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

Mitchell E. Daniels, Jr.
Governor

Thomas W. Easterly
Commissioner

100 North Senate Avenue
Indianapolis, Indiana 46204
MC 61-53
(317) 232-8603
(800) 451-6027
www.IN.gov/idem

TO: Interested Parties / Applicant

DATE: January 11, 2008

RE: Aurora Oil & Gas Corp. South Knox CPF / 083-25509-00052

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

Notice of Decision – Approval

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 326 IAC 2, this approval was effective immediately upon submittal of the application.

If you wish to challenge this decision, IC 4-21.5-3-7 requires that you file a petition for administrative review. This petition may include a request for stay of effectiveness and must be submitted to the Office of Environmental Adjudication, 100 North Senate Avenue, Government Center North, Suite N 501E, Indianapolis, IN 46204, **within eighteen (18) calendar days from 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-AM.dot12/3/07

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John Guoynes, Operations Manager
Aurora Oil & Gas Corp., South Knox CPF
4110 Copper Ridge, Suite 100
Traverse City, MI 49684

January 11, 2008

Re: Exempt Construction and Operation Status,
083-25509-00052

Dear John Guoynes:

The application from Aurora Oil & Gas Corp., South Knox CPF, received on November 7, 2007, has been reviewed. Based on the data submitted and the provisions in 326 IAC 2-1.1-3, it has been determined that the following stationary natural gas treatment and sales terminal located at Petersburg Road, T2N-R8W, Wheatland, IN is classified as exempt from air pollution permit requirements:

(a) One (1) Amine Regeneration System, identified as EU 004, approved for construction in 2008, consisting of two (2) Amine Regenerator Reboilers, each equipped with one (1) natural gas-fired 2.0 MMBtu/hr Amine Process Burner, each uncontrolled and exhausting to one (1) burner stack, and one (1) CO2 Process Tray Tower, uncontrolled and exhausting to one (1) CO2 Vent (EU 005);

(b) One (1) Triethylene Glycol (TEG) Dehydration Process, identified as EU 002, approved for construction in 2008, with a maximum capacity of 2.5 million standard cubic feet per day (MMscfd), consisting of one (1) Glycol Dehydration Reboiler, uncontrolled and exhausting to one (1) Glycol Dehydrator Vent (EU 003), and equipped with (1) natural gas-fired 0.25 MMBtu/hr Glycol Dehydrator Burner, uncontrolled and exhausting to one (1) dehydrator burner vent; and

(c) One (1) Electric Compressor, identified as EU 001, approved for construction in 2008, uncontrolled and exhausting to one (1) engine stack.

The following conditions shall be applicable:

1. The Glycol Dehydration Unit (EU 002) is subject to the following portions of 40 CFR 63, Subpart HH. Non applicable portions of the NESHAP will not be included in the exemption.

   (1) 40 CFR 63.760(a)(1) and (3), (b)(2), (f)(3) through (6), (h)
   (2) 40 CFR 63.761
   (3) 40 CFR 63.762(a), (c), (e)
   (4) 40 CFR 63.764(a), (b), (e)(ii)
   (5) 40 CFR 63.772(b)(2)(i) or (ii)
   (6) 40 CFR 63.774(a), (d)(1)(i) or (ii)
   (7) 40 CFR 63.775(a), (c)(8)
   (8) 40 CFR 63.776

   The provisions of 40 CFR 63, Subpart A – General Provisions, which are incorporated as 326 IAC 20-1-1, apply to the facility described in this section except when otherwise specified in 40 CFR 63, Subpart HH.

2. 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.

3. IAC 6-2-4 (Particulate Emission Limitations for Sources of Indirect Heating)
Pursuant to 326 IAC 6-2-4 (Particulate Matter Emission Limitations for Sources of Indirect Heating), the PM emissions from the Amine and Glycol reboilers shall be each limited to 0.6 pounds per MMBtu heat input.

4. 326 IAC 6-4 (Fugitive Dust Emissions Limitations)
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.

This exemption is the first air approval issued to this source.

An application or notification shall be submitted in accordance with 326 IAC 2 to the Office of Air Quality (OAQ) if the source proposes to construct new emission units, modify existing emission units, or otherwise modify the source. If you have any questions on this matter, please contact Hannah Desrosiers, OAQ, 100 North Senate Avenue, MC 61-53 IGCN 1003, Indianapolis, Indiana, 46204-2251, at 317-234-5374 or at 1-800-451-6027 (ext 45374).

Sincerely/Original Signed By:

Iryn Calilung, Section Chief
Permits Branch
Office of Air Quality

Attachment: 40 CFR 63, Subpart HH.

IC/hld

cc: File - Knox County
Knox County Health Department
Air Compliance Section
IDEM Southwest Regional Office
Permit Tracking
Compliance Data Section
Permits Administrative and Development
Billing, Licensing and Training Section

Exemption
Annual Notification

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

Company Name:	Aurora Oil & Gas Corp., South Knox CPF
Address:	Petersburg Road, T2N-R8W, Wheatland, IN
Phone #:	231-944-1099
Exemption #:	E 083-25509-00052

Certification by the Authorized Individual

I hereby certify that Aurora Oil & Gas Corp., South Knox CPF is still in operation and is in compliance with the requirements of Exemption E 083-25509-00052.

Name (typed):
Title:
Signature:
Phone Number:
Date:

Indiana Department of Environmental Management
Office of Air Quality

Technical Support Document (TSD) for an Exemption

Source Description and Location

Source Name: Aurora Oil and Gas Corp., South Knox CPF
Source Location: Petersburg Road, T2N-R8W, Wheatland, IN
County: Knox
SIC Code: 4924
Registration (or Exemption) No.: 083-25509-00052
Permit Reviewer: Hannah L. Desrosiers

On November 13, 2007, the Office of Air Quality (OAQ) received an application from Aurora Oil and Gas Corp., South Knox CPF, relating to the construction and operation of a new stationary natural gas treatment and sales terminal.

Existing Approvals

There have been no previous approvals issued to this source.

County Attainment Status

The source is located in Knox County.

Pollutant	Status
PM10	Attainment or Unclassifiable
PM2.5	Attainment or Unclassifiable
SO_2	Attainment
NO_2	Attainment or Unclassifiable
8-hour Ozone	Attainment or Unclassifiable
CO	Attainment or Unclassifiable
Lead	Attainment or Unclassifiable

(a) Ozone Standards

(1) On October 25, 2006, the Indiana Air Pollution Control Board finalized a rule revision to 326 IAC 1-4-1 revoking the one-hour ozone standard in Indiana.

(2) On September 6, 2007, the Indiana Air Pollution Control Board finalized a temporary emergency rule to re-designate Allen, Clark, Elkhart, Floyd, LaPorte, St. Joseph as attainment for the 8-hour ozone standard.

(3) On November 9, 2007, the Indiana Air Pollution Control Board finalized a temporary emergency rule to re-designate Boone, Clark, Elkhart, Floyd, LaPorte, Hamilton, Hancock, Hendricks, Johnson, Madison, Marion, Morgan, Shelby, and St. Joseph as attainment for the 8-hour ozone standard.

(4) 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. Knox County has been designated as attainment or unclassifiable for ozone. Therefore, VOC and NOx emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2.

(b) PM2.5

Knox County has been classified as attainment for PM2.5. U.S. EPA has not yet established the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2 for PM2.5 emissions. Therefore, until the U.S. EPA adopts specific provisions for PSD review for PM2.5 emissions, it has directed states to regulate PM10 emissions as a surrogate for PM2.5 emissions.

(c) Other Criteria Pollutants

Knox County has been classified as attainment or unclassifiable in Indiana for for Sulfur Dioxide (SO_2), Carbon Monoxide (CO) and Lead (Pb). Therefore, these emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2.

Fugitive Emissions

The fugitive emissions of criteria pollutants and hazardous air pollutants are counted toward the determination of 326 IAC 2-1.1-3 (Exemptions) applicabllity.

Background and Description of Emission Units and Pollution Control Equipment

The Office of Air Quality (OAQ) has reviewed an application, submitted by Aurora Oil and Gas Corp., South Knox CPF on November 13, 2007, relating to the construction and operation of a new natural gas treatment and sales terminal

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

(a) One (1) Amine Regeneration System, identified as EU 004, approved for construction in 2008, consisting of two (2) Amine Regenerator Reboilers, each equipped with one (1) natural gas-fired 2.0 MMBtu/hr Amine Process Burner, each uncontrolled and exhausting to one (1) burner stack, and one (1) CO2 Process Tray Tower, uncontrolled and exhausting to one (1) CO2 Vent (EU 005);

(b) One (1) Triethylene Glycol (TEG) Dehydration Process, identified as EU 002, approved for construction in 2008, with a maximum capacity of 2.5 million standard cubic feet per day (MMscfd), consisting of one (1) Glycol Dehydration Reboiler, uncontrolled and exhausting to one (1) Glycol Dehydrator Vent (EU 003), and equipped with (1) natural gas-fired 0.25 MMBtu/hr Glycol Dehydrator Burner, uncontrolled and exhausting to one (1) dehydrator burner vent; and

(c) One (1) Electric Compressor, identified as EU 001, approved for construction in 2008, uncontrolled and exhausting to one (1) engine stack.

Enforcement Issues

There are no pending enforcement actions related to this source.

Emission Calculations

See Appendix A of this TSD for detailed emission calculations.

Permit Level Determination – Exemption

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

Process/Emission Unit	Potential To Emit of the Entire Source (tons/year)							
	PM	PM10*	SO_2	NOx	VOC	CO	Total HAPs	Worst Single HAP
Amine Reboiler Burners (EU 004)	0.13	0.13	0.01	1.75	0.10	1.47	0.033	0.03 Hexane
Glycol Dehydration Reboiler (EU 002)	0.01	0.01	0.001	0.11	0.01	0.09	0.002	0.002 Hexane
Process Emissions **(representative)	0	0	0	0	7.96	0	3.75	1.35 Xylene
Fugitive Emissions	0	0	0	0	0.05	0	0	0
Total PTE of Entire Source	0.14	0.14	0.01	1.86	8.11	1.56	3.76	1.35 Xylene

* 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". US EPA has directed states to regulate PM10 emissions as surrogate for PM2.5 emissions.
** Process VOC Emissions have been represented using data from a source (Noble Energy, Plant ID 153-00037) whose activities are similar, but whose throughput (16 MMscfd) exceeds that of this source (2.5 MMscfd). Even using the representative data, this source qualifies for an exemption.
*** negl. = negligible

(a) The potential to emit (PTE) (as defined in 326 IAC 2-1.1-1(16)) of all regulated criteria pollutants are less than the levels listed in 326 IAC 2-1.1-3(e)(1). Therefore, the source is subject to the provisions of 326 IAC 2-1.1-3 (Exemptions).

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

Federal Rule Applicability Determination

New Source Performance Standards (NSPS)

(a) The New Source Performance Standards (NSPS) 40 CFR 60, Subparts D, Db, and Dc (326 IAC 12) are not included in this exemption because the Amine reboiler (EU 004) and Glycol reboiler (EU 002), each have heat input capacities less than the applicability thresholds for these regulations.

(b) The provisions of New Source Performance Standards (NSPS) 40 CFR 60, Subpart IIII - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (326 IAC 12) are not included in this exemption. The compressor engine is not one of the types of engines regulated by 40 CFR 60, Subpart IIII. 40 CFR 60, Subpart IIII applies only to compression ignition internal combustion engines.

(c) The requirements of the New Source Performance Standard, 40 CFR 60, Subpart KKK - New Source Performance Standard for Equipment Leaks of VOC from Onshore Natural Gas Processing Plants (326 IAC 12) are not included in the exemption for this source. This NSPS applies only to emission units located at "natural gas processing plants", which are defined in the rule as "...any processing site engaged in the extraction of natural

gas liquids from field gas, fractionation of mixed natural gas liquids to natural gas products or both." No extraction or fractionation of natural gas liquids occurs at this location.

(d) The requirements of the New Source Performance Standard, 40 CFR 60, Subpart LLL - Onshore Natural Gas Processing: SO_2 Emissions, are not included in this revised registration. This NSPS applies to facilities (called sweetening units) that separate H_2S and CO_2 from sour natural gas streams. The raw gas extracted at this facility is not considered “sour” or “acid” because it contains non-detectable quantities of H2S, see Appendix B, of this TSD, for the Lab Report. Therefore, this plant does not operate any sweetening units at this location.

(e) There are no New Source Performance Standards (NSPS)(326 IAC 12 and 40 CFR Part 60) included in this exemption.

National Emission Standards for Hazardous Air Pollutants (NESHAP)

(a) The requirements of 40 CFR 63, Subpart HH - National Emission Standards for Hazardous Air Pollutants from Oil and Natural Gas Production Facilities (326 IAC 20-30) are applicable to the Glycol Dehydration Process because it consists of a triethylene glycol (TEG) dehydration unit (EU 002) at an area source of Hazardous Air Pollutants (HAPs).

The Glycol Dehydration Unit (EU 002) is subject to the following portions of 40 CFR 63, Subpart HH. Non applicable portions of the NESHAP will not be included in the exemption.

(1) 40 CFR 63.760(a)(1) and (3), (b)(2), (f)(3) through (6), (h)
(2) 40 CFR 63.761
(3) 40 CFR 63.762(a), (c), (e)
(4) 40 CFR 63.764(a), (b), (e)(ii)
(5) 40 CFR 63.772(b)(2)(i) or (ii)
(6) 40 CFR 63.774(a), (d)(1)(i) or (ii)
(7) 40 CFR 63.775(a), (c)(8)
(8) 40 CFR 63.776

The provisions of 40 CFR 63, Subpart A – General Provisions, which are incorporated as 326 IAC 20-1-1, apply to the facility described in this section except when otherwise specified in 40 CFR 63, Subpart HH.

* See Appendix C of this TSD for the GRI-GLYCalc Glycol Dehydration Unit (EU 002) calculations.

(b) The requirements of 40 CFR 63, Subpart HHH - National Emission Standards for Hazardous Air Pollutants from Natural Gas Transmission and Storage Facilities (326 IAC 20-31) are not included in this exemption because this source is not a major source of HAPs.

(c) There are no other National Emission Standards for Hazardous Air Pollutants (NESHAP)(326 IAC 14, 20 and 40 CFR 61, 63) included in this registration.

Compliance Assurance Monitoring (CAM)

(a) 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:

State Rule Applicability - Entire Source

(a) 326 IAC 2-1.1-3 (Exemptions)
Exemption applicability is discussed under the Permit Level Determination – Exemption section above.

(b) 326 IAC 2-2 (Prevention of Significant Deterioration (PSD))
This source was constructed after the applicability date of August 7, 1977. However, it is not one of the 28 listed source categories defined in 326 IAC 2-2-1(gg)(1), and the potential to emit of all attainment regulated pollutants is less than 250 tons per year. Therefore, the requirements of 326 IAC 2-2 (PSD) are not applicable.

(c) 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.

(d) 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.

(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)
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 not subject to the requirements of 326 IAC 6-5, because the source does not have potential fugitive particulate emissions greater than 25 tons per year. Therefore, 326 IAC 6-5 does not apply.

(h) 326 IAC 8-4 (Petroleum Sources)
This source is located in Knox County, and is not one of the types of operations regulated by 326 IAC 8-4. Therefore, the requirements of 326 IAC 8-4 do not apply to any of the facilities at this source.

(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, the requirements of 326 IAC 9-1-2 are not applicable.

(j) 326 IAC 10-1-3 (Nitrogen Oxide Emission Requirements)
This source is not located in Clark or Floyd County. Therefore, the requirements of 326 IAC 10-1-3 are not applicable.

(k) 326 IAC 10-5-1(Nitrogen Oxide Reduction Program for Internal combustion Engines (ICE))
Pursuant to 326 IAC 10-5-1, this rule applies to owners and operators of "a large NOx SIP Call engine." Large NOx SIP Call engines are stationary internal combustion engines identified and designated as large in the NOx SIP Call engine inventory as emitting more than one tone of NOx per average ozone season day in 1995. The provisions of 326 IAC 10-5 do not apply to the compressor engine because this engine is not an affected engine identified in the NOx SIP Call inventory compiled by the U.S. EPA, including amendments under the March 2, 2000 Federal Register (65 FR 11222) and the April 21, 2004 Federal Register (69 FR 21604) for the Phase II NOx SIP Call Role.

State Rule Applicability – Amine Processes and Glycol Dehydration

(a) 326 IAC 8-1-6 (New Facilities; General Reduction Requirements)
Although constructed after January 1, 1980, the potential VOC emissions from the glycol dehydration and amine processes are each less than 25 tons per year. Therefore, the provisions of 326 IAC 8-1-6 do not apply to these facilities.

(b) 326 IAC 6-3-2 (Particulate Emission Limits for Manufacturing Processes)
The glycol dehydration and amine processes are not sources of particulate emissions. Therefore, the provisions of 326 IAC 6-3-2 do not apply.

State Rule Applicability – Amine and Glycol Reboilers

(a) 326 IAC 6-2-4 (Particulate Emission Limitations for Sources of Indirect Heating)
Pursuant to 326 IAC 6-2-4 (Particulate Matter Emission Limitations for Sources of Indirect Heating), the PM emissions from the Amine Reboiler (EU 004) and Glycol Reboiler (EU 002) shall each be limited by the following equation:

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

Where:

Pt = Pounds of particulate matter emitted per million Btu (lb/MMBtu) heat input.
Q = Total source maximum operating capacity rating in million Btu per hour heat input (4.25 MMBtu/hr)

$Pt = 1.09 / (4.25)^{0.26} = 0.75$ lb/MMBtu

However, 326 IAC 6-2-4(a) also states that if Q is less than 10 MMBtu/hr, Pt shall not exceed 0.6.

Therefore, the Amine and Glycol reboilers shall each be limited to 0.6 lb/MMBtu heat input. The following limitation has been included in the exemption:

Pursuant to 326 IAC 6-2-4 (Particulate Matter Emission Limitations for Sources of Indirect Heating), the PM emissions from the Amine and Glycol reboilers shall be each limited to 0.6 pounds per MMBtu heat input.

According to the emission calculated using AP-42 emission factors, the reboilers are able to comply with this emission limitation.

(b) 326 IAC 7-1.1-1 (Sulfur Dioxide Emission Limitations)
The potential emissions of sulfur dioxide from each reboiler is less than 25 tons per year and 10 pounds per hour. Therefore, the provisions of 326 IAC 7-1.1-1 do not apply.

(c) 326 IAC 9-1-2 (Carbon Monoxide Emission Requirements)
This source is not among the listed source categories in 326 IAC 9-1-2. Therefore, the requirements of 326 IAC 9-1-2 are not applicable.

(d) 326 IAC 10-1-3 (Nitrogen Oxide Emission Requirements)
This source is not located in Clark or Floyd County. Therefore, the requirements of 326 IAC 10-1-3 are not applicable.

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

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

State Rule Applicability - Compressor

(a) 326 IAC 6-2 (Particulate Emission Limitations for Sources of Indirect Heating)
The provisions of 326 IAC 6-2 do not apply to the compressor because it is not a source of indirect heating.

(b) 326 IAC 6-3 (Particulate Emissions Limitations for Manufacturing Processes)
The provisions of 326 IAC 6-3 do not apply to the compressor because it has potential particulate (fugitive) emissions less than 0.551 pounds per hour. Pursuant to 326 IAC 6-2-1(b)(14), manufacturing process with emissions less than 0.511 pounds per hour are exempt from 326 IAC 6-3.

(c) 326 IAC 8-1-6 (New Facilities, General Reduction Requirements)
Although constructed after January 1, 1980, the compressor is not subject to the requirements of 326 IAC 8-1-6, because its potential VOC (fugitive) emissions are less than twenty-five (25) tons per year.

(d) 326 IAC 10-4 (Nitrogen Oxides Budget Trading Program)
The provisions of 326 IAC 10-4 do not apply to the compressor because the emission unit does not meet the definition of an electricity generating unit as defined in 326 IAC 10-4-2(16) or a large affected unit as defined in 326 IAC 10-4-2(27).

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 November 7, 2007.

The construction and operation of this source shall be subject to the conditions of the attached proposed Exemption No. 083-25509-00052. The staff recommends to the Commissioner that this Exemption be approved.

IDEM Contact

(a) Questions regarding this proposed permit can be directed to Hannah Desrosiers at the Indiana

Department Environmental Management, Office of Air Quality, 100 North Senate Avenue, MC 61-53 IGCN 1003, Indianapolis, Indiana 46204-2251 or by telephone at (317) 234-5374 or toll free at 1-800-451-6027 extension 4-5374.

(b) A copy of the findings is available on the Internet at: www.in.gov/idem/permits/air/pending.html.

(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.in.gov/idem/permits/guide/.

Appendix A: Emissions Calculations
Emission Summary

Company Name: Aurora Oil and Gas Corp., South Knox CPF
Address City IN Zip: Petersburg Road, T2N-R8W, Wheatland, IN
Permit No.: 083-25509-00052
Reviewer: Hannah L. Desrosiers
Date: 11/26/2007

		Uncontrolled Potential Emissions (tons/year)				
		Emissions Generating Activity				
Category	Pollutant	Amine Reboiler Burners	Glycol Dehydration Reboiler	Process Emissions *(representative)	Fugitive Emissions	**TOTAL**
Criteria Pollutants	PM	0.13	0.01	0	0	0.14
	PM10	0.13	0.01	0	0	0.14
	SO2	0.01	0.001	0	0	0.01
	NOx	1.75	0.11	0	0	1.86
	VOC	0.10	0.01	7.96	0.05	8.11
	CO	1.47	0.09	0	0	1.56
Hazardous Air Pollutants	Benzene	3.68E-05	2.30E-06	0.51	0	5.10E-01
	Dichlorobenzene	2.10E-05	1.31E-06	0	0	2.23E-05
	Ethylbenzene	0	0	0.96	0	9.60E-01
	Formaldehyde	1.31E-03	8.21E-05	0	0	1.40E-03
	Hexane	0.03	1.97E-03	0.20	0	2.34E-01
	Toluene	5.96E-05	3.72E-06	0.73	0	7.30E-01
	Xylene	0	0	1.35	0	1.35E+00
	Cadmium	1.93E-05	1.20E-06	0	0	2.05E-05
	Chromium	2.45E-05	1.53E-06	0	0	2.61E-05
	Lead	8.76E-06	5.48E-07	0	0	9.31E-06
	Manganese	6.66E-06	4.16E-07	0	0	7.07E-06
	Nickel	3.68E-05	2.30E-06	0	0	3.91E-05
	Totals	**0.033**	**0.002**	**3.750**	**0.000**	**3.785**
						1.350

Total emissions based on rated capacity at 8,760 hours/year.

* Process VOC Emissions have been represented using data from a source (Noble Energy, Plant ID 153-00037) whose activities are similar, but whose throughput (16 MMscfd) exceeds that of this source (2.5 MMscfd). Even using the representative data, this source qualifies for an exemption.

Appendix A: Emission Calculations
Natural Gas Combustion Only
Amine Reboiler Burner(s)

Company Name: Aurora Oil and Gas Corp., South Knox CPF
Address : Petersburg Road, T2N-R8W, Wheatland, IN
Permit Number: 083-25509-00052
Reviewer: Hannah L. Desrosiers
Date: 11/26/2007

**** Two (2) Amine Burners each with a usage rate of 2.0 MMBtu/hr***

Heat Input Capacity MMBtu/hr	Potential Throughput MMCF/yr
4.00	35.0

Particulate Emissions

	Pollutant					
	PM*	PM10*	SO2	NOx	VOC	CO
Emission Factor in lb/MMCF	7.6	7.6	0.6	100.0	5.5	84.0
Potential Emission in tons/yr	0.13	0.13	0.011	1.75	0.10	1.47

HAPs Emissions

	HAPs - Organics				
	Benzene	Dichlorobenzene	Formaldehyde	Hexane	Toluene
Emission Factor in lb/MMcf	2.1E-03	1.2E-03	7.5E-02	1.8E+00	3.4E-03
Potential Emission in tons/yr	3.68E-05	2.10E-05	0.001	0.032	5.96E-05

	HAPs - Metals				
	Lead	Cadmium	Chromium	Manganese	Nickel
Emission Factor in lb/MMcf	5.0E-04	1.1E-03	1.4E-03	3.8E-04	2.1E-03
Potential Emission in tons/yr	8.76E-06	1.93E-05	2.45E-05	6.66E-06	3.68E-05

Total HAPs	**0.033**	**ton/yr**

Methodology

*PM emission factor is filterable PM only. PM10 emission factor is condensable and filterable PM10 combined.
**Emission Factors for NOx: Uncontrolled = 100 lb/MMCF
The five highest organic and metal HAPs emission factors are provided above.
Additional HAPs emission factors are available in AP-42, Chapter 1.4.

All emission factors are based on normal firing.
MMBtu = 1,000,000 Btu
MMCF = 1,000,000 Cubic Feet of Gas

Potential Throughput (MMCF) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1 MMCF/1,000 MMBtu
Emission factors from AP-42, Chapter 1.4, Tables 1.4-1 and 1.4-2, SCC #1-01-006-01, 1-01-006-04
(AP-42 Supplement D 3/98)
Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton

Appendix A: Emission Calculations
Natural Gas Combustion Only
Glycol Reboiler

Company Name: Aurora Oil and Gas Corp., South Knox CPF
Address : Petersburg Road, T2N-R8W, Wheatland, IN
Permit Number: 083-25509-00052
Reviewer: Hannah L. Desrosiers
Date: 11/26/2007

Heat Input Capacity MMBtu/hr	Potential Throughput MMCF/yr
0.250	2.2

Particulate Emissions

	Pollutant					
	PM*	PM10*	SO2	NOx	VOC	CO
Emission Factor in lb/MMCF	7.6	7.6	0.6	100.0	5.5	84.0
Potential Emission in tons/yr	0.0083	0.0083	0.0007	0.1095	0.0060	0.0920

HAPs Emissions

	HAPs - Organics				
	Benzene	Dichlorobenzene	Formaldehyde	Hexane	Toluene
Emission Factor in lb/MMcf	2.1E-03	1.2E-03	7.5E-02	1.8E+00	3.4E-03
Potential Emission in tons/yr	2.30E-06	1.31E-06	8.21E-05	1.97E-03	3.72E-06

	HAPs - Metals				
	Lead	Cadmium	Chromium	Manganese	Nickel
Emission Factor in lb/MMcf	5.0E-04	1.1E-03	1.4E-03	3.8E-04	2.1E-03
Potential Emission in tons/yr	5.48E-07	1.20E-06	1.53E-06	4.16E-07	2.30E-06

Total HAPs	**2.07E-03**	**ton/yr**

Methodology

*PM emission factor is filterable PM only. PM10 emission factor is condensable and filterable PM10 combined.
**Emission Factors for NOx: Uncontrolled = 100 lb/MMCF
The five highest organic and metal HAPs emission factors are provided above.
Additional HAPs emission factors are available in AP-42, Chapter 1.4.

All emission factors are based on normal firing.
MMBtu = 1,000,000 Btu
MMCF = 1,000,000 Cubic Feet of Gas

Potential Throughput (MMCF) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1 MMCF/1,000 MMBtu
Emission factors from AP-42, Chapter 1.4, Tables 1.4-1 and 1.4-2, SCC #1-01-006-01, 1-01-006-04
(AP-42 Supplement D 3/98)
Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton

Appendix A: Emission Calculations
From the AMINE Process and the TEG Dehydration Process

Company Name: Aurora Oil and Gas Corp., South Knox CPF
Address : Petersburg Road, T2N-R8W, Wheatland, IN
Permit Number: 083-25509-00052
Reviewer: Hannah L. Desrosiers
Date: 11/26/2007

**** Process VOC Emissions have been represented using data from a source (Noble Energy, Plant ID 153-00037) whose activities are similar, but whose throughput (16 MMscfd) exceeds that of this source (2.5 MMscfd). Even using the representative data, this source qualifies for an exemption.***

1. PTE of the Amine Process

Pollutants	PTE (tons/yr)
VOC	**0.88**
HAPs	
Benzene	0.13
Toluene	0.09
Ethylbenzene	0.14
Xylene	0.08
n-Hexane	0.04
Total HAPs	**0.48**

The PTE for this unit was calculated by the source using AMINECalc gas model assuming natural gas throughput of 16 MMscfd, lean amine recirculation rate of 120 gpm, 20 trays, gas feed pressure of 850 psia and temperature of 100 F, input natural gas composition and without control.

AMINECalc is the recommended method for emission estimation as documented in the EPA's EIIP Volume II, chapter 10, Preferred and Alternate Methods for Estimating Air Emissions from Oil and Gas Field Production and Process Operations under section 4.2.4.

Emissions are based upon 8,760 hours/year of operation

2. TEG Dehydration Process

Pollutants	PTE (tons/yr)
VOC	**7.08**
HAPs	
Benzene	0.38
Toluene	0.64
Ethylbenzene	0.96
Xylene	1.27
n-Hexane	0.16
Total HAPs	**3.41**

The PTE of this unit was calculated by the Permittee using Gas Research Institute (GRI) model GRI_GLYCalc model assuming natural gas throughput of 16 MMscfd, lean amine recirculation rate of 3.0 gpm, gas feed pressure of 800 psia and temperature of 100 F, input natural gas composition and without control.

(GRI-GLYCalc) is the recommended method, as noted in AP-42, Chapter 5.3 (Natural Gas Processing).

Emissions are based upon 8,760 hours/year of operation

Appendix A: Emission Calculations
VOC Emissions
From South Knox Natural Gas Marketing Terminal

Company Name: Aurora Oil and Gas Corp., South Knox CPF
Address : Petersburg Road, T2N-R8W, Wheatland, IN
Permit Number: 083-25509-00052
Reviewer: Hannah L. Desrosiers
Date: 11/26/2007

1. Emission Factors

Equipment Type	Service	Emission Factor (kg/hour/source)*
Valves	gas	0.000013
Connectors	gas	0.000042
Flanges	gas	0.000042
Others/Compressors	gas	0.00012

* Emission Factors from EPA-453/R-95-017, Table 2-3.

2. Uncontrolled Emissions

Sources in service are <1% VOCs by volume

Equipment Type	Component Count	VOC Emissions (kgs/hr)	VOC Emissions (lbs/yr)	VOC Emissions (tons/yr)
Valves	38	4.94E-04	9.52	0.0048
Connectors	12	5.04E-04	9.71	0.0049
Flanges	90	3.78E-03	72.85	0.0364
Total	140	0.00	92.1	**0.0460**

Methodology

VOC Emissions I lbs/yr = Component Count x Emission Factor (kgs/hr/source) x 2.2 lbs/kg x 8760 hr/yr

3. Controls

No controls

Appendix A: Emission Calculations

326 IAC Article 6
Particulate Emission Limitations for
Sources of Indirect Heating

Company Name: Aurora Oil and Gas Corp., South Knox CPF
Address : Petersburg Road, T2N-R8W, Wheatland, IN
Permit Number: 083-25509-00052
Reviewer: Hannah L. Desrosiers
Date: 11/26/2007

Pt=1.09/Q^0.26
where: Q=B1+ B2...

New Boiler & Existing Other		
Q =	4.25	MMBtu/hr
Pt =	**0.7482**	lb/MMBtu

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Lab #: 120870 Job #: 8649
Sample Name: Hancock C1-14HP Co. Lab#:
Company: Aurora Energy, LTD
Date Sampled: / / Cylinder: 1032
Container: Stainless Steel, 1L
Field/Site Name: Aurora Energy Gas Samples
Location:
Formation/Depth:
Sampling Point:
Date Received: 7/24/2007 Date Reported: 7/27/2007

Component	Chemical mol. %	Delta 13C per mil	Delta D per mil	Delta 15N per mil
Carbon Monoxide	nd			
Hydrogen Sulfide	nd			
Helium	na			
Hydrogen	na			
Argon	na			
Oxygen + Argon	nd			
Nitrogen	0.54			
Carbon Dioxide	4.79			
Methane	90.96	-49.22	-183.5	
Ethane	3.08			
Ethylene	nd			
Propane	0.299			
Iso-butane	0.0647			
N-butane	0.0304			
Iso-pentane	0.0212			
N-pentane	0.0103			
Hexanes +	0.0292			

Total BTU/cu.ft. dry @ 60deg F & 14.7psia, calculated: 991
Specific gravity, calculated: 0.622

Remarks: Report revised on 10/23/07 to include isotope data.

nd = not detected. na = not analyzed. Isotopic composition of carbon is relative to VPDB. Isotopic composition of hydrogen is relative to VSMOW. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %. Chemical analysis based on standards accurate to within 2%

GRI-GLYCalc VERSION 4.0 - AGGREGATE CALCULATIONS REPORT

Case Name: South Knox Facility
File Name: C:\Program Files\GRI-GLYCalc4\South Knox Facility.ddf
Date: December 18, 2007

DESCRIPTION:

Description: Aurora Energy

Annual Hours of Operation: 8760.0 hours/yr

EMISSIONS REPORTS:

UNCONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.0738	1.772	0.3234
Ethane	0.0166	0.398	0.0726
Propane	0.0042	0.101	0.0184
Isobutane	0.0018	0.043	0.0078
n-Butane	0.0011	0.028	0.0050
Isopentane	0.0010	0.025	0.0045
n-Pentane	0.0007	0.016	0.0029
Other Hexanes	0.0030	0.071	0.0130
Heptanes	0.0415	0.996	0.1818
Benzene	0.0320	0.767	0.1400
Toluene	0.1086	2.607	0.4759
Total Emissions	0.2843	6.824	1.2454
Total Hydrocarbon Emissions	0.2843	6.824	1.2454
Total VOC Emissions	0.1939	4.654	0.8494
Total HAP Emissions	0.1406	3.375	0.6159
Total BTEX Emissions	0.1406	3.375	0.6159

EQUIPMENT REPORTS:

ABSORBER

NOTE: Because the Calculated Absorber Stages was below the minimum allowed, GRI-GLYCalc has set the number of Absorber Stages to 1.25 and has calculated a revised Dry Gas Dew Point.

Calculated Absorber Stages: 1.25
Calculated Dry Gas Dew Point: 1.27 lbs. H2O/MMSCF

Temperature: 60.0 deg. F

25509 Aurora GlyCalc4

Pressure:	850.0 psig
Dry Gas Flow Rate:	2.0000 MMSCF/day
Glycol Losses with Dry Gas:	0.0039 lb/hr
Wet Gas Water Content:	Saturated
Calculated Wet Gas Water Content:	18.96 lbs. H2O/MMSCF
Specified Lean Glycol Recirc. Ratio:	3.00 gal/lb H2O

Component	Remaining in Dry Gas	Absorbed in Glycol
Water	6.72%	93.28%
Carbon Dioxide	99.96%	0.04%
Nitrogen	100.00%	0.00%
Methane	100.00%	0.00%
Ethane	99.99%	0.01%
Propane	99.99%	0.01%
Isobutane	99.98%	0.02%
n-Butane	99.97%	0.03%
Isopentane	99.97%	0.03%
n-Pentane	99.96%	0.04%
Other Hexanes	99.95%	0.05%
Heptanes	99.86%	0.14%
Benzene	96.27%	3.73%
Toluene	94.04%	5.96%

REGENERATOR

No Stripping Gas used in regenerator.

Component	Remaining in Glycol	Distilled Overhead
Water	8.69%	91.31%
Carbon Dioxide	0.00%	100.00%
Nitrogen	0.00%	100.00%
Methane	0.00%	100.00%
Ethane	0.00%	100.00%
Propane	0.00%	100.00%
Isobutane	0.00%	100.00%
n-Butane	0.00%	100.00%
Isopentane	0.50%	99.50%
n-Pentane	0.50%	99.50%
Other Hexanes	1.00%	99.00%
Heptanes	0.50%	99.50%
Benzene	5.00%	95.00%
Toluene	7.91%	92.09%

STREAM REPORTS:

WET GAS STREAM

Temperature: 60.00 deg. F
Pressure: 864.70 psia
Flow Rate: 8.34e+004 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	3.99e-002	1.58e+000
Carbon Dioxide	4.79e+000	4.63e+002
Nitrogen	5.40e-001	3.32e+001
Methane	9.09e+001	3.21e+003
Ethane	3.08e+000	2.03e+002
Propane	2.99e-001	2.90e+001
Isobutane	6.47e-002	8.26e+000
n-Butane	3.04e-002	3.88e+000
Isopentane	2.12e-002	3.36e+000
n-Pentane	1.03e-002	1.63e+000
Other Hexanes	2.92e-002	5.53e+000
Heptanes	1.33e-001	2.93e+001
Benzene	5.00e-003	8.58e-001
Toluene	9.00e-003	1.82e+000
Total Components	100.00	3.99e+003

DRY GAS STREAM

Temperature: 60.00 deg. F
Pressure: 864.70 psia
Flow Rate: 8.33e+004 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	2.68e-003	1.06e-001
Carbon Dioxide	4.79e+000	4.63e+002
Nitrogen	5.40e-001	3.32e+001
Methane	9.10e+001	3.21e+003
Ethane	3.08e+000	2.03e+002
Propane	2.99e-001	2.90e+001
Isobutane	6.47e-002	8.26e+000
n-Butane	3.04e-002	3.88e+000
Isopentane	2.12e-002	3.36e+000
n-Pentane	1.03e-002	1.63e+000
Other Hexanes	2.92e-002	5.53e+000
Heptanes	1.33e-001	2.92e+001
Benzene	4.82e-003	8.26e-001
Toluene	8.47e-003	1.71e+000
Total Components	100.00	3.99e+003

LEAN GLYCOL STREAM

Temperature: 60.00 deg. F
Flow Rate: 4.98e-002 gpm

Component	Conc.	Loading

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.95e+001	2.79e+001
Water	5.00e-001	1.40e-001
Carbon Dioxide	7.00e-011	1.96e-011
Nitrogen	3.11e-013	8.72e-014
Methane	8.84e-018	2.48e-018
Ethane	2.79e-008	7.82e-009
Propane	6.10e-010	1.71e-010
Isobutane	1.91e-010	5.36e-011
n-Butane	1.01e-010	2.85e-011
Isopentane	1.85e-005	5.19e-006
n-Pentane	1.20e-005	3.37e-006
Other Hexanes	1.07e-004	3.00e-005
Heptanes	7.44e-004	2.09e-004
Benzene	6.00e-003	1.68e-003
Toluene	3.33e-002	9.34e-003
Total Components	100.00	2.81e+001

RICH GLYCOL STREAM

Temperature: 60.00 deg. F
Pressure: 864.70 psia
Flow Rate: 5.38e-002 gpm
NOTE: Stream has more than one phase.

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.30e+001	2.79e+001
Water	5.38e+000	1.61e+000
Carbon Dioxide	6.54e-001	1.96e-001
Nitrogen	2.88e-003	8.65e-004
Methane	2.46e-001	7.38e-002
Ethane	5.52e-002	1.66e-002
Propane	1.40e-002	4.20e-003
Isobutane	5.95e-003	1.79e-003
n-Butane	3.82e-003	1.15e-003
Isopentane	3.46e-003	1.04e-003
n-Pentane	2.24e-003	6.73e-004
Other Hexanes	1.00e-002	3.00e-003
Heptanes	1.39e-001	4.17e-002
Benzene	1.12e-001	3.36e-002
Toluene	3.93e-001	1.18e-001
Total Components	100.00	3.00e+001

REGENERATOR OVERHEADS STREAM

Temperature: 212.00 deg. F
Pressure: 14.70 psia
Flow Rate: 3.56e+001 scfh

Component	Conc.	Loading

25509 Aurora GlyCalc4

	(vol%)	(lb/hr)
Water	8.74e+001	1.47e+000
Carbon Dioxide	4.76e+000	1.96e-001
Nitrogen	3.30e-002	8.65e-004
Methane	4.91e+000	7.38e-002
Ethane	5.88e-001	1.66e-002
Propane	1.02e-001	4.20e-003
Isobutane	3.28e-002	1.79e-003
n-Butane	2.11e-002	1.15e-003
Isopentane	1.53e-002	1.03e-003
n-Pentane	9.90e-003	6.70e-004
Other Hexanes	3.68e-002	2.97e-003
Heptanes	4.42e-001	4.15e-002
Benzene	4.37e-001	3.20e-002
Toluene	1.26e+000	1.09e-001
Total Components	100.00	1.96e+000