

Mr. Dave Gonyea  
Northeast Indiana Cremation Society, Inc.  
4602 Newaygo Drive  
Fort Wayne, IN 46808

Dear Mr. Gonyea:

Re: Exempt Construction and Operation Status,  
003-11759-00310

The application from Northeast Indiana Cremation Society, Inc., received on January 11, 2000, 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 crematory incinerator for human remains, to be located at 2120 Autumn Lake Place, Fort Wayne, Indiana is classified as exempt from air pollution permit requirements:

- (a) One (1) crematory incinerator for human remains, maximum capacity of 100 pounds per hour, supplemented by natural gas Fuel at a rate of 1.7 million British Thermal units(MMBTU) per hour.

The following conditions shall be applicable:

- (1) Pursuant to 326 IAC 5-1-2 (Opacity Limitations) except as provided in 326 IAC 5-1-3 (Temporary Exemptions), opacity shall meet the following:
  - (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 15 minutes (60 readings) in a 6-hour period 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.
- (2) Pursuant to 326 IAC 4-2-2(incinerators) shall meet the following:
  - (a) consist of primary and secondary chambers or the equivalent;
  - (b) be equipped with a primary burner unless burning wood products;
  - (c) comply with 326 IAC 5-1 and 326 IAC IAC 2;
  - (d) be maintained properly as specified by the manufacturer and approved by the commissioner;
  - (e) comply with other state and/or local rules or ordinances regarding installation and operation of incinerators;

- (f) be operated so that emissions of hazardous material including, but limited to, viable pathogenic bacteria, dangerous chemicals or gases, or noxious odors are prevented;
- (g) not emit particulate matter in excess of:
  - (1) all other incinerators; five-tenths (0.5) pounds of particulate matter per one thousand (1,000) pounds of dry exhaust gas at standard conditions corrected to fifty (50) percent excess air;
- (h) not create a nuisance or a fire hazard.

If any of the above result, the burning shall be terminated immediately.

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

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

Sincerely,

Paul Dubenetzky, Chief  
Permits Branch  
Office of Air Management

Spahi

cc: File - Allen County  
Allen County Health Department  
Air Compliance - Jennifer Schick  
Permit Tracking - Janet Mobley  
Technical Support and Modeling - Michele Boner  
Compliance Data Section - Karen Nowak

## Indiana Department of Environmental Management Office of Air Management

### Technical Support Document (TSD) for an *Exemption*

#### Source Background and Description

**Source Name:** *Northeast Indiana Cremation Society, Inc.*  
**Source Location:** *2120 Autumn Lake Place, Fort Wayne, Indiana 46818*  
**County:** *Allen*  
**SIC Code:** *7261*  
**Operation Permit No.:** *003-11759-00310*  
**Permit Reviewer:** *Spahi*

The Office of Air Management (OAM) has reviewed an application from Northeast Indiana Cremation Society, Inc. relating to the construction and operation of a crematory incinerator for human remains.

#### Permitted Emission Units and Pollution Control Equipment

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

- (a) One (1) crematory incinerator for human remains, maximum capacity of 100 pounds per hour, supplemented by natural gas fuel at a rate of 1.7 million British Thermal units(MMBTU) per hour.

#### Unpermitted Emission Units and Pollution Control Equipment

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

#### Stack Summary

| Stack ID | Operation   | Height<br>(feet) | Diameter<br>(feet) | Flow Rate<br>(acfm) | Temperature<br>(°F) |
|----------|-------------|------------------|--------------------|---------------------|---------------------|
| # 1      | Incinerator | 17               | 1.7                | 2200                | 1000                |

#### Enforcement Issue

There are no enforcement actions pending.

## 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.

A complete application for the purposes of this review was received on January 11,2000.

## Emission Calculations

See Appendix A of this document for detailed emissions calculations of natural gas incinerator. (1 page.)

See Appendix B of this document for detailed emissions calculations of incineration of human remains from the natural gas incinerator(3 pages.)

## Potential To Emit

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/year) |
|-----------------|-------------------------------|
| PM              | 0.36                          |
| PM-10           | 0.36                          |
| SO <sub>2</sub> | 0.57                          |
| VOC             | 0.0014                        |
| CO              | 0.631                         |
| NO <sub>x</sub> | 0.96                          |

- (a) The potential to emit (as defined in 326 IAC 2-1.1-3) of NO<sub>x</sub> is less than ten (10) tons per year and the potential to emit (as defined in 326 IAC 2-1.1-3) of CO is less than twenty-five(25) tons per year. Therefore , the source is subject to the provisions of 326 IAC 2-5.1-1.

## County Attainment Status

The source is located in Allen County.

| Pollutant       | Status     |
|-----------------|------------|
| PM-10           | Attainment |
| SO <sub>2</sub> | Attainment |
| NO <sub>2</sub> | Attainment |
| Ozone           | Attainment |
| CO              | Attainment |
| Lead            | Attainment |

- (a) Volatile organic compounds (VOC) and oxides of nitrogen (NO<sub>x</sub>) are precursors for the formation of ozone. Therefore, VOC emissions are considered when evaluating the rule applicability relating to the ozone standards. Allen County has been designated as attainment or unclassifiable for ozone. Therefore, VOC and NO<sub>x</sub> emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2 and 40 CFR 52.21.
- (b) Allen County has been classified as attainment or unclassifiable for PM, PM-10, SO<sub>2</sub> and CO. Therefore, these emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2 and 40 CFR 52.21.

### Source Status

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

| Pollutant        | Emissions<br>(ton/yr) |
|------------------|-----------------------|
| PM               | 0.36                  |
| PM10             | 0.36                  |
| SO <sub>2</sub>  | 0.57                  |
| VOC              | 0.0014                |
| CO               | 0.631                 |
| NO <sub>x</sub>  | 0.96                  |
| Single HAP       | 0.0                   |
| Combination HAPs | 0.0                   |

- (a) This new source is not a major stationary source because no attainment 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, and 40 CFR 52.21, the PSD requirements do not apply.

### Part 70 Permit Determination

326 IAC 2-7 (Part 70 Permit Program)

This new source is not subject to the Part 70 Permit requirements because the potential to emit (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 is the first air approval issued to this source.

### Federal Rule Applicability

- (a) This incinerator is not subject to the requirements of the New Source Performance Standard, 326 IAC 12, (40 CFR 60.50, Subpart (E)) because this incinerator has a charge capacity of 1.5 tons per day, which is less than 50 tons per day, for this rule to be applicable.

- (b) There are no National Emission Standards for Hazardous Air Pollutants (NESHAPs)(326 IAC 14 and 40 CFR art 63) applicable to this source.

#### **State Rule Applicability - Entire Source**

##### **326 IAC 2-6 (Emission Reporting)**

This source is located in Allen County, which is not one of the listed counties for this rule. Additionally, the source does not have the potential to emit CO, VOC, NO<sub>x</sub>, PM-10 and SO<sub>2</sub> at greater than 100 tons per year rate. Therefore, 326 IAC 2-6 does not apply.

##### **326 IAC 5-1 (Visible Emissions Limitations)**

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

- (a) Opacity shall not exceed an average of forty percent (40%) 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 4-2-2 (Incinerators)**

Pursuant to 326 IAC 4-2-2, the particulate matter emissions shall be limited to 0.5 pounds per 1,000 pounds of dry exhaust gas at standard conditions corrected to fifty percent(50%) excess air.

This incinerator complies with this rule.

#### **Conclusion**

The construction and operation of this incinerator shall be subject to the conditions of the attached proposed Exemption 003-11759-00310.

**Appendix A: Emissions Calculations**

Page 1 of 1 TSD App A

**Natural Gas Combustion Only****MM BTU/HR <100****Incinerator # 1****Company Name:** Northeast Indiana Cremation Society, Inc.**Address City IN Zip:** 2120 Autumn Lake Place, Fort Wayne, Indiana 46818**CP:** 003-11759**Plt ID:** 003-00310**Reviewer:** Spahi**Date:** 01-18-00Heat Input Capacity  
MMBtu/hrPotential Throughput  
MMCF/yr

1.7

14.9

| Emission Factor in lb/MMCF    | Pollutant |       |     |             |     |      |
|-------------------------------|-----------|-------|-----|-------------|-----|------|
|                               | PM*       | PM10* | SO2 | NOx         | VOC | CO   |
|                               | 1.9       | 7.6   | 0.6 | 100.0       | 5.5 | 84.0 |
| Potential Emission in tons/yr | 0.0       | 0.1   | 0.0 | **see below | 0.0 | 0.6  |

\*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

**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

Note: Check the applicable rules and test methods for PM and PM10 when using the above emission factors to confirm that the correct factor is used (i.e., condensable included/not included).

Southern Environmental Sciences, Inc. conducted emissions testing of the Industrial Equipment & Engineering Company's Power-Pak II. Model IE43-PPII crematory incinerator on May 18, 1994. The unit was located at 13011 U.S. Highway 19, Hudson, Florida. The testing was conducted for p-articulates, carbon monoxide and visible emissions. Oxygen(O<sub>2</sub>) concentrations were measured in order to correct results to 7 % O<sub>2</sub>.

Emission factors are based on a test for a larger unit of similar design- the Ener-Tek cremator.

### **Nitrogen Oxide(NO<sub>2</sub>)**

emission rate for Ener-Tek based on test results:

$$\begin{aligned} & (30.1 \text{ ppmv} \times 640 \text{ dscfm} \times 60 \text{ min/hr} \times 0.0283 \text{ m}^3/\text{ft}^3 \times 1.88 \text{ mg/m}^3/\text{ppmv}) / (453,600 \text{ mg/lb}) \\ & = 0.14 \text{ lb/hr} \times 8760 \text{ hr/yr} \times 1 \text{ ton}/2000 \text{ lb} \\ & = 0.61 \text{ ton/yr} \end{aligned}$$

Ener -Tek burn rate is 250 lb/hr; Power-Pak II burn rate is 100 lb/hr

estimated emission rate for Power- Pak II is:

$$\begin{aligned} & (100 \text{ lb/hr} / 250 \text{ lb/hr}) \times 0.14 \text{ lb/hr} \\ & = 0.06 \text{ lb/hr} \times 8760 \text{ hr/yr} \times 1 \text{ ton}/2000 \text{ lb} \\ & = 0.26 \text{ ton/yr} \end{aligned}$$

estimated concentration for Power-Pak II is:

$$\begin{aligned} & (0.06 \text{ lb/hr} \times 453,600 \text{ mg/lb}) / (587 \text{ dscfm} \times 60 \text{ min/hr} \times 0.0283 \text{ m}^3/\text{ft}^3 \times 1.88 \text{ mg/m}^3/\text{ppmv}) \\ & = 14 \text{ ppmv} \end{aligned}$$

### **Volatile Organic Compounds (VOC)**

emission rate for Ener-Tek based on test results:

$$\begin{aligned} & (0.5 \text{ ppmv} \times 640 \text{ dscfm} \times 60 \text{ min/hr} \times 0.0283 \text{ m}^3/\text{ft}^3 \times 1.88 \text{ mg/m}^3/\text{ppmv}) / (453,600 \text{ mg/lb}) \\ & = 0.0008 \text{ lb/hr} \times 8760 \text{ hr/yr} \times 1 \text{ ton}/2000 \text{ lb} \end{aligned}$$



$$= 0.0035 \text{ ton/yr}$$

Ener -Tek burn rate is 250 lb/hr; Power-Pak II burn rate is 100 lb/hr

estimated emission rate for Power- Pak II is:

$$(100 \text{ lb/hr} / 250 \text{ lb/hr}) \times 0.0008 \text{ lb/hr}$$

$$0.00032 \text{ lb/hr}$$

$$= 0.00032 \text{ lb/hr} \times 8760 \text{ hr/yr} \times 1 \text{ ton}/2000 \text{ lb}$$

$$= 0.0014 \text{ ton/yr}$$

estimated concentration for Power-Pak II is:

$$(0.0008 \text{ lb/hr} \times 453,600 \text{ mg/lb}) / (587 \text{ dscfm} \times 60 \text{ min/hr} \times 0.0283 \text{ m}^3/\text{ft}^3 \times 1.88 \text{ mg/m}^3/\text{ppmv})$$

$$= 0.2 \text{ ppmv}$$

### **Sulfur Dioxides (SO<sub>2</sub>)**

emission factor from AP-42 Table 2.1-12(2.5 lb/ton) used because of lack of test data.

$$(100 \text{ lb/hr} \times 2.5 \text{ lb/ton}) \times 1 \text{ ton}/2000 \text{ lb}$$

$$= 0.13 \text{ lb/hr} \times 8760 \text{ hr/yr} \times 1 \text{ ton}/2000 \text{ lb}$$

$$= 0.57 \text{ ton/yr}$$

estimated concentration for Power-Pak II is:

$$(0.13 \text{ lb/hr} \times 453,600 \text{ mg/lb}) / (587 \text{ dscfm} \times 60 \text{ min/hr} \times 0.0283 \text{ m}^3/\text{ft}^3 \times 1.88 \text{ mg/m}^3/\text{ppmv})$$

$$= 23 \text{ ppmv}$$

### **Carbon Monoxide (CO)**

Carbon monoxide tests were on Power-Pak II crematory.

$$\text{CO emissions} = 0.007 \text{ lb/hr}$$

$$= 0.007 \text{ lb/hr} \times 8760 \text{ hr/yr} \times 1 \text{ ton}/2000 \text{ lb}$$

$$= 0.031 \text{ tons/yr}$$

### **Compliance with 326 IAC 4-2-2(8)(b)**

Flow rate of flue gas = 2150 acfm

Temperature of flue gas = 1180° F

Oxygen level in flue gas = 10.6 %

Nitrogen level in flue gas = 82.1 %

EPA method 3 for % excess air:

$$\begin{aligned}\% \text{ Excess air} &= (\% \text{ O}_2 - 0.5\% \text{ CO}) \times 100 \% / (0.264 \text{ N}_2 - (0.5\% \text{ O}_2 - 0.5\% \text{ CO})) \\ &= (10.6\%) \times 100\% / (0.264 \times 82.1 - 10.6) \\ &= 96\%\end{aligned}$$

$$\begin{aligned}\text{Correction factor for 50\% excess air} &= (100 + \% \text{ EA})/150 \\ &= 1.31\end{aligned}$$

Particulate matter per pound of flue gas  
= (0.083 lb/hr)/2150 ft<sup>3</sup>/min of flue gas

$$\begin{aligned}\text{density of flue gas} &= P/RT \\ R &= 54.5 \text{ ft lbf/lbm } ^\circ\text{R}\end{aligned}$$

$$\begin{aligned}P(\text{density}) &= (2117 \text{ lbf/ft}^2) / (54.5 \text{ ft lbf/lbm } ^\circ\text{R}) / (1180 + 460)^\circ\text{R} \\ &= 0.024 \text{ lbm/ft}^3\end{aligned}$$

$$\begin{aligned}\text{Particulate matter per pound of gas} &= (0.083 \text{ lb/hr}) / (2150 \text{ ft}^3/\text{min}) \times ((0.024 \text{ lbm/ft}^3) \times (60 \text{ min/hr})) \\ &= 2.6 \times 10^{-5} \text{ lb PM/lb of flue gas}\end{aligned}$$

$$\begin{aligned}\text{Particulate matter per 1,000 pounds of flue gas} &= (2.6 \times 10^{-5} \text{ lb PM/lb of flue gas}) \times 1000 \text{ lb of flue gas} \\ &\quad \times 1.31 \\ &= 0.034 \text{ lbs} < 0.5 \text{ lbs}\end{aligned}$$

$$\begin{aligned}\text{Allowable PM emissions} &= 0.083 \text{ lb/hr} \times 1 \text{ ton}/2000 \text{ lb} \times 8760 \text{ hr}/1 \text{ yr} \times 0.5/0.034 \\ &= 5.34 \text{ tons/yr}\end{aligned}$$