



Proposed Rule 1110.3 Emissions from Linear Generators

Working Group #1- November 9, 2022

Join Zoom Webinar Meeting:

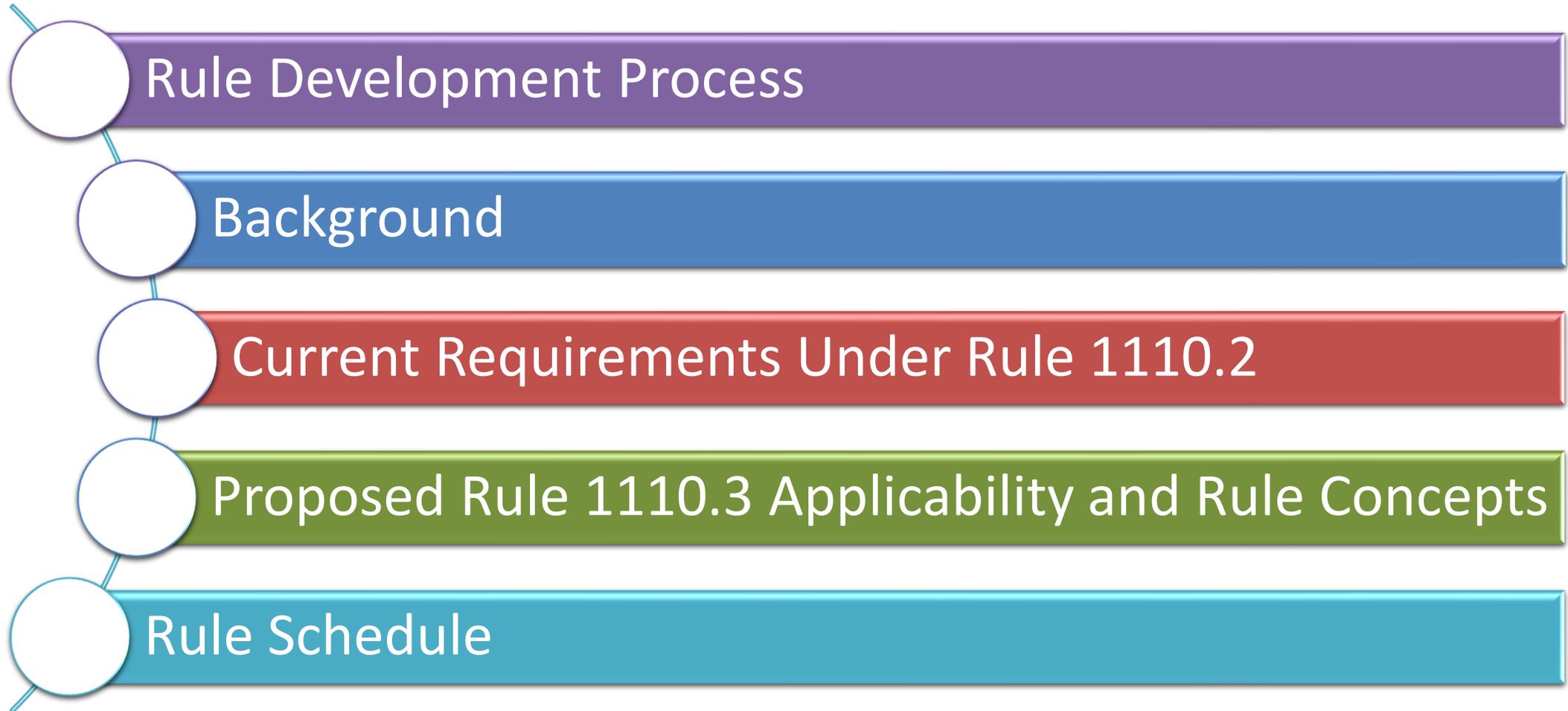
<https://scaqmd.zoom.us/j/94563453689>

Webinar ID: 945 6345 3689

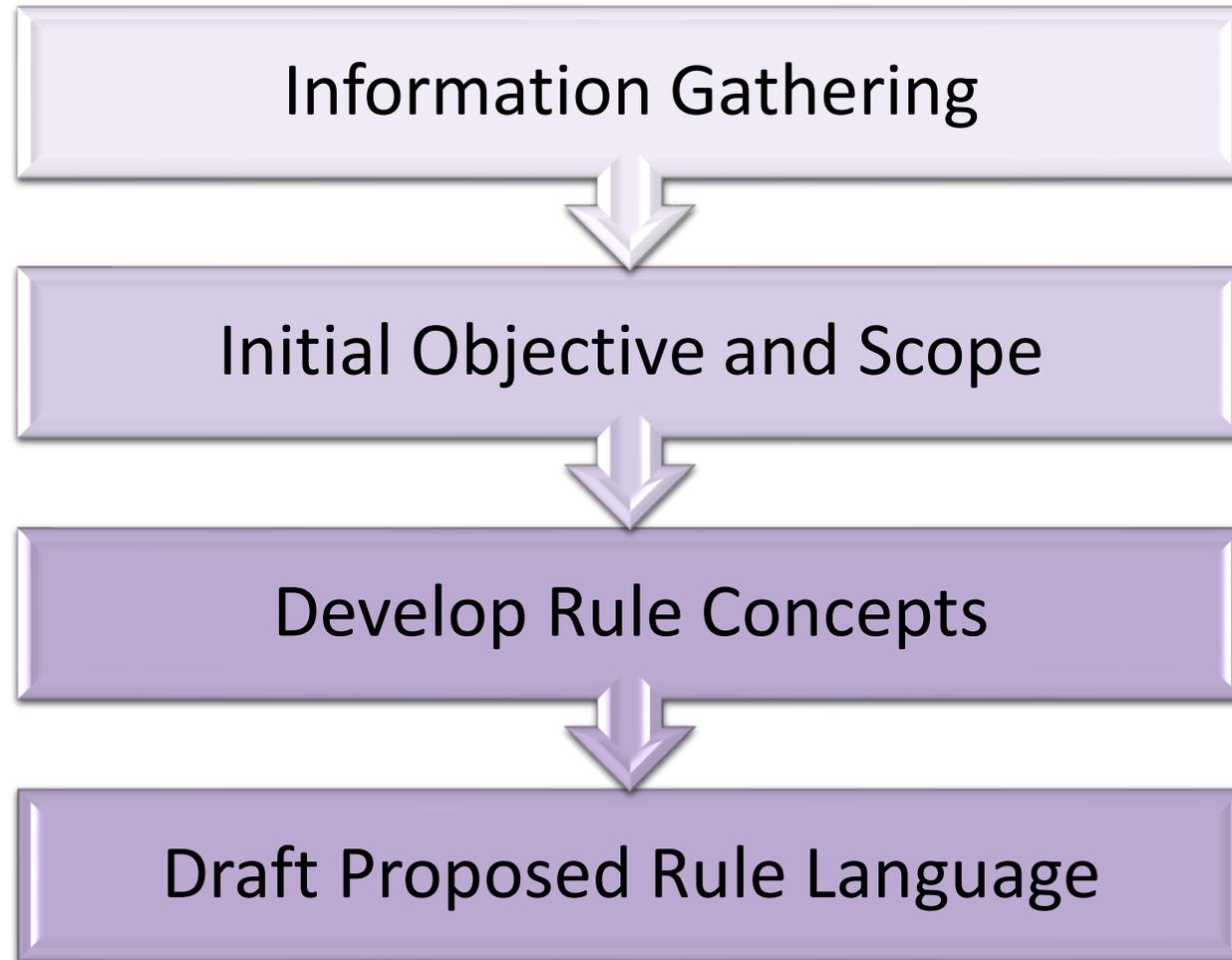
Teleconference Dial-In: 1-669-900-6833



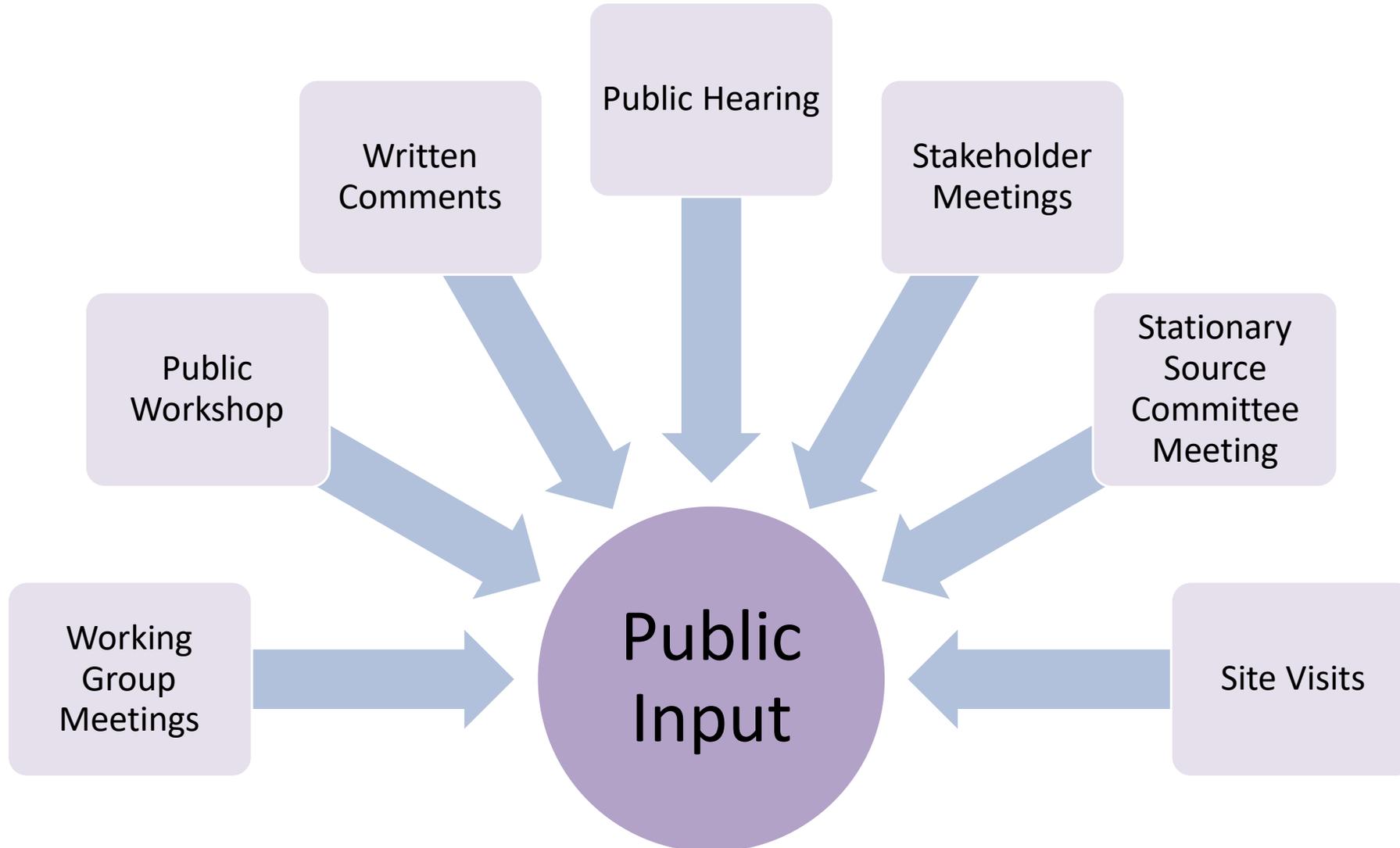
Agenda



Rule Development Process



Public Input



Stakeholder Input is Key



Staff encourages early and continued input from all stakeholders throughout the rulemaking process

Goal is a proposal that all facilities can comply with and that meets the objectives of the proposed rule

Staff encourages facilities to meet with staff to discuss any concerns – unique situations, clarifications of provisions, etc.

Vendors are welcome to present to the Working Group

Background

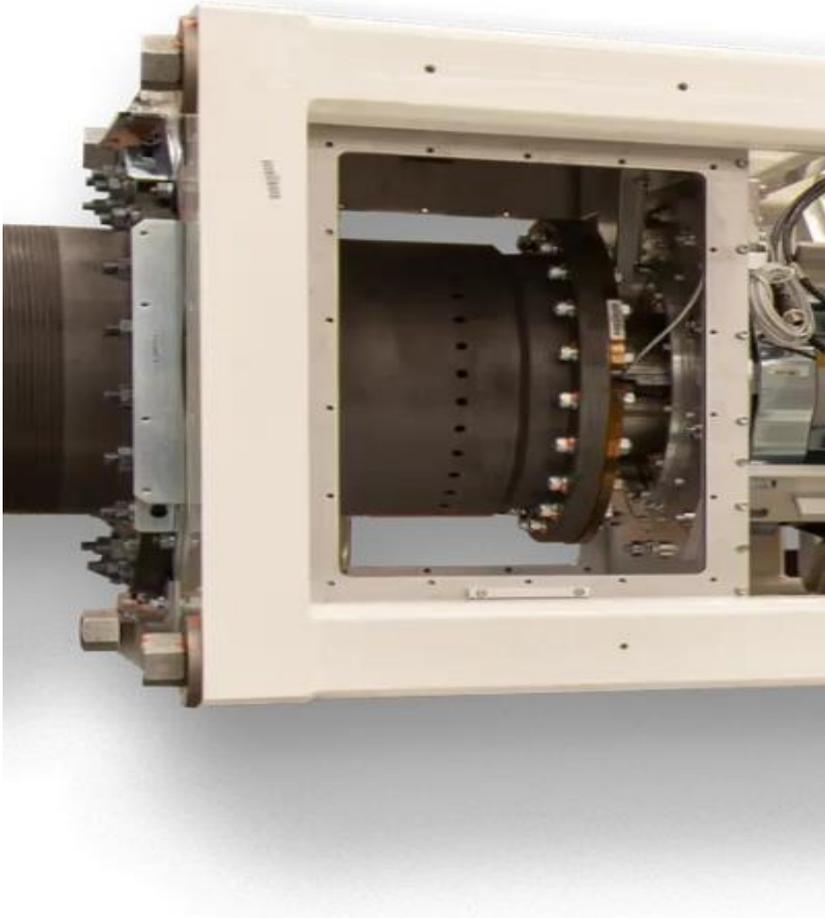
South Coast AQMD is sunsetting the RECLAIM program and transitioning to a command-and-control regulatory structure

Rule 1110.2 – Emissions from Gaseous- and Liquid-Fueled Engines (Rule 1110.2) is a command-and-control rule which regulates engines rated over 50 brake horsepower (bhp)

During the 2019 amendment of Rule 1110.2, staff was informed of linear generator technology and established emission standards for linear generators in Rule 1110.2

Due to the unique characteristics of linear generators, South Coast AQMD is proposing a separate rule

Unique Characteristics of Linear Generators



Electricity Production via Electromagnetic Induction

- Magnets are driven through copper coils to produce electricity

Low Emissions Profile

- Lower combustion temperatures results in lower NOx and CO emissions
- Uses an oxidation catalyst to further reduce VOC emissions

Multi-fuel Capabilities

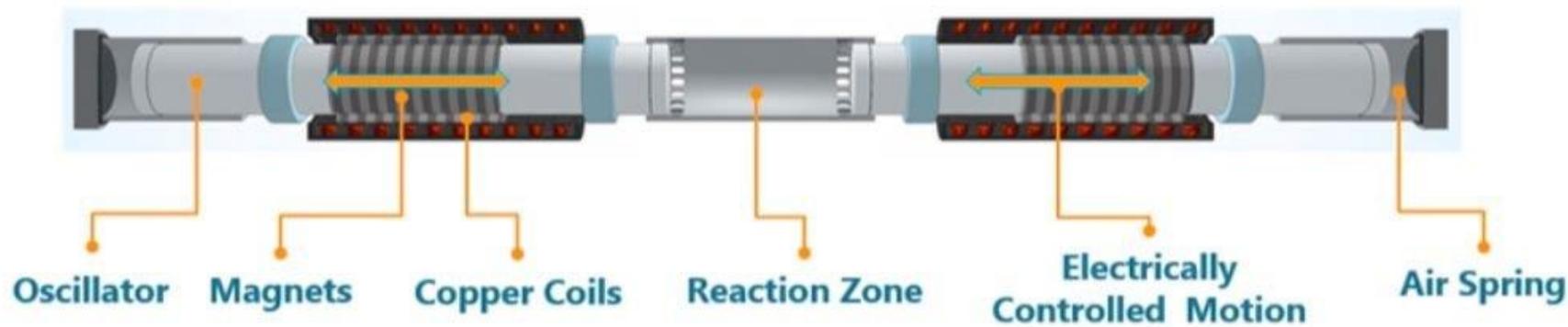
- Ability to run on natural gas, biogas, hydrogen, ammonia, and LPG

Parametric Monitoring

- Monitors fuel flow, air-to-fuel ratio, and oxidation catalyst

Linear Generators

- A linear generator converts linear motion into electricity:
 - Compresses a fuel and air mixture in a center reaction zone until a uniform reaction occurs without a flame or burning
 - Energy created from the reaction drives linear motion of oscillators
- Emergency and prime power applications



Current Rule 1110.2 Requirements- Emission Limits for Linear Generators

Pollutant	Concentration Limit (ppmvd) for engines installed on & after 1/1/2024	Concentration Limit (ppmvd) for engines installed prior to 1/1/2024
NOx	2.5	2.5
CO	12	12
VOC	10	25



- Rule 1110.2 includes a provision that allows a limited number of units to meet an interim VOC concentration limit of 25 ppmvd, until January 1, 2024
- VOC emissions in excess of 10 ppmvd from these units is capped at 45 lbs/day¹

¹South Coast AQMD Air Quality Significance threshold for VOC emissions is set at 55 lbs/day; 45 lbs/day VOC cap allows for differences in generator size and operational hours while staying under the significance threshold

Rule 1110.2 Monitoring Requirements



- Source testing required every 2 years or 8,760 hours, whichever occurs first
- Portable analyzer testing for NO_x, CO, and oxygen required weekly or 150 hours, whichever occurs later
 - After 3 consecutive compliant tests, option to test monthly or every 750 hours, whichever occurs later, until a noncompliant test

Additional Rule 1110.2 Requirements

- Submit and implement an approved Inspection & Maintenance (I&M) plan
- During 2019 amendment, staff provided an option to request an alternative I&M plan
- Records and emission reports are required to be retained for 5 years

Proposed Rule 1110.3 Applicability

Proposed linear generator definition:
A power generation technology using a
compression-induced thermochemical
reaction to generate electricity.

Staff is proposing that PR 1110.3 apply
to all linear generators



Proposed Rule 1110.3 Emission Limits

Concentration Limits for linear generators installed before January 1, 2024		
NO _x (ppmvd) ¹	CO (ppmvd) ¹	VOC (ppmvd) ²
2.5	12	25
Concentration Limits for linear generators installed on and after January 1, 2024		
NO _x (ppmvd) ¹	CO (ppmvd) ¹	VOC (ppmvd) ²
2.5	12	10

¹ Parts per million by volume, corrected to 15% oxygen on a dry basis.

² Parts per million by volume, measured as carbon, corrected to 15% oxygen on a dry basis and averaged over the sampling time required by the test method.

Staff is proposing the to remove the requirement which limits number of linear generators that can be installed (VOC emissions in excess of 10 ppmvd is capped at 45 lbs/day)

- Units must meet 10 ppmvd VOC limit

Proposed Rule 1110.3 Monitoring Concepts

Staff is proposing the following:

- Source testing every 2 years or 8,760 hours, whichever occurs first
- Evaluating the possibility of using parametric monitoring in lieu of portable analyzer testing for compliance purposes

Additional Proposed Rule 1110.3 Concepts

- Units shall not be operated unless:
 - Vented to an oxidation catalyst
 - Equipped with a properly maintained and operational air-to-fuel ratio controller, non-resettable totaling time meter, and fuel flow meter
- Recordkeeping shall be kept for a period of 5 years and include:
 - Total hours of operation
 - Fuel type and quantity of fuel consumed
 - Maintenance and repairs
- Breakdowns must be reported within 24 hours
- Inspection & Maintenance Plan required
- Maintenance required per manufacturer recommendations

Current Universe

13 active
facilities

20 permitted
linear
generators

18 open
applications

Rule Schedule



Contacts

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