



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: December 17, 2007
RE: Arrow Vault Co, Inc. -157-25518-00081
FROM: Matthew Stuckey, Deputy Branch Chief
Permits Branch
Office of Air Quality

Notice of Decision – Approval

Please be advised that on behalf of the Commissioner of the Department of Environmental Management, I have issued a decision regarding the enclosed matter. Pursuant to 326 IAC 2, this approval was effective immediately upon submittal of the application.

If you wish to challenge this decision, IC 4-21.5-3-7 requires that you file a petition for administrative review. This petition may include a request for stay of effectiveness and must be submitted to the Office of Environmental Adjudication, 100 North Senate Avenue, Government Center North, Suite N 501E, Indianapolis, IN 46204, **within eighteen (18) calendar days from the mailing of this notice**. The filing of a petition for administrative review is complete on the earliest of the following dates that apply to the filing:

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

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

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

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

Enclosures
FNPER-AM.dot12/3/07



Mitchell E. Daniels, Jr.
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100 North Senate Avenue
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Robert T. Burris, President December 17, 2007
Arrow Vault Company, Inc.
1312 Underwood Street
Lafayette, IN 47904

Re: Exempt Operation Status,
157-25518-00081

Dear Robert T. Burris:

The application from Arrow Vault Company, Inc., received on November 13, 2007, has been reviewed. Based on the data submitted and the provisions in 326 IAC 2-1.1-3, it has been determined that the following stationary human crematory located at 1312 Underwood Street, Lafayette, IN 47904, is classified as exempt from air pollution permit requirements:

- (a) One (1) natural gas human pathological incinerator, model number N-20AA, approved for construction in 1997, with a maximum capacity of 150 pounds of remains per hour, consisting of a primary and secondary chamber that fire natural gas at a rate of 1.3 million British thermal units per hour (MMBtu/hr), and consisting of the following equipment:
 - (1) One (1) natural gas-fired primary chamber with a heat input capacity of 0.300 MMBtu/hr;
 - (2) One (1) natural gas-fired secondary chamber with a heat input capacity of 1.00 MMBtu/hr;
 - (3) One (1) afterburner with a heat input capacity of 1.3 MMBtu/hr.

The following conditions shall be applicable:

- (a) Pursuant to 326 IAC 4-2-2 (Incinerators), the crematory incinerator EU 001 shall:
 - (1) Consist of primary and secondary chambers or the equivalent;
 - (2) Be equipped with a primary burner unless burning only wood products;
 - (3) Comply with 326 IAC 5-1 (Opacity Limitations) and 326 IAC 2 (Permit Review Rules);
 - (4) Be maintained, operated, and burn waste in accordance with the manufacturer's specifications or an operation and maintenance plan as specified in 326 IAC 4-2-2(c); and
 - (5) Not emit particulate matter in excess of five-tenths (0.5) pound of particulate matter per one thousand (1,000) pounds of dry exhaust gas under standard conditions corrected to fifty percent (50%) excess air.
 - (6) If any of the above requirements (1) through (5) are not met, then the owner or operator shall stop charging the incinerator until adjustments are made that address the underlying cause of the deviation.

- (7) The incinerator is exempt from requirement (5) if subject to a more stringent particulate matter emissions limit in 40 CFR 52 Subpart P, State Implementation Plan for Indiana.
- (b) 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:
 - (1) Opacity shall not exceed an average of forty percent (40%) in any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.
 - (2) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of fifteen (15) minutes (sixty (60) readings as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute non-overlapping integrated averages for a continuous opacity monitor) in a six (6) hour period.
- (c) Pursuant to 326 IAC 6-4 (Fugitive Dust Emissions Limitations), the source shall not allow fugitive dust to escape beyond the property line or boundaries of the property, right-of-way, or easement on which the source is located, in a manner that would violate 326 IAC 6-4.
- (d) Pursuant to 326 IAC 11-8-1(b)(1), the crematory incinerator, model number N-20AA, is not subject to the requirements of 326 IAC 11-8, because it will burn 90 % or more by weight of pathological waste and provided that the following are met:
 - (1) The Permittee shall notify the department and U.S. EPA that the unit meets the criteria in this subdivision.
 - (2) The Permittee shall keep records on a calendar quarter basis of the weight of pathological waste, low-level radioactive waste, chemotherapeutic waste, or any combination of these wastes burned, and the weight of all other fuels and wastes burned in the unit.

An application or notification shall be submitted in accordance with 326 IAC 2 to the Office of Air Quality (OAQ) if the source proposes to construct new emission units, modify existing emission units, or otherwise modify the source.

If you have any questions on this matter, please contact Hannah Desrosiers, OAQ, 100 North Senate Avenue, MC 61-53 IGCN 1003, Indianapolis, Indiana, 46204-2251, at 317-234-5374 or at 1-800-451-6027 (ext 45374).

Sincerely,

Original signed by

Iryn Calilung, Section Chief
Permits Branch
Office of Air Quality

IC/hld

cc: File - Tippecanoe County
Tippecanoe County Health Department
Air Compliance Section
Permit Tracking
Compliance Data Section
Permits Administrative and Development
Billing, Licensing, and Training Section

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

Technical Support Document (TSD) for an Exemption,
Transitioning from a Registration

Source Background and Description

Source Name: Arrow Vault Company, Inc.
Source Location: 1312 Underwood Street
Lafayette, IN 47904
County: Tippecanoe County
SIC Code: 7261 (Funeral Service and Crematories)
Exemption No.: 157-25518-00081
Permit Reviewer: Hannah L. Desrosiers

On November 13, 2007, the Office of Air Quality (OAQ) received an application from Arrow Vault Company, Inc., relating to the operation of an existing crematory incinerator for human remains.

Existing Emission Units and Pollution Control Equipment

The application includes information relating to the operation of the following existing emission unit:

- (a) One (1) natural gas human pathological incinerator, model number N-20AA, approved for construction in 1997, with a maximum capacity of 150 pounds of remains per hour, consisting of a primary and secondary chamber that fire natural gas at a rate of 1.3 million British thermal units per hour (MMBtu/hr), consisting of the following equipment:
 - (1) One (1) natural gas-fired primary chamber with a heat input capacity of 0.300 MMBtu/hr;
 - (2) One (1) natural gas-fired secondary chamber with a heat input capacity of 1.00 MMBtu/hr;
 - (3) One (1) afterburner with a heat input capacity of 1.3 MMBtu/hr.

Existing Approvals

The source has been operating under Registration No. 157-8301-00081, issued on April 2, 1997.

Enforcement Issue

There are no enforcement actions pending.

Recommendation

The staff recommends to the Commissioner that the application be approved as an exemption. 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 November 13, 2007.

Stack Summary

Stack ID	Operation	Height (ft)	Diameter (ft)	Flow Rate (acfm)	Temperature (°F)
1	Natural Gas Pathological Incinerator	18	1.5	1350	550

Emission Calculations

See Appendix A of this TSD for detailed emissions calculations (Appendix A, pages 3 of 3).

Potential To Emit

Pursuant to 326 IAC 2-1.1-1(16), Potential to Emit (PTE) 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/year)
PM	2.31
PM-10	2.34
SO ₂	0.82
NO _x	1.55
VOC	1.02
CO	3.76

HAPs	Potential To Emit (tons/year)
Benzene	negligible
Dichlorobenzene	negligible
Formaldehyde	negligible
Hexane	0.01
Toluene	negligible
Lead	negligible
Cadmium	negligible
Chromium	negligible
Manganese	negligible
Nickel	negligible
TOTAL HAPs	0.01

- (a) The PTE (as defined in 326 IAC 2-1.1-1(16)) of all regulated criteria pollutants are less than the levels listed in 326 IAC 2-1.1-3(e)(1). Therefore, the source is subject to the provisions of 326 IAC 2-1.1-3 (Exemptions).
- (b) The PTE (as defined in 326 IAC 2-1.1-1(16)) of any single HAP is less than ten (10) tons per year and the PTE of a combination of HAPs is less than twenty-five (25) tons per year. Therefore, the source is subject to the provisions of 326 IAC 2-1.1-3(Exemptions).
- (c) The status of the Source was changed from Registration to an Exemption due to a recent review and reevaluation of the methodology used to determine the PTE for Commercial and Industrial Solid Waste Incineration Units.

County Attainment Status

The source is located in Tippecanoe County.

Pollutant	Status
PM10	Attainment or Unclassifiable
PM2.5	Attainment or Unclassifiable
SO ₂	Attainment
NO ₂	Attainment or Unclassifiable
8-Hour Ozone	Attainment or Unclassifiable
CO	Attainment or Unclassifiable
Pb	Attainment or Unclassifiable

(a) Ozone Standards

- (1) On October 25, 2006, the Indiana Air Pollution Control Board finalized a rule revision to 326 IAC 1-4-1 revoking the one-hour ozone standard in Indiana.
- (2) On September 6, 2007, the Indiana Air Pollution Control Board finalized a temporary emergency rule to re-designate Allen, Clark, Elkhart, Floyd, LaPorte, and St. Joseph as attainment for the 8-hour ozone standard.
- (3) On November 9, 2007, the Indiana Air Pollution Control Board finalized a temporary emergency rule to re-designate Boone, Clark, Elkhart, Floyd, LaPorte, Hamilton, Hancock, Hendricks, Johnson, Madison, Marion, Morgan, Shelby, and St. Joseph as attainment for the 8-hour ozone standard.
- (4) Volatile organic compounds (VOC) and Nitrogen Oxides (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. Tippecanoe 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.

(b) PM2.5

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

(c) Other Criteria Pollutants

Tippecanoe County has been classified as attainment or unclassifiable in Indiana for Sulfur Dioxide (SO₂), Carbon Monoxide (CO) and Lead (Pb). Therefore, these emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2.

(d) Fugitive Emissions

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

Source Status

New Source PSD Definition (emissions after controls, based on 8760 hours of operation per year at rated capacity and/or as otherwise limited):

Pollutant	Emissions (tons/yr)
PM	2.31
PM-10	2.34
SO ₂	0.82
NO _x	1.55
VOC	1.02
CO	3.76
Single HAP	0.01
Combination HAPs	0.01

- (a) This existing source is not a major PSD stationary source because no attainment regulated pollutant is emitted at a rate of 250 tons per year or greater and it is not in one of the 28 listed source categories. 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 is not subject to the Part 70 Permit requirements because the PTE of:

- (a) each criteria pollutant is less than 100 tons per year,
- (b) a single hazardous air pollutant (HAP) is less than 10 tons per year, and
- (c) any combination of HAPs is less than 25 tons/year.

This status is based on the potential to emit calculations of the source (see Appendix A).

Federal Rule Applicability

- (a) The requirements of 40 CFR 63, Subpart EEE (63.1200 through 63.1214), NESHAP for Hazardous Waste Combustors (326 IAC 20-28-1), are not included in this exemption because the crematory incinerator is not considered a hazardous waste incinerator and the source is not a major source of HAPs.
- (b) There are no National Emission Standards for Hazardous Air Pollutants (NESHAP) (326 IAC 14, 20 and 40 CFR Part 61, 63) included in the exemption for this source.
- (c) The requirements of 40 CFR 60, Subpart E (60.50 through 60.54), Standards of Performance for Incinerators (326 IAC 12), are not included in this exemption because crematory incinerator has a charging rate less than fifty (50) tons per day and does not burn refuse consisting of more than 50 percent municipal type waste (household, commercial/retail, and/or institutional waste).
- (d) The requirements of the following New Source Performance Standards (NSPS), are not included in this exemption because crematory incinerator is considered a pathological waste combustor and is not considered a municipal waste combustor or hospital/medical/infectious waste incinerator:
 - (1) 40 CFR 60, Subpart Ea (60.50a through 60.59a), Standards of Performance for Large Municipal Waste Combustors for Which Construction is Commenced after December 20, 1989 and on or before September 20, 1994 (326 IAC 12)
 - (2) 40 CFR 60, Subpart Eb (60.50b through 60.59b), Standards of Performance for Large Municipal Waste Combustors for Which Construction is Commenced after

September 20, 1994, or for Which Modification or Reconstruction is commenced after June 19, 1996 (326 IAC 12)

- (3) 40 CFR 60, Subpart Ec (60.50c through 60.58c), Standards of Performance for Hospital/Medical/Infectious Waste Incinerators for Which Construction is Commenced after January 20, 1996 (326 IAC 12)
- (4) 40 CFR 60, Subpart AAAA (60.1000 through 60.1465), Standards of Performance for Small Municipal Waste Combustion Units for Which Construction is Commenced After August 30, 1999 or for Which Modification or Reconstruction is Commenced After June 6, 2001 (326 IAC 12)
- (e) The requirements of 40 CFR 60, Subpart CCCC (60.2000 through 60.2265), Standards of Performance for Commercial and Industrial Solid Waste Incinerations Units for Which Construction is Commenced After November 30, 1999 or for Which Modification or Reconstruction is Commenced on or After June 1, 2001 (326 IAC 12), are not included in this exemption because this unit is considered pathological waste incineration unit (40 CFR 60.2020(a)).
- (f) There are no New Source Performance Standards (NSPS) (326 IAC 12 and 40 CFR Part 60) included in the exemption for this source.

State Rule Applicability - Entire Source

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

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

326 IAC 2-4.1 (Major Sources of Hazardous Air Pollutants (HAP))

The requirements of 326 IAC 2-4.1 are not applicable to this source, since the potential to emit of any single HAP is less than ten (10) tons per year and the potential to emit of a combination of HAPs is less than twenty-five (25) tons per year.

326 IAC 2-6 (Emission Reporting)

This source is not subject to the requirements of 326 IAC 2-6 (Emission Reporting), because it is located in Tippecanoe County, it is not required to have an operating permit under 326 IAC 2-7, Part 70 Permit Program, and it does not emit lead into the ambient air at levels equal to or greater than 5 tons per year.

326 IAC 5-1 (Opacity Limitations)

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

- (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.

326 IAC 6-4 (Fugitive Dust Emissions Limitations)

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

State Rule Applicability - Individual Facilities

326 IAC 4-2-2 (Incinerators)

Pursuant to 326 IAC 4-2-2 (Incinerators), the crematory incinerator, model number N-20AA, shall:

- (1) Consist of primary and secondary chambers or the equivalent;
- (2) Be equipped with a primary burner unless burning only wood products;
- (3) Comply with 326 IAC 5-1 (Opacity Limitations) and 326 IAC 2 (Permit Review Rules);
- (4) Be maintained, operated, and burn waste in accordance with the manufacturer's specifications or an operation and maintenance plan as specified in 326 IAC 4-2-2(c); and
- (5) Not emit particulate matter in excess of five-tenths (0.5) pound of particulate matter per one thousand (1,000) pounds of dry exhaust gas under standard conditions corrected to fifty percent (50%) excess air.
- (6) If any of the above requirements (1) through (5) are not met, then the owner or operator shall stop charging the incinerator until adjustments are made that address the underlying cause of the deviation.
- (7) The incinerator is exempt from requirement (5) if subject to a more stringent particulate matter emission limit in 40 CFR 52 Subpart P, State Implementation Plan for Indiana.

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

Pursuant to 326 IAC 6-3-1(b)(2), the crematory incinerator, model number N-20AA, is exempt from the requirements of 326 IAC 6-3.

326 IAC 7-1 (Sulfur dioxide emission limitations: Applicability)

The crematory incinerator, model number N-20AA, is not subject to the requirements of 326 IAC 7-1, because it has potential and the actual emissions that are less than twenty-five (25) tons per year and ten (10) pounds per hour respectively.

326 IAC 8-1-6 (VOC rules: General Reduction Requirements for New Facilities)

The crematory incinerator, model number N-20AA, is not subject to the requirements of 326 IAC 8-1-6, since the potential to emit VOCs is less than twenty-five (25) tons per year.

326 IAC 9-1 (Carbon Monoxide Emission Limits)

This stationary source, constructed after the applicability date of March 21, 1972, is not subject to the requirements of 326 IAC 9-1-2(a)(3), since the crematory incinerator, model number N-20AA, burns pathological waste and does not burn refuse consisting of more than 50 percent municipal type waste (household, commercial/retail, and/or institutional waste).

326 IAC 11-7 (Emission Limitations for Municipal Waste Combustors)

The crematory incinerator, model number N-20AA, is not subject to the requirements of 326 IAC 11-7, since it is considered pathological waste combustors and not considered municipal waste combustors.

326 IAC 11-8 (Emission Limitations for Commercial and Industrial Solid Waste Incineration Units)

Pursuant to 326 IAC 11-8-1(b)(1), the crematory incinerator, model number N-20AA, is not subject to the requirements of 326 IAC 11-8, because it will burn 90 % or more by weight of pathological waste and provided that the following are met:

- (a) The Permittee shall notify the department and U.S. EPA that the unit meets the criteria in this subdivision.
- (b) The Permittee shall keep records on a calendar quarter basis of the weight of pathological waste, low-level radioactive waste, chemotherapeutic waste, or any combination of these wastes burned, and the weight of all other fuels and wastes burned in the unit.

Conclusion

The operation of this facility shall be subject to the conditions of the attached Exemption. No. 157-25518-00081.

**Appendix A: Emissions Calculations
Emission Summary**

Company Name: Arrow Vault Company, Inc.
Address City IN Zip: 1312 Underwood St., Lafayette, IN 47904
Permit Number: 157-25518-00081
Reviewer: Hannah L. Desrosiers
Date Submitted: 11/19/2007

Category	Uncontrolled Potential Emissions (tons/year)			
	Emissions Generating Activity			
	Pollutant	Incineration	Natural Gas Combustion	TOTAL
Criteria Pollutants	PM	2.30	0.01	2.31
	PM10	2.30	0.04	2.34
	SO2	0.82	0.00	0.82
	NOx	0.99	0.57	1.55
	VOC	0.99	0.03	1.02
	CO	3.29	0.48	3.76
Hazardous Air Pollutants	Chromium		8.0E-06	8.0E-06
	Manganese		2.2E-06	2.2E-06
	Nickel		1.2E-05	1.2E-05
	n-Hexane		0.01	0.01
	Toluene		1.9E-05	1.9E-05
	Benzene		1.2E-05	1.2E-05
	Dichlorobenzene		6.8E-06	6.8E-06
	Formaldehyde		4.3E-04	4.3E-04
	Lead		2.8E-06	2.8E-06
	Cadmium		6.3E-06	6.3E-06
	Totals	0	0.01	0.01
			Worse Case HAP	0.01

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

Appendix A: Emissions Calculations Incinerator

Company Name: Arrow Vault Company, Inc.
Address City IN Zip: 1312 Underwood St., Lafayette, IN 47904
Permit Number: 157-25518-00081
Reviewer: Hannah L. Desrosiers
Date Submitted: 11/19/2007

Pollutant			PM*	PM10*	SO2	NOx**	VOC	CO
Emission Factor (lb/ton)			7.0	7.0	2.5	3.0	3.0	10.0
Emission Unit	Potential Throughput (lbs/hr)	Potential Throughput (tons/yr)	Potential to Emit (tons/yr)					
			PM*	PM10*	SO2	NOx**	VOC	CO
Crematory EU 001 (Primary and Secondary Chamber)	150	657.0	2.30	2.30	0.82	0.99	0.99	3.29
Totals			2.30	2.30	0.82	0.99	0.99	3.29

Methodology

Potential Throughput (tons/yr) = [Potential Throughput (lbs/hr)] * [8,760 hrs/yr] * [ton/2000 lbs]

Potential to Emit (tons/yr) = [Potential Throughput (tons/yr)] * [Emission Factor (lb/ton)] * [ton/2,000 lbs]

Emission factors are from AP-42 (5th Edition 1/95) Table 2.1-12, Uncontrolled emission factors for industrial/commercial refuse combustors, multiple chambers

*No emission factor for PM10 available (assume PM = PM10)

Abbreviations

PM = Particulate Matter

NOx = Nitrous Oxides

PM10 = Particulate Matter (<10 um)

VOC - Volatile Organic Compounds

SO2 = Sulfur Dioxide

CO = Carbon Monoxide

Appendix A: Emissions Calculations
Natural Gas Combustion Only
MM BTU/HR <100

Company Name: Arrow Vault Company, Inc.
Address City IN Zip: 1312 Underwood St., Lafayette, IN 47904
Permit Number: 157-25518-00081
Reviewer: Hannah L. Desrosiers
Date Submitted: 11/19/2007

Emission Unit	Number of Units	Unit Heat Input Capacity (MMBtu/hr)	Combined Total Heat Input Capacity (MMBtu/hr)	Potential Throughput (MMCF/yr)	Pollutant					
					PM*	PM10*	SO2	NOx**	VOC	CO
					1.9	7.6	0.6	100	5.5	84.0
					Potential to Emit (tons/yr)					
					PM*	PM10*	SO2	NOx**	VOC	CO
Crematory Burner BL-01 (Primary and Secondary Chamber)	1	1.3	1.3	11.39	0.011	0.043	0.003	0.569	0.031	0.478
Totals	1	1.3	1.3		0.011	0.043	0.003	0.569	0.031	0.478

Pollutant	Benzene	DCB	Formaldehyde	Hexane	Toluene	Pb	Cd	Cr	Mn	Ni
Emission Factor (lb/MMCF)	2.1E-03	1.2E-03	7.5E-02	1.8E+00	3.4E-03	5.0E-04	1.1E-03	1.4E-03	3.8E-04	2.1E-03
	Potential to Emit (tons/yr)									
Emission Unit	Benzene	DCB	Formaldehyde	Hexane	Toluene	Pb	Cd	Cr	Mn	Ni
Crematory Burner BL-01 (Primary and Secondary Chamber)	1.2E-05	6.8E-06	4.3E-04	0.010	1.9E-05	2.8E-06	6.3E-06	8.0E-06	2.2E-06	1.2E-05
Totals	1.2E-05	6.8E-06	4.3E-04	0.010	1.9E-05	2.8E-06	6.3E-06	8.0E-06	2.2E-06	1.2E-05

Total HAPs (tons/yr) 0.011

*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

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

Methodology

Potential Throughput (MMCF/yr) = [Combined Total Heat Input Capacity (MMBtu/hr)] * [8,760 hrs/yr] * [1 MMCF/1,000 MMBtu]

Potential to Emit (tons/yr) = [Potential Throughput (MMCF/yr)] * [Emission Factor (lb/MMCF)] * [ton/2,000 lbs]

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)

All emission factors are based on normal firing.

MMBtu = 1,000,000 Btu, MMCF = 1,000,000 Cubic Feet of Gas

Abbreviations

PM = Particulate Matter

NOx = Nitrous Oxides

DCB = Dichlorobenzene

Cr = Chromium

PM10 = Particulate Matter (<10 um)

VOC = Volatile Organic Compounds

Pb = Lead

Mn = Manganese

SO2 = Sulfur Dioxide

CO = Carbon Monoxide

Cd = Cadmium

Ni = Nickel