2021 Redesignation Request and Maintenance Plan for the 2006 and 1997 24-Hour PM2.5 Standards for South Coast Air Basin

Public Consultation Meeting

September 7, 2021

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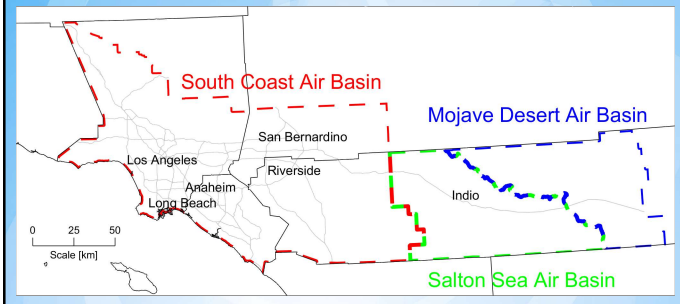
SOUTH COAST AQMD

Regional air pollution control agency

- **17 million residents**
- **12+ million vehicles**



- Air quality regulations
  - Industrial facilities
  - Other sources (e.g. paint, fireplaces, etc)
- Enforcement
  - Inspections
  - Responding to air quality complaints
- Technology to reduce air pollution
- Air monitoring
- Public outreach

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24-Hour PM2.5 National Ambient Air Quality Standards (NAAQS)

Year Established	Level of Standard	Calculation	Criteria for Attainment	Attainment Classification
2006	35 µg m^{-3}	98th Percentile of daily averages, averaged over 3 years at each station	Not to be exceeded	Serious nonattainment
1997	65 µg m^{-3}	98th Percentile of daily averages, averaged over 3 years at each station	Not to be exceeded	Moderate nonattainment

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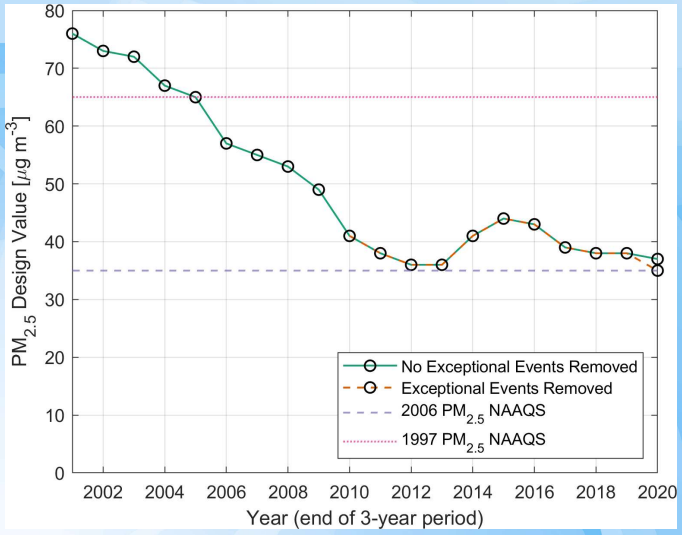
Decreasing PM2.5 in the South Coast Air Basin



South Coast Air Basin meets the 2006 PM2.5 standard in 2020 after exceptional events due to the Bobcat and El Dorado wildfires are removed

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Maintenance Plan

- Requirement for designation as attainment[1]
- Provides for continued maintenance of attainment of the NAAQS for at least 10 years

- South Coast Air Basin attained the 24-hour PM2.5 NAAQS
- Period covered by the PM2.5 maintenance plan

[1] Section 107(d)(3)(E) of the Clean Air Act (CAA)

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Maintenance Plan Requirements

1. Demonstrate that South Coast Air Basin meets the NAAQS
2. Demonstrate that improvement in air quality is due to permanent and enforceable emission reductions
3. Maintenance demonstration to show that we will continue to attain the standard
4. Commitment to maintain a future monitoring network
5. Commitment to verify continued attainment
6. Establish contingency plan

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PM2.5 Exceptional Events

Exceptional events are removed from design value calculation if:

1. Event clearly caused the exceedance
2. Event is not reasonably controllable or preventable
3. It is a natural event or an event caused by human activity that is unlikely to recur at a particular location

Wildfires

NASA Worldview MODIS/Terra Satellite

Evidence must show that the wildfire caused the measured exceedance

Fireworks

Such use of fireworks is significantly integral to traditional national, ethnic, or other cultural events including, but not limited to, July Fourth celebrations

Bobcat and El Dorado Fires (2020)

- Exceptional event that caused widespread PM2.5 impacts in the Basin
- South Coast AQMD is submitting an exceptional event demonstration for exceedances from Sept. 11-16, 2020.
- If approved by U.S. EPA, the affected data will be removed from design value calculation

Photograph by Tim Williams (NASA Armstrong Flight Research Center). Downloaded from https://earthobservatory.nasa.gov/images/147324/bobcat-fire-scorches-southern-california

Calculation of PM2.5 Design Value

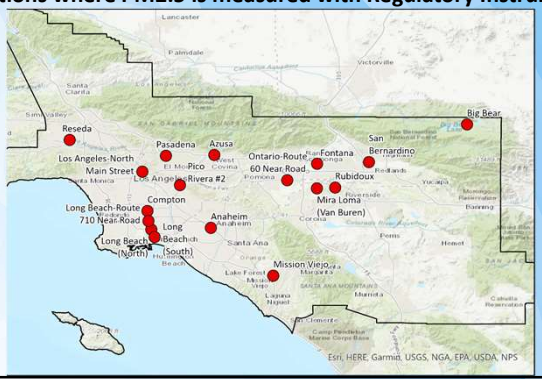
Measure 24-Hour average PM2.5 concentration (or calculate from hourly measurements)

Calculate 98th percentile in a year (8th highest value if measuring every day)

Average over consecutive 3-year period

2006 24-hour PM2.5 NAAQS is attained if average is less than or equal to 35 µg m^{-3}

Locations where PM2.5 is measured with Regulatory Instruments



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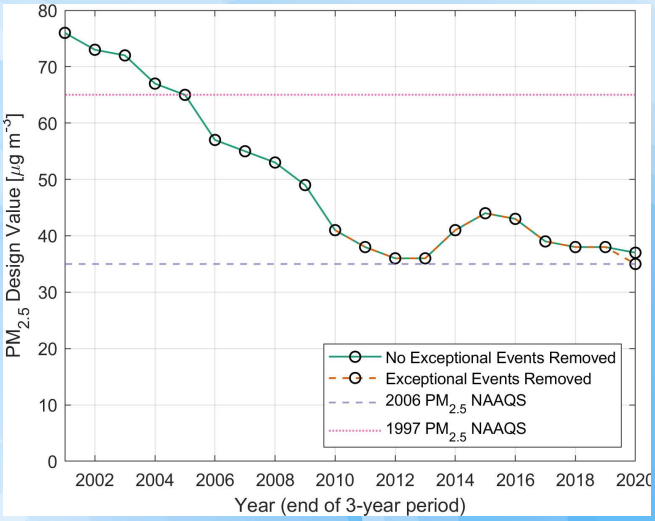
Trend of Design Value

- After removing the Bobcat and El Dorado fire event the Basin met the 35 µg/m^3 NAAQS in 2020
- Basin has met the 65 µg/m^3 NAAQS since 2005

PM2.5 design value before and after removing suspected exceptional events



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Permanent and Enforceable Emission Reductions

Attainment was not a result of favorable meteorology

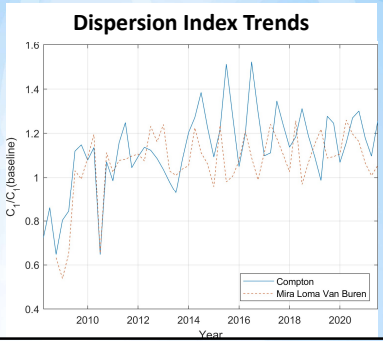
Attainment was not a result of atypical emissions from 2018-2020

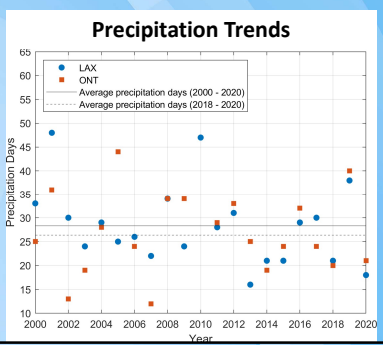
- Wildfires contributed to additional emissions
- Impact of COVID-19 related on-road vehicle changes
- Impact of COVID-19 related port congestion

Regulatory actions to reduce emissions of PM2.5 emissions and its precursors

Attainment was not a result of favorable meteorology

- Analyzed trends in meteorology
  - Used AERMOD and AERSURFACE to calculate index of dispersion that quantifies influence of meteorology on concentrations
  - Trend of precipitation
- Meteorology not more favorable to lower PM2.5 in 2018 – 2020 period
  - Less precipitation than in prior years, less dispersion

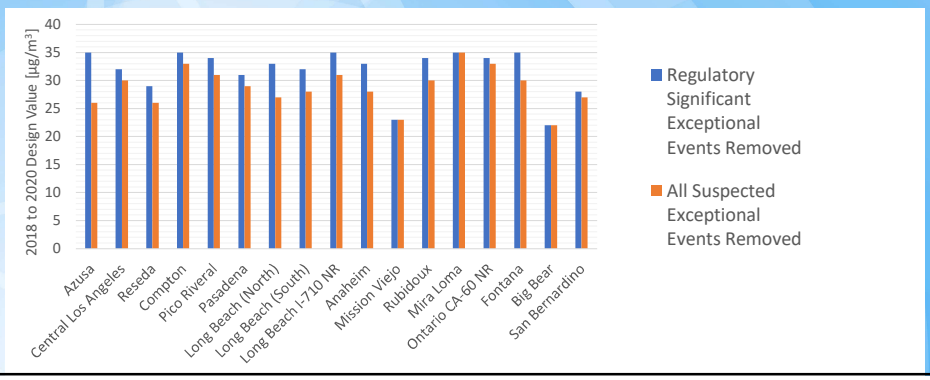




2 – Permanent and enforceable emission reductions

Wildfires Significantly Contributed to Additional PM2.5

- Exceedances associated with Bobcat & El Dorado Fire (Sept 11-16) are the only regulatory significant exceptional events; removal of only these exceedances results in attainment.
- Removal of <u>all</u> suspected exceptional events and recalculation of design values indicates impacts of wildfires and 4th of July Fireworks



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(Images from ktla.com)

Impact of COVID-19 Pandemic

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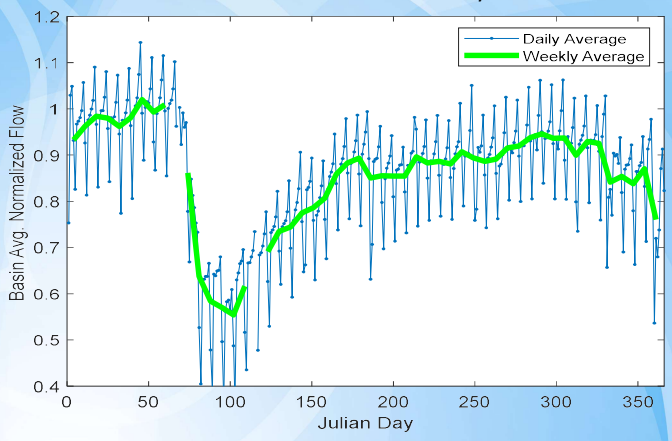
2 – Permanent and enforceable emission reductions

Traffic Flow Measured by Caltrans Performance Monitoring System (PeMS)

Traffic Volume of **all vehicles** on Freeways in 2020



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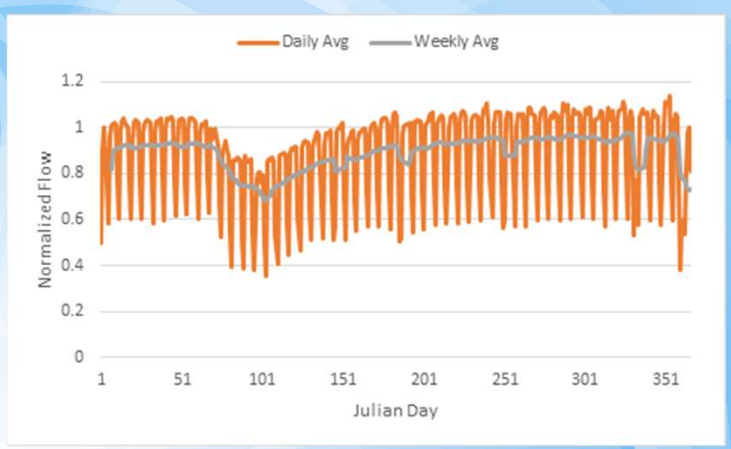
2 – Permanent and enforceable emission reductions

Traffic Flow Measured by PeMS

Traffic Volume of **Heavy Duty Vehicles** on Freeways in 2020*



*Average for Los Angeles County

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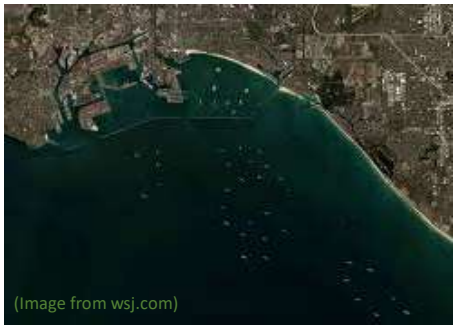
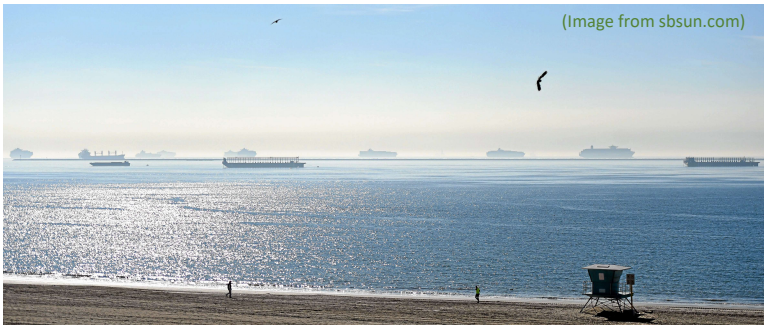

(Image from wsj.com)


(Image from sbsun.com)


(Image from marketplace.org)

Congestion in San Pedro Bay Ports

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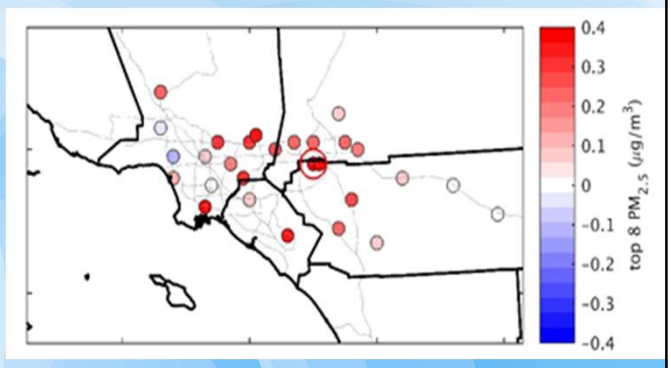
2 – Permanent and enforceable emission reductions

Congestion at the Ports

- During October 2020 to March 2021, anchorage activities were estimated to be about 3.9 times higher than 2019
- This estimate was based on a comparison of actual anchorage hours during ports congestion period and 2019 anchorage hours from IHS-Seaweb's Movement Module data
- NOx, SOx and PM emissions increased by about 11 tons per day, 1 ton per day and 0.3 ton per day, respectively
- The highest impact was estimated to be 0.47 µg/m^3 at Mira Loma



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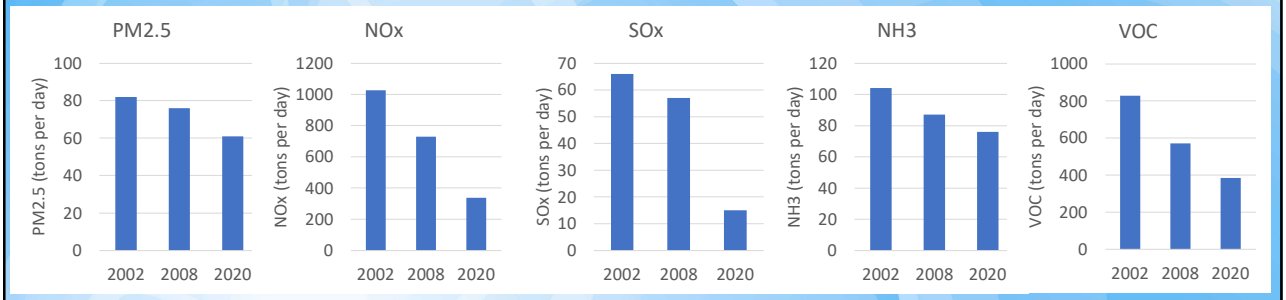
2 – Permanent and enforceable emission reductions

Permanent and Enforceable Emission Reductions

- All pollutant emissions have decreased substantially
- NOx and SOx emissions reduced by 67% and 78%, respectively, since 2002 and 2008



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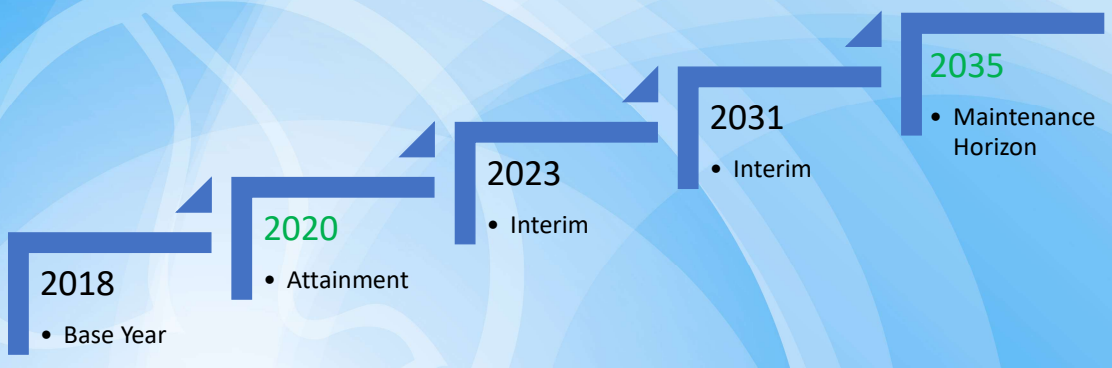
3 – Maintenance Demonstration

Timeframe included in Maintenance Demonstration



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Methods to Demonstrate Maintenance

Emissions Inventory Method

- Future emissions of a pollutant or its precursors will not exceed the level of the attainment year inventory
  - Attainment inventory is the emissions inventory for the year for which corresponding measured PM2.5 design value shows attainment

Modeling Method

- Modeling results show that future anticipated mix of sources and emissions will not cause a violation of NAAQS

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Emissions Inventory Development since 2016 AQMP

2018 SIP update	• Ocean Going Vessels **emissions**
2020 189(d) Plan	• Point sources from 2018 Annual Emissions Reporting program • On-road mobile source with EMFAC2017
2021 PM10 Maintenance Plan	• On-road mobile source - Traffic activity from 2020 Regional Transportation Plan
2021 PM2.5 Maintenance Plan	• Selected area and off-road mobile sources updates • Growth and Control Scalars for emissions projections

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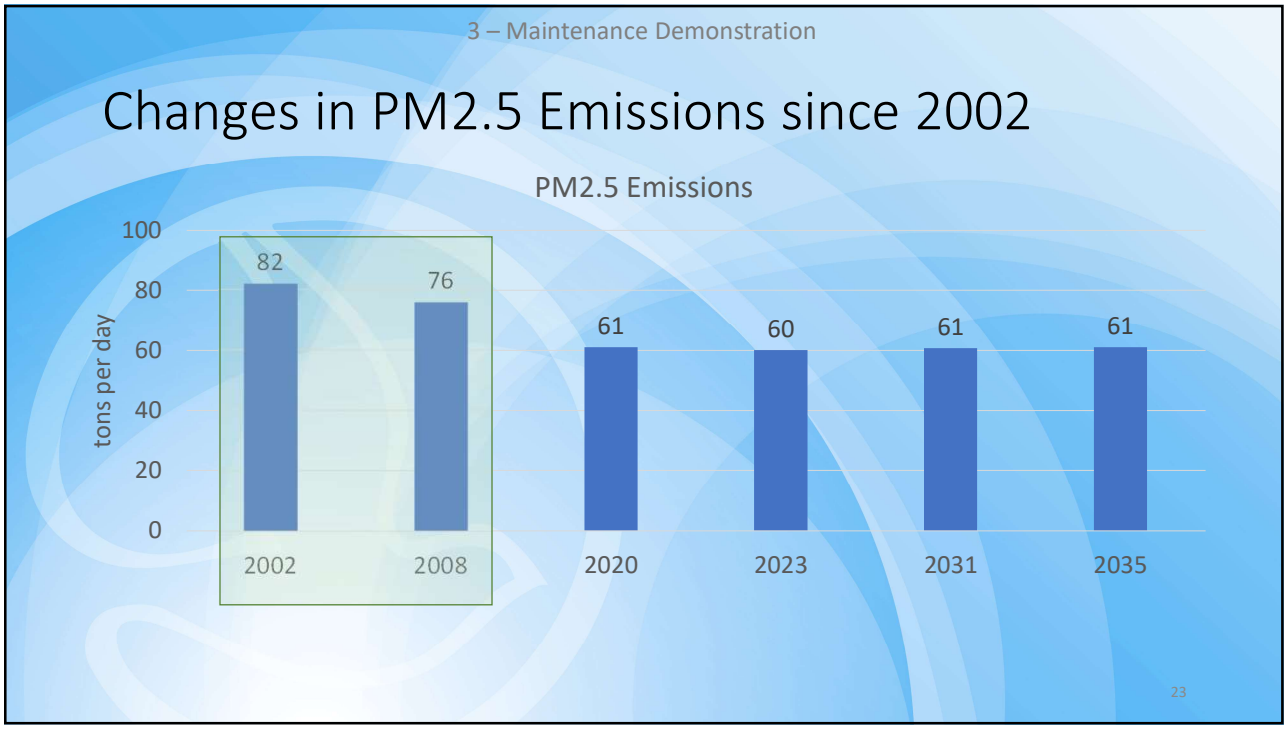
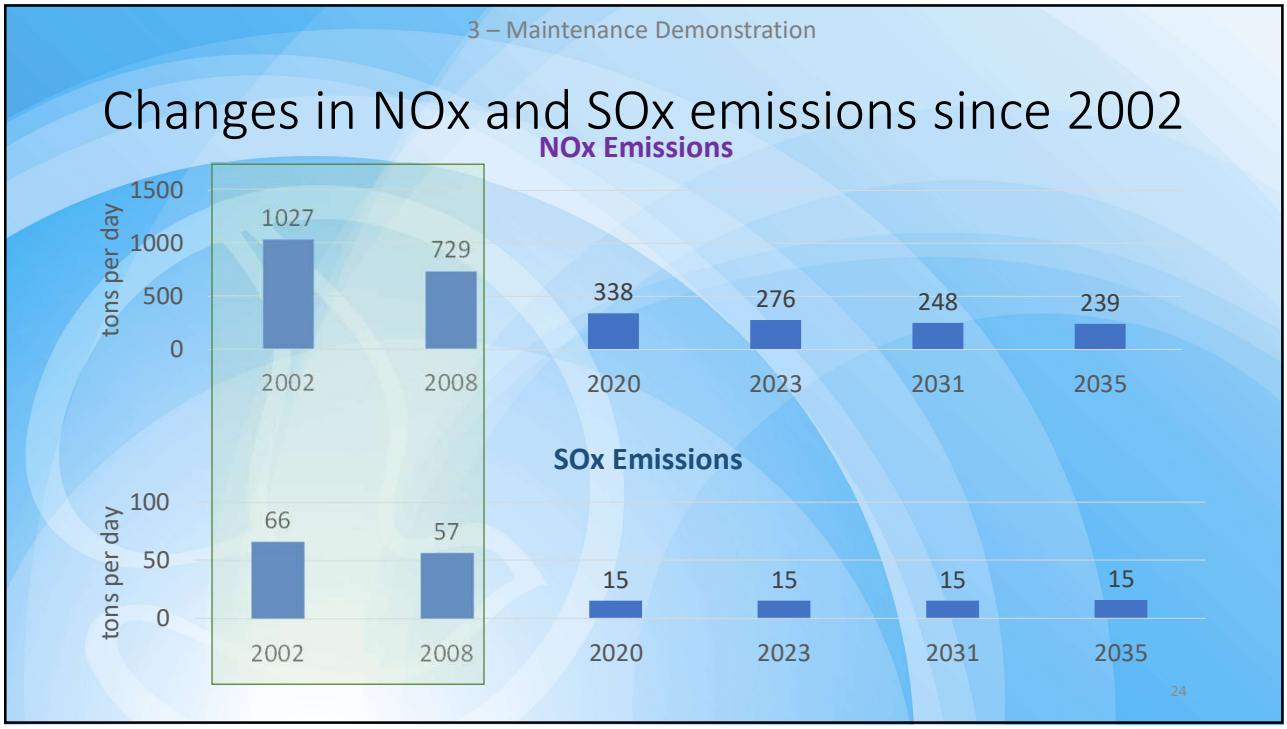

3 – Maintenance Demonstration
Changes in PM2.5 Emissions since 2002
PM2.5 Emissions
tons per day
100
80
60
40
20
0
82
76
61
60
61
61
2002
2008
2020
2023
2031
2035
23

23


3 – Maintenance Demonstration
Changes in NOx and SOx emissions since 2002
NOx Emissions
tons per day
1500
1000
500
0
1027
729
338
276
248
239
2002
2008
2020
2023
2031
2035
SOx Emissions
tons per day
100
50
0
66
57
15
15
15
15
2002
2008
2020
2023
2031
2035
24

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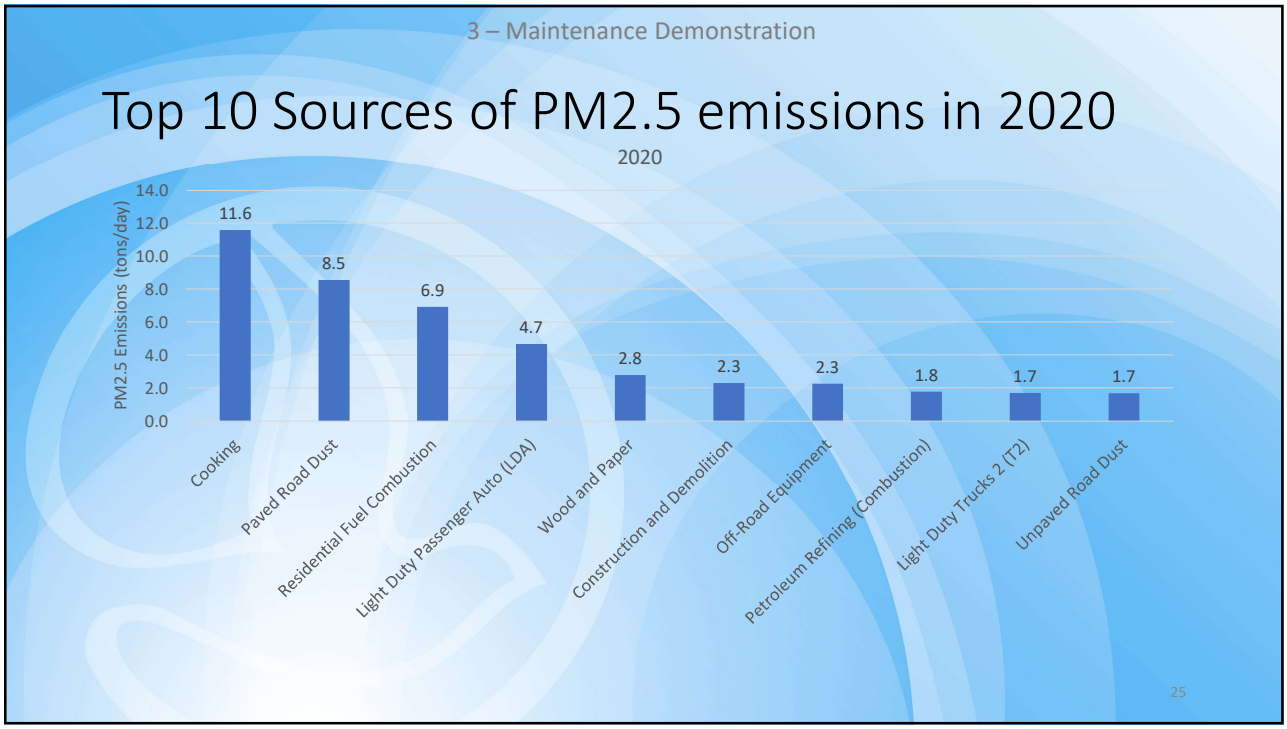
3 – Maintenance Demonstration
Top 10 Sources of PM2.5 emissions in 2020
2020
PM2.5 Emissions (tons/day)
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
11.6
8.5
6.9
4.7
2.8
2.3
2.3
1.8
1.7
1.7
Cooking
Paved Road Dust
Residential Fuel Combustion
Light Duty Passenger Auto (LDA)
Wood and Paper
Construction and Demolition
Off-Road Equipment
Petroleum Refining (Combustion)
Light Duty Trucks 2 (T2)
Unpaved Road Dust
25

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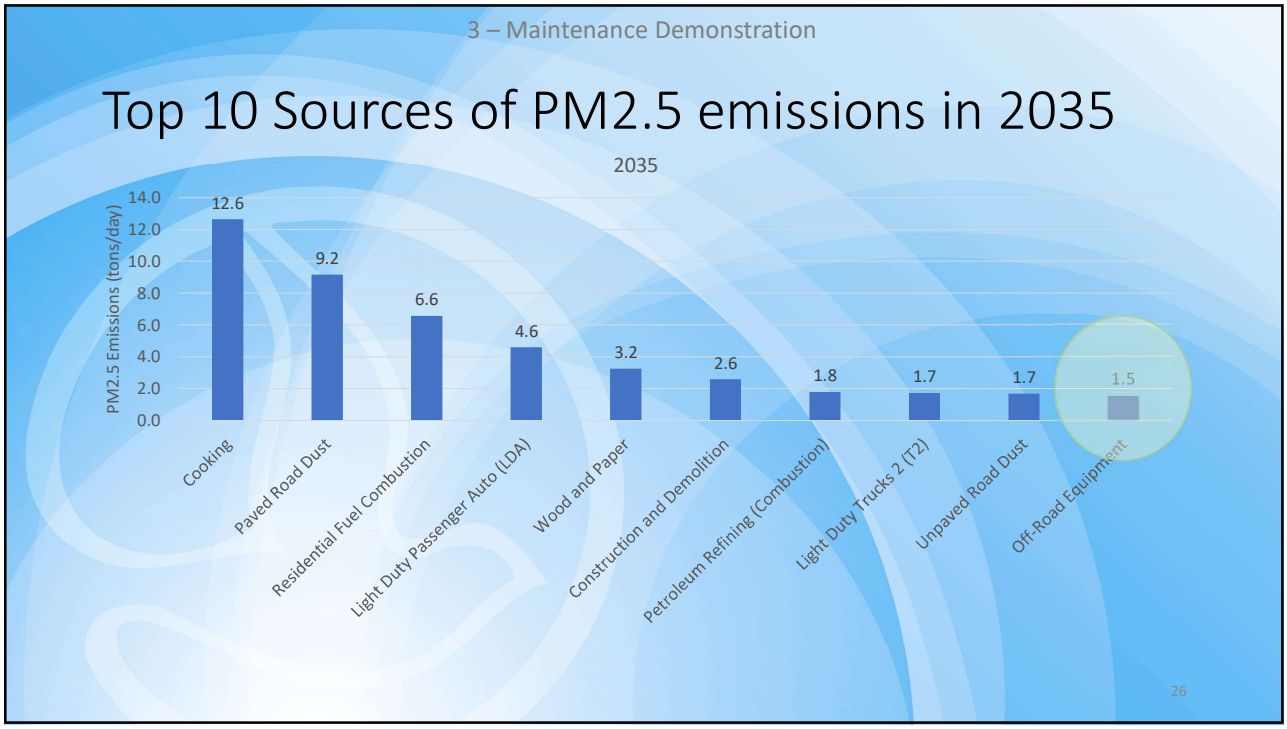
3 – Maintenance Demonstration
Top 10 Sources of PM2.5 emissions in 2035
2035
PM2.5 Emissions (tons/day)
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
12.6
9.2
6.6
4.6
3.2
2.6
1.8
1.7
1.7
1.5
Cooking
Paved Road Dust
Residential Fuel Combustion
Light Duty Passenger Auto (LDA)
Wood and Paper
Construction and Demolition
Petroleum Refining (Combustion)
Light Duty Trucks 2 (T2)
Unpaved Road Dust
Off-Road Equipment
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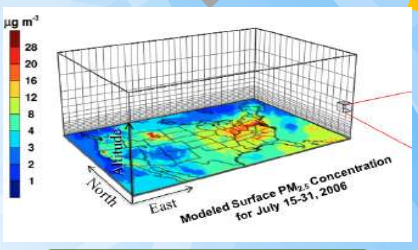
Maintenance Demonstration using a Photochemical Modeling System

Man-made emissions

Meteorology

Biogenic Emissions



Ozone, PM2.5 and other pollutants

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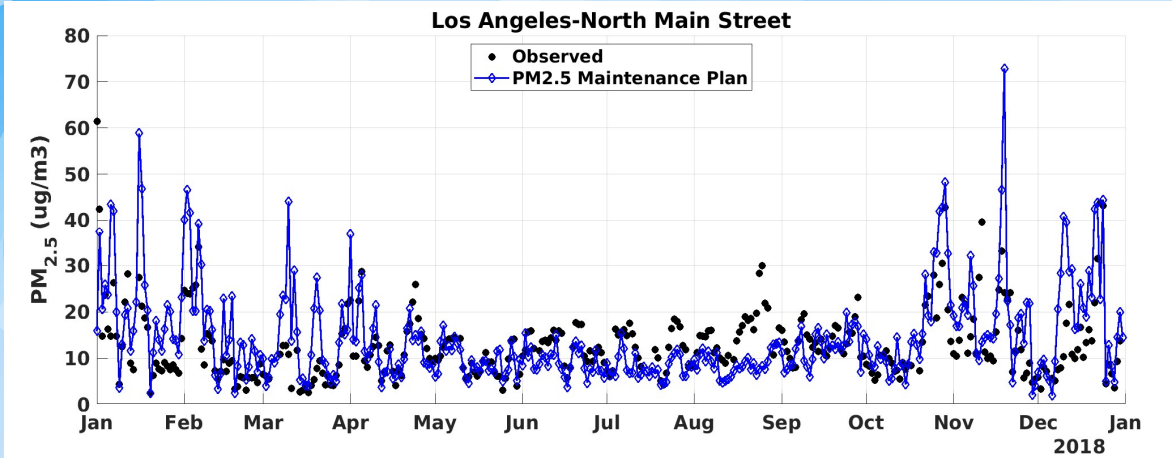
PM2.5 Measurements vs Predictions at Central Los Angeles Location



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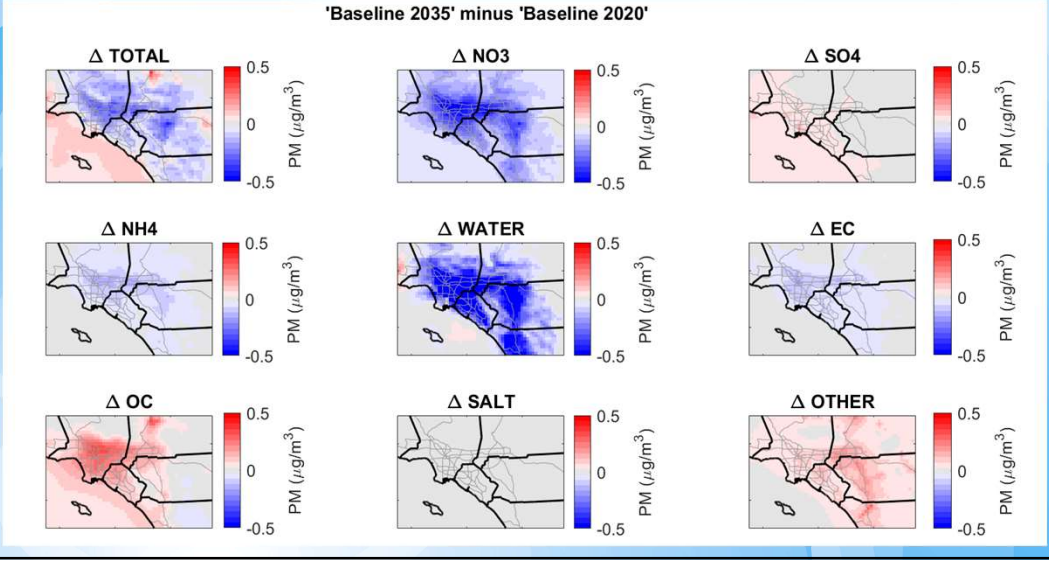
Changes in PM Chemical Components



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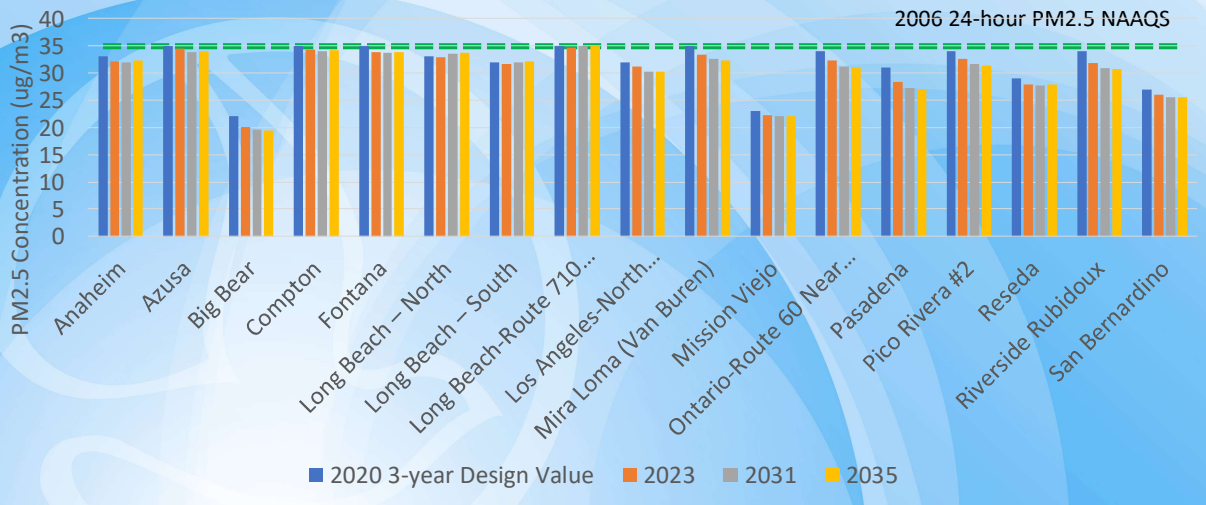
Future 24-hour PM2.5 Design Values



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Summary of Maintenance Demonstration

- PM2.5 and its precursors emissions have decreased substantially since 2002 and are expected to continue the decreasing trend (NOx and VOC) or have no significant changes (PM2.5, SOx and NH3) between the attainment year (2020) and the future maintenance horizon year (2035)
- Photochemical modeling approach was employed for the maintenance demonstration
- The attainment status of the 1997 and 2006 24-hour PM2.5 NAAQS is expected to be maintained until 2035 without further emissions reductions beyond already adopted regulations and programs
- Supplemental analysis indicates that attainment of 24-hour PM2.5 NAAQS was due to permanent and enforceable emissions reductions, not due to other events such as COVID-19 and ports congestion.

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Future Monitoring Network

- South Coast AQMD exceeds all minimum monitoring requirements for PM2.5 network design and operation
- South Coast AQMD is committed to continuous improvement of the PM2.5 monitoring network*
- Planned transition towards continuous instruments to provide better resolution PM2.5 data for attainment, forecasting, advisories, and real-time air quality index values

*As described in the July 1, 2020 Five Year Air Monitoring Network Assessment
Available at: http://www.aqmd.gov/home/air-quality/clean-air-plans/monitoring-network-plan

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5 – Commitment to Verify Continued Attainment

Verification of Continued Attainment

South Coast AQMD is committing to verify continued attainment based on review of the inputs and assumptions used for the emission inventory

- When new information becomes available
- If this periodic review indicates that inputs and assumptions have changed significantly, South Coast AQMD will:
  - Work with CARB to update the existing inventory
  - Evaluate the revised inventory against the inventories presented in the maintenance plan
  - Evaluate the potential impacts

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6 – Contingency Plan

Contingency Plan

- Maintenance plan should*
  1. Identify control measures that may be implemented as a contingency in the event of emission increase
  2. Identify the indicators or triggers that will determine when contingency measures should be implemented
- Contingency plan trigger
  1. Contingency plan is triggered if the 3-year average 98th percentile at a station, excluding exceptional events, exceeds the 2006 NAAQS
  2. Weight-of-evidence method will be used by South Coast AQMD to exclude exceptional events

*Clean Air Act Section 175A(d)

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6 – Contingency Plan

Contingency Plan Actions (Only If Triggered)

Consult with the regulated industry to determine if voluntary or incentive-based control measures could reduce emissions, if feasible

If needed

Evaluate whether changes to enforcement of existing rules could reduce emissions

If needed

Evaluate amending Rules 444 and 445 to further strengthen prohibitions on particulate emissions

If needed

Propose new rules to reduce particulate emissions

Selected rules that may be evaluated to strengthen prohibitions on particulate emissions

Rule Name	South Coast AQMD Rule
Wood-Burning Devices	445
Open Burning	444

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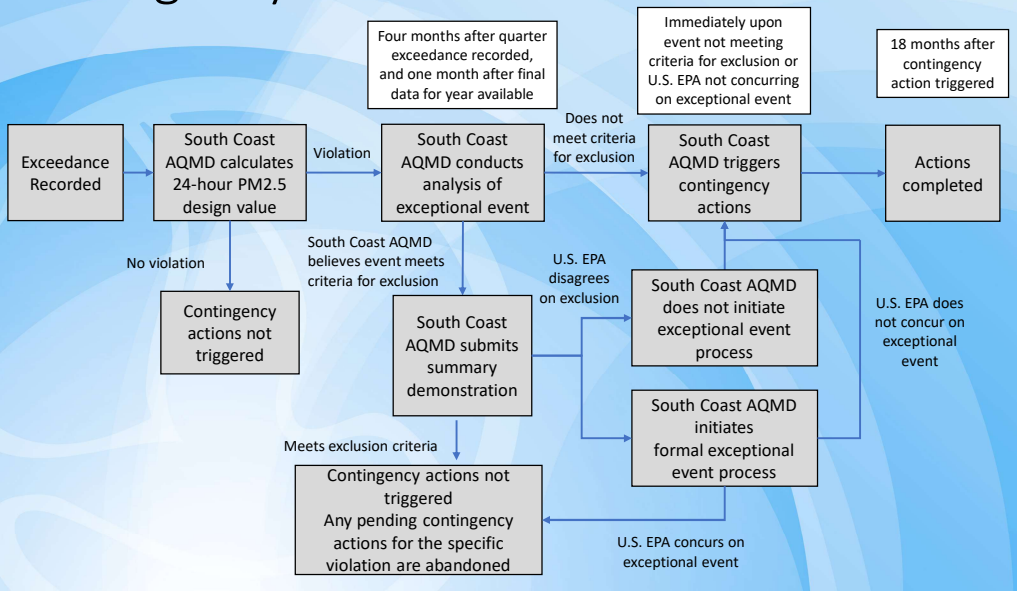
6 – Contingency Plan

Contingency Plan Schedule



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Public Process (2021)

September	October	November	December
• Draft Plan Released (September 1) • Public Consultation Meeting (September 7) • Public Comments Due (September 20)	• Mobile Source Committee (October 15) • Draft Final Plan, to be Released (October 5)	• South Coast AQMD Board Consideration (November 5) • CARB Board Consideration (November 18-19)	• Submit to U.S. EPA for inclusion in the State Implementation Plan

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Summary

- South Coast Air Basin met 2006 and 1997 24-hour PM2.5 standards in 2018-2020*
- South Coast AQMD is requesting redesignation to attainment by U.S. EPA
- Attainment of the standard* was because of emission reductions
  - PM2.5 and precursor emissions decreased substantially since 2002
  - Decreases of PM2.5 and precursor emissions, not due to COVID-19, ports congestion and wildfires

* Subject to approval of exceptional event demonstration for Bobcat and El Dorado Fires (September 2020)

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Summary (continued)

- Attainment of the 2006 and 1997 PM2.5 NAAQS is expected to be maintained until 2035 without further emission reductions beyond already adopted regulations and programs
- South Coast AQMD committed to continuous improvement of PM2.5 monitoring network and is committed to verify continued attainment based on review of inputs and assumptions for emission inventory
- Contingency plan is established in case the 2006 or 1997 24-Hour PM2.5 standard is violated in the future

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Supporting Documentation

Draft 2021 South Coast Air Basin Redesignation Request and Maintenance Plan for the 2006 and 1997 24-Hour PM2.5 Standards

http://www.aqmd.gov/home/air-quality/clean-air-plans/air-quality-mgt-plan/other-state-implementation-plan-(sip)-revisions

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Contact Information

- Address questions, comments, documents, or other relevant information to:

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- Written comments should be submitted no later than Monday, September 20, 2021

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