

STATE OF MISSOURI



DEPARTMENT OF NATURAL RESOURCES

MISSOURI AIR CONSERVATION COMMISSION

PERMIT TO CONSTRUCT

Under the authority of RSMo 643 and the Federal Clean Air Act the applicant is authorized to construct the air contaminant source(s) described below, in accordance with the laws, rules and conditions as set forth herein.

Permit Number: **092007 - 013** Project Number: 2007-04-068

Parent Company: H.T.R. Inc.

Parent Company Address: 415 Kaiser Industrial Drive, Lake Ozark, MO 65049

Installation Name: H.T.R., Inc dba HTR - Group

Installation Address: 415 Kaiser Industrial Drive, Lake Ozark, MO 65049

Location Information: Miller County, S9, T39, R15

Application for Authority to Construct was made for:

A mercury containing lamp recycler that utilizes two model LSS1 processing machines that crushes and separates (trommel screens) the lamp components into metal, crushed glass, and powder. The mercury is removed from the collected powder in a thermal retort process. This review was conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

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- Standard Conditions (on reverse) are applicable to this permit.
- Standard Conditions (on reverse) and Special Conditions are applicable to this permit.

SEP 27 2007

EFFECTIVE DATE



DIRECTOR OR DESIGNEE
DEPARTMENT OF NATURAL RESOURCES

STANDARD CONDITIONS:

Permission to construct may be revoked if you fail to begin construction or modification within two years from the effective date of this permit. Permittee should notify the Air Pollution Control Program if construction or modification is not started within two years after the effective date of this permit, or if construction or modification is suspended for one year or more.

You will be in violation of 10 CSR 10-6.060 if you fail to adhere to the specifications and conditions listed in your application, this permit and the project review. In the event that there is a discrepancy between the permit application and this permit, the conditions of this permit shall take precedence. Specifically, all air contaminant control devices shall be operated and maintained as specified in the application, associated plans and specifications.

You must notify the department's Air Pollution Control Program of the anticipated date of start up of this (these) air contaminant source(s). The information must be made available not more than 60 days but at least 30 days in advance of this date. Also, you must notify the Department of Natural Resources Regional office responsible for the area within which you are located with 15 days after the actual start up of this (these) air contaminant source(s).

A copy of this permit and permit review shall be kept at the installation address and shall be made available to Department of Natural Resources' personnel upon request.

You may appeal this permit or any of the listed special conditions to the Administrative Hearing Commission (AHC), P.O. Box 1557, Jefferson City, MO 65102, as provided in RSMo 643.075.6 and 621.250.3. If you choose to appeal, you must file a petition with the AHC within 30 days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed. If it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC.

If you choose not to appeal, this certificate, the project review and your application and associated correspondence constitutes your permit to construct. The permit allows you to construct and operate your air contaminant source(s), but in no way relieves you of your obligation to comply with all applicable provisions of the Missouri Air Conservation Law, regulations of the Missouri Department of Natural Resources and other applicable federal, state and local laws and ordinances.

The Air Pollution Control Program invites your questions regarding this air pollution permit. Please contact the Construction Permit Unit at (573) 751-4817. If you prefer to write, please address your correspondence to the Missouri Department of Natural Resources, Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102-0176, attention: Construction Permit Unit.

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SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

The special conditions listed in this permit were included based on the authority granted the Missouri Air Pollution Control Program by the Missouri Air Conservation Law (specifically 643.075) and by the Missouri Rules listed in Title 10, Division 10 of the Code of State Regulations (specifically 10 CSR 10-6.060). For specific details regarding conditions, see 10 CSR 10-6.060 paragraph (12)(A)10. "Conditions required by permitting authority."

H.T.R., Inc dba HTR - Group
Miller County, S9, T39, R15

1. Hazardous Air Pollutant operation requirement for H.T.R., Inc dba HTR - Group. H.T.R., Inc. shall develop and implement written procedures specifying how to safely crush mercury lamps and how to safely recover the mercury from the powder collected from crushing by operating a retort (EP-19). The written procedure shall be available for all operators of the equipment. This procedure must include:
 - A. Any testing and monitoring procedures.
 - B. Proper waste management procedures.
2. H.T.R., Inc. shall maintain a log of the name of the Treatment Storage Disposal facility (TSDF's) or destination facilities to which all crushed material was shipped (Proof of Certificates of recycling).
3. Any used filter media (carbon, hepa. etc.) must undergo a hazardous waste determination and if necessary must be managed in accordance with the applicable requirements of 40 CFR 260 –270.
4. H.T.R., Inc. shall operate and maintain the Model LSS1 crushing units and Lohead Hagerty 30 cubic foot retort in accordance with written procedures developed by the manufacturer of the equipment. This includes operating with shrouds in place during operation.
5. H.T.R., Inc. shall document maintenance activities and shall retain maintenance logs, test data from the manufacturer reflecting the maximum rated operating capacities and any additional test data acquired. H.T.R., Inc dba HTR - Group shall maintain an operating and maintenance log for the which shall include the following:
 - A. Incidents of malfunction, with impact on emissions, duration of event, probable cause, and corrective actions; and
 - B. Maintenance activities, with inspection schedule, repair actions, and replacements, etc.

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SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

6. A copy of the operation and maintenance records must be retained at the installation. For a period of at least five years.
7. H.T.R., Inc shall maintain records of the total annual amount of lamps crushed for a period of at least at least five years and made available to any Department of Natural Resources' personnel upon request.
8. The volume and disposition of any carbon filter or other filter media from the devices.
9. Vents required to draw added air flow into the building to allow for the fan to draw the required volume of air should be operated with the minimum amount of opening that would minimize the air flow at times when it is not needed. However, the flow into the building should be made adequate to avoid such problems as back draw through the existing fans in the warehouse, inadequate air flow to the new control device system (potential motor overload) and problems opening doors.
10. H.T.R., Inc. shall keep all doors and entrances into the process area (LSS1 machines and retort area) closed except when need for transport of supplies and production materials.

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE
SECTION (6) REVIEW

Project Number: 2007-04-068
Installation ID Number: 131-0027
Permit Number:

H.T.R., Inc dba HTR - Group
415 Kaiser Industrial Drive
Lake Ozark, MO 65049

Complete: April 18, 2007
Reviewed: July 28, 2007

Parent Company:
H.T.R. Inc.
415 Kaiser Industrial Drive
Lake Ozark, MO 65049

Miller County, S9, T39, R15

REVIEW SUMMARY

- H.T.R., Inc dba HTR - Group has applied for authority to construct a mercury containing lamp recycler that utilizes two LSS1 processing machines that crush and separates (trommel screens) the lamp components (glass, end caps, powder). The mercury is then removed from the collected powder in a thermal retort process.
- Hazardous Air Pollutant (HAP) emissions are expected from the proposed equipment. HAPs of concern from this process are mercury (CAS# 20-13-3).
- None of the New Source Performance Standards (NSPS) apply to the proposed equipment.
- None of the National Emission Standards for Hazardous Air Pollutants (NESHAPs) or currently promulgated Maximum Achievable Control Technology (MACT) regulations apply to the proposed equipment.
- Charcoal filters are being used to control the mercury emissions from the equipment in this permit.
- This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential controlled emissions of all pollutants are below de minimis levels. The uncontrolled Potential to Emit is 1.77 tons per year of mercury which is over the 0.1 tons per year de minimis levels for mercury, from 10 CSR 10-6.020 (3) (A) *Definitions and Common Reference Tables Table 1 –De Minimis Emission Levels*.
- This installation is located in Miller County, an attainment area for all criteria air pollutants.

- This installation is not on the List of Named Installations [10 CSR 10-6.020(3)(B), Table 2].
- Ambient air quality modeling was not performed since conditioned potential emissions of the application are below de minimis levels.
- Emissions testing is not required for the equipment.
- No operating permit is required for this installation.
- Approval of this permit is recommended with special conditions.

INSTALLATION DESCRIPTION

HTR –Group operates a resource recovery facility. The 4 acre facility has a processing capacity of 2,500,000 lamps per month. The process utilizes computer controlled lamp recycling equipment that operates under negative pressure to insure no fugitive emissions. The glass is cleaned and recycled as are all metal parts, aluminum end caps, plastic pieces and the cardboard boxes. The mercury is retorted from the calcium phosphate powder and reused back into industry.

The process consists of breaking mercury containing lamps under a controlled environment, retorting the powder and separating the materials into two waste streams for off site recycling. The primary waste stream generated by the process will consist of mercury. The secondary waste streams consist of scrap metal (primary aluminum with minor amounts of iron, lead and calcium) and crushed glass.

Emissions are controlled by maintaining a negative pressure environment inside the lamp recycling machine (LSS1). Exhaust air from the lamp recycling machine (LSS1) will be filtered through two series of HEPA filters and a vapor phase activated carbon adsorber (VPCA) prior to discharging to the atmosphere. Minor quantities of spent air filter media will be generated by the air emissions control system. The building is vented through a secondary control device which are filters for collecting particulate mater and carbon filters for collecting mercury.

The following permit actions have been issued to H.T.R., Inc dba HTR - Group from the Air Pollution Control Program.

Table 1: Permitting Actions issued to H.T.R., Inc dba HTR - Group (131-0027).

Permit Number	Description
No permit required	Project number 2001-09-008 Fluorescent light Recycling
No permit required	Project number 2001-11-053 Fluorescent bulb Recycling
No permit required	Project number 2002-09-081 Mercury Retort Machine
Permit required	Project number 2005-05-044 Mercury Recycling
Permit required	Project number 2005-08-066 Hg Level Calculations

PROJECT DESCRIPTION

H.T.R., Inc dba HTR - Group has applied for the authority to install a Lochead Hagerty 30 cubic feet mercury retort (EP-10). It is an electric powered, batch process, thermal retort system for the recovery of mercury from mercury containing powder. The application indicates that the capacity is 0.05 tons per hour.

Based on the information submitted on file, the plant wide non-controlled potential to emit (PTE) emissions were determined to be above mercury de minimis source levels of 0.1 tons per year. The emission factors and control efficiencies used in this analysis were obtained from the Environmental Protection Agency (EPA) document Evaluation of Mercury Emissions from Florescent Lamp Crushing, February 1994 and from mass balance data submitted by the applicant. Assumptions used in the mass balance calculations are:

- One burn of the retort per week.
- 3 years of data
- 156 burns @ 1215 pounds of phosphate powder per burn.
- Captured 166 pounds of mercury over 3 year period.

The uncontrolled Potential to Emit is 1.77 tons per year of mercury which is over the 0.1 tons per year de minimis levels for mercury, from 10 CSR 10-6.020 (3) (A) *Definitions and Common Reference Tables* Table 1 –De Minimis Emission Levels.

Mercury is a HAP that has a de minimis level established by State regulation that is below the 10 tons de minimis level. Although this plant has control devices (filters), the construction permit determination of permit required is based on non-controlled Potential to Emit (PTE). Control devices are not considered when calculating PTE permit determinations based on HAPs. However, control devices are considered when calculating controlled Potential to Emit. Table 3 reports controlled PTE. A permit is required for this installation based on the uncontrolled PTE being greater than the mercury De Minimis level of 0.1 tons.

The application claimed destruction /removal efficiency control of 99.98 % on carbon columns and 80% on carbon filters . A value of 99% was used in the absence of site specific test data for the carbon columns and 80% for the carbon filters. A combined destruction/removal efficiency control of 99.8%. A list of the emission sources is provided in the Table 2 below.

Table 2: Emission Sources

Emission Point	Description	Max hourly design rate (ton material processed/hr)	Pollutant
EP-01	# 1 Lamp Implosion Chamber	0.904	PM10
EP-02	# 1 Glass Crusher 1	0.888	PM10
EP-03	# 1 Screen Separator Trommell 1	0.888	PM10
EP-04	# 1 Screen Separator Trommell 2	0.888	PM10
EP-05	# 1 Screen Separator Trommell 3	0.888	PM10
EP-06	# 1 Glass Crusher 2	0.888	PM10
EP-07	# 1 Vibrating Screen	0.888	PM10
EP-08	# 1 Mercury Emissions from Lamp Processing	0.904	HAP-Mercury
EP-09	# 1 Calcium Phosphate Powder Drum Filling	0.044	PM10
EP-10	# 2 Lamp Implosion Chamber	0.904	PM10
EP-11	# 2 Glass Crusher 1	0.888	PM10
EP-12	# 2 Screen Separator Trommell 1	0.888	PM10
EP-13	# 2 Screen Separator Trommell 2	0.888	PM10
EP-14	# 1 Screen Separator Trommell 3	0.888	PM10
EP-15	# 2 Glass Crusher 2	0.888	PM10
EP-16	# 2 Vibrating Screen	0.888	PM10
EP-17	# 2 Mercury Emissions from Lamp Processing	0.904	HAP-Mercury
EP-18	# 2 Calcium Phosphate Powder Drum Filling	0.044	PM10
EP-19	Retort	0.05	HAP-Mercury
# 1 implies north LSS1 #2 implies south LSS1			

EMISSIONS/CONTROLS EVALUATION

The emission factors and control efficiencies used in this analysis were obtained from the Environmental Protection Agency (EPA) document Evaluation of Mercury Emissions from Florescent Lamp Crushing, February 1994 and from mass balance data submitted by the applicant. Potential emissions of the application represent the potential of the new equipment, assuming continuous operation (8760 hours per year.) The following table provides an emissions summary for this project.

Table 3: Emissions Summary (tons per year)

Pollutant	Regulatory De Minimis Levels	**Existing Potential Emissions	*Existing Actual Emissions (year EIQ)	Potential Controlled Emissions of the Application	New Installation Conditioned Potential
PM ₁₀	15.0	9.34	N/D	0.234	N/A
SO _x	40.0	N/A	N/D	N/A	N/A
NO _x	40.0	N/A	N/D	N/A	N/A
VOC	40.0	1.73	N/D	N/A	N/A
CO	100.0	N/A	N/D	N/A	N/A
HAPs	10.0/25.0	1.73	N/D	0.004	N/A
Mercury	10.0/25.0	1.73	N/D	0.004	N/A

N/A = Not Applicable; N/D = Not Determined. *No record of EIQ submittal was found.

**Existing potential emission from Applicability Determination Request project number 2005-05-044.

Maximum design rate of the lamp processing machine LSS1 was 3050 lamps per hour. Estimated lamp density was 0.593lb per lamp. Estimated glass composition was 98.14 wt % glass. Estimated metal consumption was 1.84 wt % metal. Estimated average mercury content per bulb at 30 mg Hg per lamp. Estimated maximum production rate of phosphate powder is 87.5 pounds per hour.

PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of all pollutants are below de minimis levels. The uncontrolled Potential to Emit is 1.77 tons per year of mercury which is over the 0.1 tons per year de minimis levels for mercury, from 10 CSR 10-6.020 (3) (A) *Definitions and Common Reference Tables Table 1 –De Minimis Emission Levels*.

APPLICABLE REQUIREMENTS

H.T.R., Inc dba HTR - Group shall comply with the following applicable requirements. The Missouri Air Conservation Laws and Regulations should be consulted for specific record keeping, monitoring, and reporting requirements. Compliance with these emission standards, based on information submitted in the application, has been verified at the time this application was approved.

GENERAL REQUIREMENTS

- *Submission of Emission Data, Emission Fees and Process Information, 10 CSR 10-6.110*
The emission fee is the amount established by the Missouri Air Conservation Commission annually under Missouri Air Law 643.079(1). Submission of an Emissions Inventory Questionnaire (EIQ) is required April 1 for the previous year's emissions.
- *Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin, 10 CSR 10-6.170*
- *Restriction of Emission of Visible Air Contaminants, 10 CSR 10-6.220*
- *Restriction of Emission of Odors, 10 CSR 10-3.090*

STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, I recommend this permit be granted with special conditions.

Timothy Paul Hines
Environmental Engineer

Date

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated 04/16/2007, received 04/18/2007, designating H.T. R. Inc. as the owner and operator of the installation.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.
- SWRO Site Survey, dated 05/04/2007.

Mr. Raymond Kohout
Chief Operating Officer
H.T.R., Inc dba HTR - Group
415 Kaiser Industrial Drive,
Lake Ozark, MO 65049

RE: New Source Review Permit - Project Number: 2007-04-068

Dear Mr. Kohout:

Enclosed with this letter is your permit to construct. Please study it carefully. Also, note the special conditions, if any, on the accompanying pages. The document entitled, "Review of Application for Authority to Construct," is part of the permit and should be kept with this permit in your files.

Operation in accordance with these conditions, your new source review permit application is necessary for continued compliance.

The reverse side of your permit certificate has important information concerning standard permit conditions and your rights and obligations under the laws and regulations of the State of Missouri.

If you have any questions regarding this permit, please do not hesitate to contact Tim Hines the department's Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102 or by telephone at 573-751-4817. Thank you for your attention to this matter.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

Kendall B. Hale
New Source Review Unit Chief

KBH:thl

Enclosures

c: Southwest Regional Office
PAMS File 2007-04-068
Permit Number: