

3.1.6

EMS Aspects: Education - Gross Anatomy Nitrogen Oxides (NO_x), Wastes

Aspect Ranking: 12

The University of Texas Health Science Center at Houston (UTHSC-H) is a research and educational institution which utilizes cadavers and laboratory animal specimens to train future health care professionals. Once specimens have served their educational purposes, remains and associated wastes are disposed in a cost effective, safe, and environmentally compliant manner.

Gross Anatomy, Environmental Releases

Task/Activity Description:

Cadaver and animal remains disposal; disposal of spent cadaver tank solution

There are two natural gas crematories located in the UTHSC-H Medical School Building which are run individually by Neurobiology & Anatomy's Gross Anatomy and Center for Laboratory Animal Medicine and Care (CLAMC). These crematories are utilized for the disposal of animal and human remains and utilize a common exhaust stack and can not be operated simultaneously. Nitrogen oxides (NO_x) are released during the incineration process and are regulated by the Federal Clean Air Act and the Texas Clean Air Act.

The Houston Galveston area is designated as a severe non-attainment area for ozone. This designation limits the potential to emit (PTE) for minor sources of air pollution to 25 tons per year (TPY) of VOC's and and 25 TPY of Nitrogen Oxides. The Environmental Protection Program has completed an analysis of the annual emissions from the crematories to demonstrate compliance with minor source limits.

The UTHSC-H Crematories are authorized by standard exemption 90 which applies to Pathological Waste Incinerators. The crematories were installed in the UTHSC-H Medical School Building in 1996 and are registered under permit number 33286.

The gross anatomy course utilizes human cadavers which students dissect over the course of a semester. These cadavers are embalmed using chemicals containing formaldehyde and glutaraldehyde, and are submersed in tanks containing 2% phenol as a preservative. At the end of each block, approximately 6 weeks, the tank solution is discarded and replaced.

Key Control Points:

The permit by rule and Houston-Galveston area conditions are evaluated and NO_x PTE is calculated by the Environmental Protection Program utilizing 8,760 hours for each crematory. The evaluation of permit by rule conditions was initially completed in 2003, and is reevaluated annually, or upon significant process change.

To assess disposal considerations for the spent dissection tank solution, the EPP conducts an annual hazardous waste analysis and communicates disposal requirements to Neurobiology & Anatomy Staff.

Related Forms, Records, SOPs:

- EHSA
- Certification of Air Emissions

Personnel Responsible:

Neurobiology & Anatomy Chair/CLAMC Director

- Maintain crematory usage records
- Operate crematory according to permit by rule requirements
- Dispose of spent tank solution according to local, state and federal regulations

Safety Specialists, EPP

- Assists with the collection of usage records
- Perform Semi-annual survey
- Perform annual waste analysis on spent cadaver tank solution

Safety Manager, EPP

- Oversee and conduct PTE evaluations, waste analysis and retain documented results

EH&S Director

- Liaison with the Gross Anatomy/CLAMC Directors
-

Environmental Compliance (Air Releases) Program

Task/Activity Description:

Crematory Air Emission and Environmental Health & Safety Survey

Schedule: Semiannually

To assist Gross Anatomy and CLAMC employees, who operate the crematories at the UTHSC-H Medical School Building, in complying with the requirements for control of NOx emissions, management of wastes, and general safety, the Environmental Health & Safety Department's Environmental Protection Program (EPP) conducts semiannual surveys of the crematories and waste handling practices.

Inspections are performed by the EPP manager or safety specialist utilizing a checklist survey form. Currently, deficiencies are noted on the form by checking the "yes, no, or not applicable" boxes or by adding items to an additional comments section on the survey form. Once the survey is complete, a memo listing any noted deficiencies and corrective actions is sent to the Chair of Neurobiology & Anatomy and the Director of the Center for Laboratory Animal Medicine and Care.

Deficiencies noted during the survey are tracked for resolution utilizing EHS Assistant. As part of the deficiency tracking process, at least thirty days are given to correct any deficiencies, before potentially escalating enforcement actions.

Key Control Points:

- Identify sources of NOx and compare management practices to regulatory requirements
- Identify potential mismanagement, improper storage and disposal of hazardous wastes
- Communicate environmental compliance requirements to personnel who operate incinerators and generate hazardous wastes

Related Forms, Records, SOPs:

Thermal Devices (Incinerator) Survey Form

Personnel Responsible:

Neurobiology & Anatomy Chair/CLAMC Director

- Oversee crematory operations and ensure amount and type of materials disposed of do not exceed permit by rule limits

Manager/Safety Specialists, EPP

- Initiate facility survey process with Crematory Directors
- Perform facility survey
- Enter deficiencies into database and generate memo report
- Track appropriate response through deficiency database
- Monitor inspection schedule through the EPP compliance calendar
- Advise appropriate actions on the compliance process
- Retain inspection and air emission documentation for 3 years

EH&S Director

- Liaison with the Gross Anatomy/CLAMC Directors

Annual Training – Environmental Management Systems and Environmental Awareness

Task/Activity Description:

For the communication of environmental programs and environmental management systems, the EPP provides training for Gross Anatomy and CLAMC staff. This training introduces and reinforces environmental management system principles, air emission control practices specific to the crematory operations, and environmental concerns and compliance requirements for air emissions and hazardous materials management. The training may be scheduled and lead by an instructor, administered during semi-annual inspections, or accessed via the EH&S web page.

Key Control Points:

- Communicate environmental compliance requirements and environmental management concepts to personnel who operate, clean, and maintain crematory equipment.
- Communicate environmental compliance requirements and environmental management concepts to personnel who dispose of hazardous and potentially hazardous wastes

Related Forms, Records, SOPs:

- Environmental Awareness and Environmental Management Systems (power point presentation)

Personnel Responsible:

Neurobiology & Anatomy Chair/CLAMC Director

- Ensure staff attend training

Manager/Safety Specialists, EPP

- Develop training materials and submit updates to for web page
- Schedule training as appropriate
- Present training materials to crematory operators

- Document training by obtaining a sign in sheet with all participants listed, deliver sign in sheet to EH&S administrative assistant who will enter names of personnel trained into a training data base

EH&S Director

- Provide management review, liaison with Gross Anatomy and CLAMC Directors if necessary
-