

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

## WORKING GROUP MEETING #5



**May 2, 2024**  
**1:00 pm (PDT)**  
**South Coast AQMD**  
**Diamond Bar, CA**

**Join Zoom Webinar Meeting**

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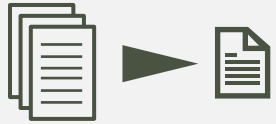
# Agenda

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- Summary of Working Group Meeting #4
- Responses to Comments
- Proposed Detailed Rule Concepts
- Next Steps



Responded to comments from Working Group Meeting #3



Summarized key findings from information sources



Presented preliminary rule concepts:

- Rule applicability
- Control strategies for fugitive emissions
- Compliance options for point sources

# Summary of Working Group Meeting #4

# Stakeholder Comments from Working Group Meeting #4

## Comment #1

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Are there other methods to treat hexavalent chromium in water besides ferrous sulfate?

## Comment #2

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Prohibiting hexavalent chromium-containing support racks is problematic because alternatives may not be feasible

## Comment #3

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Fenceline monitoring should be a compliance option

## Comment #4

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Requirements to close building openings may conflict with Cal/OSHA indoor temperature standards

# Are there other methods to treat hexavalent chromium in water besides ferrous sulfate?

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- California State Water Resources Control Board acknowledges several techniques for treating hexavalent chromium in water
  - Dosing with ferrous sulfate is one of the techniques
- Initial recommendation on Slide 19 does not prescribe any specific treatments
  - Focuses on goal of operating water quench tanks that meet concentration limit for hexavalent chromium

## Prohibiting chromium-containing support racks is problematic because alternatives may not be feasible

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- Stakeholders have informed staff that using racks other than chromium containing ones may:
  - Not hold up to higher temperature
  - Have unknown effects on metal workpieces
- Staff exploring information on racks used in furnaces and alternatives
- Upcoming proposed requirements for furnaces will seek to use source testing to further characterize emissions from support racks

# Fenceline monitoring should be a compliance option

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- Staff is open to including a fenceline monitoring option
  - However, it would likely **not** be a one-time, short-term requirement
- Many details will need to be developed:
  - Location(s) and frequency of air sampling
  - Concentration threshold
  - Guardrails to ensure that if emissions exceed the concentration threshold, facility would be required to take further action by a specific timeframe
- Detailed fenceline monitoring proposal will be explored in a subsequent working group meeting

## Requirements to close building openings may conflict with Cal/OSHA indoor temperature standards

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- Building openings can allow cross drafts, potentially causing fugitive metal dust emissions
  - Along with measures for housekeeping and best management practices, closing building openings is a key strategy for reducing emissions
- Initial recommendations include an option for alternative Building Enclosure Compliance Plans for facilities unable to comply with requirements due to worker safety conflicts

*Venting the building or furnaces to air pollution controls may have co-benefit of reducing indoor temperatures*



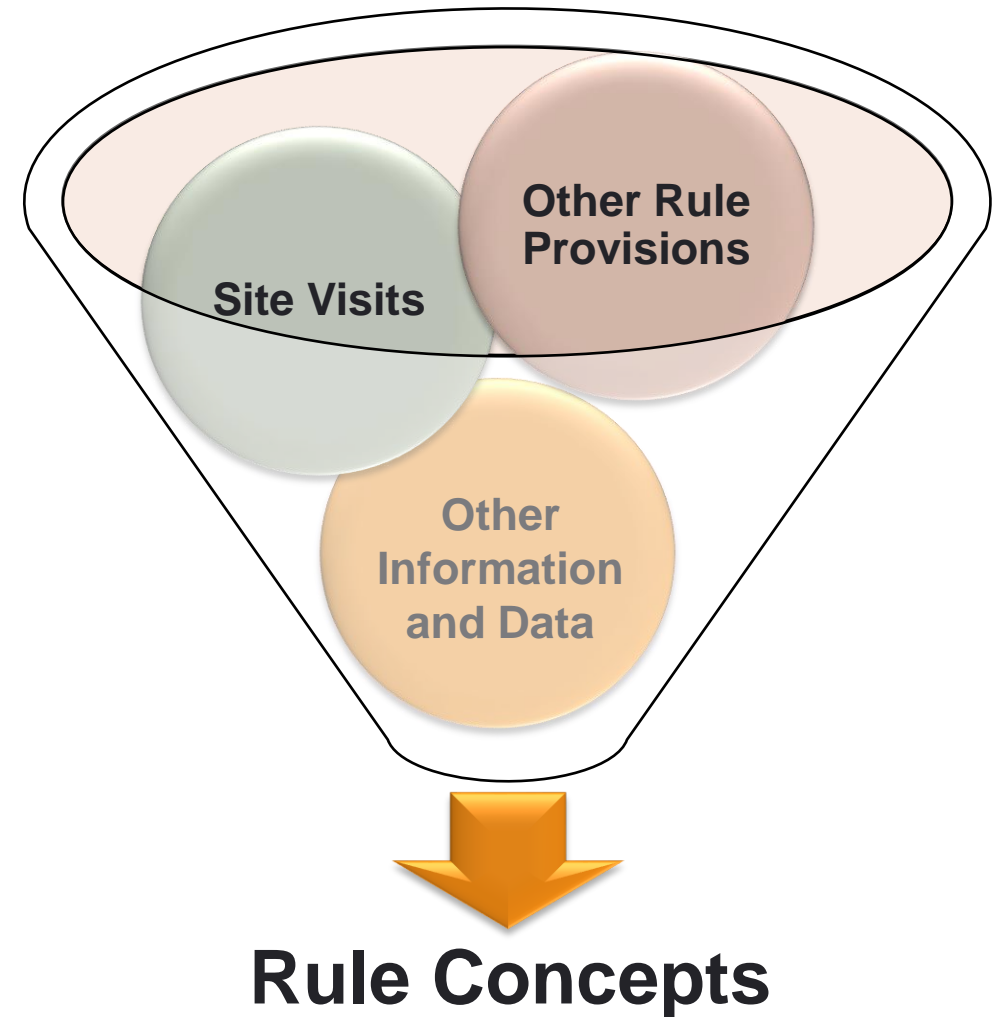
# Rule Concepts

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# Overview

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- Working Group Meeting #4 presented overview of preliminary rule concepts for control strategies for fugitive and point source emissions
- Detailed rule concepts will be presented in two working group meetings
- This WGM will seek public input on initial recommendations on rule provisions for fugitive emissions controls and quench tanks, and other requirements
  - Initial recommendations for furnace emission controls will be presented in a future WGM
- Stakeholder input on rule concepts will help shape Initial Rule Language



# PR 1435 Structure

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(a) Purpose

(b) Applicability

(c) Definitions

(d) Metal Heating Furnace Requirements\*

(e) Quench Tank Requirements

(f) Housekeeping Requirements

(g) Best Management Practices

(h) Building Requirements

(i) Parameter Monitoring Requirements for Air Pollution Control Devices\*

(j) Source Testing Requirements\*

(k) Recordkeeping Requirements\*

(l) Prohibitions

(m) Exemptions

*\* To be provided in subsequent WGM*



- (a) Purpose
  - (b) Applicability
  - (c) Definitions
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# Initial Recommendations

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## Purpose

- Reduce emissions of toxic air contaminants from Metal Heating operations

## Applicability

- PR 1435 applies to facilities conducting Metal Heating including forges, heat treaters, and other establishments conducting Metal Heating processes
- Would not apply to furnaces that:
  - Operate at maximum temperatures of less than 1250°F
  - Do not contain Rule 1401 metals
- Additional exemption concepts provided beginning on Slide 40

# Key Definitions

Building	Type of enclosure that is a structure, enclosed with a floor, walls, and a roof to prevent exposure to the elements (e.g. precipitation or wind)
Building Opening	Any opening that is designed to be part of a building, such as passages, doorways, bay doors, wall openings, roof openings, vents, and windows, not including stacks, ducts, and openings to accommodate stacks and ducts
Chromium Alloy	Any metal that is at least 0.5 percent chromium by weight
Closed Loop Cooling Tower	Cooling tower where there is no direct contact between the water to be cooled down and the air that is inside the cooling tower
Controlled Atmosphere Furnace	A Metal Heating furnace in which the atmosphere in the furnace chamber is controlled in order to avoid exposing the workpiece to ambient air during the heating process, and can include vacuum furnaces, endothermic furnaces, hydrogen furnaces, or furnaces that use inert gases in the furnace chamber, such as nitrogen, helium, or argon
Metal Heating	Any operation in which a metal or metal alloy is heated to below the melting point, including, but not limited to, forging, heat treating, and the preheating of the metal or metal alloy prior to further processing

# Approach to Facility Tiers

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- Metal heating facilities proposed to be categorized into three tiers, based on number and types of furnaces
- Tier 3 is based on a heat treating facility that modified the facility and installed point source controls
- Prior to installing controls, facility found to have elevated fence-line ambient levels of hexavalent chromium and elevated health risk

# Approach to Facility Tiers *(continued)*

	Tier	Criteria	Basis for Criteria
Higher Emissions Potential	3	<ul style="list-style-type: none"> <li>• <math>\geq 17</math> uncontrolled atmosphere furnaces</li> <li>• Process Cr alloys (<math>\geq 0.5\%</math> Cr by weight)</li> </ul>	<ul style="list-style-type: none"> <li>• Number of furnaces at heat treating facility prior to installing controls</li> </ul>
	2	<ul style="list-style-type: none"> <li>• <math>\geq 8</math> furnaces (both controlled and uncontrolled atmosphere)</li> <li>• Not a Tier 3 facility</li> <li>• Other Cr alloys that may be present in furnaces (e.g., support racks, rotary furnace components)</li> </ul>	<ul style="list-style-type: none"> <li>• Number of furnaces at heat treating facility after controls</li> <li>• Includes furnaces with less available emissions information                             <ul style="list-style-type: none"> <li>• Controlled atmosphere furnaces</li> <li>• Furnaces with other Cr alloys present</li> </ul> </li> </ul>
	1	<ul style="list-style-type: none"> <li>• <math>\leq 7</math> furnaces (both controlled and uncontrolled atmosphere) <b>OR</b></li> <li>• No Cr alloys present in furnaces</li> <li>• Confirmation of no Cr alloys present in furnaces (e.g., box-type furnaces with no Cr alloy support racks)</li> </ul>	<ul style="list-style-type: none"> <li>• Smaller facilities with less emissions potential</li> <li>• Furnaces may have other metal TAC emissions aside from hexavalent chromium</li> </ul>

Applies to furnaces with maximum operating temperature of  $\geq 1250^\circ\text{F}$





## (e) Quench Tank Requirements

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# Background

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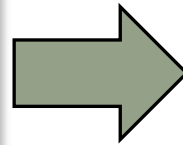
- Quench tank water shown to be a source of hexavalent chromium when heated chromium alloys are placed into the quench tank
  - Elevated levels of hexavalent chromium were detected at a heat treating facility's water quench tank and at the outlet of the tank's direct circulating cooling tower
- Small amount of hexavalent chromium detected in heat treating facility's oil quench tank fluid
  - Sampling conducted above the tank surface showed high concentrations of hexavalent chromium, however it may have been influenced by ambient dust at the facility
- A quench tank that contains elevated levels of hexavalent chromium may exceed health risk thresholds in Rule 1401 – New Source Review of Toxic Air Contaminants and thus require a Permit to Operate
- Staff recommends quenching fluid be tested to measure hexavalent chromium concentrations

## Initial Recommendations

### Water Quench Tanks

On and after date of rule adoption, a facility that processes Chromium Alloys shall measure the hexavalent chromium concentration of the quench water, using American Public Health Method 312B\*:

- For a Tier 3 or Tier 2 facility, once every calendar month
- For a Tier 1 facility, once every 3 calendar months



If measurements show that Hexavalent Chromium is present in quench water:

- No later than 7 days of receiving results, treat or replace quench water to ensure that concentrations are below 0.15 mg/L
- No later than 90 days of receiving results, submit a complete application for a permit to operate

\* In *Standard Methods for the Examination of Water and Wastewater*, published by the American Public Health Association

# Initial Recommendations

## Non-Water Quench Tanks

- Within 3 months of rule adoption, a facility shall measure the hexavalent chromium concentration of the quench fluid in a non-water quench tank, and submit the results to South Coast AQMD
- Results from non-water quench tanks tests would be collected for information purposes
- The need for further action will be determined based on testing results



## (f) Housekeeping Requirements

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# Background


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- Toxic metal particulate rules that have been recently amended or adopted all have housekeeping requirements to minimize fugitive emissions

Fugitive metal dust emissions originate from oxidized metal surfaces



Metal dust can accumulate within facility if insufficient/improper housekeeping



PR 1435 housekeeping provisions are intended to reduce metal dust accumulation

# Initial Recommendations

## Clean Floors Daily

- On and after date of rule adoption, conduct daily cleaning using Approved Cleaning Methods of all floor areas within 20 feet of:
  - Any entrance or exit point of a Building that houses Metal Heating operations
  - Metal Heating furnace openings
  - Areas where fan or air cooling of workpieces occur
  - Quenching areas
  - Workpiece storage areas

# Initial Recommendations *(continued)*

## Clean Furnace Chambers

- On and after date of rule adoption, clean all chamber surfaces of a Metal Heating furnace to remove all loose debris within the furnace:
  - At least once every two calendar months when the furnace is in operation on one or more days in the two-month period
  - At least once every 12 calendar months when the furnace is in operation on one or more days in the 12-month period, if the furnace is located and exhausted within a Permanent Total Enclosure and vented to HEPA filters 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 Recommendations *(continued)*

## Store Waste in Closed Containers

On and after date of rule adoption:

- Store in leak-proof containers materials generated as a result of a Metal Heating operation that can form any amount of Fugitive Metal Dust emissions including, but not limited to, scale from heated workpieces, used refractory material, metal scraps, trash, debris, and any waste generated from housekeeping requirements, or any maintenance and repair activity
- Collect material(s) captured by an air pollution control device into leak-proof containers to prevent any Fugitive Metal Dust emissions, except when material(s) are actively removed from the container or being prepared for disposal
- Keep containers with materials collected pursuant to above bullet points closed at all times except when material is actively deposited into or actively removed from the container

# Initial Recommendations *(continued)*

## Pressure Wash Floors

- On and after date of rule adoption, Tier 3 and Tier 2 facilities shall pressure wash the floor areas of all Metal Heating areas in the facility at least once every calendar month, for any month when Metal Heating operations are conducted on one or more days

## Operate Air Pollution Controls

- On and after date of rule adoption, a facility performing housekeeping or any kind of cleaning operations within a Building equipped with an air pollution control system shall ensure that the corresponding air pollution control system is in full operation during such activities



## (g) Best Management Practices

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# Background

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- Best management practices (BMPs) include a suite of different types of requirements that when implemented can ensure:
  - Fugitive metal dust emissions from Metal Heating operations are minimized
  - Proper operation of pollution controls
- Requirements for BMPs are present in all toxic metal particulate rules

# Initial Recommendations

## Restrictions on Compressed Air Use

- On and after date of rule adoption, a facility shall not use compressed air for activities unless:
  - Water is used to prevent Fugitive Metal Dust emissions
  - The activities are conducted in a Building and not within 20 feet of a Building Opening

## Enclose Filter Media

- On and after date of rule adoption, a facility shall enclose all filter media of emission control devices associated with Metal Heating operations at all times except for unused filter media



## (h) Building Requirements

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# Background

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- Building requirements, or enclosure requirements, are common provisions in toxic metal particulate rules
  - Necessary to help prevent fugitive emissions from leaving the facility
- Initial recommendations in subsequent slides are intended to help control fugitive metal dust emissions
- Requirements related to controlling emissions from furnace exhausts (e.g., permanent total enclosures, closing roof openings) to be discussed in the next WGM

# Initial Recommendations

## Conduct Operations Within a Building

- On and after January 1, 2027, a facility shall conduct the following operations within a Building and not within 20 feet of a Building Opening, excluding roof openings:
  - Operation of any Metal Heating furnace
  - Fan or air cooling of heated parts or products
  - Metal grinding or cutting associated with a Metal Heating operation
    - Does not include operations regulated under Rule 1430 - Control of Emissions from Metal Grinding Operations at Metal Forging Facilities



# Initial Recommendations *(continued)*

## Close Openings on Opposing Sides

- On or after January 1, 2027, if the Building contains Building Openings to the exterior that are on opposite ends of the Building where air can pass through any space where Metal Heating operations occur, a facility shall close Building Openings on at least one end for each pair of opposing ends of the building, except during the passage of vehicles, equipment, or people by using one or more of the following:
  - A door that automatically closes
  - A vestibule
  - A Barrier or obstruction, such as a large piece of equipment that prevents air from passing through any space where Metal Heating is conducted
  - Overlapping plastic strip curtain
  - An airlock system

# Initial Recommendations *(continued)*

## Close Openings Facing Sensitive Receptors

- On and after January 1, 2027, except during the movement of vehicles, equipment, or people, close any Building Opening by using one or more of the methods listed in previous slide that directly faces and opens toward the nearest:
  - Sensitive Receptor, with the exception of the nearest School\*, that is located within 1,000 feet, as measured from the property line of the Sensitive Receptor to the Building opening; and
  - School that is located within 1,000 feet, as measured from the property line of the School to the Building opening

\* School as defined in Rule 1401.1 – Requirements for New and Relocated Facilities Near Schools

# Initial Recommendations *(continued)*

## Alternative Building Enclosure Compliance Plan

If any of the Building Requirements cannot be complied with due to conflicting requirements from OSHA, Cal/OSHA, or other municipal codes or agencies directly related to worker safety:

- Submit a Building Enclosure Compliance Plan:
  - No later than 3 months after rule adoption for existing facilities
  - Prior to initial start-up for all new facilities
- Plan should include:
  - Explanation of why facility cannot comply with Building Requirements
  - Alternative compliance measures that are demonstrated to be equivalent or more effective method of preventing Fugitive Metal Dust emissions from escaping a Building

# Initial Recommendations *(continued)*

## Plan Review Process

- Executive Officer shall notify in writing whether the Plan is approved or disapproved
- If Plan is disapproved, submit a revised Plan within 30 calendar days after the notification of disapproval
  - Revised Plan shall include any information to address deficiencies identified in the disapproval letter
- Executive Officer will either approve the revised Plan or modify it and approve it as modified
  - Facility may appeal a modified Plan to the Hearing Board
- Implement approved Plan within 90 days after receiving notification of approval

# (I) Prohibitions

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# Initial Recommendations

- On and after January 1, 2026, do not operate any furnace with refractory that is manufactured to contain chromium
  - Verified through testing, Safety Data Sheet (SDS) or other official manufacturer-supplied documentation
- On and after one year of date of rule adoption, a facility with a water quench tank that processes Chromium Alloys shall not operate an evaporative cooling tower unless the cooling tower is a Closed Loop Cooling Tower

# (m) Exemptions

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# Initial Recommendations

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PR 1435 would not apply to:

- Furnaces or other Metal Heating equipment, processes, or areas associated solely with those furnaces, where:
  - Furnace maximum temperatures are less than 1250°F
  - No metals listed in Rule 1401 are present in the furnace
  - ▶ Can be demonstrated through manufacturer specs or permit condition requirements
- Educational facilities with Metal Heating operations for purposes of education or research
  - May be required to report information
- Grinding and cutting operations regulated under Rule 1430



# Overview of Furnace Control Strategies

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# Approach to Furnace Controls

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- Metal toxic air contaminant emissions from furnaces are a concern
- Aim is to provide multiple compliance pathways for facilities with largest emissions potential:
  - Install controls
  - Demonstrate health risk from metal heating operations is low
  - Conduct fence-line monitoring
- Potential requirements will be discussed in detail at the next Working Group meeting

# Proposed Metal Heating Facility Tiers

Tier	Criteria	Potential Key Requirements
3	<ul style="list-style-type: none"> <li>• <math>\geq 17</math> uncontrolled atmosphere furnaces</li> <li>• Process Cr alloys (<math>\geq 0.5\%</math> Cr by weight)</li> </ul>	<ul style="list-style-type: none"> <li>• Capture and control emissions;</li> <li>• Quantify risk impacts (with source testing); <b>OR</b></li> <li>• Fenceline monitoring</li> </ul>
2	<ul style="list-style-type: none"> <li>• <math>\geq 8</math> furnaces (both controlled and uncontrolled atmosphere)</li> <li>• Not a Tier 3 facility</li> <li>• Other Cr alloys that may be present in furnaces (e.g., support racks, rotary furnace components)</li> </ul>	<ul style="list-style-type: none"> <li>• Submit information on operating conditions and equipment; and</li> <li>• Hexavalent chromium and multi-metal source testing</li> <li><b>OR</b></li> <li>• Comply with Tier 3 requirements</li> </ul>
1	<ul style="list-style-type: none"> <li>• <math>\leq 7</math> furnaces (both controlled and uncontrolled atmosphere) <b>OR</b></li> <li>• Confirmation of no Cr alloys present in furnaces (e.g., box-type furnaces with no Cr alloy support racks)</li> </ul>	<ul style="list-style-type: none"> <li>• Submit information on operating conditions and equipment</li> </ul>

Higher Emissions Potential

**Applies to furnaces with maximum operating temperature of  $\geq 1250^\circ\text{F}$**

# Other Chromium Alloys in Furnaces

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- Aside from workpieces, other chromium alloys may also be present in a furnace:
  - Stainless steel, or other chromium alloy, support racks
  - Refractory material (e.g., stainless steel needles in door jambs)
- These metals could be heated to the same temperature along with the workpieces and can be used repeatedly, with various lifetimes
- Screening source tests showed high concentrations of hexavalent chromium emissions from a furnace processing a non-chromium alloy workpiece located on a stainless steel support rack
  - Information is qualitative, as a source test could not be conducted and mass emissions were not measured
- Prior to developing rule provisions, staff is proposing to quantify emissions from other potential sources of hexavalent chromium through source testing Tier 2 facilities
  - Source testing requirements to be presented at subsequent Working Group meeting

# Remaining Rule Provisions

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- Next WGM will present initial concepts for remaining rule provisions:
  - Furnace control options, including fenceline monitoring
  - Parametric monitoring for facilities that install controls
  - Source testing requirements
  - Recordkeeping requirements

# Working Group Meeting #5 Recap

- Discussed initial rule recommendations for:
  - Rule purpose and applicability
  - Key definitions
  - Quench tanks
  - Housekeeping
  - Best management practices
  - Buildings
  - Prohibitions
  - Exemptions
- Discussed approaches to furnace control strategies and support racks

## Next Steps

- Continuing discussions with stakeholders
- Additional site visits
- Develop initial rule language
- Working Group Meeting #6
  - Initial recommendations for furnace control strategies and remaining rule provisions

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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



# PR 1435 Staff Contacts

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