISSION ESTIMATES- COLD TERMINAL
KOCH NITROGEN COMAPNY- HUNTINGTON, INDIANA
EXPANDED SCOPE - NATURAL GAS

Company Name:	**Koch Nitrogen Company**
Address:	**502 East Hosler Road, Huntington, IN 4675(**
MSOP:	**069-26780-00058**
Reviewer:	**Calculations submitted by source and reviewed by Sarah Conner, Ph. D**
Date:	**9/30/2008**

Hours of purging	8760	hr	
Rate of Gas Release:	2	ft^3/min/purge	Neil Wick, Hansen Technologies, 5/26/04 email
Rate of Gas Release:	120	ft^3/hr	
Rate of Ammonia released	2	lb NH3/300 ft^3 gas	Manufacturer's design literature
Number of Purgers at site	2		
Amount of NH3 released to Flare or atmosphere	1.6	**lb/hr**	
	7.01	**tons/year**	

POTENTIAL EMERGENCY GENERATOR EMISSIONS (Natural Gas Fuel)- COLD TERMINAL
KOCH NITROGEN COMPANY, HUNTINGTON AMMONIA TERMINAL

Company Name: **Koch Nitrogen Company**
Address: **502 East Hosler Road, Huntington, IN 46750**
MSOP: **069-26780-00058**
Reviewer: **Calculations submitted by source and reviewed by Sarah Conner, Ph. D.**
Date: **9/30/2008**

Size: 40 HP (approx)
Pilot Fuel Type: Natural gas

Assumptions

Fuel Heat Content	1050	Btu/ft3	(max per USEPA guidance)
Annual Hours of Operation	500	hrs/yr	
Maximum Fuel Usage	162.00	ft3/hr	Estimated from product literature
Maximum Fuel Usage	81000.00	ft3/yr	
	0.17	MMBTU/hr	Calculated (1)

Combustion Products	*Emission Factor*	*Emission Rates*		*Basis of Estimate*
Nitrogen Oxides	3.17 lb/MMBTU	0.5392 lbs/hr (2)	0.135 tpy	AP-42: Table 3.2-1 (8-2000)
Carbon Monoxide	0.386 lb/MMBTU	0.0657 lbs/hr	0.016 tpy	AP-42: Table 3.2-1 (8-2000)
Particulate Matter	0.0384 lb/MMBTU	0.0065 lbs/hr	0.002 tpy	AP-42: Table 3.2-1 (8-2000)
Non-methane VOC	0.12 lb/MMBTU	0.0204 lbs/hr	0.005 tpy	AP-42: Table 3.2-1 (8-2000)
Sulfur Dioxide	0.000588 lb/MMBTU	0.0001 lbs/hr	0.000 tpy	AP-42: Table 3.2-1 (8-2000)
Ammonia	0.0000091 lb/ft3	0.0015 lbs/hr	0.000 tpy	WebFIRE Database (4-2006)

Explanation of Calculation Methodology

(1) Maximum Fuel Usage (MMBTU/hr) = Fuel usage (ft3/hr) * Fuel heat content (BTU/ft3) /1000000 BTU/1 MMBTU

(2) Pollutant Emission Rate (lbs/hr) = (Pollutant Emission factor, lbs/gallon) x (Fuel consumption, gallons/yr) / (2000 lbs/ton)

FUGITIVE COMPONENTS

Company Name: **Koch Nitrogen Company**
Address: **502 East Hosler Road, Huntington, IN 46750**
MSOP: **069-26780-00058**
Reviewer: **Calculations submitted by source and reviewed by Sarah Conner, Ph. D.**
Date: **9/30/2008**

From Elise Stucky-Gregg, 4-24-08 email,

Terminal: Huntington

Data:		Connection Points:	
Total # of valves:	1608	Liquid:	2038
Total # of relief valves:	90	Vapor:	3056
Total # of duel pump seals:	4	Valves:	
Total # of single pump seals:	2	Liquid:	679
Total # of single compressor seals	6	Vapor:	1019
Total # of duel compressor seals	4		

Assumptions: Terminal has 60% vapor valves; 40% liquid valves
Two connection points per valve; using 1.5 multiplier to account for remaining misc connections

POTENTIAL AMMONIA FUGITIVE EMISSION ESTIMATES
KOCH NITROGEN COMPANY AMMONIA TERMINAL - HUNTINGTON, INDIANA

Company Name: **Koch Nitrogen Company**
Address: **502 East Hosler Road, Huntington, IN 46750**
MSOP: **069-26780-00058**
Reviewer: **Calculations submitted by source and reviewed by Sarah Conner, Ph. D.**
Date: **9/30/2008**

Component	*Service*	*Equipment Count* [1]	*Emission Factor* [2]	*Uncontrolled Emission Rates for Liquid Ammonia* [3]	
Valve	light liquid	679	0.000043 kg/hr/component	0.064 lb/hr	0.281 tpy
Valve	gas	1019	0.000013 kg/hr/component	0.029 lb/hr	0.128 tpy
Relief Valve	gas	90	0.00012 kg/hr/component	0.024 lb/hr	0.104 tpy
Pump seal	light liquid	6	0.00054 kg/hr/component	0.007 lb/hr	0.031 tpy
Compressor seal	gas	10	0.00012 kg/hr/component	0.003 lb/hr	0.012 tpy
Connector	light liquid	2038	0.000008 kg/hr/component	0.036 lb/hr	0.157 tpy
Connector	gas	3056	0.000042 kg/hr/component	0.282 lb/hr	1.237 tpy
				0.445	***1.950***

Explanation of Calculation Methodology

(1) Facility Data from E. Stucky-Gregg email on 4/24/08 found in Valve count spreadsheet.

(2) USEPA Protocol for Equipment Leak Emission Estimates, EPA-453/R-95-017, Marketing Terminal Average Emission Factors, Table 2-3, November 1995

(3) Emission Rate = Emission Factor (kg/hr/component) x Equipment Count x 8760 (hrs/yr) x (2.2 lb/1 kg) x (1 ton/2000 lb)
x Average Weight Fraction of NH3 in Stream (1, assuming 100% NH3)

POTENTIAL FUGITIVE EMISSIONS FROM UNPAVED ROADS - COLD TERMINAL
KOCH NITROGEN COMPANY, HUNTINGTON AMMONIA TERMINAL

Company Name: Koch Nitrogen Company
Address: 502 East Hosler Road, Huntington, IN 46750
MSOP: 069-26780-00058
Reviewer: Calculations submitted by source and reviewed by Sarah Conner, Ph. D.
Date: 9/30/2008

Using AP-42 Section 13.2.2 Unpaved Roads (Dated 11/2006), an emission factor was calculated to estimate fugitive road dust in pound/vehicle mile traveled (lb/VMT).

FORMULAS:

$E = k(s/12)^a(W/3)^b$ *(equation 1a)*

$E_{EXT} = E[(365-P)/365]$ *(equation 2)*

where:

E = size-specific emission factor (lb/VMT)
s = surface material silt content (%)
W = mean vehicle weight (tons)
E_{EXT} = annual size-specific emission factor extrapolated for natural mitigation (lb/VMT)
P = number of days in a year with at least 0.254 mm (0.01 in) of precipitation + Days of effective dust control measures

and empirical constants K, a, and b are:

	PM2.5	PM10	PM30
k	0.15	1.5	4.9
a	0.9	0.9	0.7
b	0.45	0.45	0.45

For this site assume the following site-specific variable values:

s =	13	Results of driveway samples for silt and clay content dated 2/18/08
W =	29	tons[1]
P_{precip} =	125	days, estimated from AP-42 Figure 13.2.2-1 (11/06)
P_{dcm} =	0	days, assumed from dust control measures currently in place[2]
P =	125	days

[1] *Pickup trucks (weighing approximately 2 tons) are used on site that account for approximately 5% of total VMT; the other 95% of VMT is from ammonia trucks (weighing about 20 tons empty and 40 tons full).*

[2] *Dust control measures at the site includes: (a) treating road with chemical dust suppressant, (b) water spaying as need, (c) road base with low silt content, and (d) maximum speed limit on the road is 5 mph.*

CALCULATED EMISSION FACTOR:

$E_{PM2.5}$ =	0.45	lb/VMT, calculated as (0.15)*((s/12)^0.9)*((29/3)^0.45) as in Equation 1a
E_{PM10} =	4.47	lb/VMT, calculated as (1.5)*((s/12)^0.9)*((29/3)^0.45) as in Equation 1a
E_{PM30} =	14.38	lb/VMT, calculated as (4.9)*((s/12)^0.7)*((29/3)^0.45) as in Equation 1a

The emission factor above is representative of uncontrolled emissions and does not account for natural mitigation from rainfall. Therefore the emission factor is adjusted as follows:

$E_{PM2.5\ EXT}$ =	0.3	lb/VMT, calculated as $E_{PM2.5}$*((365-P)/365) as in Equation 2
$E_{PM10\ EXT}$=	2.94	lb/VMT, calculated as E_{PM10}*((365-P)/365) as in Equation 2
$E_{PM30\ EXT}$=	9.46	lb/VMT, calculated as E_{PM30}*((365-P)/365) as in Equation 2

VEHICLE MILES TRAVELED (VMT):

Maximum potential VMT for ammonia trucks are estimated as follows:

454200	tons/yr, maximum refrigerated ammonia throughput (see "Maximum Facility Capacities" table)
20	tons/truck, approximate capacity for an ammonia truck
22710	trucks/yr
0.33	miles/truck, average round trip miles in terminal per truck based on site layout
7494	miles/yr

Estimated VMT for pickup trucks are as follows:

4	pickups/day, typical traffic pattern
1460	pickups/year
0.33	miles/pickup, estimated as for ammonia trucks
482	miles/yr

Total potential VMT:

7976	miles/yr

POTENTIAL EMISSION ESTIMATES:

PM2.5 =	1.2	tons/yr
PM10 =	11.7	tons/yr
PM30 =	37.7	tons/yr

TANK DEGASSING EMISSION ESTIMATES
30K TON AMMONIA TANK
KOCH NITROGEN COMPANY, HUNTINGTON AMMONIA TERMINAL

Company Name: Koch Nitrogen Company
Address: 502 East Hosler Road, Huntington, IN 46750
MSOP: 069-26780-00058
Reviewer: Calculations submitted by source and reviewed by Sarah Conner, Ph. D.
Date: 9/30/2008

	Decommissioning								Combustion Emissions - PEC			Total		
Day	Average NH3 Concentration (% by volume)	Blower Air Flow Rate (ft3/min)	Blower NH3 Flow Rate (ft3/min)	Ammonia Captured (lbs/day)	Control Efficiency (%)	Ammonia Emissions (lbs/day)	NOx Emission Factor (lbs/ton NH3)	NOx Emissions (lbs/day)	PEC Fuel Flow Rate MMscf/hr	NOx Emission Factor (lbs/MMscf)	NOx Emissions (lbs/day)	NOx Emissions (lbs/day)	PEC Fuel Flow Rate scf/min	PEC Fuel Flow Rate scf/day
1 (6 hours)	100.00	642	642	10,367	98	207.34	11.1	57.54	0.00243	71.4	4.2	61.70	40.5	14578.3
2	100.00	642	642	41,467	98	829.35	11.1	230.14	0.00243	71.4	4.2	234.31	40.5	58313.4
3	100.00	642	642	41,467	98	829.35	11.1	230.14	0.00243	71.4	4.2	234.31	40.5	58313.4
4	100.00	642	642	41,467	98	829.35	11.1	230.14	0.00243	71.4	4.2	234.31	40.5	58313.4
5	100.00	642	642	41,467	98	829.35	11.1	230.14	0.00243	71.4	4.2	234.31	40.5	58313.4
6	100.00	642	642	41,467	98	829.35	11.1	230.14	0.00243	71.4	4.2	234.31	40.5	58313.4
7	100.00	642	642	41,467	98	829.35	11.1	230.14	0.00243	71.4	4.2	234.31	40.5	58313.4
8	100.00	642	642	41,467	98	829.35	11.1	230.14	0.00243	71.4	4.2	234.31	40.5	58313.4
9	100.00	642	642	41,467	98	829.35	11.1	230.14	0.00243	71.4	4.2	234.31	40.5	58313.4
10	95.00	642	610	39,394	98	787.88	11.1	218.64	0.00243	71.4	4.2	222.80	40.5	58313.4
11	87.63	642	563	36,336	98	726.72	11.1	201.66	0.00243	71.4	4.2	205.83	40.5	58313.4
12	79.54	642	511	32,984	98	659.68	11.1	183.06	0.00243	71.4	4.2	187.22	40.5	58313.4
13	59.04	642	379	24,483	98	489.66	11.1	135.88	0.00243	71.4	4.2	140.04	40.5	58313.4
14	40.00	642	257	16,587	98	331.74	11.1	92.06	0.00243	71.4	4.2	96.22	40.5	58313.4
15	30.00	642	192.60	12,440	98	248.80	11.1	69.04	0.00243	71.4	4.2	73.21	40.5	58313.4
16	20.00	642	128.40	8,293	98	165.87	11.1	46.03	0.00243	71.4	4.2	50.19	40.5	58313.4
17	10.00	642	64.20	4,147	98	82.93	11.1	23.01	0.00243	71.4	4.2	27.18	40.5	58313.4
18	5.00	642	32.10	2,073	98	41.47	11.1	11.51	0.00243	71.4	4.2	15.67	40.5	58313.4
19	3.00	642	19.26	1,244	98	24.88	11.1	6.90	0.00243	71.4	4.2	11.07	40.5	58313.4
20	2.36	642	15.18	981	98	19.61	11.1	5.44	0.00243	71.4	4.2	9.61	40.5	58313.4
21	1.49	642	9.60	620	98	12.40	11.1	3.44	0.00243	71.4	4.2	7.60	40.5	58313.4
22	1.00	642	6.42	415	98	8.29	11.1	2.30	0.00243	71.4	4.2	6.47	40.5	58313.4
23	0.70	642	4.49	290	98	5.81	11.1	1.61	0.00243	71.4	4.2	5.77	40.5	58313.4
24	0.53	642	3.42	221	98	4.42	11.1	1.23	0.00243	71.4	4.2	5.39	40.5	58313.4
25	0.42	642	2.72	175	98	3.51	11.1	0.97	0.00243	71.4	4.2	5.14	40.5	58313.4
26	0.32	642	2.05	132	98	2.64	11.1	0.73	0.00243	71.4	4.2	4.90	40.5	58313.4
27	0.25	642	1.59	103	98	2.06	11.1	0.57	0.00243	71.4	4.2	4.74	40.5	58313.4
28	0.18	642	1.18	76	98	1.52	11.1	0.42	0.00243	71.4	4.2	4.59	40.5	58313.4
29	0.11	642	0.68	44	98	0.88	11.1	0.25	0.00243	71.4	4.2	4.41	40.5	58313.4
30	0.06	642	0.38	25	98	0.49	11.1	0.14	0.00243	71.4	4.2	4.30	40.5	58313.4
31	0.04	642	0.27	18	98	0.35	11.1	0.10	0.00243	71.4	4.2	4.26	40.5	58313.4
32	0.04	642	0.24	16	98	0.31	11.1	0.09	0.00243	71.4	4.2	4.25	40.5	58313.4
33	0.03	642	0.19	12	98	0.25	11.1	0.07	0.00243	71.4	4.2	4.23	40.5	58313.4
34	0.03	642	0.18	11	98	0.23	11.1	0.06	0.00243	71.4	4.2	4.23	40.5	58313.4
35	0.02	642	0.15	10	98	0.19	11.1	0.05	0.00243	71.4	4.2	4.22	40.5	58313.4
36	0.02	642	0.13	8	98	0.17	11.1	0.05	0.00243	71.4	4.2	4.21	40.5	58313.4
37	0.02	642	0.11	7.1	98	0.14	11.1	0.04	0.00243	71.4	4.2	4.20	40.5	58313.4
38	0.01	642	0.08	4.99	98	0.10	11.1	0.03	0.00243	71.4	4.2	4.19	40.5	58313.4
39	0.01	642	0.06	4.147	98	0.08	11.1	0.02	0.00243	71.4	4.2	4.19	40.5	58313.4
40	0.01	642	0.06	4	98	0.08	11.1	0.02	0.00243	71.4	4.2	4.19	40.5	58313.4
41	0.01	642	0.04	2	98	0.05	11.1	0.01	0.00243	71.4	4.2	4.18	40.5	58313.4
42	0.00	642	0.02	1.1	98	0.02	11.1	0.01	0.00243	71.4	4.2	4.17	40.5	58313.4
43	0.00	642	0.01	0.68	98	0.01	11.1	0.00	0.00243	71.4	4.2	4.17	40.5	58313.4
44	0.00	642	0.01	0.622	98	0.01	11.1	0.00	0.00243	71.4	4.2	4.17	40.5	58313.4
45	0.00	642	0.01	0.622	98	0.01	11.1	0.00	0.00243	71.4	4.2	4.17	40.5	58313.4
46	0.00	642	0.01	0.622	98	0.01	11.1	0.00	0.00243	71.4	4.2	4.17	40.5	58313.4
47	0.00	642	0.01	0.622	98	0.01	11.1	0.00	0.00243	71.4	4.2	4.17	40.5	58313.4
48	0.00	642	0.01	0.458	98	0.01	11.1	0.00	0.00243	71.4	4.2	4.17	40.5	58313.4
49	0.00	642	0.00	0.161	98	0.00	11.1	0.00	0.00243	71.4	4.2	4.16	40.5	58313.4
50	0.00	642	0.00	0.161	98	0.00	11.1	0.00	0.00243	71.4	4.2	4.16	40.5	58313.4
51	0.00	642	0.00	0.161	98	0.00	11.1	0.00	0.00243	71.4	4.2	4.16	40.5	58313.4
52	0.00	642	0.00	0.161	98	0.00	11.1	0.00	0.00243	71.4	4.2	4.16	40.5	58313.4
53	0.00	642	0.00	0.161	98	0.00	11.1	0.00	0.00243	71.4	4.2	4.16	40.5	58313.4
54	0.00	642	0.00	0.161	98	0.00	11.1	0.00	0.00243	71.4	4.2	4.16	40.5	58313.4
55	0.00	642	0.00	0.161	98	0.00	11.1	0.00	0.00243	71.4	4.2	4.16	40.5	58313.4
56	0.00	642	0.00	0.161	98	0.00	11.1	0.00	0.00243	71.4	4.2	4.16	40.5	58313.4
57	0.00	642	0.00	0.161	98	0.00	11.1	0.00	0.00243	71.4	4.2	4.16	40.5	58313.4
58	0.00	642	0.00	0.161	98	0.00	11.1	0.00	0.00243	71.4	4.2	4.16	40.5	58313.4
59	0.00	642	0.00	0.161	98	0.00	11.1	0.00	0.00243	71.4	4.2	4.16	40.5	58313.4
60	0.00	642	0.00	0.161	98	0.00	11.1	0.00	0.00243	71.4	4.2	4.16	40.5	58313.4
				523,275		**10,465**		**2,904**			**250**	**3,154**	**2,430**	**3,455,066**

98 % flare efficiency
10,465 Lbs NH3 vented

Note: Average NH3 concentration taken from Actual data collected during the Huntington Tank Decommissioning project in 2003 and 2004

Company Name: Koch Nitrogen Company
Address: 502 East Hosler Road, Huntington, IN 46750
MSOP: 069-26780-00058
Reviewer: Calculations submitted by source and reviewed by Sarah Conner, Ph. D.
Date: 9/30/2008

Recommissioning									Combustion Emissions - PEC			Total		
Day	NH3 Concentration (% by volume)	Blower Air Flow Rate (ft3/min)	Blower NH3 Flow Rate (ft3/min)	Ammonia Captured (lbs/day)	Control Efficiency (%)	Ammonia Emissions (lbs/day)	NOx Emission Factor (lbs/ton NH3)	NOx Emissions (lbs/day)	PEC Fuel Flow Rate MMscf/hr	NOx Emission Factor (lbs/MMscf)	NOx Emissions (lbs/day)	NOx Emissions (lbs/day)	PEC Fuel Flow Rate scf/min	PEC Fuel Flow Rate scf/day
1	5.00	642	32	2,073	98	41.47	11.1	11.51	0.00243	71.4	4.2	15.67	40.5	58313.4
2	10.00	642	64	4,147	98	82.93	11.1	23.01	0.00243	71.4	4.2	27.18	40.5	58313.4
3	15.00	642	96	6,220	98	124.40	11.1	34.52	0.00243	71.4	4.2	38.69	40.5	58313.4
4	20.00	642	128	8,293	98	165.87	11.1	46.03	0.00243	71.4	4.2	50.19	40.5	58313.4
5	25.00	642	161	10,367	98	207.34	11.1	57.54	0.00243	71.4	4.2	61.70	40.5	58313.4
6	30.00	642	193	12,440	98	248.80	11.1	69.04	0.00243	71.4	4.2	73.21	40.5	58313.4
7	35.00	642	225	14,514	98	290.27	11.1	80.55	0.00243	71.4	4.2	84.71	40.5	58313.4
8	40.00	642	257	16,587	98	331.74	11.1	92.06	0.00243	71.4	4.2	96.22	40.5	58313.4
9	45.00	642	289	18,660	98	373.21	11.1	103.56	0.00243	71.4	4.2	107.73	40.5	58313.4
10	50.00	642	321	20,734	98	414.67	11.1	115.07	0.00243	71.4	4.2	119.24	40.5	58313.4
11	60.00	642	385	24,880	98	497.61	11.1	138.09	0.00243	71.4	4.2	142.25	40.5	58313.4
12	70.00	642	449	29,027	98	580.54	11.1	161.10	0.00243	71.4	4.2	165.26	40.5	58313.4
13	80.00	642	514	33,174	98	663.48	11.1	184.12	0.00243	71.4	4.2	188.28	40.5	58313.4
14	90.00	642	578	37,321	98	746.41	11.1	207.13	0.00243	71.4	4.2	211.29	40.5	58313.4
15	100.00	642	642	41,467	98	829.35	11.1	230.14	0.00243	71.4	4.2	234.31	40.5	58313.4
Total Ammonia Captured (lbs.)				279,905		**5,598**		**1553.47**			**62**	**1616**	**607**	**874700**

98 % flare efficiency
5,598 Lbs NH3 vented

Note: Average NH3 concentration taken from Actual data collected during the Huntington Tank Decommissioning project in 2003 and 2004

1782 l hours of operation
16,064 lbs NH3 (Total - Decommissioning and Recommissioning)
8.03 tons NH3 (Total - Decommissioning and Recommissioning)

803,180 lb of NH3 to flare
402 tons of NH3 to flare
11.1 lbs of NOx/ton of NH3
4,458 lbs of NOx

Combustion - Koch PEC Unit

Fuel Type	NG		
Heating Value NG	1050	Btu/scf NG vapor	
Heating Value Ammonia	359	Btu/scf	
Heating content (Hc)	400	Btu/scf Ammonia and NG	
Maximum Ammonia flow rate (x)	642	(ft3/min)	
NG rate to maintain heat content at maximum ammonia rate (y)	40.50	(ft3/min)	Based on 359*x+1050* y = Hc(x+y)
NG rate to maintain heat content at maximum ammonia rate	0.00243	MMscf/hr	
NG Consumption	4,329,767	scf	Sum of daily estimate of NG usage
Heat Release for project	4,546	MMBtu	2.55 MMBtu/hr max

Pollutant	Emission Factor		Emissions lbs	
CO	0.37	lb/MM BTU	1,682	AP-42: Table 13.5-1(9-1991)
PM	0	lb/MM BTU	0	AP-42: Table 13.5-1(9-1991) non-smoking flare
VOC	2.000	% of total VOC	364.6	AP-42: Chapter 13.5 (9-1991), assume 98% VOC control efficiency
SO2	2	lb/lb S	2.5	Assumed all sulfur converted to SO2
NOx	0.068	lb/MM BTU	309	AP-42: Table 13.5-1(9-1991) . Note:
NOx	71.4	lb/MM scf		Conversion of emission factor

Company Name: Koch Nitrogen Company
Address: 502 East Hosler Road, Huntington, IN 46750
MSOP: 069-26780-00058
Reviewer: Calculations submitted by source and reviewed by Sarah Conner, Ph. D.
Date: 9/30/2008

Ammonia Emissions

Tank Decommissioning

Ammonia Sent to Flare	523,275	lbs
Flare Destruction Efficiency	98	%
Ammonia Emissions	10,465	lbs

Tank Recommissioning

Ammonia Sent to Flare	279,905	lbs
Flare Destruction Efficiency	98	%
Ammonia Emissions	5,598	lbs

Total Ammonia Emissions **16,063.60** **lbs**

Nitrogen Oxide Emissions from Ammonia Combustion

Total Ammonia Sent to Flare	803,180	lbs	
Total Ammonia Sent to Flare	401.59	tons	
Nitrogen Oxide Emission Factor	11.1	lbs/ton of Ammonia Flared	TNRCC Air Permit Technical Guidance for Chemical Sources: Flares and Oxidizers [October 2000 RG-109 (Draft)]
Nitrogen Oxide Emissions	**4457.65**	lbs	

Summary of Emissions

Pollutant	Emissions (lbs)	Maximum Emissions (lbs/hr)	Emissions (tons)
Ammonia	**16,063.60**	**34.556**	**8.032**
Nitrogen Oxide	**4,766.79**	**10.283**	**2.383**
Carbon Monoxide	**1,682.11**	**0.944**	**0.841**
Particulate Matter	**0.00**	**0.000**	**0.000**
Sulfur Dioxide	**2.47**	**0.001**	**0.001**
VOCs	**364.61**	**0.205**	**0.182**

(8) Emission rate for VOC: [natural gas consumption during idling (ft^3/yr)] x [1 mole/380 ft^3] x [16 lb/mole natural gas] x [0.10 x (1-0.98)] x [1 ton/2000 lb]
For VOC emissions, a 98% destruction efficiency is assumed, and natural gas is assumed to have a 10% by weight VOC content

(9) Emission rate for SO^2 (t [Natural gas consumed (ft^3/yr)] x [2000 grains sulfur/1,000,000 ft^3 natural gas] x [1 lb sulfur/7,000 grains sulfur] x [64 lb SO_2/32 lb sulfur] x [1 ton SO2/2,000 lb SO_2]
Assumptions: 2000 grains of sulfur per 10^6 cubic feet natural gas (Footnote D of AP-42 Table 1.4-2 dated 7/98) and a ratio of 64 lb SO2 per 32 lb of S

POTENTIAL EMISSION ESTIMATES, EMISSION FACTORS- COLD TERMINAL
KOCH NITROGEN COMPANY, HUNTINGTON AMMONIA TERMINAL
EXPANDED SCOPE - NATURAL GAS

Company Name: Koch Nitrogen Company
Address: 502 East Hosler Road, Huntington, IN 46750
MSOP: 069-26780-00058
Reviewer: Calculations submitted by source and reviewed by Sarah Conner, Ph. D.
Date: 9/30/2008

Generator Emission Factors

Fuel: Natural Gas
Engine: 4-Stroke

Combustion Products	*Emission Factor (1)*	*Basis of Estimate*
Ammonia (2)	0.0000091 lb/ft3	WebFIRE Database (4-2006)
Nitrogen Oxides	3.17 lb/MMBTU	AP-42: Table 3.2-1 (8-2000)
Carbon Monoxide	0.386 lb/MMBTU	AP-42: Table 3.2-1 (8-2000)
Particulate Matter	0.0384 lb/MMBTU	AP-42: Table 3.2-1 (8-2000)
Non-methane VOC	0.12 lb/MMBTU	AP-42: Table 3.2-1 (8-2000)
Sulfur Dioxide	0.000588 lb/MMBTU	AP-42: Table 3.2-1 (8-2000)

Heater Emission Factors

Fuel: Natural Gas
Size: ***>10 MMBTU***

Combustion Products	*Emission Factor*	*Basis of Estimate*
Ammonia (2)	0.0000032 lb/ft3	WebFIRE Database (4-2006)
Nitrogen Oxides	0.0001 lb/ft^3	AP-42: Table 1.4-1 dated 7/98
Carbon Monoxide	0.000084 lb/ft^3	AP-42: Table 1.4-1 dated 7/98
Particulate Matter	0.0000076 lb/ft^3	WebFIRE Database (4-2006)
PM-10	0.0000076 lb/ft^3	WebFIRE Database (4-2006)
PM-2.5	0.0000076 lb/ft^3	WebFIRE Database (4-2006)
Non-methane VOC	0.0000055 lb/ft^3	AP-42: Table 1.4-2 dated 7/98
Sulfur Dioxide	0.0000006 lb/ft^3	AP-42: Table 1.4-2 dated 7/98

Flare Emission Factors

Pilot: Natural Gas

Combustion Products	*Emission Factor*	*Basis of Estimate*
Ammonia (2)	0.0000032 lb/ft3	WebFIRE Database (4-2006)
Nitrogen Oxides	0.068 lb/MM BTU	AP-42: Table 13.5-1(9-1991)
Carbon Monoxide	0.37 lb/MM BTU	AP-42: Table 13.5-1(9-1991)
Particulate Matter	0 lb/MM BTU	AP-42: Table 13.5-1(9-1991) non-smoking flare
Non-methane VOC	2 % of VOC flared	AP-42: Chapter 13.5 (9-1991), assume 98% control efficiency
Sulfur Dioxide	2 lb/lb S	Assumed all sulfur converted to SO2

Explanation of Calculation Methodology

(1) Generator Emission Factors (except NH3) = Emission Factor (lb/MMBTU) x Fuel Heat Content of Natural Gas (BTU/lb) x [1 MMBTU/ 1,000,000 BTU]

(2) Ammonia is a product of the combustion of natural gas

SUMMARY OF POTENTIAL EMISSIONS - HOT TERMINAL
KOCH NITROGEN COMPANY, HUNTINGTON AMMONIA TERMINAL
EXPANDED SCOPE - NATURAL GAS

Company Name: Koch Nitrogen Company
Address: 502 East Hosler Road, Huntington, IN 46750
MSOP: 069-26780-00058
Reviewer: Calculations submitted by source and reviewed by Sarah Conner, Ph. D.
Date: 9/30/2008

	Ammonia (tons/yr)	*Nitrogen Oxides (tons/yr)*	*Carbon Monoxide (tons/yr)*	*VOC (tons/yr)*	*Sulfur Dioxide (tons/yr)*	*Particulate Matter (tons/yr)*	*PM10 (tons/yr)*	*PM2.5 (tons/yr)*
Flare	3.408	1.252	1.790	0.388	0.003	0.000	0.000	0.000
Heater 1 [c]				HEATERS NOT OPERATING				
Heater 2				HEATERS NOT OPERATING				
40 HP Emergency Generator	0.000	0.135	0.016	0.005	0.000	0.002	0.002	0.002
Road Fugitives (2006 Method)						33.044	10.269	1.048
NH3 Fugitives	1.950							
Purger Emissions (if vented to atmosphere)				PURGERS NOT OPERATING				
Truck loading (if vented to atmosphere)	0.058							
TERMINAL WIDE TOTALS	**5.416**	**1.387**	**1.807**	**0.393**	**0.003**	**33.045**	**10.271**	**1.050**
Maximum Individual HAP Emission		**0.008**	**tons/yr**					
Indiana Registration Threshold	NA	10	25	10[a] / 5 [b]	10	5	5	5
Indiana Minor Permit Threshold	NA	25	100	25	25	25	25	25
Federal Major Source Threshold	NA	100	100	100	100	100	100	100

Note:
(1) Indiana does not regulate ammonia.
a - for sources not required to operate VOC control equipment
b - for sources required to operate VOC control equipment
c - Maximum emissions occur if all ammonia leaving the facility is heated by Heater 1. Hence, Heater 2 emissions are not included.

POTENTIAL HAZARDOUS AIR POLLUTANT (HAP) EMISSION ESTIMATES - HOT TERMINAL
KOCH NITROGEN COMPANY, HUNTINGTON AMMONIA TERMINAL
EXPANDED SCOPE - NATURAL GAS

Company Name: Koch Nitrogen Company
Address: 502 East Hosler Road, Huntington, IN 4675(
MSOP: 069-26780-00058
Reviewer: Calculations submitted by source and reviewed by Sarah Conner, Ph. D.
Date: 9/30/2008

Maximum Natual Gas Consumption 9,296,520 ft3/yr From Natural Gas usage spreadsheet

	Combustion Products		*Emission Factor*		*Max Emission lb/yr*	*Basis of Estimate*
	Lead		0.0005	lb/10^6 ft^3	0.005	AP-42: Table 1.4-2 dated 7/98
91-57-6	2-Methylnaphthalene		2.40E-05	lb/10^6 ft^3	0.000	AP-42: Table 1.4-3 dated 7/98
56-49-5	3-Methylchloranthrene	<	1.80E-06	lb/10^6 ft^3	0.000	AP-42: Table 1.4-3 dated 7/98
	7,12-Dimethylbenz(a)anthracene	<	1.60E-05	lb/10^6 ft^3	0.000	AP-42: Table 1.4-3 dated 7/98
83-32-9	Acenaphthene	<	1.80E-06	lb/10^6 ft^3	0.000	AP-42: Table 1.4-3 dated 7/98
203-96-8	Acenaphthylene	<	1.80E-06	lb/10^6 ft^3	0.000	AP-42: Table 1.4-3 dated 7/98
120-12-7	Anthracene	<	2.40E-06	lb/10^6 ft^3	0.000	AP-42: Table 1.4-3 dated 7/98
56-55-3	Benz(a)anthracene	<	1.80E-06	lb/10^6 ft^3	0.000	AP-42: Table 1.4-3 dated 7/98
71-43-2	Benzene		2.10E-03	lb/10^6 ft^3	0.020	AP-42: Table 1.4-3 dated 7/98
50-32-8	Benzo(a)pyrene	<	1.20E-06	lb/10^6 ft^3	0.000	AP-42: Table 1.4-3 dated 7/98
205-99-2	Benzo(b)fluoranthene	<	1.80E-06	lb/10^6 ft^3	0.000	AP-42: Table 1.4-3 dated 7/98
191-24-2	Benzo(g,h,i)perylene	<	1.20E-06	lb/10^6 ft^3	0.000	AP-42: Table 1.4-3 dated 7/98
205-82-3	Benzo(k)fluoranthene	<	1.80E-06	lb/10^6 ft^3	0.000	AP-42: Table 1.4-3 dated 7/98
218-01-9	Chrysene	<	1.80E-06	lb/10^6 ft^3	0.000	AP-42: Table 1.4-3 dated 7/98
53-70-3	Dibenzo(a,h)anthracene	<	1.20E-06	lb/10^6 ft^3	0.000	AP-42: Table 1.4-3 dated 7/98
25321-22-6	Dichlorobenzene		1.20E-03	lb/10^6 ft^3	0.011	AP-42: Table 1.4-3 dated 7/98
206-44-0	Fluoranthene		3.00E-06	lb/10^6 ft^3	0.000	AP-42: Table 1.4-3 dated 7/98
86-73-7	Fluorene		2.80E-06	lb/10^6 ft^3	0.000	AP-42: Table 1.4-3 dated 7/98
50-00-0	Formaldehyde		7.50E-02	lb/10^6 ft^3	0.697	AP-42: Table 1.4-3 dated 7/98
110-54-3	Hexane		1.80E+00	lb/10^6 ft^3	16.734	AP-42: Table 1.4-3 dated 7/98
193-39-5	Indeno(1,2,3-cd)pyrene	<	1.80E-06	lb/10^6 ft^3	0.000	AP-42: Table 1.4-3 dated 7/98
91-20-3	Naphthalene		6.10E-04	lb/10^6 ft^3	0.006	AP-42: Table 1.4-3 dated 7/98
85-01-8	Phenanathrene		1.70E-05	lb/10^6 ft^3	0.000	AP-42: Table 1.4-3 dated 7/98
129-00-0	Pyrene		5.00E-06	lb/10^6 ft^3	0.000	AP-42: Table 1.4-3 dated 7/98
108-88-3	Toluene		3.40E-03	lb/10^6 ft^3	0.032	AP-42: Table 1.4-3 dated 7/98
7440-38-2	Arsenic		2.00E-04	lb/10^6 ft^3	0.002	AP-42: Table 1.4-4 dated 7/98
7440-41-7	Beryllium	<	1.20E-05	lb/10^6 ft^3	0.000	AP-42: Table 1.4-4 dated 7/98
7440-43-9	Cadmium		1.10E-03	lb/10^6 ft^3	0.010	AP-42: Table 1.4-4 dated 7/98
7440-47-3	Chromium		1.40E-03	lb/10^6 ft^3	0.013	AP-42: Table 1.4-4 dated 7/98
7440-48-4	Cobalt		8.40E-05	lb/10^6 ft^3	0.001	AP-42: Table 1.4-4 dated 7/98
7439-96-5	Manganese		3.80E-04	lb/10^6 ft^3	0.004	AP-42: Table 1.4-4 dated 7/98
7439-97-6	Mercury		2.60E-04	lb/10^6 ft^3	0.002	AP-42: Table 1.4-4 dated 7/98
7440-02-0	Nickel		2.10E-03	lb/10^6 ft^3	0.020	AP-42: Table 1.4-4 dated 7/98
7782-49-2	Selenium	<	2.40E-05	lb/10^6 ft^3	0.000	AP-42: Table 1.4-4 dated 7/98

TOTAL HAP EMISSIONS (lb/yr) 17.551
TOTAL HAP EMISSIONS (tons/yr) 0.009

MAX INDIVIDUAL HAP EMISSION (lb/yr) 16.734
MAX INDIVIDUAL HAP EMISSION (ton/yr) 0.008

TOTAL POTENTIAL NATURAL GAS USAGE - HOT TERMINAL
KOCH NITROGEN COMPANY, HUNTINGTON AMMONIA TERMINAL

Company Name: **Koch Nitrogen Company**
Address: **502 East Hosler Road, Huntington, IN 46750**
MSOP: **069-26780-00058**
Reviewer: **Calculations submitted by source and reviewed by Sarah Conner, Ph. D.**
Date: **9/30/2008**

Usage for Flare	9,215,520 ft3	Calculated from flare spreadsheet
Usage for emergency generator	81,000 ft3	Calculated from generator spreadsheet
Usage for heater 1	0 ft3	Calculated from heater spreadsheet
Usage for heater 2	0 ft3	Calculated from heater spreadsheet
Total potential facility natural gas usage	**9,296,520 ft3**	**Total of above equipment usage**

MAXIMUM FACILITY CAPACITIES - HOT TERMINAL
KOCH NITROGEN COMPANY, HUNTINGTON AMMONIA TERMINAL

Company Name: Koch Nitrogen Company
Address: 502 East Hosler Road, Huntington, IN 46750
MSOP: 069-26780-00058
Reviewer: Calculations submitted by source and reviewed by Sarah Conner, Ph. D.
Date: 9/30/2008

Input				
	Maximum ammonia pipeline flow rate input	45	tons/ hr	Facility Data-Maximum the facility can receive via pipeline
	Maximum number of hours pipeline can operate	8760	hr	
	Maximum ammonia pipeline flow rate input	394200	tpy	This equals the maximum amount of ammonia that can possibly be entering the facility
Refrigeration				
	(Refrigeration is needed to put incoming ammonia into tanks)			
	Maximum Refrigeration system capability for incomming ammonia	0	tpy	No refrigeration in hot terminal operation
Storage				
	Total Tank Capacity for ammonia	0	tons	Tanks are vented to atmosphere. Hence, no vented storage in hot terminal operation
Output				
	Maximum theoretical ammonia for output	394200	tpy	pipeline rate plus storage capacity
	Maximum refrigerated ammonia for output	0	tpy	Maximum refrigerated throughput through the facility
	(Heaters are used to heat ammonia into truck tanks. Heaters cannot operate unless cold ammonia flows through the unit)			
	Maximum capabilty of Heater Line 1	100	tons/ hr	Smalling Heater Design Specifications
	Maximum capabilty of Heater Line 2	150	tons/ hr	Smalling Heater Design Specifications
	Maximum Heater 1 hours for refrigerated product	0.00	hours /year	
	Maximum Heater 2 hours for refrigerated product	0.00	hours/year	
	Maximum Heater 1 rate for refrigerated product	0.00	hours per day	calculated as 2752.80/365
	Maximum Heater 2 rate for refrigerated product	0.00	hours per day	calculated as 1835.20/365

POTENTIAL HEATER 1 EMISSIONS (Natural Gas Primary Fuel) - HOT TERMINAL
KOCH NITROGEN COMPANY, HUNTINGTON AMMONIA TERMINAL

Company Name: **Koch Nitrogen Company**
Address: **502 East Hosler Road, Huntington, IN 46750**
MSOP: **069-26780-00058**
Reviewer: **Calculations submitted by source and reviewed by Sarah Conner, Ph. D.**
Date: **9/30/2008**

NOTE: Heaters are used to heat cold ammonia. Heaters are not used in hot terminal operations

Heater #1

Manufacturer	Smalling		
Heater Fuel Type	Natural Gas		
NG Fuel Heat Content	1050	Btu/ft^3	
Heat Duty of Heater	25.26	MMBtu/hr	Smalling Specification sheet
Hours of Operation	0.00	Hours	Not used
Natural Gas Consumption	0	ft^3/yr	

Combustion Products	*Emission Factor*		*Total Emissions*				*Basis of Estimate*
Ammonia	0.0000032	lb/ft3	0.000	tpy	0.000	lb/hr	WebFIRE Database (4-2006)
Nitrogen Oxides	0.0001	lb/ft3	0.000	tpy	0.000	lb/hr	AP-42: Table 1.4-1 dated 7/98
Carbon Monoxide	0.000084	lb/ft3	0.000	tpy	0.000	lb/hr	AP-42: Table 1.4-1 dated 7/98
Particulate Matter	0.0000076	lb/ft3	0.000	tpy	0.000	lb/hr	WebFIRE Database (4-2006)
PM-10	0.0000076	lb/ft3	0.000	tpy	0.000	lb/hr	WebFIRE Database (4-2006)
PM-2.5	0.0000076	lb/ft3	0.000	tpy	0.000	lb/hr	WebFIRE Database (4-2006)
Non-methane VOC	0.0000055	lb/ft3	0.000	tpy	0.000	lb/hr	AP-42: Table 1.4-2 dated 7/98
Sulfur Dioxide	0.0000006	lb/ft3	0.000	tpy	0.000	lb/hr	AP-42: Table 1.4-2 dated 7/98

Explanation of Calculation Methodology

(1) Pollutant Emission Rate (tons/yr) = Emission Factor (lb/ft3) x Natural gas consumption (ft3/yr) x (1 ton / 2000 lbs)

POTENTIAL HEATER 2 EMISSIONS (Natural Gas Primary Fuel) - HOT TERMINAL
KOCH NITROGEN COMPANY, HUNTINGTON AMMONIA TERMINAL

Company Name: **Koch Nitrogen Company**
Address: **502 East Hosler Road, Huntington, IN 46750**
MSOP: **069-26780-00058**
Reviewer: **Calculations submitted by source and reviewed by Sarah Conner, Ph. D.**
Date: **9/30/2008**

NOTE: Heaters are used to heat cold ammonia. Heaters are not used in hot terminal operations

Heater #2

Manufacturer	Smalling		
Heater Fuel Type	Natural Gas		
NG Fuel Heat Content	1050	Btu/ft^3	
Heat Duty of Heater	18.50	MMBtu/hr	Specification sheet
Hours of Operation	0.00	Hours	Not used
Natural Gas Consumption	0	ft^3/yr	

Combustion Products	*Emission Factor*		*Total Emissions*				*Basis of Estimate*
Ammonia	0.0000032	lb/ft3	0.000	tpy	0.000	lb/hr	WebFIRE Database (4-2006)
Nitrogen Oxides	0.0001	lb/ft3	0.000	tpy	0.000	lb/hr	AP-42: Table 1.4-1 dated 7/98
Carbon Monoxide	0.000084	lb/ft3	0.000	tpy	0.000	lb/hr	AP-42: Table 1.4-1 dated 7/98
Particulate Matter	0.0000076	lb/ft3	0.000	tpy	0.000	lb/hr	WebFIRE Database (4-2006)
PM-10	0.0000076	lb/ft3	0.000	tpy	0.000	lb/hr	WebFIRE Database (4-2006)
PM-2.5	0.0000076	lb/ft3	0.000	tpy	0.000	lb/hr	WebFIRE Database (4-2006)
Non-methane VOC	0.0000055	lb/ft3	0.000	tpy	0.000	lb/hr	AP-42: Table 1.4-2 dated 7/98
Sulfur Dioxide	0.0000006	lb/ft3	0.000	tpy	0.000	lb/hr	AP-42: Table 1.4-2 dated 7/98

Explanation of Calculation Methodology

(1) Pollutant Emission Rate (tons/yr) = Emission Factor (lb/ft3) x Natural gas consumption (ft3/yr) x (1 ton / 2000 lbs)

POTENTIAL FLARE EMISSION ESTIMATES - HOT TERMINAL
KOCH NITROGEN COMPANY, HUNTINGTON AMMONIA TERMINAL
EXPANDED SCOPE - NATURAL GAS

Company Name: Koch Nitrogen Company
Address: 502 East Hosler Road, Huntington, IN 46750
MSOP: 069-26780-00058
Reviewer: Calculations submitted by source and reviewed by Sarah Conner, Ph. D.
Date: 9/30/2008

The operation assumes no idling since trucks would operate around the clock. Hence, natural gas flaring would occur 8760 hours per year, but ammonia flaring would occur for 240 hrs per year for maintenance plus truck loading

Flare Name:	Stackmatch with Double Pilots		
Pilot Fuel Type:	Natural Gas		
Molecular Weight	16	lb/lb mole	
Fuel Heat Content	1,050	BTU/ft^3	AP-42: Supplement D, Section 1.4.1 (7-1998)
Assumptions			***Basis***
Composition of Ammonia during Flaring	95.453	Volume percent	Calculated (1)
Composition of Natural Gas during Flaring	4.547	Volume percent	Calculated
Composition of Ammonia during Flaring	95.709	Wt. percent	Calculated (2)
Composition of Natural Gas during Flaring	4.291	Wt. percent	Calculated
Maximum Natural Gas Input Rating during pilot idling	NA		No idling
Maximum Natural Gas Input Rating during Flaring	1.10		Maximum occurs when flaring 100% natural gas (3)
Maximum Natural gas consumption rate during pilot idling	NA	ft3/hr	No idling
Maximum Natural gas consumption rate during flaring	1052.00	ft3/hr	Manufacturer's Literature @ 25 psig
Maximum Fuel Heat Content during Flaring (natural gas only)	1,050	BTU/ft^3	Fuel heat content of natural gas
Fuel Heat Content during Flaring(ammonia and natural gas)	390	BTU/ft^3	Calculated (4)
Annual Hours of Operation	8,760	hrs/yr	
Pilot Flaring (Natural Gas Combustion Only)			
Annual Hours of operation during pilot flaring	8,760		Maximum Annual hours
Natural Gas Consumption during pilot flaring	9,215,520	ft3/yr	Calculated (5)

Combustion Products	***Emission Factor***		***Emission Rates***		***Basis of Estimate***
Ammonia	0.0000032	lb/ft3	0.003366 lb/hr	0.015 tpy	WebFIRE Database (4-2006)
Nitrogen Oxides	0.068	lb/MM BTU	0.0751128 lb/hr	0.329 tpy	AP-42: Table 13.5-1(9-1991) (6)
Carbon Monoxide	0.37	lb/MM BTU	0.408702 lb/hr	1.790 tpy	AP-42: Table 13.5-1(9-1991)
Particulate Matter	0	lb/MM BTU	0 lb/hr	0.000 tpy	AP-42: Table 13.5-1(9-1991) non-smoking flare
Non-methane VOC	2	% of VOC flared	0.089 lb/hr	0.388 tpy	AP-42: Chapter 13.5 (9-1991), assume 98% control efficiency (7)
Sulfur Dioxide	2	lb/lb S	0.00000 lb/hr	0.00263 tpy	Assumed all sulfur converted to SO2 (8)

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During Flaring (Ammonia only)

			Basis
Annual Flaring hours of operation	240.00	hours	Maximum Annual hours
Ammonia Flaring flow rate	22084	ft3/hr	Eng Estimate
Annual Ammonia Flare flow rate	5,300,160	ft^3/yr	Calculated (9)
Natural Gas Consumption During Flaring	-	ft^3/yr	Calculated (10)
Annual Fuel Consumption during Flaring	5,300,160	ft^3/yr	Calculated (11)
Assumed temperature	60	F	
Gas Constant	0.7302	$(atm*ft^3)/(lb\ mole*R)$	
Assumed Pressure	1	Atm	Standard atmospheric pressure
NOx flare emission factor (12)	11.1	lb NOx/ton ammo	TNRCC Air Permit & Technical Guidance for Chemical Sources (Flares & Oxidizers)
Pounds of Ammonia sent to Flare from truck Loading	39	lb	
Moles of ammonia sent to flare per yr (for maintenance)	13,959		Calculated (13)
Pounds of ammonia sent to flare each year including truck blowdown	339,310		Calculated (14)
Flare Efficiency	0.98		
Pounds of ammonia combusted each year	332,524		Calculated (15)
Tons of ammonia emitted each year	**3.393**		Calculated (16)
Maximum pounds of ammonia emitted per hour	**19.775**		Calculated (17)
Average daily ammonia emission over year (lb/day)	**19**		Calculated (18)
Maximum Pounds of NOx emitted per yr	1845.51		Calculated (20)
Maximum Pounds of NOx emitted per hour	**7.69**		
Tons of NOx emitted per yr	**0.923**		

Totals	*Emission Rates*			
Anhydrous Ammonia	**19.778**	**lb/hr**	**3.408**	**tpy**
Nitrogen Oxides	**7.764**	**lb/hr**	**1.252**	**tpy**
Carbon Monoxide	**0.409**	**lb/hr**	**1.790**	**tpy**
Particulate Matter	**-**	**lb/hr**	**0.000**	**tpy**
Non-methane VOC	**0.089**	**lb/hr**	**0.388**	**tpy**
Sulfur Dioxide	**0.000**	**lb/hr**	**0.003**	**tpy**

Company Name: Koch Nitrogen Company
Address: 502 East Hosler Road, Huntington, IN 46750
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Explanation of Calculation Methodology

(1) Volume % of ammonia during flaring = ammonia flow rate during flaring (ft^3/hr)/total fuel consumption during flaring (ft^3/hr) * 100

(2) Weight % of ammonia during flaring = (volume % of ammonia during flaring x 17 lb/lb.mol) / [(volume % of ammonia during flaring) x 17 lb/ lb.mol) + (volume % of natural gas in flare) x 16 lb/lb.mol)] x 100

(3) Maximum Input Rating during Flaring = [natural gas consumption rate during flaring (ft3/hr)] x [fuel heat content (BTU/ft3)] / [1,000,000]

(4) Fuel heat content during flaring = [(volume % of ammonia during flaring/100) x 359 BTU/ft^3)]+[(volume % of natural gas during flaring/100) x 1050 BTU/ft^3)]

(5) Annual natural gas consumption during pilot idling = Maximum Natural gas consumption rate during pilot idling (ft3/hour) x Annual hours of pilot idling operation

(6) Emission rate for NOx, CO, or PM (tons/yr) = [emission factor (lb/MMBTU)] x [hours of pilot idling/yr] x [maximum natural gas input rating during pilot idling (MMBTU/hr)] / [2000 lb/ton]

(7) Emission rate for VOCs (tons/yr) = [natural gas consumption during pilot idling (ft^3/yr)] x [1 mole/380 ft^3] x [16 lb/mole natural gas] x [0.10 x (1-0.98)] x [1 ton/2000 lb]
For VOC emissions, a 98% destruction efficiency is assumed, and natural gas is assumed to have a 10% by weight VOC content

(8) Emission rate for SO_2 (tons/yr) = [Natural gas consumed during pilot idling (ft^3/yr)] x [2000 grains sulfur/1,000,000 ft^3 natural gas] x [1 lb sulfur/7,000 grains sulfur] x [64 lb SO2/32 lb sulfur] x [1 ton SO2/2,000 lb SO2]
Assumptions: 2000 grains of sulfur per 10^6 cubic feet natural gas (Footnote D of AP-42 Table 1.4-2 dated 7/98) and a ratio of 64 lb SO2 per 32 lb of S

(9) Annual ammonia flaring flow rate = [ammonia flaring flow rate (ft^3/hr)] x [annual hours of flare operation]

(10) Annual natural gas flaring flow rate (ft3/yr) = [maximum natural gas consumption rate during flaring (ft^3/hr)] x [annual hours of flaring operation]

(11) Total fuel consumption during flaring = [annual natural gas flaring flow rate (ft^3/yr)]+ [ammonia flaring flow rate (ft^3/yr)]

(12) The emission factor for converting Ammonia to NOx is based on an Air Permit Technical Guidance for Chemical Sources: Flares and Oxidizers from the Texas Natural Resource Conservation Commission (October 2000, RG-109 draft).

(13) Moles of ammonia sent to flare each year = [annual ammonia flaring flow rate (ft^3/yr) /0.7302 atm.ft^3/lb.mol.R]/[459 +60°F] R

(14) Pounds of ammonia sent to flare each year = Moles of ammonia combusted per year x 17 lb ammonia/1 lb.mol ammonia + tons of ammonia from purgers and truck blowdown*2000

(15) Pounds of ammonia combusted each year = Pounds of ammonia sent to flare each year x Flare efficiency

(16) Tons of ammonia emitted each year = (Pounds of ammonia sent to flare each year - Pounds of ammonia combusted each year) x (1 ton/2000 pounds)

(17) Pounds of ammonia emitted per hour = [(Moles ammonia sent to the flare each year (for maintenance) x 17 lb ammonia/lb mol ammonia x (100- flaring efficiency))/annual hours of flaring operation] - [(Pounds of ammonia sent to flare from truck loading x (100-flare efficiency)) x annual hours of flare operation)/total annual hours of operation]

(18) Average daily ammonia emission over year (lb/day) = (Pounds of ammonia sent to flare each year - Pounds of ammonia combusted each year) x (1year/365 days)

(19) Pounds of ammonia emitted each flaring day = Ammonia flaring flow rate (lb/hr) x (24 hours/day) x (100% - Flaring Efficiency %)

(20) Pounds of NOx emitted per year = Pounds of ammonia combusted per year x (1ton/2000 lbs) x NOx emission factor (lb NOx/ton ammonia)

POTENTIAL AMMONIA EMISSIONS FROM TRUCK LOADING - HOT TERMINAL
KOCH NITROGEN COMPANY, HUNTINGTON AMMONIA TERMINAL

Company Name: **Koch Nitrogen Company**
Address: **502 East Hosler Road, Huntington, IN 46750**
MSOP: **069-26780-00058**
Reviewer: **Calculations submitted by source and reviewed by Sarah Conner, Ph. D.**
Date: **9/30/2008**

note: Hot terminal operations will send liquid ammonia in pipe to flare and vapor to flare and/or atmosphere.

Truck Blowdown			
Maximum Number of trucks loading ammonia	54.0	trucks per day	Max receipt through pipe 45 tph * 24 hrs/20 tons per truck
Maximum Number of trucks loading ammonia	19710	trucks per year	
Pipe length	6	feet	
Pipe diameter	2	inches	
Volume of Pipe	0.13	ft3	
Volume of pipe	0.98	gallons	
Total volume in pipe during all unloading events	7.069	ft^3/day	
Total volume in pipe during all unloading events	2580	ft^3/yr	Calculated using volume of pipe and number of trucks per year
Total volume in pipe during all unloading events	19299	Gallons	
Density of liquid ammonia @ 40F	5.28	lb/gallon	Storage and Handling of Anhydrous Ammonia - Tanner Industries
Liquid ammonia sent to flare per year	50.95	tons	

Assume entire content of hose is emitted

Volume of Ammonia emitted per year	2580.039	ft^3/yr	

Determine pounds of NH3 vapor released to flare or atmosphere per year

Ideal Gas Law: pV = nRT

where:

p =	1	atm
V =	2580	ft^3/yr
T =	60	^{o} F
R =	0.7302	(atm*ft3)/(lb mole*R)

n = pV/RT = 6.8080 lb.mole/yr

Molecular weight of NH3 =	17	lb/lb.mole
Pounds of NH3 released to flare or atmosphere=	116	lb/yr
	0.32	**lb/day**
Federal Notification Level for NH3 =	100	lb/day
NH3 Vapor emitted per year to flare or atmosphere	**0.058**	**tons/yr**
Ammonia wt per ft3	39.27	lbs
NH3 Sent to Flare	**101,318**	**lbs/yr**

To Flare (assume all liquid in line)

POTENTIAL INERT EMISSION ESTIMATES - HOT TERMINAL
KOCH NITROGEN COMAPNY- HUNTINGTON, INDIANA
EXPANDED SCOPE - NATURAL GAS

Company Name: **Koch Nitrogen Company**
Address: **502 East Hosler Road, Huntington, IN 46750**
MSOP: **069-26780-00058**
Reviewer: **Calculations submitted by source and reviewed by Sarah Conner, Ph. D.**
Date: **9/30/2008**

NOTE: Purgers are used to as part of refrigeration system and not used in hot terminal operations

Hours of purging	0	hr	
Rate of Gas Release:	2	ft^3/min/purge	Neil Wick, Hansen Technologies, 5/26/04 email
Rate of Gas Release:	120	ft^3/hr	
Rate of Ammonia released	2	lb NH3/300 ft^3 gas	Manufacturer's design literature
Number of Purgers at site	2		
Amount of NH3 released to Flare or atmosphere	1.6	**lb/hr**	
	0.000	**tons/year**	

POTENTIAL EMERGENCY GENERATOR EMISSIONS (Natural Gas Fuel) - HOT TERMINAL
KOCH NITROGEN COMPANY, HUNTINGTON AMMONIA TERMINAL

Company Name: **Koch Nitrogen Company**
Address: **502 East Hosler Road, Huntington, IN 46750**
MSOP: **069-26780-00058**
Reviewer: **Calculations submitted by source and reviewed by Sarah Conner, Ph. D.**
Date: **9/30/2008**

Size: 40 HP (approx)
Pilot Fuel Type: Natural gas

Assumptions

Fuel Heat Content	1050	Btu/ft3	(max per USEPA guidance)
Annual Hours of Operation	500	hrs/yr	
Maximum Fuel Usage	162.00	ft3/hr	Product literature at full load
Maximum Fuel Usage	81000.00	ft3/yr	
	0.17	MMBTU/hr	Calculated (1)

AP-42: Table 3.2-1 (8-2000)

Combustion Products	*Emission Factor*		*Emission Rates*		*Basis of Estimate*
Nitrogen Oxides	3.17	lb/MMBTU	0.5392 lbs/hr (2)	0.135 tpy	AP-42: Table 3.2-1 (8-2000)
Carbon Monoxide	0.386	lb/MMBTU	0.0657 lbs/hr	0.016 tpy	AP-42: Table 3.2-1 (8-2000)
Particulate Matter	0.0384	lb/MMBTU	0.0065 lbs/hr	0.002 tpy	AP-42: Table 3.2-1 (8-2000)
Non-methane VOC	0.12	lb/MMBTU	0.0204 lbs/hr	0.005 tpy	AP-42: Table 3.2-1 (8-2000)
Sulfur Dioxide	0.000588	lb/MMBTU	0.0001 lbs/hr	0.000 tpy	AP-42: Table 3.2-1 (8-2000)
Ammonia	0.0000091	lb/ft3	0.0015 lbs/hr	0.000 tpy	WebFIRE Database (4-2006)

Explanation of Calculation Methodology

(1) Maximum Fuel Usage (MMBTU/hr) = Fuel usage (ft3/hr) * Fuel heat content (BTU/ft3) /1000000 BTU/1 MMBTU

(2) Pollutant Emission Rate (lbs/hr) = (Pollutant Emission factor, lbs/gallon) x (Fuel consumption, gallons/yr) / (2000 lbs/ton)

Draft Valve and Equipment Count

Company Name: **Koch Nitrogen Company**
Address: **502 East Hosler Road, Huntington, IN 46750**
MSOP: **069-26780-00058**
Reviewer: **Calculations submitted by source and reviewed by Sarah Conner, Ph. D.**
Date: **9/30/2008**

From Elise Stucky-Gregg, 4-24-08 email,

Terminal: Huntington

Data:		Connection Points:	
Total # of valves:	1608	Liquid:	2038
Total # of relief valves:	90	Vapor:	3056
Total # of duel pump seals:	4	Valves:	
Total # of single pump seals:	2	Liquid:	679
Total # of single compressor seals	6	Vapor:	1019
Total # of duel compressor seals	4		

Assumptions: Terminal has 60% vapor valves; 40% liquid valves
Two connection points per valve; using 1.5 multiplier to account for remaining misc connections

POTENTIAL AMMONIA FUGITIVE EMISSION ESTIMATES
KOCH NITROGEN COMPANY AMMONIA TERMINAL - HUNTINGTON, INDIANA

Company Name: **Koch Nitrogen Company**
Address: **502 East Hosler Road, Huntington, IN 46750**
MSOP: **069-26780-00058**
Reviewer: **Calculations submitted by source and reviewed by Sarah Conner, Ph. D.**
Date: **9/30/2008**

Component	*Service*	*Equipment Count* [1]	*Emission Factor* [2]	*Uncontrolled Emission Rates for Liquid Ammonia* [3]	
Valve	light liquid	679	0.000043 kg/hr/component	0.064 lb/hr	0.281 tpy
Valve	gas	1019	0.000013 kg/hr/component	0.029 lb/hr	0.128 tpy
Relief Valve	gas	90	0.00012 kg/hr/component	0.024 lb/hr	0.104 tpy
Pump seal	light liquid	6	0.00054 kg/hr/component	0.007 lb/hr	0.031 tpy
Compressor seal	gas	10	0.00012 kg/hr/component	0.003 lb/hr	0.012 tpy
Connector	light liquid	2038	0.000008 kg/hr/component	0.036 lb/hr	0.157 tpy
Connector	gas	3056	0.000042 kg/hr/component	0.282 lb/hr	1.237 tpy
				0.445	***1.950***

Explanation of Calculation Methodology

(1) Facility Data from E. Stucky-Gregg email on 4/24/08 found in Valve count spreadsheet.

(2) USEPA Protocol for Equipment Leak Emission Estimates, EPA-453/R-95-017, Marketing Terminal Average Emission Factors, Table 2-3, November 1995

(3) Emission Rate = Emission Factor (kg/hr/component) x Equipment Count x 8760 (hrs/yr) x (2.2 lb/1 kg) x (1 ton/2000 lb)
x Average Weight Fraction of NH3 in Stream (1, assuming 100% NH3)

POTENTIAL FUGITIVE EMISSIONS FROM UNPAVED ROADS - HOT TERMINAL
KOCH NITROGEN COMPANY, HUNTINGTON AMMONIA TERMINAL

Company Name: Koch Nitrogen Company
Address: 502 East Hosler Road, Huntington, IN 46750
MSOP: 069-26780-00058
Reviewer: Calculations submitted by source and reviewed by Sarah Conner, Ph. D.
Date: 9/30/2008

Using AP-42 Section 13.2.2 Unpaved Roads (Dated 11/2006), an emission factor was calculated to estimate fugitive road dust in pound/vehicle mile traveled (lb/VMT).

FORMULAS:

$E = k(s/12)^a(W/3)^b$ *(equation 1a)*

$E_{EXT} = E[(365-P)/365]$ *(equation 2)*

where:

E = size-specific emission factor (lb/VMT)
s = surface material silt content (%)
W = mean vehicle weight (tons)
E_{EXT} = annual size-specific emission factor extrapolated for natural mitigation (lb/VMT)
P = number of days in a year with at least 0.254 mm (0.01 in) of precipitation

and empirical constants K, a, and b are:

	PM2.5	PM10	PM30
k	0.15	1.5	4.9
a	0.9	0.9	0.7
b	0.45	0.45	0.45

For this site assume the following site-specific variable values:

s =	13	Results of driveway samples for silt and clay content dated 2/18/08
W =	29	tons[1]
P_{precip} =	125	days, estimated from AP-42 Figure 13.2.2-1 (11/06)
P_{dcm} =	0	days, assumed from dust control measures currently in place [2]
P =	125	days

[1] *Pickup trucks (weighing approximately 2 tons) are used on site that account for approximately 5% of total VMT; the other 95% of VMT is from ammonia trucks (weighing about 20 tons empty and 40 tons full). Mean vehicle weight is calculated as (2 tons * 5%*

[2] *Dust control measures at the site includes: (a) treating road with chemical dust suppressant, (b) water spaying as need, (c) road base with low silt content, and (d) maximum speed limit on the road is 5 mph.*

CALCULATED EMISSION FACTOR:

$E_{PM2.5}$ =	0.45	lb/VMT, calculated as (0.23)*((s/12)^0.9)*((29/3)^0.45) as in Equation 1a
E_{PM10} =	4.47	lb/VMT, calculated as (1.5)*((s/12)^0.9)*((29/3)^0.45) as in Equation 1a
E_{PM30} =	14.38	lb/VMT, calculated as (4.9)*((s/12)^0.7)*((29/3)^0.45) as in Equation 1a

The emission factor above is representative of uncontrolled emissions and does not account for natural mitigation from rainfall. Therefore the emission factor is adjusted as follows:

$E_{PM2.5\ EXT}$ =	0.3	lb/VMT, calculated as $E_{PM2.5}$*((365-P)/365) as in Equation 2
$E_{PM10\ EXT}$=	2.94	lb/VMT, calculated as E_{PM10}*((365-P)/365) as in Equation 2
$E_{PM30\ EXT}$=	9.46	lb/VMT, calculated as E_{PM30}*((365-P)/365) as in Equation 2

VEHICLE MILES TRAVELED (VMT):

Maximum potential VMT for ammonia trucks are estimated as follows:

394200	tons/yr, maximum ammonia output (see "Maximum Facility Capacities" table)
20	tons/truck, approximate capacity for an ammonia truck
19710	ammonia trucks/yr
0.33	miles/truck, average round trip miles in terminal per truck based on site layout
6504	miles/yr

Estimated VMT for pickup trucks are as follows:

4	pickups/day, typical traffic pattern
1460	pickups/year
0.33	miles/pickup, estimated as for ammonia trucks
482	miles/yr

Total potential VMT:

6986	miles/yr

POTENTIAL EMISSION ESTIMATES:

PM2.5 =	1.048	tons/yr
PM10 =	10.269	tons/yr
PM30 =	33.044	tons/yr

POTENTIAL EMISSION ESTIMATES, EMISSION FACTORS
KOCH NITROGEN COMPANY, HUNTINGTON AMMONIA TERMINAL
EXPANDED SCOPE - NATURAL GAS

Company Name: Koch Nitrogen Company
Address: 502 East Hosler Road, Huntington, IN 46750
MSOP: 069-26780-00058
Reviewer: Calculations submitted by source and reviewed by Sarah Conner, Ph. D.
Date: 9/30/2008

Generator Emission Factors

Fuel: Natural Gas
Engine: 4-Stroke

Combustion Products	*Emission Factor (1)*	*Basis of Estimate*
Ammonia (2)	0.0000091 lb/ft3	WebFIRE Database (4-2006)
Nitrogen Oxides	3.17 lb/MMBTU	AP-42: Table 3.2-1 (8-2000)
Carbon Monoxide	0.386 lb/MMBTU	AP-42: Table 3.2-1 (8-2000)
Particulate Matter	0.0384 lb/MMBTU	AP-42: Table 3.2-1 (8-2000)
Non-methane VOC	0.12 lb/MMBTU	AP-42: Table 3.2-1 (8-2000)
Sulfur Dioxide	0.000588 lb/MMBTU	AP-42: Table 3.2-1 (8-2000)

Heater Emission Factors

Fuel: Natural Gas
Size: ***>10 MMBTU***

Combustion Products	*Emission Factor*	*Basis of Estimate*
Ammonia (2)	0.0000032 lb/ft3	WebFIRE Database (4-2006)
Nitrogen Oxides	0.0001 lb/ft^3	AP-42: Table 1.4-1 dated 7/98
Carbon Monoxide	0.000084 lb/ft^3	AP-42: Table 1.4-1 dated 7/98
Particulate Matter	0.0000076 lb/ft^3	WebFIRE Database (4-2006)
PM-10	0.0000076 lb/ft^3	WebFIRE Database (4-2006)
PM-2.5	0.0000076 lb/ft^3	WebFIRE Database (4-2006)
Non-methane VOC	0.0000055 lb/ft^3	AP-42: Table 1.4-2 dated 7/98
Sulfur Dioxide	0.0000006 lb/ft^3	AP-42: Table 1.4-2 dated 7/98

Flare Emission Factors

Pilot: Natural Gas

Combustion Products	*Emission Factor*	*Basis of Estimate*
Ammonia (2)	0.0000032 lb/ft3	WebFIRE Database (4-2006)
Nitrogen Oxides	0.068 lb/MM BTU	AP-42: Table 13.5-1(9-1991)
Carbon Monoxide	0.37 lb/MM BTU	AP-42: Table 13.5-1(9-1991)
Particulate Matter	0 lb/MM BTU	AP-42: Table 13.5-1(9-1991) non-smoking flare
Non-methane VOC	2 % of VOC flared	AP-42: Chapter 13.5 (9-1991), assume 98% control efficiency
Sulfur Dioxide	2 lb/lb S	Assumed all sulfur converted to SO2

Explanation of Calculation Methodology

(1) Generator Emission Factors (except NH3) = Emission Factor (lb/MMBTU) x Fuel Heat Content of Natural Gas (BTU/lb) x [1 MMBTU/ 1,000,000 BTU]

(2) Ammonia is a product of the combustion of natural gas

SUMMARY OF POTENTIAL EMISSIONS (Propane Primary Fuel) - HOT TERMINAL
KOCH NITROGEN COMPANY, HUNTINGTON AMMONIA TERMINAL

Company Name: Koch Nitrogen Company
Address: 502 East Hosler Road, Huntington, IN 46750
MSOP: 069-26780-00058
Reviewer: Calculations submitted by source and reviewed by Sarah Conner, Ph. D.
Date: 9/30/2008

	Ammonia (tons/yr)	*Nitrogen Oxides (tons/yr)*	*Carbon Monoxide (tons/yr)*	*VOC (tons/yr)*	*Sulfur Dioxide (tons/yr)*	*Particulate Matter (tons/yr)*	*PM10 (tons/yr)*	*PM2.5 (tons/yr)*
Flare [d]	3.393	1.398	2.585	6.541	0.080	0.000	0.000	0.000
Heater 1 [c]				HEATERS NOT OPERATING				
Heater 2				HEATERS NOT OPERATING				
Propane Tank Loading				0.001				
Propane Equipment Fugitives				0.060				
Road Fugitives (2006 Method)						33.1	10.3	1.0
NH3 Fugitives	1.950							
Purger Emissions (if vented to atmosphere)				PURGERS NOT OPERATING				
Truck loading (if vented to atmosphere)	0.058							
TERMINAL WIDE TOTALS	**5.401**	**1.398**	**2.585**	**6.602**	**0.080**	**33.067**	**10.277**	**1.049**
Indiana Registration Threshold	NA	10	25	10[a] / 5 [b]	10	5	5	5
Indiana Minor Permit Threshold	NA	25	100	25	25	25	25	25
Federal Major Source Threshold	NA	100	100	100	100	100	100	100

Note:
(1) Indiana does not regulate ammonia.
a - for sources not required to operate VOC control equipment
b - for sources required to operate VOC control equipment
c - Maximum emissions occur if all ammonia leaving the facility is heated by Heater 1. Hence, Heater 2 emissions are not included.
d - Maximum emissions occur when only propane is burned in flare (1.6 MMBtu/hr). Additional NOx and ammonia emissions from 240 hr/yr ammonia flaring for maintenance, and continuous flaring of purger gas and truck loading emissions.

MAXIMUM FACILITY CAPACITIES (Propane Primary Fuel) - HOT TERMINAL
KOCH NITROGEN COMPANY, HUNTINGTON AMMONIA TERMINAL

Company Name: Koch Nitrogen Company
Address: 502 East Hosler Road, Huntington, IN 46750
MSOP: 069-26780-00058
Reviewer: Calculations submitted by source and reviewed by Sarah Conner, Ph. D.
Date: 9/30/2008

Input				
	Maximum ammonia pipeline flow rate input	45	tons/ hr	Facility Data-Maximum the facility can receive via pipeline
	Maximum number of hours pipeline can operate	8760	hr	
	Maximum ammonia pipeline flow rate input	394200	tpy	This equals the maximum amount of ammonia that can possibly be entering the facility
Refrigeration				
	(Refrigeration is needed to put incoming ammonia into tanks)			
	Maximum Refrigeration system capability for incomming ammonia	0	tpy	No refrigeration in hot terminal operation
Storage				
	Total Tank Capacity for ammonia	0	tons	Tanks are vented to atmosphere. Hence, no vented storage in hot terminal operation
Output				
	Maximum theoretical ammonia for output	394200	tpy	pipeline rate plus storage capacity
	Maximum refrigerated ammonia for output	0	tpy	Maximum refrigerated throughput through the facility
	(Heaters are used to heat ammonia into truck tanks. Heaters cannot operate unless cold ammonia flows through the unit)			
	Maximum capabilty of Heater Line 1	100	tons/ hr	BSB Heater Specifications
	Maximum capabilty of Heater Line 2	150	tons/ hr	Smalling Heater Design Specifications
	Maximum Heater 1 hours for refrigerated product	0.00	hours /year	
	Maximum Heater 2 hours for refrigerated product	0.00	hours/year	
	Maximum Heater 1 rate for refrigerated product	0.00	hours per day	calculated as 2752.80/365
	Maximum Heater 2 rate for refrigerated product	0.00	hours per day	calculated as 1835.20/365

POTENTIAL HEATER 1 EMISSIONS (Propane Primary Fuel) - HOT TERMINAL
KOCH NITROGEN COMPANY, HUNTINGTON AMMONIA TERMINAL

Company Name: Koch Nitrogen Company
Address: 502 East Hosler Road, Huntington, IN 46750
MSOP: 069-26780-00058
Reviewer: Calculations submitted by source and reviewed by Sarah Conner, Ph. D.
Date: 9/30/2008

NOTE: Heaters are used to heat cold ammonia. Heaters are not used in hot terminal operations

Heater #1

Manufacturer	Smalling		
Heater Fuel Type	Propane		
Fuel Heat Content	90,500	BTU/gallon	AP-42: Chapter 1.5.1(10-1996)
Heat Duty of Heater	25.26	MMBtu/hr	BS&B Specification sheet
Fuel Consumption	279.12	Gallons/hr	Calculated (1)
Annual Hours of Operation		hrs/yr	Not Used
Propane Consumption	0	gallons/yr	Calculated (2)
Sulfur Content in Propane	123.00	ppm	10-22-03 discussion with Franger Gas, Walton propane supplier
Mass of Propane Consumed	0	lb/yr	Calculated (3)
Percent Sulfur in Propane	0.0123	% by weight	
Mass of Sulfur from Propane Consumption	0	lb/yr	Calculated (4)

Combustion Products	*Emission Factor*		*Emission Rates*		*Basis of Estimate*
Nitrogen Oxides	0.019	lb/gallon	0.0000 lbs/hr	0.000 tpy (5)	AP-42: Table 1.5-1(10-1996) for Heat content > 10 MMBTU/hr
Carbon Monoxide	0.0032	lb/gallon	0.0000 lbs/hr	0.000 tpy	AP-42: Table 1.5-1(10-1996) for Heat content > 10 MMBTU/hr
Particulate Matter	0.0006	lb/gallon	0.0000 lbs/hr	0.000 tpy	AP-42: Table 1.5-1(10-1996) for Heat content > 10 MMBTU/hr
Non-methane VOC	0.0005	lb/gallon	0.0000 lbs/hr	0.000 tpy	AP-42: Table 1.5-1(10-1996) for Heat content > 10 MMBTU/hr
Sulfur Dioxide	2	lb/lb sulfur in propane	0.0000 lbs/hr	0.000 tpy (6)	Assumed all sulfur converted to SO2

Explanation of Calculation Methodology

(1) Fuel Consumption = Heat Duty of Heater (MMBtu/hr) * 1,000,000 (Btu/ MMBtu) / Fuel Heat Content of Propane (BTU/gallon)

(2) Propane Consumption = Fuel Consumption(gallons/hr) x Annual Hours of Operation

(3) Convert propane consumption to lb/yr = [propane consumption (gallon/yr)] x [4.24 lb liquid propane/1 gallon liquid propane]

(4) Mass of sulfur from propane consumption = [propane consumption (lb/yr)] x [0.0123 (percent sulfur by weight)] /100

(5) Pollutant Emission Rate
for NOx, CO, PM, or VOCs (tons/yr) = (Pollutant Emission factor, lbs/gallon) x (Fuel consumption, gallons/yr) / (2000 lbs/ton)

(6) Emission rate for SO_2 (tons/yr) = [Mass of sulfur from propane combustion (lb/yr)] x [2 lb SO2/1 lb sulfur] x [1 ton SO2/2000 lb SO2]

POTENTIAL HEATER 2 EMISSIONS (Propane Primary Fuel) - HOT TERMINAL
KOCH NITROGEN COMPANY, HUNTINGTON AMMONIA TERMINAL

Company Name: Koch Nitrogen Company
Address: 502 East Hosler Road, Huntington, IN 46750
MSOP: 069-26780-00058
Reviewer: Calculations submitted by source and reviewed by Sarah Conner, Ph. D.
Date: 9/30/2008

NOTE: Heaters are used to heat cold ammonia. Heaters are not used in hot terminal operations

Heater #2

Manufacturer	Smalling		
Heater Fuel Type	Propane		
Fuel Heat Content	90,500	BTU/gallon	AP-42: Chapter 1.5.1(10-1996)
Heat Duty of Heater	18.50	MMBtu/hr	Smalling Specification sheet
Fuel Consumption	204.42	Gallons/hr	Calculated (1)
Annual Hours of Operation		hrs/yr	Not Used
Propane Consumption	0	gallons/yr	Calculated (2)
Sulfur Content in Propane	123.00	ppm	10-22-03 discussion with Franger Gas, Walton propane supplier
Mass of Propane Consumed	0	lb/yr	Calculated (3)
Percent Sulfur in Propane	0.0123	% by weight	
Mass of Sulfur from Propane Consumption	0	lb/yr	Calculated (4)

Combustion Products	*Emission Factor*		*Emission Rates*		*Basis of Estimate*
Nitrogen Oxides	0.019	lb/gallon	0.0000 lbs/hr	0.000 tpy (5)	AP-42: Table 1.5-1(10-1996) for Heat content > 10 MMBTU/hr
Carbon Monoxide	0.0032	lb/gallon	0.0000 lbs/hr	0.000 tpy	AP-42: Table 1.5-1(10-1996) for Heat content > 10 MMBTU/hr
Particulate Matter	0.0006	lb/gallon	0.0000 lbs/hr	0.000 tpy	AP-42: Table 1.5-1(10-1996) for Heat content > 10 MMBTU/hr
Non-methane VOC	0.0005	lb/gallon	0.0000 lbs/hr	0.000 tpy	AP-42: Table 1.5-1(10-1996) for Heat content > 10 MMBTU/hr
Sulfur Dioxide	2	lb/lb sulfur in propane	0.0000 lbs/hr	0.000 tpy (6)	Assumed all sulfur converted to SO2

Explanation of Calculation Methodology

(1) Fuel Consumption = Heat Duty of Heater (MMBtu/hr) * 1,000,000 (Btu/ MMBtu) / Fuel Heat Content of Propane (BTU/gallon)

(2) Propane Consumption = Fuel Consumption(gallons/hr) x Annual Hours of Operation

(3) Convert propane consumption to lb/yr = [propane consumption (gallon/yr)] x [4.24 lb liquid propane/1 gallon liquid propane]

(4) Mass of sulfur from propane consumption = [propane consumption (lb/yr)] x [0.0123 (percent sulfur by weight)] /100

(5) Pollutant Emission Rate
for NOx, CO, PM, or VOCs (tons/yr) = (Pollutant Emission factor, lbs/gallon) x (Fuel consumption, gallons/yr) / (2000 lbs/ton)

(6) Emission rate for SO_2 (tons/yr) = [Mass of sulfur from propane combustion (lb/yr)] x [2 lb SO2/1 lb sulfur] x [1 ton SO2/2000 lb SO2]

POTENTIAL FLARE 1 EMISSIONS (Propane Primary Fuel) - HOT TERMINAL
KOCH NITROGEN COMPANY, HUNTINGTON AMMONIA TERMINAL

Company Name: Koch Nitrogen Company
Address: 502 East Hosler Road, Huntington, IN 46750
MSOP: 069-26780-00058
Reviewer: Calculations submitted by source and reviewed by Sarah Conner, Ph. D.
Date: 9/30/2008

The operation assumes no idling since trucks would operate around the clock. Hence, propane flaring would occur 8760 per year, but ammonia flaring would occur for 240 hrs per year for maintenance (plus flaring of purger gas and truck loading)

Flare Name	StackMatch w/double pilots	
Pilot Fuel Type	Propane	
Molecular weight	44	lb/lb mole
Fuel Heat Content	90,500	BTU/gallon liquid
Fuel Heat Content	2,516	BTU/ft^3 vapor
Conversion factor	36	ft3 vapor/gallon propane liquid
Conversion factor	4.24	lb propane/1 gallon liquid propane

Assumptions			***Basis***
Composition of Ammonia during Flaring	97.209	Volume percent	Calculated (1)
Composition of Propane during Flaring	2.791	Volume percent	Calculated
Composition of Ammonia during Flaring	93.083	Wt. percent	Calculated (2)
Composition of Propane during Flaring	6.917	Wt. percent	Calculated
Maximum Input Rating during Flaring	1.60	MMBtu/hr	Maximum occurs when flaring 100% propane (3)
Maximum Input Rating during Flare idling	NA	MMBtu/hr	No idling
Maximum Propane consumption rate during Flare idling	NA	ft3/hr	No idling
Maximum Propane consumption rate during flaring	634.00	ft3/hr	Manufacturer's Literature @ 25 psig
Fuel Heat Content during Flaring(ammonia and propane)	419	Btu/scf	
Maximum Fuel Heat Content during Flaring (propane only)	2516	Btu/scf	National Propane gas Association
Maximum Annual Hours of Operation	8760	hrs/yr	
VOC Flare efficiency	98	percent	4/28/03 Koch supplied assumption

Pilot Flaring (Propane Combustion Only)

Annual Hours of operation during Pilot Flaring	8,760		Maximum Annual Hours
Sulfur Content in Propane	123.00	ppm	10-22-03 discussion with Franger Gas, Walton propane supplier
Propane Consumption during Flaring	5,553,840	ft3/yr	Calculated from Hourly usage and hours of flaring (4)
Propane Consumption during Flaring	654,119	lb/yr	Calculated from conversion of units (5)
Mass of Sulfur during Flare idling	80.46	lb/yr	Calculated from sulfur content and propane consumption (6)

Combustion Products	***Emission Factor***		***Emission Rates***	***Basis of Estimate***
Nitrogen Oxides	0.068	lb/MM BTU	0.475 tpy (7)	AP-42: Table 13.5-1(9-1991)
Carbon Monoxide	0.37	lb/MM BTU	2.585 tpy	AP-42: Table 13.5-1(9-1991)
Particulate Matter	0	lb/MM BTU	0.000 tpy	AP-42: Table 13.5-1(9-1991) non-smoking flare
Non-methane VOC	2	% of total VOCs	6.541 tpy (8)	AP-42: Chapter 13.5 (9-1991)
Sulfur Dioxide	2	lb/# Sulfur in propane	0.080 tpy (9)	Assumed all sulfur converted to SO2

Company Name: Koch Nitrogen Company
Address: 502 East Hosler Road, Huntington, IN 46750
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During Flaring (Ammonia and Propane Combustion)

			Basis
Annual Flare hours of operation	240.00	hours	Maintenance Emissions
Ammonia flow rate during Flaring	22084	ft3/hr	Eng Estimate
Annual Ammonia flow rate during Flaring	5,300,160	ft3/yr	Calculated (10)
Annual Propane Consumption during Flaring	NA	ft3/yr	Calculated (11) - included in pilot flaring section
Annual Fuel Consumption during Flaring	5,300,160	ft3/yr	Calculated (12)
Assumed temperature	60	F	
Gas Constant	0.7302	(atm*ft3)/(lb mole*R)	
Assumed Pressure	1	Atm	Standard atmospheric pressure
Efficiency of Flare	#REF!	percent	Calculated from Koch supplied emission factor
Nox flare emission factor (13)	11.1	lb Nox/ton ammonia	Koch Supplied
Pounds of ammonia sent to flare each year including purger and truck blowdown	339310.09	lbs	Calculated (14)
Pounds of ammonia combusted per year	332523.89	lbs	98% combusted, 2% to atmosphere (15)
Pounds of Nox from ammonia combustion	1845.51	lbs	Calculated (16) Based on TNRCC emission factor
NOx tons per year from ammonia combustion	0.92	TPY	
Pounds of ammonia to atmosphere per year	6786.20	lbs	
Ammonia to atmosphere	3.39	TPY	
Propane Consumption During Flaring	0	scf/yr	
Propane Consumption During Flaring	0	lb/yr	Calculated from conversion of units
Mass of Sulfur during Flaring	0.000	lb/yr	Calculated from sulfur content and propane consumption

Combustion Products	*Emission Factor*		*Emission Rates*	*Basis of Estimate*
Nitrogen Oxides	0	lb/MMBTU	0.000 tpy	AP-42: Table 13.5-1(9-1991)
Carbon Monoxide	0	lb/MMBTU	0.000 tpy	AP-42: Table 13.5-1(9-1991)
Particulate Matter	0	lb/MMBTU	0.000 tpy	AP-42: Table 13.5-1(9-1991) non-smoking flare
Non-methane VOC	0	% of total VOC	0.000 tpy	AP-42: Chapter 13.5 (9-1991), assume 98% VOC control efficiency
Sulfur Dioxide	0	lb/lb Sulfur in Propane	0.000 tpy	Assumed all sulfur converted to SO2
Total propane used	5,553,840	ft3/yr		
	154403	gallon/yr		

Totals	*Emission Rates*
Nitrogen Oxides	**1.398 tpy**
Carbon Monoxide	**2.585 tpy**
Particulate Matter	**0.000 tpy**
Non-methane VOC	**6.541 tpy**
Sulfur Dioxide	**0.080 tpy**

Ammonia	**3.393 tpy**

Company Name: Koch Nitrogen Company
Address: 502 East Hosler Road, Huntington, IN 46750
MSOP: 069-26780-00058
Reviewer: Calculations submitted by source and reviewed by Sarah Conner, Ph. D.
Date: 9/30/2008

Explanation of Calculation Methodology

(1) Volume ammonia flow rate during flaring (ft^3/hr)/total fuel consumption during flaring (propane plus ammonia ft^3/hr) * 100

(2) Weight (volume % of ammonia during flaring x 17 lb/lb.mol) / [(volume % of ammonia during flaring) x 17 lb/ lb.mol) + (volume % of propane in flare) x 44 lb/lb.mol)] x 100

(3) Maximu [propane consumption rate during flaring (ft3/hr)] x [fuel heat content (BTU/ft3)] / [1,000,000]

(4) Annual Maximum Propane consumption rate during Flare idling (ft3/hr) x Annual hours of pilot idling operation

(5) Propane [Propane consumption (ft3/yr)] /[1 gal propane/36 ft3 propane] x [4.24 lb propane/1 gallon liquid propane]

(6) Mass of [propane consumption (lb/yr)] x [0.0123 lb sulfur/100 lb propane]

(7) Emissio [emission factor (lb/MMBTU)] x [hours of pilot idling/yr] x [maximum propane input rating during idling (MMBTU/hr)] / [2000 lb/ton]

(8) Emissic [propane consumption during idling (lb/yr)] x [(100%-98%)] x [1 ton/2000 lb]
For VOC emissions, a 98% destruction efficiency is assumed, and propane is assumed to have a 100% by weight VOC content

(9) Emissio [Mass of sulfur combusted (lb/yr)] x [2 lb SO_2/1 lb sulfur] x [1 ton SO_2/2000 lb SO_2]

(10) Ammo Hours of flare operation x Ammonia flaring flow rate (ft3/hr)

(11) Propar Hours of flare operation x Maximum propane consumption rate during flaring (ft3/hr)

(12) Total fl Ammonia flowrate during flaring (ft^3/yr) + Propane flowrate during flaring (ft^3/yr)

(13) The emission factor for converting Ammonia to NOx is based on an Air Permit Technical Guidance for Chemical Sources: Flares and Oxidizers from the Texas Natural Resource Conservation Commission (October 2000, RG-109 draft).

(14) Pound: [annual ammonia flaring flow rate (ft^3/yr) /0.7302 atm.ft^3/lb.mol.R]/[459 +60°F] R x [17lb/lb.mol]

(15) Pound: Pounds of ammonia sent to flare each year x Flare efficiency

(16) Pound: Pounds of ammonia combusted each year x (1ton/2000 lbs) x NOx emission factor (lb NOx/ton ammonia)

POTENTIAL AMMONIA EMISSIONS FROM TRUCK LOADING (Propane Primary Fuel) - HOT TERMINAL
KOCH NITROGEN COMPANY, HUNTINGTON AMMONIA TERMINAL

Company Name: **Koch Nitrogen Company**
Address: **502 East Hosler Road, Huntington, IN 46750**
MSOP: **069-26780-00058**
Reviewer: **Calculations submitted by source and reviewed by Sarah Conner, Ph. D.**
Date: **9/30/2008**

note: Hot terminal operations will send liquid ammonia in pipe to flare and vapor to flare and/or atmosphere.

Truck Blowdown			
Maximum Number of trucks loading ammonia	54.0	trucks per day	Max receipt through pipe 45 tph * 24 hrs/20 tons per truck
Pipe length	6	feet	
Pipe diameter	2	inches	
Volume of Pipe	0.13	ft3	
Volume of pipe	0.98	gallons	
Total volume in pipe during all unloading events	7.069	ft^3/day	
Total volume in pipe during all unloading events	2580	ft^3/yr	Calculated using volume of pipe and number of trucks per year
Total volume in pipe during all unloading events	19299	Gallons	
Density of liquid ammonia @ 40F	5.28	lb/gallon	Storage and Handling of Anhydrous Ammonia - Tanner Industries
Liquid ammonia sent to flare per year	50.95	tons	

Determine pounds of NH3 vapor released to flare or atmosphere per year

Ideal Gas Law: pV = nRT

where:

p =	1	atm
V =	2580	ft^3/yr
T =	60	^{o} F
R =	0.7302	(atm*ft3)/(lb mole*R)

n = pV/RT = 6.8080 lb.mole/yr

Molecular weight of NH3 =	17	lb/lb.mole
Pounds of NH3 released to flare or atmosphere=	116	lb/yr
	0.32	**lb/day**
Federal Notification Level for NH3 =	100	lb/day
NH3 Vapor emitted per year to flare or atmosphere	**0.058**	**tons/yr**

POTENTIAL INERT EMISSION ESTIMATES (Propane Primary Fuel) - HOT TERMINAL
KOCH NITROGEN COMAPNY- HUNTINGTON, INDIANA
EXPANDED SCOPE - PROPANE

Company Name: **Koch Nitrogen Company**
Address: **502 East Hosler Road, Huntington, IN 46750**
MSOP: **069-26780-00058**
Reviewer: **Calculations submitted by source and reviewed by Sarah Conner, Ph. D.**
Date: **9/30/2008**

NOTE: Purgers are used to as part of refrigeration system and not used in hot terminal operations

Hours of purging	0	hr	
Rate of Gas Release:	2	ft^3/min/purge	Neil Wick, Hansen Technologies, 5/26/04 email
Rate of Gas Release:	120	ft^3/hr	
Rate of Ammonia released	2	lb NH3/300 ft^3 gas	Manufacturer's design literature
Number of Purgers at site	2		
Amount of NH3 released to Flare or Atmosphere	1.6	**lb/hr**	
	0.00	**tons/year**	

POTENTIAL VOC EMISSIONS FROM PROPANE TANK LOADING (Propane Primary Fuel) - HOT TERMINAL
KOCH NITROGEN COMPANY, HUNTINGTON AMMONIA TERMINAL

Company Name: **Koch Nitrogen Company**
Address: **502 East Hosler Road, Huntington, IN 46750**
MSOP: **069-26780-00058**
Reviewer: **Calculations submitted by source and reviewed by Sarah Conner, Ph. D.**
Date: **9/30/2008**

Maximum Gallons needed	154,403	Gallons	Total Gallons of propane from all sources
Number of trucks unloading propane	15	trucks per year	Assume 10,000 gallons / truck
Hose length	20	feet	
Hose diameter	3	inches	
Volume of hose	0.98175	ft3 vapor	Calculated
	0.03	gallons	Calculated
density of liquid propane	4.24	lb/gallon	National Propane gas Association
Assume entire hose contents is emitted			
VOCs emitted per year	1.78533487	lbs	Calculated
VOCs emitted per year	0.000892667	tons	Calculated

POTENTIAL PROPANE FUGITIVE EMISSION ESTIMATES
KOCH NITROGEN COMPANY AMMONIA TERMINAL - HUNTINGTON, INDIANA

Company Name: **Koch Nitrogen Company**
Address: **502 East Hosler Road, Huntington, IN 46750**
MSOP: **069-26780-00058**
Reviewer: **Calculations submitted by source and reviewed by Sarah Conner, Ph. D.**
Date: **9/30/2008**

Component	*Service*	*Equipment Count* [1]	*Emission Factor* [2]	*Uncontrolled Emission Rates for Liquid Propane* [3]	
Valve	light liquid	15	0.000043 kg/hr/component	0.001 lb/hr	0.006 tpy
Valve	gas	50	0.000013 kg/hr/component	0.001 lb/hr	0.006 tpy
Flanges (connectors)	gas	102	0.000042 kg/hr/component	0.009 lb/hr	0.041 tpy
Flanges (connectors)	light liquid	31	0.000008 kg/hr/component	0.001 lb/hr	0.002 tpy
Pump seals	light liquid		0.00054 kg/hr/component	0.000 lb/hr	0.000 tpy
Pressure Relief Valves	gas	3	0.00012 kg/hr/component	0.001 lb/hr	0.003 tpy
Compressor seals	gas		0.00012 kg/hr/component	0.000 lb/hr	0.000 tpy
				0.014	***0.060***

Explanation of Calculation Methodology

(1) Assumed count from similar KNC facility

(2) USEPA Protocol for Equipment Leak Emission Estimates, EPA-453/R-95-017, Marketing Terminal Average Emission Factors, Table 2-3, November 1995

(3) Emission Rate = Emission Factor (kg/hr/component) x Equipment Count x 8760 (hrs/yr) x (2.2 lb/1 kg) x (1 ton/2000 lb)
x Average Weight Fraction of TOC in Stream (1, assuming 100% TOC)

AMMONIA FUGITIVE COMPONENTS

Company Name: **Koch Nitrogen Company**
Address: **502 East Hosler Road, Huntington, IN 46750**
MSOP: **069-26780-00058**
Reviewer: **Calculations submitted by source and reviewed by Sarah Conner, Ph. D.**
Date: **9/30/2008**

From Elise Stucky-Gregg, 4-24-08 email,

Terminal:	Huntington

Data:		Connection Points:	
Total # of valves:	1608	Liquid:	2038
Total # of relief valves:	90	Vapor:	3056
Total # of duel pump seals:	4	Valves:	
Total # of single pump seals:	2	Liquid:	679
Total # of single compressor seals	6	Vapor:	1019
Total # of duel compressor seals	4		

Assumptions: Terminal has 60% vapor valves; 40% liquid valves
Two connection points per valve; using 1.5 multiplier to account for remaining misc connections

POTENTIAL AMMONIA FUGITIVE EMISSION ESTIMATES
KOCH NITROGEN COMPANY AMMONIA TERMINAL - HUNTINGTON, INDIANA

Company Name: **Koch Nitrogen Company**
Address: **502 East Hosler Road, Huntington, IN 46750**
MSOP: **069-26780-00058**
Reviewer: **Calculations submitted by source and reviewed by Sarah Conner, Ph. D.**
Date: **9/30/2008**

Component	*Service*	*Equipment Count* [1]	*Emission Factor* [2]	*Uncontrolled Emission Rates for Liquid Ammonia* [3]	
Valve	light liquid	679	0.000043 kg/hr/component	0.064 lb/hr	0.281 tpy
Valve	gas	1019	0.000013 kg/hr/component	0.029 lb/hr	0.128 tpy
Relief Valve	gas	90	0.00012 kg/hr/component	0.024 lb/hr	0.104 tpy
Pump seal	light liquid	6	0.00054 kg/hr/component	0.007 lb/hr	0.031 tpy
Compressor seal	gas	10	0.00012 kg/hr/component	0.003 lb/hr	0.012 tpy
Connector	light liquid	2038	0.000008 kg/hr/component	0.036 lb/hr	0.157 tpy
Connector	gas	3056	0.000042 kg/hr/component	0.282 lb/hr	1.237 tpy
				0.445	***1.950***

Explanation of Calculation Methodology

(1) Facility Data from E. Stucky-Gregg email on 4/24/08 found in Valve count spreadsheet.

(2) USEPA Protocol for Equipment Leak Emission Estimates, EPA-453/R-95-017, Marketing Terminal Average Emission Factors, Table 2-3, November 1995

(3) Emission Rate = Emission Factor (kg/hr/component) x Equipment Count x 8760 (hrs/yr) x (2.2 lb/1 kg) x (1 ton/2000 lb)
x Average Weight Fraction of NH3 in Stream (1, assuming 100% NH3)

POTENTIAL FUGITIVE EMISSIONS FROM UNPAVED ROADS (Propane Primary Fuel) - HOT TERMINAL
KOCH NITROGEN COMPANY, HUNTINGTON AMMONIA TERMINAL

Company Name: Koch Nitrogen Company
Address: 502 East Hosler Road, Huntington, IN 46750
MSOP: 069-26780-00058
Reviewer: Calculations submitted by source and reviewed by Sarah Conner, Ph. D.
Date: 9/30/2008

Using AP-42 Section 13.2.2 Unpaved Roads (Dated 11/2006), an emission factor was calculated to estimate fugitive road dust in pound/vehicle mile traveled (lb/VMT).

FORMULAS:

$E = k(s/12)^a(W/3)^b$ *(equation 1a)*

$E_{EXT} = E[(365-P)/365]$ *(equation 2)*

where:

E = size-specific emission factor (lb/VMT)
s = surface material silt content (%)
W = mean vehicle weight (tons)
E_{EXT} = annual size-specific emission factor extrapolated for natural mitigation (lb/VMT)
P = number of days in a year with at least 0.254 mm (0.01 in) of precipitation

and empirical constants K, a, and b are:

	PM2.5	PM10	PM30
k	0.15	1.5	4.9
a	0.9	0.9	0.7
b	0.45	0.45	0.45

For this site assume the following site-specific variable values:

s =	13	Results of driveway samples for silt and clay content dated 2/18/08
W =	29	tons[1]
P_{precip} =	125	days, estimated from AP-42 Figure 13.2.2-1 (11/06)
P_{dcm} =	0	days, assumed from dust control measures currently in place [2]
P =	125	days

[1] *Pickup trucks (weighing approximately 2 tons) are used on site that account for approximately 5% of total VMT; the other 95% of VMT is from ammonia trucks (weighing about 20 tons empty and 40 tons full).*

[2] *Dust control measures at the site includes: (a) treating road with chemical dust suppressant, (b) water spaying as need, (c) road base with low silt content, and (d) maximum speed limit on the road is 5 mph.*

CALCULATED EMISSION FACTOR:

$E_{PM2.5}$ =	0.45	lb/VMT, calculated as (0.15)*((s/12)^0.9)*((29/3)^0.45) as in Equation 1a
E_{PM10} =	4.47	lb/VMT, calculated as (1.5)*((s/12)^0.9)*((29/3)^0.45) as in Equation 1a
E_{PM30} =	14.38	lb/VMT, calculated as (4.9)*((s/12)^0.7)*((29/3)^0.45) as in Equation 1a

The emission factor above is representative of uncontrolled emissions and does not account for natural mitigation from rainfall. Therefore the emission factor is adjusted as follows:

$E_{PM2.5\ EXT}$ =	0.3	lb/VMT, calculated as $E_{PM2.5}$*((365-P)/365) as in Equation 2
$E_{PM10\ EXT}$ =	2.94	lb/VMT, calculated as E_{PM10}*((365-P)/365) as in Equation 2
$E_{PM30\ EXT}$ =	9.46	lb/VMT, calculated as E_{PM30}*((365-P)/365) as in Equation 2

VEHICLE MILES TRAVELED (VMT):

Maximum potential VMT for ammonia trucks are estimated as follows:

394200	tons/yr, maximum ammonia output (see "Maximum Facility Capacities" table)
20	tons/truck, approximate capacity for an ammonia truck
19710	Ammonia trucks/yr
15	Propane trucks/yr
0.3300	miles/truck, average round trip miles in terminal per truck based on site layout
6509	miles/yr

Estimated VMT for pickup trucks are as follows:

4	pickups/day, typical traffic pattern
1460	pickups/year
0.3300	miles/pickup, estimated as for ammonia trucks
482	miles/yr

Total potential VMT: 6991 miles/yr

POTENTIAL EMISSION ESTIMATES:

PM2.5 =	1.0	tons/yr
PM10 =	10.3	tons/yr
PM30 =	33.1	tons/yr

POTENTIAL EMISSION ESTIMATES, EMISSION FACTORS
KOCH NITROGEN COMPANY, HUNTINGTON AMMONIA TERMINAL

Company Name: Koch Nitrogen Company
Address: 502 East Hosler Road, Huntington, IN 46750
MSOP: 069-26780-00058
Reviewer: Calculations submitted by source and reviewed by Sarah Conner, Ph. D.
Date: 9/30/2008

Vaporizers

Fuel: Propane — Sulfur Content in Propane: 123 ppm per 10-22-03 discussion with Franger Gas, Walton propane supplier
Size: ***<10 MMBTU***

Combustion Products	*Emission Factor*	*Basis of Estimate*
Nitrogen Oxides	0.014 lb/gallon	AP-42: Table 1.5-1(10-1996) for Heat content < 10 MMBTU/hr
Carbon Monoxide	0.0019 lb/gallon	AP-42: Table 1.5-1(10-1996) for Heat content < 10 MMBTU/hr
Particulate Matter	0.0004 lb/gallon	AP-42: Table 1.5-1(10-1996) for Heat content < 10 MMBTU/hr
Non-methane VOC	0.0005 lb/gallon	AP-42: Table 1.5-1(10-1996) for Heat content < 10 MMBTU/hr
Sulfur Dioxide	2 lb/lb sulfur in propane	Assumed all sulfur converted to SO_2

Heaters

Fuel: Propane — Sulfur Content in Propane: 123 ppm per 10-22-03 discussion with Franger Gas, Walton propane supplier
Size: ***>10 MMBTU***

Combustion Products	*Emission Factor*	*Basis of Estimate*
Nitrogen Oxides	0.019 lb/gallon	AP-42: Table 1.5-1(10-1996) for Heat content > 10 MMBTU/hr
Carbon Monoxide	0.0032 lb/gallon	AP-42: Table 1.5-1(10-1996) for Heat content > 10 MMBTU/hr
Particulate Matter	0.0006 lb/gallon	AP-42: Table 1.5-1(10-1996) for Heat content > 10 MMBTU/hr
Non-methane VOC	0.0005 lb/gallon	AP-42: Table 1.5-1(10-1996) for Heat content > 10 MMBTU/hr
Sulfur Dioxide	2 lb/lb sulfur in propane	Assumed all sulfur converted to SO_2

Flares

Pilot: Propane
Efficiency: 98

Combustion Products	*Emission Factor*	*Basis of Estimate*
Nitrogen Oxides	0.068 lb/MMBTU	AP-42: Table 13.5-1(9-1991)
Carbon Monoxide	0.37 lb/MMBTU	AP-42: Table 13.5-1(9-1991)
Particulate Matter	0 lb/MMBTU	AP-42: Table 13.5-1(9-1991) non-smoking flare
Non-methane VOC	2 % of total VOC	AP-42: Chapter 13.5 (9-1991), assume 98% VOC control efficiency
Sulfur Dioxide	2 lb/lb Sulfur in Propane	Assumed all sulfur converted to SO2

Generator

Fuel: Propane

Combustion Products	*Emission Factor*	*Basis of Estimate*
Nitrogen Oxides	3.17 lb/MMBTU	AP-42: Table 3.2-1 (8-2000)
Carbon Monoxide	0.386 lb/MMBTU	AP-42: Table 3.2-1 (8-2000)
Particulate Matter	0.0384 lb/MMBTU	AP-42: Table 3.2-1 (8-2000)
Non-methane VOC	0.12 lb/MMBTU	AP-42: Table 3.2-1 (8-2000)
Sulfur Dioxide	0.000588 lb/MMBTU	AP-42: Table 3.2-1 (8-2000)