

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

Working Group Meeting #7 June 26, 2025 3:00 PM

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AGENDA



RULE DEVELOPMENT UPDATE

- PR 1445 implements
 - AB 617 Community Emission Reduction Plan priority
 - AQMP control measure (TXM-05)
- Public Workshop was held on August 29, 2024 (Five comment letters were received)
- Demonstration projects have been conducted to evaluate proposed parametric monitoring requirements for portable equipment
- Purpose of meeting today is to
 - 1. Respond to workshop comments
 - 2. Present information from demonstration projects
 - 3. Present revised preliminary draft rule language, focusing on portable APCD requirements





PUBLIC COMMENTS

Comment #1 – Water Tables

• Demonstrating water table control efficiency and incremental benefit of adding ventilation system to previously permitted water tables

Comment #2 – Building Enclosure Requirements

 Concerns over potential for conflicts between PR 1445 requirements to close building openings and recently adopted Cal/OSHA Indoor Heat rule

Comment #3 – Portable Units

• Portable units are used infrequently and are not a notable source of toxic emissions

COMMENT #1: DEMONSTRATING WATER TABLE CONTROL EFFICIENCY AND INCREMENTAL BENEFIT OF ADDING VENTILATION SYSTEM TO PREVIOUSLY PERMITTED WATER TABLES

Staff Responses

- Limited data is available for water tables
 - Efforts to investigate toxics emissions from water tables, including outreach to manufacturers and vendors, and identifying potential water tables for testing, are ongoing
- To minimize air toxic emissions, PR 1445 includes a standardized approach to require high efficiency air pollution control devices (99.97% for units that cut metals with higher levels of toxics and 99% for others)
- For water tables, PR 1445 includes following pathways to demonstrate control efficiency ullet
 - Cutting stainless steel or nickel alloy or unknown metal: source testing •
 - Cutting non stainless steel or non nickel alloy: source testing, U.S. EPA fact sheet, or manufacturer • particulate removal guarantee
- For applicable existing water table units, PR 1445 establishes procedures to seek an exemption from subdivision (d) control device requirements based on low emissions/health risk [refer to exemptions – paragraphs (I)(4) and (I)(5)] 5

COMMENT #2: CONCERNS OVER POTENTIAL FOR CONFLICTS BETWEEN PR 1445 REQUIREMENTS TO CLOSE BUILDING OPENINGS AND NEWLY ADOPTED CAL/OSHA INDOOR HEAT RULE

Staff Responses

- PR 1445 building requirements are intended to facilitate proper operation of filter-based air pollution control devices and to minimize fugitive emissions
- CAL/OSHA Indoor Heat regulations require a facility to implement engineering controls (e.g., natural ventilation, air conditioning, fans, insulating heat sources, etc.) if indoor temperatures exceed thresholds
 - Allows use administrative controls (e.g., providing more breaks, rotating employees, reducing work hours, etc.), if engineering controls are not sufficient
- Although there are alternatives to natural ventilation to comply with CAL/OSHA rules, PR 1445 includes an alternative compliance pathway (i.e., use of wind barrier) [refer to slide 30 for proposed rule language]

COMMENT #3: PORTABLE UNITS ARE USED INFREQUENTLY AND ARE NOT A NOTABLE SOURCE OF TOXIC EMISSIONS

Staff Reponses

- PR 1445 is applicable to units that require permits
- South Coast AQMD Rule 219 excludes some hand-held plasma arc cutting equipment from permits <u>except</u> when risk from uncontrolled emissions is greater than health risk thresholds in Rule 1401 – New Source Review of Toxic Air Contaminants
- Using the most recent risk assessment procedures* and representative operational assumptions, uncontrolled emissions from cutting relatively small amounts of mild steel, stainless steel and nickel alloys could exceed heath risk thresholds in Rule 1401 (Refer to draft Rule 219 support document on PR 1445 web page)

RESPONSE TO COMMENT #3 (CONTINUED)

- Given that maintenance and repair activities typically involve cutting metal of unknown composition and risk assessment procedures require conservative assumptions, the emissions/risk potential could be high
- The partial exemption for maintenance/repair activities has been updated [paragraph (I)(3)]
 - Permitted units to be subject to control device, parametric monitoring requirements and pressure drop requirements, subdivisions (d), (e), and (f), respectively to minimize toxic emissions
 - Exemption for building requirements (i.e., wind barrier) and housekeeping, subdivisions (g), and (h) respectively, remain due to feasibility concerns for maintenance and repair activities

- (3) Subdivisions (g) and (h) and subparagraph (k)(1)(E) shall not apply to a Portable Unit and the corresponding APCD with a Capture Hood used for maintenance and repair activities provided:
 - (A) A fixed physical obstruction is within ten feet of the workpiece that prevents use of a Wind Barrier or the workpiece to be cut is located more than six feet above grade level; and
 - (B) The workpiece to be cut is connected to a fixed structure or pipes that are unable to be moved to be within a Building.

KEY PUBLIC COMMENTS (CONTINUED)

Comment # 4: APCDs with Capture Hood (i.e., portable APCDs)

 Concerns over the ability for an owner/operator to demonstrate that a portable air pollution control device will meet proposed parametric monitoring (capture velocity/smoke test) requirements

Comment #5: Capture (Air) Velocity Testing

 There are different ventilation systems for laser and plasma arc equipment (e.g., enclosed, semi-enclosed, open top downdraft tables). Capture velocity specifications are equipment specific, and a uniform air velocity measurement is not feasible for all units COMMENT #4: CONCERNS OVER THE ABILITY FOR AN OWNER/OPERATOR TO DEMONSTRATE THAT PORTABLE AIR POLLUTION CONTROL DEVICES MEET PROPOSED PARAMETRIC MONITORING (CAPTURE VELOCITY/SMOKE TEST) REQUIREMENTS

Staff Responses

- South Coast AQMD toxics rules include routine parametric monitoring requirements to ensure air pollution control devices (APCD) continue to operate as designed over time
- There are unique challenges for parametric monitoring for portable APCDs (frequently used outdoors)
- In response to concerns, PR 1445 portable APCD parametric monitoring requirements have been updated to incorporate quantitative alternatives that are not influenced by atmospheric conditions



• Refer to slides 18 and 21 for revised proposal

COMMENT #5: THERE ARE DIFFERENT VENTILATION SYSTEMS FOR LASER AND PLASMA ARC EQUIPMENT (E.G., ENCLOSED, SEMI-ENCLOSED, OPEN TOP DOWNDRAFT TABLES). CAPTURE VELOCITY SPECIFICATIONS ARE EQUIPMENT SPECIFIC, AND A UNIFORM AIR VELOCITY MEASUREMENT IS NOT FEASIBLE FOR ALL UNITS

Staff Responses

- It is acknowledged there are variations in equipment configurations and that equipment air flow specifications are established by manufacturers and are specific to equipment types
- Capture (air) velocity measurements no longer proposed for <u>existing</u> APCDs
- For <u>new</u> APCDs, the revised air velocity requirements are based on APCD type

New APCD Type	Requirement
With a capture hood (portable APCD typically)	Industrial Ventilation handbook design criteria at maximum cut distance
Without a capture hood (downdraft table)	200 fpm at cutting plane



Building R014 QMD RED

DEMONSTRATION PROJECT UPDATE

DEMONSTRATION PROJECT UPDATE - BACKGROUND



- PR 1445 includes parametric monitoring requirements to ensure air pollution control systems operate as designed
- Stakeholders expressed concerns over testing procedures and the ability of air pollution control
 devices to meet the proposed requirements
- In response, a series of field demonstration projects were conducted to:
 - Evaluate the feasibility of proposed requirements in the field



LA County Sanitation Districts



Laser Cutter Manufacturer



Metropolitan Water District



OC Sanitation District

DEMONSTRATION PROJECT UPDATE - METHODOLOGY



- Use PR 1445 test methods in the field
 - Appendix 1 Smoke tests
 - Appendix 2 Capture (air) velocity
- Different APCD types
 - Varying configurations and airflow ratings: 132, 210, 1000, 2100 cubic feet per minute (cfm)
 - Range of operating history: new to 20 years old
- Evaluate APCDs under different conditions (e.g., with/without wind barriers, with metal cutting, etc.)
- Collect data with APCD at varying distances from anemometer or smoke stick







DEMONSTRATION PROJECT UPDATE - RESULTS



Initial findings – June 2024

- It is feasible to conduct parametric tests in the field following the PR 1445 protocols
- 3-sided barrier equally effective as 4-sided wind barrier
- Metal cutting during tests (not required under protocol) affects smoke test results

Recent findings – January through May 2025	Rule revisions
Generally, smoke released within six inches of collection hood is collected. As distances increase, smoke is influenced by ambient conditions and typically not captured by the hood	Operational requirement added (see slide 20)
Face velocity measurements (air velocity at collection hood inlet plane) are not influenced by ambient conditions	Face velocity compliance option added for existing portable ACPD and mandatory for new portable ACPD
Face velocity measurements for a newer APCD were consistent with manufacturer specifications while measurements for older APCDs were lower than expected	Reinforces the need for periodic parametric monitoring



UPDATES TO PROPOSED PORTABLE APCD REQUIREMENTS





BACKGROUND – PORTABLE APCD

Prior rule language

- Parametric monitoring requirements applied to all filter-based APCDs
 - Smoke test every six months
 - Capture velocity test at maximum distance between cutting and capture hood every 24 months

Comments

- Subjective nature of smoke test interpretations
- Feasibility of portable APCD meeting the smoke test and capture velocity requirement at maximum cut distance
 - Influence of atmospheric conditions

Revised Proposal

Separate requirements for new versus existing APCDs

<u>New</u>

- Design criteria to establish
 maximum cut distance
- Face velocity testing at face plane

<u>Existing</u>

- Operational requirement
- Periodic smoke tests or quantitative alternatives

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PROPOSED RULE UPDATES: <u>NEW</u> PORTABLE APCD

Design Criteria

Required to meet the minimum airflow design criteria established by the Industrial Ventilation Handbook at the maximum cut distance

 Maximum cut distance and corresponding face velocity value at face plane will be assigned as permit condition conditions



 Face velocity replaces smoke tests and capture velocity measurements at maximum cutting distance to reduce influence from ambient conditions for new APCDs

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• Face velocity compliance option added for <u>existing</u> APCDs (*see slide 21*)

BACKGROUND: EXISTING PORTABLE APCD

 Majority of APCD permits that include maximum distance cut distance specify the APCD shall be located within six inches from the metal cutting plane

> Breakdown of Maximum Distance Specified in Permit Conditions





Passing smoke test generally observed at six inches or less

PROPOSED RULE UPDATES: <u>EXISTING</u> PORTABLE APCD

Operational Requirement

- Demonstration projects showed that air velocity decreases, and less smoke is collected as the distance from capture hood increases
- As noted, many permits presently have an operational requirement (i.e., max. cutting distance)
- A standardized approach is proposed to establish the following operational requirement:
 - Unless a maximum cut distance is included as a permit condition, capture hood must be within six inches of metal cutting plane
- Facilities concerned with meeting this requirement can seek permit modification by following same process as specified for a new portable APCD

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PROPOSED RULE UPDATES: EXISTING PORTABLE APCD

Parametric Monitoring

- Goal is to ensure APCD continues to work as designed
- Smoke test option remains, and the following 3 compliance options are proposed

Compliance Options	Description	Reference
Face Velocity	Permit modification needed to establish corresponding face velocity	(d)(4)(B)(ii)
Differential Pressure	Option available to an APCD that currently has permit conditions requiring a pressure gauge and operation within an acceptable range	(d)(4)(B)(iii)
Static Pressure	Install and maintain a static pressure gauge to record static pressure readings on each day when metal cutting is conducted (<i>Appendix 4 lists procedures for installing a static pressure gauge and establishing an acceptable operating range</i>)	(d)(4)(B)(iv)

REVISED PRELIMINARY DRAFT RULE LANGUAGE



FORMATTING REVISIONS

- Revised preliminary draft PR 1445 language streamlined to remove repetitive text
- Other changes proposed to improve readability

Rule Language Consolidation Example

Published Aug 16, 2024

- (2) Beginning January 1, 2026, except during the movement of vehicles, equipment, or people for ingress and egress to the Building, an owner or operator of a Unit located within a Building shall, during Metal Cutting, close any Building openings to the exterior within 20 feet of a Unit to prevent the passage of air through use of one or more of the following:
 - (A) A door that closes;
 - (B) Overlapping floor-to-ceiling plastic strip curtain; or
 - (C) A vestibule.
- (3) Beginning January 1, 2026, if the Building contains openings to the ⁽²⁾ are on opposite ends of the Building where air can pass through ar Metal Cutting occurs, an owner or operator of a Unit shall close openi one end for each pair of opposing ends of a Building during Metal C the Building, except during the passage of vehicles, equipment, ingress or egress to the Building through use of one or more of th subparagraphs (h)(2)(A) through (h)(2)(C).

Current Version

Beginning January 1, 2027, except during the passage of vehicles, equipment, or people for ingress and egress to the Building, an owner or operator of a Unit located within a Building shall, during Metal Cutting:

- (A) Close any Building openings to the exterior within 20 feet of a Unit to prevent the passage of air through use of one or more of the following:
 - (i) A door that closes;
 - (ii) Overlapping floor-to-ceiling plastic strip curtain; or
 - (iii) A vestibule; and
- (B) Close openings on at least one end for each pair of opposing ends of a Building through use of one or more of the methods in clauses (g)(2)(A)(i) through (g)(2)(A)(iii), if the Building contains openings to the exterior that are on opposite ends of the Building where air can pass through any area where Metal Cutting occurs.

Filter Based APCD: Testing Requirements -Subdivision (e)

Published Aug 16, 2024

(e) Performance Specifications for Unit(s) Vented to a Filter-Based Air Pollution Control Device

An owner or operator shall not operate a Portable or a Fixed Unit unless compliance with the following performance specifications for the associated Filter-Based Air Pollution Control Device is demonstrated pursuant to subdivision (f):

- (1) Acceptable smoke test; and
- (2) Capture Velocity of at least 150 feet per minute.
- (f) Testing Requirements for Unit(s) Vented to a Filter-Based Air Pollution Control Device
 - (1) An owner or operator of a Unit shall demonstrate compliance with paragraph (e)(1) for each Existing or New Filter-Based Air Pollution Control Device by conducting an acceptable smoke test using the procedure set forth in Appendix 1 Smoke Test
 - (2) An owner or operator of a Unit shall demonstrate compliance with paragraph (e)(2) for each Existing or New Filter-Based Air Pollution Control Device by conducting Capture Velocity measurements using the procedure set forth in Appendix 2 Capture Velocity Measurement Procedures and in accordance with the compliance schedule in Table 3 Parametric Monitoring Compliance Schedule.
 - (3) An owner or operator of an Existing or New Filter-Based Air Pollution Control Device that does not demonstrate that the Air Pollution Control Device meets the requirements in paragraph (e)(1) or (e)(2), as applicable, shall:
 - (A) Notify the Executive Officer by calling 1-800-CUT-SMOG within 24 hours of when the owner or operator knew or reasonably should have known of the Unit's failed demonstration; and
 - (B) Perform necessary actions or repairs to meet the requirements of paragraphs
 (e)(1) or (e)(2).

Current Version

- (e) Filter-Based APCD: Testing Requirements
 - (1) New and Existing Filter-Based APCD Smoke Test
 - An owner or operator of a Unit vented to a Filter-Based APCD shall demonstrate compliance with paragraph (d)(3), clause (d)(4)(B)(i) and/or subparagraph (d)(5)(A), as applicable, by conducting an acceptable smoke test using the procedure set forth in Appendix 1 Smoke Test Procedures and in accordance with the compliance schedule in Table 3 Parametric Monitoring Compliance Schedule.
 - (2) New Filter-Based APCD without a Capture Hood Capture Velocity An owner or operator of a Unit vented to a New Filter-Based APCD without a Capture Hood shall demonstrate compliance with paragraph (d)(5)(B) by conducting a Capture Velocity test using the procedure set forth in Appendix 2 – Capture Velocity Measurement Procedures and in accordance with the compliance schedule in Table 3 – Parametric Monitoring Compliance Schedule.
 - (3) New or an Existing Filter-Based APCD with a Capture Hood complying with the provisions of clause (d)(4)(A)(iii) – Face Velocity

An owner or operator of a Unit vented to a Filter-Based APCD with a Capture Hood shall demonstrate compliance with subparagraph (d)(6)(B) by conducting a Face Velocity test using the procedure set forth in Appendix 3 – Face Velocity Measurement Procedures and in accordance with the compliance schedule in Table 3 – Parametric Monitoring Compliance Schedule.

Performance specifications and testing requirements consolidated into updated Subdivision (e)

OTHER REVISIONS TO PRELIMINARY DRAFT RULE LANGUAGE

 The following slides describe more substantive changes from the preliminary draft rule language released in August 2024

(a) Purpose	
(b) Applicability	
(c) Definitions	
(d) Control Device Requirements	
(e) Filter-Based APCD: Testing Requirements	
(f) Filter Based APCD: Pressure Drop Requirements	
(g) Building Requirements	
(h) Housekeeping Requirements	
(i) Best Management Practices	
(j) Source Testing	
(k) Recordkeeping	
(I) Exemptions	
Appendix 1 – Smoke Test Procedures	
Appendix 2 – Capture Velocity Measurement Procedures	
Appendix 3 – Face Velocity Measurement Procedures	New
Appendix 4 – Static Pressure Measurements	New

Definitions - Subdivision (c)

(7) DUST COLLECTOR means a Filter-Based APCD designed to remove particulates from a gas stream using fabric filters, or other air filters that are built into a frame or cartridge.

New definitions

- (c)(4) CAPTURE Hood means a shaped inlet designed to capture and direct emissions to an APCD.
- (c)(6) CONTROL EFFICIENCY means the difference between uncontrolled and the controlled total mass emissions divided by the total uncontrolled mass emissions expressed as a percent.
- (c)(9) FACE VELOCITY means the induced air velocity at the face plane of a Capture Hood.

(c)(7) In response to a Stakeholder comment, the Dust Collector definition updated to not limit fabric filtration to filter tubes or filter bags

Definitions added based on revised rule language

Control Device Requirements - Subdivision (d)

- No changes to requirements for new units (d)(1)
 - Vent to HEPA
- Compliance dates for existing units extended (d)(2)
 - Table 1 portable units
 - Table 2 fixed units
- Based on demonstration project results, separate requirements for APCDs

APCD type	Existing APCD	New APCD
Without a capture hood	(d)(3)	(d)(5)
With a capture hood (portable APCD)	(d)(4)	(d)(6)

- Requirements for new and portable APCDs previously described
- Requirements for new APCD without a capture hood described in next slide

New APCDs Without a Capture Hood (i.e., downdraft tables)

(5) New Filter-Based APCD without Capture Hood

An owner or operator of a New Filter-Based APCD without a Capture Hood shall not operate the Unit unless:

- (A) Compliance with an acceptable smoke test is demonstrated pursuant to paragraph (e)(1).
- (B) A Capture Velocity of at least 200 feet per minute is demonstrated pursuant to paragraph (e)(2).

Paragraph (d)(5) maintains smoke and capture velocity testing for <u>new</u> filter-based APCDs without capture hoods

- Appendix 1 Smoke Test Procedures
- Appendix 2 Capture Velocity Procedures

Filter Based APCD: Testing Requirements -Subdivision (e) (continued)

Appendix	Title
1	Smoke Test Procedures
2	Capture Velocity Measurement Procedures
3	Face Velocity Measurement Procedures
4	Static Pressure Monitoring Requirements

Appendices updated to reflect the different test methods

Building Requirements - Subdivision (g)

(4) In lieu of meeting the requirement in paragraph (g)(2) and/or (g)(3), an owner or operator of a Unit located within a Building shall install and maintain a Wind Barrier around the Unit at all times except during the passage of equipment and Metal to and from the Unit when Metal Cutting does not occur. Paragraph (g)(4) adds an alternative compliance mechanism [wind barriers] to the paragraph (g)(2) and (g)(3) building closure requirements

 Minimize fugitive emissions escaping the building and crossdraft

Appendix 1 - Smoke Test Procedures Appendix 2 – Capture Velocity Measurement Procedures

- 5. Demonstration of an Acceptable Smoke Test
 - 5.1 An acceptable smoke test shall demonstrate that all smoke released from point(s) described under section 4 is completely captured by the ventilation system.

Updates to Appendices

- Section 3.1: Text added to clarify metal cutting is not required for:
 - smoke tests
 - capture velocity tests (new APCDs)

Appendix 1

 Section 5.1: For clarity, the term "meandering" is removed with results focused smoke being collected by the ventilation system

Appendix 2

 Section 4.1: Clarifications added to air velocity measurement locations for new APCDs

Appendix 3 – Face Velocity Measurement Procedures

- 1. Applicability
 - 1.1 Applicability. This method applies to an owner or operator of a New Unit that is required to measure air velocity to demonstrate that Air Pollution Control Device meets the Face Velocity requirements in paragraph (e)(3).
- Apparatus
 - 2.1 Anemometer. The anemometer shall be capable of measuring air velocity in feet per minute (fpm) within an appropriate velocity range with an accuracy within +/-10% of full scale. The anemometer shall be operated and calibrated per the manufacturer's recommendations.
- 3. Testing Conditions
 - 3.1 Equipment Operation. The test shall be conducted while the APCD is in normal operation and under typical conditions representative of the Facility's Metal Cutting operation. Metal Cutting is not required to be conducted during the smoke test evaluation. Precautions should be taken by the Facility to evaluate any potential physical hazards to ensure the Face Velocity test is conducted in a safe manner.
 - 3.2 Cross Draft. The test shall be conducted under typical draft conditions representative of the Facility's Metal Cutting operations. This includes cooling fans and openings affecting draft conditions around the Metal Cutting area including, but not limited to, Wind Barriers, vents, windows, doorways, bay doors, and roll-ups, as well as the operation of other workstations and traffic.
- Procedures
 - 4.1 The Face Velocity measurements shall be conducted at the center of the Capture Hood face plane (i.e., open face of Capture Hood where air flow is directed inward to the APCD see Figure 1). The Face Velocity measurements shall be conducted at the location the Unit is most frequently used for Metal Cutting (i.e., inside or outside a Building).

New Appendix 3

Applies to newly permitted portable APCDs with a capture hood

Face velocity standard assigned during permitting

Single, center point measurement made at the face plane

Appendix 4 – Static Pressure Monitoring Requirements

Form A - South Coast AQMD Rule 1445 Static Pressure Recordkeeping Form

Facility ID: _ Facility Nam	APCD Permit Number:		
Acceptable Range	Minimum Value: <u>1</u> inches water column Date Tested: <u>June 25, 2025</u> Staff Name: <u>Jane Doe</u>	Maximum Value: 3 inches water column Filter Type: HEPA Filter Manufacturer: ACME	
	- <i>Minimum Value</i> is established when new filter is installed	– Maximum Value is provided by filter manufacturer	

Metal Cutting date	Staff Name	Static Pressure Reading (in inches water column)	Within Acceptable Range
07/17/2025	Jane Doe	2	Yes

New Appendix 4

Applies to facility that elects to implement static pressure monitoring for a portable APCD instead of smoke tests

- 1 Install static pressure gauge
- 2

Establish acceptable operating range and record on Form A (*examples provided*)

3

Record static pressure prior to operation to ensure APCD is within an acceptable range

SUMMARY: RULE UPDATES IN RESPONSE TO STAKEHOLDER COMMENTS

Concerns	Proposed Rule Revisions
Portable APCD - Smoke tests	 Quantitative alternatives (differential pressure, static pressure, etc.) added for existing APCDs
	 New APCDs subject to face velocity testing instead of smoke tests
Portable APCD - Wind barrier/smoke tests	 Partial rule exemption for maintenance and repair activities when use of a wind barrier is infeasible due to obstructions
APCD - Capture (air) velocity testing	 Capture velocity no longer required for existing APCDs Requirements maintained for new fixed APCDs Clarifications added regarding locations to measure air velocity (Appendix 2)
Water tables	Rule includes source testing procedures and research continues to document water table control efficiency

Currently seeking public input on revised preliminary draft rule language

Submission of Comments or Documents

Comments on PR 1445 requested by July 17, 2025

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SEEKING PUBLIC INPUT

NEXT STEPS

Continue water table evaluation

Additional Working Group meetings as needed

Stationary Source Committee

Set Hearing

Public Hearing

STAYING UPDATED

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