



Odor and Noise from Cannabis Growing Operations

MHOA/MassDEP Regional Seminars

Tuesday, Feb. 27, 2024 – Virtual

Thursday, Feb. 29, 2024 – Devens

Thursday, March 7, 2024 – Holyoke



Cannabis Cultivation Operations

- Emerging source of odor complaints.
- Can also be a source of noise complaints because of the use of chillers for indoor cultivation facilities.
- Cities and towns have been taking a proactive approach in trying to prevent complaints through Host Community Agreements.



Regulated by MassDPH

- **Indoor Air Quality and Worker Exposure:**
 - On November 16, 2023, the Massachusetts Department of Public Health (DPH) released an investigative report outlining additional steps the cannabis industry should take to prevent work-related asthma and sent a bulletin to health care providers in the Commonwealth urging vigilance in identifying work-related asthma among workers in that industry. These steps were taken after an investigation conducted by DPH and the Occupational Safety and Health Administration (OSHA) confirmed that the first known occupational asthma fatality in the US cannabis workforce happened in 2022 in Massachusetts. The bulletin reminded providers that they are mandated to report cases of work-related asthma and other respiratory diseases to DPH.



MassDPH Contact for the Report

“Cannabis Flower Technician Experiences Fatal Asthma Exacerbation — Massachusetts” dated Nov. 16, 2023

- Emily H. Sparer-Fine, ScD, MS
- Director, Occupational Health Surveillance Program
- Emily.Sparer-Fine@mass.gov
- Mobile: 617-549-6169



Indoor Air - Smoking Complaints From Multi- Unit Residential Buildings

Information for residents, landlords and condo associations about smoke-free housing can be found on MassDPH's website at:

<https://www.mass.gov/info-details/smoke-free-housing>

Or, in the Boston Public Health Commission's "A Landlord's Guide to Smoke-free Housing".



MassDEP Regulations (Outdoor or Ambient Air)

- Odor Control Regulation
 - 310 CMR 7.09
- Noise Control Regulation – 310 CMR 7.10
 - Regulations adopted under the authority of M.G.L. Chapter 111, Section § 142B and § 142D and can be enforced by local officials under 310 CMR 7.52.



310 CMR 7.52 Enforcement

Provisions

- Any police department, fire department, board of health official acting within his/her jurisdictional area is authorized by the Department to enforce any regulation in which specific reference to 310 CMR 7.52 is cited.



What is an Air Contaminant per MassDEP's 310 CMR 7.00?

- **Air Contaminant** - means any substance or man-made physical phenomenon in the ambient air space and includes, but is not limited to dust, fly-ash, gas, fume, **odor**, smoke, vapor, pollen, microorganism, radioactive material, radiation, heat, **sound**, any combination, or any decay or reaction production thereof. *(See 310 CMR 7.00)*



Definition of Air Pollution

- Air Pollution - means the presence in the **outdoor** air of one or more air contaminants thereof in such **concentrations** and of such **duration** as to:





Air Pollution Definition - Continued

- A. Cause a nuisance;
- B. Be injurious, or to be on the basis of current information, potentially injurious, to human or animal life, to vegetation, or to property; or
- C. Unreasonably interfere with the comfortable enjoyment of life and property or the conduct of business.



Cannabis Cultivation Operations

- MassDEP's air pollution control plan approval threshold is one (1) ton per year of volatile organic compounds (VOC). MassDEP's Central Regional Office has not been finding out until after an odor complaint is received that certain facilities should have applied for an approval prior to installation and operation. MassDEP's Western Regional Office has been taking proactive measures by offering pre-permit meetings to proposed cannabis growing facilities who extract cannabis oil.

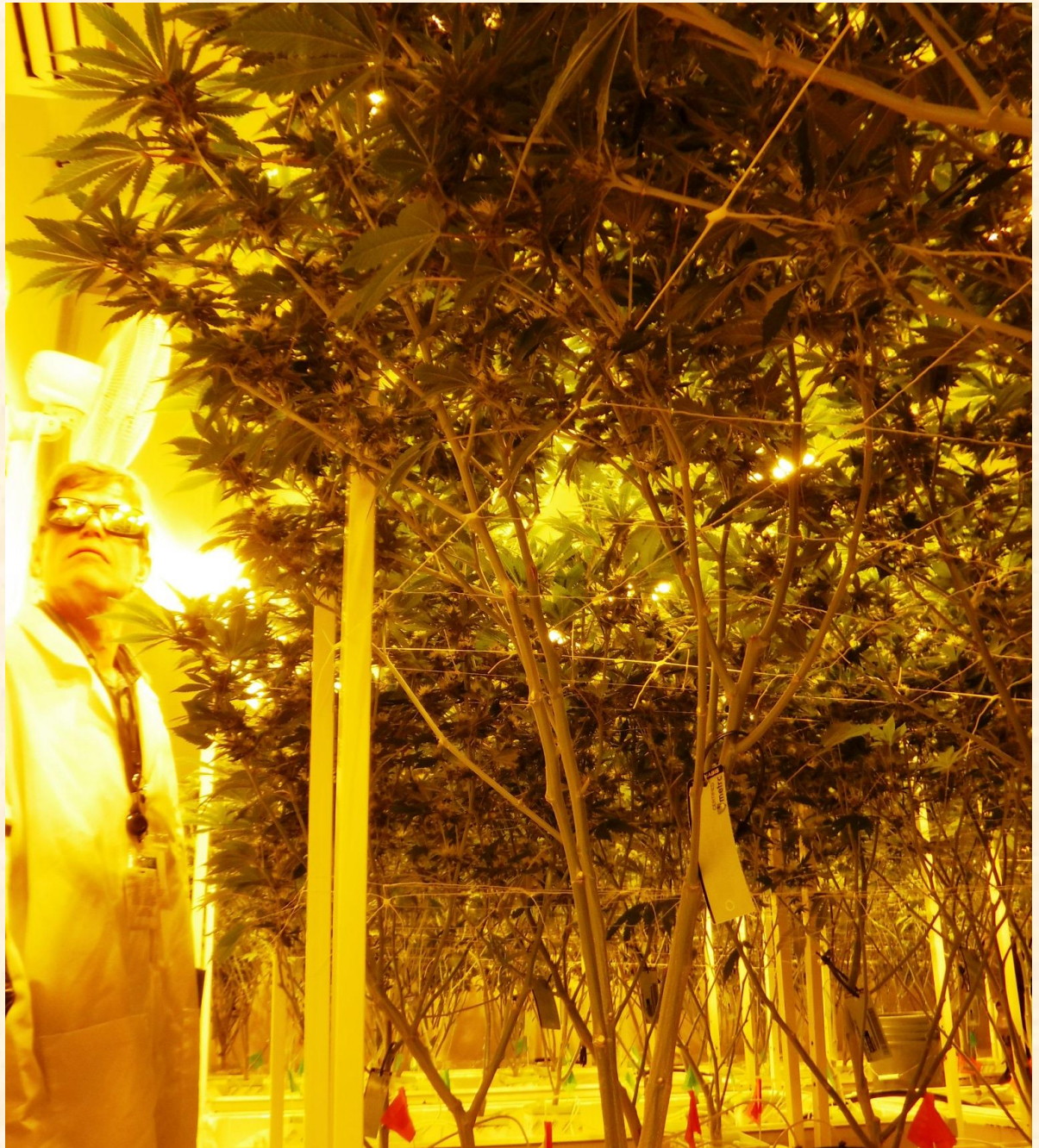


MassDEP Plan Approvals

- MassDEP's Central Regional Office has issued 7 plan approvals for cannabis growers with oil extraction. The emissions range is:
- Emissions from cleaning (usually isopropyl alcohol): **1.14 TPY - 4.6 TPY**
- Emissions from ethanol extractions: **1.39 TPY - 7.5 TPY**
- Emissions from butane/propane extractions: **3.69 TPY**



Odor





Cannabis Grow Facility Odors

- The recognizable odor from cannabis grow facilities comes from terpenes, which are volatile hydrocarbons present in different plants.
- Cannabis has higher concentrations of terpenes than most plants, so it tends to be associated with it. Cannabis can have over 150 different types of terpenes.
- Terpenes are most odorous as the growing of the plants progress, particularly in the flowering and drying stages. This is a period most facilities will need to monitor more closely for odor control.



Cannabis Plants





Carbon Filtration Grow Room



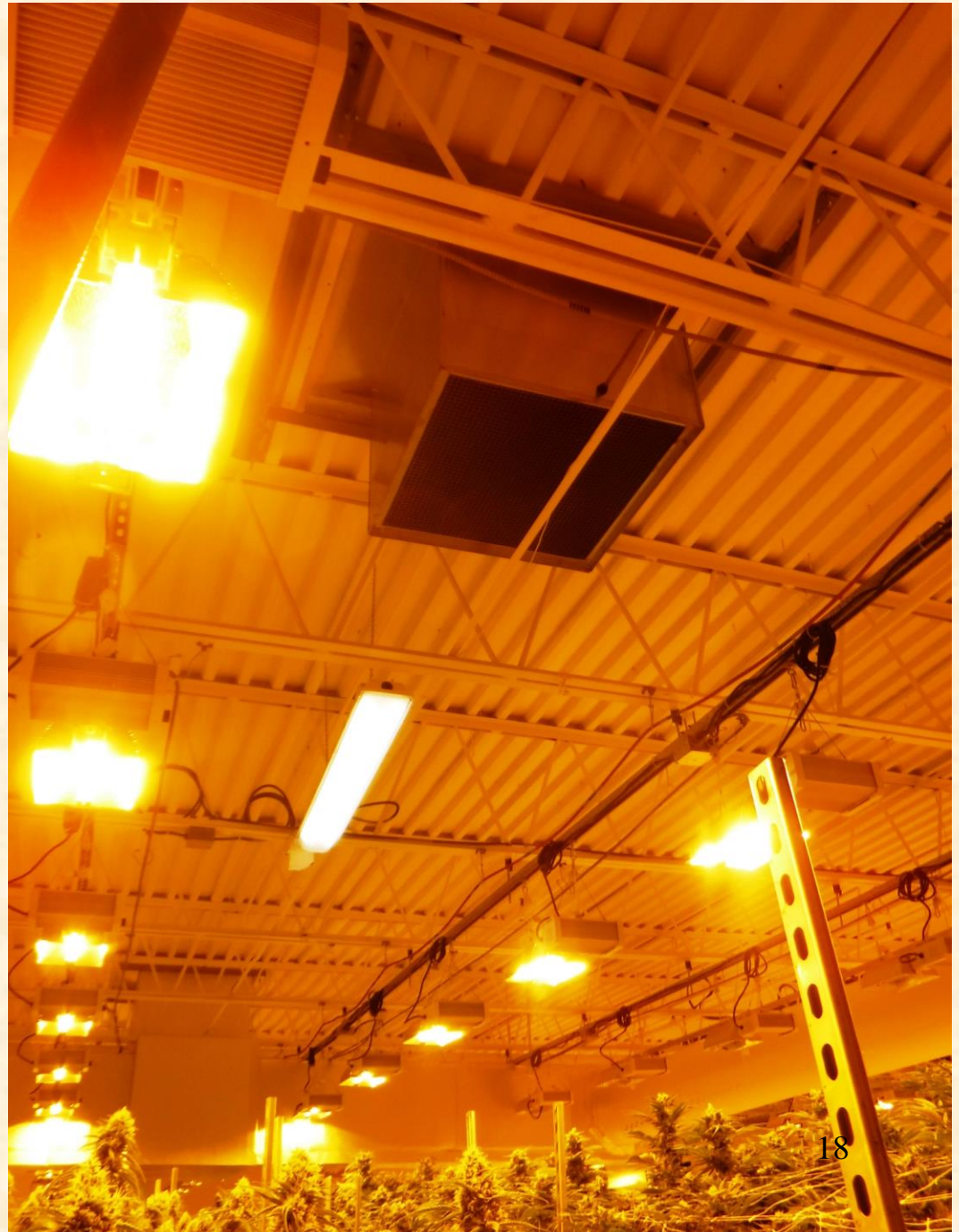


Cannabis Buds





**Grow
Room
Exhaust
Vent with
Carbon
Filter**





Cannabis Drying Rack





Cannabis Drying Room





Cannabis Distillation Area





Carbon Filter Over Distillation Area





Investigating Odor Complaints

- Note the weather condition.
- Determine if the odor can be detected on the complainant's property. Note the intensity level, frequency, duration and type of the odor.
- If an odor problem is determined, try to trace the odor back to its origin.



Investigating Odor Complaints

- Determine if the odor is unreasonably interfering with the private enjoyment of the resident's property or unreasonably interfering with the conduct of business.



Example of an Odor Intensity Scale

- 0 – Odor not detectable
- 1- **Very Light**- odor detectable but not distinguishable
- 2- **Light**- Odor detectable but not objectionable in short durations
- 3- **Moderate**- Odor detectable, clearly distinguishable and may be objectionable or irritating
- 4- **Strong**- Odor present objectionable
- 5- **Very Strong**- Odor present and overpowering-intolerable for any length of time



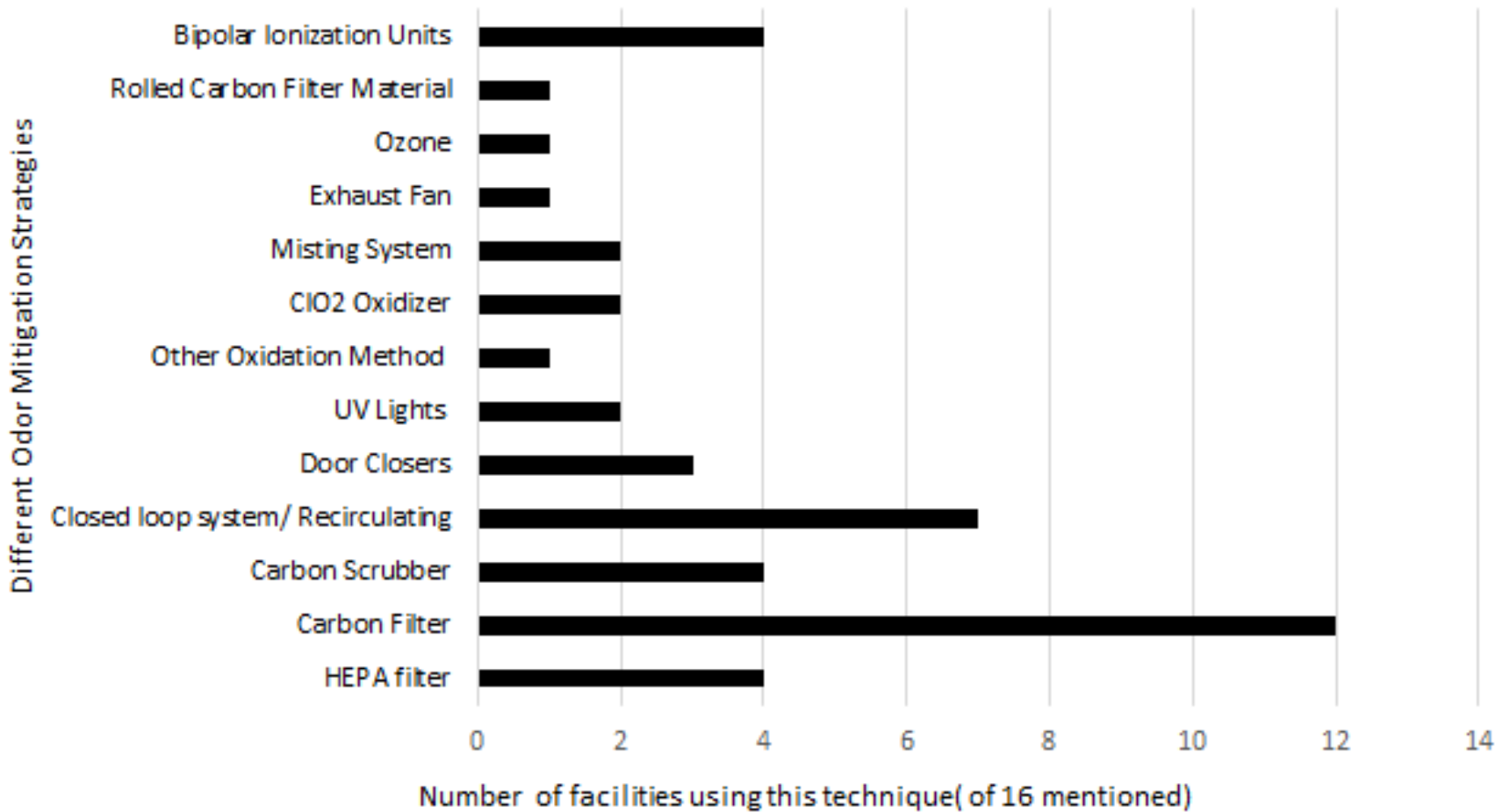
Research into Odor Control Methods

- In 2023, a MassDEP Central Regional Office intern contacted 60 cannabis growers in Massachusetts about what was used for odor mitigation.
- If off-site odors are determined to cause or contribute to a condition of air pollution, the onus is on the company to determine which control method works best for odor mitigation.



Odor Mitigation Survey 4/2023

Cannabis Cultivation Odor Mitigation Techniques in Massachusetts





MassDEP Noise Regulation

- Noise Control Regulation – 310 CMR 7.10
 - Adopted under the authority of M.G.L. Chapter 111, Section § 142B and § 142D.
 - Used to limit the noise impact of new stationary sources and to respond to complaints of certain excessive noise.
 - Can be enforced by local officials under the authority of 310 CMR 7.52.



310 CMR 7.10(1) - Noise

- “No person owning, leasing or controlling a source of sound shall willfully, negligently, or through failure to provide necessary equipment, service or maintenance or to take necessary precautions cause, suffer, allow, or permit unnecessary emissions from said source of sound that may cause noise.”



DEP Noise Policy #90-001

- A source of sound will be considered to be violating the DEP noise regulation if the source:
 1. Increases the broadband level by more than 10 dB(A) above ambient, or
 2. Produces a “pure tone” condition - when any octave band center frequency sound pressure level exceeds the two adjacent center frequency sound pressure levels by 3 decibels or more.



What is dB(A)?

- dB(A) is a unit of sound measurement where the actual sound measurement (in decibels) is altered (or weighted) to reflect human sound sensitivity. For instance, for those frequencies of sound which humans hear very well, the actual reading is enhanced or increased, in the weighting process. The “weighted” reading therefore emphasizes the frequencies best heard by humans, and likewise de-emphasizes those sound frequencies which are less well heard.



What is Ambient Sound Level?

- Ambient sound level is the sound from all sources other than the particular sound of interest (background sound level). The ambient sound measurement (A-Weighted Noise Level) is taken where the offending sound cannot be heard, or with the source sound shut-off. The ambient sound level is rarely found to be consistent over time and is usually quite variable (considered to be the level that is exceeded 90% of the time that the noise measurements are taken).



What is a “Pure tone” Condition?

- A pure-tone condition is when any octave band center frequency sound pressure level exceeds the two adjacent center frequency sound pressure levels by 3 decibels or more.
- The emergency broadcast system and emergency sirens use a pure tone which is designed to get people’s attention.



Sound Exposure in the Real World

- Quite bedroom- 30 dBA
- Dishwasher next room- 50 dBA
- Normal speech – 65 dBA
- Vacuum cleaner at 3m- 70 dBA
- Garbage disposal at 1m- 80 dBA
- Blender at 1m- 90 dBA
- Inside subway train – 100 dBA
- Jet over flight at 300m – 105 dBA
- Rock band at 5m- 110 dBA



Sources of Noise Complaints from Cannabis Growing Operations

- Chillers
- Emergency Generators



Chillers



Chillers should be equipped with sound attenuating material and/or baffled with a noise barrier.



Equipment Under Chiller Can Be Wrapped with Sound Attenuating Material





Chiller wrapped with Sound Attenuating Material





Mobil Chiller with Acoustical Wrapping





Chillers with Noise Barrier





Noise Barrier with Acoustical Panels Added





Emergency Engines – Need to be equipped with a muffler





Environmental Results Program (ERP) for Emergency Engines

- The ERP includes performance standards for the use of clean fuels, equipment maintenance, and record keeping requirements for new emergency engines with a rated power output equal to or greater than 37 kilowatts (kW). Companies who install new emergency engines must submit an initial installation certification within 60 days following the start of operation.
- One of the certification questions – “Is the unit designed, and have you located the unit, so that when operated sound impacts upon sensitive receptors will be minimized and will be in compliance with 310 CMR 7.10 Noise?”



Other Sources of Noise Complaints

- **Roof top equipment**
 - Most complaints result from equipment problems (ex. - loose belt). Company should have a maintenance plan for roof-top equipment.
 - Before adding new roof-top equipment, company should identify possible sound potential and identify sensitive receptors.



Sound Measurements

- Sound level meter phone applications are available through Google Play at no cost.
- Local officials can contact MassDEP's Regional Offices to arrange to borrow a sound level meter and receive basic training on how to utilize it.



The Best Solution is Prevention!



Preventative Measures

- New / Expanded Facilities
 - Identify possible odor and noise potential.
 - Identify sensitive receptors in relation to exhaust vents/stacks or noise generating equipment.
 - Require an odor control plan with standard operating procedures to maintain the equipment in good working order.



Preventative Measures - Continued

- New / Expanded Facilities
 - Emergency generators need a muffler and file an ERP certification with MassDEP.
 - Chillers need to be wrapped with noise mitigation material. A sound barrier around noise generating equipment may also be necessary.
 - Require mitigation to be part of design.
 - If the company is planning to extract cannabis oil, advise reaching out to MassDEP for a pre-permit meeting.

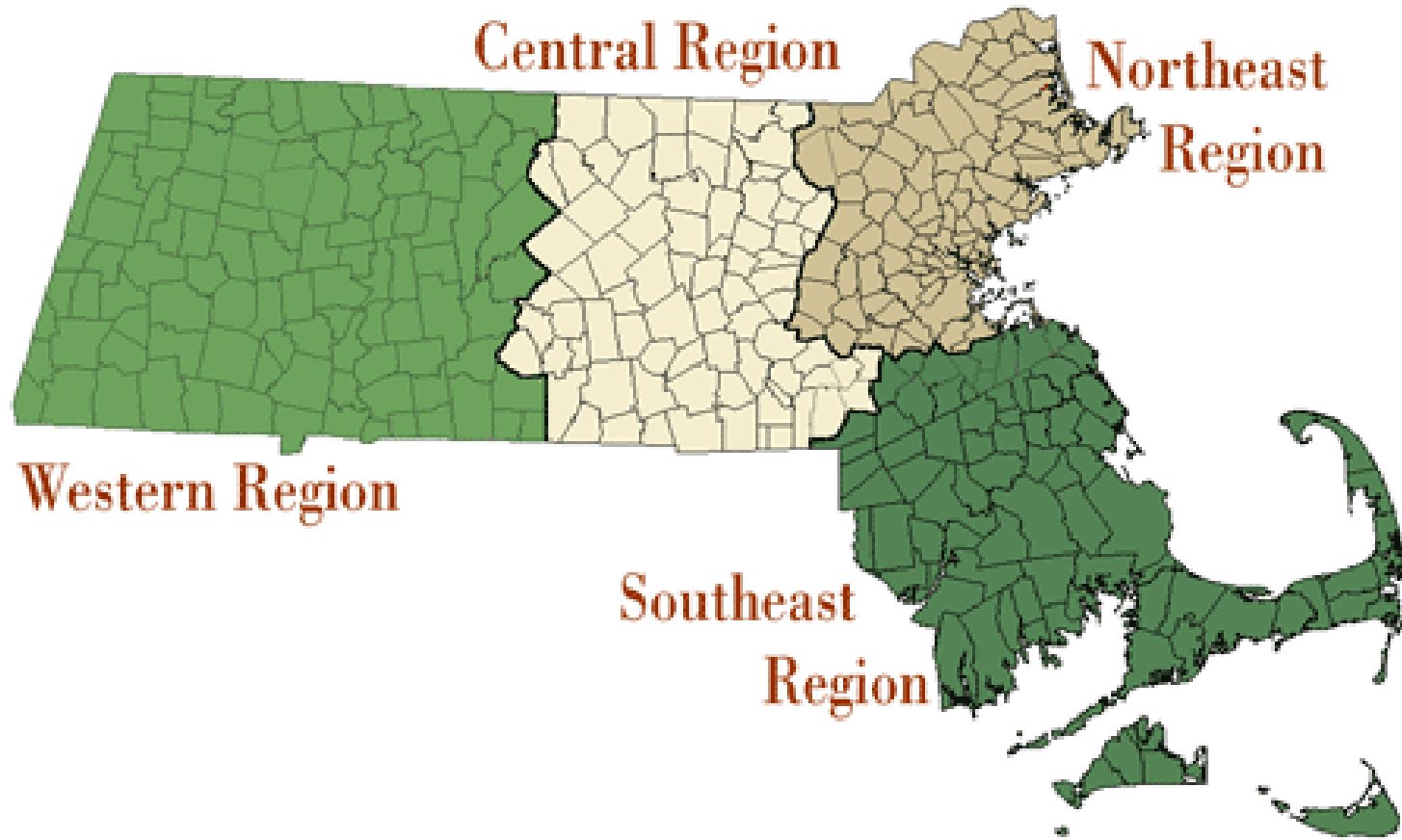


Role of MassDEP in Complaint Response

- In most cases when MassDEP receives a complaint, we will contact the Board of Health or Health Agent (in some cases, the Fire Dept) first.
 - To obtain background information
 - To foster faster response time
- MassDEP can provide technical support & guidance to the community.
 - MassDEP may take a greater role if the issue is technically complex or if it involves an industrial facility.
 - MassDEP may have a greater role if state permitting is required.



MassDEP Regions





Contacts for AQ Nuisances

- Northeast Region – Scott Fasulo, 857-208-4427, scott.fasulo@mass.gov
- Central Region – Michelle Delemarre, 857-772-6966, michelle.delemarre@mass.gov
- Southeast Region & Cape Cod – Complaint Line, 508-946-2817
- Western Region – Main Phone Number, (413) 784-1100