



# **Air Quality Permitting Statement of Basis**

**June 26, 2006**

**Permit to Construct No. P-060012**

**Ada Animal Crematory  
Boise, ID**

**Facility ID No. 001-00200**

Prepared by:

**Tracy Drouin, Air Quality Permitting Analyst 3  
AIR QUALITY DIVISION**

**FINAL**

## Table of Contents

ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURES .....	3
1. PURPOSE .....	4
2. FACILITY DESCRIPTION .....	4
3. FACILITY / AREA CLASSIFICATION .....	4
4. APPLICATION SCOPE .....	4
5. PERMIT ANALYSIS .....	5
6. PERMIT FEES .....	8
7. PERMIT REVIEW .....	8
8. RECOMMENDATION .....	9
APPENDIX A - AIRS INFORMATION .....	10
APPENDIX B - EMISSIONS INVENTORY .....	12
APPENDIX C - MODELING REVIEW .....	16
APPENDIX D - CORRESPONDENCE .....	34

## **Acronyms, Units, and Chemical Nomenclatures**

<b>AFS</b>	<b>AIRS Facility Subsystem</b>
<b>AIRS</b>	<b>Aerometric Information Retrieval System</b>
<b>AQCR</b>	<b>Air Quality Control Region</b>
<b>CO</b>	<b>carbon monoxide</b>
<b>DEQ</b>	<b>Department of Environmental Quality</b>
<b>EPA</b>	<b>U.S. Environmental Protection Agency</b>
<b>HAPs</b>	<b>Hazardous Air Pollutants</b>
<b>IDAPA</b>	<b>a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act</b>
<b>lb/hr</b>	<b>pound per hour</b>
<b>NO<sub>x</sub></b>	<b>nitrogen oxides</b>
<b>PM</b>	<b>particulate matter</b>
<b>PM<sub>10</sub></b>	<b>particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers</b>
<b>PSD</b>	<b>Prevention of Significant Deterioration</b>
<b>PTC</b>	<b>permit to construct</b>
<b>PTE</b>	<b>potential to emit</b>
<b>Rules</b>	<b>Rules for the Control of Air Pollution in Idaho</b>
<b>SIC</b>	<b>Standard Industrial Classification</b>
<b>SO<sub>2</sub></b>	<b>sulfur dioxide</b>
<b>T/yr</b>	<b>tons per year</b>
<b>TAPs</b>	<b>toxic air pollutants</b>
<b>µg/m<sup>3</sup></b>	<b>micrograms per cubic meter</b>
<b>UTM</b>	<b>Universal Transverse Mercator</b>
<b>VOC</b>	<b>volatile organic compound</b>

## 1. PURPOSE

The purpose for this memorandum is to satisfy the requirements of IDAPA 58.01.01.200, Rules for the Control of Air Pollution in Idaho, for issuing permits to construct. Specifically, the modified PTC allows the facility to replace an existing crematory unit with another unit.

## 2. FACILITY DESCRIPTION

Ada Animal Crematorium currently conducts operations at 7330 Air Way Court, Suite 101, in Boise, Idaho. Operations at the facility include cremation of animal remains obtained from local veterinary clinics. The existing emission sources at the facility include two animal cremation units.

## 3. FACILITY / AREA CLASSIFICATION

Ada Animal Crematorium is classified as a minor facility because its potential to emit is less than major source thresholds without requiring limits on its potential to emit. The AIRS classification is "B" which means actual and potential emissions are below major source thresholds. Specifically, this source does not have potential emissions rates greater than 100 tons per year (T/yr) for any pollutant. Additionally, the potential emissions rate for hazardous air pollutants (HAPs) are below 25 T/yr collectively and less than 10 T/yr for any single HAP for this source.

The facility is located within AQCR64 and UTM zone 11. The facility is located in Ada County. Northern Ada County is an attainment area for carbon monoxide (CO) and particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM<sub>10</sub>), and unclassifiable for sulfur dioxide (SO<sub>2</sub>), oxides of nitrogen (NO<sub>x</sub>), ozone (O<sub>3</sub>) and lead (Pb).

The AIRS information provided in Appendix A defines the classification for each regulated air pollutant emitted by Ada Animal Crematory. This required information is entered into the EPA AIRs database.

## 4. APPLICATION SCOPE

On March 17, 2006, the Department of Environmental Quality (DEQ) received an application from Ada Animal Crematorium to modify the facility's existing permit to construct (PTC) No. P-030050, issued November 28, 2003. The requested modification is to allow the replacement of an existing ThermTec, Model S-18 cremation unit with a Mathew's Cremation Group, Model Power-Pak II cremation unit. The existing ThermTec S-18 unit will be removed from operation prior to installation of the Power-Pak II unit.

### 4.1 Application Chronology

March 17, 2006	DEQ received an application and application fee of \$1,000 from Ada Animal Crematorium to revise the facility's existing PTC No. P-030050.
April 12, 2006	DEQ determined Ada animal Crematorium's permit application complete.
April 21, 2006	DEQ sent electronic copy of the draft permit to the Boise Regional Office for review.
April 26, 2006	Public notice for an opportunity to comment was published.

May 2, 2006	DEQ sent permittee's consultant, Troy Riecke, an electronic copy of draft permit No. P-060012 for review.
May 25, 2006	Public opportunity to comment period closed. No requests received.
June 29, 2006	Processing fee received.
July 14, 2006	Final permit issued.

## 5. PERMIT ANALYSIS

This section of the Statement of Basis describes the regulatory requirements for this PTC action.

### 5.1 Equipment Listing

As indicated in Section 4.0, Ada Animal Crematorium is planning to replace an existing ThermTec, Model S-18 cremation unit with a Mathew's Cremation Group, Model Power-Pak II cremation unit. An existing Mathew's Cremation Group, Model Power-Pak II cremation unit will remain in use at the facility. Both, the existing and replacement Mathew's Cremation Group, Model Power-Pak II cremation units utilize primary and secondary (afterburner) chambers to incinerate animal remains. The units will operate on natural gas. No other fuels will be used to operate the units (see 4/12/06 email from Troy Riecke in Appendix D). The existing and replacement units have a maximum cremation rate of 114 pounds of animal remains per hour. Anticipated annual operation of the new replacement unit is 1,860 hours per year.

### 5.2 Emissions Inventory

Millenium Science& Engineering, Inc. submitted emissions estimates with this permit application. The criteria pollutant emissions estimates are shown in the table below. The annual emissions were estimated using an operating schedule of 3,120 hours per year for the existing cremation unit and 1,860 hours per year for the new replacement unit.

EMISSIONS INVENTORY										
Ada Animal Crematorium, Boise										
Potential Emissions <sup>a</sup> – Hourly (lb/hr), and Annual (T/yr)										
Source Description	PM <sub>10</sub>		NO <sub>x</sub>		CO		VOC		SO <sub>2</sub>	
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Mathew's Cremation Group, Power-Pak II-1 (existing)	0.12	0.19	0.38	0.59	0.16	0.25	0.01	0.02	0.12	0.19
Mathew's Cremation Group, Power-Pak II-2 (replacement unit) <sup>b</sup>	0.12	0.11	0.38	0.35	0.16	0.15	0.01	0.0	0.12	0.11
<b>Total</b>	<b>0.24</b>	<b>0.30</b>	<b>0.76</b>	<b>.94</b>	<b>0.32</b>	<b>0.30</b>	<b>0.02</b>	<b>0.02</b>	<b>0.24</b>	<b>0.30</b>

<sup>a</sup> As determined by a pollutant-specific U.S. EPA reference method, a Department-approved alternative, or as determined by the Department's emissions estimation methods used in this permit analysis.

<sup>b</sup> Potential Emissions for the replacement unit are based on 1,860 hours of operation per year.

Potential emissions rate estimates for regulated pollutants emitted from each animal cremation unit are presented in Attachment 2 of the application dated March 17, 2006. Emissions estimates are presented for criteria pollutants and several toxic air pollutants (TAPs), on both hourly and annual bases.

It must be noted that, in the absence of more detailed or source-specific emissions data for these units, DEQ has accepted the emissions estimate methodology for permit development purposes. The accuracy of these estimates is inherently dependent upon unit-specific design and operational conditions or

parameters. Emissions estimates presented in the application should conservatively represent emissions from the cremation units, provided that the units are operated as specified by the equipment manufacturer.

For each Matthew's Cremation Group cremation unit, hourly emissions rates of particulate matter (PM), nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), sulfur dioxide (SO<sub>2</sub>), and volatile organic compounds (VOCs) are based on source tests and emission calculations, conducted and provided by the manufacturer of the equipment. For purposes of the permit application, it was assumed that all PM is released as particulate matter with an aerodynamic diameter of ten microns or less (PM<sub>10</sub>).

TAP constituents, other than hydrogen chloride (measured, see Attachment 2 of application), were identified through the U.S. Environmental Protection Agency's (EPA's) Factor Information Retrieval (FIRE) software (Version 6.23, October 2000), using Source Classification Code No. 3-15-021-01 (i.e., crematoriums). In the apparent absence of more source-specific emissions data, DEQ has determined that these emissions factors may be used to estimate TAP emissions for the permit application. The emissions factors are given in pounds of TAP emitted per body or cremation, and were applied to the unit's design maximum cremation rate (i.e., 0.71 cremations/hr) to derive an hourly emissions rate for each TAP. For emissions of dioxin and furans, the estimates are based upon compound-specific factors from the FIRE database, expressed as equivalent emissions of 2,3,7,8 TCDD (as required by IDAPA 58.01.01.586). The hourly hydrogen chloride emissions rate is taken directly from source test information provided by the manufacturer of the equipment.

To derive annual facility-wide pollutant emissions rates, the hourly emissions rates were conservatively scaled up. The emissions analysis, including TAPs emissions is included in Appendix B.

### **5.3 Modeling**

Modeling analysis was supplied by Millenium Science & Engineering, Inc. for the proposed project. Modeling was prepared for both the existing unit and the replacement unit based on 1,860 hours per year for each unit.

DEQ reviewed the modeling submitted for the proposed project and determined that a different anemometer height input should have been used in the analysis. After discussion with the consultant, DEQ performed a verification modeling analysis with the current anemometer height. DEQ also based the modeling for the existing cremation unit operation of 3,120 hours per year and the new replacement cremation unit operation of 1,860 hours per year. Results from the modeling determined that emissions from the facility will not cause or significantly contribute to a violation of any air quality standard.

Additional details and results of the modeling are included in the modeling memorandum in Appendix C.

### **5.4 Regulatory Review**

This section describes the regulatory analysis of the applicable air quality rules with respect to this PTC.

#### **IDAPA 58.01.01.201 ..... Permit to Construct Required**

The facility's proposed project does not meet the permit to construct exemption criteria contained in Sections 220 through 223 of the Rules. Therefore, a PTC is required.

#### **IDAPA 58.01.01.203 ..... Permit Requirements for New and Modified Stationary Sources**

The applicant has shown to the satisfaction of DEQ that the facility will comply with all applicable emissions standards, ambient air quality standards, and toxic increments.

**IDAPA 58.01.01.210 Demonstration of Preconstruction Compliance with Toxic Standards**

The applicant has demonstrated preconstruction compliance for all TAPs identified in the permit application.

**IDAPA 58.01.01.212.01 ..... Obligation to Comply**

Receipt of this revised PTC does not relieve Ada Animal Crematory from the responsibility to comply with all applicable local, state, and federal statutes, rules and regulations.

**IDAPA 58.01.01.224..... Permit to Construct Application Fee**

The applicant satisfied the PTC application fee requirement by submitting a fee of \$1,000.00 at the time the original application was submitted, March 17, 2006.

**IDAPA 58.01.01.225 ..... Permit to Construct Processing Fee**

The project is subject to the processing fee provisions of IDAPA 58.01.01.225. Ada Animal Crematory was assessed a processing fee of \$1,000.00 based on less than a 1 T/yr increase in emissions.

**5.5 Permit Conditions Review**

This section describes only those permit conditions that have been revised, modified or deleted as a result of this permit action. All other permit conditions remain unchanged. Permit conditions related to the modified permit are identified as Modified Permit Conditions. Permit conditions related to the existing permit are identified as Existing Permit Conditions.

Existing Permit Condition 2.2, Table 2.1, lists a ThermTec, Model S-18 cremation unit.

Modified Permit Condition 2.2, Table 2.1 replaces the ThermTec, Model S-18 unit with a Mathew's Cremation Group, Model Power-Pak II cremation unit. The afterburners were added as emissions control device in the modified permit condition because they control VOC emissions.

Existing Permit Condition 2.6 restricts fuel use to natural gas or liquefied petroleum gas.

Modified Permit Condition 2.6 restricts fuel use to natural gas only (see 4/12/06 email from Troy Riecke in Appendix D).

Existing Permit Condition 2.7 limits hours of operation of the Mathew's Cremation Group cremation unit to 3,210 hr/yr and the ThermTec animal cremation unit to 936 hr/yr.

Modified Permit Condition 2.7 limits hours of operation the Mathew's Cremation Group Power-Pak II (No. PPII-1) cremation unit to 3,120 hrs/yr. The existing 3,210 hr/yr was a typo and should have been 3,120 hrs/yr for the existing cremation unit. The new replacement Mathew's Cremation Group Power-Pak II (No. PPII-2) cremation unit limits hours of operation to 1,860 hr/yr. Refer to Modeling memorandum for details.

Existing Permit Condition 2.8 lists operation Requirements for the cremation units. Existing Permit Condition 2.8 was deleted. It is in the facility's best interest to properly operate and maintain the cremation units for maximum efficiency, and does not need to be enforced through the PTC.

Existing Permit Condition No. 2.9 required the permittee to develop an O&M manual for the cremation units. The Permit Condition was modified (and re-numbered to 2.8) to reflect development of an O&M manual for control equipment rather than the entire cremation unit.

Modified Permit Conditions 2.9 and 2.11 are new conditions that set a minimum temperature requirement and monitoring of the afterburner. The temperature of the afterburner must operate at a minimum temperature of 1000 degrees Fahrenheit in order to ensure adequate destruction of the products of combustion. Therefore, Permit Condition 2.11 requires the temperature of the afterburner to be read and recorded once immediately prior to loading a charge into the incinerator and at least once per hour during combustion. This will be used to assess compliance with Permit Condition 2.9.

Existing Permit Condition No. 2.10 lists inspection requirements. Existing Permit Condition No. 2.10 was deleted since it related to existing Permit Condition No. 2.8.

Existing Permit Condition No. 2.11 was deleted since it related to existing Permit Condition No. 2.8.

There are no other changes to the permit conditions except for numbering resulting from new formatting and the changes discussed above.

## 6. PERMIT FEES

The total emissions from the proposed project are less than 1 T/yr; therefore, the associated processing fee is \$1,000.00. The processing fee was received on June 29, 2006.

The emissions inventory is based on application information provided by Millenium Science & Engineering, Inc.

**Table 5.1 PTC PROCESSING FEE TABLE**

<b>Emissions Inventory</b>			
<b>Pollutant</b>	<b>Annual Emissions Increase (T/yr)</b>	<b>Annual Emissions Reduction (T/yr)</b>	<b>Annual Emissions Change (T/yr)</b>
NO <sub>x</sub>	0.35	0.40	-.05
SO <sub>2</sub>	0.11	0.03	+0.08
CO	0.15	0	+0.15
PM <sub>10</sub>	0.11	0.01	+0.10
VOC	0	0	0
TAPS/HAPS	n/a	0	n/a
<b>Total:</b>	<b>.72</b>	<b>.44</b>	<b>+0.28</b>
<b>Fee Due</b>	<b>\$ 1,000.00</b>		

## 7. PERMIT REVIEW

### 7.1 Regional Review of Draft Permit

DEQ's Boise Regional Office was provided the draft permit for review on April, 21, 2006. The Boise Regional Office had three comments. The comments were addressed.

### 7.2 Facility Review of Draft Permit

The facility did not request to review the draft permit. However, Troy Riecke, with Millenium Science & Engineering, Inc., requested to review the draft permit which was provided for review on May 2, 2006. Mr. Riecke did not have any comments.

### **7.3 Public Comment**

An opportunity for public comment period on PTC application was provided from April 26, 2006, to May 25, 2006, in accordance with IDAPA 58.01.01.209.01.c. During this time, there were no comments on the application and no requests for a public comment period on DEQ's proposed action.

### **8. RECOMMENDATION**

Based on review of application materials, and all applicable state and federal rules and regulations, staff recommend that Ada Animal Crematory be issued a draft PTC No. P-060012 for the crematory unit replacement. No public comment period is recommended, no entity has requested a comment period, and the project does not involve PSD requirements.

TD/bf                      Permit No. P-060012

G:\Air Quality\Stationary Source\SS Ltd\PTC\Ada Animal Crematory - Boise\P-060012\Final\P-060012Final SB.doc

**Appendix A**

***AIRS Information***

**P-060012**

## AIRS/AFS<sup>a</sup> FACILITY-WIDE CLASSIFICATION<sup>b</sup> DATA ENTRY FORM

**Facility Name:** Ada Animal Crematorium  
**Facility Location:** 7330 Air Way Court, Suite 101, Boise, ID  
**AIRS Number:** 001-00200

AIR PROGRAM POLLUTANT	SIP	PSD	NSPS (Part 60)	NESHAP (Part 61)	MACT (Part 63)	SM80	TITLE V	AREA CLASSIFICATION A-Attainment U-Unclassified N- Nonattainment
SO <sub>2</sub>	B							U
NO <sub>x</sub>	B							U
CO	B							A
PM <sub>10</sub>	B							A
PT (Particulate)	B							U
VOC	B							U
THAP (Total HAPs)	B							U
<b>APPLICABLE SUBPART</b>								

<sup>a</sup> Aerometric Information Retrieval System (AIRS) Facility Subsystem (AFS)

<sup>b</sup> AIRS/AFS Classification Codes:

- A = Actual or potential emissions of a pollutant are above the applicable major source threshold. For HAPs only, class "A" is applied to each pollutant which is at or above the 10 T/yr threshold, or each pollutant that is below the 10 T/yr threshold, but contributes to a plant total in excess of 25 T/yr of all HAPs.
- SM = Potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable regulations or limitations.
- B = Actual and potential emissions below all applicable major source thresholds.
- C = Class is unknown.
- ND = Major source thresholds are not defined (e.g., radionuclides).

**Appendix B**

***Emissions Inventory***

**P-060012**

**Power-Pak 8-1 Emission Estimates Summary**

**Criteria Air Pollutants**

	Maximum Uncontrolled Emissions			Significant (ton/yr)	BRC?
	(lb/hr)	(g/s)	(ton/yr)		
PM (assume all is PM10)	0.12	0.01512	0.5256	18	yes
NO <sub>x</sub>	0.38	0.04788	1.6644	40	yes
CO	0.10	0.02016	0.7008	100	yes
SO <sub>2</sub>	0.12	0.01512	0.5256	40	yes
VOC	0.01	0.00126	0.0438	40	yes

Note: Emission estimates for criteria pollutants are from source testing provided by the equipment manufacturer.

**Toxic Air Pollutants**

Cremation Rate:	114 lb/hr
Max Cremation Rate:	0.71 cremations/hr

**Dioxin/Furan 2,3,7,8-TCDD Equivalency Analysis:**

Analyte	EF (lb/cremation)	Emissions (lb/hr)	EPA TEF <sup>(1)</sup>	Equivalent (lb/hr)	Equivalent (g/s)
1,2,3,4,6,7,8-HpCDD	3.79E-09	2.71E-09	0.01	2.71E-11	3.41E-12
1,2,3,4,7,8-HxCDD	2.75E-10	1.98E-10	0.1	1.98E-11	2.48E-12
1,2,3,6,7,8-HxCDD	3.97E-10	2.84E-10	0.1	2.84E-11	3.57E-12
1,2,3,7,8,9-HxCDD	4.92E-10	3.51E-10	0.1	3.51E-11	4.43E-12
1,2,3,7,8-PeCDF	2.33E-10	1.68E-10	0.05	8.32E-12	1.05E-12
2,3,7,8-TCDF	5.19E-10	3.71E-10	0.1	3.71E-11	4.67E-12
1,2,3,4,6,7,8-HpCDF	4.57E-09	3.26E-09	0.01	3.26E-11	4.11E-12
1,2,3,4,7,8,9-HpCDF	2.78E-10	1.99E-10	0.01	1.99E-12	2.50E-13
1,2,3,4,7,8-HxCDF	9.53E-10	6.81E-10	0.1	6.81E-11	8.58E-12
1,2,3,6,7,8-HxCDF	6.52E-10	6.09E-10	0.1	6.09E-11	7.67E-12
1,2,3,7,8,9-HxCDF	1.67E-09	1.19E-09	0.1	1.19E-10	1.50E-11
2,3,4,6,7,8-HxCDF	3.44E-10	2.46E-10	0.1	2.46E-11	3.10E-12
1,2,3,7,8-TCDD	2.94E-10	2.10E-10	0.5	1.05E-10	1.32E-11
2,3,4,7,8-PeCDF	6.85E-10	6.32E-10	0.5	3.16E-10	3.98E-11
2,3,7,8-TCDD	7.94E-11	5.67E-11	1	5.67E-11	7.15E-12
<b>Total Equivalent Emission of 2,3,7,8 TCDD:</b>				<b>9.41E-10</b>	<b>1.19E-10</b>
				EL:	1.50E-10

Note: (1) TEF Toxicity Equivalence Factor from EPA guidelines.

	EF (lb/cremation)	Emissions (lb/hr)	EL (lb/hr)	Modeling?	Emissions (g/s)	Significant (ton/yr)	BRC?
Antimony	3.02E-05	2.16E-05	3.30E-02	no			
Arsenic	3.00E-05	2.14E-05	1.56E-05	yes	2.70E-06		
Barium	2.40E-05	1.71E-05	3.30E-02	no			
Beryllium	1.37E-06	9.79E-07	2.80E-05	no		0.0004	yes
Cadmium	1.11E-05	7.93E-06	3.70E-06	yes	9.99E-07		
Chromium	2.99E-05	2.14E-05	3.30E-02	no			
Chromium (VI)	1.35E-05	9.84E-06	5.80E-07	yes	1.22E-06		

	EF (lb/cremation)	Emissions (lb/hr)	EL (lb/hr)	Modeling?	Emissions (g/s)	Significant (ton/yr)	BRC?
Cobalt	1.75E-08	1.25E-06	3.30E-03	no			
Copper	2.74E-06	1.96E-06	1.30E-02	no			
Lead	6.62E-06	4.73E-06				0.6	yes
Molybdenum	1.67E-06	1.19E-06	3.33E-01	no			
Nickel	3.82E-06	2.73E-06	2.70E-06	yes	3.44E-06		
Selenium	4.36E-06	3.11E-06	1.30E-02	no			
Silver	7.30E-08	5.21E-06	1.00E-03	no			
Thallium	8.52E-06	6.06E-06	7.00E-03	no			
Vanadium	5.79E-06	4.14E-06	3.00E-03	no			
Zinc	3.53E-04	2.52E-04	6.67E-01	no			
Acenaphthene	1.11E-07	7.93E-08					
Acenaphthylene	1.22E-07	8.71E-08					
Anthracene	3.24E-07	2.31E-07					
Benzo (a) anthracene	9.76E-09	6.97E-08					
Benzo (a) pyrene	2.91E-06	2.06E-06	2.00E-06	no			
Benzo (b) fluoranthene	1.56E-06	1.14E-06					
Benzo (g,h,i) perylene	2.91E-06	2.06E-06					
Benzo (k) fluoranthene	1.42E-06	1.01E-06					
Chrysene	5.40E-06	3.86E-06					
Dibenzo (a,h) anthracene	1.27E-06	9.07E-07					
Fluoranthene	2.05E-07	1.46E-07					
Fluorene	4.17E-07	2.96E-07					
Indeno (1,2,3-cd) pyrene	1.54E-06	1.10E-06					
Pyrene	1.62E-07	1.16E-07					
Phenanthrene	2.29E-06	1.64E-06					
PAH	3.76E-06	2.66E-06	9.10E-06	no			
Hydrogen Chloride	measured	8.00E-02	5.00E-02	yes	1.01E-02		
Hydrogen fluoride	6.55E-04	4.66E-04					

Note: Toxic air pollutant emission factors from FIRE database (version 6.2).

**Power-Pak II-3 Emission Estimates Summary**

**Criteria Air Pollutants**

	Maximum Uncontrolled Emissions			Significant (ton/yr)	BRC?
	(lb/hr)	(g/s)	(ton/yr)		
PM (assume all is PM10) <sup>(1)</sup>	0.12	0.01512	0.5256	15	yes
NO <sub>x</sub> <sup>(1)</sup>	0.38	0.04788	1.6544	40	yes
CO <sup>(1)</sup>	0.18	0.02018	0.7008	100	yes
SO <sub>2</sub> <sup>(2)</sup>	0.12	0.01512	0.5256	40	yes
VOC <sup>(2)</sup>	0.01	0.00128	0.0438	40	yes

Note:

Note: Emission estimates for criteria pollutants are from source testing provided by the equipment manufacturer.

**Toxic Air Pollutants**

Cremation Rate: 114 lb/hr  
 Equivalent Cremations: 0.71 cremations/hr

**Dioxin/Furan 2,3,7,8-TCDD Equivalency Analysis:**

Analyte	EF (lb/cremation)	Emissions (lb/hr)	EPA TEF <sup>(1)</sup>	Equivalent (lb/hr)	Equivalent (g/s)
1,2,3,4,6,7,8-HpCDD	3.79E-09	2.71E-09	0.01	2.71E-11	3.41E-12
1,2,3,4,7,8-HxCDD	2.75E-10	1.96E-10	0.1	1.96E-11	2.48E-12
1,2,3,6,7,8-HxCDD	3.97E-10	2.84E-10	0.1	2.84E-11	3.57E-12
1,2,3,7,8,9-HxCDD	4.92E-10	3.51E-10	0.1	3.51E-11	4.43E-12
1,2,3,7,8-PeCDF	2.33E-10	1.66E-10	0.05	8.32E-12	1.05E-12
2,3,7,8-TCDF	5.19E-10	3.71E-10	0.1	3.71E-11	4.67E-12
1,2,3,4,6,7,8-HpCDF	4.57E-09	3.26E-09	0.01	3.26E-11	4.11E-12
1,2,3,4,7,8,9-HpCDF	2.78E-10	1.99E-10	0.01	1.99E-12	2.50E-13
1,2,3,4,7,8-HxCDF	9.53E-10	6.81E-10	0.1	6.81E-11	8.58E-12
1,2,3,6,7,8-HxCDF	8.52E-10	6.09E-10	0.1	6.09E-11	7.67E-12
1,2,3,7,8,9-HxCDF	1.67E-09	1.19E-09	0.1	1.19E-10	1.50E-11
2,3,4,6,7,8-HxCDF	3.44E-10	2.48E-10	0.1	2.48E-11	3.10E-12
1,2,3,7,8-TCDD	2.94E-10	2.10E-10	0.5	1.05E-10	1.32E-11
2,3,4,7,8-PeCDF	8.85E-10	6.32E-10	0.5	3.16E-10	3.98E-11
2,3,7,8-TCDD	7.94E-11	5.67E-11	1	5.67E-11	7.15E-12
<b>Total Equivalent Emission of 2,3,7,8 TCDD:</b>				<b>9.41E-10</b>	<b>1.19E-10</b>
				EL:	1.58E-10

Note: (1) TEF Toxicity Equivalence Factor from EPA guidelines.

	EF (lb/cremation)	Emissions (lb/hr)	EL (lb/hr)	Modeling?	Emissions (g/s)	Significant (ton/yr)	BRC?
Antimony	3.02E-05	2.16E-05	3.30E-02	no			
Arsenic	3.00E-05	2.14E-05	1.56E-05	yes	2.70E-06		
Barium	2.40E-05	1.71E-05	3.30E-02	no			
Beryllium	1.37E-05	9.79E-07	2.80E-05	no		0.0004	yes
Cadmium	1.11E-05	7.93E-06	3.70E-05	yes	9.99E-07		

**Appendix C**

***Modeling Review***

**P-060012**

## **MEMORANDUM**

**DATE:** June 16, 2006

**TO:** Tracy Drouin, Permit Writer, Air Program

**THROUGH:** Kevin Schilling, Stationary Source Modeling Coordinator, Air Program *KS*

**FROM:** Darrin Mehr, Air Quality Analyst, Air Program *DM*

**PROJECT NUMBER:** P-060012

**SUBJECT:** Modeling Review for the Ada Animal Crematorium Permit to Construct Application for their facility in Boise, Idaho.

---

### **1.0 Summary**

Ada Animal Crematorium (Ada AC) submitted a Permit to Construct (PTC) application for the replacement of an existing cremation unit with a new unit of larger capacity, on March 17, 2006. The new unit is a Matthews Power Pak II and is identical to the other existing cremation unit that is on-site and operational. Requested operating hours for the new cremation unit are 1,860 hours per year (hr/yr).

DEQ reviewed the initial modeling submittal and noted that the anemometer height used in the model for the meteorological data was input as 10 meters. The anemometer height was 6.1 meters for the 1987 through 1991 time period that the meteorological data set was collected at the Boise airport. The permittee's consultant used the 10 meter anemometer height based on written past approval from DEQ. However, DEQ's current interpretation is the 6.1 meter height produces more accurate ambient impact predictions. Therefore, DEQ agreed to perform a modeling demonstration based on the assumptions listed in Table 1.

Air quality analyses involving atmospheric dispersion modeling of emissions associated with the facility were submitted in support of a permit application to demonstrate that the facility would not cause or significantly contribute to a violation of any ambient air quality standard (IDAPA 58.01.01.203.02).

A technical review of the submitted air quality analyses was conducted by DEQ. The submitted modeling analyses in combination with DEQ's staff analyses: 1) utilized appropriate methods and models; 2) was conducted using reasonably accurate or conservative model parameters and input data; 3) adhered to established DEQ guidelines for new source review dispersion modeling; 4) showed that predicted pollutant concentrations from emissions associated with the facility, when appropriately combined with background concentrations, were below applicable air quality standards at all receptor locations. Table 1 presents key assumptions and results that should be considered in the development of the permit.

Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES	
Criteria/Assumption/Result	Explanation/Consideration
<p>DEQ performed a revised ambient impact analysis for this project using the following assumptions:</p> <p>1) Toxic air pollutant (TAP) compliance was limited to the new cremation unit (emission unit ID PPII-2) at the requested operating scenario of 24 hours per day (hr/day) and 1,860 hours per year (hr/yr). No netting of emissions was performed to account for the shutdown of the existing emission unit that is being replaced.</p> <p>2) The existing emission unit that will remain in place and operational (emission unit ID PPII-1) was evaluated for NAAQS compliance at 3,120 hr/yr of operation.</p>	<p>The permittee's ambient modeling demonstration used conservative assumptions for TAPs and NAAQS compliance demonstrations. DEQ's request to modify the anemometer height setting in the computer runs increased predicted ambient impacts, thereby requiring that the TAPs analyses be modified in order to demonstrate compliance with the allowable increments. This was necessary because the PTC application for this project was based on TAPs emissions from both PPII-1 and PPII-2, and the predicted ambient impact for arsenic was equal to the acceptable ambient concentration for carcinogen (AACC) increment.</p> <p>Item 1) The applicant performed a conservative TAPs compliance demonstration using both the existing and the proposed cremation units, each operating at 24 hr/day and 1,860 hr/yr.</p> <p>Item 2) The existing PTC limited operating hours of unit PPII-1 to 3,210 hr/yr. Correspondence with the permittee's consultant concluded with the request to correct a potential typographical error in the original PTC by using an operating limit of 3,120 hr/yr.</p>
<p>Summary of operating limitations used in the DEQ modeling analyses:</p> <ul style="list-style-type: none"> <li>• 3,120 hr/yr operation for PPII-1</li> <li>• 1,860 hr/yr operation for PPII-2</li> <li>• 24 hr/day operation for both PPII-1 and PPII-2</li> </ul>	<p>The annual operating hour limitation for PPII-1 is an existing PTC limitation established in PTC No. 030050, issued November 28, 2003, corrected to 3,120 hr/yr per the permittee's application for that PTC.</p> <p>The annual operating hour limitation for PPII-2 is a method of control of emissions and ambient impacts for the purposes of demonstrating compliance with IDAPA 58.01.01.210.07 and 210.08.</p>

## 2.0 Background Information

### 2.1 Applicable Air Quality Impact Limits and Modeling Requirements

This section identifies applicable ambient air quality limits and analyses used to demonstrate compliance.

#### 2.1.1 Area Classification

The Ada AC facility is located in Ada County, designated as an attainment or unclassifiable area for sulfur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), carbon monoxide (CO), lead (Pb), ozone (O<sub>3</sub>), and particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM<sub>10</sub>). The area operates under limited maintenance plans for PM<sub>10</sub> and CO. There are no Class I areas within 10 kilometers of the facility.

#### 2.1.2 Significant and Full Impact Analyses

If estimated maximum pollutant impacts to ambient air from the emissions sources at the facility exceed the significant contribution levels (SCLs) of IDAPA 58.01.01.006.91, then a full impact analysis is

necessary to demonstrate compliance with IDAPA 58.01.01.203.02. A full impact analysis for attainment area pollutants involves adding ambient impacts from facility-wide emissions to DEQ-approved background concentration values that are appropriate for the criteria pollutant/averaging-time at the facility location and the area of significant impact. The resulting maximum pollutant concentrations in ambient air are then compared to the National Ambient Air Quality Standards (NAAQS) listed in Table 2. Table 2 also lists SCLs and specifies the modeled value that must be used for comparison to the NAAQS.

Pollutant	Averaging Period	Significant Contribution Levels <sup>a</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	Regulatory Limit <sup>c</sup> ( $\mu\text{g}/\text{m}^3$ )	Modeled Value Used <sup>d</sup>
PM <sub>10</sub> <sup>e</sup>	Annual	1.0	50 <sup>f</sup>	Maximum 1 <sup>st</sup> highest <sup>g</sup>
	24-hour	5.0	150 <sup>h</sup>	Maximum 6 <sup>th</sup> highest <sup>g</sup>
Carbon monoxide (CO)	8-hour	500	10,000 <sup>i</sup>	Maximum 2 <sup>nd</sup> highest <sup>g</sup>
	1-hour	2,000	40,000 <sup>i</sup>	Maximum 2 <sup>nd</sup> highest <sup>g</sup>
Sulfur Dioxide (SO <sub>2</sub> )	Annual	1.0	80 <sup>f</sup>	Maximum 1 <sup>st</sup> highest <sup>g</sup>
	24-hour	5	369 <sup>h</sup>	Maximum 2 <sup>nd</sup> highest <sup>g</sup>
	3-hour	25	1,300 <sup>i</sup>	Maximum 2 <sup>nd</sup> highest <sup>g</sup>
Nitrogen Dioxide (NO <sub>2</sub> )	Annual	1.0	100 <sup>f</sup>	Maximum 1 <sup>st</sup> highest <sup>g</sup>
Lead (Pb)	Quarterly	NA	1.5 <sup>h</sup>	Maximum 1 <sup>st</sup> highest <sup>g</sup>

<sup>a</sup>IDAPA 58.01.01.006.90

<sup>b</sup>Micrograms per cubic meter

<sup>c</sup>IDAPA 58.01.01.577 for criteria pollutants

<sup>d</sup>The maximum 1<sup>st</sup> highest modeled value is always used for significant impact analysis

<sup>e</sup>Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers

<sup>f</sup>Never expected to be exceeded in any calendar year

<sup>g</sup>Concentration at any modeled receptor

<sup>h</sup>Never expected to be exceeded more than once in any calendar year

<sup>i</sup>Concentration at any modeled receptor when using five years of meteorological data

<sup>j</sup>Not to be exceeded more than once per year

Ada AC's original TAP analyses used a conservative approach that included the existing cremation unit and the new proposed cremation unit. DEQ completed a revised analysis that addressed only the new proposed cremation unit by itself (PPII-2). Operational limitations established in the existing PTC for emissions unit PPII-1 were not increased as a result of this project, and no other modifications to emissions unit PPII-1 were proposed as part of this project. A formal request to alter the modeling demonstration was received from Millennium Science & Engineering, on behalf of Ada AC, by e-mail, on June 1, 2006.

The proposed cremation unit PPII-2 is required to demonstrate compliance with the toxic air pollutant (TAP) increments with an ambient impact dispersion analysis for any TAP with a requested potential emission rate that exceeds the screening emission rate limit specified by IDAPA 58.01.01.585 or 58.01.01.586. Table 3 lists the applicable screening emission rates and regulatory limits (allowable increments) for the TAPs of concern for this project.

Pollutant	Averaging Period	Screening Emission Rate Limit <sup>a</sup> (lb/hr) <sup>b</sup>	Regulatory Limit (AAC/AACC) <sup>c</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>d</sup>	Modeled Value Used <sup>e</sup>
Hydrogen Chloride (CAS# 7647-01-0)	Annual	0.05	375	Maximum 1 <sup>st</sup> highest <sup>f</sup>
Arsenic (CAS# 7440-38-2)	Annual	1.56E-06	2.3E-04	Maximum 1 <sup>st</sup> highest <sup>f</sup>
Cadmium (CAS# 7440-43-9)	Annual	1.70E-06	5.6E-04	Maximum 1 <sup>st</sup> highest <sup>f</sup>

Pollutant	Averaging Period	Screening Emission Rate Limit <sup>a</sup> (lb/hr) <sup>b</sup>	Regulatory Limit (AAC/AACC) <sup>c</sup> (µg/m <sup>3</sup> ) <sup>d</sup>	Modeled Value Used <sup>e</sup>
Chromium VI (CAS # 7440-47-3)	Annual	5.60E-07	8.3E-05	Maximum 1 <sup>st</sup> highest <sup>f</sup>
Nickel (CAS # 7440-02-0)	Annual	2.70E-05	4.2E-03	Maximum 1 <sup>st</sup> highest <sup>f</sup>
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) (CAS# 1746-01-6)	Annual	1.50E-10	2.2E-08	Maximum 1 <sup>st</sup> highest <sup>f</sup>

<sup>a</sup>TDAPA 58.01.01.383 and 58.01.01.586

<sup>b</sup>Pounds per hour

<sup>c</sup>Increment for acceptable ambient concentration/acceptable ambient concentration for carcinogens

<sup>d</sup>Micrograms per cubic meter

<sup>e</sup>The maximum 1<sup>st</sup> highest modeled value is always used to establish TAPs compliance

<sup>f</sup>Chemical abstract service

<sup>g</sup>Concentration at any modeled receptor, never expected to be exceeded in any calendar year

## 2.2 Background Concentrations

Ambient background concentrations were revised for all areas of Idaho by DEQ in March 2003<sup>1</sup>. Background concentrations in areas where no monitoring data are available were based on monitoring data from areas with similar population density, meteorology, and emissions sources. Background concentrations used in these analyses are listed in Table 4. Background concentrations for Northern Ada County were used for background concentrations. Nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), PM<sub>10</sub> and sulfur dioxide (SO<sub>2</sub>) were included in the NAAQS modeling analyses. The TAPs increments do not have any ambient background concentrations.

Pollutant	Averaging Period	Background Concentration (µg/m <sup>3</sup> ) <sup>a</sup>
PM <sub>10</sub> <sup>b</sup>	24-hour	90
	Annual	25
NO <sub>x</sub> <sup>c</sup>	Annual	40
CO <sup>d</sup>	1-hour	12,200
	8-hour	6,800
SO <sub>2</sub> <sup>e</sup>	3-hour	120
	24-hour	40
	Annual	10

<sup>a</sup>Micrograms per cubic meter

<sup>b</sup>Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers

<sup>c</sup>Nitrogen dioxide

## 3.0 Modeling Impact Assessment

### 3.1 Modeling Methodology

Table 5 provides a summary of the modeling parameters used in the DEQ verification analyses.

1 Hardy, Rick and Schilling, Kevin. *Background Concentrations for Use in New Source Review Dispersion Modeling*. Memorandum to Mary Anderson, March 14, 2003.

Table 5. MODELING PARAMETERS		
Parameter	Description/Values	Documentation/Additional Description
Model	ISCS3-PRIME/BEE-LINE BEEST OUF	ISC3PBee Version 04272/BEEST Version 9.30
Meteorological data	1987-1991	Boise surface and upper air data <ul style="list-style-type: none"> <li>Anemometer height set at 6.1 meters</li> <li>Mixing heights set to a minimum of 50 meters</li> </ul>
Terrain	Not considered	The location of the source and surrounding terrain is relatively flat. DEQ did not import USGS DEM files to establish discrete receptor elevations and building and emission source base elevations.
Building downwash	Downwash algorithm	Building dimensions were obtained from modeling files submitted.  The permittee and DEQ used BP1P-Prime to establish building downwash.
Receptor grid	Grid 1	50 meter spacing along the edge of facility building out to approximately 500 meters in all directions

\*Graphic user interface

### 3.1.1 Modeling Protocol

A modeling protocol was not submitted for this project prior to submission of the application. Modeling was conducted using methods and data presented in the *State of Idaho Air Quality Modeling Guideline* and the modeling analyses approved for the issuance of the facility's initial PTC No. P-030050, issued on November 28, 2003.

### 3.1.2 Model Selection

ISCS3-Prime was used by Ada AC to conduct the ambient air analyses. ISCS3-Prime is the recommended model for this instance. Plume downwash is a concern due to the location of receptors within the building downwash recirculation cavities. All property immediately surrounding the main facility building is considered ambient air.

### 3.1.3 Meteorological Data

Boise surface and upper air meteorological data were used for the Ada AC site in Boise. The Boise airport is the closest area where model-ready surface meteorological data are available. These data were used in the modeling analyses.

PCRAMMET, the meteorological data preprocessor for ISCST3, occasionally generates unrealistically low mixing heights as a result of interpolation algorithms used with the twice daily measured mixing heights. DEQ verification modeling was conducted using meteorological data corrected for low mixing heights. All mixing height values below 50 meters were replaced with a value of 50 meters.

### 3.1.4 Terrain Effects

The modeling analyses submitted by Ada AC did not consider elevated terrain. DEQ did not import actual elevation data of each receptor by importing United Geological Survey (USGS) digital elevation map (DEM) files into the model. Design concentrations were predicted to occur at receptors at the edge of this facility's building. Therefore, the need to consider changes in terrain elevation are minimal.

### **3.1.5 Facility Layout**

DEQ verified proper identification of the facility location, layout, and buildings bordering the site by comparing the modeling input to a facility plot plan and satellite photographs of the area found on Google Earth. Google Earth information is current as of 2004. The facility and surrounding structures layout in the BPIP-Prime data is consistent with the submitted plot plan and the satellite photograph information.

### **3.1.6 Building Downwash**

Plume downwash effects caused by structures present at the facility were accounted for in the modeling analyses. The Building Profile Input Program (BPIP) Prime algorithm was used by Ada AC and DEQ to calculate direction-specific building dimensions and Good Engineering Practice (GEP) stack height information from building dimensions/configurations and emissions release parameters for ISC3-Prime.

### **3.1.7 Ambient Air Boundary**

Ada AC assumed that an ambient air boundary did not exist for this facility. All property immediately outside of the Ada AC building was treated as ambient air due to public access on the facility property.

### **3.1.8 Receptor Network**

The receptor grid used by Ada AC met the minimum recommendations specified in the *State of Idaho Air Quality Modeling Guideline* for the purpose of resolving the maximum predicted ambient impact. DEQ verification analyses were conducted using the same receptor grid.

## **3.2 Emission Rates**

Emissions rates used in the dispersion modeling analyses submitted by the applicant were reviewed against those in the permit application. The following approach was used for DEQ verification modeling:

- All modeled criteria and toxic air pollutant (TAP) emissions rates were equal to or greater than the Ada AC facility's emissions calculated in the PTC application or the existing permitted allowable rate.
- The hourly emission rate used for modeling to demonstrate compliance for pollutants with annual averaging periods were estimated using 3,120 hr/yr of operation for cremation unit PPII-1, and 1,860 hr/yr for cremation unit PPII-2.

Tables 6 and 7 list criteria air pollutant emissions rates for sources included in the dispersion modeling analyses. Daily emissions were modeled by Ada AC for 24 hours. Annual emissions were modeled over 8,760 hours per year using the hourly emission rates that were based on reduced allowable hours of operation.

Source ID	Description	Emission Rates (lb/hr <sup>a</sup> )		
		PM <sub>10</sub> <sup>a</sup>	SO <sub>2</sub> <sup>c</sup>	CO <sup>d</sup>
PPII-1	Matthews Power Pak II Cremation Unit (existing)	0.12	0.12	0.16
PPII-2	Matthews Power Pak II Cremation Unit (proposed)	0.12	0.12	0.16

<sup>a</sup>Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers

<sup>b</sup>Nitrogen dioxide

<sup>c</sup>Sulfur dioxide

<sup>d</sup>Carbon monoxide

<sup>e</sup>Pounds per hour

Source ID	Description	Emission Rates (lb/hr <sup>a</sup> )		
		PM <sub>10</sub> <sup>a</sup>	NO <sub>2</sub> <sup>b</sup>	SO <sub>2</sub> <sup>c</sup>
PPII-1	Matthews Power Pak II Cremation Unit (existing)	0.043	0.135	0.043
PPII-2	Matthews Power Pak II Cremation Unit (proposed)	0.025	0.081	0.025

<sup>a</sup>Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers

<sup>b</sup>Nitrogen dioxide

<sup>c</sup>Sulfur dioxide

<sup>d</sup>Pounds per hour

Table 8 lists the modeled TAP emissions rates for the proposed cremation unit PPII-2. Existing cremation unit PPII-1 is not subject to pre-construction TAPs compliance for this project. Daily emissions were modeled by Ada AC and DEQ for 24 hours. Annual emissions were modeled over 8,760 hours per year using emission rates scaled down to account for annual operating hour limitations.

Pollutant	Project Emissions Rate (lb/hr) <sup>a</sup>	Project Emissions Rate (T/yr) <sup>b</sup>
Hydrogen Chloride (CAS <sup>d</sup> # 7647-01-0)	0.08	0.35
Arsenic (CAS# 7440-38-2)	4.54E-06	1.99E-05
Cadmium (CAS# 7440-43-9)	1.68E-06	7.36E-06
Chromium VI (CAS # 7440-47-3)	2.05E-06	8.98E-06
Nickel (CAS # 7440-02-0)	5.80E-06	2.54E-05
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) (CAS# 1746-01-6)	2.00E-10	8.76E-10

<sup>a</sup>pounds per hour

<sup>b</sup>tons per year

### 3.3 Emission Release Parameters

Table 9 provides emissions release parameters, including stack height, stack diameter, exhaust temperature, and exhaust velocity. Values used in the analyses appeared reasonable and within expected ranges. Additional documentation /verification of these parameters was not required.

Release Point	Source Type	Stack Height (m) <sup>a</sup>	Modeled Diameter (m)	Stack Gas Temp. (K) <sup>b</sup>	Stack Gas Flow Velocity (m/sec) <sup>c</sup>
PPII-1	Point	6.95	0.518	811	5.82
PPII-2	Point	6.95	0.518	811	5.82

<sup>a</sup>Meters

<sup>b</sup>Kelvin

<sup>c</sup>Meters per second

### 3.4 Results for Full Impact Analyses

A significant contribution analysis was not submitted for this application. Ada AC submitted a full impact analysis for the proposed cremation unit and the existing cremation unit. No other emission sources were modeled. A copy of the ISC3-Prime modeling results is included in Appendix A of this memorandum.

Results of DEQ's modeling analyses are shown in Table 10.

Pollutant	Averaging Period	Modeled Design Concentration ( $\mu\text{g}/\text{m}^3$ ) <sup>a</sup>	Background Concentration ( $\mu\text{g}/\text{m}^3$ )	Total Ambient Impact ( $\mu\text{g}/\text{m}^3$ )	NAAQS <sup>b</sup> ( $\mu\text{g}/\text{m}^3$ )	Percent of NAAQS
PM <sub>10</sub> <sup>c</sup>	24-hour	15.26	90	105.26	150	70.2%
	Annual	1.66	23	26.66	50	53.3%
SO <sub>2</sub> <sup>d</sup>	3-hour	21.01	120	141.01	1,300	10.8%
	24-hour	15.60	40	55.60	365	15.2%
	Annual	1.66	10	11.66	80	14.6%
CO <sup>e</sup>	1-hour	34.90	12,200	12,234.90	40,000	30.6%
	8-hour	23.51	6,800	6,823.51	10,000	68.2%
NO <sub>x</sub> <sup>f</sup>	Annual	5.27	40	45.27	100	45.3%

<sup>a</sup>Micrograms per cubic meter

<sup>b</sup>National ambient air quality standards

<sup>c</sup>Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers

<sup>d</sup>Sulfur dioxide

<sup>e</sup>Carbon monoxide

<sup>f</sup>Nitrogen dioxide

Table 11 lists the maximum predicted TAP ambient developed by DEQ's verification analyses for the proposed cremation unit (PPII-2). The existing cremation unit, referred to as PPII-1, is not included in DEQ's modeling analyses because emission unit PPII-1 is a permitted existing emission unit that is not being modified in this project. All predicted TAP ambient impacts are below the applicable AAC/AACCs.

Pollutant	Year	Averaging Period	Maximum Concentration <sup>a</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	Receptor Location			AAC/AAAC <sup>d</sup> ( $\mu\text{g}/\text{m}^3$ )	Percent of Limit
				East (km) <sup>c</sup>	North (km)	Elevation (km)		
Non-Carcinogenic TAPs								
Hydrogen Chloride	1989	24-hour	5.94	416.62	413.25	0	375	1.6%
Carcinogenic TAPs								
Arsenic	1987	Annual	1.2E-04	416.62	413.25	0	2.3E-04	52.2%

Table 11. TOXIC AIR POLLUTANTS ANALYSIS RESULTS								
Pollutant	Year	Averaging Period	Maximum Concentration <sup>a</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	Receptor Location			AAC/AAAC <sup>d</sup> ( $\mu\text{g}/\text{m}^3$ )	Percent of Limit
				East (km) <sup>c</sup>	North (km)	Elevation (km)		
Cadmium	1987	Annual	4E-05	416.62	413.25	0	3.6E-04	7.1%
Chromium VI	1987	Annual	5E-05	416.62	413.25	0	8.3E-05	60.2%
Carcinogenic TAPs								
Nickel	1987	Annual	1.5E-04	416.62	413.25	0	4.2E-03	3.6%
2,3,7,8-TCDD	1987	Annual	5.06E-09	416.62	413.25	0	2.2E-08	23.0%

<sup>a</sup>highest 1<sup>st</sup> high value

<sup>b</sup>micrograms per cubic meter

<sup>c</sup>kilometers

<sup>d</sup>acceptable ambient concentration or acceptable ambient concentration for carcinogens

#### **4.0 Conclusions**

The ambient air impact analysis submitted, in combination with DEQ's verification analyses, demonstrated to DEQ's satisfaction that emissions from the facility, as represented by the applicant in the permit application, will not cause or significantly contribute to a violation of any air quality standard.

## **Appendix A**

### **Ada Animal Crematorium**

**F-060012**

**ISC3-Prime Modeling Results for  
Criteria Air Pollutants and TAPs**















**Appendix D**

***Correspondence***

**P-06001**

**Tracy Drouin**

---

**From:** Troy Riecke [tdriecke@mse-environmental.com]  
**Sent:** Wednesday, April 12, 2006 10:31 AM  
**To:** Tracy Drouin  
**Subject:** Ada Animal Crematorium  
**Attachments:** Fire Database Output - Crematoriums.xls

Tracy,

I have attached a file that includes emission factors extracted directly from the EPA FIRE database. I did a quick check and the emission factors in the database appear to match what the equipment vendor provided for the cremation unit.

As we discussed, the facility does not combust LPG in their units, only natural gas is combusted (the reference to LPG was from the vendor and was an option that was not provided during installation of the existing unit at their facility).

Also, as we discussed, the proposed hours of operation are 1860 hours/unit/year. This was determined based on modeling performed for the facility and was limited by TAPs.

Please let me know if you have any additional questions.

Thanks,

--

Troy D. Riecke, P.E.  
Project Engineer

**MSE - Millennium Science & Engineering, Inc.**  
1605 N. 13th Street, Boise, ID 83702  
(tel)208.345.8292 (fax)208.344.8007  
[tdriecke@mse-environmental.com](mailto:tdriecke@mse-environmental.com)

4/12/2006