



Frequently Asked Questions: Crematory Operations

1. Definitions:

What is cremation?

South Carolina Code of Law, Section 40-19-20, defines cremation as the reduction of the dead body by intense heat to residue.¹

What is a crematory?

South Carolina Air Pollution Control Regulation 61-62.1 defines a crematory operation as any incinerator designed and used solely for the burning of human remains or animal remains.²

2. How are human crematories regulated?

The U.S. Environmental Protection Agency (EPA) does not have any air quality regulations specifically for human crematory operations. The South Carolina Department of Health and Environmental Control (DHEC) Bureau of Air Quality (BAQ) does regulate crematory operations and requires anyone wanting to operate a crematory to apply for an air permit. The permit is written in accordance with air quality regulations which are established to protect public health and the environment.

3. How many crematories are currently in operation in the state?

There are approximately eighty (80) human crematories in operation in South Carolina.

4. What are the types of air pollutants emitted from a crematory operation?

Air pollutants are emitted as a result of the combustion process. Federal Clean Air Act-designated criteria pollutants emissions include: Particulate Matter (PM); Particulate Matter less than 10 micrometers in diameter (PM₁₀); Particulate Matter less than 2.5 micrometers in diameter (PM_{2.5}); Sulfur Dioxide (SO₂); Nitrogen Oxides (NO_x); Carbon Monoxide (CO); and Volatile Organic Compounds (VOC). Hazardous Air Pollutants (HAP), including mercury (Hg), may also be present. The amount of

¹ <http://www.scstatehouse.gov/code/t40c019.php>

² http://www.scdhec.gov/Agency/docs/air-regs/r61-62_1.pdf#page=1

mercury emitted during this process can be influenced by what is in a body, such as mercury containing dental fillings.

DHEC permits crematory operations as minor (small) sources of emissions. Emissions from crematories are expected to be less than five (5) tons per year, compared with a major source, which emits over 100 to 250 tons per year. Federal and state air quality rules frequently require more stringent emission limits and monitoring requirements on major sources because they are more likely to have a greater impact on air quality.

5. Do these emissions pose any health risks?

The U.S. EPA and DHEC regulate the pollutants listed above because of the potential risks to public health and welfare. Many people have concerns about the potential effects of mercury emissions from a crematory operation. Mercury emissions can be emitted during the crematory process due to dental amalgam fillings and other metals present in the body. As alternative dental filling materials are becoming more available, the potential for mercury emissions may be reduced. See question 9 below for operation restrictions.

Air quality regulations are set to be protective of public health and the environment and DHEC permits are written to reflect compliance with these standards. Mercury emissions, specifically, are regulated under South Carolina Regulation 61-62.5, Standard No. 8 – Toxic Air Pollutants.³

See the answer to question 8 below for additional information about how DHEC has assessed potential exposures from crematory operations.

6. What control devices are used to reduce emissions?

An afterburner is used to reduce pollutant gases being emitted from incomplete combustion, Particulate Matter, and carbon monoxide. In the afterburner, combustible materials are oxidized by maintaining a high temperature for a set time to further complete the combustion process.

7. What are the hours of operation?

Operating hours vary by facility. Some local ordinances may limit hours of operation. DHEC cannot restrict the hours of operation for a facility if the facility can demonstrate it can comply with all air quality regulations operating at normal hours. See question 9 below for other restrictions.

³ https://www.scdhec.gov/Agency/docs/air-regs/r61-62_5S8.pdf

8. What is air dispersion modeling and is it required?

Air dispersion modeling is an air quality analysis using an EPA-approved tool to predict where the maximum amount of pollutant concentration occurs at the facility property boundary and beyond. These maximum concentrations are then compared to state and national standards to determine if emissions from the facility will interfere with air quality.

DHEC developed and issued a crematory operations registration permit on August 1, 2012. An air quality analysis was conducted during this permit development process. DHEC assessed emissions and other parameters from existing South Carolina crematory operations to find the most conservative prediction of ambient air quality results. Mercury emissions were modeled based on the worst-case scenario and the results showed that the state air toxic standard was met, with restrictions. These restrictions are detailed in the response to Question 9.

9. How many cremations are allowed per day?

DHEC has issued a registration permit for crematory operations that is in accordance with S.C. Regulation 61-62.5, Standard No. 8 – Toxic Air Pollutants. The following restrictions are in place to meet this standard: crematories with uncapped stacks may not cremate more than nine (9) bodies per day; crematories with capped stacks, unless they automatically open when in operation, may not cremate more than two (2) bodies per day.

10. Will there be any odors?

The afterburner control devices are in place to reduce air pollutant emissions and may also reduce odors. However, there are no federal or state air quality odor regulations. The presence of odor does not necessarily indicate the presence of dangerous air pollution. Many air pollutants can be detected by smell at much lower concentrations than the maximum allowable concentrations established to protect public health. If operated properly, odors are not likely. If odors are detected, citizens should refer to any local ordinances or contact the appropriate regional DHEC office found at www.scdhec.gov/HomeAndEnvironment/DHECLocations/.

11. What happens if any malfunctions occur?

Air permit conditions require proper crematory operation, recordkeeping and monitoring to ensure a facility operates in compliance with air quality regulations. Any malfunctions or process upsets must be reported to the appropriate DHEC regional office within twenty-four (24) hours. A written report describing the occurrence must also be submitted, including the cause of and the action taken to

remedy the occurrence. DHEC then reviews that report to determine if any violations occurred or if permit modifications need to be made.

12. Will there be any sewage discharge? Will my well water be contaminated?

There are typically no sewage discharges associated with the cremation process.

However, some crematories may be co-located with funeral homes that may have sanitary wastewater and wastewater from other services such as embalming. Funeral homes with wastewater discharges should discharge to a sanitary sewer, where available. If sanitary sewer is not available (mostly in rural locations), funeral homes should have septic tanks for their sanitary waste. A separate holding tank would be required for embalming waste. The facility would be required to pump and haul embalming waste to a wastewater treatment facility capable of treating the wastewater in accordance with the pump and haul requirements of S.C. Regulation 61-67.300.G.2.⁴

Although crematories are not specifically addressed, S.C. Regulation 61-71.E.1 (Well Standards) specifies a well must be at a minimum distance of one hundred (100) feet from chemical, herbicide, pesticide and petroleum storage or handling sites. A well must be at a minimum distance of seventy-five (75) feet from a septic tank.⁵ These regulations are in place to ensure that underground sources of drinking water are not contaminated and public health is protected.

13. Do crematories have infectious waste?

According to South Carolina's Infectious Waste Management Regulations (S.C. Regulation 61-105, E(2)(f)), human corpses, remains, products of conception and anatomical parts that are intended to be interred, cremated, or donated for medical research are excluded from the definition of infectious waste.⁶ Furthermore, a crematory is similar to incineration; incineration is a treatment option considered to provide destruction of most infectious agents.

14. Is the process of embalming involved in cremation? If so, how does it affect the process?

According to the South Carolina Funeral Directors Association, there are no South Carolina state laws requiring bodies to be embalmed, though some funeral homes

⁴ <http://www.scdhec.gov/Agency/docs/water-regs/r61-67.pdf>

⁵ http://www.scdhec.gov/Agency/docs/lwm-regs/r61_71_well%20standards.pdf

⁶ <http://www.scdhec.gov/Agency/docs/lwm-regs/R61-105.pdf>

require it for public viewings.⁷ In discussions with funeral home operators, an embalmed body may be cremated if a public viewing was held prior to cremation.

According to the Cremation Association of North America, embalming chemicals react with blood and tissue in a way that does not adversely impact the cremation process.⁸

⁷ <http://scfda.org/consumer/final-arrangement-questions/>

⁸ <http://www.cremationassociation.org/>