



Missouri Department of Natural Resources
Missouri Air Conservation Commission
Air Pollution Control Program

PERMIT TO CONSTRUCT

PERMIT BY RULE

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

Construction Permit Number: **082014-007**
Project Number: **2014-08-003**
Installation ID: **510-2660**

Installation Name and Address

St. Louis Cremation
2135 Chouteau Avenue
St. Louis, MO 63103
St. Louis City County

Parent Company's Name and Address

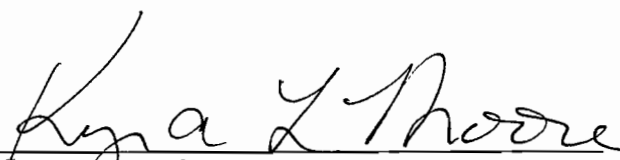
St. Louis Cremation
2135 Chouteau Avenue
St. Louis, MO 63103

Installation Description:

Installation of a Matthews Cremation Super Power Pak Plus (IE43-SPP Plus) human cremation unit.

AUG 14 2014

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 and 10 CSR 10-6.062 if you fail to adhere to the specifications and conditions listed in your permit by rule application and this permit. 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 of Natural Resources Regional office responsible for the area within which the equipment is located within 15 days after the actual start up of this air contaminant source.

A copy of this permit and permit notification 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 as provided in RSMo 643.075. If you choose to appeal, the Air Pollution Control Program must receive your written declaration within 30 days of receipt of this permit.

If you choose not to appeal, this certificate, the project review, your application and associated correspondence constitutes your permit to construct. The permit allows you to construct and operate your air contaminant sources(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 Department of Natural Resources has established the Outreach and Assistance Center to help in completing future applications or fielding complaints about the permitting process. You are invited to contact them at 1-800-361-4827 or (573) 526-6627, or you can write to the Outreach and Assistance Center, P.O. Box 176, Jefferson City, Missouri 65102-0176.

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 Air Pollution Control Program, P.O. Box 176, Jefferson City, Missouri 65102-0176, attention: Construction Permit Unit.

Matthews

INTERNATIONAL

Cremation Division

July 16, 2014

Oliver King
St. Louis Cremation
2135 Choteau Ave.
St. Louis, MO 63103

RECEIVED
2014 AUG -4 PM 12:07
AIR POLLUTION
CONTROL PERMIT

2014-08-003

Dear Mr. King:

Please find enclosed the permit application forms and additional information for the permit to install your new Super Power Pak Plus human cremator.

The highlighted areas on the forms indicate where information is needed from you. Please complete the forms and make two photocopies. The original needs to be sent to the St. Louis County DOH APCP and the other copy is for your records.

Please use the plot plan form I have enclosed so that you can prepare a layout diagram of the surroundings of your facility. The plan does not need to be precise.

Mail the original set of completed forms with a copy of all the technical supporting documentation to the following address:


St. Louis County DOH APCP
Attn.: Jeremy Rogus
4562 Lemay Ferry Rd.
St. Louis, MO 63129

A \$700.00 application fee must be included and you can make the payment to the St. Louis County Department of Health. Please include with the application a short cover letter on your letterhead stating your intentions of installing a human cremation unit at your facility.

In addition to obtaining the air pollution permit, you should be aware that approvals might also be required from your local building, gas, and electrical authorities. Your contractor should obtain these.

Please send us a copy of the permit when you receive it. If you have any questions, please feel free to contact us at (800)327-2831.

Sincerely,



Michael Tricoche
Engineer
Enclosures





MISSOURI DEPARTMENT OF NATURAL RESOURCES
 AIR POLLUTION CONTROL PROGRAM
 P.O. BOX 176, JEFFERSON CITY, MO 65102-0176

**APPLICATION FOR AUTHORITY TO CONSTRUCT
 PERMIT BY RULE NOTIFICATION
 CREMATORIES AND ANIMAL INCINERATORS**

APCP USE ONLY

CHECK NO. 8466	CHECK RECEIVED (MM/DD/YY) 8-4-14
CHECK AMOUNT \$ 700.00	CHECK DATE (MM/DD/YY) 7-30-14
PROJECT NO. F	PERMIT NO.

SECTION A: GENERAL NOTIFICATION INFORMATION - ALL NOTIFICATIONS MUST BE ACCOMPANIED BY A \$700 FEE.

SECTION A-1: GENERAL INSTALLATION INFORMATION

1. INSTALLATION NAME St. Louis Cremation		2. FIPS 510	3. PLANT NO. 2660	
4. INSTALLATION STREET ADDRESS 2135 Chouteau Ave.				
5. INSTALLATION MAILING ADDRESS 2135 Chouteau Ave.				
6. CITY St. Louis		STATE MO	ZIP CODE 63103	
7. COUNTY NAME St. Louis	8. 1/4, of 1/4, of	SECTION	TOWNSHIP	RANGE
9. PARENT COMPANY				
10. PARENT COMPANY MAILING ADDRESS				
11. CITY		STATE	ZIP CODE	
12. INSTALLATION CONTACT PERSON Justin King		13. CONTACT PERSON'S TITLE OWNER		
14. CONTACT PERSON'S MAILING ADDRESS 2135 Chouteau Ave				
15. INSTALLATION CONTACT TELEPHONE NO. (314) 241-8844		16. INSTALLATION CONTACT FAX NO. (314) 241-8855		
17. INSTALLATION CONTACT E-MAIL ADDRESS justin.king@gmail.com				
18. PROJECTED DATE TO COMMENCE CONSTRUCTION 9/1/14		19. PROJECT DATE OF OPERATION STARTUP		

SECTION A-2: INSTALLATION DESCRIPTION

20.
 Installation of a Matthews Cremation Super Power Pak Plus (IE43-SPP Plus) human cremation unit.

RECEIVED
 2014 AUG -4 PM 12:07
 AIR POLLUTION
 CONTROL PERM
 CONTROL PERM

SECTION A-3: CERTIFICATION STATEMENT

I certify that I have personally examined and am familiar with the information in this application and believe that the information submitted is accurate and complete. I am aware that making a false statement or misrepresentation in this application is grounds for denying or revoking this permit.

21. SIGNATURE OF RESPONSIBLE OFFICIAL 		22. DATE 7/18/14
23. TYPE OR PRINT NAME OF RESPONSIBLE OFFICIAL Justin King		24. RESPONSIBLE OFFICIAL'S TELEPHONE NUMBER (314) 241-8844
25. TITLE OF RESPONSIBLE OFFICIAL CFO		

SECTION B: SPECIAL CONDITIONS FOR CREMATORIES AND ANIMAL INCINERATORS

Construction and operation of this new air pollution source is subject to the special conditions listed below. These special conditions are based on the authority granted to the Missouri Air Pollution Control Program by the Missouri Air Conservation Law (specifically RSMo. 643.075) and by the Missouri Rules listed in Title 10, Division 10 of the Code of State Regulations (specifically 10 CSR 10-6.062 "Construction Permits by Rule").

Please indicate by marking the appropriate box as to whether or not the emission source complies with the rule listed in the applicable emission limit or standard. If any of the applicable emission source boxes are checked no, your source is not eligible for a crematories and animal incinerators permit by rule.

This Permit By Rule applies only to Crematories and Animal Incinerators constructed after October 31, 2003.

SPECIAL CONDITION	EMISSION SOURCE COMPLY?	APPLICABLE EMISSION LIMIT OR STANDARD	METHOD OF COMPLIANCE
10 CSR 10-6.062(3)(B)2.A.	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	The materials to be disposed of shall be limited to noninfectious human materials removed during surgery, labor and delivery, autopsy, or biopsy including body parts, tissues and fetuses, organs, bulk blood and body fluids, blood or tissue laboratory specimens, and other noninfectious anatomical remains or animal carcasses in whole or in part. The owner or operator shall minimize the amount of packaging fed to the incinerator, particularly plastic containing chlorine. The incinerators shall not be used to dispose of other non-biological medical wastes including, but not limited to, sharps, rubber gloves, intravenous bags, tubing, and metal parts.	Proper work practice.
10 CSR 10-6.062(3)(B)2.B.	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	The manufacturer's rated capacity (burn rate) shall be two hundred (200) pounds per hour or less.	Proper work practice.
10 CSR 10-6.062(3)(B)2.C.	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	The incinerator shall be a dual-chamber design.	Proper work practice.
10 CSR 10-6.062(3)(B)2.D.	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	Burners shall be located in each chamber, sized to manufacturer's specifications, and operated as necessary to maintain the minimum temperature requirements of subparagraph 10 CSR 10-6.062(3)(B)2.E. at all times when the unit is burning waste.	Proper work practice.
10 CSR 10-6.062(3)(B)2.E.	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	Excluding crematories, the second chamber must be designed to maintain a temperature of one thousand six hundred degrees Fahrenheit (1,600°F) or more with a gas residence time of one-half (1/2) second or more. The temperature shall be monitored with equipment that is accurate to plus or minus two percent (±2%) and continuously recorded. The thermocouples or radiation pyrometers shall be fitted to the incinerator and wired into a manual reset noise alarm such that if the temperature of either of the two (2) chambers falls below the minimum temperature above, the alarm will sound at which time plant personnel shall take immediate measures to either correct the problem or cease operation of the incinerator until the problem is corrected	Proper work practice and maintenance of proper alarm records. These records shall be maintained for not less than five (5) years, and they shall be immediately available to any Missouri Department of Natural Resources personnel upon request.
10 CSR 10-6.062(3)(B)2.F.	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	There shall be no obstruction to stack flow, such as by rain caps, unless such devices are designed to automatically open when the incinerator is operated. Properly installed and maintained spark arresters are not considered obstructions.	Proper work practice.

SECTION B: SPECIAL CONDITIONS FOR CREMATORIES AND ANIMAL INCINERATORS (CONTINUED)

SPECIAL CONDITION	EMISSION SOURCE COMPLY?	APPLICABLE EMISSION LIMIT OR STANDARD	METHOD OF COMPLIANCE
10 CSR 10-6.062(3)(B)2.G.	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	<p>Each incinerator operator shall be trained in the incinerator operating procedures as developed by the American Society of Mechanical Engineers (ASME), by the incinerator manufacturer, or by a trained individual with more than one (1) year experience in the operation of the incinerator that the trainee will be operating. Minimum training shall include basic combustion control parameters of the incinerator and all emergency procedures to be followed should the incinerator malfunction or exceed operating parameters. An operator who meets the training requirements of this condition shall be on duty and immediately accessible during all periods of operation. The manufacturer's operating instructions and guidelines shall be posted at the unit and the unit shall be operated in accordance with these instructions.</p>	<p>Proper work practice and maintenance of proper operator training records. These records shall be maintained for not less than five (5) years, and they shall be immediately available to any Missouri Department of Natural Resources personnel upon request.</p>
10 CSR 10-6.062(3)(B)2.H.	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	<p>The incinerator shall have an opacity of less than ten percent (10%) at all times.</p>	<p>Proper work practice such that no opacity violations are noted.</p>
10 CSR 10-6.062(3)(B)2.I.	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	<p>Heat shall be provided by the combustion of natural gas, liquid petroleum gas, or Number 2 fuel oil with less than three-tenths percent (0.3%) sulfur by weight, or by electric power.</p>	<p>Proper work practice.</p>
10 CSR 10-6.062(3)(B)2.J.	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	<p>The operator shall maintain a log of all alarm trips and the resulting action taken. A written certification of the appropriate training received by the operator, with the date of training, that includes a list of the instructor's qualifications or ASME certification school shall be maintained for each operator. The operator shall maintain an accurate record of the monthly amount and type of waste combusted.</p>	<p>Determined through proper alarm and operator training record keeping. These records shall be maintained for not less than five (5) years, and they shall be immediately available to any Missouri Department of Natural Resources personnel upon request.</p>

SECTION C: OTHER POTENTIALLY APPLICABLE REQUIREMENTS

This section is intended to identify regulations that may apply to this installation. There may be others not listed that apply. To determine rule applicability and specific standards please consult the appropriate sections in the Code of Federal Regulations (CFR) and Code of State Regulations (CSR) for the full text of the applicable requirements.

Please note: this 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.

REGULATION OR CONSTRUCTION PERMIT REFERENCE	APPLICABLE EMISSION LIMIT OR STANDARD	METHOD OF COMPLIANCE
10 CSR 10-2.100, 10-3.030, or 10-4.090, 10-5.070 Open Burning Restrictions	Shall not conduct, cause, permit or allow a salvage operation, the disposal of trade wastes or burning of refuse by open burning.	Any person intending to engage in open burning shall submit a request to the Director.
10 CSR 10-2.070, 10-3.090 or 10-4.070, Restriction of Emission of Odors	No person may cause, permit or allow the emission of odorous matter in concentrations and frequencies or for durations that odor can be perceived when air is diluted to 1:7 volumes of odorous to odor-free air for 2 separate trails not less than 15 minutes apart within 1 hour.	No odor violations noted, if and when scintometer readings are taken.
10 CSR 10-5.160 Control of Odors in the Ambient Air	No person shall emit odorous matter as to cause an objectionable odors unless within the limits established by this rule.	No odor violations noted, if an when scintometer readings are taken.
10 CSR 10-5.170 Control of Odors From Processing Animal Matter	No person shall operate or use any device, machine, equipment, or other contrivance for the reduction of animal matter unless all gases, vapors, and gas-entrained effluents from the facility are incinerated at a temperature of not less than 1,200°F for a period of not less than 0.3 seconds and otherwise in compliance with this rule.	Proper work practice.
10 CSR 10-6.050, Start-up, Shutdown and Malfunction Conditions	Shall not commence construction or modification of any installation subject to this rule; begin operation after construction or modification; or begin operation of any installation which has been shut down longer than 5 years without first obtaining a permit.	In the event of a malfunction, which results in excess emissions that exceed 1 hour, the permittee shall implement corrective action and submit reports.
10 CSR 10-6.065, Operating Permits	The permittee shall comply with all applicable requirements identified in the operating permit (OP); file for timely renewal of this OP; and retain a copy of the OP on-site and make available to any MDNR personnel upon request.	The permittee shall submit an annual compliance certification in accordance with the regulation. The permittee shall maintain a current equipment list on-site with the date of installation of the equipment.
10 CSR 10-6.110, Submission of Emission Data, Emission Fees and Process Information	Submittal of Emission Inventory Questionnaire (EIQ) and emission fees by frequency noted in 10 CSR 10-6.110.	The permittee shall complete and submit an EIQ in accordance with 10 CSR 10-6.110.
10 CSR 10-6.200 Hospital, Medical, Infectious Waste Incinerators	No owner or operator shall cause to be discharged into the atmosphere any gases that contain stack emissions in excess of those listed in 10 CSR 10-6.200(3)(A).	Proper work practice and maintenance of appropriate performance test results.
10 CSR 10-6.070 New Source Performance Regulations	The following federal NSPS standards may apply: (Ec) Medical Waste Incinerators. Standards of Performance for Incinerators.	As required by regulations.



MISSOURI DEPARTMENT OF NATURAL RESOURCES
AIR POLLUTION CONTROL PROGRAM
**APPLICATION FOR AUTHORITY TO CONSTRUCT
PERMIT BY RULE NOTIFICATION
CREMATORIES AND ANIMAL INCINERATORS**

INSTRUCTIONS

By submitting your notification, you are accepting all conditions and terms stated in this form. If you find the special conditions listed in Section B unacceptable, you may choose to submit a construction permit application and undergo a case-by-case review.

Please refer to the following line-by-line instructions to complete the notification. The notification, along with the \$700.00 fee, should be mailed to:

Air Pollution Control Program
Permit-By-Rule
P.O. Box 176
Jefferson City, Missouri 65102

You must also retain a copy of the notification at the installation and make it immediately available to any inspector.

Once the fee and notifications have been mailed or hand-delivered, you are free to begin construction of your project under the special conditions that you have accepted.

The Air Pollution Control Program will send you a letter acknowledging receipt of your notification with a permit number and a project number for agency tracking purposes.

A copy of this electronic package may be obtained from the Department of Natural Resources Air and Land Protection Division's web site at: <http://www.dnr.mo.gov/alpd/apcp/PermitInfo.htm>.

If you have any questions about the notification form or the permit-by-rule notification procedure, please feel free to contact the Permit Section at (573) 751-4817.

NOTIFICATION FORM INSTRUCTIONS

- 1.) **Installation Name:** Enter the official company name and/or plant designation for the installation that is making the permit-by-rule notification.
- 2.) **FIPS Number:** Enter the official FIPS Number (3 digit code) which corresponds to the county name for the county in which the installation is located. Please refer to <http://www.itl.nist.gov/fipspubs/co-codes/mo.txt> for a listing. The FIPS number in combination with the Plant Number provides the identification/tracking information for the installation in the State/Federal databases.
- 3.) **Plant Number:** Enter the official Plant Number that has been assigned to the installation by the respective State or Local Agencies. If you do not know your plant number, please leave blank.
- 4.) **Installation Street Address:** Enter the street address of the physical location of installation.
- 5.) **Installation Mailing Address:** Enter the mailing address if that address is different from the street address.
- 6.) **City, State and Zip Code:** Enter the City, State and Zip Code of the physical location of the installation.
- 7.) **County:** Enter the county in which the installation is located.
- 8.) **Section, Township, Range:** Enter the appropriate information on the Section, Township and Range in which the installation is located.
- 9.) **Parent Company:** Complete this block if this installation is totally or partially owned by another company.
- 10.) **Parent Company Mailing Address:** Complete this block if this installation is totally or partially owned by another company.
- 11.) **Parent Company City, State and Zip Code:** Complete this block if this installation is totally or partially owned by another company.
- 12.) **Installation Contact Person:** Enter the name of the person who is most familiar with the operations of the installation and who can answer any questions regarding information about the installation.
- 13.) **Contact Person's Title:** Enter the title of the contact person.
- 14.) **Contact Person's Mailing Address:** Enter the mailing address for the Contact Person.
- 15.) **Installation Contact Person's Telephone Number:** Enter the Contact Person's telephone number.
- 16.) **Installation Contact Person's Fax Number:** Enter the Contact Person's fax number.

NOTIFICATION FORM INSTRUCTIONS (CONTINUED)

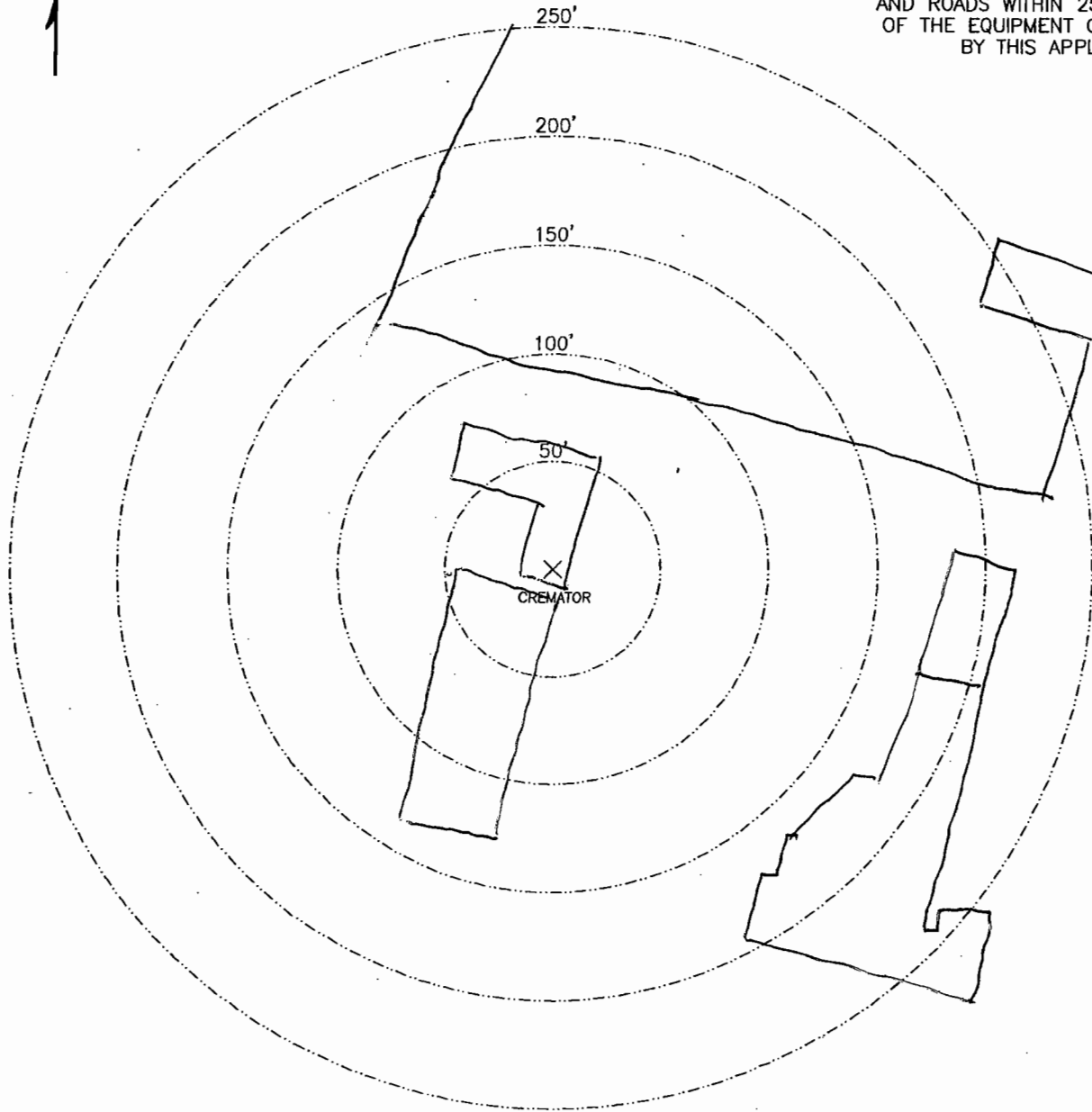
- 17.) **Installation Contact Person's E-Mail Address:** Enter the Contact Person's e-mail address.
- 18.) **Projected Date to Commence Construction:** Enter the date you intend to commence construction of your installation.
- 19.) **Projected Date of Operation Startup:** Enter the date you plan to begin operation with the installation.
- 20.) **Installation Description:** Enter the general product manufactured, the material handled by your installation and principal activity that is performed at this installation.
- 21.) **Signature of Responsible Official:** Enter the signature of the installation's official, certifying that the notification is accurate and complete. Notifications without a signed certification are not considered complete. A responsible official is:
1. The president, secretary, treasurer or vice-president of a corporation in charge of a principal business function, or any other person who performs similar policy and decision-making functions for the corporation or a duly authorization representative of this person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit and either-
 - a) The facilities employ more than 250 person or have a gross annual sales or expenditures exceeding twenty-five million dollars (in second quarter 1980 dollars); or
 - b) The delegation of authority to his representative is approved in advance by the permitting authority.
 2. A general partner in a partnership or the proprietor in a sole proprietorship.
 3. Either a principal executive officer or a ranking elected official in a municipality, state, federal, or other public agency. For the purpose of this part, a principal executive officer of a federal agency includes the chief executive officer having responsibility for the operations of a principal geographic unit of the agency; or
 4. The designated representative of an affected source insofar as actions, standards, requirements or prohibitions under Title IV of the Clean Air Act or the regulations promulgated under the Act are concerned or the designated representative for any purposes under Part 70.
- 22.) **Date:** Enter the date that the Signature of the Responsible Official was obtained.
- 23.) **Type or Print Name of Responsible Official:** Type or print the name of the Responsible Official signing in item 21.
- 24.) **Responsible Official's Telephone Number:** Enter the telephone number where the Responsible Official may be contacted who signed in item 21.
- 25.) **Title of Responsible Official:** Enter the official title of the Responsible Official from item 21.

PLOT PLAN

NORTH



SHOW ALL SURROUNDING BUILDINGS
AND ROADS WITHIN 250 FEET
OF THE EQUIPMENT COVERED
BY THIS APPLICATION.



STRUCTURE DESCRIPTION

INSTRUCTIONS

1. INDICATE LOCATION AND TYPE OF BUILDING BY THE USE OF SMALL NUMBERED CIRCLES WITH THE DESCRIPTION BELOW.
2. SHOW ROADS AS LINES REPRESENTING THE ROAD EDGES. INDICATE STREET NAMES AND HIGHWAY NUMBERS.
3. SHOW WOODED OR CLEARED AREA BY APPROXIMATE BOUNDARY LINES AND THE WORDS "WOODS," "CLEARED," "CORNFIELD," ETC.

- (1)
- (2)
- (3)
- (4)
- (5)
- (6)
- (7)
- (8)
- (9)
- (10)

Traffic, Bicycling, Terrain, Directions

Midwest Aerials & Equipment

Volvo Rents

Papin St

US Paint Corporation

Papin St

Papin St

S 22nd St

St. Louis Cremation Services

Heal and Pet Cremation

Veterans Funeral Care

Chouteau Ave

100

Chouteau Ave

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Chouteau Ave

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Chouteau Ave

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Chouteau Ave

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Chouteau Ave

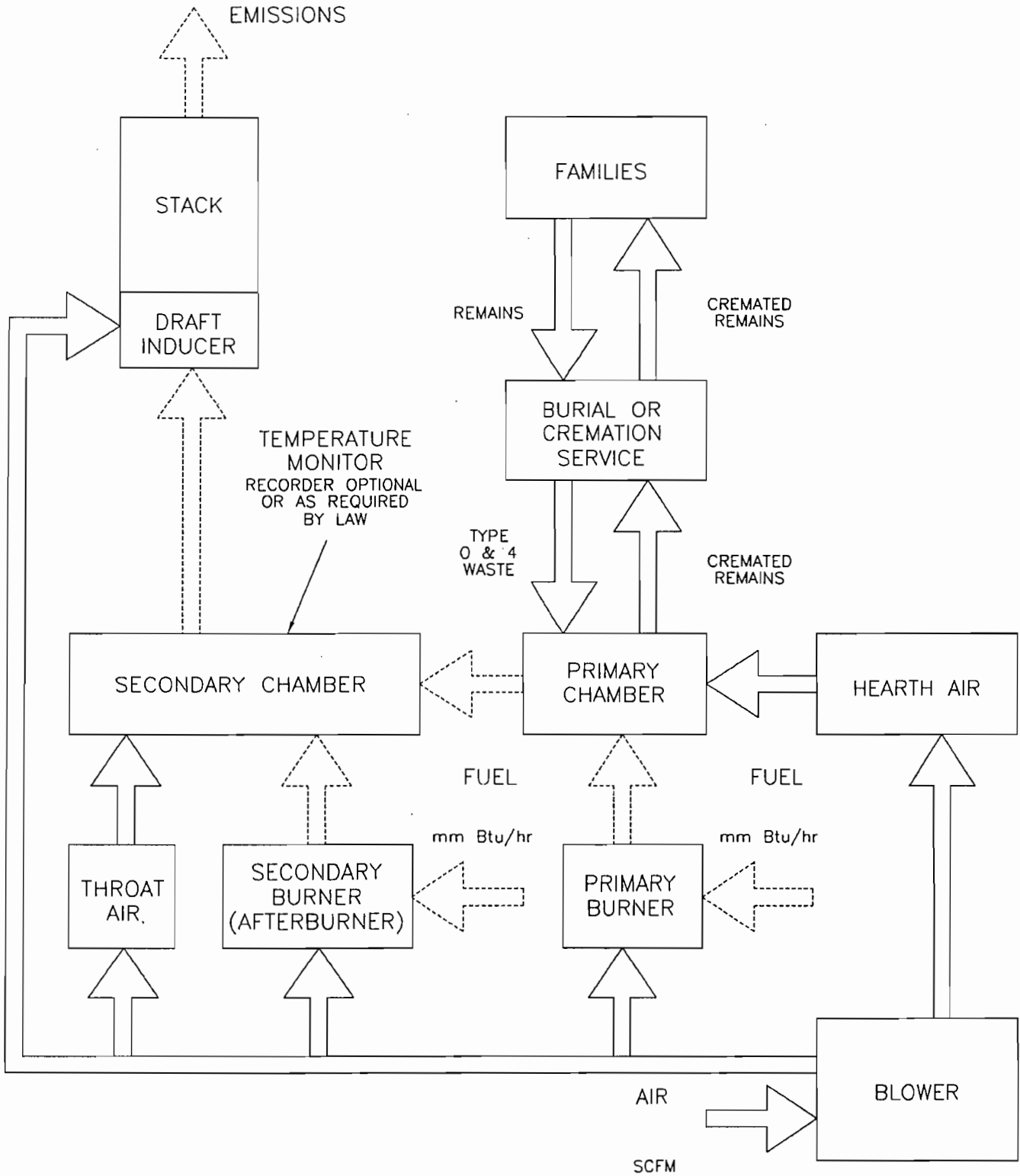
Vin De Set

Midwest Petroleum

Map data ©2014 Google

50 ft

PROCESS FLOW DIAGRAM CREMATOR



SPECIFICATIONS- Model Super Power-Pak Plus

1. Equipment Type..... Super Power-Pak Plus
 - A. Model No. IE43-SPP Plus
 - B. Underwriters Laboratories Listing and File No. ... 87E8; MH14647

2. Dimensions
 - A. Footprint 10' – 5" x 7' – 6 "
 - B. Maximum Length..... 12' – 9 ¼" (3.89 m)
 - C. Maximum Width 8' – 10" (2.69m)
 - D. Maximum Height 9' – 6 ¼" (2.90 m)
 - E. Chamber Loading Opening 32" H x 43" W (0.81m x 1.09m)

3. Weight 33,000 lbs. (14,968 kg)

4. Utility/Air Requirements
 - A. Gross Gas Input, Natural or LP Gas 2,700,000 BTU/hr. maximum (733kW)
 - Running Gas Pressure, Natural Gas 11 inches (280 mm) water column or greater
 - Running Gas Pressure, LP Gas 11 inches (280 mm) water column or greater
 - B. Electrical Supply..... 230 volt, 3Ø or 1Ø, 50/60 hz (other available)
 - C. Air Supply..... 2,500 cfm (70 standard m³/min)

5. Incineration Capacity 200 lbs./hr. (91 kg/h) max.

6. Typical Loading Capacity of Waste Types 750 lbs. (340 kg/h)

7. Construction and Safety Standards Incineration Institute of America, Underwriters Laboratories, Canadian Standards Association

8. Steel Structure Construction
 - A. Frame 2" (51 mm) square tubing
 - B. Front/Rear Plates 3/8" (10 mm) plate
 - C. Floor Plates..... 3/16" (5 mm) plate
 - D. Outer Side Casing..... 12 gauge (3 mm) plate
 - E. Inner Side Casing 12 gauge (3 mm) plate

9. Stack Construction
 - A. Inner Wall..... 4 1/2" (110 mm) insulating firebrick or castable
 - B. Outer Wall..... 12 gauge (3 mm) sheet, 304 s.s., welded seams
(unlined stack available)

10. Draft Nozzle Construction Schedule 40 type 316 s.s., welded connections

11. Main Chamber Door Construction
 - A. Steel Shell..... 3/16" (5 mm) steel, welded with reinforcement
 - B. Outer Refractory 1" (25 mm) insulating block
 - C. Inner Refractory 4½" (110 mm) insulating firebrick

12. Primary Chamber Wall Construction
 - A. Outer Casing Wall..... 12 gauge (3 mm) sheet

SPECIFICATIONS- Model Super Power-Pak Plus

- | | | |
|--|--|---|
| B. | Inner Frame/Air Compartment..... | 2" (51 mm) air compartment |
| C. | Inner Casing Wall..... | 12 gauge (3 mm) sheet |
| D. | Outer Refractory Wall | 5" (127 mm) insulating block (minimum) |
| E. | Inner Refractory Wall | 4½" (110 mm) firebrick |
| 13. Secondary Chamber Wall Construction | | |
| A. | Outer Casing Wall..... | 12 gauge (3 mm) sheet |
| B. | Inner Frame/Air Compartment..... | 2" (51 mm) air compartment |
| C. | Inner Casing Wall..... | 12 gauge (3 mm) sheet |
| D. | Outer Refractory Wall | 6" (150 mm) insulating block |
| E. | Inner Refractory Wall | 4½" (110 mm) firebricks |
| 14. Refractory Temperature Ratings | | |
| A. | Standard Firebrick..... | 3,100° F. (1700° C) |
| B. | Insulating Firebrick..... | 2,600° F. (1430° C) |
| C. | Castable Refractory (Hearth) | 2,550° F. (1370° C) |
| D. | Castable Refractory | 2,550° F. (1370° C) |
| E. | Insulating Block..... | 1,900° F. (1040° C) |
| F. | Bonding Mortar | 3,200° F. (1760° C) |
| 15. Chamber Volumes (not including external flues, stacks or chimneys) | | |
| A. | Primary Chamber | 80 cubic feet (2.27 m ³) |
| B. | Secondary Chamber | 104 cubic feet (2.9 m ³) |
| 16. Emission Control Features | | |
| A. | Secondary Chamber with Afterburner | Included |
| B. | Opacity Monitor and Controller with Visual and Audible Alarms..... | Included |
| C. | Auxiliary Air Control System..... | Included |
| D. | Microprocessor Temperature Control System | Included |
| 17. Operating Temperatures | | |
| A. | Primary Chamber..... | 1,200° F. - 1,800° F. (650° C - 1000° C) |
| B. | Secondary Chamber | 1,400° F. - 1,800° F. (760° C - 1000° C) as required |
| 18. | Secondary Chamber Retention Time..... | > 1 second |
| 19. | Ash Removal | Door functions as a heat shield. Sweep out beneath rear door into hopper that fills collection pan. |
| 20. Safety Interlocks | | |
| A. | High Gas Pressure..... | Optional |
| B. | Low Gas Pressure..... | Optional |
| C. | Blower Air Pressure | Included |
| D. | Door Position | Included |
| E. | Opacity..... | Included |
| F. | Motor Starter Function | Included |
| G. | Chamber Temperature..... | Included |

SPECIFICATIONS- Model Super Power-Pak Plus

H. Motor Overload	Included
I. Flame Quality	Included
J. Burner Safe Start	Included
 21. Burner Description	 The nozzle mix burners used on this cremation equipment are industrial quality and designed for incinerator use.
 22. Ultraviolet Flame Detection	 Ultraviolet flame detection has proven to be the most reliable means of flame safety. The system is completely sealed in a quartz capsule to eliminate problems, caused by moisture and dust created in the cremation process, which effect flame rod detectors.
 23. Operating Panel Indicating Lights	
A. Safe Run	Included
B. Door Closed	Included
C. Pollution Alarm	Included
D. Afterburner On (Secondary Burner)	Included
E. Cremation Burner On	Included
F. Temperature Control	Included
G. Afterburner (Secondary Burner) Reset	Included
H. Cremation Burner Reset	Included
I. Hearth Air	Included
J. Throat Air Off	Included
 24. Automatic Timer Functions	
A. Master Cycle	Included
B. Afterburner (Secondary Burner)	Included
C. Cremation Burner	Included
D. Low Fire Cremation Burner	Included
E. Hearth Air	Included
F. Throat Air	Included
G. Pollution Monitoring	Included
H. Afterburner (Secondary Burner) Prepurge	Included
I. Cremation Burner Prepurge	Included
J. Cool Down	Included
 25. Exterior Finish	
A. Primer	2 coats rust inhibiting
B. Finish	2 coats textured finish
 26. Start-Up and Training	 Startup of cremation equipment and training of operators to properly operate and maintain the equipment is performed on-site under actual operating conditions. Included is a comprehensive owner's manual, with details on the equipment, its components and proper operation.



Calculation Of Emissions Potential to Emit

Matthews Cremation Division (MCD)
(formerly Industrial Equipment and Engineering Company (IEE))
Crematory Incinerator Model IE43-SPP Plus

Total Incinerator Burn Capacity: 200 lb/hr of remains (type 4) and associated containers (type 0)
Flue gas flow rate = 1147 dscfm 12 Hours/Day X 6 Days/Week X 52 Weeks/Year
(100 % Excess Air) = 3744 Hours/Year

Total Emission Rate = Incinerator Burn Rate X Emission Factor

Sulfur Dioxide (SO₂)

$$\frac{200 \text{ lb/hr} \times 2.5 \text{ lb/ton} \times 1 \text{ ton}}{2000 \text{ lbs}} = 0.250 \text{ lb/hr}$$

$$= 0.468 \text{ TPY}$$

$$\frac{0.25 \text{ lb/hr} \times 4.54\text{E}+05 \text{ mg/lb} \times 1 \text{ ppmv}}{1147 \text{ dscfm} \times 60 \text{ min/hr} \times 0.0283 \text{ m}^3/\text{ft}^3 \times 2.61 \text{ mg/m}^3} = 22.33 \text{ ppmv}$$

Nitrogen Oxide (NO_x - as Nitrogen Dioxide)

$$\frac{200 \text{ lb/hr} \times 3 \text{ lb/ton} \times 1 \text{ ton}}{2000 \text{ lbs}} = 0.3 \text{ lb/hr}$$

$$= 0.5616 \text{ TPY}$$

$$\frac{0.3 \text{ lb/hr} \times 4.54\text{E}+05 \text{ mg/lb} \times 1 \text{ ppmv}}{1147 \text{ dscfm} \times 60 \text{ min/hr} \times 0.028 \text{ m}^3/\text{ft}^3 \times 1.88 \text{ mg/m}^3} = 37.60 \text{ ppmv}$$

Hydrocarbons (TOC/VOC - methane)

$$\frac{200 \text{ lb/hr} \times 3 \text{ lb/ton} \times 1 \text{ ton}}{2000 \text{ lbs}} = 0.3 \text{ lb/hr}$$

$$= 0.5616 \text{ TPY}$$

$$\frac{0.3 \text{ lb/hr} \times 4.54\text{E}+05 \text{ mg/lb} \times 1 \text{ ppmv}}{1147 \text{ dscfm} \times 60 \text{ min/hr} \times 0.0283 \text{ m}^3/\text{ft}^3 \times 0.65 \text{ mg/m}^3} = 107.59 \text{ ppmv}$$

Lead (Pb)

(6.62E-05 % of body weight)

$$\frac{200 \text{ lb/hr} \times 0.0000662 \text{ lb Pb}}{100 \text{ lb}} = 0.0001 \text{ lb/hr}$$

$$= 0.0002 \text{ TPY}$$

Particulates (PM & PM₁₀) (Actual Levels lower as shown by test results)

$$\frac{200 \text{ lb/hr} \times 7 \text{ lb/ton} \times 1 \text{ ton}}{2000 \text{ lbs}} = 0.7 \text{ lb/hr}$$

$$= 1.3104 \text{ TPY}$$

$$\frac{0.7 \text{ lb/hr} \times 7.00\text{E}+03 \text{ gr/lb}}{1147 \text{ dscfm} \times 60 \text{ min/hr}} = 0.07 \text{ gr/dscf}$$

Carbon Monoxide (CO)

$$\frac{200 \text{ lb/hr} \times 10 \text{ lb/ton} \times 1 \text{ ton}}{2000 \text{ lbs}} = 1 \text{ lb/hr}$$

$$= 1.872 \text{ TPY}$$

$$\frac{1 \text{ lb/hr} \times 4.54\text{E}+05 \text{ mg/lb} \times 1 \text{ ppmv}}{1147 \text{ dscfm} \times 60 \text{ min/hr} \times 0.028 \text{ m}^3/\text{ft}^3 \times 1.14 \text{ mg/m}^3} = 206.67 \text{ ppmv}$$

Notes:

1. Incinerator Emissions based on EPA emissions from Table 2.1-12 of AP-42 (5th Edition)
2. All conversion factors from AP-42 Appendix A.

CREMATOR MASS BALANCE
Matthews Cremation
SPP Plus

THESE CALCULATIONS HAVE BEEN PREPARED TO EVALUATE THE COMBUSTION PROCESS IN THIS UNIT.

THE INCINERATOR INSTITUTE OF AMERICA HAS PUBLISHED THE FOLLOWING SPECIFICATIONS COVERING AVERAGE WASTES.

WASTE TYPE	TYPE 0	TYPE 4
BTU PER POUND	8500	1000
POUND ASH PER POUND WASTE	0.05	0.05
POUND MOISTURE PER POUND WASTE	0.1	0.85
POUND COMBUSTIBLES PER POUND WASTE	0.85	0.1
HOURLY CONSUMPTION OF WASTE (LBS)	10	190

1. MASS OF PRODUCTS OF COMBUSTION FROM CONTAINER

A. COMBUSTION AIR

$$\frac{8500 \text{ BTU/LB}}{100 \text{ BTU/CF OF AIR}^*} \times 0.075 \text{ LB/CF OF AIR} = 6.38 \text{ LB/LB BURNED}$$

B. COMBUSTIBLES AND WATER VAPOR FROM CHART ABOVE = 0.95 LB/LB BURNED

C. TOTAL FLUE PRODUCT MASS PER LB BURNED = 7.33 LB/LB BURNED

2. MASS OF PRODUCTS OF COMBUSTION FROM BODY

A. COMBUSTION AIR

$$\frac{1000 \text{ BTU/LB}}{100 \text{ BTU/CF OF AIR}^*} \times 0.075 \text{ LB/CF OF AIR} = 0.75 \text{ LB/LB BURNED}$$

B. COMBUSTIBLES AND WATER VAPOR FROM CHART ABOVE = 0.95 LB/LB BURNED

C. TOTAL FLUE PRODUCT MASS PER LB BURNED = 1.70 LB/LB BURNED

SPECIFICATIONS	
PRIMARY BURNER FUEL CONSUMPTION (MMBTU/HR)	0.6
SECONDARY BURNER FUEL CONSUMPTION (MMBTU/HR)	1.2
ADDITIONAL SECONDARY AIR SUPPLIED (CFM)	200
SEC. CHAMBER OPERATING TEMPERATURE (°F)	1600
SECONDARY CHAMBER VOLUME (CU. FT)	104
SEC. CHAMB. CROSS-SECTIONAL AREA (SQ. FT)	2.44
FLAME PORT AREA (SQ. FT)	2.95
MIXING BAFFLES AREA (SQ. FT)	1.36

*AIR AT STANDARD CONDITIONS

3. TOTAL FLUE PRODUCTS

A. MAXIMUM PRIMARY BURNER GAS USAGE

$$600000 \text{ BTU/HR} \times 4.8\text{E-}05 \text{ LBS/BTU} = 28.8 \text{ LBS/HR}$$

B. COMBUSTION AIR FOR PRIMARY BURNER

$$\frac{600000 \text{ BTU/HR}}{100 \text{ BTU/CF AIR}} \times 1 \text{ Burner} \times 0.075 \text{ LB/CF AIR} = 450 \text{ LBS/HR}$$

C. MAXIMUM SECONDARY BURNER GAS USAGE

$$1200000 \text{ BTU/HR} \times 4.8\text{E-}05 \text{ LBS/BTU} = 58 \text{ LBS/HOUR}$$

D. COMBUSTION AIR FOR SECONDARY BURNER

$$\frac{1200000 \text{ BTU/HR}}{100 \text{ BTU/CF AIR}} \times \frac{1 \text{ Burner}}{1} \times 0.075 \text{ LB/CF AIR} = 900 \text{ LBS/HOUR}$$

E. PRODUCTS FROM TYPE 0 WASTE (CONTAINER)

$$7.33 \text{ LBS/LB BURNED} \times 10 \text{ LB/HR BURN RATE} = 73 \text{ LBS/HOUR}$$

F. PRODUCTS FROM TYPE 4 WASTE (TISSUE)

$$1.70 \text{ LBS/LB WASTE} \times 190 \text{ LB/HR BURN RATE} = 323 \text{ LBS/HOUR}$$

G. ADDITIONAL SECONDARY CHAMBER COMBUSTION AIR (THROAT AIR)

$$12000 \text{ CF/HR}^* \times 0.075 \text{ LB/CF AIR} = 900 \text{ LBS/HOUR}$$

H. TOTAL FLUE PRODUCTS

$$= \underline{\underline{2733 \text{ LBS/HOUR}}}$$

2. VELOCITY AND TIME CALCULATIONS

A. SCFM CALCULATION

(PRODUCTS ASSUMED TO HAVE DENSITY CLOSE TO AIR)

$$2733 \text{ LBS/HR} \times \frac{13.35 \text{ STD. CU. FT/LB}}{60 \text{ MIN/HR}} = 608 \text{ SCFM}$$

B. TOTAL PRODUCTS ACFM @ 1600 °F

$$\frac{2060 \text{ °RANKINE}}{530 \text{ °RANKINE}} \times 608.0 \text{ CFM} = 2363 \text{ ACFM}$$

C. RETENTION TIME

$$\frac{104 \text{ CU. FT}}{2363 \text{ ACFM}} \times \frac{60 \text{ SECONDS}}{1 \text{ MINUTE}} = 2.64 \text{ SECONDS}$$

D. VELOCITY IN FLAME PORT

$$\frac{2363 \text{ ACFM}}{2.95 \text{ SQ. FT}} \times \frac{1 \text{ MINUTE}}{60 \text{ SECONDS}} = 13.4 \text{ FEET/SECOND}$$

E. VELOCITY AT MIXING BAFFLES

$$\frac{2363 \text{ ACFM}}{1.36 \text{ SQ. FT}} \times \frac{1 \text{ MINUTE}}{60 \text{ SECONDS}} = 29.0 \text{ FEET/SECOND}$$

F. VELOCITY IN SECONDARY CHAMBER

$$\frac{2363 \text{ ACFM}}{2.44 \text{ SQ. FT}} \times \frac{1 \text{ MINUTE}}{60 \text{ SECONDS}} = 16.1 \text{ FEET/SECOND}$$



Jeremiah W. (Jay) Nixon, Governor • Sara Parker Pauley, Director

DEPARTMENT OF NATURAL RESOURCES

www.dnr.mo.gov

AUG 14 2014

Mr. Justin King
Owner
St. Louis Cremation
2135 Chouteau Avenue
St. Louis, MO 63103

RE: New Source Review Permit, Permit by Rule
Project Number: 2014-08-003; Facility ID Number: 510-2660

Dear Mr. King:

Enclosed with this letter is your permit to construct. Please review your permit carefully. Section A and Section B of your permit application "General Notification Information for Authority to Construct" and "Special Conditions for Crematories and Animal Incinerators" are part of your permit. The entire permit must be retained in your files. 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.

Operation in accordance with these conditions and your operating permit is necessary for continued compliance. A Basic Operating permit is currently required for all incinerators within 30 days of startup of operation. A copy of the Basic Operating permit application can be found at <http://www.dnr.mo.gov/forms/index.html>.

In order to streamline the permitting process, the initial on-site compliance inspection requirement (which is mandatory prior to issuance of a permit) has been waived. However, an on-site compliance inspection will be performed at a later date, to validate your statements and conditions claimed on the permit by rule notification.

If you have any questions regarding this permit, please do not hesitate to contact me at the Department of Natural Resources' 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

Susan Heckenkamp, P.E.
New Source Review Unit Chief

KLM:shk

Enclosures

c: Saint Louis Regional Office

AMS File 2014-08-003

Permit Number:

082014-007

