Working Group Meeting #4

March 13, 2024

9:00 AM

PROPOSED RULE 1445 – CONTROL OF TOXIC EMISSIONS FROM LASER AND PLASMA ARC CUTTING

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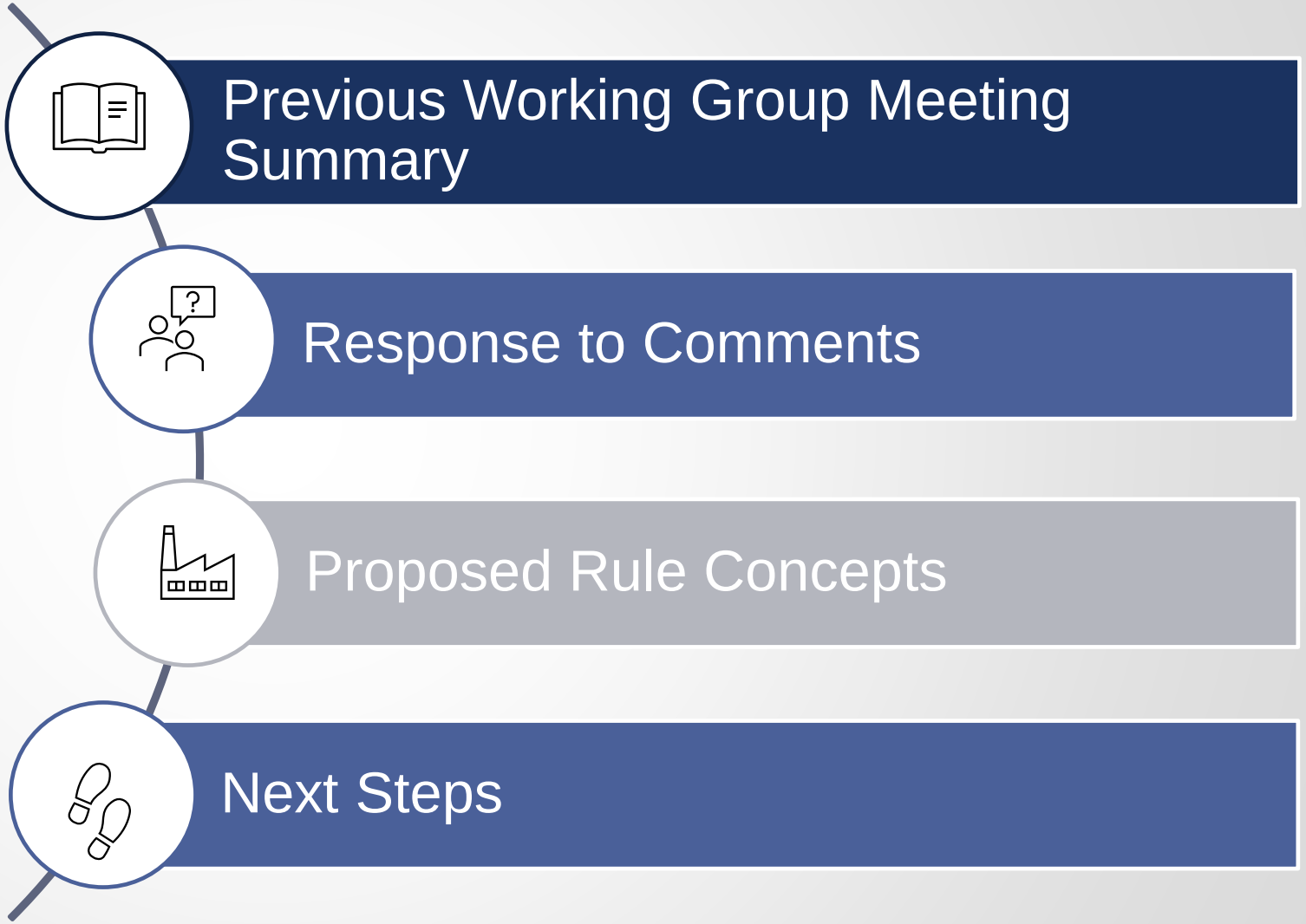
AGENDA


Previous Working Group Meeting Summary
Response to Comments
Proposed Rule Concepts
Next Steps

WORKING GROUP MEETING #3 RECAP

- Responded to comments made in WGM #2
- Presented an overview of rule concepts:
  - Applicability
  - Control Devices
  - Housekeeping
  - Best Management Practices
  - Parametric Monitoring
  - Recordkeeping

STAKEHOLDER COMMENTS (WORKING GROUP MEETING #3)

Comment #1

- What are the emissions estimates for laser and plasma arc cutting equipment?

Comment #2

- What are the procedures to determine capture efficiency for portable equipment?

Comment #3

- Will there be different requirements for low emission sources?

RESPONSE TO COMMENT #1 -WHAT ARE THE EMISSIONS ESTIMATES FOR LASER AND PLASMA ARC CUTTING EQUIPMENT?

- Emissions are estimated as part of the permit application review process
- Hexavalent chromium and nickel identified as key toxic drivers for health risk values
  - Top emitters from **portable** equipment:
    - All have permit conditions for amount/type of metals cut but the identified equipment is not vented to an air pollution control device
  - Top emitters from **stationary** equipment:
    - Majority use water tables (most use semi-dry cutting)
- Available source tests documented emissions of hexavalent chromium from stationary laser and plasma arc cutting equipment
  - Examples of hexavalent chromium emissions upstream of control device
    - 0.00084 pounds per hour for plasma arc cutting
    - 0.00134 pounds per hour for laser cutting
- Even at low levels, hexavalent chromium is a concern due to toxicity (highly carcinogenic)

RESPONSE TO COMMENT #2 – WHAT ARE THE PROCEDURES TO DETERMINE CAPTURE EFFICIENCY FOR PORTABLE EQUIPMENT?

- Capture efficiency is critical to ensure the overall control efficiency of an Air Pollution Control Device
  - Emissions that are not collected are fugitive and not controlled
- Parametric monitoring (e.g., air velocity and smoke tests) have been used in other South Coast AQMD toxic metal particulate rules to ensure adequate capture efficiency
- PR 1445 will include parametric monitoring requirements and identify procedures for conducting tests

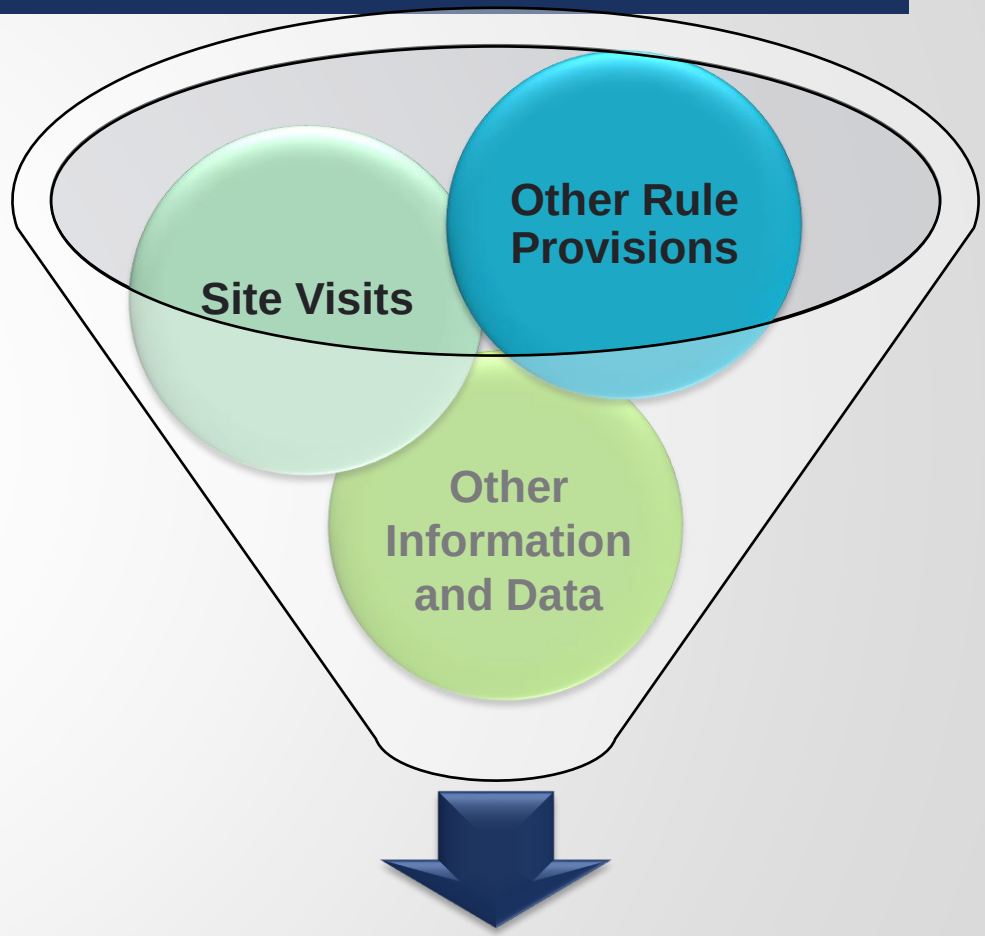
RESPONSE TO COMMENT #3 - WILL THERE BE DIFFERENT REQUIREMENTS FOR LOW EMISSION SOURCES?

- PR 1445 is proposed to be applicable to Laser and Plasma Arc Cutting Equipment that requires issuance of a South Coast AQMD permit
- Rule 219 – Equipment Not Requiring A Written Permit Pursuant to Regulation II identifies equipment, processes, or operations that do not require a permit based on low emissions potential
- PR 1445 exemptions under consideration for cutting of metals that are not comprised of compounds identified in Rule 1401 – New Source Review of Toxic Air Contaminants
  - Examples of metals not included in Rule 1401: aluminum, iron
  - Safety Data Sheet (SDS) or certified testing will be used to determine composition of metals
- PR 1445 is based on the technological feasibility of air pollution controls

RULE CONCEPTS

OVERVIEW

- Working Group Meeting #3 presented information on control technologies (availability and technical feasibility) and overview of rule concepts
- This WGM will go over the details of the rule concepts and seek public input
- Stakeholder input on rule concepts helps shape Initial Rule Language



PR 1445 STRUCTURE

a) Purpose

b) Applicability

c) Definitions

d) Control Device Requirements

e) Parametric Monitoring

f) Differential Pressure

g) Building Requirements

h) Housekeeping Requirements

i) Best Management Practices

j) Recordkeeping

k) Exemptions

Appendix 1 - Smoke Test Procedures

Appendix 2 - Air Velocity Measurement Procedures

INITIAL RECOMMENDATIONS

a) Purpose

- Reduce toxic air contaminant emissions from Laser or Plasma Arc Cutting Equipment used for Metal Cutting

b) Applicability

- Facilities that operate Laser or Plasma Arc Cutting Equipment that requires a South Coast AQMD permit

c) Definitions

- Key terms used throughout PR 1445

c) Key Definitions

Existing	Laser or Plasma Arc Cutting Equipment or Air Pollution Control Device with a Permit to Construct issued before rule adoption
New	Laser or Plasma Arc Cutting Equipment or Air Pollution Control Device that is not an Existing Laser or Plasma Arc Cutting Equipment or Air Pollution Control Device
HEPA Filter	Filter(s) that are individually tested and certified by the manufacturer to have a control efficiency of not less than 99.97 percent on 0.3 micron particles
Stationary	A Metal Cutting device that is installed in a building, structure or facility and is attached to a foundation, or if not attached to a foundation, resides at the same location
Portable	A Metal Cutting device listed as handheld, portable or various locations in the equipment description section of a South Coast AQMD Permit to Construct or Permit to Operate
Stainless Steel	A steel alloy with a minimum of 10.5 percent chromium content by mass as determined by the applicable Safety Data Sheet (SDS) or other certified testing
Nickel Alloy	A steel alloy with a minimum of 10.5 percent nickel content by mass as determined by the applicable Safety Data Sheet (SDS) or other certified testing

d) Control Device Requirements

BACKGROUND – TOXIC AIR CONTAMINANTS

- Approximately 300 existing active permits
  - Oldest active permit issued in the 1980s
  - Subject to a Rule 1401 – New Source Review of Toxic Air Contaminants health risk assessment during the permitting process (adopted 1990, periodically updated)
- Based on a review of permit applications
  - Hexavalent chromium and nickel emissions are key drivers for health risk assessments
- California Office of Environmental Health Hazard Assessment (OEHHA) makes periodic updates to risk factors and the assessment methodology based on best available science

OEHHA Toxicity Criteria Updates

- Hexavalent Chromium: last updated in **2001** (Chronic REL)
- Nickel: last updated in **2012** (Acute, Chronic , 8-hr Chronic REL)

OEHHA Risk Assessment Methodology Update

- **2015** updates include age sensitivity factors based on the most recent scientific data
  - Resulted higher risk estimates to residential and sensitive receptors

REGULATORY GAP

- Existing cutting equipment is subject to varying degree of control (e.g., no control, water tables, dust collectors and dust collectors with HEPA filtration)
  - Portable: 40 out of 73 equipment achieving less than 99% control efficiency
  - Stationary
    - Plasma: 34 out of 100 equipment achieving less than 99% control efficiency
    - Laser: 6 out of 117 equipment achieving less than 99% control efficiency
- Highest control efficiency commonly applied:
  - Portable: 99.97% control efficiency
  - Stationary: 99.97% control efficiency
- Some equipment processing stainless steel or nickel alloy may not be employing high efficiency controls to reduce its emissions

Existing Control Technology Summary

Plasma Arc - Stationary

- ~70% have a high efficiency (≥99%) dust collector
  (~23% have dust collector + HEPA final stage filters (≥99.97% control efficiency)]

Plasma Arc - Portable

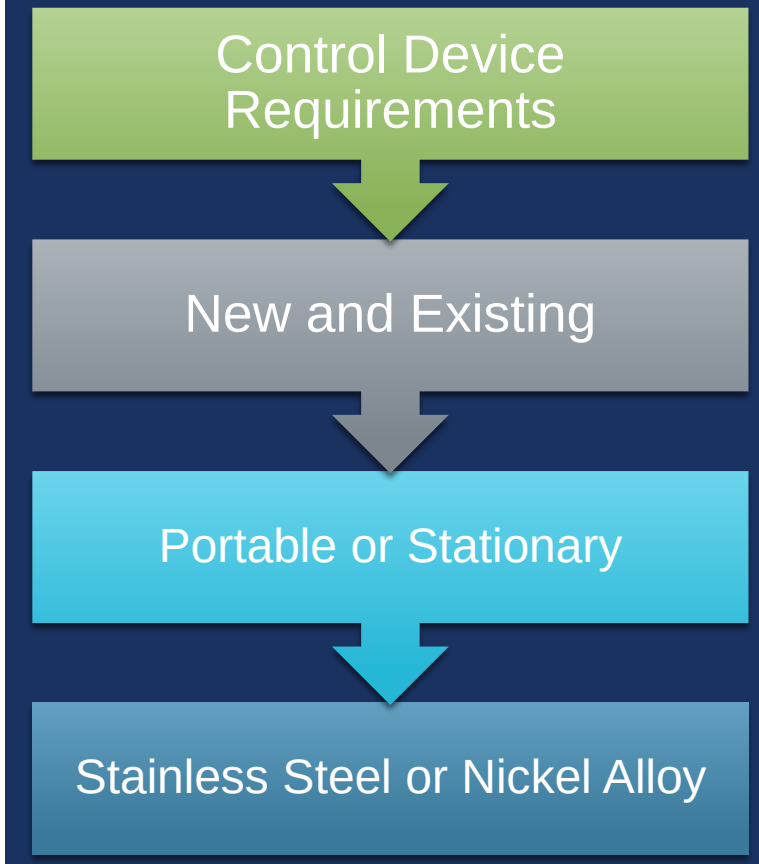
- ~45% have a high efficiency dust collector
  (~27% have HEPA filtration)

Laser

- 94% have a high efficiency dust collector
  (~35% have HEPA filtration)

EMISSIONS REDUCTION POTENTIAL

- American Conference of Governmental Industrial Hygienists (ACGIH) establishes guidance materials to design and evaluate ventilation systems
- According to the *ACGIH Industrial Ventilation*: Manual of recommended practices for design for industrial ventilation systems (Ventilation manual)
  - "When highly toxic dusts are involved, a designer should consider the use of secondary absolute filtration such as HEPA filters."
- Based on review of permit applications, air pollution control devices with HEPA filtration are currently in use for each category of Laser and Plasma Arc Cutting Equipment
- Further reductions in toxic air contaminant emissions are possible based on standardized air pollution control device requirements



Overview of Control Device Requirements

Grouped by source type:

- New equipment and Existing equipment
- Portable and Stationary equipment
- Type of metal cut

Implementation

Compliance schedule for Existing equipment based on:

- Type of metal cut
- Level of control currently in use
  - Uncontrolled or controlled with an Air Pollution Control Devices at or below certain control efficiency

INITIAL RECOMMENDATION

New Equipment

- New Laser or Plasma Arc Cutting Equipment means a device that is not “Existing” equipment
- Control device integration for new equipment is more straightforward compared to retrofitting existing equipment
- Vent emissions from New Portable or Stationary Laser or Plasma Arc Cutting Equipment to Air Pollution Control Device with HEPA filter or filters individually tested and certified by the manufacturer to have a control efficiency of **at least 99.97%** on 0.3 micron or smaller particles

INITIAL RECOMMENDATION

Existing Equipment

- Focus on operations cutting metals with 10.5 percent or greater chromium and/or nickel content by mass
- Install or retrofit control system to achieve:
  - 99% control efficiency if cutting non-stainless steel or non-nickel alloy
  - 99.97% control efficiency if cutting Stainless Steel or Nickel Alloy

Table 1 – Requirements and Compliance Schedule for Existing Portable Equipment

Metal Cut	Minimum Control Device Efficiency Requirement	Effective Date	Permit Application Due Date
Non-Stainless or Non-Nickel Alloy	99% (Dust Collector*)	January 1, 2028	January 1, 2026
Stainless Steel or Nickel Alloy	99.97% (HEPA)	January 1, 2027	January 1, 2025

*Air Pollution Control Device must demonstrate at least 99% control efficiency based on individually tested and certified filters, manufacturers' specifications, or source tests

Table 2 – Requirements and Compliance Schedule for Existing Stationary Equipment

Metal Cut	Current Control Efficiency or Control Type	Minimum Control Device Efficiency Requirement	Effective Date	Permit Application Due Date
Non-Stainless Steel or Non-Nickel Alloy	*Water Tables conducting fully submerge cutting**	99% (Dust Collector**)	January 1, 2039	January 1, 2037
	*Others (e.g. dry cutting, no APCD)**		January 1, 2029	January 1, 2027
Stainless Steel or Nickel Alloy	*At or above 99% and below 99.97%*	99.97% (HEPA)	January 1, 2039	January 1, 2037
	Others (below 99% or no APCD)		January 1, 2029	January 1, 2027

*Operators of water tables may submit a permit application to demonstrate at least 99% control efficiency based on manufacturers' specifications or source tests

**Air Pollution Control Device must demonstrate at least 99% control efficiency based on individually tested and certified filters, manufacturers' specifications, or source tests

AREAS SEEKING INPUT

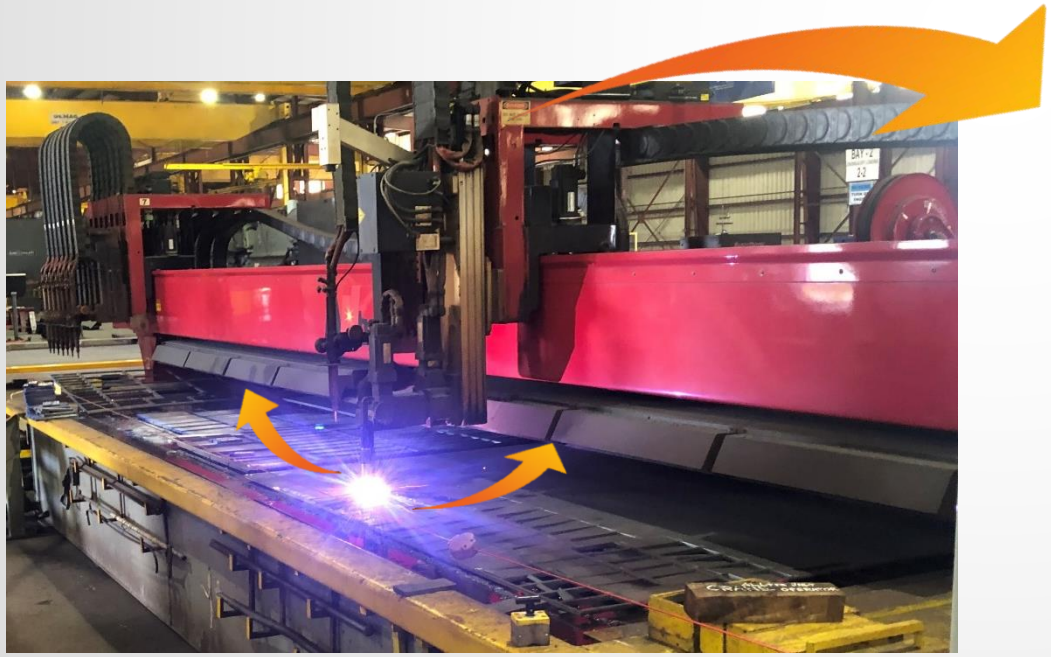
Input Requested

- Operational feasibility for Portable equipment
- Equipment life for Portable and Stationary equipment
- Test data documenting control efficiencies for various types / models of Water Tables
- Feasibility of compliance schedule

e) Parametric Monitoring

PARAMETRIC MONITORING - BACKGROUND

- Capture (collection) efficiency is a key element to ensure the overall control efficiency of an Air Pollution Control Device
- Emissions that are not collected and directed to an Air Pollution Control Device are fugitive and not controlled



ventilation system directed to an Air Pollution Control Device

PARAMETRIC MONITORING - CONCEPT

- Source testing can be a method to gather emissions data or to document overall performance of an Air Pollution Control Device but typically not required for PR 1445 equipment
- Air velocity measurements and smoke tests are used in some available source tests to demonstrate capture efficiency
- Periodic parametric monitoring can be used to ensure an Air Pollution Control Device is collecting emissions as an alternative to requiring routine source tests
- Procedures for conducting parametric monitoring included in other toxic metal particulate rules

Anemometer

Smoke test

INITIAL RECOMMENDATIONS

Routine Parametric Monitoring

Smoke Test

- Smoke device placed within area where collection of emissions by the ventilation system occurs can be used to demonstrate acceptable collection

Capture Velocity Measurements

- Anemometer used to measure inward face velocity at the cutting plane
- Minimum of 200 feet per minute based on average of five measurements

Test Methods

- PR 1445 appendices to include Smoke Test Procedures and Capture Velocity Measurement Procedures

PARAMETRIC MONITORING FREQUENCY

Table 3 – Compliance Schedule for Portable and Stationary Equipment

Requirement	Existing Air Pollution Control Device		New Air Pollution Control Device	
	Initial Test	**Frequency**	**Initial Test**	**Frequency**
Smoke Test	On or before January 1, 2025	At least once every 6 months after the prior test	Within 90 days of issuance of Permit to Operate	At least once every 6 months after the prior test
Capture Velocity	On or before January 1, 2027	At least once every 12 months after the prior test	Within 90 days of issuance of Permit to Operate	At least once every 12 months after the prior test

Comments Requested

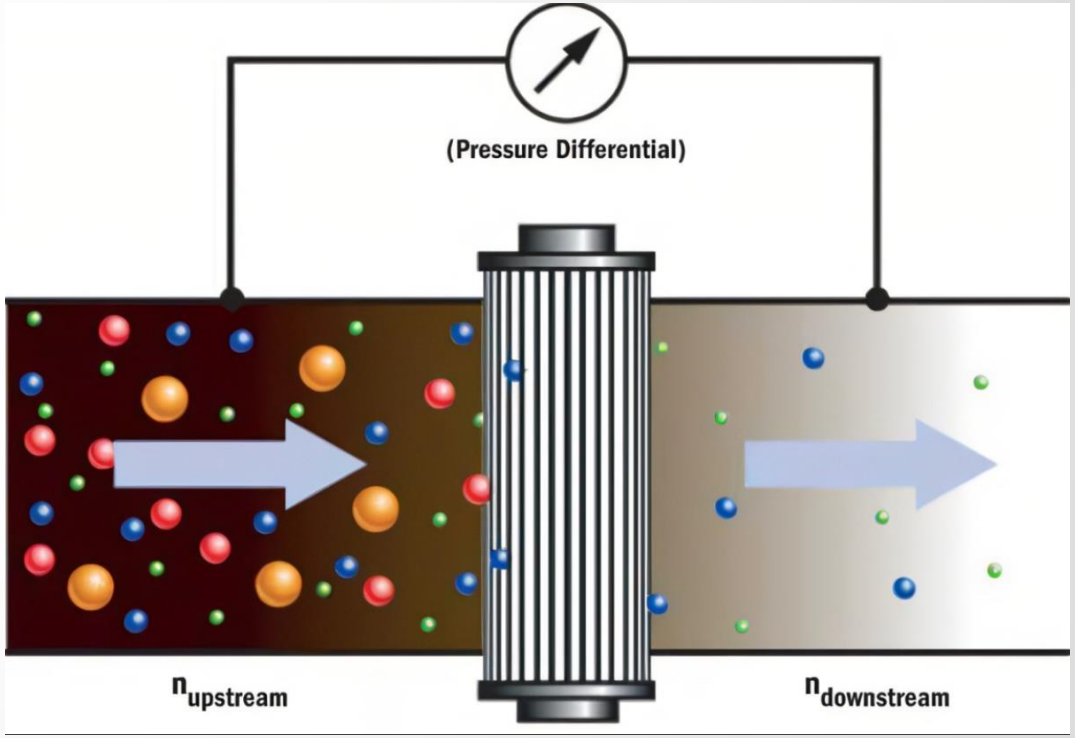
- Feasibility of implementation timeline

f) Differential Pressure

DIFFERENTIAL PRESSURE - BACKGROUND

Measurement of airflow resistance

- Can be used to monitor air flow and filter performance for an Air Pollution Control Device
  - Filters that are clogged will not allow proper airflow through the exhaust system and reduce the ability to capture particles (pressure increase)
  - Filters that are torn or not seated properly will allow particles to escape through the exhaust (pressure decrease)



DIFFERENTIAL PRESSURE - CONCEPTS

- Existing Air Pollution Control Device permit conditions can include:
  - Installation and operation of differential pressure gauge
  - Prohibit operation unless under maximum pressure differential limit
  - Maintain pressure differential within a minimum and maximum range
- PR 1445 provisions can ensure consistency

Differential Pressure Monitor

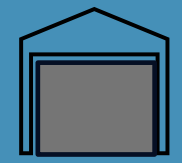
DIFFERENTIAL PRESSURE – INITIAL RECOMMENDATION

- Require a gauge to measure pressure differential (in inches water column) across each filtration stage of the Air Pollution Control Device
- In operation, maintain the pressure differential across each filter stage within the range (minimum and maximum) specified:
  - According to permit conditions, or
  - As specified by manufacturer if not identified in permit conditions

Comments Requested

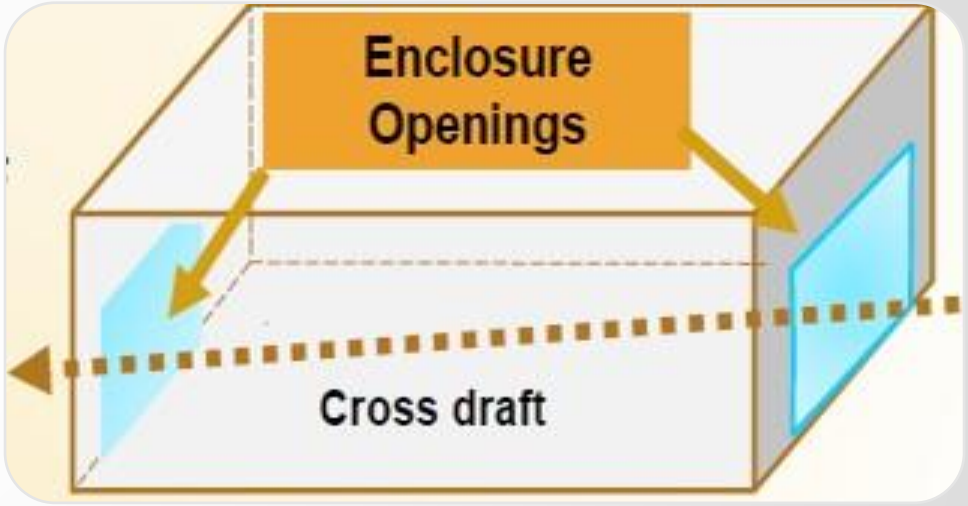
- Feasibility of installing differential pressure gauge for an Air Pollution Control Device that does not include such a device
- Whether manufacturers specify minimum and maximum pressure differential

g) Building Requirements



BUILDING REQUIREMENTS – BACKGROUND

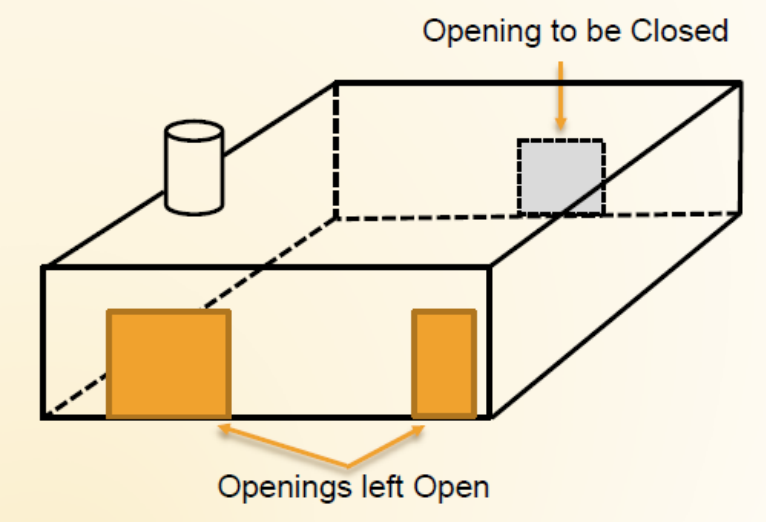
- Operating equipment within a Building can minimize the release of fugitive emissions by reducing cross draft that affect the collection efficiency of an Air Pollution Control Device
- Existing permits may not require equipment to be operated within a Building



- It is recognized some Portable Plasma Arc Cutting Equipment must be operated outside a Building

BUILDING REQUIREMENTS – INITIAL RECOMMENDATION

- Conduct Metal Cutting within a Building
  (defined as: structure enclosed on all sides with a floor, and a roof to prevent exposure to the elements [e.g., precipitation or wind]).
- During Metal Cutting,
  except for passage of vehicles, people or equipment:
  - Openings on opposite ends of a building are not to be simultaneously open
  - Close Building openings within 20 feet of cutting equipment



- Close building openings that face a nearest Sensitive Receptor and a nearest School (i.e., within 1,000 feet from opening to property line of the receptor)

BUILDING REQUIREMENTS – INITIAL RECOMMENDATIONS

- Alternative compliance for Metal Cutting not within a Building
  - Portable equipment may operate in an outdoor environment
  - Intent is to minimize cross drafts that may impact performance of control devices
- Beginning with the date that an Air Pollution Control Device is required for portable equipment (proposed 2027/2028)
  - For ground-level operations, require the use of a Temporary Enclosure (defined as: structure enclosed on all sides with a roof to prevent exposure to the elements with access openings closed during Metal Cutting operations)
  - For non-ground level operations, conduct an acceptable smoke test prior to and on the same day of conducting Metal Cutting
    - Accounting for the operational infeasibility to use a Temporary Enclosure for non ground-level operations

AREAS SEEKING INPUT

Input Requested

- Operational feasibility for proposed requirements within a Building
- Operational feasibility of a temporary enclosure for portable equipment

h) Housekeeping

HOUSEKEEPING - BACKGROUND

- In recent years, South Coast AQMD has adopted or amended toxic metal particulate rules
- Housekeeping requirements were strengthened in these rules to minimize fugitive emissions from operations involving toxic metal particulates
- PR 1445 proposes housekeeping requirements that are consistent with recently adopted rules to minimize fugitive emissions

HOUSEKEEPING RULE CONCEPTS

Approved Cleaning Methods

- Intent is to identify cleaning methods that will not resuspend material during the cleaning process

Routine Cleaning

- Intent is to minimize potential for material to be resuspended by passing workers, equipment or vehicles where particles containing toxics metals can accumulate (e.g., near cutting equipment)

HOUSEKEEPING - INITIAL RECOMMENDATIONS

- Identify a list of Approved Cleaning Methods
  - Cleaning using a wet mop, damp cloth, wet wash, low pressure spray nozzle, HEPA Vacuum, or a combination of the above methods that minimizes Fugitive Metal Dust emissions
- Require use of Approved Cleaning Methods for:
  - Daily cleaning within 20 feet of Laser or Plasma Arc Cutting Equipment
    - On calendar days when equipment is used
  - Weekly cleaning within 20 feet of Air Pollution Control Device(s)

Input Requested

- List of Approved Cleaning Methods
- Feasibility to conduct cleaning at specified locations

i) Best Management Practices

BEST MANAGEMENT PRACTICES - BACKGROUND

- Best management practices are preventative measures that can minimize generation of fugitive emissions
- Most best management practices are based on good practices observed during site visits to facilities that operate Laser or Plasma Arc Cutting Equipment
- Air Pollution Control Device permits typically include requirements for equipment to be properly maintained and kept in good operating condition
- Adding specific best management practices into standardized requirements for all applicable facilities can help to further minimize fugitive emissions

BEST MANAGEMENT PRACTICES – INITIAL RECOMMENDATIONS

- Require weekly inspection of filter media
- Prevent obstructions between cutting equipment and Air Pollution Control Device
- Comply with Air Pollution Control Device manufacturers' inspection and maintenance schedule
  - Quarterly inspections if frequency is not specified by manufacturer

Input Requested

- Ability to conduct visual inspections of filter media and ventilation collection system
- Inspection schedule for Air Pollution Control Device(s)

j) Recordkeeping

RECORDKEEPING - CONCEPTS

- Provides a mechanism to confirm compliance with rule requirements
- Recordkeeping requirements included in recent toxic metal particulate rules
- In some instances, checklists can streamline the process

RECORDKEEPING – INITIAL RECOMMENDATIONS

- Records required for:
  - Housekeeping
  - Control device inspections
  - Parametric monitoring
  - Differential pressure readings on days when equipment in use
    - Optional use of continuous data acquisition system (DAS)
  - Air Pollution Control Device information
    - Manufacturer-supplied control efficiency
    - Filter replacement dates
- Records to be maintained for five years, at least two years of most recent records available on site

k) Exemptions

EXEMPTIONS – CONCEPTS

- The purpose of PR 1445 is to reduce toxic emissions
  - Metals cut that contain any toxic air contaminant as identified in Rule 1401 - New Source Review of Toxic Air Contaminants are considered a source of toxic emissions
  - Rule 1401's list of toxic air contaminants is updated periodically based on information provided by the California Office of Environmental Health Hazard Assessment (OEHHA)
- Intent is to exclude equipment that is not a source of toxic emissions from PR 1445
- A mechanism is necessary to ensure excluded equipment does not cut metals that contain Rule 1401 toxic air contaminants

EXEMPTIONS – INITIAL CONSIDERATIONS

Exemption for Facility Not Cutting Toxic Metal

- Facilities where *all* Laser and Plasma Arc Cutting Equipment includes permit conditions that:
  - Prohibit the cutting of any metal that contains a Rule 1401 toxic air contaminant
  - Require recordkeeping of metals cut*
- Applicable Rule 1401 toxic air contaminants
  - Existing facilities – Rule 1401 (current version amended in 2017)
  - New facilities – Version of Rule 1401 in effect at the time an application is deemed complete

**Material content will be based on manufacturer-supplied Safety Data Sheets or certified testing*

Example: A facility has three plasma arc cutters processing iron, exclusively. The iron processed does not include materials listed as a toxic air contaminant in Rule 1401.

Scenario A: If the facility has a permit condition prohibiting cutting materials identified in Rule 1401 (2017 version), the facility is required to keep records to demonstrate that it meets the permit condition and would be exempt from other parts of PR 1445

Scenario B: If the facility has a permit condition prohibiting cutting materials identified in Rule 1401 (1998 version). The facility would need to amend the permit condition to reference the 2017 version of Rule 1401.

EXEMPTIONS – INITIAL CONSIDERATIONS (CONT'D)

Exemption for Equipment not Cutting Toxic Metal

- *Any* Laser and Plasma Arc Cutting Equipment that includes permit conditions to:
  - Prohibit the cutting of any metal with a Rule 1401* toxic air contaminant
  - Require recordkeeping of metals cut**

Exemption from Building Requirements to Reduce Cross Draft

- Facilities where all Laser and Plasma Arc Cutting Equipment is operated within a Permanent Total Enclosure and vented to an Air Pollution Control Device

** Applicable version:*

Existing equipment: Rule 1401 (2017 version)

New equipment: Rule 1401 version when permit application deemed complete

***Material content will be based on manufacturer-supplied Safety Data Sheets or certified testing*

SUMMARY OF WORKING GROUP MEETING #4

Potential rule concepts discussed

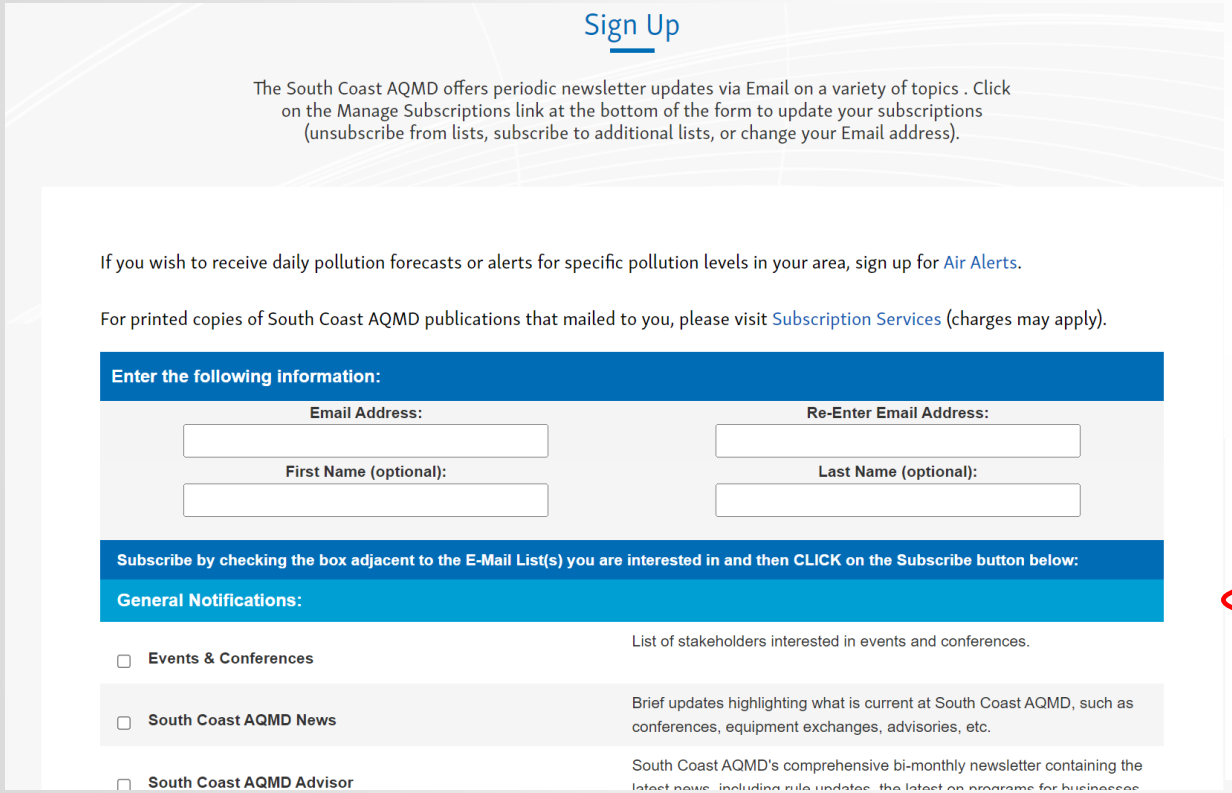
- Control device requirements
  - New equipment
  - Existing equipment
- Parametric Monitoring
- Differential Pressure
- Building Requirements
- Housekeeping
- Best Management Practices
- Recordkeeping
- Exemptions

NEXT STEPS

Develop Initial Rule Language

Next Working Group meeting

STAYING UPDATED



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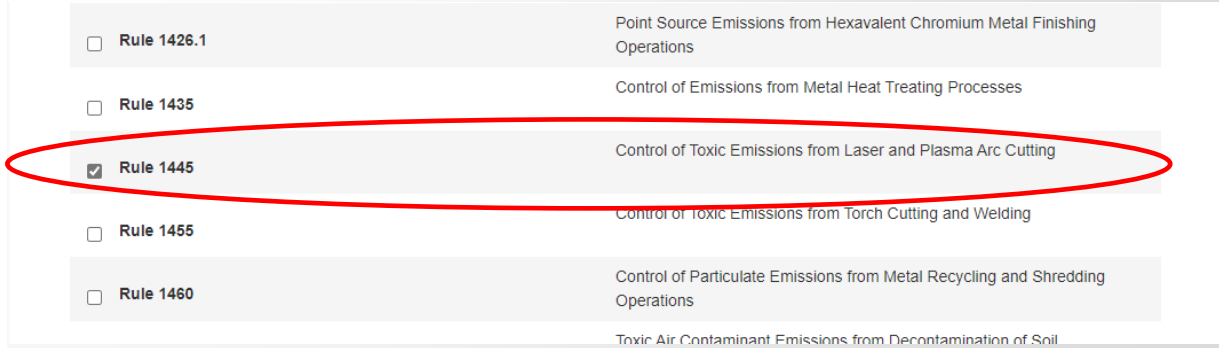

☐ Rule 1426.1	Point Source Emissions from Hexavalent Chromium Metal Finishing Operations
☐ Rule 1435	Control of Emissions from Metal Heat Treating Processes
☑ Rule 1445	Control of Toxic Emissions from Laser and Plasma Arc Cutting
☐ Rule 1455	Control of Toxic Emissions from Torch Cutting and Welding
☐ Rule 1460	Control of Particulate Emissions from Metal Recycling and Shredding Operations
	Toxic Air Contaminant Emissions from Decontamination of Soil

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