Proposed Rule 1435 – Control of Toxic Air Contaminant Emissions from Metal Heating Operations

WORKING GROUP MEETING #8

August 26, 2026
3:00 PM (PT)
South Coast AQMD
Diamond Bar, CA

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Agenda

- Summary of Working Group #7
- Key Comment Received at Working Group #7
- Reassessment of Fugitive Source Requirements
- Reassessment of Quench Tank Requirements
- Next Steps

Summary of Working Group #7

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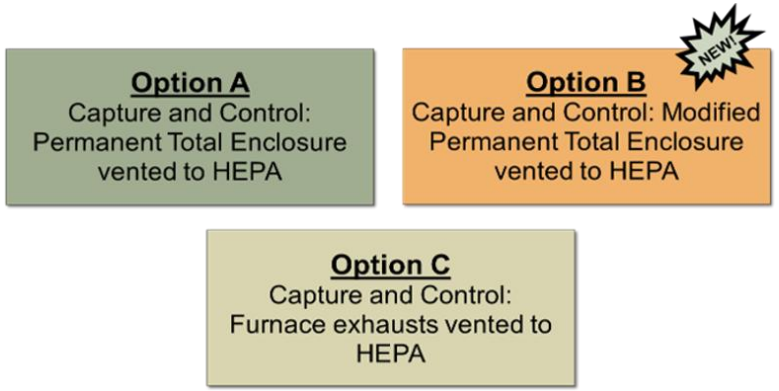
- Presented stakeholder feedback on rule concepts 1.0:
  - Unnecessary to control furnaces that heat metal in an oxygen-free environment or below the established temperature threshold
  - Alternate compliance pathway to control point source emissions
- Presented rule concepts 2.0:
  - Limit point source control requirements to emitting air furnaces
  - Emitting air furnaces will have technology-based compliance pathways to control furnace emissions:
    - Option A – PTE
    - Option B – Modified PTE
    - Option C – Direct controls



Key Comment Received at Working Group #7

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What is the process to determine a material is a source of chromium?

- Workpieces may contain trace amounts of chromium
- Other toxic rules established a minimum percentage of chromium by weight (e.g., Rule 1407.1 – at least 0.5% chromium by weight)

Rule Concept 2.0

- Require emissions from air furnaces to be controlled, if the following criteria are met:
  - Potential **source of chromium** in furnace (e.g., chromium alloy parts, chromium containing fixture, chromium containing refractory/coating)
  - Greater than or equal to 1250°F

Response: How would a facility demonstrate that materials in an air furnace are chromium free?

- Staff assessed potential methods to determine chromium content
  - Assessment of the material using XRF
  - Source testing the air furnace
  - Laboratory analysis of the material
  - Manufacturer data sheets or other documentation
- Using analysis or testing to determine the presence of chromium
  - Source testing and laboratory analysis would take time and may not be representative of all situations
  - Handheld XRF is used for screening, but surface conditions can influence the results
- Manufacturer data sheets are an established method to verify chemical percentages for many different South Coast AQMD rules

Assessment of Chemical Data Sheets

- Initial evaluation of potential methods indicated that manufacturer data sheets may be the best method to determine chromium content or if the material is “chromium free”
- Evaluate manufacturer data sheets for material that is used in an air furnace at a heat treating facility
  - Workpiece comprised of titanium ingot
  - Refractory brick
- Determine if manufacturer data sheets list:
  - Chromium content for material that is “chromium free”
  - Maximum weight percent for metals not listed

Example 1: Titanium Ingot

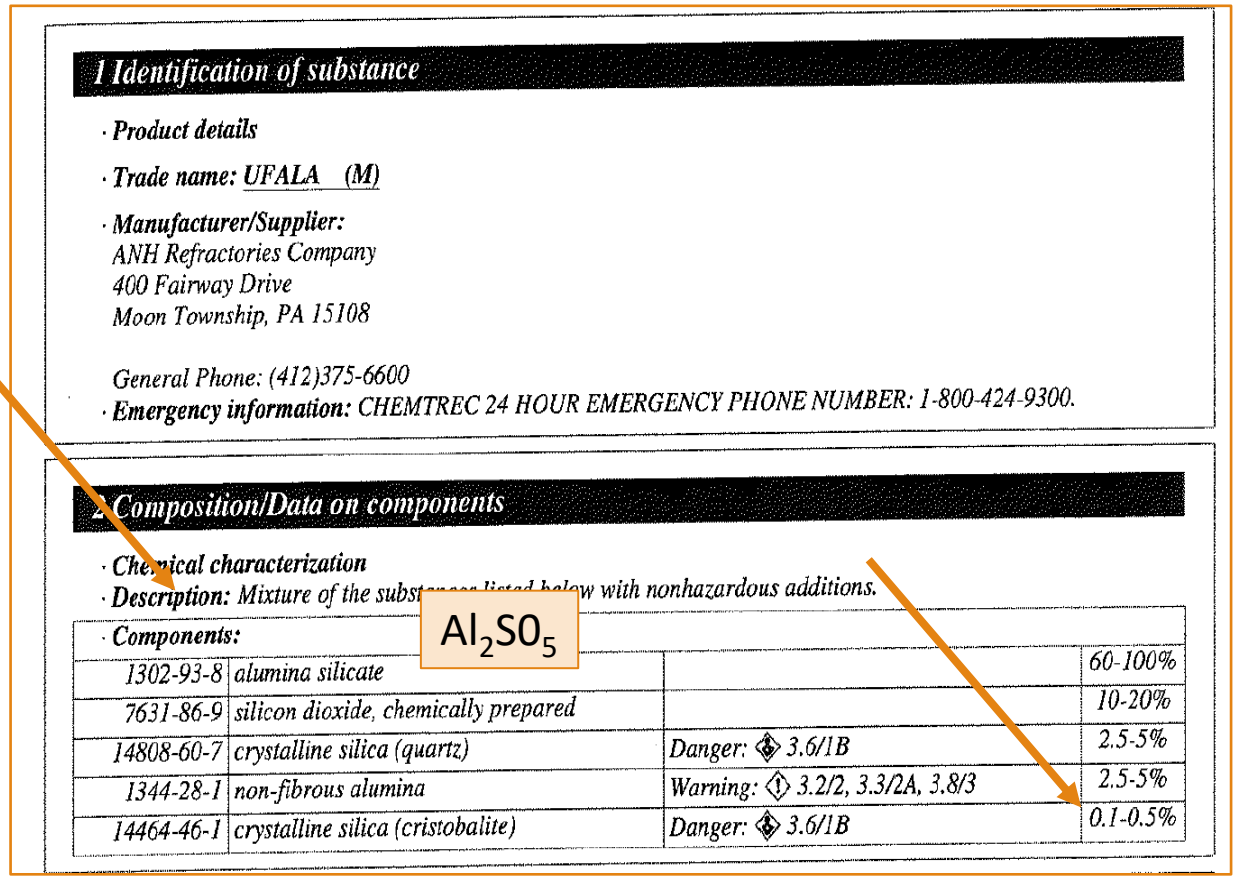
CHEMISTRY WT %

Location	H	N	O	Fe	C	Al	V	Sn	Zr	Cu	Mo	Mn	Ti	B	*	Si	Y	Beta Transus °F
TOP	.0003	.006	.16	.21	.016	6.0	4.2						BAL.	<.003	<.10	<.03	<.005	1803**
BOTTOM	.0001	.008	.17	.18	.016	6.0	4.0						BAL.	<.003	<.10	<.03	<.005	1813**

*Other elements do not exceed .10 maximum or .30 total. Virgin Material – 20.1% Melt Method: 2X VAR **TITANIUM INGOT**

- An ingot is raw stock of a metal alloy
- Example of documentation confirming weight percentages of metal alloys from an elemental analysis of a titanium ingot from a forging facility
- Certificate of Test from the supplier of the ingot shows that trace elements of chromium and other elements is below 0.1% by weight
- Chromium content of the material can be demonstrated to not exceed 0.1% using a Certificate of Test or similar documentation

Example 2: Refractory Brick



1 Identification of substance

· **Product details**

· **Trade name:** UFALA (M)

· **Manufacturer/Supplier:**
ANH Refractories Company
400 Fairway Drive
Moon Township, PA 15108

General Phone: (412)375-6600
· **Emergency information:** CHEMTREC 24 HOUR EMERGENCY PHONE NUMBER: 1-800-424-9300.

2 Composition/Data on components

· **Chemical characterization**
· **Description:** Mixture of the substances listed below with nonhazardous additions.

Al_2SO_5

· **Components:**

1302-93-8	alumina silicate		60-100%
7631-86-9	silicon dioxide, chemically prepared		10-20%
14808-60-7	crystalline silica (quartz)	Danger: 3.6/1B	2.5-5%
1344-28-1	non-fibrous alumina	Warning: 3.2/2, 3.3/2A, 3.8/3	2.5-5%
14464-46-1	crystalline silica (cristobalite)	Danger: 3.6/1B	0.1-0.5%

- Refractory brick line furnace chambers
- Documentation confirming weight percentages of metal alloys from a compound analysis of refractory brick from a heat treating facility
- Example refractory brick did not contain chromium
- Material data sheet lists compounds with a weight percent of at least 0.1%

Modification to Rule Concept – Chemical Data Sheets

- The assessment of chemical data sheets concluded:
  - Manufacturer sheets list metals or metals compounds with a weight percent of at least 0.1%
  - A material may contain an unlisted metal, but it would be less than 0.1%
- Modified threshold for chromium would be < 0.1% to be considered "chromium free" based on a manufacturer data sheet
- Instead of defining "chromium free", PR 1435 will provide an additional compliance pathway as an alternative to controlling emissions for emitting air furnaces that are "chromium free"

Option D – Off-Ramp Key Requirement Concepts

Not heat material that contains more than 0.1% chromium

Permit condition to prohibit the heating of material that contains more than 0.1% chromium by weight

- Provides guardrails to ensure that chromium alloys are not being processed

Prescriptive cleaning of furnace chamber or replace refractory material after modification of permit

- Ensures that the air furnace would not have residual chromium containing material

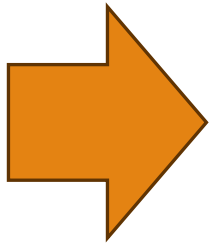
Maintain records of material heated in the air furnace specifying weight percentages of metals and chemical compounds

- Verification of compliance with permit condition

Overview of Revision

Rule Concept 2.0

- Require emissions from air furnaces to be controlled, if:
  - Potential **source of chromium** in furnace
  - Greater than or equal to 1250°F



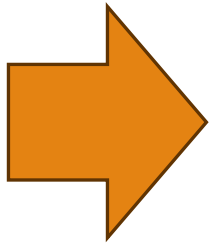
Option A
Capture and Control: Permanent Total Enclosure vented to HEPA

Option B NEW!
Capture and Control: Modified Permanent Total Enclosure vented to HEPA

Option C
Capture and Control: Furnace exhausts vented to HEPA

Revised Rule Concept 2.0

- Require emissions from heat treating air furnaces to be controlled, if:
  - Heating a material containing a metal in furnace
  - Greater than or equal to 1250°F



Option A
Capture and Control: Permanent Total Enclosure(s) vented to HEPA

Option B
Capture and Control: Modified Permanent Total Enclosure(s) vented to HEPA

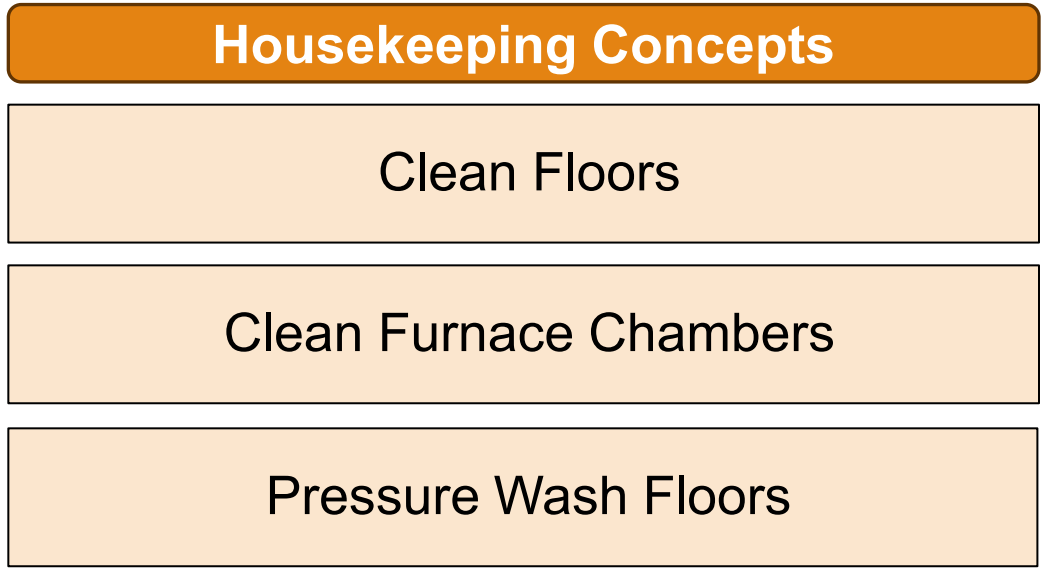
Option C
Capture and Control: Furnace exhausts vented to HEPA

Option D NEW!
Off-Ramp

Reassessment of Fugitive Source Requirements

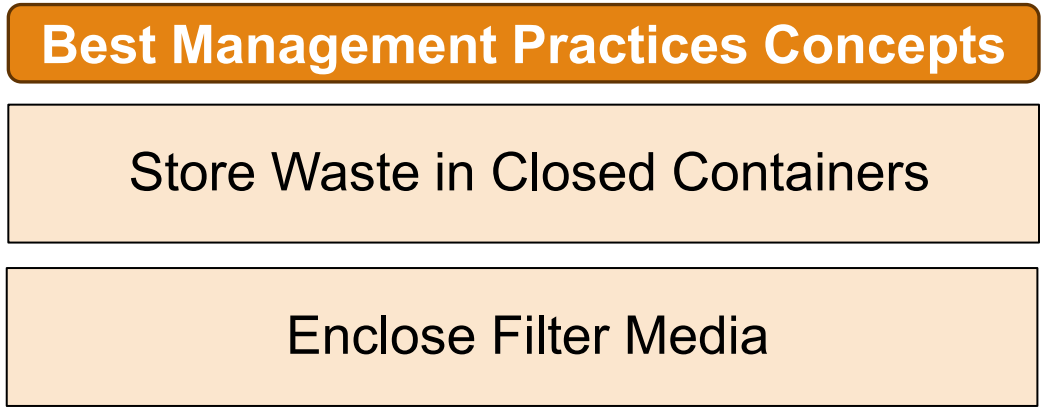
Housekeeping

- Housekeeping removes fugitive metal dust that can accumulate and become re-entrained
- Examples of housekeeping:
  - Routine cleaning of specified areas where metal particulates are likely to accumulate
  - Using cleaning methods that do not resuspend material (e.g., wet cleaning, HEPA vacuum, etc.)



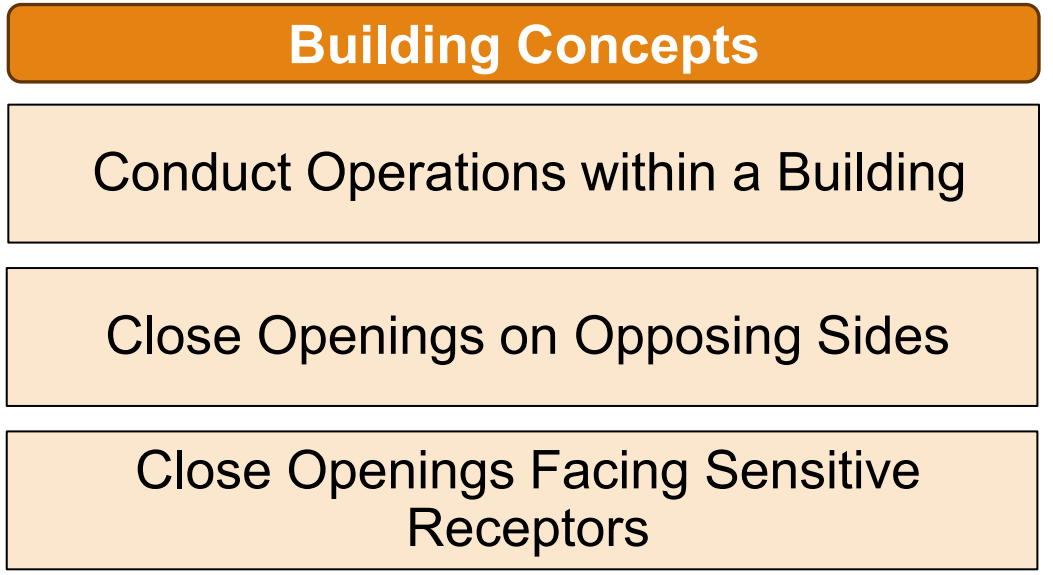
Best Management Practices

- Best management practices (BMPs) reduce the formation or generation of fugitive metal dust that can be re-entrained
- Examples of best management practices:
  - Disposal of metal particulates into closed containers
  - Enclosing filter media from emission control devices



Building Requirements

- Prescriptive building design requirements that reduce re-entrained fugitive metal dust from leaving the building by preventing cross-drafts



Fugitive Emission Sources at Heat Treating Facilities

- Prior working group meeting identified the following potential sources of fugitive emissions at heat treating facilities:
  - Metal particulate dust accumulating on surfaces (e.g., floors)
  - Openings and gaps in buildings
  - Uncontrolled emissions from furnaces
  - Handling and storing of workpieces after heat treating (e.g., air cooling, water quench)
- Requirements to minimize emissions from fugitive sources include:

Proposed Rule Concepts 1.0 – Feedback and Observations at Site Visits

- Staff received feedback and made observations regarding fugitive source rule concepts 1.0 through site visits with facilities:

Housekeeping	
Site Visit Observation	**Stakeholder Comment**

• Reduced scale at facilities with non-qualifying air furnaces and non-air furnaces
• Metal dust accumulated on:
  • Outside surfaces of furnaces
  • Outside surfaces of quench tanks
	• Cleaning furnace chamber requires shutting down furnace and removing door
	• Pressure washing can damage workpieces

Proposed Rule Concepts 2.0 – Housekeeping – Frequency

- Staff received feedback and made observations that the formation of fugitive emissions are different for emitting air furnaces and non-emitting furnaces
  - Non-air furnaces heat workpieces in an oxygen-free environment and scale is reduced in these furnaces
  - Non-qualifying air furnaces were observed to have reduced scale
- Based on this feedback and observations, housekeeping frequency will be based on furnace type
- Non-air and non-qualifying air furnaces will still have housekeeping requirements to ensure fugitive emissions are minimized, but will be less frequent than emitting air furnaces

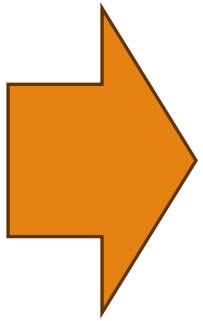
Proposed Rule Concepts 2.0 – Furnace Types

Furnace Type	What is the maximum temperature?	Does the furnace heat metal in the presence of oxygen?	Does the furnace processes chromium alloy parts and/or chromium-containing furnace elements?	Point source control requirements?
Emitting Air Furnace	Greater than or equal to 1250 °F	Yes	Yes	Yes
Non-Qualifying Air Furnace	Less than 1250 °F	Yes	Yes	No
Non-Air Furnace	No restriction	No	Yes	No

Proposed Rule Concepts 2.0 – Housekeeping

Initial Concept

Universal Housekeeping Requirements



Revised Concept

Emitting Air Furnace Housekeeping Requirements

Non-Qualifying Air Furnace and Non-Air Furnace Housekeeping Requirements

Cleaning of Floors – Frequency

Rule Concepts 1.0	Emitting Air Furnace Requirements	Non-Qualifying Air Furnace and Non-Air Furnace Requirements
Cleaning of floors within 20 feet of: • Entrance or exit point of the room or building with a furnace • Furnace openings • Areas where fans or air cooling of workpieces occur • Quenching areas • Workpiece storage areas		
• **Daily**	• **Daily**	• **Weekly**

- Staff observed reduced scale at facilities with non-qualifying air furnaces and non-air furnaces
- Weekly cleaning of floors was consistent with existing housekeeping practices of non-qualifying air furnace and non-air furnace facilities

Cleaning of Floors – Expanded Applicability Areas

Rule Concepts 1.0	Emitting Air Furnace Requirements	Non-Qualifying Air Furnace and Non-Air Furnace Requirements
• Not included	• Added “processing areas”	• Added “processing areas”

- A processing area is where heat treating-related operations are conducted
  - Forging, cooling, or any other process that is conducted on a workpiece that has undergone heat treating
- During site visits, staff observed scale coming off workpieces after being removed from a heat treating furnace
- Cleaning of processing area floors was added to prevent the accumulation of scale or other metal containing materials

Cleaning of Furnace – Frequency

Rule Concepts 1.0	Emitting Air Furnace Requirements	Non-Qualifying Air Furnace and Non-Air Furnace Requirements
• Every **six months** clean the furnace chamber • **Yearly** cleaning of furnace chamber for PTE or fenceline monitoring	• **Monthly** prescriptive cleaning of furnace chamber before point source controls are installed • **Yearly** prescriptive cleaning of furnace chamber meeting the requirements of Option A-Option C	• **Biannual** prescriptive cleaning of furnace chamber

- Key evidence to support prescriptive cleaning of the furnace chamber:
  - CE-CERT study found that internal cleaning of furnaces reduced hexavalent chromium emissions
  - Risk Reduction Plan of a Paramount heat treating facility had yearly cleaning of the furnace interior to reduce emissions
- Emitting air furnaces will have additional requirements before point source controls are installed
- Internal cleaning was aligned with external cleaning because the furnaces will need to be shut down to clean

Cleaning of Furnace and Quench Tanks

Rule Concepts 1.0	Emitting Air Furnace Requirements	Non-Qualifying Air Furnace and Non-Air Furnace Requirements
• Not applicable	• **Monthly** cleaning of outside surfaces of a furnace	• Every **two months** clean the of outside surfaces of a furnace
	Facility with an Emitting Air Furnace	**Facility with Only Non-Qualifying Air Furnaces and Non-Air Furnaces**
• Not applicable	• **Monthly** cleaning of outside surfaces of a quench tank	• Every **two months** clean the outside surfaces of a quench tank

- Staff observed the accumulation of metal dust on the outside surfaces of furnaces and quench tanks
- Additional areas required to be cleaned periodically were added to address these findings

Pressure Washing

Rule Concepts 1.0	Facility with an Emitting Air Furnace	Facility with Only Non-Qualifying Air Furnaces and Non-Air Furnaces
• Monthly pressure washing of floors	• Removed requirement to pressure wash floors	

- Staff received feedback during site visits that pressure washing can damage workpieces
- Daily prescriptive cleaning of floors will address accumulation of fugitive metal dust
- Pressure washing of floors has been removed as a rule concept

Reassessment of Quench Tank Requirements

Background to Quench Tanks Requirements

- Quench tanks are used to rapidly cool workpieces
  - Quench tank media includes water, oil, polymer, or brine
- Key takeaways regarding quench tanks from the Paramount Investigation:
  - Water quench tanks were shown to be a point source of hexavalent chromium when heated chromium alloys are placed into the quench tank
  - Oil quench tanks were shown to contain hexavalent chromium at lesser amounts and were not shown to be a point source of hexavalent chromium
- Quench tank requirements are meant to minimize point source emissions from water and non-water quench tanks

Proposed Rule Concepts 2.0 – Quench Tank Requirements

- Quench tank requirements will be based on furnace type
  - Less frequent testing for facilities with non-qualifying air furnaces and non-air furnaces
- Additional requirements for non-water quench tanks
  - Guardrails to ensure that non-water quench tanks are being tested and maintained if hexavalent chromium is detected in quench fluid

Water Quench Tank

Rule Concepts 1.0	Facility with an Emitting Air Furnace	Facility with Only Non-Qualifying Air Furnaces and Non-Air Furnaces
• **Monthly** testing for a Tier 3 or Tier 2 facility • Every **three months** for a Tier 1 facility	• **Monthly** testing for hexavalent chromium	• Every **three months** test for hexavalent chromium

- Updating testing frequency to align with the revised approach for addressing point source emissions

Non-Water Quench Tank

<table>
<tr><th>Rule Concepts 1.0</th><th>Facility with an Emitting Air Furnace</th><th>Facility with Only Non-Qualifying Air Furnaces and Non-Air Furnaces</th></tr>
<tr><td rowspan="2">• Within three months of rule adoption, test for hexavalent chromium
• Provided information on non-water quench tank
• No concentration limit</td><td colspan="2">• Maintain hexavalent chromium concentration < 0.15 mg/L
• Within three months of rule adoption, test for hexavalent chromium</td></tr>
<tr><td>• If concentration is < 0.15 mg/L:
  • Test every three months
• If concentration is ≥ 0.15 mg/L:
  • Test monthly</td><td>• If concentration is < 0.15 mg/L:
  • Test every six months
• If concentration is ≥ 0.15 mg/L:
  • Test monthly</td></tr>
</table>

- Added additional testing and maintenance requirements for non-water quench tanks
- Ensure that non-water quench tanks are being tested and maintained if the hexavalent chromium concentration is greater than or equal to 0.15 mg/L

Summary of Working Group Meeting #8

- Determined a process to show that a material is not a source of chromium
  - Created a new pathway (Option D) for air furnaces to show that chromium alloys are not processed in the furnace
- Key requirements of Option D:
  - No chromium alloys or chromium compounds
  - Adding a permit condition
  - Prescriptive cleaning of furnace chamber or completely replace all refractory material
  - Recordkeeping of safety data sheets or any other data sheets that show chromium is not processed
- Revised housekeeping requirements
  - Updated the frequency for periodic cleaning non-air and non-qualifying air furnaces
  - Added additional areas for cleaning
  - Removed pressure washing requirement
- Revised quench tanks requirements
  - Updated frequency of water quench tank requirements
  - Added additional testing and maintenance requirements for non-water quench tanks

Next WGM will discuss building enclosure rule concepts

Next Steps

Next Steps

- Continue site visits
- Working Group Meeting #9 – Building Enclosures
- Draft preliminary rule concepts

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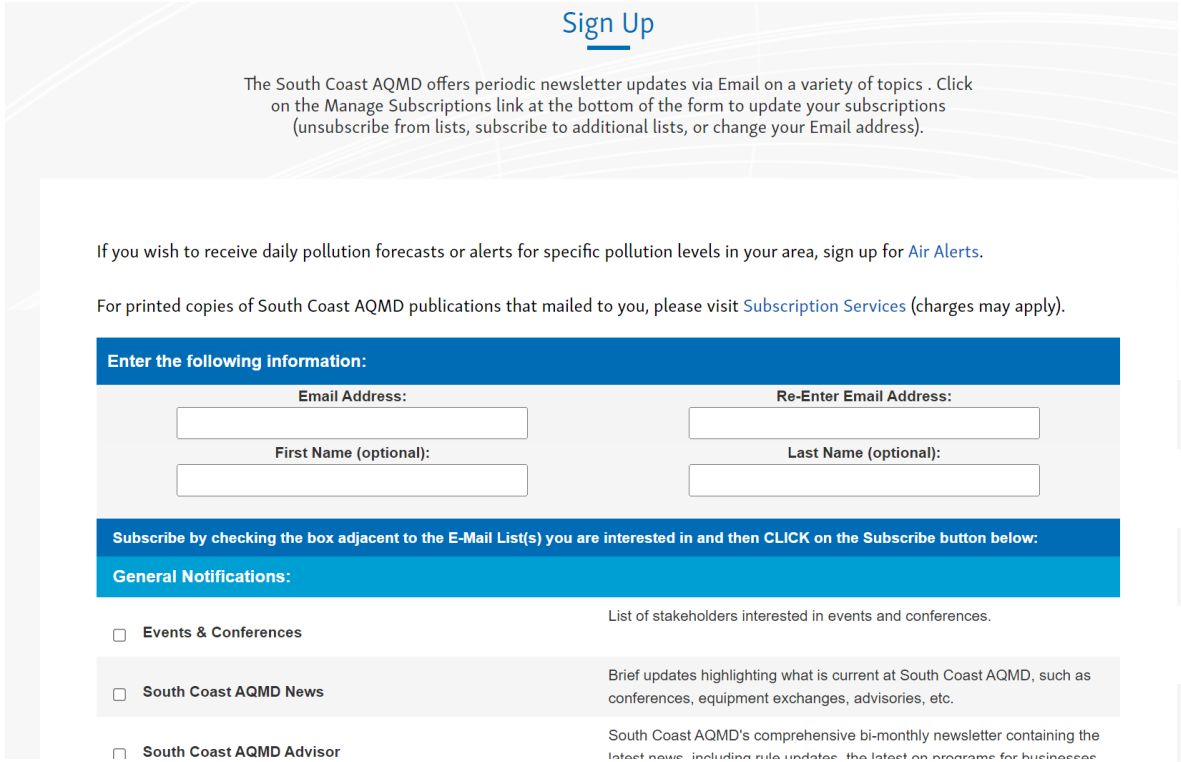

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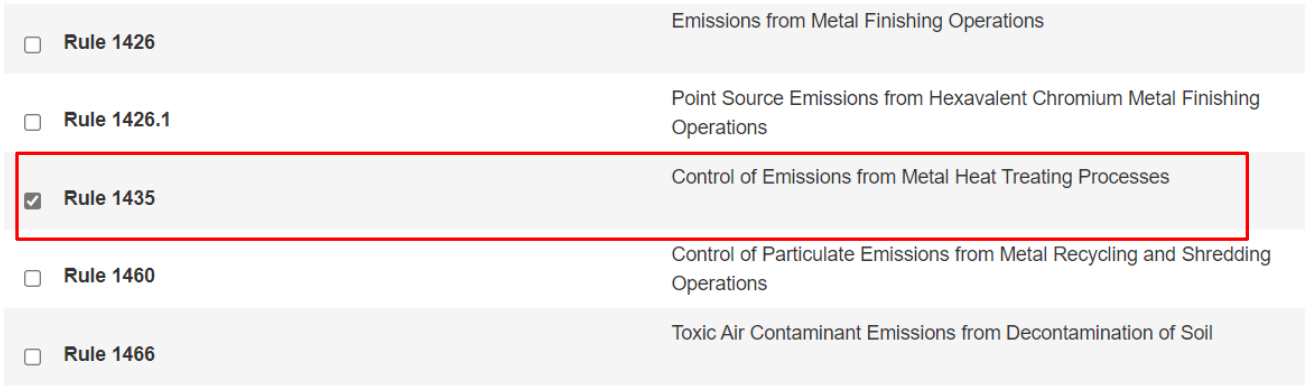

☐ Rule 1426	Emissions from Metal Finishing Operations
☐ Rule 1426.1	Point Source Emissions from Hexavalent Chromium Metal Finishing Operations
☑ Rule 1435	Control of Emissions from Metal Heat Treating Processes
☐ Rule 1460	Control of Particulate Emissions from Metal Recycling and Shredding Operations
☐ Rule 1466	Toxic Air Contaminant Emissions from Decontamination of Soil

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