



Mitchell E. Daniels, Jr.
Governor

Thomas W. Easterly
Commissioner

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

TO: Interested Parties / Applicant
DATE: March 29, 2006
RE: Quicksilver Resources Inc. / 061-21945-00033
FROM: Nisha Sizemore
Chief, Permits Branch
Office of Air Quality

Notice of Decision: Approval - Effective Immediately

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

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

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

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

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

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

Enclosures
FNPER.dot 03/23/06



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Indianapolis, Indiana 46204-2251
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**NEW SOURCE CONSTRUCTION PERMIT
MINOR SOURCE OPERATING PERMIT
OFFICE OF AIR QUALITY**

**Quicksilver Resources Inc. – Sherman Central Processing Facility (CPF)
598 Highway 11 SW
Laconia, Indiana 47135**

(herein known as the Permittee) is hereby authorized to construct and operate subject to the conditions contained herein, the emission units 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.

Operation Permit No.: MSOP 061-21945-00033	
Issued by: Original signed by Paul Dubenetzky, Assistant Commissioner Office of Air Quality	Issuance Date: March 29, 2006 Expiration Date: March 29, 2011

TABLE OF CONTENTS

A	SOURCE SUMMARY	3
A.1	General Information [326 IAC 2-5.1-3(c)] [326 IAC 2-6.1-4(a)]	
A.2	Emission Units and Pollution Control Equipment Summary	
B	GENERAL CONDITIONS	4
B.1	Permit No Defense [IC 13]	
B.2	Definitions	
B.3	Effective Date of the Permit [IC 13-15-5-3]	
B.4	Revocation of Permits [326 IAC 2-1.1-9(5)]	
B.5	Modification to Permit [326 IAC 2]	
B.6	Permit Term and Renewal [326 IAC 2-6.1-7(a)] [326 IAC 2-1.1-9.5]	
B.7	Minor Source Operating Permit [326 IAC 2-6.1]	
B.8	Annual Notification [326 IAC 2-6.1-5(a)(5)]	
B.9	Preventive Maintenance Plan [326 IAC 1-6-3]	
B.10	Permit Revision [326 IAC 2-5.1-3(e)(3)] [326 IAC 2-6.1-6]	
B.11	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]	
B.12	Transfer of Ownership or Operation [326 IAC 2-6.1-6(d)(3)]	
B.13	Annual Fee Payment [326 IAC 2-1.1-7]	
B.14	Credible Evidence [326 IAC 1-1-6]	
C	SOURCE OPERATION CONDITIONS	8
C.1	Particulate Emission Limitation For Processes with Process Weight Rates Less Than One Hundred (100) Pounds per Hour [326 IAC 6-3-2]	
C.2	Permit Revocation [326 IAC 2-1.1-9]	
C.3	Opacity [326 IAC 5-1]	
C.4	Asbestos Abatement Projects [326 IAC 14-10] [326 IAC 18] [40 CFR 61, Subpart M]	
	Testing Requirements	
C.5	Performance Testing [326 IAC 3-6]	
	Compliance Requirements [326 IAC 2-1.1-11]	
C.6	Compliance Requirements [326 IAC 2-1.1-11]	
	Compliance Monitoring Requirements	
C.7	Compliance Monitoring [326 IAC 2-1.1-11]	
C.8	Monitoring Methods [326 IAC 3] [40 CFR 60] [40 CFR 63]	
C.9	Actions Related to Noncompliance Demonstrated by a Stack Test	
	Record Keeping and Reporting Requirements	
C.10	Malfunctions Report [326 IAC 1-6-2]	
C.11	General Record Keeping Requirements [326 IAC 2-6.1-5]	
C.12	General Reporting Requirements [326 IAC 2-1.1-11] [326 IAC 2-6.1-5] [IC 13-14-1-13]	
D.1	EMISSIONS UNIT OPERATION CONDITIONS: Natural gas compression	13
	Emission Limitations and Standards	
D.1.1	Particulate Emission Limitations for Sources of Indirect Heating [326 IAC 6-2-4]	
	Annual Notification	14
	Malfunction Report	15

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 natural gas compression source.

Authorized Individual:	Regional Operations Manager
Source Address:	598 Highway 11 SW, Laconia, Indiana 47135
Mailing Address:	777 West Rosedale Street, Suite 300, Fort Worth, TX 76104
General Source Phone:	817 – 665 – 4933
SIC Code:	1311
County Location:	Harrison
Source Location Status:	Attainment for all criteria pollutants
Source Status:	Minor Source Operating Permit Minor Source, under PSD

A.2 Emissions Units and Pollution Control Equipment Summary

This stationary source is approved to construct and operate the following emissions units and pollution control devices:

- (a) One (1) 145 horsepower natural gas-fired 4-cycle rich burn reciprocating internal combustion engine, identified as E-01, installed in 2005, capacity: 1.13 million British thermal units per hour.
- (b) One (1) natural gas-fired glycol dehydrator, identified as DEHY, to be installed in 2006, exhausting to vent DEHY-1, consisting of:
 - (1) One (1) reboiler, identified as REB-1, capacity: 0.100 million British thermal units per hour.
 - (2) One (1) dehydrator, identified as D-1, capacity: 40 gallons of TEG glycol per hour.
- (c) One (1) Caterpillar G398NA natural gas-fired 4-cycle rich burn reciprocating internal combustion engine, identified as E-02, to be installed in 2006, equipped with a catalytic converter for emissions control, capacity: 3.91 million British thermal units per hour.

SECTION B GENERAL CONDITIONS

THIS SECTION OF THE PERMIT IS BEING ISSUED UNDER THE PROVISIONS OF 326 IAC 2-1.1 AND 40 CFR 52.780, WITH CONDITIONS LISTED BELOW.

B.1 Permit No Defense [IC 13]

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

B.2 Definitions

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

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

B.4 Revocation of Permits [326 IAC 2-1.1-9(5)]

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

B.5 Permit Term and Renewal [326 IAC 2-6.1-7(a)] [326 IAC 2-1.1-9.5]

This permit 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 of this permit do not affect the expiration date.

The Permittee shall apply for an operation permit renewal at least ninety (90) days prior to the expiration date. If a timely and sufficient permit application for a renewal has been made, this permit shall not expire and all terms and conditions shall continue in effect until the renewal permit has been issued or denied.

B.6 Modification to Permit [326 IAC 2]

Notwithstanding the Section B condition entitled "Minor Source Operating Permit", all requirements and conditions of this construction permit shall remain in effect unless modified in a manner consistent with procedures established for modifications of construction permits pursuant to 326 IAC 2 (Permit Review Rules).

B.7 Minor Source Operating Permit [326 IAC 2-6.1]

This document shall also become a minor source operating permit pursuant to 326 IAC 2-6.1 when, prior to start of operation, the following requirements are met:

- (a) The attached Affidavit of Construction shall be submitted to the Office of Air Quality (OAQ), Permit Administration & Development Section.
 - (1) If the Affidavit of Construction verifies that the facilities covered in this Construction Permit were constructed as proposed in the application, then the facilities may begin operating on the date the Affidavit of Construction is postmarked or hand delivered to IDEM.
 - (2) If actual construction of the emission units differs from the construction proposed in the application, the source may not begin operation until the permit has been revised pursuant to 326 IAC 2-6.1-6 and an Operation Permit Validation Letter is

issued.

- (b) If construction is completed in phases; i.e., the entire construction is not done continuously, a separate affidavit must be submitted for each phase of construction. Any permit conditions associated with operation start up dates such as stack testing for New Source Performance Standards (NSPS) shall be applicable to each individual phase.
- (c) Upon receipt of the Operation Permit Validation Letter from the Chief of the Permit Administration & Development Section, the Permittee shall attach it to this document.
- (d) The operation permit will be subject to annual operating permit fees pursuant to 326 IAC 2-1.1-7(Fees).

B.8 Annual Notification [326 IAC 2-6.1-5(a)(5)]

- (a) Annual notification shall be submitted 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) Noncompliance with any condition must be specifically identified. If there are any permit conditions or requirements for which the source is not in compliance at any time during the year, the Permittee must provide a narrative description of how the source did or will achieve compliance and the date compliance was, or will be, achieved. The notification must be signed by an authorized individual.
- (c) The annual notice shall cover the time period from January 1 to December 31 of the previous year, and shall be submitted in the format attached no later than March 1 of each year to:

Compliance Branch, Office of Air Quality
Indiana Department of Environmental Management
100 North Senate Avenue
Indianapolis, Indiana 46204-2251
- (d) 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.9 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 emissions unit:
 - (1) Identification of the individual(s) responsible for inspecting, maintaining, and repairing emission control devices;
 - (2) A description of the items or conditions that will be inspected and the inspection schedule for said items or conditions; and
 - (3) Identification and quantification of the replacement parts that will be maintained in inventory for quick replacement.

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

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

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

- (b) A copy of the PMPs shall be submitted to IDEM, OAQ, upon request and within a reasonable time, and shall be subject to review and approval by IDEM, OAQ. IDEM, OAQ, may require the Permittee to revise its PMPs whenever lack of proper maintenance causes or is the primary contributor to an exceedance of any limitation on emissions or potential to emit. The PMP does not require the certification 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.10 Permit Revision [326 IAC 2-5.1-3(e)(3)] [326 IAC 2-6.1-6]

- (a) Permit revisions are governed by the requirements of 326 IAC 2-6.1-6.
- (b) Any application requesting an amendment or modification of this permit shall be submitted to:

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

Any such application shall be certified by an “authorized individual” as defined by 326 IAC 2-1.1-1.

- (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)]
- (d) No permit amendment or modification is required for the addition, operation or removal of a non-road engine, as defined in 40 CFR 89.2.

B.11 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] [IC13-17-3-2] [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 this title or the conditions of this permit or any operating permit revisions;

- (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 processes, emissions units (including monitoring and air pollution control equipment), practices, or operations regulated or required under this permit or any operating permit revisions;
- (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.12 Transfer of Ownership or Operation [326 IAC 2-6.1-6(d)(3)]

Pursuant to [326 IAC 2-6.1-6(d)(3)]:

- (a) In the event that ownership of this source is changed, the Permittee shall notify IDEM, OAQ, Permits Branch, within thirty (30) days of the change.
- (b) The written notification shall be sufficient to transfer the permit to the new owner by an notice-only change pursuant to 326 IAC 2-6.1-6(d)(3).
- (c) IDEM, OAQ, shall issue a revised permit.

The notification which shall be submitted by the Permittee does require the certification by the “authorized individual” as defined by 326 IAC 2-1.1-1.

B.13 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.14 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

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 one hundred (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 construct and 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 non-overlapping integrated averages for a continuous opacity monitor) in a six (6) hour period.

C.4 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
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.

- (e) **Procedures for Asbestos Emission Control**
The Permittee shall comply with the applicable emission control procedures in 326 IAC 14-10-4 and 40 CFR 61.145(c). Per 326 IAC 14-10-1, emission control requirements are applicable for any removal or disturbance of RACM greater than three (3) linear feet on pipes or three (3) square feet on any other facility components or a total of at least 0.75 cubic feet on all facility components.
- (f) **Demolition and renovation**
The Permittee shall thoroughly inspect the affected facility or part of the facility where the demolition or renovation will occur for the presence of asbestos pursuant to 40 CFR 61.145(a).
- (g) **Indiana Accredited Asbestos Inspector**
The Permittee shall comply with 326 IAC 14-10-1(a) that requires the owner or operator, prior to a renovation/demolition, to use an Indiana Accredited Asbestos Inspector to thoroughly inspect the affected portion of the facility for the presence of asbestos. The requirement to use an Indiana Accredited Asbestos inspector is not federally enforceable.

Testing Requirements

C.5 Performance Testing [326 IAC 3-6]

- (a) Compliance testing on new emissions units shall be conducted within 60 days after achieving maximum production rate, but no later than 180 days after initial start-up, if specified in Section D of this approval. All testing shall be performed according to the provisions of 326 IAC 3-6 (Source Sampling Procedures), except as provided elsewhere in this permit, utilizing any applicable procedures and analysis methods specified in 40

CFR 51, 40 CFR 60, 40 CFR 61, 40 CFR 63, 40 CFR 75, or other procedures approved by IDEM, OAQ.

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

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

no later than thirty-five (35) days prior to the intended test date.

- (b) The Permittee shall notify IDEM, OAQ of the actual test date at least fourteen (14) days prior to the actual date.
- (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 the 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.6 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

C.7 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.8 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.9 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 emissions unit 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 re-testing in one-hundred and twenty (120) days is not practicable, IDEM, OAQ may extend the re-testing deadline.

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

The response action documents submitted pursuant to this condition do not require the certification by an “authorized individual” as defined by 326 IAC 2-1.1-1.

Record Keeping and Reporting Requirements

C.10 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.11 General Record Keeping Requirements [326 IAC 2-6.1-5]

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- (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 when operation begins.

C.12 General Reporting Requirements [326 IAC 2-1.1-11] [326 IAC 2-6.1-5] [IC 13-14-1-13]

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- (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
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, any quarterly report required in Section D of this permit shall be submitted within thirty (30) days of the end of the reporting period. The report does not 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.

SECTION D.1 EMISSIONS UNITS OPERATION CONDITIONS

Emissions Unit Description: Natural gas compression

- (a) One (1) 145 horsepower natural gas-fired 4-cycle rich burn reciprocating internal combustion engine, identified as E-01, installed in 2005, capacity: 1.13 million British thermal units per hour.
- (b) One (1) natural gas-fired glycol dehydrator, identified as DEHY, to be installed in 2006, exhausting to vent DEHY-1, consisting of:
 - (1) One (1) reboiler, identified as REB-1, capacity: 0.100 million British thermal units per hour.
 - (2) One (1) dehydrator, identified as D-1, capacity: 40 gallons of TEG glycol per hour.
- (c) One (1) Caterpillar G398NA natural gas-fired 4-cycle rich burn reciprocating internal combustion engine, identified as E-02, to be installed in 2006, equipped with a catalytic converter for emissions control, capacity: 3.91 million British thermal units per hour.

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

Emission Limitations and Standards

D.1.1 Particulate Emission Limitations for Sources of Indirect Heating [326 IAC 6-2-4]

Pursuant to 326 IAC 6-2-4 (Particulate emission limitations for sources of indirect heating: emission limitations for facilities specified in 326 IAC 6-2-1(d)), the PM emissions from reboiler, identified as REB-1, to be installed in 2006, shall not exceed 0.6 pound per million Btu heat input (lb/MMBtu), when Q is less than ten (10) million British thermal units per hour.

Compliance Determination Requirements

There are no compliance determinations applicable to these facilities.

Compliance Monitoring Requirements [326 IAC 2-5.1-3(e)(2)] [326 IAC 2-6.1-5(a)(2)]

There are no compliance monitoring requirements applicable to these facilities.

Record Keeping and Reporting Requirements [326 IAC 2-5.1-3(e)(2)] [326 IAC 2-6.1-5(a)(2)]

There are no record keeping requirements applicable to these facilities.

**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:	Quicksilver Resources Inc. – Sherman Central Processing Facility (CPF)
Address:	598 Highway 11 SW
City:	Laconia, Indiana 47135
Phone #:	817 – 665 – 4933
MSOP #:	061-21945-00033

I hereby certify that **Quicksilver Resources Inc. – Sherman Central Processing Facility (CPF)** is

- still in operation.
- no longer in operation.

I hereby certify that **Quicksilver Resources Inc. – Sherman Central Processing Facility (CPF)** is

- in compliance with the requirements of MSOP 061-21945-00033.
- not in compliance with the requirements of MSOP 061-21945-00033.

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 - 317 233-5967**

**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 ?_____, 100TONS/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 PERM 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:

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

**Technical Support Document (TSD) for a New Source Construction and
Minor Source Operating Permit**

Source Background and Description

Source Name: Quicksilver Resources Inc. – Sherman Central Processing Facility (CPF)
Source Location: 598 Highway 11 SW, Laconia, Indiana 47135
County: Harrison
SIC Code: 1311
Operation Permit No.: MSOP 061-21945-00032
Permit Reviewer: Brian J. Pedersen

The Office of Air Quality (OAQ) has reviewed an application from Quicksilver Resources Inc. – Sherman Central Processing Facility (CPF) relating to the construction and operation of a natural gas compression source.

History

Quicksilver Resources Inc. registered the Sherman Booster Station under R 061-21580-00032 on September 19, 2005. The Caterpillar 3306NA engine that was registered at that site will be moved to the new site, Sherman Central Processing Facility. These plants have the same address and shall be considered one (1) source. The Sherman Booster Station also plans to install one (1) glycol dehydrator, identified as DEHY, and one (1) Caterpillar G398NA engine, identified as E-02. Based on the potential to emit after the new construction the source shall now be subject to the provisions of 326 IAC 2-6.1.

Source Definition

This natural gas compression company consists of two (2) plants:

- (a) Quicksilver Resources Inc. – Sherman Central Processing Facility (CPF) is located at 598 Highway 11 SW, Laconia, Indiana 47135; and
- (b) Quicksilver Resources Inc. – Sherman Booster Station is located at 598 Highway 11 SW, Laconia, Indiana 47135.

Since the two (2) plants are located in contiguous properties, have the same SIC codes and are owned by one (1) company, they will be considered one (1) source.

Permitted Emission Units and Pollution Control Equipment

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

One (1) 145 horsepower natural gas-fired 4-cycle rich burn reciprocating internal combustion engine, identified as E-01, installed in 2005, capacity: 1.13 million British thermal units per hour.

Unpermitted Emission Units and Pollution Control Equipment

There are no unpermitted emission units operating at this source during this review process.

New Emission Units and Pollution Control Equipment

The application includes information relating to the prior approval for the construction and operation of the following new equipment:

- (a) One (1) natural gas-fired glycol dehydrator, identified as DEHY, to be installed in 2006, exhausting to vent DEHY-1, consisting of:
 - (1) One (1) reboiler, identified as REB-1, capacity: 0.100 million British thermal units per hour.
 - (2) One (1) dehydrator, identified as D-1, capacity: 40 gallons of TEG glycol per hour.
- (b) One (1) Caterpillar G398NA natural gas-fired 4-cycle rich burn reciprocating internal combustion engine, identified as E-02, to be installed in 2006, equipped with a catalytic converter for emissions control, capacity: 3.91 million British thermal units per hour.

Existing Approvals

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

R 061-21580-00032

All conditions from this previous approval was incorporated into this permit.

Enforcement Issue

There are no enforcement actions pending.

Stack Summary

There are no stacks associated with this source.

Recommendation

The staff recommends to the Commissioner that the construction and operation be approved. This recommendation is based on the following facts and conditions:

Unless otherwise stated, information used in this review was derived from the application and additional information submitted by the applicant.

An application for the purposes of this review was received on October 21, 2005, with additional information received on December 15, 2005 and December 22, 2005.

Emission Calculations

See pages 1 through 6 of Appendix A of this document for detailed emission calculations.

The potential to emit from the natural gas-fired glycol dehydrator, identified as DEHY, was estimated using the GRI-GLYcalc model. This model represents the only practical method to represent VOC emissions from the great variety of conditions under which the dehydrator will operate. Total VOC emissions from the dehydrator have been calculated and provided by the applicant.

These calculations have been verified as accurate and the natural gas-fired glycol dehydrator meets the guidelines in Appendix B from Chapter 10 of the Emission Inventory Improvement Program documents, while using the thermodynamic version. The U.S. EPA has approved the use of the GRI-GLYcalc model for emissions inventory purposes. The results of the model for this dehydrator have been shown on page 3 of 6 of Appendix A.

Potential to Emit Before Controls of the Entire Source

Pursuant to 326 IAC 2-1.1-1(16), Potential to Emit is defined as “the maximum capacity of a stationary source or emissions unit to emit any air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of a source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or type or amount of material combusted, stored, or processed shall be treated as part of its design if the limitation is enforceable by the U.S. EPA, the department, or the appropriate local air pollution control agency.”

Pollutant	Potential to Emit (tons/yr)
PM	0.220
PM ₁₀	0.213
SO ₂	0.013
VOC	0.778
CO	82.1
NO _x	48.8

HAPs	Potential to Emit (tons/yr)
Formaldehyde	1.17
Acetaldehyde	0.185
Total	1.59

- (a) The potential to emit (as defined in 326 IAC 2-7-1(29)) of all criteria pollutants is less than one hundred (100) tons per year and NO_x emissions are greater than twenty five (25) tons per year. Therefore, the source is subject to the provisions of 326 IAC 2-6.1. An MSOP will be issued.
- (b) The potential to emit (as defined in 326 IAC 2-7-1(29)) of any single HAP is less than ten (10) tons per year and the potential to emit (as defined in 326 IAC 2-7-1(29)) of a combination of HAPs is less than twenty-five (25) tons per year. Therefore, the source is not subject to the provisions of 326 IAC 2-7.
- (c) Fugitive Emissions
Since this type of operation is not one of the twenty-eight (28) listed source categories under 326 IAC 2-2 and since there are no applicable New Source Performance Standards that were in effect on August 7, 1980, the fugitive particulate matter (PM) and volatile organic compound (VOC) emissions are not counted toward determination of PSD and Emission Offset applicability.

County Attainment Status

The source is located in Harrison County.

Pollutant	Status
PM _{2.5}	attainment
PM ₁₀	attainment
SO ₂	attainment
NO ₂	attainment
1-Hour Ozone	attainment
8-Hour Ozone	attainment
CO	attainment
Lead	attainment

- (a) Volatile organic compounds (VOC) and nitrogen oxides (NO_x) 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 NO_x emissions are considered when evaluating the rule applicability relating to ozone. Harrison County has been designated as attainment or unclassifiable for ozone. Therefore, VOC and NO_x emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2. See the State Rule Applicability - Entire Source section of this document.
- (b) Harrison County has been classified as unclassifiable or attainment for PM_{2.5}. U.S. EPA has not yet established the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2 for PM_{2.5} emissions. Therefore, until the U.S.EPA adopts specific provisions for PSD review for PM_{2.5} emissions, it has directed states to regulate PM₁₀ emissions as a surrogate for PM_{2.5} emissions. See the State Rule Applicability for the source section.
- (c) Harrison County has been classified as attainment or unclassifiable in Indiana for all criteria pollutants. Therefore, these emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2. See the State Rule Applicability - Entire Source section of this document.

Source Status

Existing Source PSD, Part 70, or FESOP Definition (emissions after controls, based on 8,760 hours of operation per year at rated capacity and/or as otherwise limited):

Pollutant	Emissions (tons/yr)
PM	0.220
PM ₁₀	0.213
SO ₂	0.013
VOC	0.778
CO	40.8
NO _x	18.6

Pollutant	Emissions (tons/yr)
Single HAP (Formaldehyde)	1.17
Combination HAPs	1.59

- (a) This existing source is **not** a major stationary source because no attainment regulated pollutant is emitted at a rate of two-hundred fifty (250) tons per year or greater and it is not in one of the twenty-eight (28) listed source categories.
- (b) Emissions were based on the MSOP application the source submitted (See pages 1 through 6 of Appendix A).

Proposed Modification

Unlimited PTE from the proposed modification (based on 8,760 hours of operation per year at rated capacity including enforceable emission control and production limit where applicable):

Pollutant	PM (ton/yr)	PM ₁₀ (ton/yr)	SO ₂ (ton/yr)	VOC (on/yr)	CO (ton/yr)	NO _x (ton/yr)
Proposed Modification	0.171	0.166	0.010	0.631	63.6	37.8
PSD Threshold Level	250	250	250	250	250	250

This modification to an existing minor stationary source is not major because the emission increase is less than the PSD major source levels. Therefore, pursuant to 326 IAC 2-2, the PSD requirements do not apply.

Part 70 Permit Determination

326 IAC 2-7 (Part 70 Permit Program)

This existing source, including the emissions from this permit MSOP 061-21945-00033, is still not subject to the Part 70 Permit requirements because the potential to emit (PTE) of:

- (a) criteria pollutant is less than one-hundred (100) tons per year,
- (b) a single hazardous air pollutant (HAP) is less than ten (10) tons per year, and
- (c) the combination of HAPs is less than twenty-five (25) tons per year.

This status is based on all the air approvals issued to the source.

Federal Rule Applicability

- (a) The requirements of the New Source Performance Standard for Stationary Gas Turbines, 326 IAC 12 (40 CFR 60.330, Subpart GG), are not included in the permit for this source because the engines are reciprocating engines, not turbine engines.
- (b) The requirements of the New Source Performance Standard for Equipment Leaks of VOC from Onshore Natural Gas Processing Plants, 326 IAC 12 (40 CFR 60.630, Subpart

KKK), are not included in the permit for this source because the compressor engines are not located at a natural gas processing plant. Therefore, pursuant to 40 CFR 60.630(e), the source is exempt from this rule.

- (c) This requirements of the New Source Performance Standard for Onshore Natural Gas Processing: SO₂ Emissions, 326 IAC 12 (40 CFR 60.640, Subpart LLL), are not included in the permit for this source because this NSPS applies only to emission units (called sweetening units) that separate H₂S and CO₂ from the sour natural gas streams and this source does not propose to operate any sweetening units.
- (d) There are no other New Source Performance Standards included in the permit for this source.
- (e) The requirements of the National Emission Standards for Hazardous Air Pollutants (NESHAP), 40 CFR 63.6590 Subpart ZZZZ, Reciprocating Internal Combustion Engines, are not included in the permit because this source is not a major source of HAPs, as defined in 40 CFR 63.2.
- (f) The requirements of the National Emission Standards for Hazardous Air Pollutants (NESHAP), 40 CFR 63.760 Subpart HH, Oil and Natural Gas Production Facilities, are not included in the permit because this source is not a major source of HAPs, as defined in 40 CFR 63.2.
- (g) The requirements of the National Emission Standards for Hazardous Air Pollutants (NESHAP), 40 CFR 63.1270 Subpart HHH, Natural Gas Transmission and Storage Facilities, are not included in the permit because this source is not a major source of HAPs, as defined in 40 CFR 63.2.
- (h) The requirements of the National Emission Standards for Hazardous Air Pollutants (NESHAP), 40 CFR 63.6080 Subpart YYYY, Stationary Combustion Turbines, are not included in the permit because this source is not a major source of HAPs, as defined in 40 CFR 63.2.
- (i) The requirements of the National Emission Standards for Hazardous Air Pollutants (NESHAP), 40 CFR 61.240 Subpart V, Equipment Leaks (Fugitive Emission Sources), are not included in the permit because the source does not have any equipment which contacts a fluid that is at least ten (10%) percent by weight a volatile hazardous pollutant.
- (j) The requirements of the National Emission Standards for Hazardous Air Pollutants (NESHAP), 40 CFR 63.7840 Subpart DDDDD, Industrial, Commercial, and Institutional Boilers and Process Heaters, are not included in the permit because because this source is not a major source of HAPs, as defined in 40 CFR 63.2.
- (k) There are no other National Emission Standards for Hazardous Air Pollutants included in the permit for this source.

State Rule Applicability – Entire Source

326 IAC 2-2 (Prevention of Significant Deterioration (PSD))

Pursuant to R 061-21945-00032, the unrestricted potential emissions of each attainment criteria pollutant was less than two-hundred fifty (250) tons per year. The combined potential to emit from the existing equipment and the new equipment is less than the PSD thresholds for each

criteria pollutant. Therefore, this source, which is not one of the twenty-eight (28) listed source categories, is a minor source pursuant to 326 IAC 2-2, PSD.

326 IAC 2-4.1-1 (New source toxics control)

The operation of a natural gas compression source will emit less than ten (10) tons per year of a single HAP and twenty-five (25) tons per year of a combination of HAPs. Therefore, 326 IAC 2-4.1 does not apply.

326 IAC 2-6 (Emission Reporting)

This source is not located in Lake or Porter County with the potential to emit greater than twenty-five (25) tons per year of NO_x, does not emit five (5) tons per year or more of lead and does not require a Part 70 Operating Permit. Therefore, the requirements of 326 IAC 2-6 do not apply.

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 the permit:

- (a) Opacity shall not exceed an average of forty percent (40%) in any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.
- (b) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of fifteen (15) minutes (sixty (60) readings as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a continuous opacity monitor) in a six (6) hour period.

State Rule Applicability – Individual Facilities

326 IAC 6-2-4 (Particulate Emission Limitations for Sources of Indirect Heating)

Pursuant to 326 IAC 6-2-4 (Particulate emission limitations for sources of indirect heating: emission limitations for facilities specified in 326 IAC 6-2-1(d)), particulate emissions from the insignificant activity consisting of one (1) natural gas fired reboiler, identified as REB-1, to be constructed in 2006, shall be limited by the following equation:

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

Pt= Pounds of particulate matter per million Btu (lb/mmBtu) heat input

Q= Total source maximum operating capacity rating in million Btu per hour (mmBtu/hr) heat input. The maximum operating capacity rating is defined as the maximum capacity at which the facility is operated or the nameplate capacity, whichever is specified in the facility's permit application, except when some lower capacity is contained in the facility's operation permit; in which case, the capacity specified in the operation permit shall be used.

$$Pt = \frac{1.09}{0.100^{0.26}} = 1.98 \text{ pounds of particulate matter emitted per mmBtu}$$

For Q less than ten (10) mmBtu/hr, Pt shall not exceed 0.6 pounds of particulate matter emitted per mmBtu.

As shown in the on page 3 of Appendix A for the reboiler combustion, the total PM emissions from the one (1) natural gas fired reboiler, identified as REB-1, is 0.001 tons per year. This is equivalent to 0.0002 pounds per hour of particulate matter per 0.100 million British thermal units heat input or 0.228 pounds per million British thermal unit. Therefore, the one (1) natural gas fired reboiler, identified as REB-1, shall comply with the rule.

326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes)

Pursuant to 326 IAC 6-3-1.5(2), the definition of a manufacturing process is "any single or series of actions, operations, or treatments in which a mechanical, physical, or chemical transformation of material occurs that emits, or has the potential to emit, particulate in the production of the product. The term includes transference, conveyance, or repair of a product." Natural gas is not considered a product for the purposes of this rule. Therefore, the requirements of 326 IAC 6-3 do not apply to the two (2) compressor engines, identified as E-01 and E-02, nor the one (1) glycol dehydrator, identified as DEHY.

326 IAC 7-1.1 (Sulfur Dioxide Emission Limitations)

The potential SO₂ emissions from the facilities at this source are less than ten (10) pounds per hour and twenty-five (25) tons per year. Therefore, the requirements of 326 IAC 7-1.1 are not applicable.

326 IAC 8-1-6 (New facilities; General reduction requirements)

The potential VOC emissions from the two (2) compressor engines, identified as E-01 and E-02, and the one (1) glycol dehydrator, identified as DEHY, constructed after January 1, 1980 are less than twenty five (25) tons per year. Therefore, the requirements of 326 IAC 8-1-6 are not applicable.

326 IAC 10-1 (Nitrogen Oxides Control in Clark and Floyd Counties)

This source is not located in Clark or Floyd County. Therefore, the requirements of 326 IAC 10-1 are not applicable.

Conclusion

The construction and operation of this a natural gas compression source shall be subject to the conditions of the **New Source Construction and Minor Source Operating Permit 061-21945-00033**.

**Appendix A: Emission Calculations
Internal Repicocating Engines - Natural Gas Fired**

Company Name: Quicksilver Resources Inc. – Sherman Central Processing Facility (CPF)
Address City IN Zip: 598 Highway 11 SW, Laconia, Indiana 47135
Permit Number: M 061-21945
Plt ID: 061-00033
Reviewer: Brian J. Pedersen
Application Date: October 21, 2005

Fuel Usage
MM scf/yr
(E-01)

Heat Input Capacity
MM Btu/hr

9.7

1.13

Emission Factor in lb/MMBtu	Pollutant					
	PM*	PM10*	SO2	NOx	VOC	CO
	9.91E-03	9.50E-03	0.00	2.21	0.030	3.72
Potential Emission in tons/yr	0.049	0.047	0.003	10.97	0.147	18.46

Methodology

Potential Throughput (hp-hr/yr) = hp * 8760 hr/yr

Emission Factors are from AP42 (Supplement B 10/96), Table 3.2-3

Heat input rate (MMBtu/hr) = Fuel Usage (MMscf/yr) * 1020 Btu/scf * yr/8760 hrs

Emission (tons/yr) = [Heat input rate (MMBtu/hr) x Emission Factor (lb/MMBtu)] * 8760 hr/yr / (2,000 lb/ton)

Emission (tons/yr) = [Potential Throughput (hp-hr/yr) x Emission Factor (lb/hp-hr)] / (2,000 lb/ton)

See page 2 for HAP emission calculations

Appendix A: Emission Calculations
Internal Repicocating Engines - Natural Gas Fired

Company Name: Quicksilver Resources Inc. – Sherman Central Processing Facility (CPF)
Address City IN Zip: 598 Highway 11 SW, Laconia, Indiana 47135
Permit Number: M 061-21945
Plt ID: 061-00033
Reviewer: Brian J. Pedersen
Application Date: October 21, 2005

Fuel Usage MM scf/yr	Heat Input Capacity MM Btu/hr
9.7	1.13

Pollutant	Emission Factor (lbs/MMBtu)	Emissions (lbs/hr)	Emissions (tpy)
1,1,2,2-Tetrachlorethane	4.00E-05	4.53E-05	1.98E-04
1,1,2-Trichloroethane	3.18E-05	3.60E-05	1.58E-04
1,1-Dichloroethane	2.36E-05	2.67E-05	1.17E-04
1,2,4-Trimethylbenzene	1.43E-05	1.62E-05	7.10E-05
1,2-Dichlorethane	2.36E-05	2.67E-05	1.17E-04
1,2-Dichloropropane	2.69E-05	3.05E-05	1.33E-04
1,3-Butadiene	2.67E-04	3.02E-04	1.32E-03
1,3-Dichloropropene	2.64E-05	2.99E-05	1.31E-04
2,2,4-Trimethylpentane	2.50E-04	2.83E-04	1.24E-03
Acetaldehyde	8.36E-03	9.47E-03	4.15E-02
Acrolein	5.14E-03	5.82E-03	2.55E-02
Benzene	4.40E-04	4.98E-04	2.18E-03
Biphenyl	2.12E-04	2.40E-04	1.05E-03
Carbon Tetrachloride	3.97E-05	4.50E-05	1.97E-04
Chlorobenzene	3.04E-05	3.44E-05	1.51E-04
Chloroethane	1.87E-06	2.12E-06	9.28E-06
Chloroform	2.85E-05	3.23E-05	1.41E-04
Ethylbenzene	3.97E-05	4.50E-05	1.97E-04
Ethylene Dibromide	4.43E-05	5.02E-05	2.20E-04
Formaldehyde	5.28E-02	5.98E-02	2.62E-01
Methanol	2.50E-03	2.83E-03	1.24E-02
Methylene Chloride	2.00E-05	2.27E-05	9.92E-05
n-Hexane	1.11E-03	1.26E-03	5.51E-03
Naphthalene	7.44E-05	8.43E-05	3.69E-04
Phenol	2.40E-05	2.72E-05	1.19E-04
Styrene	2.36E-05	2.67E-05	1.17E-04
Toluene	4.08E-04	4.62E-04	2.02E-03
Vinyl Chloride	1.49E-05	1.69E-05	7.39E-05
Xylene	1.84E-04	2.08E-04	9.13E-04
Total HAP Emissions		0.08 (lbs/hr)	0.36 (tpy)

Methodology

Emission Factors are from AP-42, Chapter 3.2, Table 3.2-2, SCC #2-02-0002-54

Potential Emissions (lbs/hr) = Emission Factor(lbs/MMbtu) * Specific Heat Capacity(Btu/hp-hr) *
 (1MMBtu/1,000,000 Btu) * Rating(hp)

Potential Emissions (tpy) = Potential Emissions(lbs/hr) * 8760(hr/yr) / 2000(lbs/ton)

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

Company Name: Quicksilver Resources Inc. – Sherman Central Processing Facility (CPF)
Address City IN Zip: 598 Highway 11 SW, Laconia, Indiana 47135
Permit Number: M 061-21945
Plt ID: 061-00033
Reviewer: Brian J. Pedersen
Application Date: October 21, 2005

Heat Input Capacity
MMBtu/hr
(reboiler)
0.100

Potential Throughput
MMCF/yr
1

Emission Factor in lb/MMCF	Pollutant					
	PM*	PM10*	SO2	NOx	VOC	CO
	1.90	7.60	0.600	100 **see below	5.50	84.0
Potential Emission in tons/yr	0.001	0.003	0.0003	0.044	0.002	0.037

*PM emission factor is filterable PM only. PM10 emission factor is filterable and condensable PM10 combined.

**Emission Factors for NOx: Uncontrolled = 100, Low NOx Burner = 50, Low NOx Burners/Flue gas recirculation = 32

GRI-GLYCalc Version 4 -AggregateCalculation Report From Applicant

Dehydrator Process Emissions

Description: 1.4 mmcf per day, 40 gallons per hour, 4015 pump, 40 spm 0.667 gpm

Uncontrolled Regenerator Emissions

Total VOC emissions = 0.123 tons per year

Methodology

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 are from AP 42, Chapter 1.4, Tables 1.4-1, 1.4-2, 1.4-3, SCC #1-02-006-02, 1-01-006-02, 1-03-006-02, and 1-03-006-03 (SUPPLEMENT D 3/98)

Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton

See page 4 for HAPs emissions calculations.

Appendix A: Emissions Calculations
Natural Gas Combustion Only
MM BTU/HR <100
Glycol Dehydrator Reboiler
HAPs Emissions

Company Name: Quicksilver Resources Inc. – Sherman Central Processing Facility (CPF)
Address City IN Zip: 598 Highway 11 SW, Laconia, Indiana 47135
Permit Number: M 061-21945
Plt ID: 061-00033
Reviewer: Brian J. Pedersen
Application Date: October 21, 2005

HAPs - Organics					
Emission Factor in lb/MMcf	Benzene 0.00210	Dichlorobenzene 0.00120	Formaldehyde 0.07500	Manganese 0.0004	Toluene 0.00340
Potential Emission in tons/yr	0.000001	0.000001	0.000033	0.00000	0.000001

HAPs - Metals						
Emission Factor in lb/MMcf	Lead 0.0005	Cadmium 0.0011	Chromium 0.0014	Hexane 1.80000	Nickel 0.0021	Total
Potential Emission in tons/yr	0.00000	0.00000	0.00000	0.000788	0.00000	0.001

Methodology is the same as page 3.

The five highest organic and metal HAPs emission factors are provided above. Additional HAPs emission factors are available in AP-42, Chapter 1.4.

**Appendix A: Emission Calculations
Internal Repicocating Engines - Natural Gas Fired**

Company Name: Quicksilver Resources Inc. – Sherman Central Processing Facility (CPF)
Address City IN Zip: 598 Highway 11 SW, Laconia, Indiana 47135
Permit Number: M 061-21945
Plt ID: 061-00033
Reviewer: Brian J. Pedersen
Application Date: October 21, 2005

Fuel Usage
MM scf/yr
(E-02)
33.5

Heat Input Capacity
MM Btu/hr
3.91

Emission Factor in lb/MMBtu	Pollutant					
	PM*	PM10*	SO2	NOx	VOC	CO
	9.91E-03	9.50E-03	0.00	2.21	0.030	3.72
Uncontrolled Potential Emissions in tons/yr	0.170	0.163	0.010	37.8	0.506	63.6
Controlled Potential Emissions in tons/yr (catalytic converter)	0.170	0.163	0.010	7.56	0.506	22.3

Methodology

Potential Throughput (hp-hr/yr) = hp * 8760 hr/yr
Emission Factors are from AP42 (Supplement B 10/96), Table 3.2-3
Heat input rate (MMBtu/hr) = Fuel Usage (MMscf/yr) * 1020 Btu/scf * yr/8760 hrs
Emission (tons/yr) = [Heat input rate (MMBtu/hr) x Emission Factor (lb/MMBtu)] * 8760 hr/yr / (2,000 lb/ton)
Emission (tons/yr) = [Potential Throughput (hp-hr/yr) x Emission Factor (lb/hp-hr)] / (2,000 lb/ton)
Catalytic Converter controls 80% NOx and 65% CO
Controlled Emissions (tons/yr) = Emission (tons/yr) * (1 - control efficiency (%)) / 100
See page 6 for HAP emission calculations

Appendix A: Emission Calculations
Internal Repicocating Engines - Natural Gas Fired

Company Name: Quicksilver Resources Inc. – Sherman Central Processing Facility (CPF)
Address City IN Zip: 598 Highway 11 SW, Laconia, Indiana 47135
Permit Number: M 061-21945
Plt ID: 061-00033
Reviewer: Brian J. Pedersen
Appication Date: October 21, 2005

Fuel Usage MM scf/yr	Heat Input Capacity MM Btu/hr
33.5	3.91

Pollutant	Emission Factor (lbs/MMBtu)	Emissions (lbs/hr)	Emissions (tpy)
1,1,2,2-Tetrachlorethane	4.00E-05	1.56E-04	6.84E-04
1,1,2-Trichloroethane	3.18E-05	1.24E-04	5.44E-04
1,1-Dichloroethane	2.36E-05	9.22E-05	4.04E-04
1,2,4-Trimethylbenzene	1.43E-05	5.58E-05	2.45E-04
1,2-Dichlorethane	2.36E-05	9.22E-05	4.04E-04
1,2-Dichloropropane	2.69E-05	1.05E-04	4.60E-04
1,3-Butadiene	2.67E-04	1.04E-03	4.57E-03
1,3-Dichloropropene	2.64E-05	1.03E-04	4.52E-04
2,2,4-Trimethylpentane	2.50E-04	9.76E-04	4.28E-03
Acetaldehyde	8.36E-03	3.26E-02	1.43E-01
Acrolein	5.14E-03	2.01E-02	8.79E-02
Benzene	4.40E-04	1.72E-03	7.53E-03
Biphenyl	2.12E-04	8.28E-04	3.63E-03
Carbon Tetrachloride	3.97E-05	1.55E-04	6.79E-04
Chlorobenzene	3.04E-05	1.19E-04	5.20E-04
Chloroethane	1.87E-06	7.30E-06	3.20E-05
Chloroform	2.85E-05	1.11E-04	4.88E-04
Ethylbenzene	3.97E-05	1.55E-04	6.79E-04
Ethylene Dibromide	4.43E-05	1.73E-04	7.58E-04
Formaldehyde	5.28E-02	2.06E-01	9.03E-01
Methanol	2.50E-03	9.76E-03	4.28E-02
Methylene Chloride	2.00E-05	7.81E-05	3.42E-04
n-Hexane	1.11E-03	4.33E-03	1.90E-02
Naphthalene	7.44E-05	2.91E-04	1.27E-03
Phenol	2.40E-05	9.37E-05	4.11E-04
Styrene	2.36E-05	9.22E-05	4.04E-04
Toluene	4.08E-04	1.59E-03	6.98E-03
Vinyl Chloride	1.49E-05	5.82E-05	2.55E-04
Xylene	1.84E-04	7.19E-04	3.15E-03
Total HAP Emissions		0.28 (lbs/hr)	1.23 (tpy)

Methodology

Emission Factors are from AP-42, Chapter 3.2, Table 3.2-2, SCC #2-02-0002-54

Potential Emissions (lbs/hr) = Emission Factor(lbs/MMbtu) * Specific Heat Capacity(Btu/hp-hr) *
 (1MMBtu/1,000,000 Btu) * Rating(hp)

Potential Emissions (tpy) = Potential Emissions(lbs/hr) * 8760(hr/yr) / 2000(lbs/ton)