

January 13, 2020

Mr. Mike Stoker  
Regional Administrator  
Region 9  
U.S. Environmental Protection Agency  
75 Hawthorne Street  
San Francisco, California 94105

Dear Mr. Stoker:

The California Air Resources Board (CARB) is submitting to the United States Environmental Protection Agency (U.S. EPA) the San Joaquin Valley Air Pollution Control District's (District) *2019 Quantitative Milestone Report for the 2012 NAAQS* (2019 Report).

The San Joaquin Valley Air Basin (Basin) is currently designated as a nonattainment area for the 12 microgram per cubic meter ( $\mu\text{g}/\text{m}^3$ ) annual standard. The District addressed the Clean Air Act (Act) requirements for this standard in the *2018 Plan for the 1997, 2006, and 2012 PM<sub>2.5</sub> Standards* (2018 Plan), including reasonable further progress (RFP) emissions targets and quantitative milestones for 2019. Further, the Act requires PM<sub>2.5</sub> nonattainment areas to submit a quantitative milestone report within 90 days of each RFP milestone year.

The enclosed 2019 Report documents implementation of CARB and District rules that provided the emissions reductions needed between 2013 and 2019 to meet the 2019 RFP emissions targets. The 2019 Report also demonstrates that the 2019 quantitative milestones have been met.

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CARB is committed to working with U.S. EPA staff to provide any additional clarifying information needed. If you have any questions, please contact Mr. Kurt Karperos, Deputy Executive Officer, at (916) 322-2739, or have your staff contact Dr. Michael Benjamin, Chief, Air Quality Planning and Science Division, at (916) 201-8968.

Sincerely,



Richard W. Corey  
Executive Officer

Enclosure

cc: (with enclosure via email)

Ms. Elizabeth Adams  
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Mr. Samir Sheikh  
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Mr. Kurt Karperos  
Deputy Executive Officer

Dr. Michael T. Benjamin, Chief  
Air Quality Planning and Science Division



January 9, 2020

Dr. Michael Benjamin  
Division Chief, Air Quality Planning and Science Division  
California Air Resources Board  
1001 "I" Street P.O. Box 2815  
Sacramento, CA 95812

Dr. Benjamin:

Enclosed, please find the 2019 Quantitative Milestone Report for the 2012 PM<sub>2.5</sub> National Ambient Air Quality Standard (NAAQS).

The San Joaquin Valley is currently designated as nonattainment for the 2012 annual PM<sub>2.5</sub> standard of 12 µg/m<sup>3</sup>. The San Joaquin Valley Air Pollution Control District addressed Clean Air Act requirements for this standard in the *2016 Moderate Area Plan for the 2012 PM<sub>2.5</sub> Standard* and the *2018 Plan for the 1997, 2006, and 2012 PM<sub>2.5</sub> Standards*, including reasonable further progress emissions targets and quantitative milestones to be achieved by 2019. The Clean Air Act requires states to identify quantitative milestones to be achieved every three years which demonstrate reasonable further progress towards attainment of the applicable standard, and to provide a report on progress 90 days after the milestone due date.

The attached 2019 Quantitative Milestone Report satisfies applicable Clean Air Act reporting requirements, and demonstrates that reasonable further progress has been achieved towards attainment of the 2012 PM<sub>2.5</sub> NAAQS. We request that the California Air Resources Board transmit this report to the United States Environmental Protection Agency.

If you have any questions regarding this report, please contact Jessica Coria at [jessica.coria@valleyair.org](mailto:jessica.coria@valleyair.org) or (559) 230-5800. The District thanks you and your staff for your assistance and collaboration during the preparation of this report.

Sincerely,

Jonathan Klassen  
Director of Air Quality Science and Planning

**Attachments**

**Samir Sheikh**  
Executive Director/Air Pollution Control Officer

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**San Joaquin alley**  
AIR POLLUTION CONTROL DISTRICT

# 2019 Quantitative Milestone Report for the 2012 PM<sub>2.5</sub> NAAQS





## 2019 QUANTITATIVE MILESTONE REPORT FOR THE 2012 PM<sub>2.5</sub> NAAQS

Consistent with CAA section 189(c)(1), the state must submit in each attainment plan for a PM<sub>2.5</sub> nonattainment area specific quantitative milestones that demonstrate Reasonable Further Progress (RFP) toward attainment of the applicable PM<sub>2.5</sub> National Ambient Air Quality Standards (NAAQS). A quantitative milestone report must be submitted following each quantitative milestone period.

This 2019 Quantitative Milestone Report addresses the federal annual PM<sub>2.5</sub> standard of 12 µg/m<sup>3</sup>, established in 2012. The Valley was designated Moderate nonattainment for the 2012 PM<sub>2.5</sub> standard effective April 15, 2015. Each attainment plan submission for an area initially classified as moderate nonattainment for the 2012 PM<sub>2.5</sub> NAAQS must contain quantitative milestones to be achieved no later than 4.5 and 7.5 years from the date of designation of the area<sup>1</sup>. As such, the first quantitative milestone date for this standard is October 15, 2019, and is addressed by this quantitative milestone report. Subsequent quantitative milestone dates for this standard occur on October 15 in the years 2022, 2025, and 2028. Each quantitative milestone report is to be submitted to the United States Environmental Protection Agency (EPA) no later than 90 days after the applicable milestone date.

As demonstrated by this report, each quantitative milestone report submitted by a state must include, at minimum<sup>2</sup>:

- A certification by the Governor or Governor's designee that the SIP control strategy is being implemented consistent with the RFP plan, as described in the applicable attainment plan;
- Technical support, including calculations, sufficient to document completion statistics for appropriate milestones and to demonstrate that the quantitative milestones have been satisfied and how the emissions reduction achieved to date compare to those required or scheduled to meet RFP;
- A discussion of whether the area will attain the applicable PM<sub>2.5</sub> NAAQS by the projected attainment date for the area.

EPA requires that the RFP demonstration for milestone years include direct PM<sub>2.5</sub>, as well as PM precursors that have been determined to be significant. As demonstrated in Appendices G and K of the District's *2018 Plan for the 1997, 2006, and 2012 PM<sub>2.5</sub> Standards (2018 PM<sub>2.5</sub> Plan)*, California Air Resources Board (CARB) modeling determined ammonia, VOCs, and SO<sub>x</sub> do not contribute significantly to PM<sub>2.5</sub> levels that exceed the 1997, 2006, or 2012 NAAQS in the Valley. As such, this report appropriately only addresses direct PM<sub>2.5</sub> and NO<sub>x</sub> emissions.

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<sup>1</sup> 40 CFR 51.1013(a)(1). The Valley was designated nonattainment for the 2012 PM<sub>2.5</sub> standard effective April 15, 2015.

<sup>2</sup> 40 CFR 51.1013(b)

The direct PM<sub>2.5</sub> and NO<sub>x</sub> control strategy developed to meet the federal air quality standards for PM<sub>2.5</sub> in the Valley includes commitments for emission reductions from both stationary sources under the jurisdiction of the San Joaquin Valley Air Pollution Control District (District), as well as significant emission reductions from mobile sources, regulated by CARB. As such, quantitative milestones have been established to report progress towards emission reductions committed to occur from the implementation of both stationary and from mobile source control measures. These milestones are outlined in Chapter 3 of the *2016 Moderate Area Plan for the 2012 PM<sub>2.5</sub> Standard (2016 PM<sub>2.5</sub> Plan)*, and in Appendix H of the *2018 PM<sub>2.5</sub> Plan*.

The District and CARB collaboratively developed this report to demonstrate that reasonable further progress has been made towards attainment of the 2012 NAAQS in 2025, as committed to in the *2018 PM<sub>2.5</sub> Plan*. Based on guidance received from EPA, this report will address progress towards attainment achieved for each quantitative milestone in the period between 2013 (the base year of the *2018 PM<sub>2.5</sub> Plan*), through the quantitative milestone date of October 15, 2019. Further details about progress made to date from the implementation of both District and CARB control measures are provided in the following report sections.

## 1. CONTROL MEASURE IMPLEMENTATION

### 1.1 STATIONARY SOURCE RULES AND REGULATIONS

The District has one of the most stringent regulatory programs that have set benchmarks for California and the nation for a wide variety of sources, including boilers, steam generators, internal combustion engines, refineries, residential fireplaces, glass manufacturing, and agricultural burning. Only states and the federal government can directly regulate tailpipe emissions from mobile sources. However, the District has also adopted innovative regulations such as Indirect Source Review and Employer-based Trip Reduction to reduce emissions from mobile sources within the District's limited jurisdiction over these sources. Additionally, the District has an extremely successful incentive program that has achieved significant emissions reductions from sources outside of the District's regulatory purview.

Quantitative milestones provide an objective way to ensure that reasonable progress towards attainment of federal air quality standards is being achieved as expected and outlined in attainment plans. Significant emissions reductions have been achieved to date through the implementation of control measures outlined in attainment plans, including the District's 2016 and 2018 PM<sub>2.5</sub> attainment plans addressing the 2012 PM<sub>2.5</sub> NAAQS. In the reporting period of 2013 to 2019, direct PM<sub>2.5</sub> and NO<sub>x</sub> emissions in the Valley have been reduced by 3.3 tpd and 102.8 tpd, respectively. For the 2012 PM<sub>2.5</sub> NAAQS, specific commitments have been outlined as quantitative milestones to be achieved in milestone years to ensure that progress is being made towards attainment of the standard.

For the 2012 PM<sub>2.5</sub> NAAQS milestone year of 2019, the District is reporting on the following milestones:

- The status of SIP measures adopted between 2017 and 2019 as per the schedule included in the adopted Plan, including:
  - Residential Wood Burning Strategy, and
  - Commercial Underfired Charbroiler Incentive-Based Strategy.

The status of implementation of the above District strategies and related regulatory actions are further discussed below.

#### Milestone: Status of District Residential Wood Burning Strategy and Compliance Milestones in District Rule 4901 (Wood Burning Fireplaces and Wood Burning Heaters)

Enhancements to the District's Residential Wood Burning Strategy were identified as quantitative milestones in the *2016 PM<sub>2.5</sub> Plan* and the *2018 PM<sub>2.5</sub> Plan*. The District takes a multifaceted and proactive approach to reducing emissions from wood burning fireplaces and wood burning heaters in the Valley. District Rule 4901 (Wood Burning Fireplaces and Wood Burning Heaters) reduces emissions from residential burning through stringent curtailment requirements during the wood-burning season. Through the District Check Before You Burn program, the District has declared and enforced episodic wood burning curtailments, also called "No Burn" days, since 2003. Check Before You Burn and District Rule 4901 reduce harmful species of PM<sub>2.5</sub> when and where those reductions are most needed, in impacted urbanized areas when the local weather is forecast to hamper particulate matter dispersion.

The District's Burn Cleaner Wood Stove Change-out Program (Burn Cleaner Program) plays a key role in the success of the transition from older more polluting wood burning heaters and open hearth fireplaces to cleaner wood burning heaters and natural gas-fired devices. Since 2006, the Burn Cleaner Program has been helping residents overcome some of the financial obstacles in purchasing cleaner alternatives. There are currently more than 30 hearth retailers in the Valley that have partnered with the District to successfully implement the Burn Cleaner Program. Additionally, the District has a successful outreach and education program with regards to residential wood burning and educating Valley residents about air quality, the effects of air pollution on the population's health, and on options they can take to reduce emissions.

Rule 4901 was amended on June 20, 2019 to include enhanced Valleywide measures and targeted measures focused in specific Hot Spot areas of the Valley (Madera, Fresno, and Kern counties) that will achieve further emission reductions where they are needed most to protect public health and help the Valley attain federally mandated air quality standards. The Valleywide amendments to Rule 4901 included new requirements for significant remodels of a fireplace or chimney that require the removal of open hearth fireplaces or replacement to cleaner devices, only allowing seasoned wood to be burned, enhanced compliance during transfers of residential real property, further restrictions on installations of new wood burning devices, and enhanced visible emission limitations. The amendments to Rule 4901 also established more stringent curtailment levels in the Hot Spot counties of Madera, Fresno, and Kern as follows:

- Lower the "No Burning Unless Registered" threshold (Level One) from the

- current level of 20  $\mu\text{g}/\text{m}^3$  to 12  $\mu\text{g}/\text{m}^3$ , and
- Lower the “No Burning for All” threshold (Level Two) from the current level of 65  $\mu\text{g}/\text{m}^3$  to 35  $\mu\text{g}/\text{m}^3$ .

The total PM<sub>2.5</sub> emission reductions achieved from the enhancements to the District’s wood burning reduction strategy is estimated at 0.42 tons per day (tpd), on an annual average basis, as committed to in the *2018 PM<sub>2.5</sub> Plan*. The total PM<sub>2.5</sub> reductions achieved from the amendment of District Rule 4901 to require stricter wood burning curtailment levels is calculated at 0.26 tpd, beginning in the 2019/2020 winter burning season.

Along with emission reductions calculated to be achieved through lower wood burning curtailment levels required by the recent Rule 4901 amendments, additional PM<sub>2.5</sub> emission reductions of 0.16 tpd will be achieved through the District’s Burn Cleaner Program by 2024. From the 2013 base year of the *2018 PM<sub>2.5</sub> Plan* through the milestone date of October 15, 2019, the District has replaced over 14,000 units through the Burn Cleaner Program.

To support the implementation of the new enhanced curtailment thresholds in Hot Spot counties and to maximize the effectiveness of limited available resources, in 2019, the District increased incentive grants in areas subject to the new more stringent curtailment levels to encourage participation and achieve the needed transition to cleaner devices and associated emissions reductions.

As demonstrated above, the District continues to achieve significant emission reductions through the combined regulatory and incentive-based Residential Wood Burning Strategy. Emission reductions achieved through stricter wood burning curtailments levels required by recent amendments to District Rule 4901, combined with the continued replacement of older, high polluting wood burning devices with cleaner units through the District’s Burn Cleaner Program, has resulted in significant emission reductions to date. This successful strategy will result in continued emission reductions through the 2012 PM<sub>2.5</sub> NAAQS attainment year of 2025.

Based on the progress discussed above in implementing the Residential Wood Burning Strategy, the District has met this milestone through 2019.

#### Milestone: Status of Commercial Underfired Charbroiler Incentive-Based Strategy

Reporting on the status of the District’s Commercial Underfired Charbroiler Incentive-Based Strategy was identified as a quantitative milestone in the *2018 PM<sub>2.5</sub> Plan*. While this measure has action dates of 2020 identified for both regulatory and incentive-based components in the *2018 PM<sub>2.5</sub> Plan*, significant progress has been made during this reporting period, as described below.

Since 2002, the District has required the installation and operation of particulate matter control devices on chain-driven commercial charbroilers through District Rule 4692



(Commercial Charbroilers). Rule 4692 applies to owners and operators of commercial cooking operations using chain-driven and underfired charbroilers to cook meat, including beef, lamb, pork, poultry, fish, and seafood. The rule currently requires that chain-driven charbroilers be equipped and operated with a certified catalytic oxidizer control device and maintained in good working order to minimize emissions of VOCs and PM. The unavailability of a technologically feasible and cost-effective control technology has been the barrier to the District's attempt to enact similar requirements for underfired charbroiling operations. Current emission control efforts are aimed at promoting the installation of underfired charbroiling emissions control units at commercial operations through incentive funding, combined with the development of a future-year regulatory backstop to encourage program participation.

Rule 4692 was amended on June 21, 2018, to add reporting and registration requirements for commercial underfired charbroiler units including:

- Owner or operator of a commercial underfired charbroiler required to submit a one-time report to provide information about the location, size, fuel source, usage, and meat cooking throughputs of underfired charbroiler units;
- Requirements for record keeping of total quantity, in pounds, of meat cooked on commercial underfired charbroilers; and
- Underfired charbroiler Permit-Exempt Equipment Registration (PEER) required for units with a meat throughput greater than 400 pounds/week, or greater than 10,800 pounds/year, not to exceed 875 pounds/week.

Since this rule amendment, the District has received over 650 one-time reports from restaurants with underfired charbroilers, of which 130 PEERs have been issued. An additional 2,600 commercial cooking operations in the Valley do not have underfired charbroiler units installed. Data collected through this reporting requirement will assist the District in updating the existing inventory for commercial charbroiling to assist in further potential regulatory requirements committed to be evaluated in the *2018 PM<sub>2.5</sub> Plan*. In addition to these regulatory requirements, the District has launched a public outreach effort to incentivize the installation of control technology for commercial underfired charbroiling units.

In June 2015, the District's Governing Board approved \$750,000 to fund the Restaurant Charbroiler Technology Partnership (RCTP) program to provide funding for restaurants to install particulate control systems for under-fired charbroilers as demonstration projects to assess their feasibility and effectiveness. The District has been working with restaurants and control technology manufacturers to test and demonstrate control technologies. This program funds the full cost of purchase, installation, operation, maintenance of control equipment, and other costs such as modifications to the existing system configurations and structural reinforcements.

To date, the RCTP program has resulted in a successful installation of a wet-scrubber based control device at Habit Burger Grill in Stockton, CA. The District is continuing to work with other additional restaurant owners to potentially install pollution control units utilizing the incentive funding available through the RCTP. Additional applications have been received from local commercial cooking operations interested in participating in

the RCTP program. However, feasibility issues related to required building infrastructure upgrades to support the weight and footprint of control units, city permitting requirements, and the burdensome time and cost of maintenance required to keep potential control technologies operational have resulted in the owners/operators of some of these facilities being uninterested in pursuing control unit installation.

The District hosted a scoping meeting on December 12, 2019, to discuss and receive public feedback about incentive funding available through the District's RCTP program, and about potential amendments to Rule 4692. Public engagement and outreach efforts will be ongoing throughout the rule development process in 2020.

The efforts described above have been implemented in support of incentivized installation of under-fired charbroiling emissions control equipment, as well as the evaluation of further regulatory controls for this source category. Regulatory action is planned to occur in 2020, and emission reductions to be achieved as a result of this control strategy will be demonstrated in subsequent quantitative milestone reports.

Based on the progress discussed above in implementing the Commercial Underfired Charbroiler Incentive-Based Strategy, the District has met this milestone through 2019.

### **Stationary Source Program Conclusion**

As committed to in the *2016 PM2.5 Plan* and the *2018 PM2.5 Plan*, the District has met the 2019 quantitative milestones for the 2012 PM2.5 NAAQS. The District's stationary source regulatory program and other successful emission reduction measures will continue to provide emission reductions beyond 2019 to achieve the federal air quality standards for PM2.5.

## **1.2 MOBILE SOURCE RULES AND REGULATIONS**

The RFP demonstration in the *2018 PM2.5 Plan* relied, in part, on reductions from California mobile source regulations that reduce NOx and direct PM2.5 emissions. State mobile source milestones focus on those CARB regulations that provide the most significant benefit to meeting RFP targets.

The mobile source emissions control program in California is the most stringent in the nation due to the severity of California's air quality challenges, the need for ongoing emission reductions, and the unique authority given to California under the Clean Air Act (CAA). California's comprehensive mobile source control program relies on four fundamental approaches:

- Stringent emissions standards that minimize emissions from new vehicles and equipment;
- In-use programs that target the existing fleet and require the use of the cleanest vehicles and emissions control technologies;
- Cleaner fuels that minimize evaporative and combustion emissions; and

- Incentive programs that remove older, dirtier vehicles and equipment and pay for early adoption of the cleanest available technologies.

This multifaceted approach has spurred the development of increasingly cleaner technologies and fuels and achieved emission reductions across all mobile source sectors that go far beyond national programs or programs in other states. Since California mobile source programs account for a significant part of the emissions reductions in the RFP demonstration, it is appropriate to include milestones for implementation of mobile source regulations.

For the 12  $\mu\text{g}/\text{m}^3$  annual PM<sub>2.5</sub> standard 2019 qualitative milestones, CARB is reporting on the following three milestones:

1. Implementation of the *On-Road Heavy-Duty Diesel Vehicles (In-Use) Regulation* (the Truck and Bus Regulation) between 2013 and 2019 that required particulate filters and cleaner engine standards on existing California heavy-duty diesel truck and buses;
2. Implementation of the *In-Use Off-Road Diesel-Fueled Fleets Regulation* (the Off-Road Regulation) that began in 2014 for large fleets, 2017 for medium fleets, and 2019 for small fleets, and limited emissions from existing off-road diesel vehicles operated in California; and
3. The status of SIP measures adopted between 2017 and 2019, including the California *Low-NOx Engine Standard* for new on-road heavy-duty engines used in medium- and heavy-duty trucks purchased in California.

#### Milestone 1. On-Road Heavy-Duty Diesel Vehicles (In-Use) Regulation Requirements from 2013 through 2019

The Truck and Bus Regulation provides substantial reductions in the years 2013 to 2019. The Truck and Bus Regulation, first adopted in 2008, represents a multi-year effort to turn over the legacy fleet of truck and bus engines and replace them with the cleanest technology available. Starting in 2012, the Truck and Bus Regulation included phase-in requirements applicable to an increasingly larger percentage of the truck and bus fleet over time; by 2023, nearly all pre-2010 vehicles must be upgraded to have exhaust emissions meeting 2010 model year engine emissions levels. The 2010 model year engine includes a particulate filter in addition to a cleaner performing engine and therefore provides both PM<sub>2.5</sub> and NO<sub>x</sub> benefits. The Truck and Bus Regulation applies to nearly all diesel-fueled trucks and buses with a gross vehicle weight rating (GVWR) greater than 14,000 pounds, including school buses and some off-road agricultural yard trucks.

CARB implementation of the Truck and Bus Regulation provided PM<sub>2.5</sub> emission benefits that began in 2012. By 2016, the particulate filter requirement for heavier trucks (greater than 26,001 lbs. GVWR) was fully implemented in the San Joaquin Valley Air Basin. The 2010 model-year engine requirement in the Truck and Bus Regulation also provided NO<sub>x</sub> reductions that began in 2015 when heavier vehicles with



1993 model year and older engines had to be replaced with 2010 model year engines. By the beginning of 2020, all heavier trucks with 2000 and older model year engines were required to have a 2010 engine installed or replaced by a truck with a 2010 model year engine (Table 1).

**Table 1: Truck and Bus Regulation Implementation through 2020 for Heavier Trucks and Buses\***

Implementation Deadline	Vehicle Engine Year	Implementation Requirement
January 1, 2012	1996-1999	Particulate Filter
January 1, 2013	2000-2004	Particulate Filter
January 1, 2014	2005 or newer	Particulate Filter
January 1, 2015	Pre-1994	2010 Engine
January 1, 2016	1994-1995	2010 Engine
January 1, 2017	1997	2010 Engine
January 1, 2020	2000 & older	2010 Engine

\*<https://www.arb.ca.gov/regact/2014/truckbus14/tb14appa.pdf>, page A-18

In lieu of complying with the particulate filter schedule set forth in Table 1, heavier truck and bus fleets may alternatively comply with a phase-in schedule. Fleets electing this option must retrofit or replace with cleaner new vehicles to meet an annual PM filter percentage requirement (Table 2).

**Table 2: Truck and Bus Regulation Particulate Filter Phase-In Implementation Schedule through 2017 for Heavier Trucks and Buses\***

Implementation Deadline	Percent of Fleet with Filters
January 1, 2012	30
January 1, 2013	60
January 1, 2014	90
January 1, 2016	100

\*<https://www.arb.ca.gov/regact/2014/truckbus14/tb14appa.pdf>, page A-21

The Truck and Bus regulation required light-duty (14,000 to 26,000 lbs. GVWR) trucks and buses with 1995 and older engines to replace the engines with a 2010 or newer model year engine by January 1, 2015. The regulation further required that by the end of 2019, all lighter trucks with 2003 model year engines and older have 2010 engines installed or have been replaced by a new truck with a 2010 model year engine (Table 3). The requirements between 2012 and 2019 resulted in engines between the ages of 1998 and 2003 being removed from the light-duty fleet in the San Joaquin Valley.

**Table 3: Truck and Bus Regulation Implementation between 2013 and 2020 for Light-Duty Trucks and Buses**

2010 Engine Requirement	Engine Year
January 1, 2015	1995 and older
January 1, 2016	1996
January 1, 2017	1997
January 1, 2018	1998
January 1, 2019	1999
January 1, 2020	2003 & older

\*<https://www.arb.ca.gov/regact/2014/truckbus14/tb14appa.pdf>, page A-17

The Truck and Bus Regulation is designed to achieve reductions of both NO<sub>x</sub> and PM<sub>2.5</sub>. NO<sub>x</sub> emissions in the Valley from vehicles regulated by the Truck and Bus Regulation were 128.7 tons per day (tpd) in 2013 and had decreased to 74.8 tpd in 2019, a reduction of 53.8 tpd or 41.8 percent. PM<sub>2.5</sub> emissions from the same vehicle categories were 4.1 tpd in 2013 and 1.2 tpd in 2019, a 2.9 tpd or 71.5 percent reduction. The Truck and Bus Regulation provided a significant portion of these reductions.

CARB has implemented all of the Truck and Bus Regulation requirements through 2019 and has met Milestone 1.

#### Milestone 2. In-Use Off-Road Diesel-Fueled Fleets Regulation Requirements from 2013 through 2019

On July 26, 2007, CARB adopted the Off-Road Regulation to reduce PM<sub>2.5</sub> and NO<sub>x</sub> emissions from in-use off-road heavy-duty diesel vehicles in California used in such applications as construction, mining, and industrial operations. The Off-Road Regulation requires owners to modernize their fleets by replacing older engines or vehicles with newer, cleaner models; retiring older vehicles or using them less often; or by applying retrofit exhaust controls. The Off-Road Regulation also imposes idling limits on off-road diesel vehicles in addition to reporting and labeling requirements.

Beginning on July 1, 2014, for large fleets, on January 1, 2017, for medium fleets, and on January 1, 2019, for small fleets, the Off-Road Regulation required increasingly stringent fleet average indices for Off-Road diesel-fueled fleets. A fleet average index is an indicator of a fleet's overall emissions rate of diesel particulates and NO<sub>x</sub> based on the horsepower and model year of each engine in the fleet. All fleets were required to meet, or be below, their average target in each year (Table 4). More information can be found in the Final Regulation Order at:

<https://ww3.arb.ca.gov/msprog/ordiesel/documents/finalregorder-dec2011.pdf>

**Table 4: Off-Road Regulation Implemented through 2019**

Implementation Deadline	Fleet Size (total fleet hp)	Implementation Requirement*
2014-2023	Large (> 5000)	Met Fleet Average Target
2017-2023	Medium (> 2500)	Met Fleet Average Target
2019-2028	Small (< 2500)	Met Fleet Average Target

\*See Table 3 and 4 in the Final Regulation Order

Alternatively, the Off-Road Regulation allowed fleets to demonstrate they meet Best Available Control Technology (BACT) requirements by turning over or installing Verified Diesel Emissions Control Strategies (VDECS) on a percentage of the total fleet horsepower (hp) that was subject to BACT (Table 5). For fleets under 500 hp, a percentage of the fleet must have a Tier 2 or higher engine (Table 6).

**Table 5: Off-Road Regulation Optional BACT Requirement**

Implementation Deadline	Fleet Size (total fleet hp)	Percent Fleet Turnover or VDECS Installation*
2015 to 2017	Large (> 5000)	8
2018 to 2023		10
2017	Medium (> 2500)	8
2018 to 2023		10
2019 to 2028	Small (< 2500)	10

\*See page 43 in the Final Regulation Order

**Table 6: Optional Compliance Schedule for Fleets with 500 HP or Less**

Implementation Deadline	Percent of Fleet (by hp) Which Must Have a Tier 2 or Higher Engine
2019	25
2022	50

\*See Table 1 in the Final Regulation Order

CARB implemented other requirements including a ban on fleets adding off-road vehicles with Tier 2 engines. While off-road vehicles with Tier 1 and below engines have been banned for all fleets as of January 1, 2016, beginning January 1, 2018, for large and medium fleets, and January 1, 2023, for small fleets, a fleet may not add a vehicle with a Tier 2 engine. The engine tier must be Tier 3 or higher.

The Off-Road Regulation is designed to achieve reductions of both NO<sub>x</sub> and PM<sub>2.5</sub>. NO<sub>x</sub> emissions in the Valley from vehicles regulated by the Off-Road Regulation were 13.6 tpd in 2013 and had decreased to 12.1 tpd in 2019, a reduction of 1.5 tpd or 11.3 percent. PM<sub>2.5</sub> emissions from the same vehicle categories were 0.6 tpd in 2013



and 0.5 tpd in 2019, a 0.1 tpd or 19.5 percent reduction. The Off-Road Regulation provided a significant portion of these reductions.

CARB has implemented all of the Off-Road Regulation requirements through 2019 and has met Milestone 2.

### Milestone 3. Status of SIP Measures Adopted Between 2017 and 2019

CARB has made significant strides in meeting the commitments contained in the *2018 PM<sub>2.5</sub> Plan*. In addition to adoption of four regulations committed to in the Valley State SIP Strategy (Lower Opacity Limits for Heavy-Duty Vehicles in May 2018, Amended Warranty Requirements for Heavy-Duty Vehicles in June 2018, Innovative Clean Transit in December 2018, and Zero-Emission Airport Shuttle Buses in June 2019), California has petitioned U.S. EPA for action on two major source categories under their authority. Moreover, CARB has made progress in the development and public process on the following measures, with consideration by the Board expected on each in the coming years:

<b>MEASURE</b>	<b>PUBLIC PROCESS BEGAN</b>
<b>LOW-EMISSION DIESEL FUEL REQUIREMENT</b>	Public Workshop, October 18, 2019
<b>ACCELERATED TURNOVER OF TRUCKS AND BUSES</b>	Introduced in the <i>Fiscal Year 2019-20 Funding Plan for Clean Transportation Incentives</i> , September 20, 2019
<b>ACCELERATED TURNOVER OF OFF-ROAD EQUIPMENT</b>	Introduced in the <i>Fiscal Year 2019-20 Funding Plan for Clean Transportation Incentives</i> , September 20, 2019
<b>HEAVY-DUTY INSPECTION AND MAINTENANCE PROGRAM</b>	Public Workshop, February 11, 2019
<b>ACCELERATED TURNOVER OF AGRICULTURAL EQUIPMENT</b>	Inventory Data Collection Survey, February 8, 2019
<b>CLEANER IN-USE AGRICULTURAL EQUIPMENT</b>	Inventory Data Collection Survey, February 8, 2019
<b>ZERO-EMISSION AIRPORT GROUND SUPPORT EQUIPMENT</b>	Public Workshop, June 6, 2018
<b>ADVANCED CLEAN CARS 2</b>	ACC Midterm Review Update to the Board, March 23, 2017
<b>LOW-NOX ENGINE STANDARD – CALIFORNIA ACTION</b>	Public Workshop, November 3, 2016
<b>ADVANCED CLEAN LOCAL TRUCKS</b>	Public Workshop, November 1, 2016
<b>SMALL OFF-ROAD ENGINES</b>	Public Workshop, May 23, 2016
<b>TRANSPORT REFRIGERATION UNITS USED FOR COLD STORAGE</b>	Public Workshop, April 13, 2016

Two of CARB's most substantial commitments for the Valley were the Heavy-Duty Vehicle Inspection and Maintenance Program (Heavy-Duty I/M) and the Low-NOx Engine Standard for heavy-duty vehicles. Workshops began in February 2019 for Heavy-Duty I/M, and with the passing of California Senate Bill 210, the program is on track for consideration by CARB in the coming year. The California Low-NOx Engine Standard for heavy-duty vehicles has been part of an extensive public process with workshops beginning in November 2016. CARB staff is working hard to ensure the California program will meet all of the State's needs while preserving the ability to harmonize with the federal low-NOx program that U.S. EPA has initiated through its Cleaner Trucks Initiative.

The other considerable commitments for the Valley included efforts to use incentives to accelerate the turnover of agricultural equipment and other types of vehicles to the cleanest engines possible. CARB has "a history of funding incentive grant programs to reduce emissions from on- and off-road engine fleets."<sup>3</sup> For the current measures, turnover efforts for a variety of categories are well underway, with new funding allocated each year by the California Legislature. In the three most recent fiscal years, CARB has received over \$2.8 billion to use for incentive purposes throughout the State; while only a portion of this will be used in the San Joaquin Valley, funding allocations for many programs continue to be significant each year. For example, allocations for the Funding Agricultural Replacement Measures for Emission Reductions, or FARMER, program total approximately \$212 million designated for use in the San Joaquin Valley from fiscal years 2017-18 and 2018-19, with another \$50 million likely from fiscal year 2019-20.

In December 2019, CARB adopted the first of the formal Valley State SIP Strategy measures to facilitate the SIP credibility of reductions from incentivized engine and equipment turnover to cleaner technologies. This SIP-creditable incentive measure quantifies reductions in 2024 and 2025 from turnover of agricultural equipment and engines. With this measure, CARB staff quantifies the emissions reductions and demonstrates how those emissions reductions meet U.S. EPA requirements to qualify for SIP credit. The incentive measure demonstrates that, with identified funding programs, California has already achieved half of the emissions reductions expected from accelerated replacement of agricultural engines in 2024 and 2025.

With the progress on measures as described above, CARB has met Milestone 3.

### **Mobile Source Program Conclusion**

CARB has met the 2019 quantitative milestones for the 12 µg/m<sup>3</sup> annual PM<sub>2.5</sub> standard. These milestones ensure emissions were reduced in 2019. CARB's mobile program will continue to provide emission reductions beyond 2019 ultimately contributing to attainment of the standard.

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<sup>3</sup> U.S. EPA Proposed Rule to Approve the South Coast 2016 AQMP <https://www.regulations.gov/document?D=EPA-R09-OAR-2019-0051-0001>

## 2. DEMONSTRATION OF REASONABLE FURTHER PROGRESS

The term “reasonable further progress” (RFP) means such annual incremental reductions in emissions of the relevant air pollutant as are required or may reasonably be required by EPA for the purpose of ensuring attainment of the applicable national ambient air quality standard by the applicable date. Each attainment plan for a PM<sub>2.5</sub> nonattainment area is required to include an RFP plan that demonstrates that sources in the area will achieve such annual incremental reductions in emissions of direct PM<sub>2.5</sub> and PM<sub>2.5</sub> plan precursors as are necessary to ensure attainment of the applicable PM<sub>2.5</sub> NAAQS as expeditiously as practicable.<sup>4,5</sup>

Quantitative milestone reports are submitted to EPA to document milestones achieved, as committed to in attainment plans, and to show RFP towards attainment. Historically, EPA’s interpretation of the RFP requirement has been “generally linear progress” from the base year to the attainment year, demonstrated at RFP milestone years.<sup>6</sup> In its most recent PM<sub>2.5</sub> Implementation Rule, EPA clarified that RFP requirements may be satisfied through generally linear progress, or through a stepwise demonstration. As a part of the submittal of the *2018 PM<sub>2.5</sub> Plan*, CARB and the District submitted justification to EPA to explain why generally linear progress is not appropriate for the RFP demonstrations for the 12 µg/m<sup>3</sup> annual PM<sub>2.5</sub> standard. The state relied on a stepwise demonstration for RFP for the 2012 PM<sub>2.5</sub> NAAQS, due to the time required to implement additional control requirements at sources in the Valley and to achieve associate emissions reductions.

The table below demonstrates that the RFP target emissions levels, calculated in Appendix H of the *2018 PM<sub>2.5</sub> Plan* and the supplemental technical correction, have been satisfied through the emission reductions that have been achieved up to the year 2019, as reflected in the latest emissions inventory, California Emission Projection Analysis Model (CEPAM), 2016 SIP Baseline Emission Projections, Version 1.05.

**Table 7: RFP Target Analysis for the 2012 PM<sub>2.5</sub> NAAQS**

Pollutant	2019 RFP Target Emissions Level (tpd)	2019 Attainment Emissions Inventory (tpd)	RFP satisfied?
Direct PM <sub>2.5</sub>	59.2	59.2	YES
NO <sub>x</sub>	214.5	214.5	YES

## 3. SUMMARY AND CONCLUSIONS

This quantitative milestone report demonstrates that the emission reductions needed for RFP have been achieved, that the 2019 quantitative milestones have been met, and

<sup>4</sup> 40 CFR §51.1012 Reasonable further progress requirements.

<sup>5</sup> Clean Air Act Section 171(1)

<sup>6</sup> 72 FR 20633, codified at 40 CFR 51 Subpart Z §51.1000 (definitions)



thus that ongoing progress is being made to attain the 2012 NAAQS by 2025, as committed in the District's *2018 PM2.5 Plan*. Emission reductions will continue to be achieved through the implementation of both District and CARB control measures to move the Valley towards attainment of the health-protective federal PM2.5 air quality standards as expeditiously as practicable.