

# EBC Noise Program

## MassDEP Noise Policy Implementation – Have You Heard About It?

# Welcome

## Ruth Silman

*Chair, EBC Climate Change and Air Committee*

*Partner, Nixon Peabody LLP*



**Environmental Business Council of New England**  
*Energy Environment Economy*

# Program Introduction & Overview

**Mike Feinblatt**

*Program Chair & Moderator*

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**Environmental Business Council of New England**  
*Energy Environment Economy*

# EBC Noise Program

MassDEP Noise Policy Implementation  
Have You Heard About It?

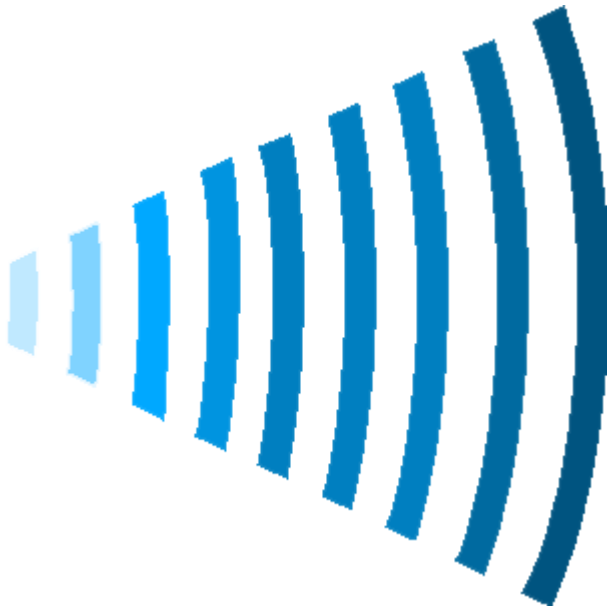
## PROGRAM INTRODUCTION & OVERVIEW

March 28, 2018

Presented by:

**Mike Feinblatt**

[mfeinblatt@essgroup.com](mailto:mfeinblatt@essgroup.com)



# About ESS Group, Inc.

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- Multi-disciplinary environmental consulting and engineering firm serving energy and industrial markets
- Under current ownership since 1997
- Offices in Waltham, MA and East Providence, RI



# MassDEP Noise Control Regulation

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The MassDEP regulates noise as an air pollutant:

310 CMR 7.10(1)

No person owning, leasing, or controlling a source of sound shall willingly, 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.

# MassDEP Noise Policy

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## DAQC Policy 90-001 (February 1, 1990)

A source of sound will be considered to be violating the Department's noise regulation (310 CMR 7.10) if the source:

1. Increases the broadband sound 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.

These criteria are measured both at the property line and at the nearest inhabited residence. Ambient is defined as the background A-weighted sound level that is exceeded 90% of the time measured during equipment operating hours. The ambient may also be established by other means with the consent of the Department.



# MassDEP Noise Policy Interpretation

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<https://www.mass.gov/files/documents/2018/01/31/noise-interpretation.pdf>

Noise levels that exceed the criteria at the source's property line by themselves do not necessarily result in a violation of air pollution under MassDEP's regulations.

- ✓ A new noise source will be required to mitigate its sound emissions if they are projected to cause the broadband sound level at a residence or building housing sensitive receptors to exceed ambient background by more than 10 dB(A).
- ✓ A new noise source that would be located in an area that is not likely to be developed for residential use in the future, or in a commercial or industrial area with no sensitive receptors may not be required to mitigate its noise impact in those areas, even if projected to cause noise levels at the facility's property line to exceed ambient background by more than 10 dB(A).



# MassDEP Noise Policy Compliance

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Historically, Massachusetts air plan approval applicants proposing new sources which will increase sound levels at their property line have done the following to comply with the MassDEP Noise Policy:

1. Conduct ambient sound measurements at the proposed property line and at nearby sensitive receptors during different time periods (day/night, weekday/weekend) to establish the background sound level ( $L_{90}$ ) which is exceeded 90% of the time.
2. Conduct noise propagation modeling to predict the maximum operational sound levels at the property line and at the nearby sensitive receptors during worst-case facility operations (all equipment operating at the same time).
3. Compare the predicted maximum operational sound levels at each location with the measured background sound levels. If there are no predicted increases more than 10 dB(A), compliance has been demonstrated. If there is an increase greater than 10 dB(A), repeat modeling with mitigation until compliance is demonstrated.

# MassDEP “New” Noise Policy Interpretation?

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## **MassDEP BWP AQ Sound Form (6/11)**

### **Introduction**

When proposing sound suppression/mitigation measures, similar to the traditional “top-down” BACT process, the “top case” sound suppression/mitigation measures which deliver the lowest sound level increase above background are required to be implemented, unless these measures can be eliminated based upon technological or economic infeasibility. An applicant cannot “model out” of the use of the “top case” sound suppression/mitigation measures by simply demonstrating that predicted sound levels at the property line when employing a less stringent sound suppression/mitigation strategy will result in a sound level increase of less than or equal to the 10 dBA above background sound level increase allowed by the MassDEP; it is not the sound level increase upon which the design of sound suppression/mitigation strategies should be based. Also, take into consideration that the city or town that the project is located in may have a noise ordinance that may be more stringent than the criteria in the MassDEP Noise Policy.

# MassDEP “New” Noise Policy Interpretation?

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## Issues with the “New” Noise Policy Interpretation

- The Noise BACT requirement is not being enforced consistently – some long term regional MassDEP AQ staff are not even aware of the requirement
- BACT for most stationary air pollution sources is well established:
  - ✓ The available control technologies are limited and known
  - ✓ The control efficiencies of the available control technologies are known
  - ✓ Control cost thresholds (\$/ton) have been established and are known
- BACT for noise mitigation measures has not been established:
  - ✓ The available mitigation measures are virtually unlimited when you consider that walls of different materials can theoretically be placed at any relative distance/direction/orientation from the source and at any height
  - ✓ The control efficiencies of the available mitigation measures can only be determined through iterative modeling, which can make determining the top case measures problematic
  - ✓ Control cost thresholds (\$/dB(A)) have not been established – how much is too much to spend to achieve how much of an increase?
- Applicants are left without noise mitigation cost or design certainty until their application is reviewed

## Conclusions

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- Applicants for a MassDEP Air Plan Approval may be required to demonstrate compliance with the MassDEP Noise Policy
- The MassDEP Noise Policy as written is clear-cut and historically it has been relatively straightforward for applicants to demonstrate compliance
- The MassDEP is now requiring some applicants to go beyond compliance and propose the “top case” mitigation measures which deliver the lowest sound level increase, unless these measures are economically or technologically infeasible
- The thresholds for determining whether proposed mitigation measures are “top case” or if they are economically or technologically infeasible are unclear, leaving applicants without cost or design certainty when it comes to noise mitigation
- Additional clarification from the MassDEP on their planned implementation of the Noise Policy going forward would provide applicants with more cost and design certainty for future projects

# Thank you. Any questions?

**Mike Feinblatt**

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# MassDEP and Municipal Legal Authority to Regulate Noise

**Daniel Bailey**

*Partner*

*Pierce Atwood LLP*



**Environmental Business Council of New England**  
*Energy Environment Economy*

# MassDEP and Municipal Legal Authority to Regulate Noise

Daniel J. Bailey, Esq. Partner  
Pierce Atwood LLP  
Environmental Business Council  
March 28, 2018

## STATE LAW AUTHORITY TO REGULATE NOISE

- Sources of Authority – Massachusetts Clean Air Act M.G.L. Chapter 111, Sections 142A-M and the MassDEP Air Pollution Control Regulations 310 CMR 7.00.
- Regulations provide little guidance on noise regulation.
- “Noise” defined as “sound of sufficient intensity and/or duration as to cause a condition of air pollution.”
- “Air pollution” in turn defined as:

The presence in the ambient air space of one or more air contaminants or combinations thereof in such concentrations and of such duration as to:

- Cause a nuisance;
- Be injurious or potentially injurious to human health or animal life, to vegetation, or to property;
- Unreasonably interfere with the comfortable enjoyment of life and property.



# NOISE POLLUTION

- Noise pollution is prohibited in 310 CMR 7.10(1), which provides that:

[n]o 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.

- Specific examples of violations:
  - Prolonged and unattended sounding of burglar alarms;
  - Operation of construction equipment without noise controls.
- Broadly interpreted and can also cover “other man-made sounds that cause noise.”
- Certain activities exempted:
  - Parades, sporting events;
  - Emergency vehicles;
  - Domestic equipment such as lawn mowers and power saws between 7 am and 9 pm.

## HOW DOES DEP EVALUATE NOISE IMPACTS?

- Applications for new sources of air pollution.
- DEP looks at the potential increase in sound levels over ambient conditions and the impacts of noise.

## DEP NOISE POLICY

Division of Air Quality Control Policy 90-001, February 1, 1990

- A source of sound will be considered to be violating the Department's noise regulation (310 CMR 7.10) if the source:
  1. Increased the broadband sound 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.
- Measured at the property line and at the nearest inhabited residence.
- Ambient is defined as the background A-weighted sound level that is exceeded 90% of the time measured during equipment operating hours.
- The ambient may also be established by other means with the consent of the Department.

## DEP NOISE POLLUTION POLICY INTERPRETATION

- Established January 2018
- When does DEP evaluate noise?
  1. When DEP reviews applications for approval under its air pollution regulations – typically large commercial and industrial facilities
  2. In response to complaints from the public

## DEP ENFORCEMENT

- Clean air act provides DEP with authority to issue fines up to \$25000 day for violations.
- Dep involvement usually in noise issues usually occurs when a project requires a DEP issued permit.
- If there are noise complaints DEP will investigate.
- Violations will result in a notice of non-compliance.
- Most likely result is an administrative consent order that requires mitigation.
- Can revoke permits in extreme situations.

## DEP ENFORCEMENT (con't)

- DEP enforcement is rare.
- DEP website has only a few examples of noise enforcement over the last 3 years.
- DEP has broad enforcement authority but it is rare for DEP to issue a NON to a noise generator that does not have a DEP permit.

## APPEALS / DEP

- NON can be appealed like any other DEP enforcement order.
- Appeal goes to Office of Administrative Dispute Resolution (OADR).
- Sometimes appeal is brought by neighbors opposed to new or expanded facility see *Century Acquisition, Inc.* OADR Docket No 2011-25 and 26.

## MUNICIPAL REGULATION OF NOISE

- Most municipalities have a noise ordinance
- Often based on MNS
- Enforcement depends on the terms of the ordinance
- Most typically a board of health by law enforced through the local health event
- Building inspector may also have enforcement authority



## MUNICIPAL ENFORCEMENT DIFFICULT

- Ordinances often vague.
- Building inspectors and board of health agents are not noise experts.
- Sensitivity to noise can be subjective.
- Large industrial and commercial facilities are often large employers.
- Very little case law
  - Glass v Marblehead Board of Health, Mass. Superior Court No. 2007-05499

## MUNICIPAL REMEDIES

- Fine - but probably limited to \$300 day.
- Injunction from superior court ordering noise source shut down.
- Injunction remedy unlikely unless compelling public safety or health issue.

## MUNICIPAL ENFORCEMENT OF 310 CMR 7.00

- 310 CMR 7.52 authorizes boards of health to enforce DEP noise regulations.
- Confirmed in *Glass*
- In community with no noise ordinance board of health can act against excessive noise.
- If there is municipal ordinance then can seek enforcement under both clean air act and local ordinance.
- \$25,000 day fines?

## APPEALS

- Some ordinances provide appeal to town board such as board of health.
- If zoning based any order of building inspector can be appealed to zoning board of appeal.
- If no appeal process provided by ordinance then can appeal to superior court.

## DEP ENFORCEMENT

7.10: U Noise (1) 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. (2) 310 CMR 7.10(1) shall pertain to, but shall not be limited to, prolonged unattended sounding of burglar alarms, construction and demolition equipment which characteristically emit sound but which may be fitted and accommodated with equipment such as enclosures to suppress sound or may be operated in a manner so as to suppress sound, suppressible and preventable industrial and commercial sources of sound, and other man-made sounds that cause noise. (3) 310 CMR 7.10(1) shall not apply to sounds emitted during and associated with: (a) parades, public gatherings, or sporting events, for which permits have been issued provided that said parades, public gatherings, or sporting events in one city or town do not cause noise in another city or town; (b) emergency police, fire, and ambulance vehicles; (c) police, fire, and civil and national defense activities; (d) domestic equipment such as lawn mowers and power saws between the hours of 7:00 A.M. and 9:00 P.M. (4) 310 CMR 7.10(1) is subject to the enforcement provisions specified in 310 CMR 7.52.

# Noise Concerns in an Industrial Setting

**Joseph Dufresne**

*Manager, Site Environmental Compliance  
and Planning*

*Saint-Gobain Abrasives*

# NOISE CONCERNS IN AN INDUSTRIAL SETTING

MARCH 28, 2018

JOE DUFRESNE  
MGR. ENVIRONMENTAL COMPLIANCE  
SAINT-GOBAIN, WORCESTER, MA





## OUR SETTING

- Manufacturing operations began on site in 1885
- 24/7 365 day operation
- Approximately 50 control devices with blowers or fans, most running 24/7
- Situated in a valley
- Residential housing developed around the complex
- New housing developments built in the 1990s are “above” the complex





# TYPICAL AIR PERMITTING REQUIREMENTS

- Each company has air permitting requirements overseen by the Massachusetts Department of Environmental Protection (MassDEP)
- When neighbors express a concern of noise, the MassDEP may impose additional requirements for permitting external manufacturing operations equipment, including:
  - Requirements to submit a noise test protocol with an equipment application
  - Hiring of a noise consultant to test the area during times when there is limited “background” noise, such as a highway
  - Submit a report to the MassDEP with details of the findings

## EXPERIENCE OF PAST 10 YEARS

- Common fence line neighbor issues may include:
  - back-up alarms on trucks and plows
  - fans and condensers
  - low frequency emissions
- Make all fence line neighbor concerns a priority and determine the root cause of the noise as soon as possible through engagement and study
- Work in concert with local regulators and stakeholders, such as:
  - Affected neighbors
  - Local city/town Inspectional Services
  - Massachusetts Department of Environmental Protection
  - Local Police Department
  - Local Fire Department

## HOW CAN I HELP?

- Identify and hire qualified noise consultants to assist in identifying the root cause of the noise
  - Visiting neighbors at their homes to learn their concerns
  - Setting-up equipment on neighbor's property to collect data on noise exposure
  - Sampling at the property line to determine any changes in decibels
  - Arranging for manufacturing operations equipment to be turned on/turned off while at the neighbors home to narrow down potential cause
- Sometimes, the noise isn't related to the company!

## CASE STUDY: NOISE MITIGATION PROJECT

- Received multiple neighbor concerns who described the noise as a “vibration”
- Conducted a noise study at neighbor homes to identify the issue
- Learned a pair of dust collectors were giving off a low frequency vibration, particularly during the winter and often when our operations were not being fully utilized (weekends/holidays)
- Hired a third-party consultant
- Designed a plan to modify the blower fans
- Issue resolved

## WHAT HAVE I LEARNED

- It is often difficult to identify the offending equipment when you have many units operating
- Period of the most frequent neighbor concerns often do not coincide with manufacturing activity
- There is a very real emotional side to noise concerns
- Importance of expertise and high-technology equipment a typical EHS Department does not have
  - Sometimes “thinking out of the box” ideas need to be applied!
- Solving concerns may be very time consuming and expensive

## ADDITIONAL INFORMATION, ANY QUESTIONS

- Any questions on anything covered?
- Thanks for your attention and interest



# Technical Aspects of MassDEP Noise Regulation

**Michael Bahtiarian**

*Principal Consultant*

*Acentech*



**Environmental Business Council of New England**  
*Energy Environment Economy*



# ACENTECH

## Technical Aspects of the MADEP Noise Regulation



Presented By:

**Mike Bahtiarian, INCE Bd. Cert.**

**Principal Consultant**

March 28, 2018







# Introduction & Background

- **Personal:**
  - INCE Board Certified
  - 24 years experience (23.5 years at another firm)
  - Member of “WNTAG” (Wind Turbine Noise Technical Advisory Group)
- **Corporate:**
  - Specializes in
    - Acoustics
    - Noise
    - Vibration
    - AV/IT/Security
  - Offices in Cambridge, Philadelphia & Los Angeles
  - Incorporated in 1991
  - Branch of BBN – (Bolt, Beranek & Newman)




# 310 CMR 7.10 (the Mass Noise Regulation)

## Regulation 310 CMR 7.10: Noise

(1) 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.



  
*The Commonwealth of Massachusetts*  
*Executive Office of Environmental Affairs*  
*Department of Environmental Quality Engineering*  
*Division of Air Quality Control*  
*One Winter Street, Boston 02108*

February 1, 1990  
DAQC Policy 90-001

DIVISION OF AIR QUALITY CONTROL POLICY

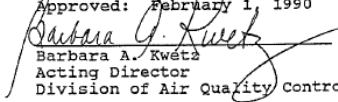
This policy is adopted by the Division of Air Quality Control. The Department's existing guideline for enforcing its noise regulation (310 CMR 7.10) is being reaffirmed.

**P O L I C Y**

A source of sound will be considered to be violating the Department's noise regulation (310 CMR 7.10) if the source:

1. Increases the broadband sound 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.


These criteria are measured both at the property line and at the nearest inhabited residence. Ambient is defined as the background A-weighted sound level that is exceeded 90% of the time measured during equipment operating hours. The ambient may also be established by other means with the consent of the Department.

Approved: February 1, 1990      Effective: Immediately  
  
Barbara A. Kwetz  
Acting Director  
Division of Air Quality Control



# Noise Reg Quick Read

- **Violation occurs if any source of sound:**
  - Increases the Broadband SPL\* by 10 dB above the Ambient SPL\*\*
  - or**
  - Produces a Pure Tone\*\*\*
- **Applies at either:**
  - Property Line
  - and** (but should this have been “or”?)
  - Nearest Inhabited Residence



fact sheet

**Noise**

**Background**

Noise is a type of air pollution that results from sounds that cause a nuisance, are or could injure public health, or unreasonably interfere with the comfortable enjoyment of life, property, or the conduct of business. Types of sounds that may cause noise include:

- "Loud" continuous sounds from industrial or commercial activity, demolition, or highly amplified music;
- Sounds in narrow frequency ranges such as "squealing" fans or other rotary equipment; and
- Intermittent or "impact" sounds such as those from pile drivers, jackhammers, slamming truck tailgates, public address systems, etc.

**Policy**

A noise source will be considered to be violating the Department's noise regulation (310 CMR 7.10) if the source:

1. Increases the broadband sound level by more than 10 dB(A) above ambient, or
2. Produce 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.

These criteria are measured both at the property line and at the nearest inhabited residence. "Ambient" is defined as the background A-weighted sound level that is exceeded 90% of the time, measured during equipment operating hours. "Ambient" may also be established by other means with consent of the Department.

**For more information:**

For complaints about specific noise sources, call the Board of Health for the municipality in which the noise source is located.

To learn more about responding to noise, odor and dust complaints or to request state assistance or support, please contact the service center in the nearest DEP regional office.

- Central Region, Worcester: (508) 792-7683
- Northeast Region, Wilmington: (978) 661-7677
- Southeast Region, Lakeville: (508) 946-2714
- Western Region, Springfield: (413) 755-2214

This Policy was originally adopted by the MA Department of Public Health in the early 1970's. It was reaffirmed by DEP's Division of Air Quality Control on February 1, 1990, and has remained in effect.

noisefacts • Page 1 of 1

Massachusetts Department of Environmental Protection  
One Winter Street  
Boston, MA 02108-4746

Commonwealth of Massachusetts  
Mitt Romney, Governor

Executive Office of Environmental Affairs  
Ellen Roy Herzfelder, Secretary

Department of Environmental Protection  
Edward P. Kunoe, Acting Commissioner

Produced by the Bureau of Waste Prevention  
February 2003.  
Printed on recycled paper.

This information is available in alternate format by calling our ADA Coordinator at (617) 574-6872.



# MADEP Definitions

\* **Broadband SPL** is the A-weighted overall sound pressure level.

\*\* **Ambient SPL** is defined as the background A-weighted sound pressure level that is exceeded 90% of the time measured during equipment operation. The ambient may also be established by other means with the consent of the Department.

\*\* **Pure Tone** is defined when any octave band center frequency sound pressure level exceeds the two adjacent center frequency sound pressure levels by 3 decibels or more.





# How do you measure background noise?

- There is no detailed method from MADEP
- Consultants have done it many different ways and we held one meeting of the Boston Chapter of ASA on this topic
- Approaches will depend on noise source and environment

## What do we know from MADEP Fact Sheet:

- Need to measure A-weighted SPL
- Measure during equipment operating hours
- Need to measure level that is exceeded 90% of the time
- Ambient sound may be established by other means





# How do you measure background noise?

## What is not specified:

- Location of the Sound Level Meter
- Instrumentation Type(s) or Settings
- Noise Metrics
- Duration of Survey
- Sampling Periods
- Compilation of Data Sets







# How do I measure background noise?

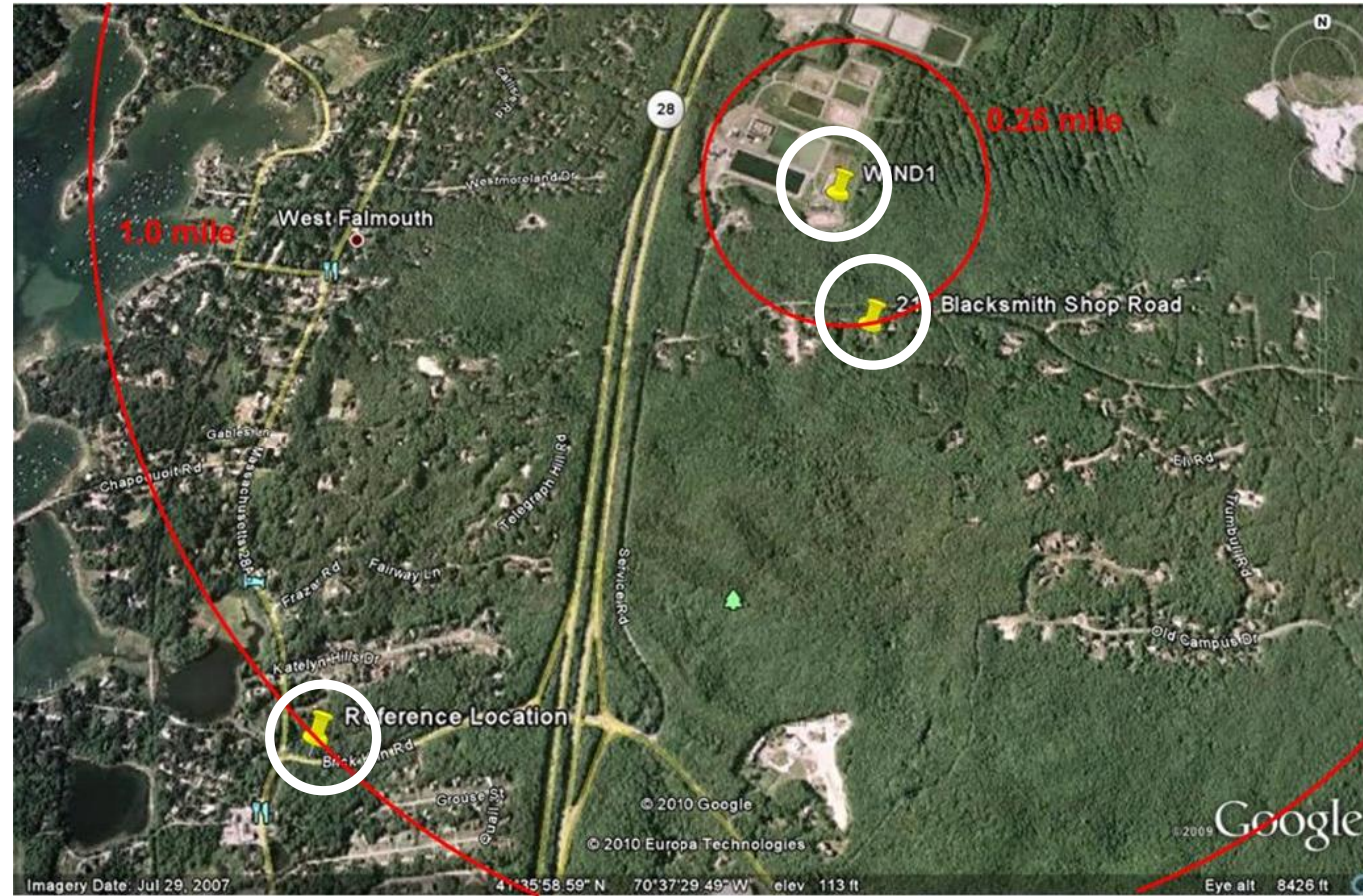
- Instrumentation: **Type 1 Logging Sound Level Meter**
- Noise Metrics:  **$L_{EQ}$ ,  $L_{90}$ ,  $L_{10}$  (sometimes others)**
- Time of Day for Measurement\*\*:
  - **Daytime (7am to 7pm)**
  - **Evening (7pm to 10pm)**
  - **Nighttime (10pm to 7am)**
- Duration of Measurement
  - 20 minutes
  - 2 to 3 hours
  - 3 to 4 days
  - **1 week**
- Sampling Period: **1 hour** (but sometimes 5 minutes)

\*These time periods were originally defined in the EPA “Levels Document” (1974) and more recently in ANSI S12.9-Part 1 (2013).





# My Use of a Reference Location



*Graphic from author's prior work at Noise Control Engineering, LLC PowerPoint Presentation dated June 2011.*





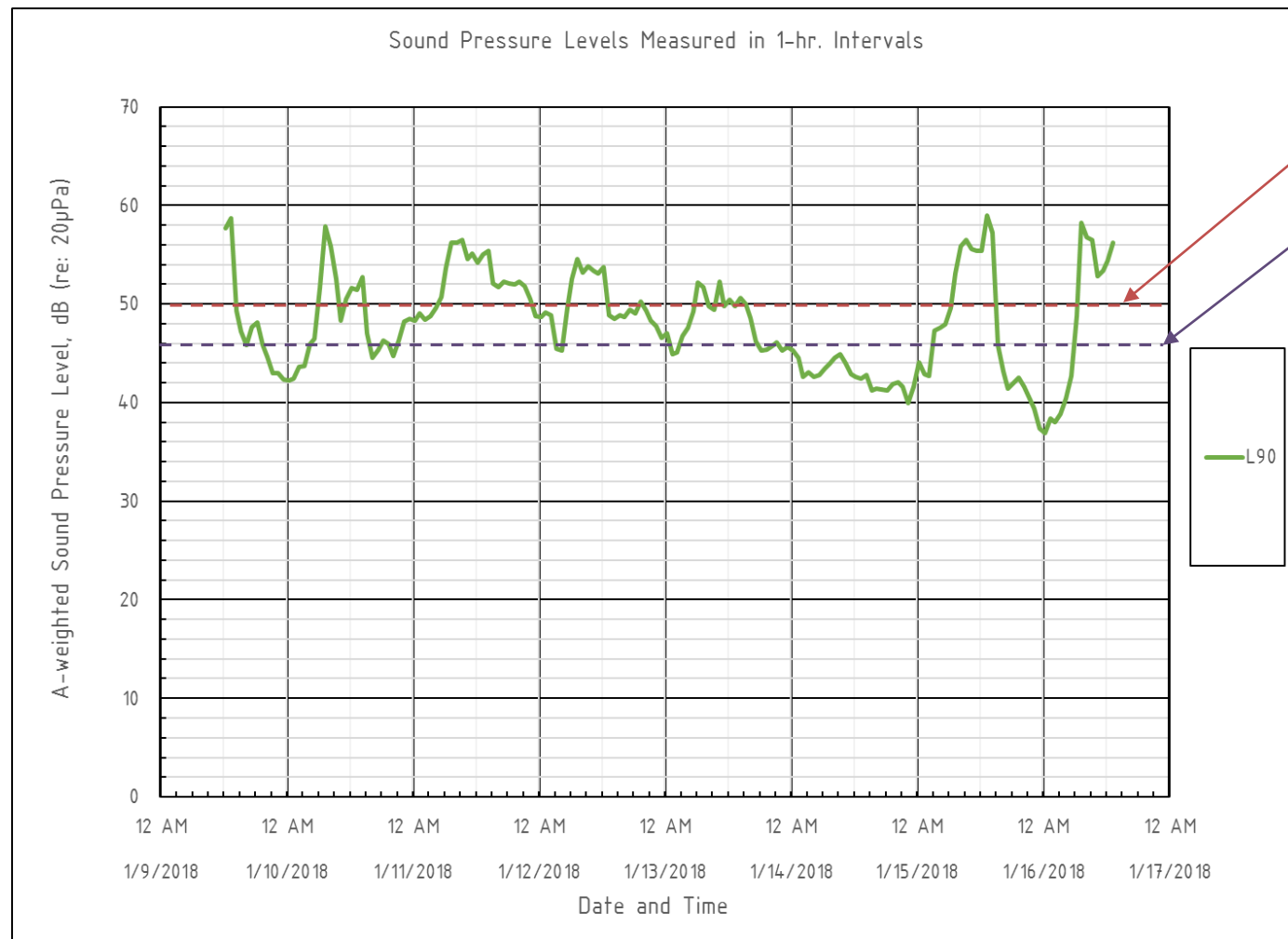
# How do you compile background noise data?

- No guidance in MADEP Fact Sheet
- Extensive sampling offered by newer SLM's
- Longer sample periods should be divided
- Single Values:
  - Minimum
  - Average
  - Maximum
- Details could vary depending on situation





# Which SPL is Background?





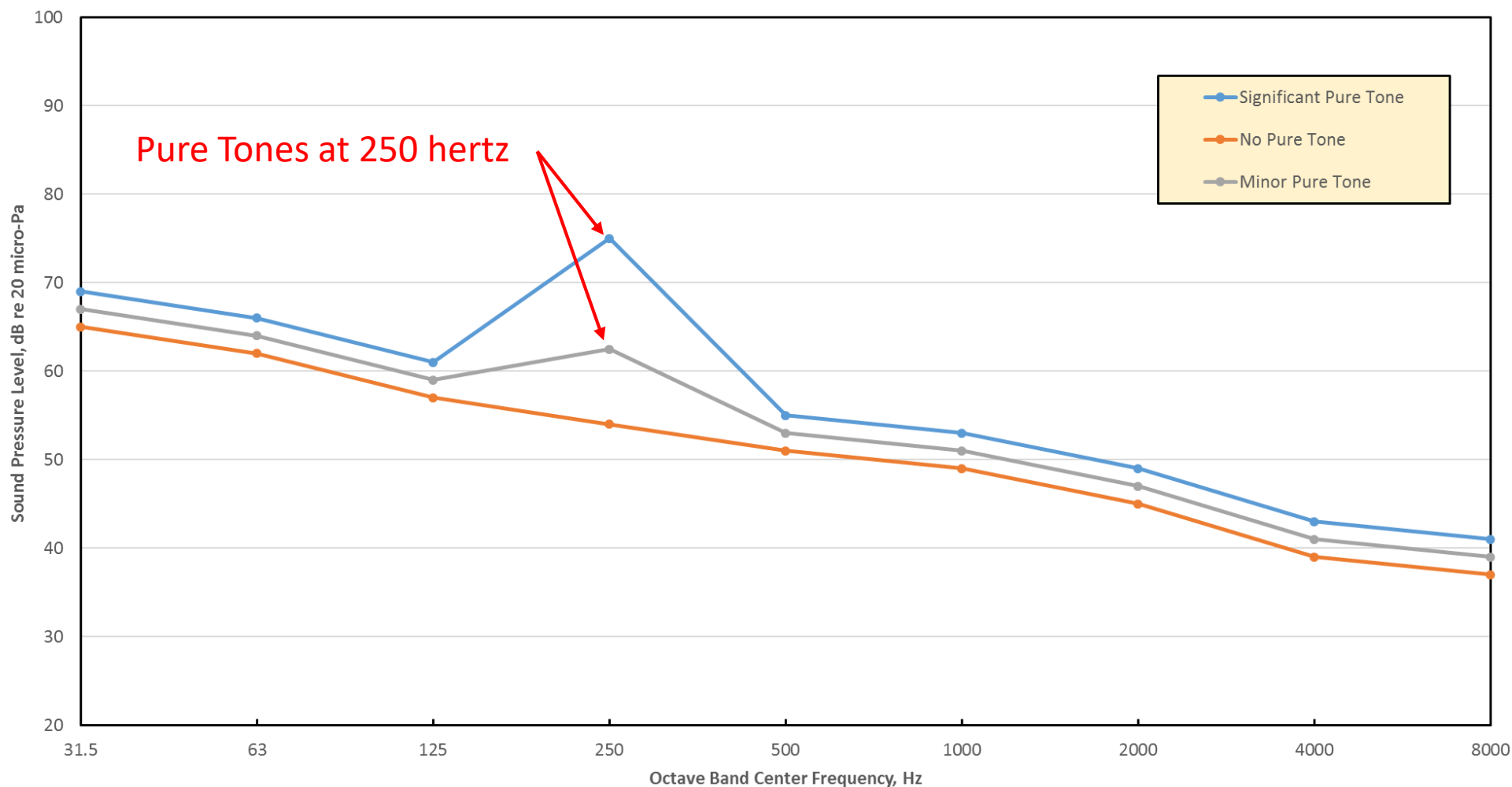
# How do I compile background noise data?

- Compile  $L_{90}$  values by time of day
  - Daytime (7am to 7pm)
  - Evening (7pm to 10pm)
  - Nighttime (10pm to 7am)
- Sampling Period of 1 hour or 5 minutes
- Take Arithmetic Average  $L_{90}$  for each sample in each daytime period per above
- *To be extra conservative, some people take the 90<sup>th</sup> percentile of each  $L_{90}$  data set.*



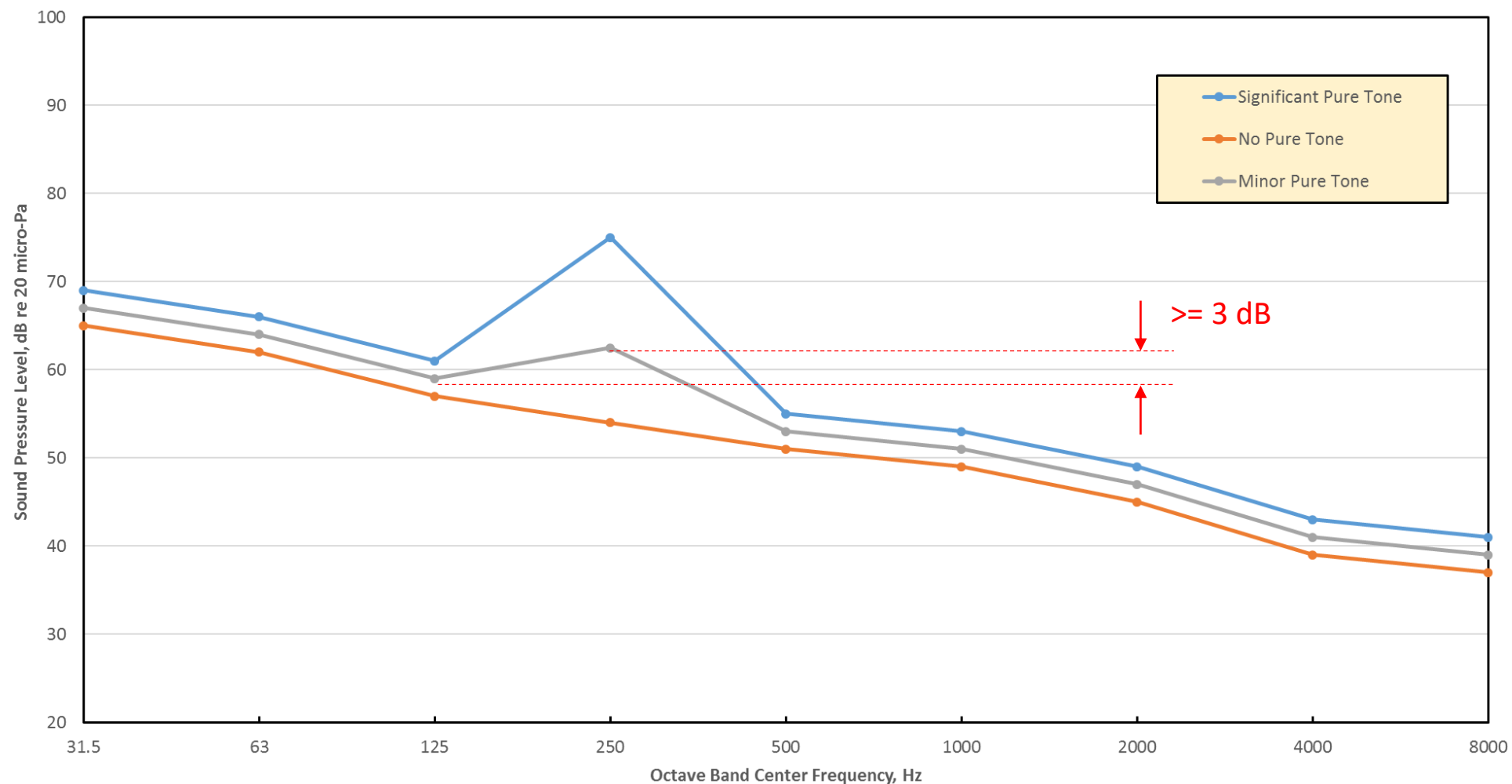


# What is a Pure Tone Look Like





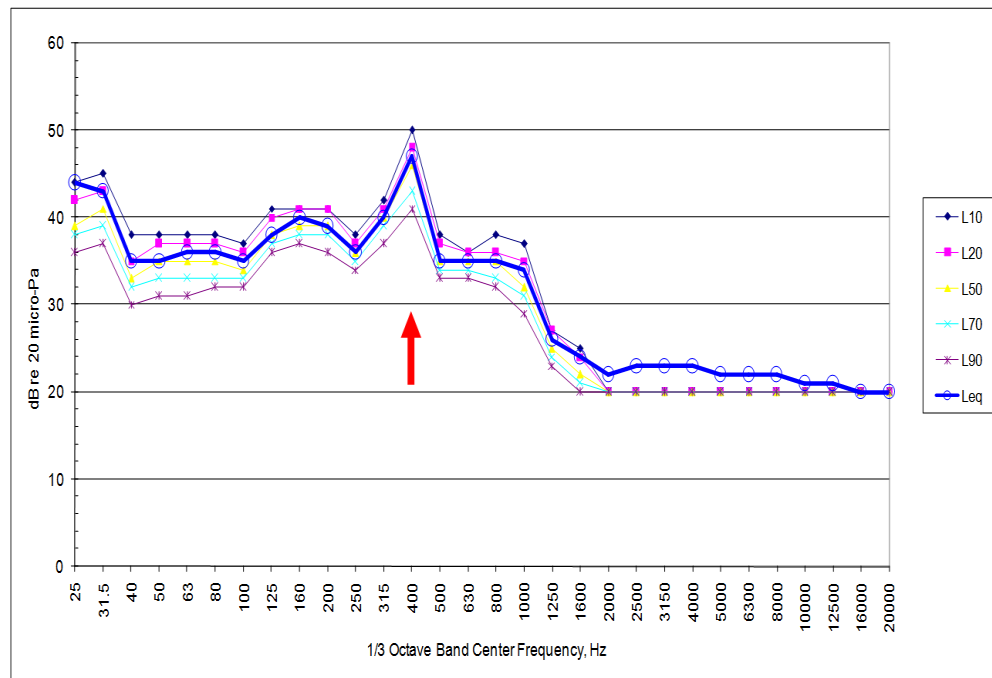
# How is it defined?



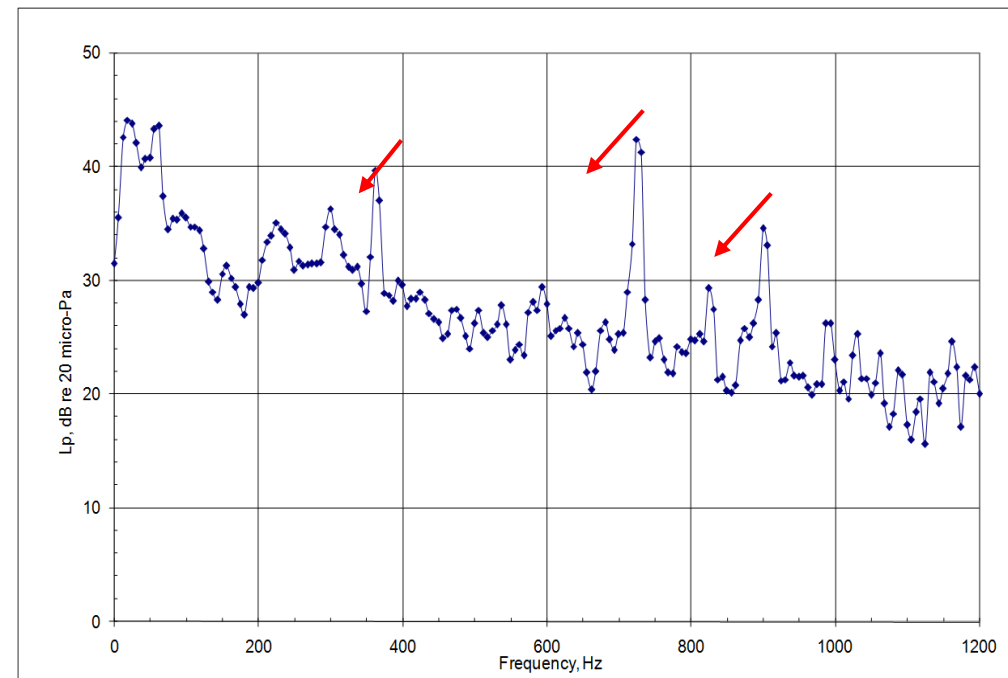


# Other Ways to Measure Pure Tones

## One-third Octave Band



## Narrowband

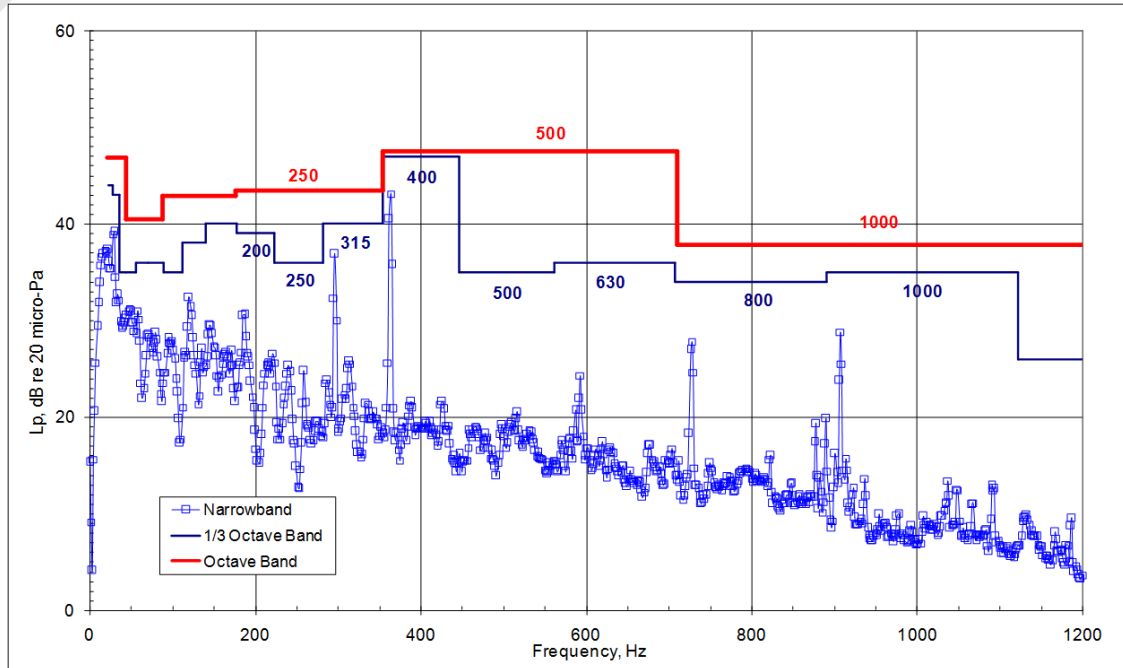


Data from Bahtiarian, Michael, "Deficiency of the Massachusetts Pure Tone Noise Regulation", 2009 Acoustical Society of America Conference, Portland.

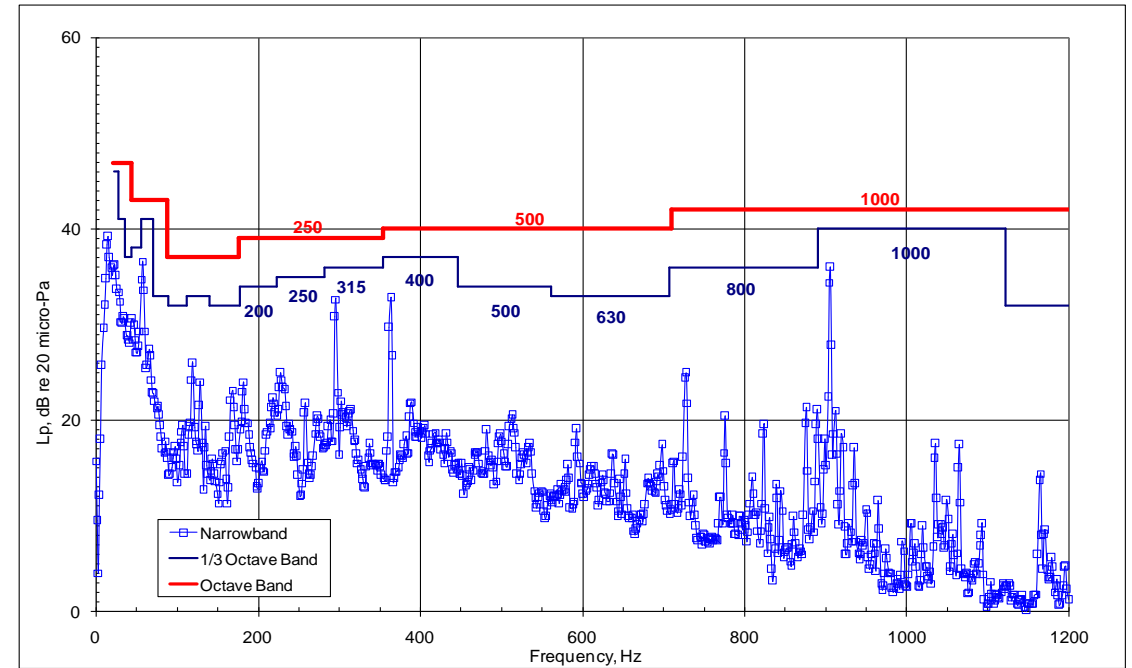


# CASE STUDY #1: Pure Tone Pitfall

Okay



False Negatives

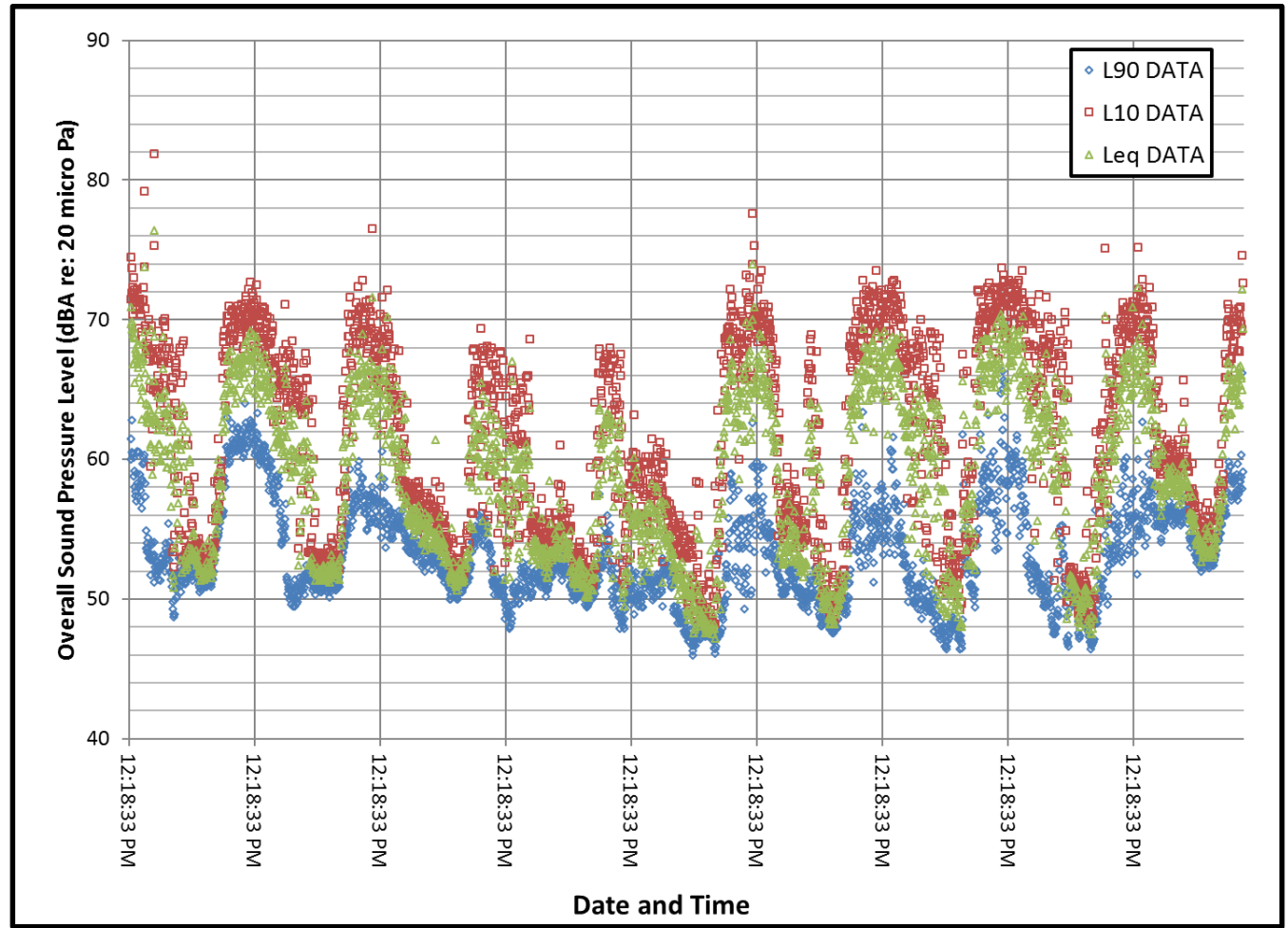


Data from Bahtiarian, Michael, "Deficiency of the Massachusetts Pure Tone Noise Regulation", 2009 Acoustical Society of America Conference, Portland.



# CASE STUDY #2: Urban Site

- Urban site under Redevelopment
- Impacted by:
  - Adjacent to transportation hub
  - Airport traffic
  - Busy local street
- Data shows diurnal patterns



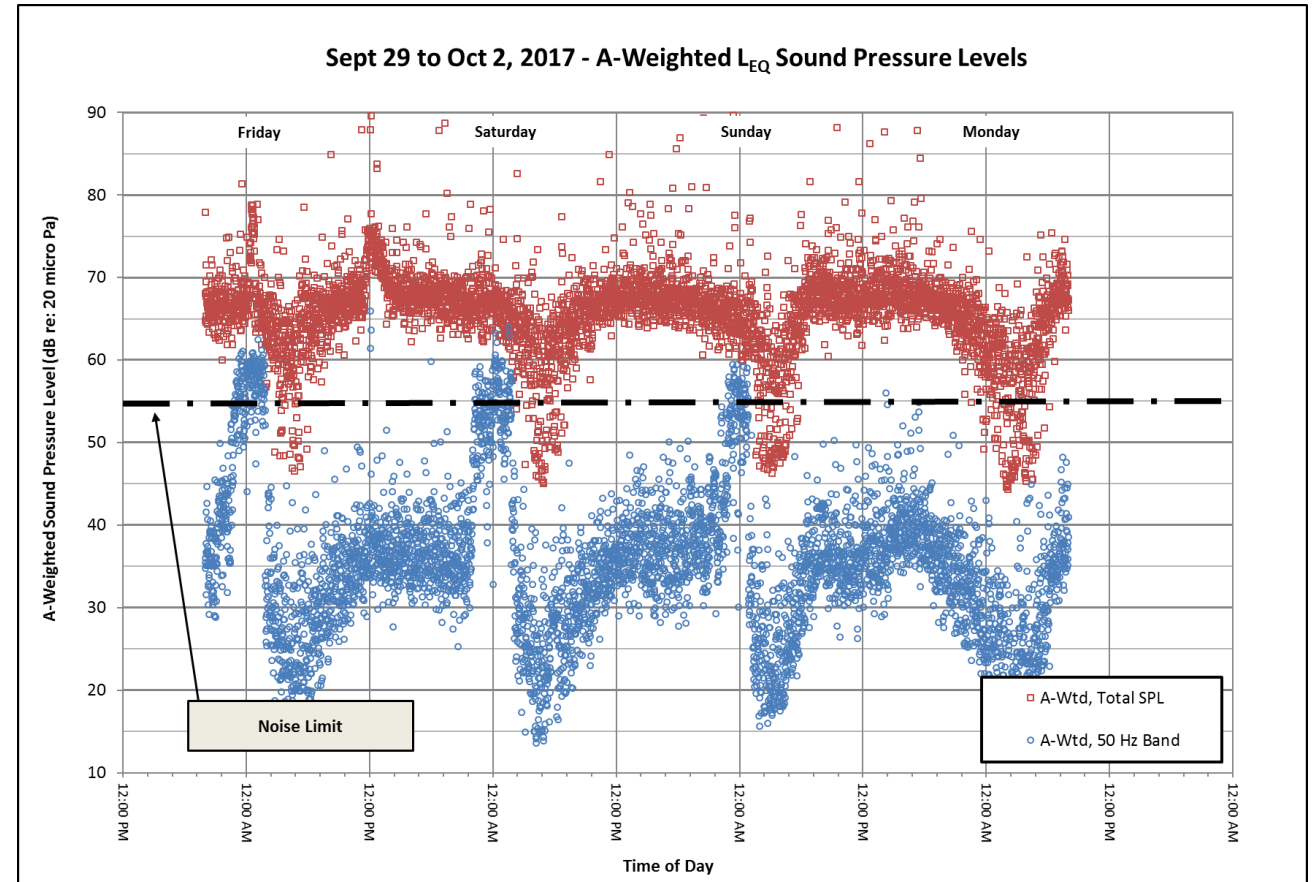




# CASE STUDY #3: ???

- Urban Site
- 4 days of monitoring, through a weekend
- Graphed dBA & 50 Hz one-third octave band

**What Am I?**





## Questions / Contact Info:



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Principal Consultant  
ACENTECH

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mbahtiarian@acentech.com

**Thanks to the EBC for this opportunity speak**



# Open Discussion

## Moderator:

- **Mike Feinblatt**, *ESS Group, Inc.*

## Panel Members:

- **Daniel Bailey**, *Pierce Atwood LLP*
- **Joseph Dufresne**, *Saint-Gobain Abrasives*
- **Michael Bahtiarian**, *Acentech*