

## AIR QUALITY PERMIT

Issued to: Bitter Root Humane Association  
262 Fairgrounds Road  
Hamilton, MT 59840

Permit #4175-00  
Application Complete: 1/2/08  
Preliminary Determination Issued: 2/8/08  
Department Decision Issued: 3/14/08  
Permit Final: 4/1/08  
AFS #081-0009

A Montana Air Quality Permit (MAQP), with conditions, is hereby granted to Bitter Root Humane Association (BRHA), pursuant to Sections 75-2-204, 211, and 215, Montana Code Annotated (MCA), as amended, and Administrative Rules of Montana (ARM) 17.8.740, *et seq.*, as amended, for the following:

### SECTION I: Permitted Facilities

#### A. Permitted Equipment

BRHA owns and operates a 2008 Universal Cremation Equipment A-500P animal crematory (crematorium) with a maximum incineration capacity of 75 pounds per hour (lb/hr) and associated equipment. A complete description of the permitted equipment is contained in the permit analysis.

#### B. Plant Location

The BRHA facility is located at 262 Fairgrounds Road in Hamilton, Montana. The legal description of the site is Section 19, Township 6 North, Range 20 West, in Ravalli County, Montana.

### SECTION II: Limitations and Conditions

#### A. Operational Requirements

1. BRHA shall not incinerate/cremate any material other than animal remains and/or any corresponding container unless otherwise approved by the Department of Environmental Quality (Department) in writing (ARM 17.8.749).
2. The crematorium shall be equipped with auxiliary fuel burners. The auxiliary fuel burners shall be used to preheat the secondary chamber of the crematorium to the minimum required operating temperature prior to igniting the primary chamber burner. The operating temperatures shall be maintained during operation and for ½ hour after waste feed has stopped, as follows:

The secondary chamber operating temperature of the crematorium shall be maintained above 1600 degrees Fahrenheit (°F) for any 1-hour averaging period (ARM 17.8.752).

3. BRHA shall operate the crematorium as specified in the application for MAQP #4175-00. Further, BRHA shall develop crematorium operation procedures for the crematorium, print those procedures in a crematorium operation procedures manual, and require all personnel who operate the unit to familiarize themselves with the operating procedures. The operating procedures manual shall be readily available to all personnel who operate the unit. A copy of this manual shall be supplied to the Department upon request (ARM 17.8.752).

B. Emission Limitations

BRHA shall not cause or authorize to be discharged into the atmosphere from the crematorium:

1. Visible emissions that exhibit an opacity of 10% or greater averaged over 6 consecutive minutes (ARM 17.8.752); and
2. Any particulate emissions in excess of 0.10 grains per dry standard cubic foot (gr/dscf) corrected to 12% carbon dioxide (CO<sub>2</sub>) (ARM 17.8.752).

C. Testing Requirements

1. All compliance source tests shall conform to the requirements of the Montana Source Test Protocol and Procedures Manual (ARM 17.8.106).
2. The Department may require further testing (ARM 17.8.105).

D. Monitoring Requirements

BRHA shall install, calibrate, maintain, and operate continuous monitoring and recording equipment on the crematorium to measure the secondary chamber exit gas temperature. BRHA shall also record the daily quantity of material incinerated/cremated and the daily hours of operation of the crematory (ARM 17.8.749).

E. Operational Reporting Requirement

1. BRHA shall supply the Department with annual production information for all emission points, as required by the Department in the annual emission inventory request. The request will include, but is not limited to, all sources of emissions covered by this permit.

Production information shall be gathered on a calendar-year basis and submitted to the Department by the date required in the emission inventory request. Information shall be in the units required by the Department. This information may be used to calculate operating fees, based on actual emissions from the facility, and/or to verify compliance with permit limitations (ARM 17.8.505).

2. BRHA shall notify the Department of any construction or improvement project conducted pursuant to ARM 17.8.745, that would include a change in control equipment, stack height, stack diameter, stack flow, stack gas temperature, source location or fuel specifications, or would result in an increase in source capacity above its permitted operation or the addition of a new emission unit. The notice must be submitted to the Department, in writing, 10 days prior to start up or use of the proposed de minimis change, or as soon as reasonably practicable in the event of an unanticipated circumstance causing the de minimis change, and must include the information requested in ARM 17.8.745(1)(d) (ARM 17.8.745).
3. All records compiled in accordance with this permit must be maintained by BRHA as a permanent business record for at least 5 years following the date of the measurement, must be available at the plant site for inspection by the Department, and must be submitted to the Department upon request (ARM 17.8.749).

F. Notification

BRHA shall provide the Department with written notification of the following dates within the specified time periods (ARM 17.8.749):

1. Commencement of construction of the crematorium within 30 days after commencement of construction.
2. Actual start-up date of the crematorium within 15 days after the actual start-up date.

SECTION III: General Conditions

- A. Inspection – BRHA shall allow the Department’s representatives access to the source at all reasonable times for the purpose of making inspections or surveys, collecting samples, obtaining data, auditing any monitoring equipment (CEMS, CERMS) or observing any monitoring or testing, and otherwise conducting all necessary functions related to this permit.
- B. Waiver – The permit and the terms, conditions, and matters stated herein shall be deemed accepted if BRHA fails to appeal as indicated below.
- C. Compliance with Statutes and Regulations – Nothing in this permit shall be construed as relieving BRHA of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq.* (ARM 17.8.756).
- D. Enforcement – Violations of limitations, conditions and requirements contained herein may constitute grounds for permit revocation, penalties, or other enforcement action as specified in Section 75-2-401, *et seq.*, MCA.
- E. Appeals – Any person or persons jointly or severally adversely affected by the Department’s decision may request, within 15 days after the Department renders its decision, upon affidavit setting forth the grounds therefore, a hearing before the Board of Environmental Review (Board). A hearing shall be held under the provisions of the Montana Administrative Procedures Act. The filing of a request for a hearing does not stay the Department’s decision, unless the Board issues a stay upon receipt of a petition and a finding that a stay is appropriate under Section 75-2-211(11)(b), MCA. The issuance of a stay on a permit by the Board postpones the effective date of the Department’s decision until conclusion of the hearing and issuance of a final decision by the Board. If a stay is not issued by the Board, the Department’s decision on the application is final 16 days after the Department’s decision is made.
- F. Permit Inspection – As required by ARM 17.8.755, Inspection of Permit, a copy of the air quality permit shall be made available for inspection by the Department at the location of the source.
- G. Permit Fee – Pursuant to Section 75-2-220, MCA, as amended by the 1991 Legislature, failure to pay the annual operation fee by BRHA may be grounds for revocation of this permit, as required by that section and rules adopted thereunder by the Board.
- H. Construction Commencement – Construction must begin within 3 years of permit issuance and proceed with due diligence until the project is complete or the permit shall be revoked (ARM 17.8.762).

Permit Analysis  
Bitter Root Humane Association  
Permit #4175-00

I. Introduction

A. Permitted Equipment

On December 3, 2007, Bitter Root Humane Association (BRHA) submitted a Montana Air Quality Permit (MAQP) application for the installation and operation of a 2008 Universal Cremation Equipment A-500P animal crematory (crematorium) with a maximum incineration capacity of 75 pounds per hour (lb/hr). The application was deemed complete on January 2, 2008.

The BRHA facility is located at 262 Fairgrounds Road in Hamilton, Montana. The legal description of the site is Section 19, Township 6 North, Range 20 West, in Ravalli County, Montana.

B. Source Description

The crematory is fired on natural gas and is capable of incinerating up to 75 lb/hr of animal remains. Material (animal remains) are burned in the primary chamber. This process generates a highly combustible gas mixture that flows into a secondary chamber (afterburner) operated at 1600 degrees Fahrenheit (°F), in order to complete combustion of all gaseous materials.

Initial and supplementary combustion is provided by two natural gas-fired burners, one in the primary chamber and one in the secondary chamber, with a total maximum rated design capacity of 1.5 million British thermal units per hour (MMBtu/hr).

II. Applicable Rules and Regulations

The following are partial explanations of some applicable rules and regulations that apply to the facility. The complete rules are stated in the Administrative Rules of Montana (ARM) and are available, upon request, from the Department of Environmental Quality (Department). Upon request, the Department will provide references for location of complete copies of all applicable rules and regulations or copies where appropriate.

A. ARM 17.8, Subchapter 1 – General Provisions, including, but not limited to:

1. ARM 17.8.101 Definitions. This rule includes a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.
2. ARM 17.8.105 Testing Requirements. Any person or persons responsible for the emission of any air contaminant into the outdoor atmosphere shall, upon written request of the Department, provide the facilities and necessary equipment (including instruments and sensing devices) and shall conduct tests, emission or ambient, for such periods of time as may be necessary using methods approved by the Department.
3. ARM 17.8.106 Source Testing Protocol. The requirements of this rule apply to any emission source testing conducted by the Department, any source or other entity as required by any rule in this chapter, or any permit or order issued pursuant to this chapter, or the provisions of the Clean Air Act of Montana, 75-2-101, *et seq.*, Montana Code Annotated (MCA).

BRHA shall comply with the requirements contained in the Montana Source Test Protocol and Procedures Manual, including, but not limited to, using the proper test methods and supplying the required reports. A copy of the Montana Source Test Protocol and Procedures Manual is available from the Department upon request.

4. ARM 17.8.110 Malfunctions. (2) The Department must be notified promptly by telephone whenever a malfunction occurs that can be expected to create emissions in excess of any applicable emission limitation or to continue for a period greater than 4 hours.
5. ARM 17.8.111 Circumvention. (1) No person shall cause or permit the installation or use of any device or any means that, without resulting in reduction of the total amount of air contaminant emitted, conceals or dilutes an emission of air contaminant that would otherwise violate an air pollution control regulation. (2) No equipment that may produce emissions shall be operated or maintained in such a manner as to create a public nuisance.

B. ARM 17.8, Subchapter 2 – Ambient Air Quality, including, but not limited to the following:

1. ARM 17.8.210, Ambient Air Quality Standards for Sulfur Dioxide
2. ARM 17.8.211, Ambient Air Quality Standards for Nitrogen Dioxide
3. ARM 17.8.212, Ambient Air Quality Standards for Carbon Monoxide
4. ARM 17.8.214, Ambient Air Quality Standard for Hydrogen Sulfide
5. ARM 17.8.220, Ambient Air Quality Standard for Settled Particulate Matter
6. ARM 17.8.223, Ambient Air Quality Standard for PM<sub>10</sub>

BRHA must maintain compliance with the applicable ambient air quality standards. As part of the risk assessment required for this project, the Department conducted SCREENVIEW modeling, an EPA-approved air dispersion model. The screening analysis demonstrated that the proposed project would comply with all applicable ambient air quality standards and demonstrated negligible risk to human health as required for permit issuance.

C. ARM 17.8, Subchapter 3 – Emission Standards, including, but not limited to:

1. ARM 17.8.304 Visible Air Contaminants. This rule requires that no person may cause or authorize emissions to be discharged into the outdoor atmosphere from any source installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes.
2. ARM 17.8.308 Particulate Matter, Airborne. This rule requires an opacity limitation of less than 20% for all fugitive emission sources and that reasonable precautions be taken to control emissions of airborne particulate matter (PM).
3. ARM 17.8.309 Particulate Matter, Fuel Burning Equipment. This rule requires that no person shall cause, allow, or permit to be discharged into the atmosphere particulate matter caused by the combustion of fuel in excess of the amount determined by this rule.

4. ARM 17.8.310 Particulate Matter, Industrial Process. This rule requires that no person shall cause, allow, or permit to be discharged into the atmosphere particulate matter in excess of the amount set forth in this rule.
5. ARM 17.8.316 Incinerators. This rule requires that no person may cause or authorize emissions to be discharged into the outdoor atmosphere from any incinerator, particulate matter in excess of 0.10 grains per standard cubic foot (gr/dscf) of dry flue gas, adjusted to 12% carbon dioxide and calculated as if no auxiliary fuel had been used. Further, no person shall cause or authorize to be discharged into the outdoor atmosphere from any incinerator, emissions that exhibit an opacity of 10% or greater averaged over 6 consecutive minutes.

This rule does not apply to the crematory because BRHA has applied for and received an air quality permit in accordance with ARM 17.8.770 and MCA 75-2-215 for this unit.

6. ARM 17.8.322 Sulfur Oxide Emissions--Sulfur in Fuel. This rule requires that no person shall burn liquid, solid, or gaseous fuel in excess of the amount set forth in this rule.
7. ARM 17.8.340 Standard of Performance for New Stationary Sources. This rule incorporates, by reference, 40 Code of Federal Regulations (CFR) Part 60, Standards of Performance for New Stationary Sources (NSPS). This facility is not a NSPS affected source because it does not meet the definition of any NSPS subpart defined in 40 CFR Part 60.

D. ARM 17.8, Subchapter 4 – Stack Height and Dispersion Techniques, including, but not limited to:

1. ARM 17.8.401 Definitions. This rule includes a list of definitions used in this chapter, unless indicated otherwise in a specific subchapter.
2. ARM 17.8.402 Requirements. BRHA must demonstrate compliance with the ambient air quality standards with a stack height that does not exceed Good Engineering Practices (GEP). The proposed height of the new or altered stack for BRHA is below the allowable 65-meter GEP stack height.

E. ARM 17.8, Subchapter 5 – Air Quality Permit Application, Operation, and Open Burning Fees, including, but not limited to:

1. ARM 17.8.504 Air Quality Permit Application Fees. This rule requires that an application submit an air quality permit application fee concurrent with the submittal of an air quality permit application. A permit application is incomplete until the proper application fee is paid to the Department. BRHA submitted the appropriate permit application fee for the current permit action.
2. ARM 17.8.505 Air Quality Operation Fees. An annual air quality operation fee must, as a condition of continued operation, be submitted to the Department by each source of air contaminants holding an air quality permit (excluding an open burning permit) issued by the Department. The air quality operation fee is based on the actual or estimated actual amount of air pollutants emitted during the previous calendar year.

An air quality operation fee is separate and distinct from an air quality permit application fee. The annual assessment and collection of the air quality operation fee, described above, shall take place on a calendar-year basis. The Department may insert into any final permit issued after the effective date of these rules, such conditions as may be necessary to require the payment of an air quality operation fee on a calendar-year basis, including provisions which pro-rate the required fee amount.

- F. ARM 17.8, Subchapter 7 – Permit, Construction, and Operation of Air Contaminant Sources, including, but not limited to:
1. ARM 17.8.740 Definitions. This rule is a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.
  2. ARM 17.8.743 Montana Air Quality Permits--When Required. This rule requires a person to obtain an air quality permit or permit alteration to construct, alter, or use any air contaminant sources that have the Potential to Emit (PTE) greater than 25 tons per year (TPY) of any pollutant. BRHA does not have the PTE greater than 25 TPY of any pollutant; however, in accordance with the MCA 75-2-215, an air quality permit must be obtained prior to the construction and operation of any incinerator, regardless of potential incinerator emissions. Because BRHA must obtain an air quality permit, all normally applicable requirements apply in this case.
  3. ARM 17.8.744 Montana Air Quality Permits--General Exclusions. This rule identifies the activities that are not subject to the Montana Air Quality Permit program.
  4. ARM 17.8.745 Montana Air Quality Permits--Exclusion for De Minimis Changes. This rule identifies the de minimis changes at permitted facilities that do not require a permit under the Montana Air Quality Permit Program.
  5. ARM 17.8.748 New or Modified Emitting Units--Permit Application Requirements. (1) This rule requires that a permit application be submitted prior to installation, alteration, or use of a source. BRHA submitted the required permit application for the current permit action. (7) This rule requires that the applicant notify the public by means of legal publication in a newspaper of general circulation in the area affected by the application for a permit. BRHA submitted an affidavit of publication of public notice for the December 5, 2007, issue of *The Ravalli Republic*, a newspaper of general circulation in the town of Hamilton in Ravalli County, as proof of compliance with the public notice requirements.
  6. ARM 17.8.749 Conditions for Issuance or Denial of Permit. This rule requires that the permits issued by the Department must authorize the construction and operation of the facility or emitting unit subject to the conditions in the permit and the requirements of this subchapter. This rule also requires that the permit must contain any conditions necessary to assure compliance with the Federal Clean Air Act (FCAA), the Clean Air Act of Montana, and rules adopted under those acts.
  7. ARM 17.8.752 Emission Control Requirements. This rule requires a source to install the maximum air pollution control capability that is technically practicable and economically feasible, except that Best Available Control Technology

(BACT) shall be utilized. The required BACT analysis is included in Section III of this permit analysis.

8. ARM 17.8.755 Inspection of Permit. This rule requires that air quality permits shall be made available for inspection by the Department at the location of the source.
9. ARM 17.8.756 Compliance with Other Requirements. This rule states that nothing in the permit shall be construed as relieving BRHA of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq.*
10. ARM 17.8.759 Review of Permit Applications. This rule describes the Department's responsibilities for processing permit applications and making permit decisions on those permit applications that do not require the preparation of an environmental impact statement.
11. ARM 17.8.762 Duration of Permit. An air quality permit shall be valid until revoked or modified, as provided in this subchapter, except that a permit issued prior to construction of a new or altered source may contain a condition providing that the permit will expire unless construction is commenced within the time specified in the permit, which in no event may be less than 1 year after the permit is issued.
12. ARM 17.8.763 Revocation of Permit. An air quality permit may be revoked upon written request of the permittee, or for violations of any requirement of the Clean Air Act of Montana, rules adopted under the Clean Air Act of Montana, the FCAA, rules adopted under the FCAA, or any applicable requirement contained in the Montana State Implementation Plan (SIP).
13. ARM 17.8.764 Administrative Amendment to Permit. An air quality permit may be amended for changes in any applicable rules and standards adopted by the Board of Environmental Review (Board) or changed conditions of operation at a source or stack that do not result in an increase of emissions as a result of those changed conditions. The owner or operator of a facility may not increase the facility's emissions beyond permit limits unless the increase meets the criteria in ARM 17.8.745 for a de minimis change not requiring a permit, or unless the owner or operator applies for and receives another permit in accordance with ARM 17.8.748, ARM 17.8.749, ARM 17.8.752, ARM 17.8.755, and ARM 17.8.756, and with all applicable requirements in ARM Title 17, Chapter 8, Subchapters 8, 9, and 10.
14. ARM 17.8.765 Transfer of Permit. This rule states that an air quality permit may be transferred from one person to another if written notice of intent to transfer, including the names of the transferor and the transferee, is sent to the Department.
15. ARM 17.8.770 Additional Requirements for Incinerators. This rule specifies the additional information that must be submitted to the Department for incineration facilities subject to 75-2-215, MCA.

G. ARM 17.8, Subchapter 8 – Prevention of Significant Deterioration of Air Quality, including, but not limited to:



1. ARM 17.8.801 Definitions. This rule is a list of applicable definitions used in this subchapter.
2. ARM 17.8.818 Review of Major Stationary Sources and Major Modifications-- Source Applicability and Exemptions. The requirements contained in ARM 17.8.819 through ARM 17.8.827 shall apply to any major stationary source and any major modification, with respect to each pollutant subject to regulation under the FCAA that it would emit, except as this subchapter would otherwise allow.

This facility is not a major stationary source since this facility is not a listed source and the facility's PTE is below 250 TPY of any pollutant (excluding fugitive emissions).

H. ARM 17.8, Subchapter 12 – Operating Permit Program Applicability, including, but not limited to:

1. ARM 17.8.1201 Definitions. (23) Major Source under Section 7412 of the FCAA is defined as any stationary source having:
  - a. PTE > 100 tons/year of any pollutant;
  - b. PTE > 10 tons/year of any one Hazardous Air Pollutant (HAP), PTE > 25 tons/year of a combination of all HAPs, or lesser quantity as the Department may establish by rule; or
  - c. PTE > 70 tons/year of particulate matter with an aerodynamic diameter less than or equal to 10 microns (PM<sub>10</sub>) in a serious PM<sub>10</sub> nonattainment area.
2. ARM 17.8.1204 Air Quality Operating Permit Program Applicability. (1) Title V of the FCAA Amendments of 1990 requires that all sources, as defined in ARM 17.8.1204 (1), obtain a Title V Operating Permit. In reviewing and issuing MAQP #4175-00 for BRHA, the following conclusions were made:
  - a. The facility's PTE is less than 100 tons/year for any pollutant.
  - b. The facility's PTE is less than 10 tons/year for any one HAP and less than 25 tons/year of all HAPs.
  - c. This source is not located in a serious PM<sub>10</sub> nonattainment area.
  - d. This facility is not subject to any current NSPS.
  - e. This facility is not subject to any current National Emission Standards for Hazardous Air Pollutants (NESHAP) standards.
  - f. This source is not a Title IV affected source.
  - g. This source is not an EPA designated Title V source.

Based on these facts, the Department determined that BRHA will be a minor source of emissions as defined under the Title V operating permit program.

I. MCA 75-2-103, Definitions provides, in part, as follows:

1. "Incinerator" means any single or multiple-chambered combustion device that burns combustible material, alone or with a supplemental fuel or catalytic

combustion assistance, primarily for the purpose of removal, destruction, disposal, or volume reduction of all or any portion of the input material.

2. "Solid waste" means all putrescible and nonputrescible solid, semisolid, liquid, or gaseous wastes, including, but not limited to...air pollution control facilities...

J. MCA 75-2-215, Solid or hazardous waste incineration - additional permit requirements:

1. MCA 75-2-215 requires air quality permits for all new solid waste incinerators; therefore, BRHA must obtain an air quality permit.
2. MCA 75-2-215 requires the applicant to provide, to the Department's satisfaction, a characterization and estimate of emissions and ambient concentrations of air pollutants, including hazardous air pollutants from the incineration of solid waste. The Department determined that the information submitted in this application is sufficient to fulfill this requirement.
3. MCA 75-2-215 requires that the Department reach a determination that the projected emissions and ambient concentrations constitute a negligible risk to public health, safety, and welfare. The Department completed a health risk assessment based on an emissions inventory and ambient air quality modeling for this proposal. Based on the results of the emission inventory, modeling, and the health risk assessment, the Department determined that BRHA's proposal complies with this requirement.
4. MCA 75-2-215 requires the application of pollution control equipment or procedures that meet or exceed BACT. The Department determined that the proposed incinerator (crematorium) constitutes BACT.

III. BACT Determination

A BACT determination is required for each new or altered source. BRHA shall install on the new or altered source the maximum air pollution control capability which is technically practicable and economically feasible, except that BACT shall be utilized. In addition, MCA 75-2-215 requires a BACT determination for all pollutants resulting from the crematorium operations, not only criteria pollutants.

The Department reviewed other BACT analyses as part of this analysis. BRHA proposes to control the emissions from the incinerator/crematorium with a secondary chamber designed specifically to reduce the amount of pollutants, including hazardous air pollutants, emitted from the incinerator/crematorium. Previous research conducted by the Department indicates very few crematoriums have been required to install additional air pollution control equipment beyond that provided by the design of the incinerator. With the estimated potential PM<sub>10</sub> emissions from the crematorium being 0.82 TPY, the incremental cost per ton of additional control would be very high and not in line with control costs of other similar sources. In addition, the incinerator is limited by permit to 0.10 gr/dscf for particulate matter and to 10% opacity. Therefore, the Department determined that compliance with the particulate matter and opacity emission limits, with no additional controls required, constitutes BACT in this case.

BACT for products of combustion/incineration (carbon monoxide (CO), oxides of nitrogen (NO<sub>x</sub>), volatile organic compounds (VOCs), and sulfur dioxide (SO<sub>2</sub>)) and HAPs resulting from crematorium operations is good combustion, including the requirement that the secondary chamber must be maintained at an operating temperature which exceeds 1600°F on an hourly average. The operating procedures and minimum operating temperature requirements contained

in MAQP #4175-00 will ensure good combustion and constitute BACT for this source.

Further, natural gas combustion inherently results in low emissions of air pollutants. Because potential emissions of all regulated pollutants resulting from natural gas combustion are low, incorporation of available pollutant-specific control technologies would result in high cost-effective (\$/ton removed) values, thereby making pollutant-specific add-on controls economically infeasible. Therefore, the Department determined that combustion of pipeline-quality natural gas only and proper operation and maintenance of the crematorium with no additional control constitutes BACT for all regulated pollutants resulting from natural gas combustion.

The control options selected have controls and control costs comparable to other recently permitted similar sources and are capable of achieving the appropriate emission standards.

#### IV. Emission Inventory

An emission inventory was completed for BRHA's proposal. This emission inventory for criteria pollutants was based on emission factors from the AIRS FACILITY SUBSYSTEM SOURCE CLASSIFICATION CODES (AFSSCC) manual dated March 1990 and from AP-42, Section 2.3, Medical Waste Incineration. The application indicated that the fuel used would be natural gas; therefore, the Department also used emission factors from AP-42, Section 1.4, Natural Gas Combustion, to estimate project-specific emissions from the combustion of natural gas.

Further, because the cremation unit is also subject to the requirements of MCA 75-2-215, the Department developed a HAP emission inventory using those emission factors contained in FIRE (the EPA emission factor repository) under SCC 5-02-005-05, pathological incineration. In accordance with the requirements of MCA 75-2-215, estimated HAP emissions from the crematorium will be used to demonstrate project compliance with negligible risk to human health and the environment. The Department considered only those HAPs for which an emission factor was available and that have been analyzed for other permitted similar sources. A detailed analysis and the results of the demonstration are contained in Section V and VI of the permit analysis. A complete emissions inventory is on file with the Department.

Criteria Pollutant Emissions (TPY)							
Source	PM	PM <sub>10</sub>	NO <sub>x</sub>	VOC	CO	SO <sub>x</sub>	Lead
Crematorium	0.77	0.77	0.08	0.49	0.48	0.36	0.01
Crematorium - Natural Gas Fuel Combustion	0.05	0.05	0.64	0.04	0.54	0.00	0.00
<b>Total Criteria Pollutant Potential Emissions</b>	<b>0.82</b>	<b>0.82</b>	<b>1.23</b>	<b>0.53</b>	<b>1.03</b>	<b>0.36</b>	<b>0.01</b>

Hazardous Air Pollutant Emissions	
HAP	TPY
Bromoform	0.00000
Carbon Tetrachloride	0.00001
Chloroform	0.00001
1,2-Dichloropropane	0.00022
Ethyl Benzene	0.00026
Naphthalene	0.00191
Tetrachloroethylene	0.00001
1,1,2,2-Tetrachloroethane	0.00002
Toluene	0.00076
Vinylidene Chloride	0.00001
Xylene	0.00036
<b>Total HAP Potential Emissions</b>	<b>0.00357</b>

## V. Air Quality Impacts

The Department conducted SCREENVIEW, an EPA-approved screening model, using the indicated inputs obtained from the permit application and a HAP emission rate of 1.03E-04 gram per second (g/s), which is the sum of all the hazardous air pollutant emissions from the proposed crematorium.

The individual one-hour results for each pollutant were then calculated by multiplying the modeled impact of 6.71E-02  $\mu\text{g}/\text{m}^3$  by the percentage of each individual HAP making up the total of the HAP emissions. The maximum 1-hour concentrations were then converted to an annual average and used in the risk assessment. The results are contained in Section VI, Health Risk Assessment, of the permit analysis.

### Crematorium: SCREENVIEW Model Run

#### Simple Terrain Inputs:

Source Type	=	POINT
Emission Rate (G/S)	=	0.103E-03
Stack Height (M)	=	2.4384
Stack Inside Diam (M)	=	0.5090
Stack Exit Velocity (M/S)	=	3.2005
Stack Gas Exit Temp (K)	=	755.3722
Ambient Air Temp (K)	=	293.0000
Receptor Height (M)	=	0.0000
Urban/Rural Option	=	RURAL

Stack exit velocity was calculated using a volumetric flow rate of 1,380 actual cubic feet per minute (ACFM).

#### Summary of Screen View Model Results

Calculation Procedure	Maximum 1 Hour Concentration ( $\mu\text{g}/\text{m}^3$ )	Distance of Maximum (M)	Terrain Height (M)
Simple Terrain	6.713E-02	100	0

## VI. Health Risk Assessment

A health risk assessment was conducted to determine if the proposed incinerator/crematorium complies with the negligible risk requirement of MCA 75-2-215. The emission inventory did not contain sufficient quantities of any pollutant on the Department's list of pollutants for which non-inhalation impacts must be considered; therefore, the Department determined that inhalation risk was the only necessary pathway to consider. Only those hazardous air pollutants for which there were established emission factors were considered in the emission inventory.

Negligible Risk Assessment <sup>(1)</sup>					
Hazardous Air Pollutant	Modeled Concentration (µg/m <sup>3</sup> )	Cancer URF <sup>(2)</sup> (µg/m <sup>3</sup> ) <sup>-1</sup>	Cancer Risk <sup>(3)</sup>	CNCREL <sup>(6)</sup> (µg/m <sup>3</sup> )	CNCREL Hazard Quotient <sup>(7)</sup>
Bromoform	8.96625E-06	1.10E-06	9.86E-12	ND	NA
Carbon Tetrachloride	1.7747E-05	1.50E-05	2.66E-10	1.90E+02	9.34E-08
Chloroform	1.68504E-05	2.30E-05	3.88E-10	9.80E+01	1.72E-07
1,2-Dichloropropane <sup>(4)</sup>	0.000408119	1.90E-05	7.75E-09	4.00E+00	1.02E-04
Ethyl Benzene	0.000497781	ND	ND	1.00E+03	4.98E-07
Naphthalene	0.0035865	3.40E-05	1.22E-07	3.00E+00	1.20E-03
Tetrachloroethylene <sup>(5)</sup>	1.246E-05	5.90E-06	7.35E-11	2.70E+02	4.61E-08
1,1,2,2-Tetrachloroethane	3.40099E-05	5.80E-05	1.97E-09	ND	NA
Toluene	0.001428416	ND	ND	4.00E+02	3.57E-06
Vinylidene Chloride	2.19519E-05	5.00E-05	1.10E-09	2.00E+02	1.10E-07
Xylene	0.000680198	ND	ND	1.00E+02	6.80E-06
<b>Total Risks</b>	-----	-----	<b>1.34E-07</b>	-----	<b>1.31E-03</b>
A copy of the Screen View modeling conducted for this project is on file with the Department.					
(1) Source of chronic dose-response values is from Table 1: Prioritized Chronic Dose Response Values for Screening Risk Assessments ( <a href="http://www.epa.gov/ttn/atw/toxsource/table1.pdf">www.epa.gov/ttn/atw/toxsource/table1.pdf</a> , 2/28/06).					
(2) Cancer Chronic Inhalation Risk Factor (1/ug/m <sup>3</sup> ).					
(3) Cancer Risk is unitless and is calculated by multiplying the predicted concentration by the URF.					
(4) AKA Propylene dichloride.					
(5) AKA Tetrachloroethene, Perchloroethylene.					
(6) Chronic Noncancer Reference Exposure Level.					
(7) The CNCREL hazard quotient is determined by calculating the modeled HAP concentration by the CNCREL.					

The Department determined that the risks estimated in the risk assessment for the crematorium are in compliance with the requirement to demonstrate negligible risk to human health and the environment. As documented in the above table and in accordance with the negligible risk requirement, no single HAP concentration results in Cancer Risk greater than 1.00E-06 and the sum of all HAPs results in a Cancer Risk of less than 1.00E-05. Further, the sum of the Chronic Noncancer Reference Exposure Level (CNCREL) hazard quotient is 7.15E-03, which is less than 1.0 as required to demonstrate compliance with the negligible risk requirement.

## VII. Taking or Damaging Implication Analysis

As required by 2-10-105, MCA, the Department conducted a private property taking and damaging assessment and determined there are no taking or damaging implications.

## VIII. Environmental Assessment

An environmental assessment, required by the Montana Environmental Policy Act, was completed for this project. A copy is attached.

Analysis Prepared By: Moriah Peck, P.E.  
Date: February 1, 2008

DEPARTMENT OF ENVIRONMENTAL QUALITY  
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Air Resources Management Bureau  
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**FINAL ENVIRONMENTAL ASSESSMENT (EA)**

Issued For: Bitter Root Humane Association  
262 Fairgrounds Road  
Hamilton, MT 59840

Permit Number: 4175-00

*Preliminary Determination Issued: 2/8/08*

*Department Decision Issued: 3/14/08*

*Permit Final: 4/1/08*

1. *Legal Description of Site:* The BRHA facility is located at 262 Fairgrounds Road in Hamilton, Montana. The legal description of the site is Section 19, Township 6 North, Range 20 West, in Ravalli County, Montana.
2. *Description of Project:* BRHA proposed to install and operate a 2008 Universal Cremation Equipment A-500P animal crematory (crematorium) and associated equipment. The crematorium is fired on natural gas and would be capable of incinerating up to 75 pounds per hour of animal remains.
3. *Objectives of Project:* The project would allow BRHA to install a crematorium to dispose of animal remains while maintaining compliance with negligible risk requirements as discussed in Section VI of the permit analysis.
4. *Alternatives Considered:* In addition to the proposed action, the Department also considered the “no-action” alternative. The “no-action” alternative would deny issuance of the air quality preconstruction permit to the proposed facility. However, the Department does not consider the “no-action” alternative to be appropriate because BRHA demonstrated compliance with all applicable rules and regulations as required for permit issuance. Therefore, the “no-action” alternative was eliminated from further consideration.
5. *A Listing of Mitigation, Stipulations, and Other Controls:* A list of enforceable conditions for the crematorium, including a BACT analysis, would be included in MAQP #4175-00.
6. *Regulatory Effects on Private Property:* The Department considered alternatives to the conditions imposed in this permit as part of the permit development. The Department determined that the permit conditions are reasonably necessary to ensure compliance with applicable requirements and demonstrate compliance with those requirements and do not unduly restrict private property rights.

7. The following table summarizes the potential physical and biological effects of the proposed project on the human environment. The “no-action” alternative was discussed previously.

		Major	Moderate	Minor	None	Unknown	Comments Included
A	Terrestrial and Aquatic Life and Habitats			X			Yes
B	Water Quality, Quantity, and Distribution			X			Yes
C	Geology and Soil Quality, Stability and Moisture			X			Yes
D	Vegetation Cover, Quantity, and Quality			X			Yes
E	Aesthetics			X			Yes
F	Air Quality			X			Yes
G	Unique Endangered, Fragile, or Limited Environmental Resources			X			Yes
H	Demands on Environmental Resource of Water, Air and Energy			X			Yes
I	Historical and Archaeological Sites				X		Yes
J	Cumulative and Secondary Impacts			X			Yes

**SUMMARY OF COMMENTS ON POTENTIAL PHYSICAL AND BIOLOGICAL EFFECTS:** The following comments have been prepared by the Department.

**A. Terrestrial and Aquatic Life and Habitats**

Emissions from the proposed project would affect terrestrial and aquatic life and habitats in the proposed project area. However, as detailed in Section V and Section VI of the permit analysis, any emissions and resulting impacts from the project would be minor due to the low concentration of those pollutants emitted.

Further, the proposed crematorium would require only a limited amount of construction and would be located in between an existing shop/garage and animal shelter in a packed driveway area. Overall, any impact to the terrestrial and aquatic life and habitats of the proposed project area would be minor.

**B. Water Quality, Quantity and Distribution**

The proposed project would not affect water quantity or distribution in the proposed project area. The crematorium would operate within a building and would not discharge or use water as part of the project.

Emissions from the proposed project would affect water quality in the proposed project area. However, as detailed in Section V and Section VI of the permit analysis, any emissions and resulting deposition impacts from the project would be minor due to the low concentration of those pollutants emitted.

**C. Geology and Soil Quality, Stability, and Moisture**

The proposed project would not affect the geology, soil quality, stability, and moisture of the proposed project area. The proposed crematorium would require only a limited amount of construction and would be located in between an existing shop/garage and animal shelter in a packed driveway area.

Further, as described in Section V and Section VI of the permit analysis, the crematorium would result in minor air pollution emissions to the outside ambient environment. These pollutants would deposit on the soils in the surrounding area. Any impact from deposition of these pollutants would be minor due to dispersion characteristics and the low concentration of those pollutants emitted.

D. Vegetation Cover, Quantity, and Quality

Emissions from the proposed project would affect vegetation cover, quantity, and quality in the proposed project area. However, as detailed in Section V and Section VI of the permit analysis any emissions and resulting impacts from the project would be minor.

Further, the proposed project would not affect the vegetation cover, quantity, and quality of the proposed project area. The proposed crematorium would require only a limited amount of construction and would be located in between an existing shop/garage and animal shelter in a packed driveway area. No plants, trees, grasses, or crops are reported to be within 75 feet of the proposed site. Overall, any impact to the vegetation cover, quantity, and quality of the proposed project area would be minor.

E. Aesthetics

The proposed project would not impact the aesthetic nature of the proposed project area because the proposed crematorium would require only a limited amount of construction and would be located in between an existing shop/garage and animal shelter in a packed driveway area. Because the project area is currently used as an animal shelter, the project would not change the aesthetic nature of the area. Further, visible emissions from the source would be limited to 10% opacity and the permit would include emission control requirements. Also, the project would result in only a minor amount of noise from normal operations.

F. Air Quality

The proposed project would result in the emission of various criteria pollutants and HAPs to the ambient air in the proposed project area. However, as detailed through air dispersion modeling in Section V and Section VI of the permit analysis, any air quality impacts from the proposed project would be minor and would constitute negligible risk to human health and the environment.

The Department conducted air dispersion modeling to determine the ambient air quality impacts from HAPs that would be generated by the crematorium. The SCREENVIEW model was selected for the air dispersion modeling. The full meteorology option was selected to provide a conservative result. Receptors were placed from 100 to 5,000 meters in a simple terrain array.

Stack parameters and emission rates used in the SCREENVIEW model are contained in Section V of the permit analysis and are on file with the Department. Stack velocity and gas temperature were taken from data provided by the manufacturer of the crematorium. Due to the dispersion characteristics and low levels of pollutants that would be emitted from the proposed project, the Department determined that any impacts to air quality would be minor.

G. Unique Endangered, Fragile, or Limited Environmental Resources

In an effort to identify any unique, fragile, or limited environmental resources in the proposed area of construction and operation, the Department contacted the Montana Natural Heritage Program, Natural Resources Information System (NRIS). NRIS search results concluded that there are seven known species of concern within the search locale. The search locale is defined by the section, township, and range of the proposed site, with an additional 1-mile buffer. The



known species of concern include the gray wolf, Westslope cutthroat trout, Lewis's Woodpecker, Fringed Myotis, Bald Eagle, Bull Trout, and Townsend's Big-eared Bat. These species are listed as sensitive and/or threatened. While these resources may be found in specific habitats through the defined area, the NRIS search did not indicate that these species of special concern would locate directly on or relatively near the proposed site. Therefore, it is unlikely that these species of special concern would realize any impacts from the proposed project beyond minor air emissions impact.

Emissions from the proposed project could impact the previously identified unique endangered, fragile, or limited environmental resource located in the proposed project area. However, as detailed in Section VI of the permit analysis, any emissions and resulting impacts from the project would be minor due to the low concentration of those pollutants emitted. Overall, any impact to this unique endangered, fragile, or limited environmental resource of the proposed project area would be minor.

#### H. Demands on Environmental Resources of Water, Air, and Energy

The proposed project would result in minor demands on environmental resources of water and air as discussed in Section 7.B and 7.F, respectively, of this EA. Further, as detailed in Section V and Section VI of the permit analysis, project impacts on air resources in the proposed project area would be minor due to dispersion characteristics and the low concentration of those pollutants emitted. Finally, because the project is small by industrial standards, little energy would be required for operation and the resulting impact on energy resources would be minor.

#### I. Historical and Archaeological Sites

The Department contacted the Montana Historical Society - State Historic Preservation Office (SHPO) in an effort to identify any historical and/or archaeological sites that may be present at the proposed project site. Search results concluded that there are no previously recorded historical or archaeological sites within the project area. According to the SHPO, there would be a low likelihood cultural properties would be impacted. Therefore, no impacts upon historical or archaeological sites would be expected as a result of this project.

#### J. Cumulative and Secondary Impacts

Overall, the cumulative and secondary impacts from this project on the physical and biological environment in the immediate area would be minor due to the relatively small size and potential environmental impact of the proposed operation. The Department believes that this facility could be expected to operate in compliance with all applicable rules and regulations as outlined in MAQP #4175-00.

8. The following table summarizes the potential economic and social effects of the proposed project on the human environment. The “no-action” alternative was discussed previously.

		Major	Moderate	Minor	None	Unknown	Comments Included
A	Social Structures and Mores				X		Yes
B	Cultural Uniqueness and Diversity				X		Yes
C	Local and State Tax Base and Tax Revenue			X			Yes
D	Agricultural or Industrial Production				X		Yes
E	Human Health			X			Yes
F	Access to and Quality of Recreational and Wilderness Activities				X		Yes
G	Quantity and Distribution of Employment			X			Yes
H	Distribution of Population			X			Yes
I	Demands for Government Services			X			Yes
J	Industrial and Commercial Activity			X			Yes
K	Locally Adopted Environmental Plans and Goals				X		Yes
L	Cumulative and Secondary Impacts			X			Yes

**SUMMARY OF COMMENTS ON POTENTIAL ECONOMIC AND SOCIAL EFFECTS:** The Department has prepared the following comments.

**A. Social Structures and Mores**

The proposed project would not cause a disruption to any native or traditional lifestyles or communities (social structures or mores) in the area because the project would be located at an existing animal shelter. The proposed project would not change the nature of the site.

**B. Cultural Uniqueness and Diversity**

The proposed project would not have an impact on the cultural uniqueness and diversity of the proposed area of operation because the crematorium would require only a limited amount of construction and would be located at an existing animal shelter. The predominant use of the surrounding area would not change as a result of the proposed project.

**C. Local and State Tax Base and Tax Revenue**

The proposed project would have a minor impact on the local and state tax base and tax revenue. The project is small by industrial standards, thus any economic impact to the area would be minor. Further, the project would require only a minor amount of new construction and a limited amount of employees/operators for normal operations. The animal shelter currently employs seven fulltime staff members, and anticipates adding one additional employee within the year.

**D. Agricultural or Industrial Production**

Because the crematorium would require only a limited amount of construction and would operate at an existing animal shelter, the project would not affect or displace any land used for agricultural production. Further, no additional industrial production would result from the proposed project.

## E. Human Health

The peak annual ambient HAP impact from the operation of the crematorium would be 6.713E-03  $\mu\text{g}/\text{m}^3$ . The predicted annual ambient impact of each individual HAP was determined by multiplying the peak annual ambient concentration by the emission rate of the HAP. The impacts calculated for each HAP are compared to the cancer and non-cancer levels specified in Tables 1 and 2 of ARM 17.8.770. If the predicted ambient impact of a particular HAP is less than the level specified in the table and the inhalation pathway is the only appropriate pathway, that HAP can be excluded from the human health risk assessment. The table summarized in Section V of the permit analysis indicates the calculated ambient impacts of the HAPs, the cancer and non-cancer levels, and whether or not each HAP passes the screening criteria.

As detailed in Section VI of the permit analysis, a health risk assessment was conducted to determine if the proposed crematorium would comply with the negligible risk requirement of MCA 75-2-215 and ARM 17.8.770. The emission inventory did not contain sufficient quantities of any pollutant on the Department's list of pollutants for which non-inhalation impacts must be considered; therefore, the Department determined that inhalation risk would be the only necessary pathway to consider. As defined in ARM 17.8.740(10), negligible risk is *"an increase in excess lifetime cancer risk of less than  $1.0 \times 10^{-6}$  for any individual pollutant, and  $1.0 \times 10^{-5}$  for the aggregate of all pollutants, and an increase in the sum of the non-cancer hazard quotients for all pollutants with similar toxic effects of less than 1.0 in order to determine negligible risk."* For the purposes of determining the negligible risk of the crematorium, all pollutants were included in the human health risk assessment.

All of the individual pollutant concentrations for the Chronic Non-cancer Reference Exposure Level (CNCREL) meet the acceptable risk limit because they are less than 1.00E-06 for each pollutant and less than 1.00E-05 for the aggregate of all pollutants. Further, the sums of the chronic and acute non-cancer hazard quotients are less than 1.0. Therefore, the crematorium proposed for the BRHA facility meets the criteria of ARM 17.8.770 and operation of the incinerator would be considered a negligible risk to public health, safety, welfare, and to the environment. Overall, any impacts to human health in the proposed project area would be minor.

## F. Access to and Quality of Recreational and Wilderness Activities

Because the crematorium would require only a limited amount of construction and would operate at an existing animal shelter, the project would not affect any access to or quality of any recreation or wilderness activities in the area.

## G. Quantity and Distribution of Employment

The proposed project would result in only minor impacts to the quantity or distribution of employment at the facility and surrounding community. The project would require only a minor amount of new construction and a limited amount of employees/operators for normal operations. The animal shelter currently employs seven fulltime staff members, and anticipates adding one additional employee within the year.

## H. Distribution of Population

The crematorium would require only a limited amount of employees/operators for normal operations. The animal shelter currently employs seven fulltime staff members, and anticipates adding one additional employee within the year. Therefore, the proposed project would have only a minor impact, if any, on the distribution of population in the area.

I. Demands for Government Services

Government services would be required for acquiring the appropriate permits from government agencies. In addition, the permitted source of emissions would be subject to periodic inspections by government personnel. Overall, demands for government services would be minor.

J. Industrial and Commercial Activity

The proposed project would result in only a minor impact on local industrial and commercial activity because the crematorium would require only a limited amount of new construction, would operate at an existing animal shelter, and would not result in additional industrial production. Overall, any impacts to industrial and commercial activity in the proposed area of operation would be minor.

K. Locally Adopted Environmental Plans and Goals

The Department is not aware of any locally adopted environmental plans or goals in the immediate area affected by the proposed project. The state standards would be protective of the proposed project area.

L. Cumulative and Secondary Impacts

Overall, cumulative and secondary impacts from this project would result in minor impacts to the economic and social environment in the immediate area due to the relatively small size of the operation. The Department believes that this facility could be expected to operate in compliance with all applicable rules and regulations as would be outlined in MAQP #4175-00.

*Recommendation:* No Environmental Impact Statement (EIS) is required.

*If an EIS is not required, explain why the EA is an appropriate level of analysis:* The current permit action is for the construction and operation of a crematorium. MAQP #4175-00 includes conditions and limitations to ensure the facility would operate in compliance with all applicable rules and regulations. In addition, as detailed in the above EA, there are no significant impacts associated with the proposed project.

*Other groups or agencies contacted or which may have overlapping jurisdiction:* Montana Historical Society – State Historic Preservation Office; Natural Resource Information System – Montana Natural Heritage Program

*Individuals or groups contributing to this EA:* Department of Environmental Quality – Air Resources Management Bureau; Montana Historical Society – State Historic Preservation Office; Natural Resource Information System – Montana Natural Heritage Program

*EA prepared by:* Moriah Peck, P.E.

*Date:* February 1, 2008