

REPORT TO THE LEGISLATURE ON THE  
REGULATORY ACTIVITIES OF THE  
SOUTH COAST  
AIR QUALITY MANAGEMENT DISTRICT

Pursuant to  
Chapter 1702, Statutes of 1990 (SB 1928)



October 2019  
Cleaning the Air that We Breathe...

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT  
GOVERNING BOARD**

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Wayne Natri  
Executive Officer

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# EXECUTIVE SUMMARY

## **Introduction**

The South Coast Air Quality Management District (South Coast AQMD) is subject to internal and external reviews of its air quality programs. These include annual reviews of the South Coast AQMD's budget, forecast and proposed operating budget for the upcoming fiscal year, and compliance program audits. In addition, the South Coast AQMD is required to submit to the California Air Resources Board (CARB) and State Legislature an annual review of its regulatory activities for the preceding calendar year (CY). The attached report satisfies this latter requirement which is mandated pursuant to Chapter 1702, Statutes of 1990 (SB 1928, Presley), Section 40452 of the California Health and Safety Code.

## **Rule Adoptions and Amendments in 2018 and CEQA Alternatives**

This section contains a summary of each major rule adoption or amendment adopted by the South Coast AQMD Governing Board in the preceding CY (e.g., 2018). Each summary contains detailed information about the estimated emission reductions, cost-effectiveness, alternatives considered pursuant to the requirements in the California Environmental Quality Act (CEQA), socioeconomic impacts, and sources of funding.

The South Coast AQMD has a robust public process that is used for all rulemakings that includes working group meetings, public workshops, individual stakeholder meetings, and site visits. For each rule development project, staff works with a working group that is tailored for the specific rule project that includes affected facilities, consultants, agencies, environmental, and community representatives. This allows staff to work on specific provisions and address key issues with stakeholders, with the goal to build consensus. Throughout 2018, staff held over 100 working group meetings and public workshops.

In 2018, rulemaking activities focused on addressing the transition of the NO<sub>x</sub> Regional Clean Air Incentives Market (RECLAIM) to a command-and-control regulatory structure, consistent with the 2016 AQMP and addressing air toxic issues identified through air monitoring efforts. To facilitate the transition of RECLAIM, for each type of equipment a corresponding command-and-control landing rule is needed, that establishes an emission standard that is representative of Best Available Retrofit Control Technology (BARCT). California State Assembly Bill (AB) 617, which was signed into law in July 2017, requires an expedited schedule for implementing BARCT at facilities in the state greenhouse gas cap-and-trade program. Many of these facilities are also subject to RECLAIM and implementation of BARCT is required by December 31, 2023. In 2018, four landing rules were amended to facilitate the RECLAIM transition: Rule 1135 for electric generating facilities, and Rules 1146, 1146.1, and 1146.2 for boilers and process heaters. In addition, Rule 1100 was adopted which establishes the implementation schedule for RECLAIM and former RECLAIM facilities. Rules 2001 and 2002 which are RECLAIM rules were also amended to facilitate the transition.

Rule 1469 for chrome plating and anodizing facilities was amended to establish emission standards for certain tanks with hexavalent chromium emissions that were previously unregulated. Ambient air monitoring near three plating and anodizing facilities identified the need for this rule

amendment. In addition, Rule 408 was amended to clarify circumvention provisions based on observations at facilities near ambient air monitoring conducted by the South Coast AQMD.

In 2018, other rule amendments included Rule 1178 to allow an alternative technology for floating roof tanks, with subsequent amendments to Rule 219 which corresponded to the amendments to Rule 1178, and amendments to Rule 301 for fee updates. Rule 1111 which establishes NOx emission limits for residential furnaces was amended to extend the mitigation fee to allow manufacturers additional time to meet the final compliance date. Also, in 2018, South Coast AQMD amended the BACT Guidelines and one plan (1-Hour Ozone Standard Attainment Demonstration). Of these projects, analyses of CEQA alternatives were required and conducted for Rules 1111, 1146, 1146.1, and 1146.2, and 1469.

Refer to Chapter 1 for the details regarding rule adoptions, rule amendments, and CEQA alternatives.

### **CEQA Lead Agency Projects**

South Coast AQMD also acts as the Lead Agency under CEQA for non-South Coast AQMD projects where South Coast AQMD typically has primary approval, i.e., discretionary permitting authority. In 2018, the South Coast AQMD approved one lead agency project, the Addendum to the April 2007 Final Mitigated Negative Declaration for Southern California Edison: Barre Peaker Project, Stanton.

Refer to Chapter 1 for details regarding this lead agency project.

### **Socioeconomic Impact Assessments**

California Health and Safety Code Section 40440.8 requires that South Coast AQMD perform socioeconomic impact assessments for its rules and regulations that will significantly affect air quality or emissions limitations. Prior to the requirements of Section 40440.8, South Coast AQMD staff had been evaluating the socioeconomic impacts of its actions pursuant to a 1989 Governing Board Resolution. Additionally, South Coast AQMD staff assesses socioeconomic impacts of CEQA alternatives analyzed for rules with significant cost and emission reduction impacts.

The elements of socioeconomic impact assessments include direct effects on various types of affected industries in terms of control costs and cost-effectiveness as well as public health benefits associated with AQMPs. Additionally, South Coast AQMD staff uses an economic model developed by Regional Economic Models, Inc. (REMI) to analyze the potential direct and indirect socioeconomic impacts of South Coast AQMD rules on Los Angeles, Riverside, Orange, and San Bernardino Counties. These impacts include, but are not limited to, employment and competitiveness.

In 2018, the South Coast AQMD identified and analyzed new socioeconomic impacts for four projects which include one newly adopted rule (Rule 1100) and seven amended rules (Rules 1135, 1146, 1146.1, 1146.2, 1469, 2001, and 2002). The South Coast AQMD also identified and analyzed ongoing socioeconomic impacts for one amended regulation (Regulation III). No socioeconomic impacts were identified for five projects which included amendments to seven rules (Rules 219, 301, 408, 1111, 1178, 2001, and 2002). BACT guidelines were also amended, but

posed no significant socioeconomic impacts because they did not result in more stringent requirements than would otherwise occur. Additionally, updates to the 1-hour ozone attainment demonstration were found not to pose significant socioeconomic impacts because they did not change any rules or required control measures.

Refer to Chapter 1 for details regarding the socioeconomic impact assessments.

## **Engineering and Permitting**

### Background

Section 40452 of the California Health and Safety Code requires that the South Coast AQMD submit an annual report to both the state board and Legislature that summarizes its regulatory activities for the preceding CY. Paragraph (b) of Section 40452 requires that the annual report include data on “the number of permits to operate or to construct, by type of industry, that are issued and denied, and the number of permits to operate that are not renewed.” Paragraph (c) of section 40452 requires that the annual report also includes data on emission offset transactions and applications during the previous fiscal year, including an accounting of the number of applications for permits for new or modified sources that were denied because of the unavailability of emission offsets. In addition, South Coast AQMD Rule 2015 requires submittal of annual Regional Clean Air Incentives Market (RECLAIM) Audit Reports to the Legislature.

The following paragraphs provide a brief summary for each report.

### Permitting Data – CY 2018

During CY 2018, South Coast AQMD dispositioned a total of 9,726 applications. The majority of these applications were for Permits to Operate (3,440), Area Sources & Certified/ Registrations (1,556), and Changes of Operators (1,332). Also, 1,119 permits were not renewed. The total number of dispositioned applications for 2018 is about 7% lower than the total for 2017, mainly attributed to the South Coast AQMD’s Permit Application Backlog Reduction efforts that peaked in 2017. This data, broken down into nine different categories, is summarized in Table 1 on page 35.

Table 2 contains a breakdown of permits dispositioned (in the nine categories) and permits not renewed, by type of industry. The type of industry was based on North American Industry Classification System (NAICS) codes, which were provided by the applicant at the time of application filing. The top four NAICS codes were 324110 – Petroleum Refineries, 445110 – Supermarkets and Other Grocery (except for Convenience) Stores, 447190 – Other Gasoline Stations, and 611110 – Elementary and Secondary Schools.

## Emission Offset Transactions Data – Fiscal Year 2017/2018

During fiscal year 2017-18, a total of 84 emission offset transactions were completed, which include 52 transactions for reactive organic gases (ROG), 5 transactions for oxides of nitrogen (NO<sub>x</sub>), 1 transaction for oxides of sulfur (SO<sub>x</sub>), 3 transactions for carbon monoxide (CO), and 23 transactions for particulate matter with an aerodynamic diameter less than 10 microns (PM<sub>10</sub>). The amount of emissions offsets transferred, by pollutant, include 793 pounds per day of ROG, 69 pounds per day of NO<sub>x</sub>, 4 pounds per day of SO<sub>x</sub>, 82 pounds per day of CO, and 90 pounds per day of PM<sub>10</sub> (see Table 3). There were 3 banking applications (1 for ROG and 2 for PM<sub>10</sub>) completed resulting in the issuance of new Short Term Emission Reduction Credits (STERCs) for a total of 37 pounds per day of ROG and 17 pounds per day of PM<sub>10</sub>. No applications were denied permits for new or modified sources due to unavailability of emission offsets. (See Attachment A for details).

## RECLAIM Audit Report

The REgional CLean Air Incentives Market (RECLAIM) program was adopted in 1993 to provide facilities with flexibility in achieving the same emissions reduction goals as would have been achieved under the traditional command-and-control approach, while lowering the cost of compliance. To ensure RECLAIM is achieving its goal, South Coast AQMD Rule 2015 - Backstop Provisions, requires preparation of an annual audit report on the program. This Annual RECLAIM Audit Report assesses emission reductions, availability of RECLAIM Trading Credits (RTCs) and their average annual prices, job impacts, compliance issues, and other measures of performance for the twenty-fourth year of this program. The results of the annual audit show that RECLAIM continues to meet its aggregate emission goals and all other specified objectives.

As discussed in more detail in the audit report (see Chapter V), a total of 258 facilities were in the RECLAIM program at the end of Compliance Year 2017. Total NO<sub>x</sub> emissions from RECLAIM facilities were 19% less than the aggregate NO<sub>x</sub> allocations, and SO<sub>x</sub> emissions were 17% less than the aggregate SO<sub>x</sub> allocations for the program. The vast majority of RECLAIM facilities complied with their allocations during the 2017 compliance year (95% of NO<sub>x</sub> facilities and 90% of SO<sub>x</sub> facilities).

A total of over \$1.48 billion in RTCs has been traded since the adoption of RECLAIM, of which \$3.9 million occurred in CY 2018 (compared to \$6.9 million in CY 2017), excluding swaps. The annual average prices of discrete-year NO<sub>x</sub> and SO<sub>x</sub> RTCs and infinite-year block (IYB – trades that involve blocks of RTCs with a specified start year and continuing in perpetuity) NO<sub>x</sub> and SO<sub>x</sub> RTCs traded in calendar years 2017 and 2018 were all below the applicable thresholds for initiating program review.

In Compliance Year 2017, RECLAIM facilities reported a net loss of 276 jobs, representing 0.26% of their total employment. The RECLAIM program also met other applicable requirements including meeting the applicable federal offset ratio under New Source Review and having no significant seasonal fluctuation in emissions. Additionally, there is no evidence that RECLAIM resulted in any increase in health impacts due to emissions of air toxics.

Refer to Chapter V for the “Annual RECLAIM Audit Report for 2017 Compliance Year.”

## **Budget and Work Program**

Refer to Chapter III for the Fiscal Year 2019-2020 Budget Report.

## **Clean Fuels Program**

### **2018 Annual Report**

In CY 2018, the following were executed under the South Coast AQMD Clean Fuels Program: 74 new contracts, projects or studies and modification of one continuing project adding dollars toward research, development, demonstration and deployment (RD3) projects as well as technology assessment and transfer of alternative fuel and clean fuel technologies.

The South Coast AQMD Clean Fuels Program contributed nearly \$27 million in partnership with other governmental organizations, private industry, academia and research institutes, and interested parties, with total project costs of more than \$85 million. The \$27 million includes \$12.3 million recognized into the Clean Fuels Fund as pass-through funds from project partners to facilitate project administration by the Clean Fuels Program. This \$12.3 million, which is about double the typical amount recognized into Clean Fuels on an average year, included \$3.1 million from a U.S. EPA Airshed Grant for near-zero CNG school buses, with the remaining incoming revenue from a U.S. EPA DERA Grant, CEC and the Ports as stakeholder partners. Additionally, in CY 2018, the Clean Fuels Program continued to leverage other outside funding opportunities, securing new awards totaling \$54.5 million from federal, state and local funding opportunities. Similar to the last couple of years, the significant project scope of a few key contracts executed in 2018 resulted in higher than average leveraging of Clean Fuels dollars. Typical leveraging is \$3-\$4 for every \$1 in Clean Fuels funding. In 2017, leveraging was more than \$1:\$6; in 2018, South Coast AQMD continued this upward trend with nearly \$6 leveraged for every \$1 in Clean Fuels funds. Leveraging dollars and aggressively pursuing funding opportunities are more important than ever given the magnitude of needed funding identified in the 2016 AQMP to achieve federal ozone air quality standards.

The projects or studies executed in 2018 included a diverse mix of advanced technologies. The following core areas of technology advancement for 2018 executed contracts (in order of funding percentage) include:

1. Electric and Hybrid Vehicle Technologies and Related Infrastructure (emphasizing electric and hybrid electric trucks developed by OEMs and container transport technologies with zero emission operations);
2. Engine Systems/Technologies (emphasizing alternative and renewable fuels for truck and rail applications);
3. Fueling Infrastructure and Deployment (predominantly natural gas and renewable fuels);
4. Technology Assessment and Transfer/Outreach;
5. Fuel/Emissions Studies;
6. Hydrogen and Mobile Fuel Cell Technologies and Infrastructure; and
7. Emissions Control Technologies.



During CY 2018, the South Coast AQMD supported a variety of projects and technologies, ranging from near-term to long-term RD3 activities. This “technology portfolio” strategy provides the South Coast AQMD the ability and flexibility to leverage state and federal funding while also addressing the specific needs of the Basin. Projects included significant electric and hybrid electric technologies and infrastructure to develop and demonstrate medium- and heavy-duty vehicles in support of transitioning to a near-zero and zero emissions goods movement industry; development, demonstration and deployment of large displacement natural gas and ultra-low emissions engines; and demonstration of emissions control technologies for heavy-duty engines; and natural gas and renewable natural gas deployment and support.

In addition to the 75 executed contracts and projects, 21 RD3 projects or studies and 24 technology assessment and transfer contracts were completed in 2018. As of January 1, 2019, there were 106 open contracts in the Clean Fuels Program.

In accordance with California Health & Safe Code Section 40448.5.1(d), the Clean Fuels Program annual report was submitted to the state legislature by March 31, 2019, after it was approved by the South Coast AQMD Governing Board.

### **2019 Plan Update**

Every year, staff re-evaluates the Clean Fuels Program to develop a Plan Update based on a reassessment of the technology progress and direction for the agency. The Program continually seeks to support the development and deployment of lower-emitting technologies with an increasing collaboration with OEMs. The design and implementation of the Program Plan must balance the needs in the various technology sectors with technology readiness, emissions reduction potential and cofunding opportunities. As the state continues to focus a great deal of its attention to climate change and petroleum reduction goals, the South Coast AQMD has necessarily remained committed to developing, demonstrating and commercializing technologies that reduce criteria pollutants, specifically NO<sub>x</sub> and toxic air contaminants (TACs). Fortunately, many, if not the majority, of these technologies that address the Basin’s need for NO<sub>x</sub> and TAC reductions also garner reductions in greenhouse gases (GHG) and petroleum use. Due to these “co-benefits,” the South Coast AQMD has been successful in partnering with the state, which allows the Clean Fuels Program to leverage its funding extensively.

To identify technology and project opportunities where funding can make a significant difference in deploying progressively cleaner technologies in the Basin, the South Coast AQMD employs a number of outreach and networking activities. These activities range from close involvement with state and federal collaboratives, partnerships and industrial coalitions, to the issuance of Program Opportunity Notices to solicit project ideas and concepts as well as issuance of Requests for Information (RFIs) to determine the state of various technologies and the development and commercialization challenges faced by those technologies. Potential development, demonstration and certification projects resulting from these outreach and networking activities are included conceptually within the Draft 2019 Plan Update.

The Plan Update includes projects to develop, demonstrate and commercialize a variety of technologies, from near-term to long-term commercialization, that are intended to provide solutions to the emissions control needs identified in the 2016 AQMP. Given the need for significant reductions over the next five to ten years, near-zero and zero emissions technologies are emphasized. Areas of focus include:

- reducing emissions from port-related activities, such as cargo handling equipment and container movement technologies, including demonstration and deployment of zero emissions drayage trucks;
- developing and demonstrating ultra-low emissions liquid fuel larger displacement engines and zero emissions heavy-duty vehicles;
- developing, demonstrating and deploying advanced (increased efficiency) natural gas engines and vehicles as well as near-zero and zero emissions technologies for high horsepower applications;
- mitigating criteria pollutant increases from renewable fuels, such as renewable natural gas, diesel and hydrogen as well as other renewable fuels and waste streams;
- producing transportation fuels and energy from renewable and waste stream sources;
- developing and demonstrating electric-drive (fuel cell, battery, plug-in hybrid and hybrid) technologies across light-, medium- and heavy-duty platforms; and
- establishing large-scale hydrogen refueling and EV charging infrastructures to help accelerate the introduction of zero emissions vehicles into the market.

These potential projects for 2019 total \$16.9 million, with anticipated leveraging of more than \$4 for every \$1 of Clean Fuels funding for total project costs of \$73.7 million. Some of the proposed projects may also be funded by revenue sources other than the Clean Fuels Program, especially VOC and NO<sub>x</sub> mitigation and incentive projects.

**CHAPTER I**  
**RULE DEVELOPMENT, CEQA, and SOCIOECONOMIC IMPACT ANALYSES**

## **RULE ADOPTIONS AND AMENDMENTS IN 2018 AND CEQA ALTERNATIVES**

This section contains a summary of each major rule adoption or amendment adopted by the South Coast AQMD Governing Board in the preceding CY (e.g., 2018). Each summary provides detailed information about the estimated emission reductions, cost-effectiveness, alternatives considered pursuant to the requirements in the California Environmental Quality Act (CEQA), socioeconomic impacts, and sources of funding.

Projects undertaken by public agencies are subject to CEQA, so rules and regulations promulgated by South Coast AQMD must be reviewed to determine if they are considered to be a “project” as defined by CEQA. For any proposal that is either not a “project” or determined to be exempt from CEQA, no further action is required. If the project has the potential to create significant or less than significant adverse effects on the environment, then an environmental analysis is necessary. New rules being adopted, or existing rules being amended or rescinded typically require a comprehensive CEQA document that contains an environmental impact analysis which includes the following:

- identification of potentially significant adverse environmental impacts evaluated based on environmental checklist topics;
- identification of feasible measures, if any, to mitigate significant adverse environmental impacts to the greatest extent feasible;
- if necessary, a discussion and comparison of the relative merits of feasible project alternatives that generally achieve the goals of the project, but may generate fewer or less severe adverse environmental impacts; and,
- identification of environmental topics not significantly adversely affected by the project.

If significant adverse environmental impacts are identified, feasible mitigation measures, if any, and alternatives must be identified and an analysis of the relative merits of each alternative is required. However, if the CEQA document concludes that no significant adverse environmental impacts would be generated by a proposed project, neither the identification of feasible mitigation measures nor an analysis of CEQA alternatives to the project is required. However, even if a project is determined not to have significant environmental impacts, the CEQA document will contain a focused analysis of the potential environmental impacts.

South Coast AQMD operates under a regulatory program certified by the Secretary for Resources pursuant to Public Resources Code Section 21080.5 and CEQA Guidelines Section 15251(l). The adoption, amendment or rescission of South Coast AQMD rules and regulations are subject to South Coast AQMD’s certified CEQA program, while the adoption, amendment or rescission of plans such as the AQMP are not. Having a certified regulatory program means that the South Coast AQMD can incorporate its environmental analyses into CEQA documents other than environmental impact reports (EIRs), negative declarations (NDs), or mitigated NDs (MNDs) without being subject to a limited number of specific CEQA requirements identified in Public Resources Code Section 21080.5. Instead, all CEQA documents prepared by South Coast AQMD pursuant to its certified regulatory program are either called an Environmental Assessment (EA), or some variant of an EA such as a Subsequent or Supplemental EA, or Addendum to an EA.

The following section identifies all new and amended rules that were adopted by the Governing Board in 2018, in sequential order by the month projects were approved. No rules were rescinded in 2018. The type of CEQA document (including projects that were determined to be exempt from CEQA) is described for each new rule or rule amendment project. Alternatives are summarized only for those projects identified as having potentially significant impacts requiring an alternatives analysis pursuant to CEQA.

## **JANUARY 5, 2018**

Three rules were amended in January, as follows:

- 1. Amended Rule 301 – Permitting and Associated Fees:** Rule 301 was amended to restore South Coast AQMD’s authority to charge a fee for preparing and distributing a notice for any project requiring notification in accordance with Rule 212 (c); this fee was inadvertently deleted during the June 2, 2017 amendments. Staff’s analysis of the proposed amendments concluded that the project qualified for an exemption from CEQA pursuant to CEQA Guidelines Section 15061(b)(3) – Activities Covered by General Rule, and CEQA Guidelines Section 15273 - Rates, Tolls, Fares, and Charges. Projects that are exempt from CEQA do not require an alternatives analysis. As such, no alternatives analysis was prepared for this project. The South Coast AQMD Governing Board determined that the project was exempt from CEQA and approved the project as proposed. A Notice of Exemption was prepared pursuant to CEQA Guidelines Section 15062.

*Estimated Emission Reductions:* None. *Cost-Effectiveness:* None, not required. *CEQA Alternatives:* None, not required. *Socioeconomic Impact:* None, not required. *Source(s) of Funding:* Permit Fees, Emission Fees, and Annual Operating Fees.

- 2. Amended Rule 2001 – Applicability and Amended Rule 2002 – Allocations for Oxides of Nitrogen (NO<sub>x</sub>) and Oxides of Sulfur (SO<sub>x</sub>):** Rules 2001 and 2002 were amended to initiate the transition of facilities that are currently in the Regional Clean Air Incentives Market (RECLAIM) program to a command-and-control regulatory structure. Rule 2001 was amended so that no additional facilities can enter RECLAIM. Rule 2002 was amended to add procedures for notifying facilities transitioning out of the NO<sub>x</sub> RECLAIM program and provisions for handling RECLAIM Trading Credits (RTCs) during the transition period. Staff’s analysis of the proposed amendments concluded that the project qualified for an exemption from CEQA pursuant to CEQA Guidelines Section 15061(b)(3) – Activities Covered by General Rule. Projects that are exempt from CEQA do not require an alternatives analysis. As such, no alternatives analysis was prepared for this project. The South Coast AQMD Governing Board determined that the project was exempt from CEQA and approved the project as proposed. A Notice of Exemption was prepared pursuant to CEQA Guidelines Section 15062.

*Estimated Emission Reductions:* None. *Cost-Effectiveness:* None, not required. *CEQA Alternatives:* None, not required. *Socioeconomic Impact:* Yes, see Socioeconomic Impact Assessments section. *Source(s) of Funding:* Permit Fees, Emission Fees, and Annual Operating Fees.

## **FEBRUARY 2, 2018**

BACT Guidelines were amended in February, as follows:

- 1. Amended BACT Guidelines:** BACT Guidelines were amended to reflect the most current achieved-in-practice air pollution control equipment and/or processes. The following new major source categories were added to Part B, Section 1 – South Coast AQMD Lowest Achievable Emissions Rate (LAER): 1) Food Ovens (Bakery with Catalytic Oxidizer add-on control, Tortilla Chip, and Snack Food); 2) Furnace, Heat Treating Aluminum ( $\leq 900$  degrees Fahrenheit); and 3) Flares (Biogas rated at 12 million British Thermal Units per hour (MMBTU/hr) and 39.3 MMBTU/hr, and Landfill Gas rated at 120 MMBTU/hr). Updates to the following major source categories were added to Part B, Section 1 – South Coast AQMD LAER: 1) Boiler rated at 39.9 MMBTU/hr with selective catalytic reduction (SCR); and 2) Internal Combustion (I.C.) Engine - Digester Gas-Fired rated at 3,471 brake horsepower (hp) and 2,500 kilowatts with digester gas cleanup, oxidation catalyst, and SCR. Part B, Section III – Other Technologies, was updated for the following categories of emerging technologies in operation with an air quality permit that are not yet qualified as LAER: 1) I.C. Engine, Stationary, Emergency, Electrical Generator rated at 1 megawatt with a particulate matter trap and SCR; and 2) Fuel Cell Electricity Generator – Digester Gas fueled, electrical power generation with digester gas cleanup rated at 1.4 megawatts. Part D – Minor Source BACT was updated for the following categories: 1) Printing, Graphic Arts (Flexographic, Lithographic or Offset, Heatset, and Screen Printing and Drying); 2) Dryer or Oven; 3) I.C. Engine, Stationary, Non-Emergency, Non-Electrical Generators; 4) I.C. Engine, Portable (Tier 4 Final, rated between 75 hp and 175 hp). In addition, the following new minor source categories were added to Part D: 1) Food Oven – Ribbon, Direct-fired and Infrared Burners, Other Burners and Add-on control for bakery oven; and 2) I.C. Engine, Stationary, Non-Emergency, Electrical Generators. The category of I.C. Engine, Stationary, Non-Emergency was deleted from Part D. Lastly, an equipment category search web link was proposed to make the BACT Guidelines user friendly. Staff's analysis of the proposed amendments concluded that the project qualified for an exemption from CEQA pursuant to CEQA Guidelines Section 15061(b)(3) – Activities Covered by General Rule. Projects that are exempt from CEQA do not require an alternatives analysis. As such, no alternatives analysis was prepared for this project. Since the project was determined to be exempt from CEQA, no alternatives analysis was required. The South Coast AQMD Governing Board determined that the project was exempt from CEQA and approved the project as proposed. A Notice of Exemption was prepared pursuant to CEQA Guidelines Section 15062.

*Estimated Emission Reductions:* None. *Cost-Effectiveness:* None, not required. *CEQA Alternatives:* None, not required. *Socioeconomic Impact:* None, not required. *Source(s) of Funding:* Permit Fees, Emission Fees and Annual Operating Fees.

## **MARCH 2, 2018**

One rule was amended in March, as follows:

- 1. Amended Rule 1111 – Reduction of NO<sub>x</sub> Emissions from Natural-Gas-Fired, Fan-Type Central Furnaces; and Recognize Revenue:** Rule 1111 was amended to increase the mitigation fee and extend the mitigation fee alternative compliance option to allow additional time for manufacturers to develop and commercialize a range of natural-gas-fired fan-type

furnaces that meet the NO<sub>x</sub> emission limit of 14 nanograms per Joule (ng/J). Rule 1111 was also amended to provide an exemption of rule applicability for natural gas furnaces installed with propane conversion kits for propane firing only, with a defined labeling requirement. A Final Subsequent Environmental Assessment (SEA) was prepared for the project and the analysis concluded that the project would have significant unavoidable air quality impacts during operation because the quantity of emission reductions foregone would exceed the South Coast AQMD's significance operational threshold for NO<sub>x</sub>. Because the Final SEA concluded that the project would have a significant adverse operational air quality impact on the environment, mitigation measures were required. However, because no feasible mitigation measures were identified that would eliminate or reduce the significant adverse operational air quality impacts for NO<sub>x</sub> emissions to less than significant levels, mitigation measures were not made a condition of approval of this project. Thus, a Mitigation Monitoring and Reporting Plan, pursuant to Public Resources Code Section 21081.6 and CEQA Guidelines Section 15097, was not required or adopted for this project. Findings were made pursuant to CEQA Guidelines Section 15091. A Statement of Overriding Considerations pursuant to CEQA Guidelines Section 15093 was adopted for this project. Since significant adverse environmental impacts were identified, an alternatives analysis was required by CEQA and prepared that include the following alternatives:

**Alternative A – No Project:** Alternative A, the no project alternative, means that the version of Rule 1111 that was amended in September 2014 would remain in effect. Under the September 2014 version of Rule 1111, condensing, non-condensing, weatherized, and mobile home units would have to comply with the applicable NO<sub>x</sub> emission limits from 2018 to 2022. Compliance with these NO<sub>x</sub> emission limits would result in NO<sub>x</sub> emission reductions occurring from 2018 through 2022. Under this alternative, however, suppliers indicated that they could not provide equipment that meets the applicable NO<sub>x</sub> emission limits, which in turn, created potential compliance issues for the manufacturers, distributors and installers. Under the No Project alternative, the originally projected NO<sub>x</sub> emission reductions in the September 2014 version of Rule 1111 would not have been able to be achieved if the September 2014 version of Rule 1111 remained in effect.

**Alternative B – More Stringent NO<sub>x</sub> Emission Limit Alternative (10 ng/J NO<sub>x</sub> Emission Limit):** Under Alternative B, the NO<sub>x</sub> emission limit of 10 ng/J is more stringent than the 14 ng/J NO<sub>x</sub> emission limit that was adopted in the March 2018 version of Rule 1111 (the proposed project). Under Alternative B, condensing, non-Condensing, weatherized, and mobile home units would have to comply with the NO<sub>x</sub> emission limit starting in 2018. The compliance dates for achieving the more stringent NO<sub>x</sub> emission limit under Alternative B would be equivalent to the compliance dates in the March 2018 version of Rule 1111 (the proposed project). Recovery of the NO<sub>x</sub> emission reductions foregone were expected to occur starting in 2018 as older equipment gets replaced or retrofitted over time. When compared to the March 2018 version of Rule 1111 (the proposed project), the NO<sub>x</sub> emission reductions foregone were expected to be recovered more quickly each year from compliance year 2018 to 2022 under Alternative B.

**Alternative C – Less Stringent Timing Alternative (Three Year Extension for Compliance Dates):** Under Alternative C, the NO<sub>x</sub> emission limit would remain the same as the March 2018 version of Rule 1111 (the proposed project). However, under

Alternative C, the compliance dates for all equipment types would be extended by three years from the September 2014 version of Rule 1111, which is less stringent than the compliance date extension that was adopted in the March 2018 version of Rule 1111 (the proposed project). Condensing, non-condensing, weatherized, and mobile home units were expected to comply with applicable NOx emission limits over the applicable extended compliance period of three years starting in 2018. Recovery of the NOx emission reductions foregone were expected to occur starting in 2018 as older equipment gets replaced or retrofitted over time. Under Alternative C, the NOx emission reductions foregone were expected to be recovered each year from compliance year 2018 to 2024.

**Alternative D – More Mitigation Alternative (Increased Mitigation Fees):** Under Alternative D, the NOx emission limit would remain the same as the March 2018 version of Rule 1111 (the proposed project). However, under Alternative D, the mitigation fee for all equipment types would be increased to \$500 per unit, which is more stringent than the two-phase \$400 mitigation fee schedule that was adopted in the March 2018 version of Rule 1111 (the proposed project). Under Alternative D, condensing, non-condensing, weatherized, and mobile home units would still have to comply with the same applicable NOx emission limits set forth in the March 2018 version of Rule 1111 (the proposed project). Under Alternative D, the amount of NOx emission reductions foregone were expected to be equivalent to the March 2018 version of Rule 1111 (the proposed project) and would occur starting in 2018 as older equipment gets replaced or retrofitted over time. Under Alternative D, the NOx emission reductions foregone were expected to be recovered each year from compliance year 2018 to 2024.

The South Coast AQMD Governing Board certified the Final SEA and approved the project as proposed. A Notice of Decision was prepared pursuant to Public Resources Code Section 21080.5(d)(2)(E), CEQA Guidelines Sections 15252(b) and 15094(b), and South Coast AQMD Rule 110(f) and filed with the Office of the Secretary of Resources.

*Estimated Emission Reductions:* Foregone NOx emissions reductions of: 0.07 to 0.09 tons per day in 2018, 0.26 to 0.32 tons per day in 2023, and 0.26 to 0.32 tons per day in 2031. Even though the March 2018 version of Rule 1111 delayed a compliance date, the foregone NOx emission reductions were attributed to not meeting a previous compliance date in the September 2014 version of Rule 1111. However, the amendment did not cause any overall change to future year emissions. Full implementation of Rule 1111 is expected to occur in 2046. *Cost-Effectiveness:* None, not required since no additional requirements on manufacturers meeting the 14 ng/J NOx emission limit were imposed. However, a cost-effectiveness analysis was performed for the 2009 amendments to Rule 1111 when the 14 ng/J NOx emission limit was first introduced. *CEQA Alternatives:* Four alternatives were analyzed, see alternatives described above. *Socioeconomic Impact:* No impact, see Socioeconomic Impact Assessments section. *Source(s) of Funding:* Emission Fees and Annual Operating Fees.



## APRIL 6, 2018

Two rules were amended in April, as follows:

- 1. Amended Rule 1178 – Further Reductions of VOC Emissions from Storage Tanks at Petroleum Facilities, and Amended Rule 219 – Equipment Not Requiring a Written Permit Pursuant to Regulation II:** Rule 1178 was amended to provide storage tank operators with an additional option for controlling volatile organic compound (VOC) emissions from aboveground floating roof tanks and to make the rules consistent with the 2000 United States Environmental Protection Agency (U.S. EPA) Storage Tank Emission Reduction Partnership Program (STERPP) Agreement. Specifically, the amendments to Rule 1178: 1) allow the installation of a Flexible Enclosure System on a slotted guide pole of any internal, external, or domed floating roof tank provided that the applicable combination of components is used to replace a pole float and float wiper/seal; 2) clarify repair or replacement provisions; 3) clarify due dates for inspection reports and related documents; and 4) update inspection procedures and compliance report forms. Rule 219 was amended to exempt from permit certain installations of a Flexible Enclosure System that occur in accordance with the corresponding amendments made to Rule 1178. Staff's analysis of the proposed amendments concluded that the project qualified for an exemption from CEQA pursuant to CEQA Guidelines Section 15061(b)(3) – Activities Covered by General Rule. Projects that are exempt from CEQA do not require an alternatives analysis. As such, no alternatives analysis was prepared for this project. The South Coast AQMD Governing Board determined that the project was exempt from CEQA and approved the project as proposed. A Notice of Exemption was prepared pursuant to CEQA Guidelines Section 15062 and filed with the county clerks of Los Angeles, Orange, Riverside, and San Bernardino counties.

*Estimated Emission Reductions:* None. *Cost-Effectiveness:* None, not required. *CEQA Alternatives:* None, not required. *Socioeconomic Impact:* No impact, see Socioeconomic Impact Assessments section. *Source(s) of Funding:* Emission Fees and Annual Operating Fees.

## MAY 4, 2018

One regulation and one rule were amended in May, as follows:

- 1. Amended Regulation III – Fees:** Amendments to Regulation III rules (Rules 301, 303, 304, 304.1, 306, 307.1, 308, 309, 311, 313, 314, and 315) include the following: 1) pursuant to Rule 320, an increase of most fees by 3.4% consistent with the Consumer Price Index; 2) new fees which are necessary to meet the requirements of recently adopted rules and state mandates; and 3) new or increased fees which are necessary to provide more specific cost recovery for other regulatory actions taken by the agency. Other changes were made to Regulation III, which had no fee impact, but included clarifications, deletions, or corrections to existing rule language. Staff's analysis of the proposed amendments concluded that the project qualified for an exemption from CEQA pursuant to CEQA Guidelines Section 15061(b)(3) – Activities Covered by General Rule, and CEQA Guidelines Section 15273 - Rates, Tolls, Fares, and Charges. Projects that are exempt from CEQA do not require an alternatives analysis. As such, no alternatives analysis was prepared for this project. The South Coast AQMD Governing Board determined that the project was exempt from CEQA and approved the project as proposed. A Notice of Exemption was prepared pursuant to CEQA Guidelines Section 15062.

*Estimated Emission Reductions:* None. *Cost-Effectiveness:* None, not required. *CEQA Alternatives:* None, not required. *Socioeconomic Impact:* Yes, see Socioeconomic Impact Assessments section. *Source(s) of Funding:* Permit Fees, Emission Fees, and Annual Operating Fees.

- 2. Amended Rule 408 – Circumvention:** Rule 408 was amended to address specific circumstances where facilities may attempt to avoid compliance by prohibiting a facility from altering business operations or equipment to evade detection or conceal emissions during monitoring and testing, and by limiting the existing exemption for cases in which the only violation is an odor nuisance. Staff’s analysis of the proposed amendments concluded that the project qualified for an exemption from CEQA pursuant to CEQA Guidelines Section 15061(b)(3) – Activities Covered by General Rule, and CEQA Guidelines Section 15308 – Actions by Regulatory Agencies for Protection of the Environment. Projects that are exempt from CEQA do not require an alternatives analysis. As such, no alternatives analysis was prepared for this project. The South Coast AQMD Governing Board determined that the project was exempt from CEQA and approved the project as proposed. A Notice of Exemption was prepared pursuant to CEQA Guidelines Section 15062 and filed with the county clerks of Los Angeles, Orange, Riverside and San Bernardino counties.

*Estimated Emission Reductions:* None. *Cost-Effectiveness:* None, not required. *CEQA Alternatives:* None, not required. *Socioeconomic Impact:* None, not required. *Source(s) of Funding:* Emission Fees and Annual Operating Fees.

## **JUNE 1, 2018**

No rules were adopted, amended, or rescinded in June.

## **JULY 6, 2018**

One rule was amended in July, as follows:

- 1. Amended Rule 1111 – Reduction of NOx Emissions from Natural-Gas-Fired, Fan-Type Central Furnaces:** Rule 1111 was amended to add a new consumer notification requirement, effective October 1, 2018, that will be applicable to any furnace where a mitigation fee is paid that allows the unit to be sold or distributed inside the Basin in lieu of meeting the compliant NOx emission limit of 14 nanograms per Joule (ng/J). Amended Rule 1111 also requires manufacturers that distribute or publish informative materials, such as consumer brochures, technical specification sheets for the furnace, and the manufacturer’s website promoting the non-compliant furnace, to clearly display specific language that the furnace does not meet the current emission limit, is subject to a mitigation fee, and is not eligible for the South Coast AQMD’s rebate program. Staff’s analysis of the proposed amendments concluded that the project qualified for an exemption from CEQA pursuant to CEQA Guidelines Section 15061(b)(3) – Activities Covered by General Rule. Projects that are exempt from CEQA do not require an alternatives analysis. As such, no alternatives analysis was prepared for this project. The South Coast AQMD Governing Board determined that the project was exempt from CEQA and approved the project as proposed. A Notice of Exemption was prepared pursuant to CEQA Guidelines Section 15062 and filed with the county Clerks of Los Angeles, Orange, Riverside, and San Bernardino counties.

*Estimated Emission Reductions:* None. *Cost-Effectiveness:* None, not required. *CEQA Alternatives:* None, not required. *Socioeconomic Impact:* None, not required. *Source(s) of Funding:* Emission Fees and Annual Operating Fees.

## **AUGUST 2018**

There was no Governing Board meeting in August, so no rules were adopted, amended, or rescinded.

## **SEPTEMBER 7, 2018**

No rules were adopted, amended, or rescinded in September.

## **OCTOBER 5, 2018**

Two rules were amended in October, as follows:

- 1. Amended Rule 2001 – Applicability and Amended Rule 2002 – Allocations for Oxides of Nitrogen (NO<sub>x</sub>) and Oxides of Sulfur (SO<sub>x</sub>):** Rules 2001 and 2002 were amended to facilitate the transition of the NO<sub>x</sub> RECLAIM program to a command-and-control regulatory structure. Rule 2001 was amended to allow any facility to exit RECLAIM provided that it meets specific criteria. Rule 2002 was amended to allow facilities to remain in RECLAIM after the issuance of an initial determination notification for potential. RECLAIM facilities will be required to comply with Best Available Retrofit Control Technology (BARCT) requirements under any applicably adopted or amended command-and-control rule. The amendments to Rules 2001 and 2002 were administrative in nature and did not impose a new or more stringent emission limit or standard. A Final Subsequent Environmental Assessment (SEA) was prepared for the project and the analysis concluded that there would be no significant adverse environmental impacts for any environmental topic area. The South Coast AQMD Governing Board certified the Final SEA and approved the project as proposed. A Notice of Decision was prepared pursuant to Public Resources Code Section 21080.5(d)(2)(E), CEQA Guidelines Sections 15252(b) and 15094(b), and South Coast AQMD Rule 110(f) and filed with the Office of the Secretary of Resources.

*Estimated Emission Reductions:* None. *Cost-Effectiveness:* None, not required. *CEQA Alternatives:* None, not required. *Socioeconomic Impact:* No impact, see Socioeconomic Impact Assessment section. *Source(s) of Funding:* AB 617, Permit Fees, Annual Operating Fees, and Emission Fees.

## **NOVEMBER 2, 2018**

One rule and one plan were amended in November, as follows:

- 1. Amended 1-Hour Ozone Standard Attainment Demonstration:** In order to demonstrate attainment of the 1-hour ozone standard by 2022, the attainment demonstration of the federal 1979 1-hour ozone standard that was included in the 2016 AQMP was updated by: 1) making the emissions inventory consistent with final emissions inventory used for the attainment demonstrations of the 8-hour ozone and PM<sub>2.5</sub> standards in the 2016 AQMP; 2) revising the air quality modeling; and 3) revising the attainment strategy for meeting the 1-hour ozone

standard by removing emission reductions from CARB’s SIP strategies, including federal Clean Air Section 182(e)(5) measures (“black box” measures) since they are no longer needed to demonstrate attainment with the 1-hour ozone standard. Staff’s analysis of the proposed amendments concluded that the project qualified for an exemption from CEQA pursuant to CEQA Guidelines Section 15061(b)(3) – Activities Covered by General Rule, and CEQA Guidelines Section 15308 – Actions by Regulatory Agencies for Protection of the Environment. Projects that are exempt from CEQA do not require an alternatives analysis. As such, no alternatives analysis was prepared for this project. The South Coast AQMD Governing Board determined that the project was exempt from CEQA and approved the project as proposed. A Notice of Exemption was prepared pursuant to CEQA Guidelines Section 15062.

*Estimated Emission Reductions:* None. *Cost-Effectiveness:* Not applicable. *CEQA Alternatives:* None, not required. *Socioeconomic Impact:* None, not required. *Source(s) of Funding:* Permit Fees, Emission Fees, and Annual Operating Fees.

- 2. Amended Rule 1135 – Emissions of Oxides of Nitrogen from Electricity Generating Facilities:** Rule 1135 was amended to reduce oxide of nitrogen emissions (NOx) emissions from RECLAIM and non-RECLAIM electricity generating facilities which are owned or operated by an investor-owned electric utility, a publicly owned electric utility, or have electric generating units with a combined generation capacity of 50 megawatts or more of electrical power for distribution in the state or local electrical grid system. The amendments to Rule 1135: 1) expanded the rule's applicability to include units at RECLAIM electricity generating facilities and units at electricity generating facilities that were not at electric power generating systems previously subject to Rule 1135; 2) updated the NOx and ammonia emission limits for boilers and gas turbines; 3) established NOx emission limits and added new emission limits for ammonia, carbon monoxide, volatile organic compounds, and particulate matter for internal combustion engines; 4) revised monitoring, reporting, and recordkeeping requirements; and 5) revised exemptions. The project is estimated to reduce NOx emissions by 1.7 tons per day by January 1, 2027 after implementation of the best available retrofit control technology (BARCT) limits. A Final Mitigated Subsequent Environmental Assessment (SEA) was prepared for the project and the analysis concluded that although a reduction of NOx emissions is expected to create an environmental benefit and protect public health, the activities that the affected facilities may undertake to ensure compliance with amended Rule 1135 may also create potentially significant adverse environmental impacts for the topic of hazards and hazardous materials due to the storage and use of aqueous ammonia. As such, mitigation measures were crafted that were shown to reduce the potentially significant adverse hazards and hazardous materials impacts to less than significant levels. No other environmental topic areas were identified as having potentially significant adverse environmental impacts. Thus, the Final Mitigated SEA concluded that amended Rule 1135 would not result in significant adverse impacts to any environmental topic areas, including the topic of hazards and hazardous materials after mitigation measures are applied. Mitigation measures were made a condition of project approval and a Mitigation, Monitoring, and Reporting Plan pursuant to Public Resources Code Section 21081.6 and CEQA Guidelines Section 15097 was prepared and adopted for this project. Findings, pursuant to CEQA Guidelines Section 15091, and a Statement of Overriding Considerations, pursuant to Public Resources Code Section 21081.6 and CEQA Guidelines Section 15093, were not required and therefore, not adopted for this

project. The South Coast AQMD Governing Board certified the Final Mitigated SEA and approved the project as proposed. A Notice of Decision was prepared pursuant to Public Resources Code Section 21080.5(d)(2)(E), CEQA Guidelines Sections 15252(b) and 15094(b), and South Coast AQMD Rule 110(f), and filed with the Office of the Secretary of Resources.

*Estimated Emission Reductions:* 1.7 tons per day of NO<sub>x</sub> after implementation of the BARCT limits (e.g., by January 1, 2027). *Cost-Effectiveness:* For diesel internal combustion engines, 0.1 tons per day of NO<sub>x</sub> emission reductions at an average cost-effectiveness of approximately \$23,000 per ton of NO<sub>x</sub> reduced. For natural gas boilers, 1.6 tons per day of NO<sub>x</sub> emission reductions at an average cost-effectiveness of approximately \$5,630 per ton of NO<sub>x</sub> reduced. *CEQA Alternatives:* None, not required. *Socioeconomic Impact:* Yes, see Socioeconomic Impact Assessments section. *Source(s) of Funding:* AB 617, Permit Fees, Emission Fees, and Annual Operating Fees.

- 3. Amended Rule 1469 – Hexavalent Chromium Emissions from Chromium Electroplating and Chromic Acid Anodizing Operations:** Rule 1469 was amended to further reduce hexavalent chromium emissions from chromium electroplating and chromic acid anodizing operations. Amended Rule 1469 incorporated new requirements for: 1) hexavalent chromium-containing tanks, such as dichromate seal tanks, that are currently not regulated; 2) air pollution control equipment to be installed on Tier III hexavalent chromium tanks that emit or have the potential to emit hexavalent chromium; 3) conducting periodic source testing and parametric monitoring of air pollution control equipment; 4) complying with building enclosure provisions; 5) conducting additional housekeeping and implementing best management practices for all hexavalent chromium containing tanks; 6) permanent total enclosures to be vented to air pollution control equipment in the event of non-compliance with specific source testing or monitoring requirements; 7) reducing allowable surface tension limits; 8) prohibiting the use of chemical fume suppressants that contain perfluorooctane sulfonic acid (PFOS); and 9) evaluating the use of non-PFOS chemical fume suppressants with toxicity concerns via a revised certification process conducted by South Coast AQMD and the California Air Resources Board. A Revised Final Environmental Assessment (EA) was prepared for the project and the analysis concluded that there would be no significant adverse environmental impacts. Since no significant adverse environmental impacts were identified, an alternatives analysis and mitigation measures were not required by CEQA. Mitigation measures were not made a condition of project approval and a Mitigation, Monitoring, and Reporting Plan pursuant to Public Resources Code Section 21081.6 and CEQA Guidelines Section 15097 was not required or adopted for this project. Findings, pursuant to CEQA Guidelines Section 15091, and a Statement of Overriding Considerations, pursuant to Public Resources Code Section 21081.6 and CEQA Guidelines Section 15093, were not required and therefore, not adopted for this project. The South Coast AQMD Governing Board certified the Revised Final EA and approved the project as proposed. A Notice of Decision was prepared pursuant to Public Resources Code Section 21080.5(d)(2)(E), CEQA Guidelines Sections 15252(b) and 15094(b), and South Coast AQMD Rule 110(f) and filed with the Office of the Secretary of Resources.

*Estimated Emission Reductions:* Implementation of amended Rule 1469 will reduce the exposure to hexavalent chromium, a toxic air contaminant. Emission reductions of hexavalent chromium could not be quantified. *Cost-Effectiveness:* None, not required for proposed toxic air contaminants rules or rule amendments. *CEQA Alternatives:* None, not required.

*Socioeconomic Impact:* Yes, see Socioeconomic Impact Assessments section. *Source(s) of Funding:* Annual Operating Fees, and Emission Fees.

## **DECEMBER 7, 2018**

Three rules were amended and one rule was adopted as one project in December, as follows:

- 1. Amended Rules 1146 – Emissions of Oxides of Nitrogen (NO<sub>x</sub>) from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; 1146.1 – Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; 1146.2 – Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters; and Adopted Rule 1100 – Implementation Schedule for NO<sub>x</sub> Facilities:** Rules 1146, 1146.1, and 1146.2 were amended to achieve additional NO<sub>x</sub> emission reductions. Amendments were needed to transition facilities in the RECLAIM program to a command-and-control regulatory structure. Rule 1100 was adopted to establish the compliance schedule for RECLAIM facilities with Rule 1146 and/or 1146.1 units. Rules 1146 and 1146.1 updated the NO<sub>x</sub> emission limits for boilers, heaters, and steam generators. Rule 1146.2 removed the exemption for RECLAIM facilities with no changes to the NO<sub>x</sub> emission limits for larger water heaters and small boilers and process heaters. The NO<sub>x</sub> emission limits under Rules 1146, 1146.1, and 1146.2 represent BARCT and apply to RECLAIM and non-RECLAIM facilities. The amendments to Rules 1146 and 1146.1 also limited ammonia emissions for new or modified units with applicable air pollution control equipment and required quarterly ammonia source testing (if four consecutive quarterly source tests demonstrate compliance, an annual source test may be conducted), required certain units at non-RECLAIM facilities to meet new NO<sub>x</sub> emission limits, and allowed units at municipal sanitation service facilities to maintain existing NO<sub>x</sub> emission limits until a South Coast AQMD Regulation XI – Source Specific Standards rule is adopted or amended.

A Final Subsequent Environmental Assessment (SEA) was prepared for the project and the analysis concluded that although a reduction of NO<sub>x</sub> emissions are expected to create an environmental benefit and protect public health, the activities that the affected facilities may undertake to comply with the applicable NO<sub>x</sub> emission limits (e.g., installing selective catalytic reduction (SCR) systems for air pollution control purposes) may also create potentially significant adverse environmental impacts for the topic of hazards and hazardous materials due to the storage and use of aqueous ammonia needed for the operation of SCR systems. As such, mitigation measures were required and crafted to reduce the severity of the effects of the potentially significant adverse hazards and hazardous materials impacts and these mitigation measures were made a condition of approval of this project; however, the impacts could not be mitigated to less than significant levels. No other environmental topic areas were identified as having potentially significant adverse environmental impacts. Thus, a Mitigation, Monitoring, and Reporting Plan, pursuant to Public Resources Code Section 21081.6 and CEQA Guidelines Section 15097, was required and adopted for this project. Findings were made pursuant to CEQA Guidelines Section 15091. A Statement of Overriding Considerations pursuant to CEQA Guidelines Section 15093 was adopted for this project. Since significant adverse environmental impacts were identified, an alternatives analysis was required by CEQA and prepared that included the following alternatives:

**Alternative A - No Project:** Alternative A, the no project alternative, means that the current versions of Rules 1146 and 1146.1 that were amended in November 2013, and the current version of 1146.2 that was amended in April 2006, would remain in effect and affected facilities subject to these rules would not transition out of the NOx RECLAIM program. Under the November 2013 versions of Rules 1146 and 1146.1, units at RECLAIM facilities would not have to comply with the NOx emission limits presented in Tables 1146-1 and 1146.1-1, respectively. Under Alternative A, no NOx emission reductions will be achieved and the units subject to Rules 1146 and 1146.1 at RECLAIM facilities would not meet BARCT level equivalency. However, the December 2015 amendments to the NOx RECLAIM program evaluated BARCT level equivalency for combustion units that would have otherwise been subject to Rules 1146, 1146.1, and 1146.2 had they not been in the RECLAIM program. Furthermore, the environmental impacts for the December 2015 amendments to the NOx RECLAIM program were evaluated in the Final Program EA that was certified in December 2015<sup>1</sup>. Under Alternative A, units subject to Rules 1146, 1146.1, and 1146.2 at RECLAIM facilities would not begin the transition to a command-and-control regulatory structure. In addition, under Alternative A, the implementation schedule contained in new Rule 1100 would also not take effect.

**Alternative B - Compliance Deadline Extension:** The requirements under Alternative B are equivalent to the proposed project, but the compliance deadline for meeting the NOx emission limits would be extended by one year for all units. At any facility, 75 percent of the units subject to Rules 1146 and 1146.1 would need to meet the applicable NOx emission limit by January 1, 2022 and 100 percent would need to achieve compliance by January 1, 2023. In addition, the facilities would have one additional year to submit permit applications. The extension of the compliance deadline for units subject to Rules 1146 and 1146.1 under Alternative B is less stringent than the proposed project.

**Alternative C - 100% of Units by January 1, 2021:** The NOx emission limits under Alternative C are the same as the proposed project, but facilities would need to achieve 100 percent compliance one year earlier than the proposed project, e.g., by January 1, 2021. The earlier compliance date would apply to 25 percent of the units subject to Rules 1146 and 1146.1. The earlier compliance date under Alternative C is more stringent than the proposed project.

**Alternative D - All Ultra-Low NOx Burners:** Under Alternative D, the NOx emission limit is less stringent for Group I (Rule 1146) units than the proposed project, but Alternative D has the same compliance deadline as the proposed project. Under Alternative D, the Group I units would need to meet a NOx emission limit of nine ppm (or 0.011 pound per MMBtu) instead of five ppm (or 0.0062 pound per MMBtu). The Group II and III units subject to Rule 1146 and fire-tube boilers rated between two and five MMBtu subject to Rule 1146.1 would need to meet a NOx emission limit of nine ppm (or 0.011 pound per MMBtu) instead of five ppm or seven ppm (or 0.00085 pound per MMBtu) as required by the proposed project. Under Alternative D, the NOx emission limit for thermal fluid heaters remains at 30 ppm (or 0.037 pound per MMBtu) instead of 12 ppm (0.015 pound per

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<sup>1</sup> South Coast AQMD, Final Program Environmental Assessment for Proposed Amended Regulation XX - RECLAIM, November 2015. <http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2015/regxxfinalpeaplusappendices.pdf>

MMBtu) as required by the proposed project. Thus, under Alternative D, the thermal fluid heaters would not be able to meet BARCT NOx emissions equivalency. All other requirements in the proposed project are the same for Alternative D. Overall, Alternative D is less stringent than the proposed project.

**Alternative E – NOx RECLAIM Facilities Transitioning to Command-and-Control Regulatory Structure at Current Limits:** Under Alternative E, only NOx RECLAIM facilities would be affected instead of NOx sources at both non-RECLAIM and RECLAIM facilities under the proposed project. The NOx emission limits under Alternative E are less stringent than the proposed project for the following: 1) units with a rated heat input of greater than or equal to 20 and less than 75 MMBtu per hour (Group II); 2) units with a rated heat input of greater than or equal to two but less than 20 MMBtu per hour (Rules 1146 and 1146.1) for fire-tube boilers; and 3) thermal fluid heaters. Alternative E would require Group II and Group III units to meet a NOx emission limit of nine ppm (or 0.011 pounds per MMBtu) instead of the following NOx emission limits contained in the proposed project: 1) five ppm (or 0.0062 pound per MMBtu) for Group II units with an existing NOx emission limit greater than 12 ppm; 2) seven ppm (or 0.0085 pound per MMBtu) for Group II units that are fire-tube boilers with an existing NOx emission limit less than or equal to nine ppm greater than five ppm; and 3) seven ppm (or 0.0085 pound per MMBtu) for Group III units that are fire-tube boilers with an existing NOx emission limit less than or equal to 9 ppm prior to December 7, 2018.

In addition, under Alternative E, any units with a rated heat input greater than two but less than five MMBtu per hour would need to meet a NOx emission limit of nine ppm. In the proposed project, units with a rated heat input greater than two but less than five MMBtu per hour are required to meet a NOx emission limit of seven ppm for fire-tube boilers with an existing NOx emission limit less than or equal to nine ppm prior to December 7, 2018, and nine ppm for all others. In addition, under Alternative E, thermal fluid heaters would remain at the current NOx emission limit of 30 ppm (or 0.037 pound per MMBtu). All other requirements in the proposed project are the same for Alternative E. Overall, Alternative E is less stringent than the proposed project.

The South Coast AQMD Governing Board certified the Final Subsequent Environmental Assessment and approved the project as proposed. A Notice of Decision was prepared pursuant to Public Resources Code Section 21080.5(d)(2)(E), CEQA Guidelines Sections 15252(b) and 15094(b), and South Coast AQMD Rule 110(f) and filed with the Office of the Secretary of Resources.

*Estimated Emission Reductions:* 0.27 tons per day NOx by January 1, 2023. *Cost-Effectiveness:* \$26,500 per ton of NOx reduced. *CEQA Alternatives:* Five alternatives were analyzed, see alternatives described above. *Socioeconomic Impact:* Yes, see Socioeconomic Impact Assessments section. *Sources of Funding:* AB 617, Permit Fees, Emission Fees, and Annual Operating Fees.



## CEQA LEAD AGENCY PROJECTS

South Coast AQMD also acts as the Lead Agency under CEQA for non-South Coast AQMD projects where South Coast AQMD typically has primary approval (i.e., discretionary permitting authority). Under CEQA, the Lead Agency is responsible for determining whether an EIR, ND, or other type of CEQA document is necessary for any proposal considered to be a “project” as defined by CEQA. Further, the Lead Agency is responsible for preparing the environmental analysis, complying with all procedural requirements of CEQA, and approving the environmental documents. All documents prepared by South Coast AQMD for permit projects are subject to the standard CEQA requirements. South Coast AQMD staff is responsible for preparing or reviewing prepared CEQA documents for stationary source permit projects.

In 2018, one lead agency project with corresponding CEQA documents were approved by the South Coast AQMD’s Executive Officer, as summarized below.

**Addendum to the April 2007 Final Mitigated Negative Declaration for Southern California Edison: Barre Peaker Project, Stanton (project approved October 30, 2018):**

Southern California Edison operators proposed additional changes to their project that was previously evaluated and adopted in the Final Mitigated Negative Declaration (MND) for the Southern California Edison Barre Peaker Project in Stanton, CA on April 3, 2007, herein referred to as the April 2007 Final MND. The project evaluated in the April 2007 Final MND was for the installation of a General Electric natural gas-fired turbine generator, also referred to as a “peaker” unit, plus an air pollution control system comprised of a selective catalytic reduction (SCR) unit and oxidation catalyst to reduce emissions to levels that meet all applicable local air quality emission standards. The peaker is capable of producing up to 45 MW of electricity on short notice during periods when the local electrical system needs power and local voltage support.

Subsequent to the adoption of the April 2007 Final MND, SCE operators proposed to modify the peaker’s turbine air pollution control system to: 1) decrease the water-injection rate into the turbine’s combustor by up to 54 percent; 2) replace the SCR catalyst and increase the cross-sectional area (by nearly three times) and the pitch (i.e., angle) of the SCR catalyst beds to maximize the contact area and time the turbine’s exhaust gas moves across the catalyst, without increasing the size (outside dimensions) of the SCR enclosure; 3) replace the oxidation catalyst with an updated design and higher conversion rate, which provides functionally equivalent emissions control; 4) modify the exhaust flow distribution design and ammonia injection grid design to improve the deliverability of ammonia to the catalyst; and; 5) increase the concentration of aqueous ammonia delivered to the facility, stored on-site, and injected into the SCR from 19 percent to 29 percent. In addition, to increase the operating flexibility of the peaker so that it can provide reliable power to the grid when dispatched by the California Independent System Operator (CAISO) during peak times when renewable energy resources are not available, SCE is proposing to revise its South Coast AQMD Title V Operating Permit to allow the turbine to generate power over its full operating range, from less than one megawatt (MW) to full load, while continuing to meet the emission limits in the current permit without increasing: 1) utilization of the Barre Peaker for power generation; 2) fuel-input limits, generation capacity, or the heat rate of the turbine; and, 3) The potential to emit of criteria pollutants, greenhouse gases, or toxic air contaminants (TACs).

The Addendum to the April 2007 MND concluded that the proposed modifications to the original project previously analyzed in the April 2007 Final MND would not create any new significant adverse environmental impacts or substantially increase the severity of the significant effects previously identified. The mitigation measures that were made a condition of approval of the original project analyzed in the April 2007 Final MND and the corresponding Mitigation, Monitoring, and Reporting Plan that was adopted at that time will remain in effect. No new or modified mitigation measures were made as a condition of the approval of this project. Since there were no significant impacts that could not be mitigated to less than significant levels in the April 2007 MND and there are no new significant impacts in the Addendum to the April 2007 MND, no alternatives analysis is required under CEQA. Findings were not made and a Statement of Overriding Considerations was not required or adopted for the original project analyzed in the March 2007 Final MND since no significant adverse impacts were identified that could not be mitigated to less than significant levels. Further, because there are no new significant impacts as a result of the amended project analyzed in the Addendum to the April 2007 MND, neither Findings nor a Statement of Overriding Considerations are required.

## **SOCIOECONOMIC IMPACT ANALYSES**

California Health and Safety Code Section 40440.8 requires that South Coast AQMD perform socioeconomic impact assessments for its rules and regulations that will significantly affect air quality or emissions. Prior to the requirements of Section 40440.8, South Coast AQMD staff had been evaluating the socioeconomic impacts of its actions pursuant to a 1989 resolution of its Governing Board. Additionally, South Coast AQMD staff assesses socioeconomic impacts of CEQA alternatives to those rules with significant cost and emission reduction impacts.

The elements of socioeconomic impact assessments include direct effects on various types of affected industries in terms of control costs and cost-effectiveness as well as public health benefits associated with AQMPs. Additionally, South Coast AQMD staff uses an economic model developed by Regional Economic Models, Inc. (REMI) to analyze the potential direct and indirect socioeconomic impacts of South Coast AQMD rules on Los Angeles, Riverside, Orange, and San Bernardino Counties. These impacts include, but are not limited to employment and competitiveness.

There were eleven rule projects in 2018 which included adoption of one new rule and amendments to twelve rules and one regulation. There were two additional projects to update BACT Guidelines and the 1-hour ozone standard attainment demonstration. Out of the 13 projects, four had socioeconomic impacts. Additionally, one rule, Rule 320, did not undergo any amendments that were brought to the South Coast AQMD Governing Board, but because it contains a requirement for an automatic annual California Consumer Price Index (CPI) adjustment that has associated socioeconomic impacts, this rule has also been included in this summary.

## **Rule Adoptions and Amendments with Socioeconomic Impacts**

### **Amended Rule 2001 – Applicability, and Amended Rule 2002– Allocations for Oxides Of Nitrogen (NO<sub>x</sub>) and Oxides of Sulfur (SO<sub>x</sub>) (January 5, 2018)**

Rules 2001 and 2002 were amended to initiate the transition of facilities that are currently in the Regional Clean Air Incentives Market (RECLAIM) program to a command-and-control regulatory structure. The socioeconomic analysis identified 266 potentially affected facilities in the NO<sub>x</sub> RECLAIM program as of November 2017. None of these facilities were identified as being affected by amended Rule 2001, while 38 facilities would be affected initially by amended Rule 2002. All 38 affected facilities were already compliant with BARCT limits and therefore, would not incur increased compliance costs as a result of amended Rule 2002. If these facilities were to remain in the NO<sub>x</sub> RECLAIM program, three facilities would hold an estimated 0.027 tons per day surplus of NO<sub>x</sub> RECLAIM trading credits (RTCs) valued at an estimated \$62,000 per compliance year available for future sale or transfer. In addition, 19 other facilities would have insufficient RTCs for future compliance needs, approximately 0.110 tons per day, resulting in an approximate \$254,000 cost savings per compliance year. Staff concluded that the potential impact of amended Rule 2002 on demand and supply of the NO<sub>x</sub> RTC market would be minimal, and large RTC price fluctuations were unlikely to occur as a result of the exit of these facilities out of the NO<sub>x</sub> RECLAIM program. Therefore, it was concluded that amended Rule 2002 would have minimal impacts on existing facilities that are not yet ready to exit the NO<sub>x</sub> RECLAIM program. The minimal cost impacts would result in minimal job impacts in the regional economy.

### **Amended Rule 1469 – Hexavalent Chromium Emissions from Chromium Electroplating and Chromic Acid Anodizing (November 2, 2018)**

Rule 1469 was amended to protect public health by minimizing exposure to hexavalent chromium emissions. Amended Rule 1469 requires the following: 1) installation of air pollution control equipment on hexavalent chromium containing tanks that emit or have the potential to emit hexavalent chromium that are currently not regulated; 2) periodic source testing and parametric monitoring of air pollution control equipment; 3) building enclosures with openings that do not exceed three and a half percent of the building envelope; 4) conditional criteria for installing Permanent Total Enclosures (PTE); 5) implementation of Best Management Practices (BMP) for all hexavalent chromium containing operations; and 6) re-certification of non-PFOS chemical fume suppressants due to potential toxicity concerns via an enhanced certification process conducted by South Coast AQMD and CARB. Amended Rule 1469 also prohibits the use of chemical fume suppressants that contain PFOS.

South Coast AQMD conducted a facility-based impact analysis in order to provide further information on the potential impacts of the proposed amendments to Rule 1469 for small businesses. This analysis measures the annual compliance cost a facility may incur under the proposed amendments relative to its annual revenues. Staff identified 115 facilities that either conduct decorative or hard chromium electroplating or chromic acid anodizing operations within South Coast AQMD's jurisdiction. The majority of the compliance costs, which range from \$2.64 million (low cost scenario) to \$4.30 (high cost scenario), is associated with the capital, installation, and operation and maintenance of air pollution control systems that are expected to be installed in order to comply with the rule's requirements. For 27 facilities that currently use chemical fume suppressants as the only method of air pollution control, a certified non-PFOS chemical fume

suppressant is expected to be available by 2021 which may be a lower cost compliance option because its use would allow a facility to forego the installation of an air pollution control system.

South Coast AQMD does not conduct a dollar per ton cost-effectiveness for risk-based rules which regulate toxic air contaminants (TACs) since other factors such as toxic potency, the location of receptors and the amount of air pollution can affect risk. Since Rule 1469 regulates a TAC, hexavalent chromium, a cost-effectiveness analysis is not required, and thus, was not conducted for this amendment.

Amended Rule 1469 is expected to result in 37 to 63 jobs foregone annually, on average, between 2019 and 2035 as a result of the compliance costs associated with the purchase, installation, and operation of air pollution control systems and the implementation of best management practices. The projected jobs loss impacts represent about 0.001% of the total employment in the four-county region.

### **Amended Rule 1135 – Emissions of Oxides of Nitrogen from Electricity Generating Facilities (November 2, 2018)**

Rule 1135 was amended to reduce NO<sub>x</sub> emissions from electricity generating facilities (EGF). Rule 1135 was the first command-and-control rule to be amended as part of the transition from the NO<sub>x</sub> RECLAIM program to a command-and-control regulatory structure. Amended Rule 1135 applies to RECLAIM and non-RECLAIM electricity generating facilities that own and operate electricity generating units (e.g., boilers, gas turbines with the exception of cogeneration turbines, and internal combustion engines on Santa Catalina Island) and are investor-owned electric utilities, publicly owned electric utilities, or have a generation capacity of at least 50 megawatts (MW) of electrical power. Amended Rule 1135 updates the NO<sub>x</sub> emission limits to reflect current Best Available Retrofit Control Technology (BARCT) according to required implementation timeframes.

Amended Rule 1135 establishes NO<sub>x</sub> and ammonia (NH<sub>3</sub>) emission limits for boilers and gas turbines and emission limits for NO<sub>x</sub>, NH<sub>3</sub>, carbon monoxide, volatile organic compounds, and particulate matter for internal combustion engines with the exception of emergency internal combustion engines. Additionally, amended Rule 1135 establishes additional requirements to conduct monitoring, reporting, and recordkeeping, and exemptions from specific provisions. The Final Socioeconomic Impact Assessment for amended Rule 1135 was conducted based on an original NO<sub>x</sub> emission reduction estimate of 1.9 tons per day by January 1, 2027, which did not include changes made to the Final Staff Report for Amended Rule 1135 which reflected an adjusted NO<sub>x</sub> emission reduction estimate to 1.7 tons per day. This discrepancy did not affect the cost-effectiveness calculations, as these were performed in the Final Staff Report.

There are 31 electricity generating facilities subject to amended Rule 1135. The electricity generating units at 28 of these facilities are not expected to require modifications to comply with amended Rule 1135 because the each electricity generating unit either: 1) currently meets the applicable revised NO<sub>x</sub> emission limit; 2) currently qualifies for an exemption from having to comply with the revised NO<sub>x</sub> emission limit because of the low-use provision; 3) has an existing, permitted NO<sub>x</sub> emission limit that is near the revised NO<sub>x</sub> emission limit such that the unit may qualify for an exemption from having to comply with the revised NO<sub>x</sub> emission limit because the

cost of potential equipment modifications would exceed a cost-effectiveness threshold of \$50,000 per ton of NOx reduced; or 4) is scheduled by facility operators to be either shut down or repowered due to other regulatory requirements not pertaining to amended Rule 1135.

The average annual compliance cost is expected to range from \$7.4 million to \$10.0 million depending on the real interest rate assumed (1% to 4%). The majority of the costs can be attributed to the installation of three natural gas turbines at a single facility, with a projected cost of \$7.2 million. Additional costs of SCR replacement, installation of five diesel internal combustion engines, and application fees for making permit modifications account for the remainder of the compliance costs that may be associated with amended Rule 1135.

The projected impact on employment is estimated to result in 104 to 154 jobs forgone, on average annually between 2019 and 2045. The projected job loss impacts represent 0.0009% to 0.0014% of total employment in the four-county region.

**Amended Rule 1146 - Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; Amended Rule 1146.1 - Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; Amended Rule 1146.2 - Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters; and Adopted Rule 1100 - Implementation Schedule for NOx Facilities (December 7, 2018)**

The amendments to Rules 1146, 1146.1 and 1146.2, referred to herein as the Rule 1146 series, were developed to continue the ongoing transition of equipment from the NOx RECLAIM program to a command-and-control regulatory structure while achieving Best Available Retrofit Control Technology (BARCT) to achieve NOx reductions. NOx reductions are expected to be achieved through BARCT retrofits using selective catalytic reduction (SCR) and ultra-low NOx burners (ULNB) in order to comply with the applicable NOx emission limits in the Rule 1146 series. In addition, South Coast AQMD staff has adopted new Rule 1100, an administrative rule, to establish the compliance schedule for facilities exiting the RECLAIM program.

In order to meet the applicable NOx emission limits, amended Rule 1146 may result in: 1) two facilities with Group I units to retrofit for three SCR units at an average cost of \$1.4 million (including installation and permitting for each unit), 2) 30 facilities with 52 Group II units to retrofit SCRs at an average cost of \$565,000 per unit; and 3) 36 facilities with 67 Group III units to install ULNBs at an average cost of \$134,000.

There are 824 non-RECLAIM facilities operating an estimated 1,075 non-RECLAIM units that are subject to amended Rule 1146. Further, there are 732 non-RECLAIM units subject to amended Rule 1146.1. With the exception of non-RECLAIM units using thermal fluid heaters, Group II and Group III units subject to amended Rule 1146 and all units subject to amended Rule 1146.1 are not required to meet the applicable NOx emission limits until either the burner is replaced or 15 years after rule adoption.

The average annual compliance cost associated with the Rule 1146 series is estimated at \$5.6 million to \$6.8 million between 2020 and 2045, depending on real interest rate assumed (1% to 4%). The majority of the costs are associated with the purchase and installation of SCR and ULNB

retrofits, and are estimated at an average annual cost of \$4.1 to \$5.4 million. Amended Rule 1146 Group II incurs the largest annual compliance cost due to the capital and recurring costs associated with SCRs.

An average of 57 to 72 jobs are estimated to be foregone annually between 2020 and 2045 as a result of the Rule 1146 series. This projected loss represents about 0.0021% of the total employment in the four-county region.

## **Rule Amendments without Socioeconomic Impacts**

### **Amended Rule 301 – Permitting and Associated Fees (January 5, 2018)**

In the amendments to Regulation III that were previously adopted in 2017, staff had inadvertently deleted the South Coast AQMD's authority to charge for the preparation of a notice for a project requiring notification as defined in Rule 212 (c). To restore South Coast AQMD's previously deleted authority, administrative changes were made to Rule 301. The administrative changes were concluded to not have no impacts to air quality or emission limitations such that adverse socioeconomic impacts would not be expected to occur and therefore, a socioeconomic impact assessment was not required.

### **Amended Rule 1178 – Further Reductions of VOC Emissions from Storage Tanks at Petroleum Facilities, and Amended Rule 219 – Equipment Not Requiring a Written Permit Pursuant to Regulation II (April 6, 2018)**

Amended Rule 1178 clarifies rule requirements and provides additional regulatory flexibility. Specifically, the amendments allow facilities to replace a pole float and float wiper/seal with a Flexible Enclosure System, which completely encloses the slotted guide-pole in floating roof tanks. The cost of installing a Flexible Enclosure System for a 48-foot tall tank is estimated at \$5,500 with an additional cost of \$2,200 for an optional transition box. Because the use of a Flexible Enclosure System is completely voluntary, no adverse socioeconomic impacts are expected to occur. Amended Rule 219 provides cost savings to affected facilities by not requiring permits for slotted guide-pole Flexible Enclosure Systems.

### **Amended Rule 408 – Circumvention (May 4, 2018)**

Amended Rule 408 clarifies the rule language and makes several revisions that are administrative in nature without imposing any additional costs to facilities or result in other socioeconomic impacts. Implementation of amended Rule 408 provides greater assurance that monitored air emissions are more representative of actual conditions by prohibiting alteration of normal operations or equipment to suppress emissions. Since amended Rule 408 does not require the installation of air pollution control equipment, require material formulations or process changes, or establish an emission limit or standard, the analysis concluded that the changes would not significantly affect air quality or emission limitations. Therefore, no socioeconomic impact assessment was required or conducted pursuant to Health and Safety Code Sections 40440.8 and 40728.5.

**Amended Rule 1111 – Reduction of NOx Emissions from Natural-Gas-Fired, Fan-Type Central Furnaces (March 2, 2018 and July 6, 2018)**

Rule 1111 was amended twice in 2018, and the provisions affected manufacturers of gas-fired fan-type furnaces. At the March 2, 2018 Public Hearing which adopted amendments to Rule 1111 that reduced the NOx emission limits from natural-gas-fired fan-type furnaces, the Governing Board directed staff to develop additional labeling requirements. None of the furnace manufacturers are located within the four-county jurisdiction of South Coast AQMD, but potential downstream businesses, such as wholesalers, retailers, and contractors who install or repair these furnaces, could be affected by the March 2018 amendments. Under the March 2018 version of amended Rule 1111, an extended alternative compliance option is allowed if a mitigation fee is paid, and the original equipment manufacturers (OEM) would benefit from the rebate program that could lower the overall price of their product and increase demand. Therefore, staff determined that no adverse socioeconomic impacts would result from the reducing NOx emissions in accordance with the March 2018 version of amended Rule 1111.

In response to Governing Board direction at the March 2, 2018 Public Hearing, the July 6, 2018 amendments to Rule 1111 added consumer notification requirements for informational materials, including marketing brochures, technical specification sheets, and manufacturers' websites, for furnaces that are not certified to meet the 14 ng/J NOx emission limit and are participating in the alternate compliance option. The July 2018 amendments to Rule 1111 were concluded to be administrative in nature. Further, because the cost impacts to manufacturers were expected to be minimal, no significant adverse socioeconomic impacts were expected to result. Further, the July 2018 amendments to Rule 1111 do not require manufacturers to generate additional brochures or specification sheets. Instead, the necessary information is required to be added to brochures, technical specification sheets, and each manufacturer's website(s), which are already created, maintained, and distributed. In addition, the analysis concluded that the July 2018 amendments to Rule 1111 would not significantly affect air quality and emission limitations. Therefore, no socioeconomic impact assessment was required under Health and Safety Codes Sections 40440.8 and 40728.5.

**Amended Rule 2001 – Applicability, & Amended Rule 2002– Allocations for Oxides Of Nitrogen (NOx) and Oxides of Sulfur (SOx) (October 5, 2018)**

The October 2018 amendments to Rule 2001 and Rule 2002 are administrative in nature and do not impose new or more stringent emission limits or standards, and therefore do not directly result in additional economic costs to RECLAIM facilities. However, as subsequent command-and-control rules are amended to address future BARCT limits, facilities will likely incur potentially significant economic costs, as these facilities must comply with these new BARCT requirements.

Given the uncertainty regarding new BARCT requirements for subsequent command-and-control rules affecting transitioning RECLAIM facilities, it is speculative to estimate the economic costs associated with these future rule amendments. In 2018, four rules were amended that specifically applied to facilities transitioning out of the NOx RECLAIM program and that included BARCT requirements and projected economic impacts: 1) Amended Rules 1146, 1146.1, and 1146.2 in December 2018 for boilers, process heaters, steam generator and large water heaters; 2) Amended Rule 1135 in 2018 for electricity generating facilities. Socioeconomic assessments were prepared for these rule amendments.

As more command-and-control rules are adopted/amended to accommodate additional groups of facilities exiting the RECLAIM program, the total economic costs to all facilities exiting RECLAIM (and macroeconomic impacts to the South Coast Air Basin) will become clearer. At this point in the RECLAIM transition, however, it would be speculative to assume what the new BARCT requirements and projected economic impacts will be, as most BARCT assessments have not yet been conducted.

### **Other Projects without Socioeconomic Impacts**

#### **Amended Best Available Control Technology (BACT) Guidelines (February 2, 2018)**

Amendments to the BACT Guidelines were adopted to maintain consistency with recent changes to South Coast AQMD rules and state requirements. The amended BACT Guidelines were updated to reflect achieved-in-practice emission control equipment and/or processes and include other administrative changes which were concluded to not result in more stringent requirements than would otherwise occur and would not result in any significant socioeconomic impacts. Therefore, a socioeconomic impact assessment was not required.

#### **Amended 1-Hour Ozone Standard Attainment Demonstration (November 2, 2018)**

In order to demonstrate attainment with the 1-hour ozone standard by 2022, the attainment demonstration for the federal 1979 1-hour ozone standard that was included in the 2016 AQMP was updated by: 1) making the emissions inventory consistent with final emissions inventory used for the attainment demonstrations of the 8-hour ozone and PM<sub>2.5</sub> standards in the 2016 AQMP; 2) revising the air quality modeling; and 3) revising the attainment strategy for meeting the 1-hour ozone standard by removing emission reductions from CARB's SIP strategies, including federal Clean Air Section 182(e)(5) measures ("black box" measures) since they are no longer needed to demonstrate attainment with the 1-hour ozone standard. Since this project was not a rule and the update did not add or delete control measures from the previously adopted 2016 AQMP, the analysis concluded that the changes would not significantly affect air quality or emission limitations. Therefore, no socioeconomic impact assessment was required or conducted pursuant to Health and Safety Code Sections 40440.8 and 40728.5. In addition, because the amended 1-hour ozone standard attainment demonstration did not change the control measures that will be implemented, no socioeconomic impacts would occur.

### **Existing Rules/Regulation with Ongoing Socioeconomic Impacts**

#### **Amended Regulation III – Fees (May 4, 2018), and Ongoing Rule 320 - Automatic Adjustment Based on Consumer Price Index (CPI) for Regulation III Fees**

Pursuant to Rule 320, an across-the-board 3.4-percent increase in fee rates (equivalent to the change in the California CPI from December 2016 to December 2017) occurred on July 1, 2018. The fee increase is applicable to most fees occurring within Rules 301, 303, 304, 304.1, 306, 307.1, 308, 309, 311, 313, 314, and 315. The October 29, 2010 South Coast AQMD Governing Board Resolution annually requires, by March 15, an assessment of the increase in fee rates based on the previous year's CPI. Rule 320 does not affect air quality or emission limits and as such no socioeconomic and cost-effectiveness analyses are required. However, a socioeconomic assessment was conducted to assess the cost impacts of the fee increase and to provide background



information, such as historical trends of South Coast AQMD revenues from various fees and sectoral distributions of these fees.

Nearly all the facilities regulated by the South Coast AQMD would be affected by the proposed fee increases and these facilities belong to every sector of the economy. The fees examined included emissions fees, permit processing fees, annual permit renewal fees, toxic hot spot fees, source testing fees, and a portion of fees under Rule 2202 – On-Road Motor Vehicle Mitigation Options.

The across-the-board CPI-based fee rate increase would bring additional revenue totaling \$2.74 million to the South Coast AQMD. Based on the fee categories examined in the analysis, the manufacturing sector as a whole would experience the largest increase in fees (approximately \$1.20 million for about 3,700 facilities), followed by the services sector (approximately \$0.49 million for about 10,600 facilities) and the retail trade sector (approximately \$0.37 million for about 4,000 facilities). Within the manufacturing sector, the petroleum and coal products manufacturing industry, mostly comprised of refineries, will experience an increase of approximately \$0.51 million.

**CHAPTER II**  
**ENGINEERING AND PERMITTING ACTIVITIES**

## ENGINEERING AND PERMITTING

During CY 2018, South Coast AQMD dispositioned a total of 9,726 applications. The majority of these applications were for Permits to Operate (3,440), Area Sources & Certified/Registrations (1,556), and Changes of Operators (1,332). Also, 1,119 permits were not renewed. The total number of dispositioned applications for 2018 is about 7% lower than the total for 2017, mainly attributed to the South Coast AQMD's Permit Application Backlog Reduction efforts that peaked in 2017. This data, broken down into nine different categories, is summarized below in Table 1.

<b>TABLE - 1</b>	
<b>Permit Applications Completed During CY 2018</b>	
<b>Type</b>	<b>Count</b>
Permits to Construct	431
Permits to Operate	3,440*
Changes of Operator	1,322
Denials	19
Cancellations	577
ERCs	143
Plans	2,051
Title V/RECLAIM	187
Area Sources & Certified/Registrations	1,556
<b>Total</b>	<b>9,726</b>
<i>Permits Not Renewed</i>	1,119

\*This includes 2,190 applications for Permit to Construct that were issued as Permits to Construct/Operate

Table 2 contains a breakdown of permits dispositioned (in the nine categories) and permits not renewed, by type of industry. The type of industry was based on North American Industry Classification System (NAICS) codes, which were provided by the applicant at the time of application filing.

Table 2- Permits Dispositioned by NAICS Codes

Total Applications ----->		431	3440	1322	19	577	143	2051	187	1556	1119
NAICS code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	RECLAIM/TV	Area Source/Cert & Registration	Permit Not Renewed
111332	Grape Vineyards							7			
111422	Floriculture Production			2							
111920	Cotton Farming							1			
111998	All Other Miscellaneous Crop Farming	1	2			1		3			
112120	Dairy Cattle and Milk Production			2				1		2	
112990	All Other Animal Production		1	1				2		1	
115112	Soil Preparation, Planting, and Cultivating		1								
115114	Postharvest Crop Activities (except Cotton Ginning)					1					
115115	Farm Labor Contractors and Crew Leaders							2			
115210	Support Activities for Animal Production		3	3				1			
211110	Oil and Gas Extraction									5	
211111	Crude Petroleum and Natural Gas Extraction	6	36			12	4	5	4	12	6
211112	Natural Gas Liquid Extraction									9	
211120	#N/A							1			
212210	Iron Ore Mining		4								
212319	Other Crushed and Broken Stone Mining and Quarrying		3			1					
212321	Construction Sand and Gravel Mining		8			1					
212393	Other Chemical and Fertilizer Mineral Mining		1								
212399	All Other Nonmetallic Mineral Mining		2							2	
213112	Support Activities for Oil and Gas Operations		6	2						2	4
221111	Hydroelectric Power Generation							1			
221112	Fossil Fuel Electric Power Generation	4	48	2		3		4	9	3	2

Table 2- Permits Dispositioned by NAICS Codes

Total Applications ----->		431	3440	1322	19	577	143	2051	187	1556	1119
NAICS code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	RECLAIM/TV	Area Source/Cert & Registration	Permit Not Renewed
221117	Biomass Electric Power Generation								1		
221118	Other Electric Power Generation	4	10	3		4		10	4		1
221122	Electric Power Distribution							1		1	
221210	Natural Gas Distribution		7					1	2	2	
221310	Water Supply and Irrigation Systems	3	37	1		1		23		16	
221320	Sewage Treatment Facilities	2	26			7		15	1	4	
221330	Steam and Air-Conditioning Supply		4					5			
230000	Construction										1
236115	New Single-Family Housing Construction (except For-Sale Builders)		15	1		2		7		74	34
236116	New Multifamily Housing Construction (except For-Sale Builders)		2					8			1
236117	New Housing For-Sale Builders		5								
236118	Residential Remodelers									2	
236210	Industrial Building Construction							1		13	2
236220	Commercial and Institutional Building Construction		32					4		6	1
237110	Water and Sewer Line and Related Structures Construction		4					2	1	2	1
237120	Oil and Gas Pipeline and Related Structures Construction										2
237210	Land Subdivision	1	3					14		2	3
237310	Highway, Street, and Bridge Construction		2				8			3	1
237990	Other Heavy and Civil Engineering Construction		2								1
238110	Poured Concrete Foundation and Structure Contractors		10	3		1		2			
238130	Framing Contractors							1			1
238140	Masonry Contractors		3					1			2

Table 2- Permits Dispositioned by NAICS Codes

<b>Total Applications -----&gt;</b>		<b>431</b>	<b>3440</b>	<b>1322</b>	<b>19</b>	<b>577</b>	<b>143</b>	<b>2051</b>	<b>187</b>	<b>1556</b>	<b>1119</b>
NAICS code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	RECLAIM/TV	Area Source/Cert & Registration	Permit Not Renewed
238160	Roofing Contractors					1				20	2
238210	Electrical Contractors and Other Wiring Installation Contractors	1	9			3		3		12	2
238220	Plumbing, Heating, and Air-Conditioning Contractors	1	2					8			1
238310	Drywall and Insulation Contractors					1				8	23
238320	Painting and Wall Covering Contractors		3	1							11
238340	Tile and Terrazzo Contractors		3								
238350	Finish Carpentry Contractors			1							3
238390	Other Building Finishing Contractors					2					
238910	Site Preparation Contractors							3		64	16
238990	All Other Specialty Trade Contractors		29	32		1		6		99	116
311111	Dog and Cat Food Manufacturing		1			2			1		1
311211	Flour Milling	5									
311224	Soybean and Other Oilseed Processing							3			
311351	Chocolate and Confectionery Manufacturing from Cacao Beans		2								
311412	Frozen Specialty Food Manufacturing		4			3		3			1
311421	Fruit and Vegetable Canning		2								
311422	Specialty Canning		4					1		2	
311511	Fluid Milk Manufacturing		11								
311513	Cheese Manufacturing							1			
311514	Dry, Condensed, and Evaporated Dairy Product Manufacturing							1			
311611	Animal (except Poultry) Slaughtering		4	75		7		1	2	3	
311612	Meat Processed from Carcasses	4	1			2		5		1	

Table 2- Permits Dispositioned by NAICS Codes

Total Applications ----->		431	3440	1322	19	577	143	2051	187	1556	1119
NAICS code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	RECLAIM/TV	Area Source/Cert & Registration	Permit Not Renewed
311613	Rendering and Meat Byproduct Processing		14						2	2	
311710	Seafood Product Preparation and Packaging		7								
311811	Retail Bakeries									1	
311812	Commercial Bakeries	2	2				13	1	1		
311821	Cookie and Cracker Manufacturing		3			3					
311824	Dry Pasta, Dough, and Flour Mixes Manufacturing from Purchased Flour	1	1			3					
311830	Tortilla Manufacturing		9			9		1		5	
311911	Roasted Nuts and Peanut Butter Manufacturing					1		1			
311919	Other Snack Food Manufacturing	10	7					1	1		
311920	Coffee and Tea Manufacturing		11					1			
311930	Flavoring Syrup and Concentrate Manufacturing	1	19						1		
311941	Mayonnaise, Dressing, and Other Prepared Sauce Manufacturing		2								
311942	Spice and Extract Manufacturing		18			2					
311999	All Other Miscellaneous Food Manufacturing		7	1				2		3	4
312111	Soft Drink Manufacturing		4	3				1			
312112	Bottled Water Manufacturing		2								
312120	Breweries		3			1		1	3	12	
312140	Distilleries		3				1				
313210	Broadwoven Fabric Mills	2	8	2					2		
313240	Knit Fabric Mills		2								
313310	Textile and Fabric Finishing Mills	7	20			3			4		
313320	Fabric Coating Mills	2	3	4							
314110	Carpet and Rug Mills		1			1					

Table 2- Permits Dispositioned by NAICS Codes

Total Applications ----->		431	3440	1322	19	577	143	2051	187	1556	1119
NAICS code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	RECLAIM/TV	Area Source/Cert & Registration	Permit Not Renewed
314999	All Other Miscellaneous Textile Product Mills		3			1					
315190	Other Apparel Knitting Mills										1
315220	Men's and Boys' Cut and Sew Apparel Manufacturing		1								
315990	Apparel Accessories and Other Apparel Manufacturing									2	
316998	All Other Leather Good and Allied Product Manufacturing										1
321211	Hardwood Veneer and Plywood Manufacturing		1								5
321911	Wood Window and Door Manufacturing					1		1			
321918	Other Millwork (including Flooring)		1							1	
321991	Manufactured Home (Mobile Home) Manufacturing		3								
321999	All Other Miscellaneous Wood Product Manufacturing										1
322110	Pulp Mills			2		1		1			
322121	Paper (except Newsprint) Mills	5	2						1		
322130	Paperboard Mills	2	6			1			3		
322211	Corrugated and Solid Fiber Box Manufacturing		10	7					1	2	
322212	Folding Paperboard Box Manufacturing		1					2			
322220	Paper Bag and Coated and Treated Paper Manufacturing	1	1						1	1	
322291	Sanitary Paper Product Manufacturing		2								
323111	Commercial Printing (except Screen and Books)		23			5	1	3		1	6
323113	Commercial Screen Printing		1								
324110	Petroleum Refineries	27	66	224		58	7	25	38	14	4



Table 2- Permits Dispositioned by NAICS Codes

<b>Total Applications -----&gt;</b>		<b>431</b>	<b>3440</b>	<b>1322</b>	<b>19</b>	<b>577</b>	<b>143</b>	<b>2051</b>	<b>187</b>	<b>1556</b>	<b>1119</b>
NAICS code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	RECLAIM/TV	Area Source/Cert & Registration	Permit Not Renewed
324121	Asphalt Paving Mixture and Block Manufacturing		25			50	2		1		
324122	Asphalt Shingle and Coating Materials Manufacturing	3	24					2	5	2	
324191	Petroleum Lubricating Oil and Grease Manufacturing	7	13					1	4		
325110	Petrochemical Manufacturing		1			1		4			1
325120	Industrial Gas Manufacturing	2	2						3		1
325130	Synthetic Dye and Pigment Manufacturing		8	52		1					
325180	Other Basic Inorganic Chemical Manufacturing		17	13					1	1	
325199	All Other Basic Organic Chemical Manufacturing		2							1	
325211	Plastics Material and Resin Manufacturing	1	15				1	2	4	2	
325212	Synthetic Rubber Manufacturing		6	68				2	1	6	
325311	Nitrogenous Fertilizer Manufacturing		1	2							1
325411	Medicinal and Botanical Manufacturing		1			1		5	1		
325412	Pharmaceutical Preparation Manufacturing	2	16			4	3	7	2		3
325414	Biological Product (except Diagnostic) Manufacturing							2		6	
325510	Paint and Coating Manufacturing	21	7			7				1	9
325520	Adhesive Manufacturing		6			1					
325612	Polish and Other Sanitation Good Manufacturing		7								
325620	Toilet Preparation Manufacturing		11	1		1				2	15
325992	Photographic Film, Paper, Plate, and Chemical Manufacturing		2								
325998	All Other Miscellaneous Chemical Product and Preparation Manufacturing		16			1			1		

Table 2- Permits Dispositioned by NAICS Codes

Total Applications ----->		431	3440	1322	19	577	143	2051	187	1556	1119
NAICS code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	RECLAIM/TV	Area Source/Cert & Registration	Permit Not Renewed
326111	Plastics Bag and Pouch Manufacturing	2	3								
326112	Plastics Packaging Film and Sheet (including Laminated) Manufacturing	3	3			1		3	2		
326113	Unlaminated Plastics Film and Sheet (except Packaging) Manufacturing	2	7								
326121	Unlaminated Plastics Profile Shape Manufacturing		8			3					
326130	Laminated Plastics Plate, Sheet (except Packaging), and Shape Manufacturing		1					3			
326140	Polystyrene Foam Product Manufacturing		1					1		6	
326150	Urethane and Other Foam Product (except Polystyrene) Manufacturing		1			3				3	
326160	Plastics Bottle Manufacturing		2								
326191	Plastics Plumbing Fixture Manufacturing		1					1	1		3
326199	All Other Plastics Product Manufacturing	1	60			6	15	2		1	5
326211	Tire Manufacturing (except Retreading)	1									
326212	Tire Retreading		2	5							
326291	Rubber Product Manufacturing for Mechanical Use		8			1					
326299	All Other Rubber Product Manufacturing	3	5			2		1		1	
327120	Clay Building Material and Refractories Manufacturing	5	2						2		
327213	Glass Container Manufacturing		8			4		1	3	1	
327215	Glass Product Manufacturing Made of Purchased Glass		3								
327310	Cement Manufacturing						16	1			

Table 2- Permits Dispositioned by NAICS Codes

Total Applications ----->		431	3440	1322	19	577	143	2051	187	1556	1119
NAICS code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	RECLAIM/TV	Area Source/Cert & Registration	Permit Not Renewed
327320	Ready-Mix Concrete Manufacturing		37			4					5
327331	Concrete Block and Brick Manufacturing		1							1	2
327390	Other Concrete Product Manufacturing		9	9						2	
327420	Gypsum Product Manufacturing		1						1		
327910	Abrasive Product Manufacturing										6
327991	Cut Stone and Stone Product Manufacturing		2								
327999	All Other Miscellaneous Nonmetallic Mineral Product Manufacturing		7								10
331110	Iron and Steel Mills and Ferroalloy Manufacturing	2	3			2		1	3		
331210	Iron and Steel Pipe and Tube Manufacturing from Purchased Steel		9			2		1		2	
331221	Rolled Steel Shape Manufacturing	2	2								
331222	Steel Wire Drawing	2	6						3		
331313	Alumina Refining and Primary Aluminum Production									1	
331315	Aluminum Sheet, Plate, and Foil Manufacturing		9						1	7	
331318	Other Aluminum Rolling, Drawing, and Extruding		3	10				1	4	6	
331420	Copper Rolling, Drawing, Extruding, and Alloying		2			3					
331491	Nonferrous Metal (except Copper and Aluminum) Rolling, Drawing, and Extruding		7	14							
331492	Secondary Smelting, Refining, and Alloying of Nonferrous Metal (except Copper and Aluminum)	5	3			3			3		
331512	Steel Investment Foundries		9					1		2	
331513	Steel Foundries (except Investment)		1			1					

Table 2- Permits Dispositioned by NAICS Codes

Total Applications ----->		431	3440	1322	19	577	143	2051	187	1556	1119
NAICS code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	RECLAIM/TV	Area Source/Cert & Registration	Permit Not Renewed
331523	Nonferrous Metal Die-Casting Foundries		2							2	1
331524	Aluminum Foundries (except Die-Casting)		3								3
331529	Other Nonferrous Metal Foundries (except Die-Casting)		1								
332111	Iron and Steel Forging	5	9						2		
332112	Nonferrous Forging	15	14			17			6	5	
332114	Custom Roll Forming								1		
332215	Metal Kitchen Cookware, Utensil, Cutlery, and Flatware (except Precious) Manufacturing		1								
332216	Saw Blade and Handtool Manufacturing		5								2
332311	Prefabricated Metal Building and Component Manufacturing		2								
332312	Fabricated Structural Metal Manufacturing							2			2
332313	Plate Work Manufacturing		1								
332321	Metal Window and Door Manufacturing		4								
332322	Sheet Metal Work Manufacturing	1	24			2					
332323	Ornamental and Architectural Metal Work Manufacturing										4
332410	Power Boiler and Heat Exchanger Manufacturing							1			
332420	Metal Tank (Heavy Gauge) Manufacturing		1								
332431	Metal Can Manufacturing		2					2	1	2	
332439	Other Metal Container Manufacturing		2					1			
332510	Hardware Manufacturing		2								1
332613	Spring Manufacturing		2								
332710	Machine Shops	1	3							1	1

Table 2- Permits Dispositioned by NAICS Codes

<b>Total Applications -----&gt;</b>		<b>431</b>	<b>3440</b>	<b>1322</b>	<b>19</b>	<b>577</b>	<b>143</b>	<b>2051</b>	<b>187</b>	<b>1556</b>	<b>1119</b>
NAICS code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	RECLAIM/TV	Area Source/Cert & Registration	Permit Not Renewed
332721	Precision Turned Product Manufacturing		2					1			
332722	Bolt, Nut, Screw, Rivet, and Washer Manufacturing		10			1				3	
332811	Metal Heat Treating	7	12						1		1
332812	Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers	4	30	5		2		1	2		2
332813	Electroplating, Plating, Polishing, Anodizing, and Coloring	9	55	4		12		6		3	34
332912	Fluid Power Valve and Hose Fitting Manufacturing		1								
332913	Plumbing Fixture Fitting and Trim Manufacturing	2	5								
332919	Other Metal Valve and Pipe Fitting Manufacturing									2	
332996	Fabricated Pipe and Pipe Fitting Manufacturing		7			4		1	2		
332999	All Other Miscellaneous Fabricated Metal Product Manufacturing	2	9								
333111	Farm Machinery and Equipment Manufacturing		5								
333120	Construction Machinery Manufacturing		4						1		
333132	Oil and Gas Field Machinery and Equipment Manufacturing		1			1					
333241	Food Product Machinery Manufacturing							1			
333314	Optical Instrument and Lens Manufacturing		3								2
333318	Other Commercial and Service Industry Machinery Manufacturing		6	1				1			1
333414	Heating Equipment (except Warm Air Furnaces) Manufacturing		2			1					1
333415	Air-Conditioning and Warm Air Heating Equipment and Commercial		6					9			

Table 2- Permits Dispositioned by NAICS Codes

Total Applications ----->		431	3440	1322	19	577	143	2051	187	1556	1119
NAICS code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	RECLAIM/TV	Area Source/Cert & Registration	Permit Not Renewed
	and Industrial Refrigeration Equipme										
333511	Industrial Mold Manufacturing					1					
333514	Special Die and Tool, Die Set, Jig, and Fixture Manufacturing		1			1					
333517	Machine Tool Manufacturing		2								
333612	Speed Changer, Industrial High-Speed Drive, and Gear Manufacturing					1					
333618	Other Engine Equipment Manufacturing		4	8		1					
333911	Pump and Pumping Equipment Manufacturing		3								
333912	Air and Gas Compressor Manufacturing		7								
333924	Industrial Truck, Tractor, Trailer, and Stacker Machinery Manufacturing	9						1			
333992	Welding and Soldering Equipment Manufacturing										1
333999	All Other Miscellaneous General Purpose Machinery Manufacturing		1							2	
334111	Electronic Computer Manufacturing		1								
334112	Computer Storage Device Manufacturing										2
334118	Computer Terminal and Other Computer Peripheral Equipment Manufacturing		1							1	
334220	Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing	1	3					9			
334290	Other Communications Equipment Manufacturing										1
334310	Audio and Video Equipment Manufacturing		1								

Table 2- Permits Dispositioned by NAICS Codes

Total Applications ----->		431	3440	1322	19	577	143	2051	187	1556	1119
NAICS code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	RECLAIM/TV	Area Source/Cert & Registration	Permit Not Renewed
334413	Semiconductor and Related Device Manufacturing		14			2		1			5
334416	Capacitor, Resistor, Coil, Transformer, and Other Inductor Manufacturing					1					
334417	Electronic Connector Manufacturing	2									
334418	Printed Circuit Assembly (Electronic Assembly) Manufacturing		7			1		2			1
334419	Other Electronic Component Manufacturing		14	2							1
334510	Electromedical and Electrotherapeutic Apparatus Manufacturing		2			5		4			
334511	Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System and Instrument Manufactu										1
334512	Automatic Environmental Control Manufacturing for Residential, Commercial, and Appliance Use										1
334513	Instruments and Related Products Manufacturing for Measuring, Displaying, and Controlling Industria		3	2						1	
334514	Totalizing Fluid Meter and Counting Device Manufacturing		1								3
334515	Instrument Manufacturing for Measuring and Testing Electricity and Electrical Signals					3		1		17	
334516	Analytical Laboratory Instrument Manufacturing		77			15		5			1
334614	Software and Other Prerecorded Compact Disc, Tape, and Record Reproducing							1			1

Table 2- Permits Dispositioned by NAICS Codes

Total Applications ----->		431	3440	1322	19	577	143	2051	187	1556	1119
NAICS code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	RECLAIM/TV	Area Source/Cert & Registration	Permit Not Renewed
335121	Residential Electric Lighting Fixture Manufacturing		5			1					
335122	Commercial, Industrial, and Institutional Electric Lighting Fixture Manufacturing		2								
335129	Other Lighting Equipment Manufacturing										1
335220	#N/A		1								
335311	Power, Distribution, and Specialty Transformer Manufacturing			9							
335312	Motor and Generator Manufacturing		2								
335313	Switchgear and Switchboard Apparatus Manufacturing		3								
335911	Storage Battery Manufacturing	13	15		1	6		2			
335931	Current-Carrying Wiring Device Manufacturing							1			
335991	Carbon and Graphite Product Manufacturing								1		
335999	All Other Miscellaneous Electrical Equipment and Component Manufacturing		1	1						1	
336111	Automobile Manufacturing		2								2
336211	Motor Vehicle Body Manufacturing		9								2
336320	Motor Vehicle Electrical and Electronic Equipment Manufacturing	1									
336350	Motor Vehicle Transmission and Power Train Parts Manufacturing									1	
336390	Other Motor Vehicle Parts Manufacturing	5	17			3		12	1		
336411	Aircraft Manufacturing	5	12	1		4		8	3	4	
336412	Aircraft Engine and Engine Parts Manufacturing	3	2			2		3	2		1



Table 2- Permits Dispositioned by NAICS Codes

Total Applications ----->		431	3440	1322	19	577	143	2051	187	1556	1119
NAICS code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	RECLAIM/TV	Area Source/Cert & Registration	Permit Not Renewed
336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing	2	15	1		3		5			
336414	Guided Missile and Space Vehicle Manufacturing	7	10								
336419	Other Guided Missile and Space Vehicle Parts and Auxiliary Equipment Manufacturing						1	1		1	
337110	Wood Kitchen Cabinet and Countertop Manufacturing		4	11				1			2
337121	Upholstered Household Furniture Manufacturing		3								1
337122	Nonupholstered Wood Household Furniture Manufacturing		3	4		1		1			1
337124	Metal Household Furniture Manufacturing										5
337125	Household Furniture (except Wood and Metal) Manufacturing			1							
337127	Institutional Furniture Manufacturing		7					1			
337211	Wood Office Furniture Manufacturing										3
337212	Custom Architectural Woodwork and Millwork Manufacturing		3								1
337214	Office Furniture (except Wood) Manufacturing					1				1	1
337215	Showcase, Partition, Shelving, and Locker Manufacturing		1								
339112	Surgical and Medical Instrument Manufacturing		8					5		1	
339113	Surgical Appliance and Supplies Manufacturing			3						1	
339114	Dental Equipment and Supplies Manufacturing		8			4				3	
339115	Ophthalmic Goods Manufacturing	3	31			1					
339910	Jewelry and Silverware Manufacturing			1				1			

Table 2- Permits Dispositioned by NAICS Codes

Total Applications ----->		431	3440	1322	19	577	143	2051	187	1556	1119
NAICS code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	RECLAIM/TV	Area Source/Cert & Registration	Permit Not Renewed
339920	Sporting and Athletic Goods Manufacturing		1								1
339950	Sign Manufacturing		6								
339991	Gasket, Packing, and Sealing Device Manufacturing		3							1	
339992	Musical Instrument Manufacturing	1	1			1		1			
339999	All Other Miscellaneous Manufacturing		7								2
423110	Automobile and Other Motor Vehicle Merchant Wholesalers		3			1					
423120	Motor Vehicle Supplies and New Parts Merchant Wholesalers		5	1				1		2	4
423130	Tire and Tube Merchant Wholesalers							1			
423140	Motor Vehicle Parts (Used) Merchant Wholesalers		2								
423210	Furniture Merchant Wholesalers		3					1		1	5
423310	Lumber, Plywood, Millwork, and Wood Panel Merchant Wholesalers		5	1							1
423320	Brick, Stone, and Related Construction Material Merchant Wholesalers		21	6	2	3	2			2	
423390	Other Construction Material Merchant Wholesalers									1	
423410	Photographic Equipment and Supplies Merchant Wholesalers							1			
423430	Computer and Computer Peripheral Equipment and Software Merchant Wholesalers	1	5					1			1
423440	Other Commercial Equipment Merchant Wholesalers		2								
423450	Medical, Dental, and Hospital Equipment and Supplies Merchant Wholesalers	1	2					1			
423490	Other Professional Equipment and Supplies Merchant Wholesalers							1			

Table 2- Permits Dispositioned by NAICS Codes

Total Applications ----->		431	3440	1322	19	577	143	2051	187	1556	1119
NAICS code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	RECLAIM/TV	Area Source/Cert & Registration	Permit Not Renewed
423510	Metal Service Centers and Other Metal Merchant Wholesalers		7			4					2
423520	Coal and Other Mineral and Ore Merchant Wholesalers							1			
423610	Electrical Apparatus and Equipment, Wiring Supplies, and Related Equipment Merchant Wholesalers		3					1			
423620	Household Appliances, Electric Housewares, and Consumer Electronics Merchant Wholesalers										3
423690	Other Electronic Parts and Equipment Merchant Wholesalers							3			
423710	Hardware Merchant Wholesalers		1	1						1	
423720	Plumbing and Heating Equipment and Supplies (Hydronics) Merchant Wholesalers									15	
423730	Warm Air Heating and Air-Conditioning Equipment and Supplies Merchant Wholesalers							1			
423810	Construction and Mining (except Oil Well) Machinery and Equipment Merchant Wholesalers		3			1		1		3	
423820	Farm and Garden Machinery and Equipment Merchant Wholesalers										1
423830	Industrial Machinery and Equipment Merchant Wholesalers		4	3		2		2	1	5	3
423840	Industrial Supplies Merchant Wholesalers		1	19						1	4
423850	Service Establishment Equipment and Supplies Merchant Wholesalers		2							1	
423860	Transportation Equipment and Supplies (except Motor Vehicle) Merchant Wholesalers		3			3		1			
423910	Sporting and Recreational Goods and Supplies Merchant Wholesalers		2								

Table 2- Permits Dispositioned by NAICS Codes

Total Applications ----->		431	3440	1322	19	577	143	2051	187	1556	1119
NAICS code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	RECLAIM/TV	Area Source/Cert & Registration	Permit Not Renewed
423920	Toy and Hobby Goods and Supplies Merchant Wholesalers							3			1
423930	Recyclable Material Merchant Wholesalers	3	29			3		10			2
423940	Jewelry, Watch, Precious Stone, and Precious Metal Merchant Wholesalers									1	
423990	Other Miscellaneous Durable Goods Merchant Wholesalers		2	2		10		2			6
424210	Drugs and Druggists' Sundries Merchant Wholesalers		16								
424310	Piece Goods, Notions, and Other Dry Goods Merchant Wholesalers							1			
424320	Men's and Boys' Clothing and Furnishings Merchant Wholesalers		5					1			
424340	Footwear Merchant Wholesalers			2				2			1
424410	General Line Grocery Merchant Wholesalers	2	5					3			
424420	Packaged Frozen Food Merchant Wholesalers		1					1			
424450	Confectionery Merchant Wholesalers		1								
424470	Meat and Meat Product Merchant Wholesalers	2	1								
424480	Fresh Fruit and Vegetable Merchant Wholesalers							3			
424490	Other Grocery and Related Products Merchant Wholesalers		6					1			
424690	Other Chemical and Allied Products Merchant Wholesalers		11								3
424710	Petroleum Bulk Stations and Terminals	5	17	1			4	4	3		
424720	Petroleum and Petroleum Products Merchant Wholesalers (except Bulk Stations and Terminals)	4	19	7				2			1
424810	Beer and Ale Merchant Wholesalers		14			2					

Table 2- Permits Dispositioned by NAICS Codes

Total Applications ----->		431	3440	1322	19	577	143	2051	187	1556	1119
NAICS code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	RECLAIM/TV	Area Source/Cert & Registration	Permit Not Renewed
424910	Farm Supplies Merchant Wholesalers		2								
424930	Flower, Nursery Stock, and Florists' Supplies Merchant Wholesalers		1								1
424950	Paint, Varnish, and Supplies Merchant Wholesalers		2								
424990	Other Miscellaneous Nondurable Goods Merchant Wholesalers		2	30		1			1	1	4
441110	New Car Dealers		11	1		1	1	3			3
441120	Used Car Dealers			3							1
441210	Recreational Vehicle Dealers		1								
441228	Motorcycle, ATV, and All Other Motor Vehicle Dealers		3								
441310	Automotive Parts and Accessories Stores		7	4				1		1	4
441320	Tire Dealers			6				1			2
442110	Furniture Stores		2	1				1		2	9
442299	All Other Home Furnishings Stores		2	1						1	2
443141	Household Appliance Stores							1			1
443142	Electronics Stores		4	1				8			
444110	Home Centers		5	4							4
444120	Paint and Wallpaper Stores		2	1							
444130	Hardware Stores		1			1					
444190	Other Building Material Dealers	10	4	1				1			4
444210	Outdoor Power Equipment Stores		1								
444220	Nursery, Garden Center, and Farm Supply Stores		10								
445110	Supermarkets and Other Grocery (except Convenience) Stores	1	30	3		9	1	335	1	11	4
445120	Convenience Stores	5	41	3		2		14		1	
445220	Fish and Seafood Markets									1	
445230	Fruit and Vegetable Markets										1

Table 2- Permits Dispositioned by NAICS Codes

Total Applications ----->		431	3440	1322	19	577	143	2051	187	1556	1119
NAICS code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	RECLAIM/TV	Area Source/Cert & Registration	Permit Not Renewed
445291	Baked Goods Stores									2	1
445299	All Other Specialty Food Stores		2				2	3		1	1
445310	Beer, Wine, and Liquor Stores		2							1	
446110	Pharmacies and Drug Stores					1		71		1	
446191	Food (Health) Supplement Stores			1				2			
446199	All Other Health and Personal Care Stores		2								
447100	Gasoline Stations										1
447110	Gasoline Stations with Convenience Stores	1	19						1	1	
447190	Other Gasoline Stations	22	204	42		4	2	6		1	7
448110	Men's Clothing Stores		1					2			
448120	Women's Clothing Stores										2
448140	Family Clothing Stores		1	1				4			1
448150	Clothing Accessories Stores							2			
448210	Shoe Stores							4			
448310	Jewelry Stores			4				1			
451110	Sporting Goods Stores			1							1
451120	Hobby, Toy, and Game Stores			1						1	1
452111	Department Stores (except Discount Department Stores)		2					30		7	4
452112	Discount Department Stores		1					17		41	
452210	#N/A			2				2		1	
452910	Warehouse Clubs and Supercenters		49			1	19	1		42	
452990	All Other General Merchandise Stores							22			
453110	Florists			1				3		1	3
453210	Office Supplies and Stationery Stores										1
453220	Gift, Novelty, and Souvenir Stores		4								

Table 2- Permits Dispositioned by NAICS Codes

Total Applications ----->		431	3440	1322	19	577	143	2051	187	1556	1119
NAICS code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	RECLAIM/TV	Area Source/Cert & Registration	Permit Not Renewed
453310	Used Merchandise Stores		10			3		1			
453910	Pet and Pet Supplies Stores		1								5
453998	All Other Miscellaneous Store Retailers (except Tobacco Stores)		7	5				12		25	3
454210	Vending Machine Operators										1
454310	Fuel Dealers	1	9								1
454390	Other Direct Selling Establishments		1	10				1		2	1
481111	Scheduled Passenger Air Transportation		2	1				2	1		
481112	Scheduled Freight Air Transportation	1	3								
481219	Other Nonscheduled Air Transportation		2								
482111	Line-Haul Railroads										1
483112	Deep Sea Passenger Transportation		2					1			
484110	General Freight Trucking, Local		18					2		5	10
484121	General Freight Trucking, Long-Distance, Truckload		4	1						2	
484230	Specialized Freight (except Used Goods) Trucking, Long-Distance							1			
485111	Mixed Mode Transit Systems		12					4		1	
485113	Bus and Other Motor Vehicle Transit Systems		2					4			
485210	Interurban and Rural Bus Transportation			1							
485310	Taxi Service							2		2	
485320	Limousine Service		1								
485410	School and Employee Bus Transportation		2					1			
485999	All Other Transit and Ground Passenger Transportation					1					
486110	Pipeline Transportation of Crude Oil		3			4			1		

Table 2- Permits Dispositioned by NAICS Codes

Total Applications ----->		431	3440	1322	19	577	143	2051	187	1556	1119
NAICS code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	RECLAIM/TV	Area Source/Cert & Registration	Permit Not Renewed
486210	Pipeline Transportation of Natural Gas	2	9			6		2	1		
487210	Scenic and Sightseeing Transportation, Water										1
487990	Scenic and Sightseeing Transportation, Other							1			
488111	Air Traffic Control		23			4			2		
488119	Other Airport Operations	2	10	7		2		3	3	1	
488190	Other Support Activities for Air Transportation		5	1				1	1		5
488210	Support Activities for Rail Transportation		1			2					1
488310	Port and Harbor Operations		1						1		
488320	Marine Cargo Handling		3								
488410	Motor Vehicle Towing										2
488490	Other Support Activities for Road Transportation		5								
488510	Freight Transportation Arrangement		3	4				1			
488999	All Other Support Activities for Transportation		2	2				4		2	4
491110	Postal Service							4			
492210	Local Messengers and Local Delivery		1								
493110	General Warehousing and Storage		5	2				8		7	4
493120	Refrigerated Warehousing and Storage		2								
493190	Other Warehousing and Storage		2				1	1			1
511110	Newspaper Publishers		1					1			
511120	Periodical Publishers			2							
511130	Book Publishers		1					1			
511210	Software Publishers		1	2				1			



Table 2- Permits Dispositioned by NAICS Codes

Total Applications ----->		431	3440	1322	19	577	143	2051	187	1556	1119
NAICS code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	RECLAIM/TV	Area Source/Cert & Registration	Permit Not Renewed
512110	Motion Picture and Video Production		6	3		30		19		1	2
512120	Motion Picture and Video Distribution		2								
512131	Motion Picture Theaters (except Drive-Ins)		1								
512191	Teleproduction and Other Postproduction Services	2	1			1					1
512240	Sound Recording Studios							1			
515111	Radio Networks		1	1							
515112	Radio Stations							1			
515120	Television Broadcasting			3	1			3			
515210	Cable and Other Subscription Programming		1					4			6
517110	Wired Telecommunications Carriers							11			1
517210	Wireless Telecommunications Carriers (except Satellite)	1	4		1			4		1	1
517311	#N/A	1		1						1	
517312	#N/A			1							
517911	Telecommunications Resellers		4	2				106			1
517919	All Other Telecommunications		2	4				3		1	1
518210	Data Processing, Hosting, and Related Services		1					3			
519120	Libraries and Archives		4					10		1	
521110	Monetary Authorities-Central Bank							4			
522110	Commercial Banking							6			4
522120	Savings Institutions							1	1		
522130	Credit Unions		1					4			
522220	Sales Financing										1
522293	International Trade Financing		1								

Table 2- Permits Dispositioned by NAICS Codes

Total Applications ----->		431	3440	1322	19	577	143	2051	187	1556	1119
NAICS code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	RECLAIM/TV	Area Source/Cert & Registration	Permit Not Renewed
522298	All Other Nondepository Credit Intermediation							1			
522310	Mortgage and Nonmortgage Loan Brokers			1				7		1	1
522320	Financial Transactions Processing, Reserve, and Clearinghouse Activities			1							
522390	Other Activities Related to Credit Intermediation		1					1			
523110	Investment Banking and Securities Dealing										1
523910	Miscellaneous Intermediation		4	3				3		1	4
523920	Portfolio Management			2				1		1	
523930	Investment Advice		1			1		6			
523991	Trust, Fiduciary, and Custody Activities		1	1							
524113	Direct Life Insurance Carriers							1			
524114	Direct Health and Medical Insurance Carriers		1	2				1			1
524126	Direct Property and Casualty Insurance Carriers			1				8			
524127	Direct Title Insurance Carriers		2								
524210	Insurance Agencies and Brokerages		1					1			
524298	All Other Insurance Related Activities									36	
525910	Open-End Investment Funds							1			
525920	Trusts, Estates, and Agency Accounts		1	2				4			
525990	Other Financial Vehicles			2				2			
531110	Lessors of Residential Buildings and Dwellings	1	21	5				8		2	4
531120	Lessors of Nonresidential Buildings (except Miniwarehouses)		2	6				24		2	2

Table 2- Permits Dispositioned by NAICS Codes

Total Applications ----->		431	3440	1322	19	577	143	2051	187	1556	1119
NAICS code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	RECLAIM/TV	Area Source/Cert & Registration	Permit Not Renewed
531130	Lessors of Miniwarehouses and Self-Storage Units	5							1		
531190	Lessors of Other Real Estate Property	5						2			1
531210	Offices of Real Estate Agents and Brokers		10	7		2		58		1	9
531311	Residential Property Managers		1					1			1
531312	Nonresidential Property Managers			1				8		2	
532111	Passenger Car Rental		1	1		1		1			1
532120	Truck, Utility Trailer, and RV (Recreational Vehicle) Rental and Leasing		2	2							2
532230	Video Tape and Disc Rental		2								
532289	#N/A			6							
532299	All Other Consumer Goods Rental							2			1
532411	Commercial Air, Rail, and Water Transportation Equipment Rental and Leasing		7					3			
532412	Construction, Mining, and Forestry Machinery and Equipment Rental and Leasing		1							14	2
532490	Other Commercial and Industrial Machinery and Equipment Rental and Leasing		5	6				1			
541110	Offices of Lawyers		2	6				7			1
541213	Tax Preparation Services						1			12	
541219	Other Accounting Services							2			
541310	Architectural Services							3		1	1
541330	Engineering Services	28	19	48		2		7		1	8
541380	Testing Laboratories		1					1		16	3
541410	Interior Design Services										9
541430	Graphic Design Services		6			1					

Table 2- Permits Dispositioned by NAICS Codes

Total Applications ----->		431	3440	1322	19	577	143	2051	187	1556	1119
NAICS code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	RECLAIM/TV	Area Source/Cert & Registration	Permit Not Renewed
541490	Other Specialized Design Services		10								
541511	Custom Computer Programming Services			2				3		1	2
541512	Computer Systems Design Services									1	
541611	Administrative Management and General Management Consulting Services	11	16	1		3		2	1	4	4
541613	Marketing Consulting Services		1	2			2			1	
541614	Process, Physical Distribution, and Logistics Consulting Services		1								
541618	Other Management Consulting Services		1					5		38	1
541620	Environmental Consulting Services		13	2		1		2		37	8
541690	Other Scientific and Technical Consulting Services		5			1				2	6
541711	Research and Development in Biotechnology		7			5					6
541712	Research and Development in the Physical, Engineering, and Life Sciences (except Biotechnology)		11					3		1	2
541715	#N/A							1			
541720	Research and Development in the Social Sciences and Humanities			1				3			
541810	Advertising Agencies							3			
541860	Direct Mail Advertising		1					4			
541890	Other Services Related to Advertising		1								1
541910	Marketing Research and Public Opinion Polling		3	1				3			
541921	Photography Studios, Portrait							1			1
541922	Commercial Photography		1								
541930	Translation and Interpretation Services							1			
541940	Veterinary Services	1	1							1	

Table 2- Permits Dispositioned by NAICS Codes

Total Applications ----->		431	3440	1322	19	577	143	2051	187	1556	1119
NAICS code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	RECLAIM/TV	Area Source/Cert & Registration	Permit Not Renewed
541990	All Other Professional, Scientific, and Technical Services		11	4		3	3	7		5	1
551111	Offices of Bank Holding Companies		1								
551112	Offices of Other Holding Companies		2	6				5			
561110	Office Administrative Services		5	3		2		11			4
561210	Facilities Support Services		29			2		4		77	
561311	Employment Placement Agencies		3					1			
561320	Temporary Help Services							1		1	
561421	Telephone Answering Services							3			
561499	All Other Business Support Services		43	6			1	16		6	17
561510	Travel Agencies		2	1							
561520	Tour Operators										1
561612	Security Guards and Patrol Services										1
561622	Locksmiths		1							1	1
561710	Exterminating and Pest Control Services							2			
561720	Janitorial Services		10	4				2		14	4
561730	Landscaping Services		5		1	5		1			2
561740	Carpet and Upholstery Cleaning Services			1							2
561790	Other Services to Buildings and Dwellings		6	4				2		1	2
561910	Packaging and Labeling Services		13			6		2			
561920	Convention and Trade Show Organizers			1							1
561990	All Other Support Services	8	20	8	1	17		10		15	23
562111	Solid Waste Collection		2					1			
562112	Hazardous Waste Collection							1			2

Table 2- Permits Dispositioned by NAICS Codes

Total Applications ----->		431	3440	1322	19	577	143	2051	187	1556	1119
NAICS code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	RECLAIM/TV	Area Source/Cert & Registration	Permit Not Renewed
562211	Hazardous Waste Treatment and Disposal	1	9	5						16	1
562212	Solid Waste Landfill		27		1	12	1	20	4	8	2
562219	Other Nonhazardous Waste Treatment and Disposal		6			4					
562910	Remediation Services		10							111	8
562920	Materials Recovery Facilities		16							1	2
562991	Septic Tank and Related Services									1	
562998	All Other Miscellaneous Waste Management Services		3								
611110	Elementary and Secondary Schools		15		1	1		146		27	11
611210	Junior Colleges		11					4	1	2	
611310	Colleges, Universities, and Professional Schools		13					55		17	1
611512	Flight Training		1								
611519	Other Technical and Trade Schools							2			
611620	Sports and Recreation Instruction	1									2
611699	All Other Miscellaneous Schools and Instruction		3					2			
611710	Educational Support Services							1			
621111	Offices of Physicians (except Mental Health Specialists)		8					11		36	4
621112	Offices of Physicians, Mental Health Specialists		1					4			1
621210	Offices of Dentists		2					5		3	
621310	Offices of Chiropractors							2			1
621320	Offices of Optometrists									1	
621340	Offices of Physical, Occupational and Speech Therapists, and Audiologists									1	
621399	Offices of All Other Miscellaneous Health Practitioners		1								

Table 2- Permits Dispositioned by NAICS Codes

<b>Total Applications -----&gt;</b>		<b>431</b>	<b>3440</b>	<b>1322</b>	<b>19</b>	<b>577</b>	<b>143</b>	<b>2051</b>	<b>187</b>	<b>1556</b>	<b>1119</b>
NAICS code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	RECLAIM/TV	Area Source/Cert & Registration	Permit Not Renewed
621410	Family Planning Centers							1			
621420	Outpatient Mental Health and Substance Abuse Centers							1		1	
621491	HMO Medical Centers		9					3	1		
621492	Kidney Dialysis Centers		2	2							1
621493	Freestanding Ambulatory Surgical and Emergency Centers			1				2			
621498	All Other Outpatient Care Centers									1	2
621511	Medical Laboratories		2					2			
621610	Home Health Care Services		6	1				1			
621991	Blood and Organ Banks		1					2			
621999	All Other Miscellaneous Ambulatory Health Care Services		1	1				5			1
622110	General Medical and Surgical Hospitals		30	5	2	2		53			2
622210	Psychiatric and Substance Abuse Hospitals		6					4		1	3
622310	Specialty (except Psychiatric and Substance Abuse) Hospitals							3			
623110	Nursing Care Facilities (Skilled Nursing Facilities)		8					2		4	1
623220	Residential Mental Health and Substance Abuse Facilities		1					2			
623311	Continuing Care Retirement Communities		3								
623312	Assisted Living Facilities for the Elderly							1			
623990	Other Residential Care Facilities		3					3			1
624110	Child and Youth Services		1							1	
624120	Services for the Elderly and Persons with Disabilities		2					2		1	2
624190	Other Individual and Family Services		2	1				4			
624310	Vocational Rehabilitation Services		2								

Table 2- Permits Dispositioned by NAICS Codes

Total Applications ----->		431	3440	1322	19	577	143	2051	187	1556	1119
NAICS code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	RECLAIM/TV	Area Source/Cert & Registration	Permit Not Renewed
624410	Child Day Care Services							3		1	
711130	Musical Groups and Artists			1							
711190	Other Performing Arts Companies		3	1				1			
711211	Sports Teams and Clubs										1
711219	Other Spectator Sports		2								
711310	Promoters of Performing Arts, Sports, and Similar Events with Facilities							2			
711410	Agents and Managers for Artists, Athletes, Entertainers, and Other Public Figures			3				4			
711510	Independent Artists, Writers, and Performers		2								6
712110	Museums		1					1		1	
713110	Amusement and Theme Parks	13	29			7		2	2	5	
713910	Golf Courses and Country Clubs		6	5				3		9	
713920	Skiing Facilities			2		1			1	5	
713940	Fitness and Recreational Sports Centers		2					8			2
713950	Bowling Centers										1
721110	Hotels (except Casino Hotels) and Motels		6	3	1			15		10	5
721214	Recreational and Vacation Camps (except Campgrounds)		2					1			
722320	Caterers		1							2	5
722330	Mobile Food Services									1	
722410	Drinking Places (Alcoholic Beverages)		2	1		1		3		2	5
722511	Full-Service Restaurants	3	10	6			2	13		69	47
722513	Limited-Service Restaurants	1	11	1		1		6		53	77
722514	Cafeterias, Grill Buffets, and Buffets									1	



Table 2- Permits Dispositioned by NAICS Codes

Total Applications ----->		431	3440	1322	19	577	143	2051	187	1556	1119
NAICS code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	RECLAIM/TV	Area Source/Cert & Registration	Permit Not Renewed
722515	Snack and Nonalcoholic Beverage Bars							1			
811111	General Automotive Repair		26	21		2		5		5	18
811112	Automotive Exhaust System Repair		1							1	
811113	Automotive Transmission Repair			1							
811118	Other Automotive Mechanical and Electrical Repair and Maintenance		14	2		1				1	
811121	Automotive Body, Paint, and Interior Repair and Maintenance	6	96	41	1	5		3		1	63
811122	Automotive Glass Replacement Shops		1								
811191	Automotive Oil Change and Lubrication Shops		1	1							
811192	Car Washes		8	5		1		1			2
811198	All Other Automotive Repair and Maintenance		6	2		3		1			3
811211	Consumer Electronics Repair and Maintenance		2	1							
811219	Other Electronic and Precision Equipment Repair and Maintenance		3								1
811310	Commercial and Industrial Machinery and Equipment (except Automotive and Electronic) Repair and Mai		14					3			4
811412	Appliance Repair and Maintenance	3	11	1	1			3		21	2
811420	Reupholstery and Furniture Repair		3					1			4
811430	Footwear and Leather Goods Repair							1			
811490	Other Personal and Household Goods Repair and Maintenance		3	1							2
812000	Personal and Laundry Services		1								
812112	Beauty Salons		2							1	
812113	Nail Salons									1	1
812199	Other Personal Care Services							1		1	

Table 2- Permits Dispositioned by NAICS Codes

Total Applications ----->		431	3440	1322	19	577	143	2051	187	1556	1119
NAICS code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	RECLAIM/TV	Area Source/Cert & Registration	Permit Not Renewed
812210	Funeral Homes and Funeral Services		9	1		3					
812220	Cemeteries and Crematories	2	10	1		1		8			
812300	Drycleaning and Laundry Services		1								
812310	Coin-Operated Laundries and Drycleaners					1					2
812320	Drycleaning and Laundry Services (except Coin-Operated)		45	22	2	1		5		1	49
812331	Linen Supply	2	3		1				1		
812332	Industrial Launderers					2		3			2
812910	Pet Care (except Veterinary) Services							1			
812921	Photofinishing Laboratories (except One-Hour)							1			
812930	Parking Lots and Garages		1					6			1
812990	All Other Personal Services		3			1		2			
813110	Religious Organizations		2					13		3	
813319	Other Social Advocacy Organizations		1					1		1	
813410	Civic and Social Organizations		2	2				12		1	7
813910	Business Associations		2					1			
813920	Professional Organizations							2			
813930	Labor Unions and Similar Labor Organizations							2			
813990	Other Similar Organizations (except Business, Professional, Labor, and Political Organizations)		2	1				2			5
921110	Executive Offices	1	12		1	1		17		12	5
921120	Legislative Bodies					1		3			
921130	Public Finance Activities		1								
921190	Other General Government Support		1					7		1	1
922110	Courts							17		1	

Table 2- Permits Dispositioned by NAICS Codes

Total Applications ----->		431	3440	1322	19	577	143	2051	187	1556	1119
NAICS code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	RECLAIM/TV	Area Source/Cert & Registration	Permit Not Renewed
922120	Police Protection		4					18			
922130	Legal Counsel and Prosecution							2			
922140	Correctional Institutions		2			2		1		5	
922150	Parole Offices and Probation Offices							8			
922160	Fire Protection		7					1		1	
922190	Other Justice, Public Order, and Safety Activities									1	
923110	Administration of Education Programs							3			
923120	Administration of Public Health Programs							2			
923130	Administration of Human Resource Programs (except Education, Public Health, and Veterans' Affairs P		1					2			1
924110	Administration of Air and Water Resource and Solid Waste Management Programs		11			2		7		13	1
924120	Administration of Conservation Programs		1								
925110	Administration of Housing Programs										1
926110	Administration of General Economic Programs							1			1
926120	Regulation and Administration of Transportation Programs		3			1					3
926130	Regulation and Administration of Communications, Electric, Gas, and Other Utilities							1		1	
927110	Space Research and Technology		2					2	1		
928110	National Security	1	5			1		4	3		2
999990	Undefined	17	131	222	1	11	37	49	1	71	22

## Attachment A

### Emission Reduction Credit (ERC) And Short Term Emission Reduction Credit (STERC) Transactions for Fiscal Year 2017-18<sup>2</sup> (California Health and Safety Code Section 40452)

Pursuant to paragraph (c) of section 40452 of the California Health and Safety Code, this report summarizes data on emission offset transactions and applications, by pollutant, during the previous fiscal year. Note that during Fiscal Year 2017-18, no applications were denied for a permit for a new source for the reason of failure to provide the required emission offsets.

Table 1 summarizes privately held Emission Reduction Credit (ERC) and Short Term Emission Reduction Credit (STERC) transactions for Fiscal Year 2017-18, including totals, by pollutant, of the number of emission offset transactions and the quantity of emission offsets transferred in units of pounds per day and tons per year. Table 2 summarizes ERC banking applications processed during Fiscal Year 2017-18, including the number of newly generated STERCs by pollutant in units of pounds per day and tons per year.

Tables 3 and 4 provide details on the amount of each emission offset transaction and processed ERC banking application, respectively.

**Table 1: Emission Offset Transactions – Fiscal Year 2017-18**

Criteria Pollutant	Number of Emission Offset Transfer Transactions <sup>3</sup>				Quantity of Emission Offsets Transferred <sup>4</sup> (lbs/day)				Annualized Quantity of Emission Offsets Transferred <sup>3</sup> (tons/year)			
	ERC	STERC <sup>5</sup>	STERC <sup>6</sup>	TOTAL	ERC	STERC <sup>4</sup>	STERC <sup>5</sup>	TOTAL	ERC	STERC <sup>4</sup>	STERC <sup>5</sup>	TOTAL
ROG	51	1	0	52	781	12	0	793	142.1	2.2	0	144.3
NOx	3	2	0	5	67	2	0	69	12.2	0.4	0	12.6
SOx	1	0	0	1	4	0	0	4	0.7	0	0	0.7
CO	3	0	0	3	82	0	0	82	14.9	0	0	14.9
PM10	9	14	0	23	34	56	0	90	6.1	10	0	16.1

**Table 2: Emission Offset Applications – Fiscal Year 2017-18**

Criteria Pollutant	Number of Banking Applications Resulting in the Issuance of New STERCs <sup>7</sup>	Quantity of Emission Reductions Achieved (STERCs) <sup>8</sup> (lbs/day)	Annualized Quantity of Emission Reductions Achieved <sup>7</sup> (tons/year)
ROG	1	37	6.8
NOx	0	0	0
SOx	0	0	0
CO	0	0	0
PM10	2	17	3.1

<sup>2</sup> This report does not include RECLAIM Trading Credit (RTC) transactions.

<sup>3</sup> Includes all emission offset certificates that transferred ownership.

<sup>4</sup> Includes the total amount of emission offsets transferred.

<sup>5</sup> STERC transfer transactions including the long term emission offset, those that have an ending year of 9999.

<sup>6</sup> STERC transfer transactions not including the long term emission offset in which the emission offset with the greatest year is treated like a long term emission offset.

<sup>7</sup> Includes all emission offset applications resulting in the generation of new certificates.

<sup>8</sup> Includes the total amount of emission offsets generated.

**Table 3: Emission Offset Transaction Summary – Fiscal Year 2017-18  
Sorted by Pollutant and Amount**

<b>SOUTH COAST AQMD NO.</b>	<b>POLLUTANT</b>	<b>AMOUNT (LBS/DAY)</b>	<b>AMOUNT (TONS/YR)</b>	<b>TYPE</b>	<b>START YEAR</b>	<b>END YEAR</b>
SC1718-001	ROG	1	0.2	ERC	N/A	N/A
SC1718-002	ROG	1	0.2	ERC	N/A	N/A
SC1718-003	ROG	14	2.6	ERC	N/A	N/A
SC1718-004	ROG	6	1.1	ERC	N/A	N/A
SC1718-005	ROG	6	1.1	ERC	N/A	N/A
SC1718-006	ROG	14	2.6	ERC	N/A	N/A
SC1718-007	ROG	13	2.4	ERC	N/A	N/A
SC1718-008	ROG	4	0.7	ERC	N/A	N/A
SC1718-009	ROG	10	1.8	ERC	N/A	N/A
SC1718-010	ROG	2	0.4	ERC	N/A	N/A
SC1718-011	ROG	66	12	ERC	N/A	N/A
SC1718-012	ROG	1	0.2	ERC	N/A	N/A
SC1718-013	ROG	66	12	ERC	N/A	N/A
SC1718-014	ROG	172	31.4	ERC	N/A	N/A
SC1718-015	ROG	16	2.9	ERC	N/A	N/A
SC1718-016	ROG	13	2.4	ERC	N/A	N/A
SC1718-017	ROG	21	3.8	ERC	N/A	N/A
SC1718-018	ROG	10	1.8	ERC	N/A	N/A
SC1718-019	ROG	4	0.7	ERC	N/A	N/A
SC1718-020	ROG	3	0.5	ERC	N/A	N/A
SC1718-021	ROG	9	1.6	ERC	N/A	N/A
SC1718-022	ROG	5	0.9	ERC	N/A	N/A
SC1718-023	ROG	4	0.7	ERC	N/A	N/A
SC1718-024	ROG	14	2.6	ERC	N/A	N/A
SC1718-025	ROG	14	2.6	ERC	N/A	N/A
SC1718-026	ROG	13	2.4	ERC	N/A	N/A
SC1718-027	ROG	16	2.9	ERC	N/A	N/A
SC1718-028	ROG	6	1.1	ERC	N/A	N/A
SC1718-029	ROG	35	6.4	ERC	N/A	N/A
SC1718-030	ROG	4	0.7	ERC	N/A	N/A
SC1718-031	ROG	1	0.2	ERC	N/A	N/A
SC1718-032	ROG	4	0.7	ERC	N/A	N/A
SC1718-033	ROG	16	2.9	ERC	N/A	N/A
SC1718-034	ROG	1	0.2	ERC	N/A	N/A
SC1718-035	ROG	2	0.4	ERC	N/A	N/A
SC1718-036	ROG	0	0.0	STERC	2018	2018
SC1718-037	ROG	12	2.2	STERC	2019	9999
SC1718-038	ROG	38	6.9	ERC	N/A	N/A
SC1718-039	ROG	7	1.3	ERC	N/A	N/A
SC1718-040	ROG	4	0.7	ERC	N/A	N/A
SC1718-041	ROG	4	0.7	ERC	N/A	N/A
SC1718-042	ROG	4	0.7	ERC	N/A	N/A
SC1718-043	ROG	3	0.5	ERC	N/A	N/A

**Table 3: Emission Offset Transaction Summary – Fiscal Year 2017-18  
Sorted by Pollutant and Amount**

SOUTH COAST AQMD NO.	POLLUTANT	AMOUNT (LBS/DAY)	AMOUNT (TONS/YR)	TYPE	START YEAR	END YEAR
SC1718-044	ROG	3	0.5	ERC	N/A	N/A
SC1718-045	ROG	3	0.5	ERC	N/A	N/A
SC1718-046	ROG	5	0.9	ERC	N/A	N/A
SC1718-047	ROG	3	0.5	ERC	N/A	N/A
SC1718-048	ROG	3	0.5	ERC	N/A	N/A
SC1718-049	ROG	5	0.9	ERC	N/A	N/A
SC1718-050	ROG	5	0.9	ERC	N/A	N/A
SC1718-051	ROG	4	0.7	ERC	N/A	N/A
SC1718-052	ROG	3	0.5	ERC	N/A	N/A
SC1718-053	ROG	100	18.3	ERC	N/A	N/A
<b>Total</b>		<b>793</b>	<b>144.3</b>		<b>N/A</b>	

SOUTH COAST AQMD NO.	POLLUTANT	AMOUNT (LB/SDAY)	AMOUNT (TONS/YR)	TYPE	START YEAR	END YEAR
SC1718-054	NOx	1	0.2	STERC	2016	9999
SC1718-055	NOx	1	0.2	STERC	2016	9999
SC1718-056	NOx	4	0.7	ERC	N/A	N/A
SC1718-057	NOx	53	9.7	ERC	N/A	N/A
SC1718-058	NOx	10	1.8	ERC	N/A	N/A
<b>Total</b>		<b>69</b>	<b>12.6</b>		<b>N/A</b>	

SOUTH COAST AQMD NO.	POLLUTANT	AMOUNT (LBS/DAY)	AMOUNT (TONS/YR)	TYPE	START YEAR	END YEAR
SC1718-059	SOx	4	0.7	ERC	N/A	N/A
<b>Total</b>		<b>4</b>	<b>0.7</b>		<b>N/A</b>	

SOUTH COAST AQMD NO.	POLLUTANT	AMOUNT (LBS/DAY)	AMOUNT (TONS/YR)	TYPE	START YEAR	END YEAR
SC1718-060	CO	28	5.1	ERC	N/A	N/A
SC1718-061	CO	28	5.1	ERC	N/A	N/A
SC1718-062	CO	26	4.7	ERC	N/A	N/A
<b>Total</b>		<b>82</b>	<b>14.9</b>		<b>N/A</b>	

**Table 3: Emission Offset Transaction Summary – Fiscal Year 2017-18  
Sorted by Pollutant and Amount**

<b>SOUTH COAST AQMD NO.</b>	<b>POLLUTANT</b>	<b>AMOUNT (LBS/DAY)</b>	<b>AMOUNT (TONS/YR)</b>	<b>TYPE</b>	<b>START YEAR</b>	<b>END YEAR</b>
SC1718-063	PM10	0	0.0	STERC	2018	2018
SC1718-064	PM10	5	0.9	STERC	2019	9999
SC1718-065	PM10	1	0.2	ERC	N/A	N/A
SC1718-066	PM10	0	0.0	STERC	2018	2018
SC1718-067	PM10	0	0.0	STERC	2018	2018
SC1718-068	PM10	3	0.5	STERC	2019	9999
SC1718-069	PM10	0	0.0	STERC	2018	2018
SC1718-070	PM10	4	0.7	STERC	2019	9999
SC1718-071	PM10	0	0.0	STERC	2018	2018
SC1718-072	PM10	4	0.7	STERC	2019	9999
SC1718-073	PM10	0	0.0	STERC	2018	2018
SC1718-074	PM10	5	0.9	STERC	2019	9999
SC1718-075	PM10	0	0.0	STERC	2018	2018
SC1718-076	PM10	4	0.7	STERC	2019	9999
SC1718-077	PM10	3	0.5	STERC	2018	9999
SC1718-078	PM10	3	0.5	ERC	N/A	N/A
SC1718-079	PM10	1	0.2	STERC	2019	9999
SC1718-080	PM10	1	0.2	ERC	N/A	N/A
SC1718-081	PM10	7	1.3	STERC	2018	9999
SC1718-082	PM10	1	0.2	ERC	N/A	N/A
SC1718-083	PM10	5	0.9	ERC	N/A	N/A
SC1718-084	PM10	1	0.2	STERC	2018	9999
SC1718-085	PM10	9	1.6	STERC	2015	9999
SC1718-086	PM10	3	0.5	ERC	N/A	N/A
SC1718-087	PM10	7	1.3	ERC	N/A	N/A
SC1718-088	PM10	9	1.6	ERC	N/A	N/A
SC1718-089	PM10	0	0.0	STERC	2018	2018
SC1718-090	PM10	2	0.4	STERC	2019	9999
SC1718-091	PM10	0	0.0	STERC	2018	2018
SC1718-092	PM10	4	0.7	STERC	2019	9999
SC1718-093	PM10	0	0.0	STERC	2018	2018
SC1718-094	PM10	4	0.7	STERC	2019	9999
SC1718-095	PM10	4	0.7	ERC	N/A	N/A
<b>Total</b>		<b>90</b>	<b>16.1</b>	<b>N/A</b>		

**Table 4: Emission Offset Application Summary – Fiscal Year 2017-18  
Sorted by Pollutant and Amount**

<b>SOUTH COAST AQMD NO.</b>	<b>POLLUTANT</b>	<b>AMOUNT<sup>8</sup> (LBS/DAY)</b>	<b>AMOUNT<sup>8</sup> (TONS/YR)</b>	<b>TYPE</b>	<b>START YEAR</b>	<b>END YEAR</b>
SC1718-096	ROG	0	0	STERC	2017	2017
SC1718-097	ROG	0	0	STERC	2018	2018
SC1718-098	ROG	0	0	STERC	2019	2019
SC1718-099	ROG	0	0	STERC	2020	2020
SC1718-100	ROG	0	0	STERC	2021	2021
SC1718-101	ROG	0	0	STERC	2022	2022
SC1718-102	ROG	0	0	STERC	2023	2023
SC1718-103	ROG	37	6.8	STERC	2024	9999
<b>Total</b>		<b>37</b>	<b>6.8</b>		<b>N/A</b>	

<b>SOUTH COAST AQMD NO.</b>	<b>POLLUTANT</b>	<b>AMOUNT<sup>8</sup> (LBS/DAY)</b>	<b>AMOUNT<sup>8</sup> (TONS/YR)</b>	<b>TYPE</b>	<b>START YEAR</b>	<b>END YEAR</b>
SC1718-104	PM10	0	0	STERC	2018	2018
SC1718-105	PM10	0	0	STERC	2019	2019
SC1718-106	PM10	0	0	STERC	2020	2020
SC1718-107	PM10	0	0	STERC	2021	2021
SC1718-108	PM10	0	0	STERC	2022	2022
SC1718-109	PM10	0	0	STERC	2023	2023
SC1718-110	PM10	0	0	STERC	2024	2024
SC1718-111	PM10	15	2.7	STERC	2025	9999
SC1718-112	PM10	0	0	STERC	2018	2018
SC1718-113	PM10	0	0	STERC	2019	2019
SC1718-114	PM10	0	0	STERC	2020	2020
SC1718-115	PM10	0	0	STERC	2021	2021
SC1718-116	PM10	0	0	STERC	2022	2022
SC1718-117	PM10	0	0	STERC	2023	2023
SC1718-118	PM10	0	0	STERC	2024	2024
SC1718-119	PM10	2	0.4	STERC	2025	9999
<b>Total</b>		<b>17</b>	<b>3.1</b>		<b>N/A</b>	

<sup>8</sup> Only long term emission offsets, those that have an ending year of 9999, are quantified to avoid over counting.



**CHAPTER III**  
**FISCAL YEAR 2019-2020 BUDGET**

*Due to the bulk of these material, Chapter III is available online at <https://www.aqmd.gov/docs/default-source/finance-budgets/fy-2019-20/fy2019-20-proposed-budget.pdf>. Anyone who would like to obtain a hard copy may do so by contacting South Coast AQMD's Public Information Center at (909)396-2001.*

**CHAPTER IV**  
**CLEAN FUELS PROGRAM 2018 ANNUAL REPORT AND 2019 PLAN UPDATE**

*Due to the bulk of these material, Chapter IV is available online at <https://www.aqmd.gov/docs/default-source/technology-research/annual-reports-and-plan-updates/2018-annual-report-2019-plan-update.pdf>. Anyone who would like to obtain a hard copy may do so by contacting South Coast AQMD's Public Information Center at (909)396-2001.*

**CHAPTER V  
ANNUAL RECLAIM AUDIT REPORT  
FOR 2017 COMPLIANCE YEAR**

*Due to the bulk of these material, Chapter V is available online at <http://www.aqmd.gov/docs/default-source/reclaim/reclaim-annual-report/reclaim-2017-audit-report.pdf>. Anyone who would like to obtain a hard copy may do so by contacting South Coast AQMD's Public Information Center at (909)396-2001.*



# Budget

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**Fiscal Year 2019-2020**

South Coast Air Quality Management District



**SOUTH COAST**

**AIR QUALITY MANAGEMENT DISTRICT**

# **BUDGET**

## **FISCAL YEAR 2019-2020**

**Prepared by Finance**  
**Sujata Jain, Assistant Deputy Executive Officer - Finance**



**SOUTH COAST**  
**AIR QUALITY MANAGEMENT DISTRICT**



**SOUTH COAST**

**AIR QUALITY MANAGEMENT DISTRICT**

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**SOUTH COAST**

**AIR QUALITY MANAGEMENT DISTRICT**

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT**

**GOVERNING BOARD**

DR. WILLIAM A. BURKE  
Chairman  
Speaker of the Assembly Appointee

DR. CLARK E. PARKER, SR.  
Vice Chair  
Senate Rules Committee Appointee

LISA BARTLETT  
County of Orange Representative

BEN BENOIT  
Cities of Riverside County Representative

JOE BUSCAINO  
City of Los Angeles Representative

MICHAEL A. CACCIOTTI  
Cities of Los Angeles County Representative  
Eastern Region

JANICE HAHN  
County of Los Angeles Representative

LARRY McCALLON  
Cities of San Bernardino County  
Representative

JUDITH MITCHELL  
Cities of Los Angeles County Representative  
Western Region

V. MANUEL PEREZ  
County of Riverside Representative

DWIGHT ROBINSON  
Cities of Orange County Representative

JANICE RUTHERFORD  
County of San Bernardino Representative

VACANT  
Governor's Appointee

WAYNE NASTRI  
Executive Officer



**SOUTH COAST**

**AIR QUALITY MANAGEMENT DISTRICT**



# South Coast Air Quality Management District

21865 Copley Drive, Diamond Bar, CA 91765-4178  
(909) 396-2000 • [www.aqmd.gov](http://www.aqmd.gov)

May 3, 2019

South Coast Air Quality Management District Board and Stakeholders

## Transmittal of the Executive Officer's Fiscal Year 2019-20 Budget and Work Program

This document represents South Coast Air Quality Management District's (South Coast AQMD) proposed General Fund Budget and Work Program for FY 2019-20. The budget was developed based on South Coast AQMD's commitment to clean the air and to protect the health of all residents in the South Coast Air District through practical and innovative strategies. The proposed budget for FY 2019-20 is a balanced budget with expenditures and revenues of \$170.9 million.

The proposed FY 2019-20 level of expenditures, up 5.1% from the FY 2018-19 adopted budget, includes increased costs for retirement, salaries due to labor negotiation agreements approved in FY 2017-18, salaries associated with new positions for the AB 617 Community Air Protection Program, the Volkswagen Settlement Project, the China Partnership for Cleaner Shipping, Rule 1180 implementation, and the Career Development Intern Program. There is a net increase of 62.6 FTEs from the FY 2018-19 adopted budget. This includes the addition of two positions in Legislative and Public Affairs/Media Office, the deletion of the Chief Administrative Officer position, and the deletion of 0.4 FTE that provided five months of critical overlap and service continuity before an Assistant Deputy Executive Officer in Science, Technology and Advancement retired in Fall 2018. The net increase in positions also includes the already approved FY 2018-19 mid-year actions adding 47 positions for AB617, four positions for Rule 1180 - Refinery Fenceline and Community Air Monitoring, five positions for the Volkswagen Settlement Project, two positions for the China Partnership for Cleaner Shipping and four positions for the Career Development Intern Program.

The FY 2019-20 proposed revenue budget of \$170.9 million, up 5.1% from the FY 2018-19 adopted budget, includes a CPI fee adjustment of 3.5% and the third and final year of the June 2017 Board approved additional fee adjustment for Title V facilities to permit processing fees and annual operating permit renewal fees of 10.66% to better align program costs with revenue. At \$100.7 million or 58.9% of the projected revenue

budget, stationary source revenues account for the largest source of revenue. Over the past two decades, total permit fees (including permit processing, annual operating permit, and annual emissions based fees) collected from stationary sources has increased by about 43.9% from \$66.8 million in FY 1991-92 to \$96.1 million (estimated) in FY 2018-19. When adjusted for inflation however, stationary source revenues have decreased by 16% over this same period.

While significant efforts are put forth to develop a detailed budget for the next fiscal year, including a five year projection, uncertain political and economic issues create challenges. These challenges may include changes in federal and state grant revenue funding levels, fluctuations in the financial market which will determine the performance of South Coast AQMD's retirement investments and thus impact pension liability, increased infrastructure costs due to an aging headquarters building, and onetime Penalties and Settlement revenue that varies annually. South Coast AQMD is well positioned to address these uncertainties by monitoring funding sources, our retirement plan, and actual financial results on a continuous basis and is prepared to make timely resource allocation adjustments as warranted. Additionally, the proposed budget includes an assigned/unassigned general fund balance of 29% of revenues to provide a reasonable financial safety net.

The public and the business community have multiple opportunities to participate in the budget development process. These include meetings of the Budget Advisory Committee which is made up of representatives from the business and environmental communities, a public consultation meeting to discuss the proposed budget and work program, and two meetings of the Governing Board. The public consultation meeting and Governing Board meetings are noticed to the public through direct mail to permitted facilities, print media, and through the South Coast AQMD website.

In summary, I am proposing a balanced budget for FY 2019-20 that allows our programs to operate efficiently, transparently, and in a manner sensitive to public agencies, businesses and the public, while providing a continuum of emissions reductions and health benefit improvements. The proposed FY 2019-20 Budget and Work Program serves to ensure the continued strength and stability of the District as we make progress toward attaining the federal and state clean air mandates.

Respectfully,



Wayne Natri,  
Executive Officer

SJ:DRP



GOVERNMENT FINANCE OFFICERS ASSOCIATION

*Distinguished  
Budget Presentation  
Award*

PRESENTED TO

**South Coast Air Quality Management District  
California**

For the Fiscal Year Beginning

**July 1, 2018**

*Christopher P. Morill*

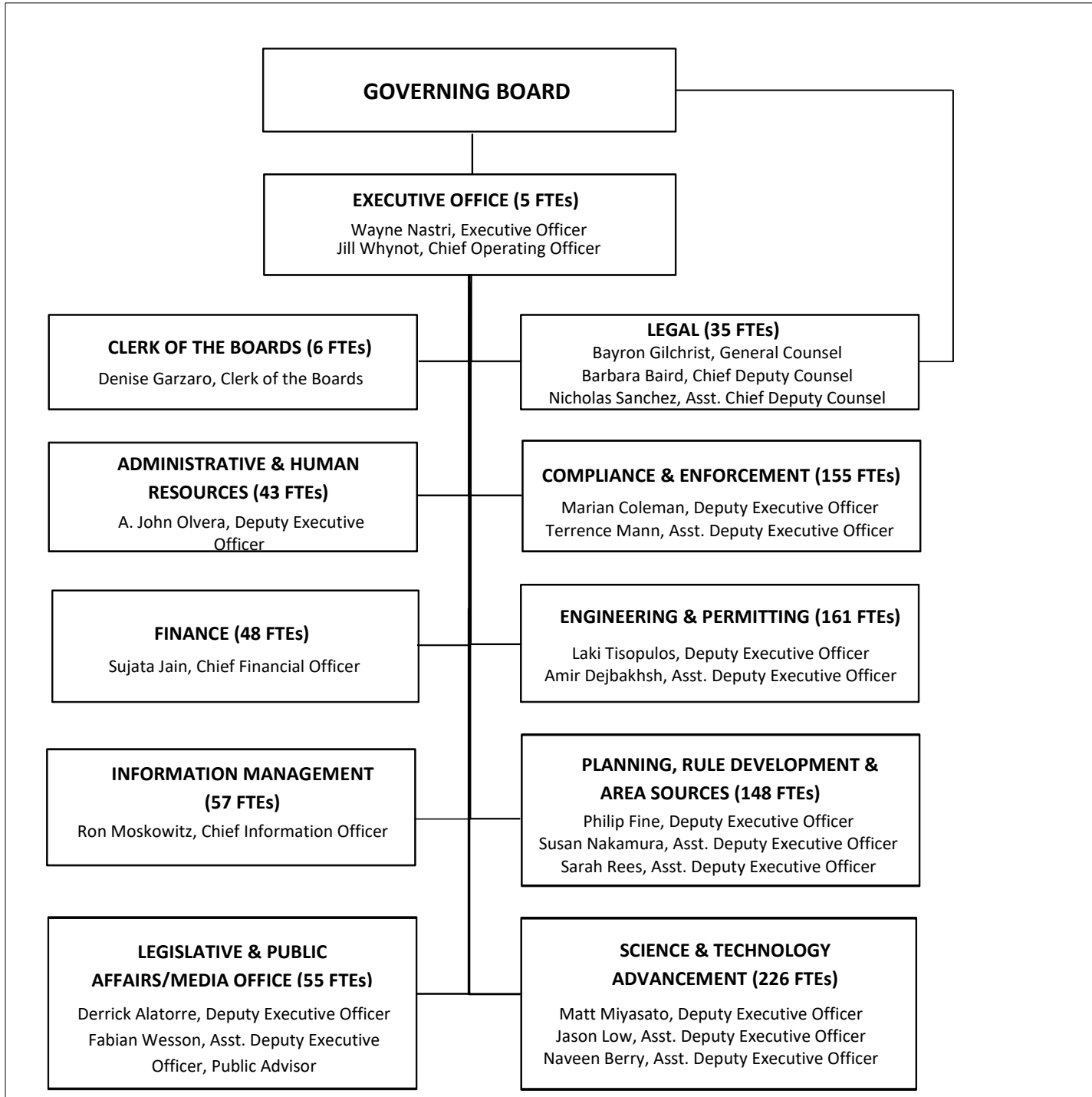
Executive Director

The Government Finance Officers Association of the United States and Canada (GFOA) presented a Distinguished Budget Presentation award to South Coast Air Quality Management District, California, for its Annual Budget for the fiscal year beginning July 1, 2018. In order to receive this award, a government unit must publish a budget document that meets program criteria as a policy document, as a financial plan, as an operations guide, and as a communications device.

This award is valid for a period of one year only. We believe our current budget continues to conform to program requirements, and we are submitting it to GFOA to determine its eligibility for another award.



**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT  
(939 FTEs)**



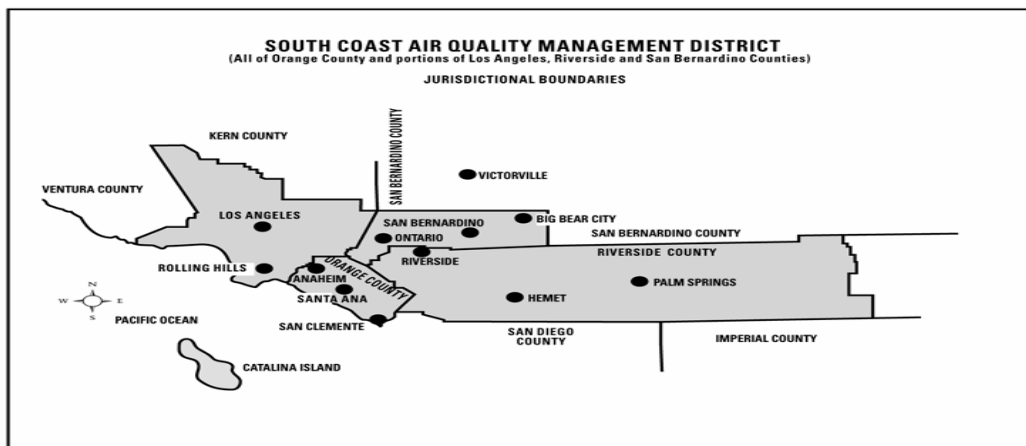
# SUMMARY

## Preface

This document represents the proposed FY 2019-20 Budget and Work Program of the South Coast Air Quality Management District (South Coast AQMD). The proposed budget is available for public review and comment during the month of April. A public consultation meeting is scheduled to discuss the proposed budget and proposed fees changes on April 9, 2019. In addition, a workshop for the Governing Board is scheduled on April 12, 2019. A final Proposed Budget and Work Program and Proposed Amended Regulation (PAR) III - Fees, which may include changes based on input from the public and Board, will be presented for adoption at a public hearing on May 3, 2019.

## Introduction

The South Coast Air Quality Management District (South Coast AQMD) began operation on February 1, 1977 as a regional governmental agency established by the California Legislature pursuant to the Lewis Air Quality Management Act. The South Coast AQMD encompasses all of Orange County and parts of Los Angeles, San Bernardino and Riverside Counties. It succeeded the Southern California Air Pollution Control District (APCD) and its predecessor four county APCDs, of which the Los Angeles County APCD was the oldest in the nation, having been formed in 1947. The South Coast AQMD Governing Board is composed of 13 members, including four members appointed by the Boards of Supervisors of the four counties in South Coast AQMD's jurisdiction, six members appointed by cities in the South Coast AQMD's jurisdiction and three members appointed by the Governor, the Speaker of the State Assembly and the Rules Committee of the State Senate, respectively. The members appointed by the Boards of Supervisors and cities consist of one member of the Board of Supervisors of Los Angeles, Orange, Riverside, and San Bernardino Counties, respectively, and a mayor or member of the city council of a city within Orange, Riverside, and San Bernardino Counties. Los Angeles County cities have three representatives, one each from the western and eastern portions and one member representing the City of Los Angeles.

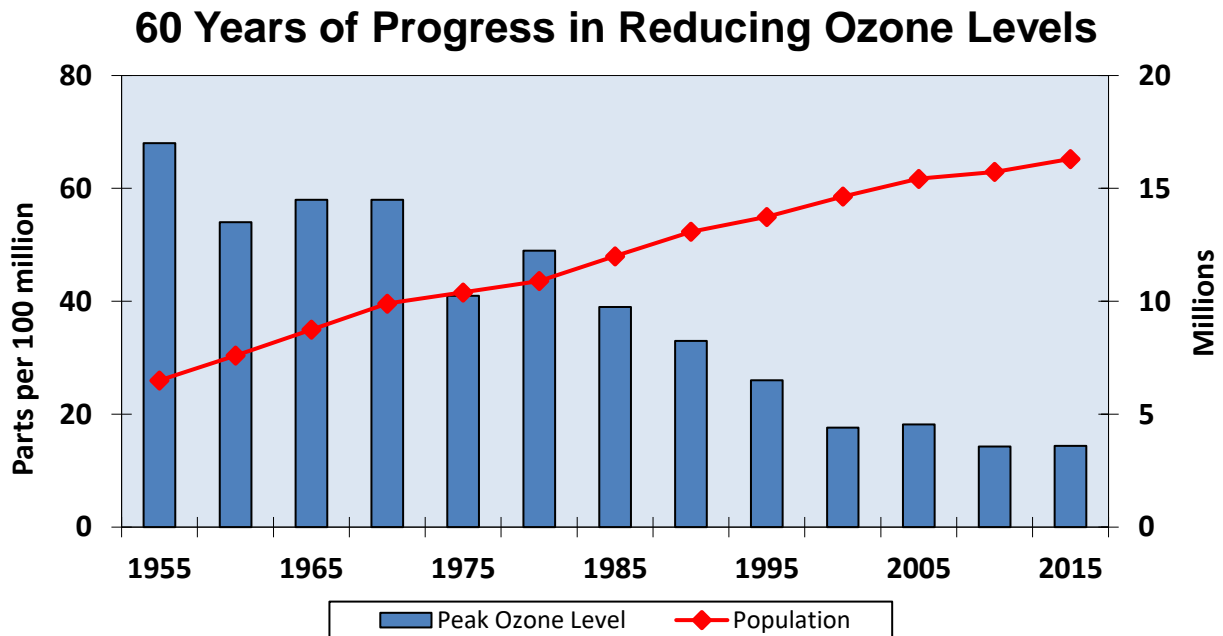


## Air Quality History

The South Coast Air Basin (Basin) has suffered unhealthy air since its rapid population growth and industrialization during World War II. While air quality has improved, the residents of the Basin still breathe some of the most polluted air in the nation.

The 68-year history of the region's air pollution control efforts is, in many ways, one of the world's key environmental success stories. Peak ozone levels have been cut by almost three-fourths since air monitoring began in the 1950s. Population exposure was cut in half during the 1980s alone.

Since the late 1940s when the war on smog began to 2017, the region's population has more than tripled from 4.8 million to 17.1 million; the number of motor vehicles has increased almost six-fold from 2.3 million to 13.8 million; and the area has grown into one of the most prosperous regions of the world. This phenomenal economic growth illustrates that pollution control and strong economic growth can coincide.



## Mission

South Coast AQMD's mission is to clean the air and protect the health of all residents in the South Coast Air District through practical and innovative strategies. This mission is pursued through a comprehensive program of planning, regulation, education, enforcement, compliance incentives, technical innovation and promoting public understanding of air quality issues. The South Coast

AQMD has implemented a policy of working with regulated businesses to ensure their participation in making the rules which will impact them. This cooperative approach has resulted in greater business support of rulemaking efforts for air that is more healthful to breathe.

To carry out its mission, South Coast AQMD develops a set of Goals and Priority Objectives which are evaluated and revised annually and presented as part of the budget proposal. The following proposed goals have been identified as being critical to meeting South Coast AQMD's Mission for FY 2019-20:

- I. Achieve Clean Air Standards.
- II. Enhance Public Education and Equitable Treatment for All Communities.
- III. Operate Efficiently and Transparently.

These goals are the foundation for South Coast AQMD's Work Program categories. Each goal is supported by multiple activities, which target specific areas of program performance.

## **Air Quality**

### Overview

The four-county Southern California region, designated for air quality purposes as the South Coast Air Basin (Basin), has some of the highest air pollution levels in the United States. The federal government has designated seven pollutants that are pervasive enough across the nation to warrant federal health standards, called National Ambient Air Quality Standards (NAAQS). Known as "criteria pollutants," these are: ozone (O<sub>3</sub>); nitrogen dioxide (NO<sub>2</sub>); particulates (PM<sub>10</sub>); fine particulates (PM<sub>2.5</sub>); carbon monoxide (CO); lead (Pb); and sulfur dioxide (SO<sub>2</sub>).

In addition, the State of California through the California Air Resources Board (CARB) sets ambient air quality standards for these same pollutants. California's standards are in some cases tighter than the U.S. Environmental Protection Agency's (U.S. EPA) standards, reflecting the conclusion on CARB's part that some of the federal standards are not adequate to protect public health in this region. Toxic compounds also are a potential problem. More toxic pollution is emitted into the air in the Basin than in any other region in California. The Basin's large number of motor vehicles and small sources, including small businesses and households using ozone-forming consumer products and paints, compound the problem.

### Air Quality Trends

While our air quality continues to improve, the Basin remains one of the most unhealthful areas in the nation in terms of air quality. Ozone levels have fallen by more than three-quarters since peaks in the mid-1950s. U.S. EPA revised and strengthened the 8-hour ozone NAAQS, effective December 28, 2015, from concentrations exceeding 75 parts-per-billion (ppb) to concentrations exceeding 70 ppb. In 2018, the new 2015 8-hour ozone NAAQS was exceeded in the Basin on 141 days and the former 2008 ozone NAAQS was exceeded on 109 days. The 2015 ozone NAAQS

was exceeded in the Basin on 145 days in 2017 and 132 days in 2016. The number of exceedance days decreased slightly as compared to 2017. However, there were significantly fewer days with air quality index values that reached the “unhealthy” or “very unhealthy” categories in 2018 compared to the previous two years. Though the trend in ozone exceedance days has been decreasing over the past few decades, year-to-year variability can mask the underlying trends when focusing on short time periods. Year-to-year variability can be caused by enhanced photochemical ozone formation due to persistent weather patterns that limit vertical mixing and warm the lower atmosphere, which likely contributed to elevated concentrations in the 2016 and 2017 ozone season. Changes in the relative emissions of VOC or NO<sub>x</sub> can also affect the chemistry of ozone formation and lead to marginal short-term increases in ozone concentrations as NO<sub>x</sub> is reduced. While the ozone control strategy continued to reduce precursor emissions from man-made sources in the Basin, ozone-forming emissions transported from several long-term, large wildfires throughout California in the summer and year-to-year changes in the VOC emissions from vegetation resulting from dry and wet rainy-seasons may have also played a role in the increase of exceedance days. The maximum observed ozone levels also show some year-to-year variability, but have generally been decreasing over the years. The highest 8-hour ozone level in the 2018 data was 125 ppb, compared to 136 ppb in 2017 and 121 ppb in 2016.

PM<sub>2.5</sub> levels have decreased dramatically in the Basin since 1999; however, design value concentrations are still above the current annual 24-hour NAAQS. Effective March 18, 2013, U.S. EPA strengthened the annual average PM<sub>2.5</sub> standard from 15 µg/m<sup>3</sup> to 12 µg/m<sup>3</sup>, while retaining the 24-hour PM<sub>2.5</sub> NAAQS of 35 µg/m<sup>3</sup>. In 2018, the 24-hour PM<sub>2.5</sub> NAAQS was exceeded on 9 days at the highest station (Long Beach near road site), based on preliminary filter data. The PM<sub>2.5</sub> NAAQS was exceeded on 19 days in 2018. Because the highest PM<sub>2.5</sub> concentrations typically occur during the rainy-season, design values are heavily dependent on the frequency of wintertime storm systems, which increase ventilation and remove PM when rainfall is present. PM<sub>2.5</sub> concentrations are also significantly influenced by wildfire smoke, which can be transported across wide distances. Smoke from historically-large wildfires throughout California in December 2017 and November 2018 contributed to several exceedances of the 24-hour standard all throughout the South Coast Air Basin. Preliminary analysis indicates that removal of wildfire-caused exceedances in 2018 through the U.S. EPA exceptional events demonstration process may lead to 98<sup>th</sup> percentile concentrations that do not exceed 35 µg/m<sup>3</sup>. The Basin’s peak annual average PM<sub>2.5</sub> level in 2018, 14.5 µg/m<sup>3</sup> (preliminary data) at the Ontario near road site was lower than the 2017 value, 14.6 µg/m<sup>3</sup>, which occurred at the same site.

In 2006, U.S. EPA rescinded the annual federal standard for PM<sub>10</sub> but retained the 24-hour standard. U.S. EPA re-designated the Basin as attainment of the health based standard for PM<sub>10</sub>, effective July 26, 2013. With the exception of three high wind events in 2015 and 2016, ambient levels of PM<sub>10</sub> in the Basin have continued to meet the federal 24-hour PM<sub>10</sub> NAAQS through 2018.

In November 2008, U.S. EPA revised the lead NAAQS from a 1.5 µg/m<sup>3</sup> quarterly average to a rolling 3-month average of 0.15 µg/m<sup>3</sup> and added new near-source monitoring requirements.

The Los Angeles County portion of the Basin has been designated non-attainment for lead due to monitored concentrations near one facility. However, starting with the 3-year 2012-2014 design value, the Basin has met the lead standard. A re-designation request to U.S. EPA is pending.

Nitrogen dioxide, sulfur dioxide, and carbon monoxide levels have improved in the Basin and are in full attainment of the NAAQS. In 2007, U.S. EPA formally re-designated the Basin to attainment of the carbon monoxide NAAQS. Maximum levels of carbon monoxide in the Basin have been consistently less than one-third of the federal standards since 2004. In 2010, U.S. EPA revised the NO<sub>2</sub> 1-hour standard to a level of 100 ppb and the SO<sub>2</sub> 1-hour standard to a level of 75 ppb. In 2017, all sites in the Basin remained in attainment of these NAAQS.

### Mandates

South Coast AQMD is governed and directed by a comprehensive federal law (Federal Clean Air Act) and several state laws that provide the regulatory framework for air quality management in the Basin. These laws require South Coast AQMD to take prescribed steps to improve air quality.

Generally speaking, South Coast AQMD is responsible for stationary sources such as factories and businesses. CARB and U.S. EPA are primarily responsible for motor vehicles. South Coast AQMD and CARB share responsibilities with respect to area sources. South Coast AQMD and the Southern California Association of Governments (SCAG) share some responsibilities with CARB regarding certain aspects of mobile source emissions related to transportation and land use. Control of emissions from sources such as airports, harbors, and trains is shared by U.S. EPA, CARB and South Coast AQMD. Without adequate efforts by CARB and U.S. EPA to control emission sources under their sole authority, it is impossible for the region to reach federal clean air standards.

The following is a more specific summary of the laws governing South Coast AQMD.

#### Federal Law:

Federal Clean Air Act (CAA): The CAA requires attainment of National Ambient Air Quality Standards (NAAQS) for criteria air pollutants, i.e. pollutants causing human health impacts due to their release from numerous sources. The following criteria pollutants have been identified: ozone, particulate matter (PM<sub>10</sub>), carbon monoxide, lead, nitrogen dioxide, and sulfur dioxide. Current deadlines vary by pollutant and severity of pollution in the region.

State Implementation Plans: The CAA requires each state to develop a State Implementation Plan (SIP) to attain the NAAQS by the applicable attainment deadlines. SIPs must be approved by U.S. EPA as containing sufficient measures to timely attain NAAQS and meet other requirements described below. SIPs must contain air pollution measures in adopted, "regulatory" form within one year after approval by U.S. EPA. Upon approval by U.S. EPA, SIP requirements can be enforced against regulated sources by U.S. EPA and by any citizen. South Coast AQMD must develop and submit to CARB for review, followed by submittal to U.S. EPA, an element of the SIP referred to as the South Coast AQMD Air Quality Management Plan (AQMP) demonstrating how the Basin will achieve the NAAQS.

Among the numerous other CAA requirements are: a mandate that the region achieve a three percent annual reduction in emissions of ozone precursors (VOC and NO<sub>x</sub>); a requirement that new sources over 10 tons per year of VOC or NO<sub>x</sub>, and modifications to such sources, achieve lowest achievable emission rate and offset their emission increases by equal reductions elsewhere in the region and transportation control measures to reduce vehicle trips.

To date, the South Coast AQMD's Governing Board has adopted AQMPs in 1989, 1991, 1994, 1997, 1999 (amendments to the plan adopted in 1997), 2003, 2007, 2012 and 2017. The 2016 AQMP was approved in March 2017.

Sanctions, Federal Implementation Plans, and Conformity Findings: The CAA mandates that sanctions be imposed on an area if a suitable SIP is not adopted and approved by U.S. EPA. These sanctions can include loss of key federal funds and more stringent requirements on new or expanding industries. Specific requirements for South Coast AQMD's AQMP include stringent requirements plus Lowest Achievable Emission Rate (LAER) and offsets for major new sources. Federal law also requires an operating permit program for major stationary sources, known as Title V, which must be supported by permit fees. In addition, air toxics regulations adopted by U.S. EPA pursuant to Title III must be implemented by South Coast AQMD.

Motor Vehicle Emission Controls: The CAA initially required U.S. EPA to adopt emission limitations for motor vehicles. The 1990 Amendments require U.S. EPA to adopt regulations to achieve further reductions in emissions from motor vehicles, as well as from other mobile sources such as locomotives. States are preempted from adopting emission limitations for motor vehicles and certain other mobile sources. Exception: California can adopt motor vehicle standards, and standards for some --but not all-- other mobile sources, and other states can adopt the California standards.

Hazardous Air Pollutants: In addition to criteria pollutants, the CAA regulates "hazardous air pollutants," i.e., those which can cause cancer or other severe localized health effects due to emissions from a single facility. U.S. EPA is required to adopt regulations mandating that new and existing sources emitting 10 tons per year or more of such pollutants employ Maximum Achievable Control Technology (MACT) according to specified schedules. U.S. EPA is to consider further reductions in the future to eliminate any remaining unacceptable residual risk.

#### California Law:

The California Clean Air Act (CCAA): The CCAA establishes numerous requirements for Air District air quality plans to attain state ambient air quality standards for criteria air contaminants. For example, a plan must contain measures adequate to achieve five percent per year emission reductions or must contain all feasible measures and an expeditious adoption schedule. For Air Districts with serious air pollution, its attainment plan should include the following: no net increase in emissions from new and modified stationary sources; and best available retrofit technology for existing sources.

Toxic Air Contaminants: The Air Toxic Hot Spots Act (Health & Safety Code §§ 44300, et seq.) requires facilities emitting specified quantities of pollutants to conduct risk assessments describing the health impacts to neighboring communities created by their emissions of numerous specified hazardous compounds. If an Air District determines the health impact to be significant, neighbors must be notified. In addition, state law requires the facility to develop and implement a plan to reduce the health impacts to below significance, generally within five years. Additional control requirements for hazardous emissions from specific industries are established by the state and enforced by Air Districts.

State law also includes the following measures:

- Tanner Air Toxics Process (AB 1807) which requires CARB to adopt air toxic control measures to limit emissions of toxic air contaminants from classes of industrial facilities. Local Air Districts are required to enforce these regulations or adopt equally or more stringent regulations of their own;
- Health & Safety Code §42705.5 which requires Air Districts to deploy a community air monitoring system in selected locations and Section 42706.5 which requires Air Districts to design, develop, install, operate and maintain refinery-related community air monitoring systems;
- Authority for South Coast AQMD to adopt a command-and-control regulatory structure requiring Best Available Retrofit Control Technology (BARCT);
- A requirement for South Coast AQMD to establish an expedited schedule for implementing BARCT at pre-determined greenhouse cap and trade facilities;
- A requirement for South Coast AQMD to establish a program to encourage voluntary participation in projects to increase the use of clean-burning fuels; and
- A requirement for South Coast AQMD to adopt and enforce rules to ensure no net emission increases from stationary sources.

### Air Quality Control

Developing solutions to the air quality problem involve highly technical processes and a variety of resources and efforts to meet the legal requirements of California and federal laws.

Monitoring: The first step in air quality control is to determine the smog problem by measuring air pollution levels. South Coast AQMD currently operates 43 monitoring stations in the South Coast Air Basin and a portion of the Salton Sea Air Basin in Coachella Valley. These range from fully equipped stations that measure levels of all criteria pollutants, as well as some air toxic pollutant levels, to those which measure a specific pollutant in critical areas. These measurements provide the basis of our knowledge about the nature of the air pollution problem and the data for planning and compliance efforts to address the problem.

Pollution Sources: South Coast AQMD, in cooperation with CARB and SCAG, estimates the sources of emissions causing the air pollution problem. Nature itself causes a portion of the emissions and must be considered. In general, South Coast AQMD estimates stationary and natural sources of emissions, SCAG develops the information necessary to estimate population and traffic, and CARB develops the information necessary to estimate mobile and area source



emissions using the SCAG traffic data. This data is then consolidated in South Coast AQMD's AQMP for use in developing the necessary control strategies.

**Air Quality Modeling:** Using air quality, meteorological and emissions models, South Coast AQMD planners simulate air pollution to demonstrate attainment of the air quality standards and the impacts of sources to local and regional air quality. Due to the nature of air pollution, air quality models can be very complex. Some pollutants are not emitted directly into the air but are products of photochemical reactions in the atmosphere. For example, VOCs mix with nitrogen dioxide (NO<sub>2</sub>) and react in sunlight to form ozone; similarly, nitrogen oxide gases from tailpipes and smokestacks can be transformed into nitrates or particulates (PM<sub>2.5</sub> and PM<sub>10</sub>). The planners thus must take into account transport, land use characteristics and chemical reactions of emissions in the atmosphere to evaluate air quality impacts. Using model output, planners can look at different control scenarios to determine the best strategies to reduce air pollution for the lowest cost.

The considerable data required for these analyses is collected on an ongoing basis by South Coast AQMD staff. Modeling data is prepared and delivered using a geographic information system (GIS). GIS capability is used to prepare and produce data and spatial analysis maps for various needs by South Coast AQMD including rulemaking and California Environmental Quality Act (CEQA) document development.

**Planning:** With emissions data and an air quality model in place, planners can develop possible control strategies and scenarios. South Coast AQMD focuses most of its effort on stationary source controls. As mentioned earlier, strategies to reduce vehicle miles traveled (VMT) are developed primarily by SCAG, while mobile source control standards are developed primarily by CARB.

Once a plan of emission controls to achieve the NAAQS is outlined, South Coast AQMD is required to hold multiple public meetings to present the proposed control strategies and receive public input. South Coast AQMD also conducts a socioeconomic analysis of the strategies. South Coast AQMD maintains an ongoing and independent advisory group of outside experts for both its air quality modeling and socioeconomic assessment methodologies.

To meet federal air quality standards, the AQMPs and SIP submittals, including the 2016 AQMP, called for significant emissions reductions from projected baseline emissions in order to meet the NAAQS by the federal attainment deadlines (2019 for the 2006 24-hour PM<sub>2.5</sub> NAAQS, 2025 for the 2012 annual PM<sub>2.5</sub> NAAQS, 2023 for the 1979 1-hour ozone NAAQS, 2024 for the 1997 8-hour ozone NAAQS, and 2032 for the 2008 8-hour ozone NAAQS). These combined reductions, while meeting most NAAQS, will still not result in attainment of all California State ambient air quality standards or the revised 2015 8-hour ozone NAAQS. The 2012 AQMP addressed the 24-hour PM<sub>2.5</sub> NAAQS. The 2016 AQMP addresses the 2008 8-hour ozone NAAQS and the 2012 annual PM<sub>2.5</sub> NAAQS, and demonstrates compliance with the requirements for being a "serious" non-attainment area for the 24-hour PM<sub>2.5</sub> NAAQS requirements. South Coast AQMD will continue to improve the emissions inventories and modeling techniques in order to address the

2015 8-hour NAAQS for the next AQMP revision which has an anticipated adoption in the 2022 timeframe.

**Rulemaking:** The regulatory process, known as rulemaking, takes the concepts of control measures outlined in the AQMP and turns them into proposed rule language. This process involves the following: extensive research on technology; site inspections of affected industries to determine feasibility; typically a year or more of public task force and workshop meetings; in-depth analyses of environmental, social and economic impacts; and thorough review with appropriate Governing Board Committees.

This extensive process of public and policymaker participation encourages consensus in development of rule requirements so that affected sources have an opportunity for input into the rules that will regulate their operations. Once the requirements are developed, the proposed rule, along with an Environmental Assessment and a socioeconomic report, is presented to South Coast AQMD's Governing Board at a public hearing. Public testimony is presented and considered by the Board before any rule is adopted. The adopted or amended rules are then submitted to CARB and U.S. EPA for their approval. It is not uncommon for rulemaking to include follow-up implementation studies. These studies may extend one or more years past rule adoption/amendment and prior to rule implementation. Such studies are typically submitted to the Governing Board or appropriate Governing Board Committee.

**Enforcement and Education:** South Coast AQMD issues permits to construct and operate equipment to companies to ensure equipment is operated in compliance with adopted rules. Follow-up inspections are made to ensure that equipment is being operated under permit conditions.

**Technical Innovation:** In the late 1980s, South Coast AQMD recognized that technological innovation, as well as rule enforcement, would be necessary to achieve clean air standards. Thus the Technology Advancement Office was created to look for and encourage technical innovation to reduce emissions. The California State Legislature supported this effort by providing a \$1 surcharge on every DMV registration fee paid within the Basin. These funds have been matched at a ratio of approximately three-to-one with funds from the private sector to develop new technologies such as low-emission vehicles, low-NO<sub>x</sub> burners for boilers and water heaters, zero-pollution paints and solvents, fuel cells and other innovations.

An additional \$4 vehicle registration fee was authorized by the state legislature in 1990. These fees are administered through South Coast AQMD with \$1.20 going to South Coast AQMD for mobile source emissions reductions, \$1.60 subvented directly to cities and counties to support their air quality programs, and \$1.20 to the Mobile Source Air Pollution Reduction Review Committee (MSRC). The MSRC is an outside panel established by state law whose function is to make the decisions on the actual projects to be funded from that portion of the revenue.

**Public Education:** South Coast AQMD's efforts to clean up the air will be successful only to the extent that the public understands air quality issues and supports and participates in cleanup

effort. Thus, South Coast AQMD strives to involve and inform the public through the Legislative and Public Affairs/Media Office, public meetings, publications, the press, public service announcements, and social media.

## **Budget Synopsis**

South Coast AQMD's annual budget is adopted for the General Fund for a fiscal year that runs from July 1 through June 30. The period covered by the FY 2019-20 budget is from July 1, 2019 to June 30, 2020. The General Fund budget is the agency's operating budget and is structured by Office and account. The accounts are categorized into three Major Objects: Salaries and Employee Benefits, Services and Supplies, and Capital Outlays. The budget is supplemented with a Work Program containing nine program categories which estimate staff resources and expenditures along program and activity lines. Each category consists of a number of Work Programs, or activities. A Work Program Output Justification form is completed for each Work Program which identifies performance goals, measureable outputs, legal mandates, activity changes and revenue categories.

The annual expenditure and revenue budget for the General Fund is adopted on a modified accrual basis. All annual expenditure appropriations lapse at fiscal year-end if they have not been expended or encumbered. Throughout the year, budget amendments may be necessary to accommodate additional revenues and expenditure needs. Any amendments due to budget increases or transfers between expenditure accounts in different Major Objects must be approved by South Coast AQMD's Governing Board. They are submitted to the Governing Board for approval at a monthly Board meeting in the format of a board letter which documents the need for the request and the source of funding for the expenditure. Budget amendments resulting from transfers between expenditure accounts within the same Major Object are approved at the Office level.

South Coast AQMD does not adopt annual budgets for its Special Revenue Funds. Special Revenue Funds are used to record transactions applicable to specific revenue sources that are legally restricted for specific purposes. All transactions in Special Revenue Funds are approved by the Governing Board on an as-needed basis.

### **Budget Process**

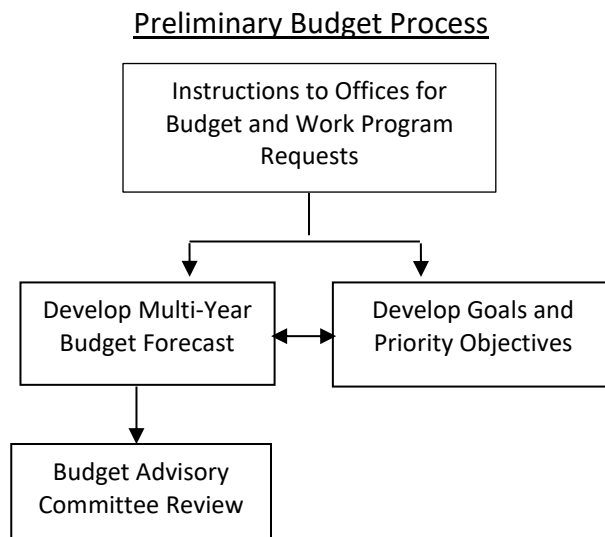
The South Coast AQMD budget process begins with the Assistant Deputy Executive Officer of Finance issuing instructions and guidelines to the Offices. Under the guidance of the Executive Officer, the Chief Operating Officer and the Assistant Deputy Executive Officer of Finance, the Offices also begin establishing Goals and Priority Objectives for the fiscal year. The proposed annual budget and multi-year forecast is then developed by the Offices, Finance, Executive Council, Chief Operating Officer and the Executive Officer based on the Goals and Priority Objectives as well as guidelines issued by the Executive Officer. Each Office submits requests for staffing, select Salary accounts, Services and Supplies accounts, and the Capital Outlays account. The remaining salary and benefit costs are developed by Finance. Capital expenditure requests

are reviewed by an in-house committee who prioritizes the requests. Revenue projections are developed by Finance based on input received from the appropriate Offices and incorporate any proposed changes to Regulation III - Fees. This information is integrated into an initial budget request, including a multi-year forecast, and then fine-tuned under the direction of the Chief Operating Officer and the Executive Officer to arrive at a proposed budget. The public, business community, and other stakeholders have several opportunities to participate in the budget process, up to and at the budget adoption hearing by the Governing Board, including:

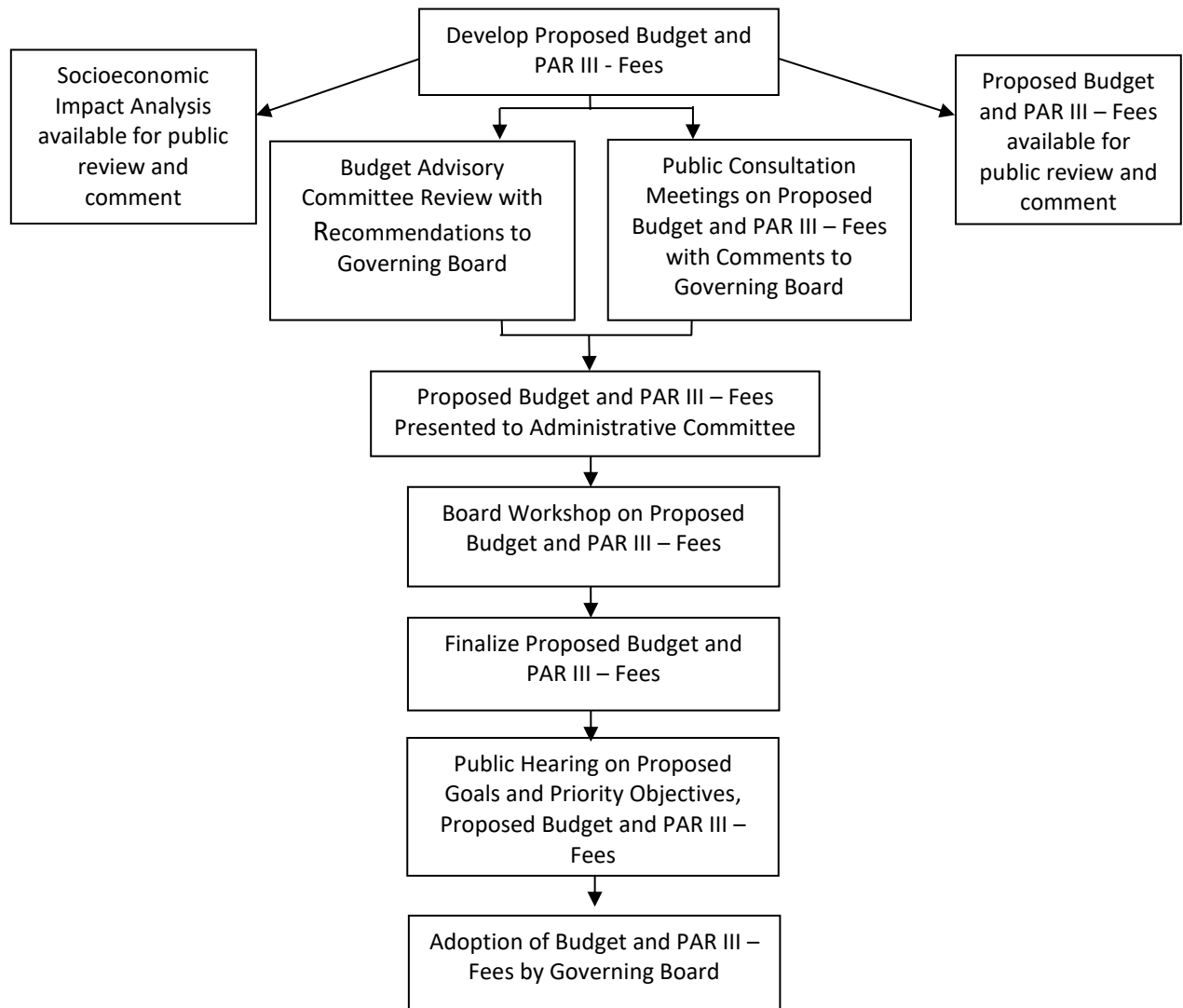
- two meetings of the Budget Advisory Committee whose members include various stakeholder representatives
- one public consultation meeting to discuss the proposed amendments to Regulation III - Fees and a second public consultation meeting to discuss the proposed budget and proposed amendments to Regulation III - Fees
- a public hearing on the Proposed Budget and Work Program and Proposed Amended Regulation (PAR) III – Fees

The proposed budget is presented to South Coast AQMD’s Governing Board at a budget workshop and to South Coast AQMD’s Administrative Committee. Any public comments and Budget Advisory Committee recommendations are submitted to the Governing Board by April 15 of each year. The proposed budget, including Regulation III - Fees, is adopted by the Governing Board and is in place on July 1 for the start of the new fiscal year.

The following flow charts represent the major milestones and processes that take place in developing South Coast AQMD’s budget:



### Annual Budget Process



<b>Budget Timeline</b>	
Budget submissions received from Offices	Jan 18, 2019
Budget Advisory Committee meeting	Jan 18, 2019
Budget Advisory Committee meeting on proposed budget and PAR III – Fees	April 5, 2019
Proposed budget available for public review	April 9, 2019
Public Consultation Meeting on proposed budget and PAR III - Fees	April 9, 2019
Public comments and Budget Advisory Committee recommendations submitted to Governing Board	April 12, 2019
Proposed budget and PAR III – Fees presented to Administrative Committee	April 12, 2019
Governing Board Budget Study Session	April 12, 2019
Public Hearing & Governing Board adoption of budget and PAR III – Fees	May 3, 2019

## Proposed Budget & Work Program

### Budget Overview

The budget for FY 2019-20 is a balanced budget with revenues/transfers in and expenditures/transfers out of \$170.9 million. To compare against prior years, the following table shows South Coast AQMD’s amended budget and actual expenditures for FY 2017-18, adopted and amended budgets for FY 2018-19 and proposed budget for FY 2019-20.

Description	FY 2017-18 Amended	FY 2017-18 Actual	FY 2018-19 Adopted	FY 2018-19 Amended <sup>1</sup>	FY 2019-20 Proposed
Staffing	872	-	876.4	938	939
Revenue/Transfers In	\$158.7	\$161.9	\$162.6	\$167.5	\$170.9
Expenditures/ Transfers Out	\$164.2	\$153.1	\$162.6	\$175.9	\$170.9

<sup>1</sup> Includes Board approved changes through March 2019

The FY 2019-20 proposed budget reflects a decrease of \$5.0 million in expenditures/transfers out from the FY 2018-19 amended budget and an increase of \$8.3 million in expenditures/transfers out from the budget adopted for FY 2018-19. The increase in expenditures/transfers out from the FY 2018-19 adopted budget can be attributed to increases in retirement costs, salaries associated with 62.6 new positions under the AB 617 Community Air Protection Program, the Volkswagen Settlement Project, the China Partnership for Cleaner Shipping, Rule 1180 implementation and the Career Development Intern Program, and a transfer to the Health Effects Research Fund. The FY 2019-20 proposed budget of 939 positions has a net increase of one position over the FY 2018-19 amended budget with the addition of two positions in Legislative and Public Affairs/Media Office and the deletion of the Chief Administrative Officer position.

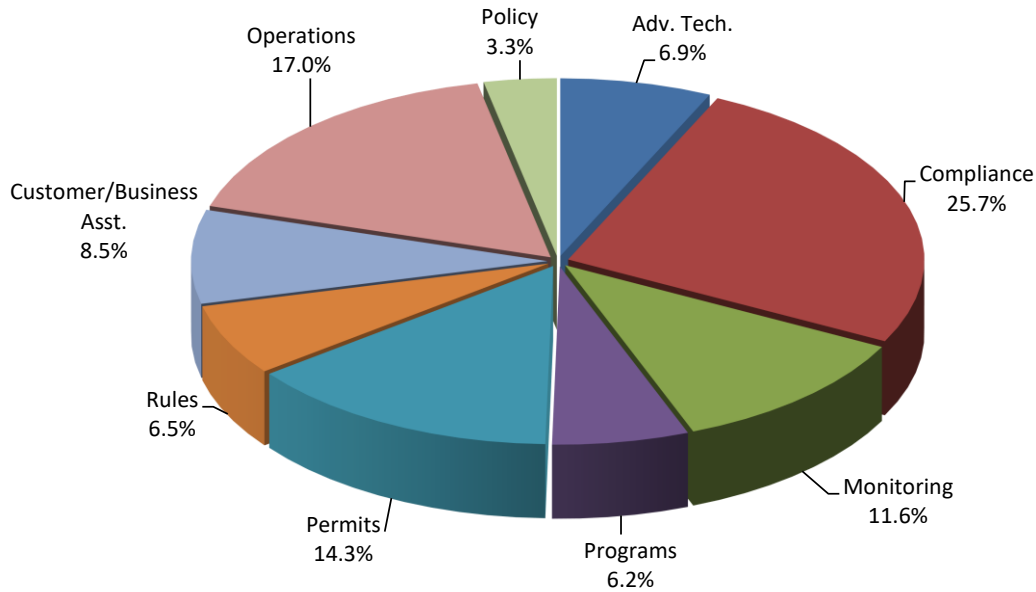
## Expenditures

### Work Program

South Coast AQMD expenditures are organized into nine Work Program Categories: Advance Clean Air Technology; Ensure Compliance with Clean Air Rules; Customer Service and Business Assistance; Develop Programs to Achieve Clean Air; Develop Rules to Achieve Clean Air; Monitoring Air Quality; Operational Support; Timely Review of Permits; and Policy Support. Each category consists of a number of Work Programs, or activities, which are classified according to the nature of the activity being performed.

Each Work Program ties to the goals and objectives of the agency and identifies resources, performance measures/outputs and legal mandates. A complete description of each program category along with a detailed work program sort by program is included in the Goals and Priority Objectives and Work Program section. The pie chart that follows represents the budgeted expenditures by Program Category for FY 2019-20.

## Work Program Category Expenditures



The following table compares South Coast AQMD Work Program expenditures by category for the FY 2018-19 adopted budget and FY 2019-20 proposed budget.

Work Program Categories	FY 2018-19 Adopted Budget	FY 2019-20 Proposed Budget
Advance Clean Air Technology	\$ 11,108,263	\$ 11,780,542
Customer Service and Business Assistance	14,496,926	14,558,947
Develop Programs to Achieve Clean Air	9,387,075	10,589,771
Develop Rules to Achieve Clean Air	10,982,868	11,082,515
Ensure Compliance with Clean Air Rules	43,655,133	43,912,182
Monitoring Air Quality	15,150,150	19,764,170
Operational Support	28,105,108	29,113,274
Policy Support	5,066,054	5,648,222
Timely Review of Permits	24,679,524	24,447,102
<b>Total</b>	<b>\$ 162,631,101</b>	<b>\$170,896,725</b>

Account Categories

The following table compares the FY 2018-19 adopted budget and the FY 2018-19 amended budget to the proposed budget for FY 2019-20 by account category. The FY 2018-19 amended budget includes the Board-approved mid-year adjustments through March 2019.

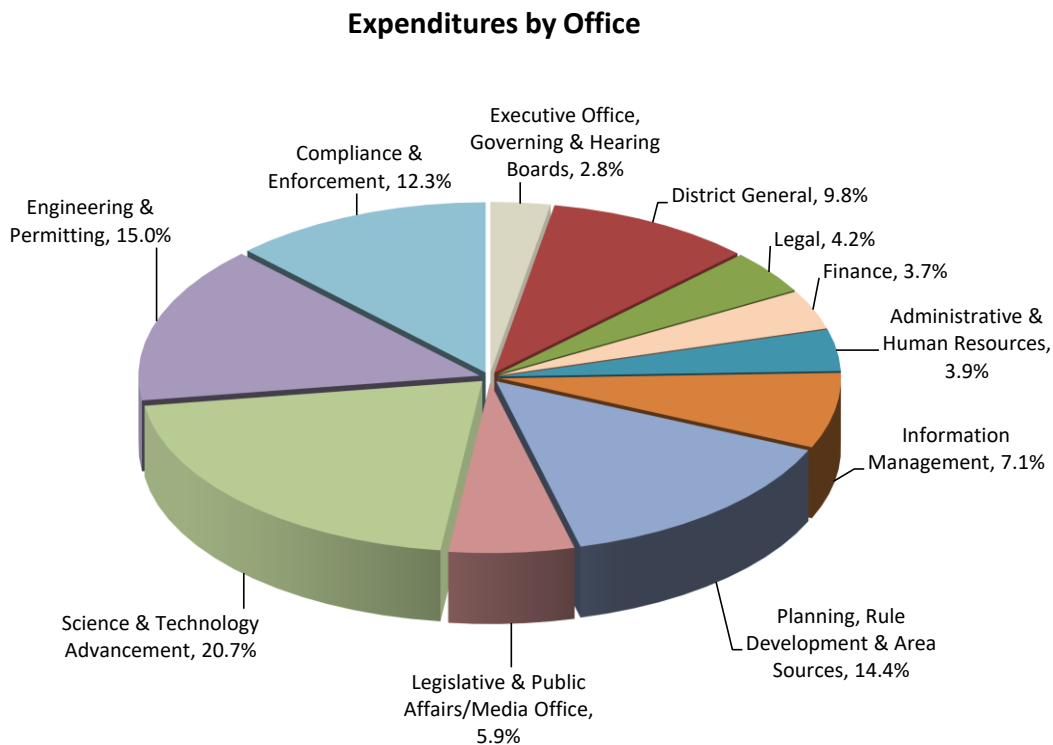
<b>Account Description</b>	<b>FY 2018-19 Adopted Budget</b>	<b>FY 2018-19 Amended Budget</b>	<b>FY 2019-20 Proposed Budget</b>
Salaries/Benefits	\$132,868,320	\$134,484,879	\$141,667,712
Insurance	1,317,400	1,382,900	1,317,400
Rents	761,071	814,573	511,823
Supplies	2,510,982	3,445,623	2,880,142
Contracts and Services	10,523,187	14,253,370	10,230,004
Maintenance	2,367,143	2,708,872	1,825,343
Travel/Auto Expense	940,445	1,107,751	931,323
Utilities	1,959,620	2,147,788	1,959,620
Communications	717,800	742,573	707,800
Capital Outlays	1,088,300	5,010,344	395,000
Other	1,386,433	1,577,059	1,438,583
Debt Service	6,190,400	6,190,400	6,190,622
Transfers Out	-	2,063,229	841,353
<b>Total</b>	<b>\$162,631,101</b>	<b>\$175,929,361</b>	<b>\$170,896,725</b>

As mentioned previously, the proposed budget for FY 2019-20 represents an approximately \$5.0 million decrease in expenditures from the FY 2018-19 amended budget. The FY 2018-19 amended budget includes mid-year increases associated with the following: the development of a new South Coast AQMD mobile app; the purchase of integrated filter-based samplers for monitoring and laboratory activities; further development of the online permitting modules and security portal system enhancements; consultant services for an impact assessment of a potential indirect source rule on local warehouses; Office 365 licenses and services; the purchase of services and supplies for the fifth Multiple Air Toxics Exposure Study (MATES V); the purchase of fleet vehicles, services and supplies and capital budget for critical projects and programs; the purchase of educational kits to provide learning opportunities for high school students and teachers on air quality; staff for the China Partnership for Cleaner Shipping Project; staff, capital outlay expenditures and contractual services for the Community Air Protection Program under AB 617 and Rule 1180 implementation; staff for the VW Mitigation Projects; and grant-related expenditures offset by revenue.



## Office Categories

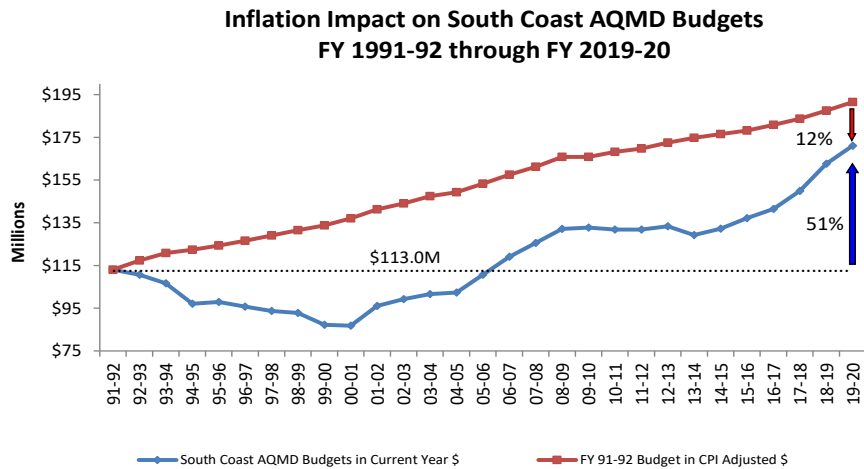
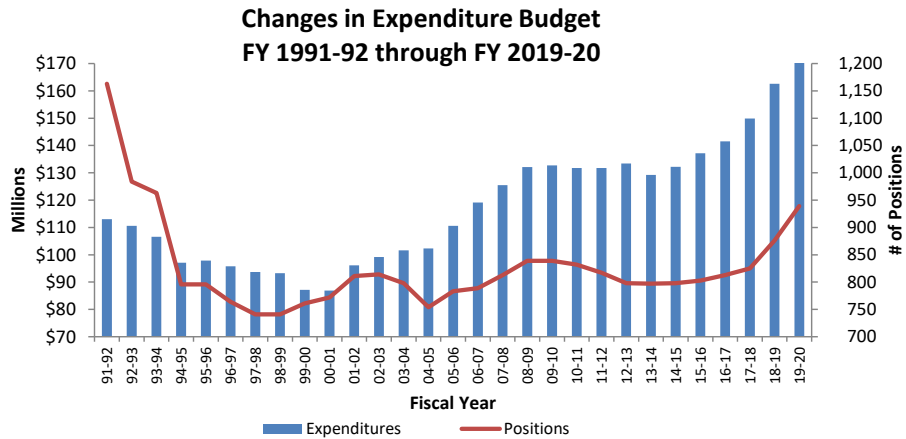
The following pie chart represents budgeted expenditures by Office for FY 2019-20.



## Budget Strategy

Over the years, South Coast AQMD has focused on streamlining many of its operations while still meeting its program commitments despite new federal and state mandates and increased workload complexity. The focus has been, and continues to be, on reducing or maintaining expenditure levels in the Major Object of Services and Supplies and maximizing the efficient use of staff resources to enable select vacant positions to remain vacant, be deleted or be unfunded whenever possible. However, In FY 2017-18, South Coast AQMD's workload increased substantially when the agency began to receive funding from the California Resource Board under AB 617 to reduce exposure in neighborhoods most impacted by air pollution as well as funding under the AB 134 Community Air Protection Fund. An additional 83 new positions funded by AB 617 and 11 positions funded by AB 134 have been added, along with various services, supplies and capital equipment, to support these programs. Nonetheless, South Coast AQMD's focus continues to be on the efficient use of its resources to keep expenditure and staffing levels as low as possible. In addition, the budgeted vacancy rate is reviewed and adjusted, as necessary, as part of the annual budget process. These efforts have resulted in reduced program costs overall and a balanced budget for FY 2019-20. The following charts show South Coast AQMD's staffing and budget levels starting in FY 1991-92 when staffing was at 1,163 FTEs. The proposed budget for FY 2019-20 reflects a staffing level of 939 FTEs. This staffing level is 19% (224 FTEs) below the FY 1991-92 level.

The FY 2019-20 proposed budget is 51% higher when compared to the FY 1991-92 adopted budget of \$113 million. However, after adjusting the FY 1991-92 adopted budget for CPI over the last 28 years, the FY 2019-20 proposal is 12% lower.



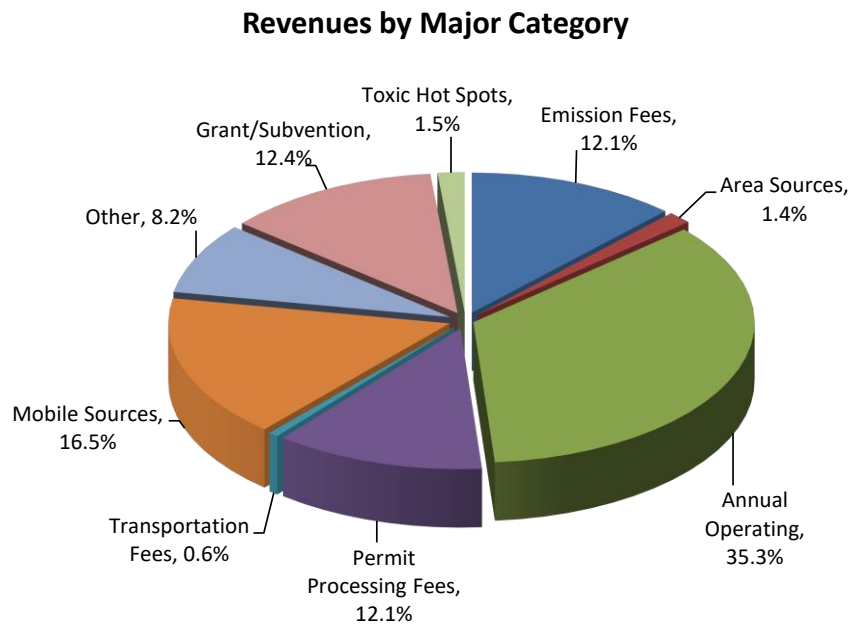
Note: CPI adjustment based on California Consumer Price Index for the preceding Calendar Year

## Revenues

### Revenue Categories

Each year, in order to meet its financial needs, the South Coast AQMD Governing Board adopts a budget supported by a system of annual operating and emission fees, permit processing fees, toxic “hot spots” fees, area sources fees, source test/analysis fees, and transportation plan fees. In FY 2019-20, these fees are projected to generate approximately \$107.3 million or about 63% of South Coast AQMD revenues; of this \$107.3 million, \$100.7 million or 59% of South Coast AQMD’s projected revenues are from stationary sources. Other sources, which include

penalties/settlements, Hearing Board fees, interest, and miscellaneous income, are projected to generate approximately 8% of total revenues in FY 2019-20. The remaining 29% of revenue is projected to be received in the form of federal and state grants, California Air Resource Board (CARB) subvention, and California Clean Air Act motor vehicle fees. Beginning in Fiscal Year 1978-79 Budget, the South Coast AQMD became a fee supported agency no longer receiving financial support from property taxes. The FY 2019-20 proposed revenue budget includes a proposed CPI fee adjustment of 3.5% and the third and final year of the June 2017 Board approved additional fee adjustment for Title V facilities to permit processing fees and annual operating permit renewal fees of 10.66% in order to better align program costs with revenue. The following pie chart represents revenues by Major Category for FY 2019-20.



The following table compares the FY 2018-19 adopted revenue budget and the FY 2018-19 amended revenue budget to the proposed revenue budget for FY 2019-20. The FY 2018-19 amended revenue budget includes Board-approved mid-year changes through March 2019.

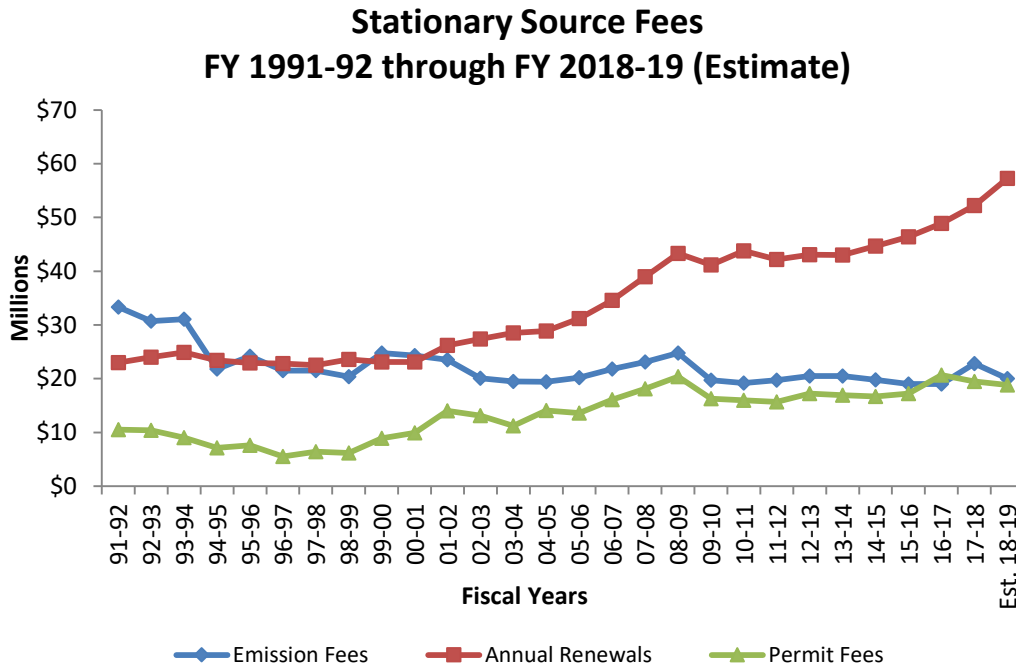
<b>Revenue Description</b>	<b>FY 2018-19 Adopted Budget</b>	<b>FY 2018-19 Amended Budget</b>	<b>FY 2019-20 Proposed Budget</b>
Annual Operating Emission Fees	\$ 19,729,280	\$ 19,729,280	\$ 20,675,800
Annual Operating Permit Renewal Fees	57,270,930	57,270,930	59,351,020
Permit Processing Fees	19,856,640	19,856,640	20,643,870
Portable Equipment Registration Program	1,200,000	1,200,000	1,000,000
Area Sources	2,274,800	2,274,800	2,277,000
Grants/Subvention	16,888,530	19,829,869	21,155,180
Mobile Sources	30,625,320	30,625,754	28,129,833
Transportation Programs	951,280	951,280	963,900
Toxic Hot Spots	2,849,590	2,849,590	2,647,420
Other <sup>1</sup>	9,700,141	8,173,002	9,763,002
Transfers In	1,284,590	4,750,449	4,289,700
<b>Total</b>	<b>\$162,631,101</b>	<b>\$167,511,594</b>	<b>\$170,896,725</b>
<sup>1</sup> Includes revenues from Interest, Lease Income, Source Testing, Hearing Board, Penalties/Settlements, Subscriptions, and Other.			

Over the past two decades, total permit fees (including permit processing, annual operating permit, and annual emissions-based fees) collected from stationary sources has increased by about 44% from \$66.8 million in FY 1991-92 to \$96.1 million (estimated) in FY 2018-19. When adjusted for inflation however, stationary source revenues have decreased by 16% over this same period.

Mobile source revenues that are subvended to the South Coast AQMD by the Department of Motor Vehicles (DMV) are projected to increase slightly from the FY 2018-19 budgeted amounts based on vehicle registration information from the DMV and recent revenue received. In addition, this category reflects reimbursements of incentive programs (Clean Fuels, Carl Moyer, Prop 1B, and AB 134) whose contract activities and revenues are recorded in special revenue funds (outside the General Fund). These incentive program costs incurred by the General Fund are reimbursed to the General Fund from the various special revenue funds (subject to any administrative caps) and are reflected under the Mobile Source revenue category.

Revenues from the federal government, (Environmental Protection Agency, Department of Homeland Security, and Department of Energy) are projected to increase in FY 2019-20 from FY 2018-19 budgeted levels reflecting the anticipated level of federal funding from one-time and on-going grants in support of air quality efforts. State Subvention funding is expected to remain at the current level for FY 2019-20. In addition, funding from CARB for the AB 617 Community Air Protection Program is expected to increase from the FY 2018-19 budgeted level.

The following graph tracks actual stationary source revenues by type of fee from FY 1991-92 (when CPI limits were placed on South Coast AQMD fee authority) to estimated revenues for FY 2018-19.



### Debt Structure

#### Pension Obligation Bonds

These bonds were issued jointly by the County of San Bernardino and the South Coast AQMD in December 1995. In June 2004 the South Coast AQMD went out separately and issued pension obligation bonds to refinance its respective obligation to the San Bernardino County Employee’s Retirement Association (SBCERA) for certain amounts arising as a result of retirement benefits accruing to members of the Association.

The annual payment requirements under these bonds are as follows:

Year Ending June 30	Principal	Interest	Total
2020	\$ 3,686,640	\$ 3,503,982	\$ 7,190,622
2021	3,840,443	3,353,106	7,193,549
2022	4,006,881	3,186,361	7,193,242
2023	3,780,000	348,736	4,128,736
2024	4,010,000	118,897	4,128,897
Total	\$19,323,964	\$10,511,082	\$29,835,046

## Fund Balance

South Coast AQMD is projecting an Unreserved (Unassigned) Fund Balance for June 30, 2020 of \$43,597,488 in addition to the following Reserved and Unreserved Designated Fund Balances for FY 2019-20.

Classification	Reserves/Unreserved Designations	Amount
Committed	Reserve for Encumbrances	\$ 16,321,000
Nonspendable	Reserve for Inventory of Supplies	80,000
	Unreserved Designations:	
Assigned	For Enhanced Compliance Activities	883,018
Assigned	For Other Post Employment Benefit (OPEB) Obligations	2,952,496
Assigned	For Permit Streamlining	234,159
Assigned	For Self-Insurance	2,000,000
Assigned	For Unemployment Claims	80,000
Total Reserved & Unreserved Designations		\$ 22,550,673

Reserves are portions of the fund balance set aside for future use and are therefore not available for appropriation. These funds are made-up of encumbrances which represent the estimated amount of current and prior years' purchase orders and contract commitments at year-end and inventory which represents the value at cost of office, computer, cleaning and laboratory supplies on hand at year-end.

Unreserved Designations in the fund balance indicate plans for use of financial resources in future years. The Designation for Enhanced Compliance Activities provides funding for inspection/compliance efforts. The Designation for Other Post Employment Benefit Obligations (OPEB) provides funding to cover the current actuarial valuation of the inherited OPEB obligation for long-term healthcare costs from the County of Los Angeles resulting from the consolidation of the four county Air Pollution Control Districts (APCDs). The Designation for Permit Streamlining was established to fund program enhancements to increase permitting efficiency and customer service. South Coast AQMD is self-insured for general liability, workers' compensation, automobile liability, premises liability, and unemployment.

## Long-Term Projection

South Coast AQMD continues to face a number of challenges in the upcoming years, including continued higher operating costs, the need for major information technology and building infrastructure improvement projects, and growing program commitments while meeting air quality goals and permit processing targets. Recruiting, training and retaining the high level of technical staffing expertise necessitated by the Community Air Protection Program established

in 2017 under AB 617, the VW Mitigation Settlement Projects, the Refinery Fenceline Air Monitoring Plans under Rule 1180, and additional incentive funding under AB 134, as well as for South Coast AQMD’s ongoing projects and programs, will continue to be an issue further complicated by the increasing number of retirements among our current staff.

Increasing retirement costs and any future actions SBCERA may take which could significantly impact South Coast AQMD’s level of expenditures remains a primary uncertainty. Any legislative action that may impact the level of federal and state funding from grant awards, particularly AB 617 funding, and subvention funds is another unknown that must be considered as South Coast AQMD plans for the future. Cost recovery within the constraints of Proposition 26 is an additional uncertainty as South Coast AQMD strives to balance program operating expenses with revenues collected from fees.

In order to face these challenges, South Coast AQMD has a five year plan in place that provides for critical infrastructure improvement projects, maintains a stable vacancy rate in order to maximize cost efficiency, better aligns program revenues with costs, and strives to keep the percentage of unreserved fund balance to revenue within the Governing Board policy of 20%.

The following chart, outlining South Coast AQMD’s financial projection over this time period, shows the agency’s commitment to meet these challenges and uncertainties while protecting the health of the residents within the South Coast AQMD boundaries and remaining sensitive to business. Starting in FY 2023-24, South Coast AQMD will realize a \$3.1M savings in Pension Obligation Bond payments.

<b>Fiscal 2018-19 Estimate and Five Year Projection</b>						
<b>(\$ in Millions)</b>						
	<b>FY 18-19 Estimate</b>	<b>FY 19-20 Proposed</b>	<b>FY 20-21 Projected</b>	<b>FY 21-22 Projected</b>	<b>FY 22-23 Projected</b>	<b>FY 23-24 Projected</b>
STAFFING	938	939	939	939	939	939
REVENUES/TRANSFERS IN*	\$165.5	\$170.9	\$175.1	\$175.0	\$176.1	\$178.4
EXPENDITURES/TRANSFERS OUT	\$170.6	\$170.9	\$180.7	\$184.0	\$185.0	\$179.2
Change in Fund Balance	-\$5.1	-	-\$5.6	-\$9.0	-\$8.9	-\$0.8
UNRESERVED FUND BALANCE (at year-end)	\$49.7	\$49.7	\$44.1	\$35.1	\$26.2	\$25.4
<b>% of REVENUE</b>	<b>30%</b>	<b>29%</b>	<b>25%</b>	<b>20%</b>	<b>15%</b>	<b>14%</b>
*Includes proposed CPI fee increase of 3.5% for FY 2019-20 with the third and final year of an additional 10.66% increase for Title V annual operating permit renewal and permit processing fees; a CPI of 3.7% for FY 2020-21; a CPI of 3.2% for FY 2021-22; a CPI of 2.9% for FY 2022-23; and a CPI of 2.8% for FY 2023-24. Starting in FY 2021-22, assumes on-going AB 617 revenue.						

As part of the Five Year Projection, South Coast AQMD has identified projected building maintenance and capital outlay improvement projects for its headquarters building. These projects are outlined in the following chart. In addition, the Infrastructure Improvement Special Revenue Fund was created with unanticipated one-time revenues from the General Fund for some of the capital outlay building-related improvement projects. The primary project proposed to be funded from the Infrastructure Improvement Fund is retrofitting the elevators in the South Coast AQMD headquarters building.

<b>GENERAL FUND POTENTIAL BUILDING MAINTENANCE and CAPITAL OUTLAY PROJECTS FY 2019-20 through 2023-24</b>
Child Care Building Roof Replacement
Elevator Retrofits
Carpet Installation 3 <sup>rd</sup> & 4 <sup>th</sup> Floor
Air Handler Fan Walls Retrofit
Leibert AC Units-Computer Room Replacement
Gaylord Air Scrubbers Replacement
Energy Management System Upgrade
Aging Kitchen Equipment Replacement
Pneumatic Controls to Direct Digital Control Conversion
Restroom and Copy/Coffee Sink and Counter Tops Replacement
Vinyl Wall Covering (Various Areas) Replacement
Saw Tooth Lab Roof Refurbishment
Restroom Panels Refurbishment/Replacement
Roofing Surface - Recoat
Parking Lot Repair and Reseal
Sidewalks and Curbs -Concrete Repair
Fire Life Safety System Upgrade
Lighting Controls Upgrade
Can Lighting Retrofit (LED)
Patio Area - Rebuild/Recompact
Building Interior - Repaint
Landscape Renovation
Parking Lot Lights LED Conversion
Conference Center - Repaint and Wallpaper
VCT Tiles (Various Areas) Replacement
Upper Parking Deck Repair and Re-coating
EVES Charger and Support System Upgrades
Fluorescent Office Lighting to LED Conversion





**SOUTH COAST**

**AIR QUALITY MANAGEMENT DISTRICT**

**SUMMARY OF FISCAL YEAR 2019-20 PROPOSED BUDGET**

	<b>FY 2018-19 Adopted Budget</b>	<b>FY 2018-19 Amended Budget <sup>1</sup></b>	<b>FY 2018-19 Estimate <sup>2</sup></b>	<b>FY 2019-20 Proposed</b>
<b>Funding Sources</b>				
Revenue	\$ 161,346,511	\$ 162,761,145	\$ 160,546,575	\$ 166,607,025
Transfers-In	1,284,590	4,750,449	4,907,253	4,289,700
<b>Total Funding Sources</b>	<b>\$ 162,631,101</b>	<b>\$ 167,511,594</b>	<b>\$ 165,453,828</b>	<b>\$ 170,896,725</b>
<b>Funding Uses</b>				
Salaries & Employee Benefits	\$ 132,868,320	\$ 134,484,879	\$ 129,105,617	\$ 141,667,712
Services & Supplies	28,674,481	34,370,909	34,370,909	27,992,660
Capital Outlays	1,088,300	5,010,344	5,010,344	395,000
Transfers-Out	-	2,063,229	2,063,229	841,353
<b>Total Funding Uses</b>	<b>\$ 162,631,101</b>	<b>\$ 175,929,361</b>	<b>\$ 170,550,099</b>	<b>\$ 170,896,725</b>

<b>Fund Balances - Reserves &amp; Unreserved Designations</b>	<b>Classification</b>	<b>Projected June 30, 2019</b>	<b>Projected June 30, 2020</b>
Reserve for Encumbrances	Committed	\$ 14,941,000	\$ 16,321,000
Reserve for Inventory of Supplies	Nonspendable	80,000	80,000
Designated for Enhanced Compliance Activities	Assigned	883,018	883,018
Designated for Other Post Employment Benefit (OPEB) Obligations	Assigned	2,952,496	2,952,496
Designated for Permit Streamlining	Assigned	234,159	234,159
Designated for Self-Insurance	Assigned	2,000,000	2,000,000
Designated for Unemployment Claims	Assigned	80,000	80,000
<b>Total Reserves &amp; Unreserved Designations</b>		<b>\$ 21,170,673</b>	<b>\$ 22,550,673</b>
Unassigned Fund Balance	Unassigned	\$ 43,502,488	\$ 43,597,488
<b>Total Fund Balances</b>		<b>\$ 64,673,161</b>	<b>\$ 66,148,161</b>

<sup>1</sup> The FY 18-19 Amended Budget includes mid-year changes through March 2019.

<sup>2</sup> Includes estimated encumbrances of \$10,800,000 which will be applicable to the fiscal year ending June 30, 2019.

**ANALYSIS OF PROJECTED JUNE 30, 2019 FUND BALANCE**

<b>Fund Balances as of June 30, 2018</b>		
Reserves	\$ 11,294,214	
Designated	7,228,892	
Unassigned	47,532,700	
<b>Total Fund Balances, June 30, 2018</b>	<b>\$ 66,055,806</b>	
<b>Add Excess Fiscal Year 2018-19 Revenues over Expenditures</b>		
Revenues	\$ 165,453,828	
Expenditures <sup>1</sup>	157,682,244	
<b>Sub-Total</b>	<b>\$ 7,771,584</b>	
Deduct Decrease in Encumbrances Open on June 30, 2019		(7,091,000)
Deduct Projected FY 2018-19 Transfers Out to Other Funds		(2,063,229)
<b>Total Projected Fund Balances, June 30, 2019</b>	<b>\$ 64,673,161</b>	
<b>Fund Balances (Projected) at June 30, 2019</b>		
Reserve for Encumbrances	\$ 14,941,000	
Reserve for Inventory of Supplies	80,000	
Designated for Enhanced Compliance Activities	883,018	
Designated for Other Post Employment Benefit (OPEB) Obligations	2,952,496	
Designated for Permit Streamlining	234,159	
Designated for Self-Insurance	2,000,000	
Designated for Unemployment Claims	80,000	
Unassigned	43,502,488	
<b>Total Projected Fund Balances, June 30, 2019</b>	<b>\$ 64,673,161</b>	
Note: This analysis summarizes the estimated amount of funds that will be carried into FY 2019-20.		
<sup>1</sup> Expenditures do not include estimated \$10,800,000 encumbrances for the Fiscal Year ended June 30, 2019.		

**SCHEDULE OF AVAILABLE FINANCING AND PROPOSED FISCAL YEAR 2019-20  
RESERVES AND DESIGNATIONS**

Fund Balances	\$ 64,673,161	
Emission Fees	20,675,800	
Annual Renewal Fees	59,351,020	
Permit Processing Fees	20,643,870	
Portable Equipment Registration Program	1,000,000	
State Subvention	3,924,550	
State Grant	11,090,280	
Federal Grant	6,140,350	
Interest Revenue	1,718,490	
Lease Revenue	176,960	
Source Test/Analysis Fees	755,550	
Hearing Board Fees	217,350	
Penalties and Settlements	5,000,000	
Area Sources	2,277,000	
Transportation Programs	963,900	
Mobile Sources/Clean Fuels	28,129,833	
Air Toxics "Hot Spots"	2,647,420	
Other Revenues/Transfers In	6,184,352	
Total Funds		\$ 235,569,886
Less Proposed Fiscal Year 2019-20 Reserves and Designations		
Reserve for Encumbrances	\$ 16,321,000	
Reserve for Inventory of Supplies	80,000	
Designated for Enhanced Compliance Activities	883,018	
Designated for Other Post Employment Benefit (OPEB) Obligations	2,952,496	
Designated for Permit Streamlining	234,159	
Designated for Self-Insurance	2,000,000	
Designated for Unemployment Claims	80,000	
Total Proposed Reserves and Designations		\$ 22,550,673
Available Financing		\$ 213,019,213

**ANALYSIS OF PROJECTED JUNE 30, 2020 FUND BALANCE**

Fund Balances as of June 30, 2019		
Reserves	\$ 15,021,000	
Designated	6,149,673	
Unassigned	43,502,488	
Total Fund Balances, June 30, 2019		\$ 64,673,161
Add Excess Fiscal Year 2019-20 Revenues over Expenditures		
Revenues	\$ 170,896,725	
Expenditures <sup>1</sup>	160,076,725	
Sub-Total		\$ 10,820,000
Deduct Decrease in Encumbrances Open on July 1, 2019		(9,345,000)
Total Projected Fund Balances, June 30, 2020		\$ 66,148,161
Fund Balances (Projected) Fiscal Year 2019-20		
Reserve for Encumbrances		\$ 16,321,000
Reserve for Inventory of Supplies		80,000
Designated for Enhanced Compliance Activities		883,018
Designated for Other Post Employment Benefit (OPEB) Obligations		2,952,496
Designated for Permit Streamlining		234,159
Designated for Self-Insurance		2,000,000
Designated for Unemployment Claims		80,000
Unassigned		43,597,488
Total Projected Fund Balances, June 30, 2020		\$ 66,148,161

<sup>1</sup> Expenditures do not include estimated \$10,820,000 encumbrances for the Fiscal Year ended June 30, 2020.

Revenue Comparison				
Revenue Account	FY 2017-18 Actual	FY 2018-19 Adopted Budget	FY 2018-19 Estimated	FY 2019-20 Proposed
Emission Fees	\$ 22,786,660	\$ 19,729,280	\$ 19,989,573	\$ 20,675,800
Annual renewal Fees	51,006,780	57,270,930	56,105,118	59,351,020
Permit Processing Fees	19,538,295	19,856,640	18,828,740	20,643,870
Portable Equipment Registration Program	1,175,989	1,200,000	1,225,815	1,000,000
State Subvention	3,939,075	3,939,080	3,924,547	3,924,550
State Grant	5,319,196	8,075,000	11,006,597	11,090,280
Federal Grant	7,949,213	4,874,450	7,833,919	6,140,350
Interest Revenue	1,041,333	1,116,070	1,412,411	1,718,490
Lease Revenue	147,660	166,980	166,682	176,960
Source Test/Analysis Fees	663,011	781,700	698,635	755,550
Hearing Board Fees	351,979	258,500	139,946	217,350
Penalties and Settlements	14,316,145	5,000,000	6,554,100	5,000,000
Area Sources	2,293,947	2,274,800	2,274,800	2,277,000
Transportation Programs	845,718	951,280	1,020,317	963,900
Mobile Sources/Clean Fuels	22,015,710	30,625,320	26,006,515	28,129,833
Air Toxics "Hot Spots"	2,538,247	2,849,590	2,557,890	2,647,420
Other Revenues/Transfers In	5,992,113	3,661,481	5,708,228	6,184,352
Total Revenue	\$ 161,921,070	\$ 162,631,101	\$ 165,453,828	\$ 170,896,725

## EXPLANATION OF REVENUE SOURCES

### **Annual Operating Emissions Fees**

The Lewis-Presley Air Quality Management Act (Health & Safety Code Section 40400-40540) authorizes the South Coast AQMD to collect fees for permitted sources to recover the costs of District programs related to these sources. (Health & Safety Code 40410(b)). South Coast AQMD initiated an annual operating emissions fees program in January 1978. As the program currently exists, all permitted facilities pay a flat fee for up to four tons of emissions. In addition to the flat fee, facilities that emit four tons or greater (from both permitted and unpermitted equipment) of any organic gases, specific organics, nitrogen oxides, sulfur oxides, or particulate matter, or 100 tons per year or greater of carbon monoxide, also pay fees based on the facility's total emissions. These facilities pay for emissions from permitted equipment as well as emissions from unpermitted equipment and processes which are regulated, but for which permits are not required, such as solvent use. In addition, a fee-per-pound is assessed on the following toxic air contaminants and ozone depleters: ammonia; asbestos; benzene; cadmium; carbon tetrachloride; chlorinated dioxins and dibenzofurans; ethylene dibromide; ethylene dichloride; ethylene oxide; formaldehyde; hexavalent chromium; methylene chloride; nickel; perchloroethylene; 1,3-butadiene; inorganic arsenic; beryllium; polynuclear aromatic hydrocarbons (PAHs); vinyl chloride; lead; 1,4-dioxane; trichloroethylene; chlorofluorocarbons (CFCs); and 1,1,1-trichloroethane. The rates are set forth in South Coast AQMD Rule 301.

*FY 2019-20 Proposed Budget:* The non-RECLAIM emissions are based on Annual Emission Report (AER) data for Calendar Year 2017. The RECLAIM NO<sub>x</sub> and SO<sub>x</sub> emission projection is based on holdings according to the RECLAIM Trading Credit (RTC) listing. The flat emission fees are projected based on the number of active facilities with at least one permit. A 3.5% CPI increase is included.

### **Annual Operating Permit Renewal**

State law authorizes South Coast AQMD to have an annual permit renewal program and authorizes fees to recover the costs of the program (Health & Safety Code Section 42300; 40510(b)). The annual operating permit renewal program, initiated by the South Coast AQMD in February 1977, requires that all active permits be renewed on an annual basis upon payment of annual renewal fees. The annual renewal rates are established in South Coast AQMD Rule 301 and are based on the type of equipment, which is related to the complexity of related compliance activity. For basic equipment (not control equipment) the operating fee schedule also corresponds to some extent to the emission potential of the equipment. Along with annual operating emissions fees, annual operating permit renewal fees are intended to recover the costs of programs such as South Coast AQMD's compliance program, planning, rule making, monitoring, testing, source education, public outreach, civil enforcement, including the South Coast AQMD's Hearing Board, and stationary and area source research projects.

*FY 2019-20 Proposed Budget:* The projection is based on an estimated number of permits at the various equipment fee schedules. A 3.5% CPI increase is included. Also included is the third and final year of a phased-in increase approved by the Governing Board in June 2017 (a 10.66% increase for Title V annual operating permit renewal fees).

## EXPLANATION OF REVENUE SOURCES

### **Permit Processing Fees**

Under the Health & Safety Code 42300, South Coast AQMD may adopt and implement a program requiring that a permit be obtained from South Coast AQMD to construct or operate any equipment which emits or controls air pollution in South Coast AQMD's jurisdictional boundaries before the construction or operation of the equipment. South Coast AQMD has adopted rules requiring such permits, to ensure that equipment in South Coast AQMD's jurisdictional boundaries is in compliance with South Coast AQMD Rules and Regulations but exempts certain equipment which is deemed to have de minimis emissions (Rule 219). Permit fees are authorized by state law to recover the reasonable costs of the permit program involving permitting, planning, enforcement, and monitoring related activities. Permit processing fees support the permit processing program and the fee rate schedules for the different equipment categories are based on the average time it takes to process and issue a permit. Each applicant, at the time of filing, pays a permit processing fee which partially recovers the costs for normal evaluation of the application and issuance of the permit to construct and permit modifications. This category also includes fees charged to partially recover the costs of evaluation of plans, including but not limited to Rule 403 dust control plans, and Rule 1118 flare monitoring plans. The permit processing fees also cover the administrative cost to process Change of Operator applications, applications for Emission Reduction Credits, and Administrative Changes to permits. This category also includes a number of specific fees such as Title V permit processing fees, RECLAIM permit processing fees, CEQA and air quality modeling fees, and public noticing fees. Finally this category includes some fees that are related to specific activity such as asbestos notification and Rule 222 'registration in lieu of permit.'

Included in this year's budget is a new permit fee to recover the cost associated with revising and reissuing permits to facilities exiting the RECLAIM program in accordance with the South Coast AQMD's Governing Board resolution. Currently, RECLAIM facilities, including both Title V and non-Title V facilities, are subject to a South Coast AQMD-issued facility permit. The facility permit identifies conditions associated with compliance with the RECLAIM program. The process of exiting the RECLAIM program requires a re-evaluation of existing facility permits, with case-by-case analysis of each device (piece of equipment) for incorporation of Non-RECLAIM regulatory limits, monitoring, recordkeeping and reporting requirements, emission factors, emission limits, and removing permit conditions and requirements related to RECLAIM that are no longer applicable. This is a one-time fee for the proposed transition process associated with exiting the RECLAIM program.

*FY 2019-20 Proposed Budget:* The projection is based on the anticipated number and type of applications that will be processed. A 3.5% CPI increase is included. Also included is the third and final year of a phased-in increase approved by the Governing Board in June 2017 (a 10.66% increase for Title V permit processing fees).

### **Portable Equipment Registration Program (PERP)**

The California Air Resources Board (CARB) provides revenues to local air districts to offset the costs of inspecting equipment registered under CARB's Portable Equipment Registration Program (PERP). Fees for inspection of PERP-registered engines by South Coast AQMD field staff are collected by CARB at the time of registration and passed through to South Coast AQMD on an annual basis. Fees for



## EXPLANATION OF REVENUE SOURCES

inspection of all other PERP-registered equipment are billed at an hourly rate set forth in South Coast AQMD Rule 301, as determined by CARB and collected by South Coast AQMD at the time the inspection is conducted.

*FY 2019-20 Proposed Budget:* The revenue projection is based on the anticipated number of inspections.

### **Area Sources**

Emissions fees and quantity-based fees from architectural coatings revenue covers architectural coatings fair share of emissions supported programs. South Coast AQMD Rule 314 covers emission-based fees and quantity-based fees. Fees on area sources are authorized by Health & Safety Code §40522.5. Architectural coatings are assessed annually based on quantity (gallons) distributed or sold for use in South Coast AQMD's jurisdiction. This revenue allows South Coast AQMD to recover the costs of staff working on compliance, laboratory support, architectural coatings emissions data, rule development, and architectural coatings revenue collection.

*FY 2019-20 Proposed Budget:* Fees are based on the annual quantity and emissions of architectural coatings distributed or sold into or within and for use in the South Coast AQMD for the previous calendar year. Emissions are decreasing while sales volume is increasing. A 3.5% CPI increase is included.

### **California Air Resources Board Subvention**

Under Health and Safety Code Section 39800-39811, the State appropriates monies each year to CARB to subvene to the air quality districts engaged in the reduction of air contaminants pursuant to the basin wide air pollution control plan and related implementation programs. South Coast AQMD has received subvention funds since its inception beginning in 1977.

*FY 2019-20 Proposed Budget:* The current amount of \$3.9 million is included in the FY 2019-20 proposed budget.

### **State Grant**

Under AB 617, recently adopted by the state legislature, CARB funding is distributed to air districts to implement the Community Air Protection Program which includes monitoring and developing emissions reductions plans in disadvantaged communities with high cumulative exposure to air toxics.

*FY 2019-20 Proposed Budget:* The proposed budget includes the anticipated reimbursement from CARB funding for staff time, services and supplies, and equipment needed to implement the program.

### **Federal Grants/Other Federal Revenue**

South Coast AQMD receives funding from EPA Section 103 and 105 grants to help support the South Coast AQMD in its administration of active air quality control and monitoring programs where the South Coast AQMD is required to perform specific agreed-upon activities. Other EPA and Department of Energy (DOE) grants provide funding for various air pollution reduction projects. A Department of Homeland Security (DHS) grant funds a special particulate monitoring program. When stipulated in the grant agreement, the General Fund is reimbursed for administrative costs associated with grant-funded projects. Most federal grants are limited to specific purposes but EPA Section 105 grants are available for the general support of air quality-related programs.

*FY 2019-20 Proposed Budget:* The revenue projection is based on funding levels from current federal grants.

## EXPLANATION OF REVENUE SOURCES

### **Interest**

Revenue from this source is the result of investing South Coast AQMD's General Fund cash balances.

*FY 2019-20 Proposed Budget:* The revenue projection is based on average cash balances and anticipated interest rates.

### **Leases**

Revenue in this category is a result of leasing available space at South Coast AQMD's Headquarters facility.

*FY 2019-20 Proposed Budget:* The projection is based on the existing lease agreements

### **Source Test/Sample Analysis Fees**

Revenue in this category includes fees for source tests, test protocol and report reviews, continuous emissions monitoring systems (CEMS) evaluations and certifications, laboratory approval program (LAP) evaluations, and laboratory sample analyses. The revenue recovers a portion of the costs of performing tests, technical evaluations, and laboratory analyses.

*FY 2019-20 Proposed Budget:* The revenue projection is based on the anticipated number of tests and analyses. A 3.5% CPI increase is included.

### **Hearing Board**

Hearing Board revenue is from the filing of petitions for variances and appeals, excess emissions fees, and daily appearance fees. The revenue recovers a portion of the costs associated with these activities. Petitions for Orders for Abatement, which go before the Hearing Board, are filed by South Coast AQMD; therefore, there are no Hearing Board fees/revenue related to these proceedings.

*FY 2019-20 Proposed Budget:* The estimate is based on the projected number of hearings to be held and cases to be heard. A 3.5% CPI increase is included.

### **Penalties/Settlements**

The revenue from this source is derived from cash settlements for violations of permit conditions, South Coast AQMD Rules, or state law. This revenue source is available for the general support of the South Coast AQMD's programs.

*FY 2019-20 Proposed Budget:* It is anticipated that revenue in this category will be approximately \$5.0 million.

### **Mobile Sources**

Mobile Sources revenue is composed of five components: AB2766 revenue and administrative/program cost reimbursements from four programs: Carl Moyer, AB 134, Proposition 1B, and MSRC.

AB2766:

Section 9250.17 of the Vehicle Code gives the Department of Motor Vehicles (DMV) the authority and responsibility to collect and forward to South Coast AQMD four dollars for every vehicle registered in South Coast AQMD's jurisdictional boundaries. Thirty percent of the money (\$1.20 per vehicle) collected is recognized in South Coast AQMD's General Fund as mobile sources revenue and is used

## EXPLANATION OF REVENUE SOURCES

for programs to reduce air pollution from motor vehicles and to carry out related planning, monitoring, enforcement, and technical studies authorized by, or necessary to implement, the California Clean Air Act of 1988 or the South Coast AQMD Air Quality Management Plan. A proportionate share of programs that are not associated with any individual type of source (e.g., air quality monitoring) is supported by these revenues. The remaining monies are used to pay for projects to reduce air pollution from mobile vehicles: 40% (\$1.60 per vehicle) to the Air Quality Improvement Special Revenue Fund to be passed through to local governments and 30% (\$1.20 per vehicle) to the Mobile Source Air Pollution Reduction Fund (MSRC) to pay for projects recommended by the MSRC and approved by the South Coast AQMD Governing Board (see MSRC below).

### Carl Moyer Program:

The Carl Moyer Memorial Air Quality Standards Attainment Program (Carl Moyer Program) provides funding from the state of California for the incremental cost of cleaner heavy-duty vehicles, off-road vehicles and equipment, marine, and locomotive engines. The General Fund receives reimbursements from the Carl Moyer Fund for staff time and other program implementation/administration costs up to specified limits.

### AB 134:

AB 134 increases funding for the Carl Moyer program. The General Fund will receive reimbursements from the AB 134 Special Revenue Fund (up to 6.25 percent) for administrative costs incurred to implement the program.

### Proposition 1B:

The Proposition 1B Program is a \$1 billion bond program approved by California voters in November 2006. This incentive program is designed to reduce diesel emissions and public health risks from goods movement activities along California's trade corridors. The General Fund receives reimbursements from the Proposition 1B Funds for staff time and other program implementation/administration costs up to specified limits.

### MSRC:

MSRC revenue reflects the reimbursement from the Mobile Source Air Pollution Reduction Special Revenue Fund for the cost of staff support provided to the MSRC in administering a mobile source program. These administrative costs are limited by State law and the MSRC adopts a budget for staff support each year.

*FY 2019-20 Proposed Budget:* Revenue projections are based on vehicle registration data from the DMV, other state revenue received, and anticipated reimbursable implementation/administration costs for the Carl Moyer, AB 134, Prop 1B, and MSRC programs.

## Clean Fuels

The General Fund receives reimbursements from the Clean Fuels Program Special Revenue Fund for staff time and other program implementation/administration costs necessary to implement the Clean Fuels Program.

Section 9250.11 of the Vehicle Code gives the DMV authority to collect and forward to South Coast AQMD money for clean fuels technology advancement programs and transportation control measures related to motor vehicles, according to the plan approved pursuant to Health & Safety Code §40448.5. One dollar is collected by the DMV for every vehicle registered in South Coast AQMD's jurisdictional boundaries, forwarded to South Coast AQMD, and deposited in the Clean Fuels Program Special Revenue Fund.

Clean fuels fees from stationary sources are recorded in a separate revenue account within the Clean Fuels Program Special Revenue Fund. Fees authorized by Health & Safety Code §40512 are collected from sources that emit 250 tons or more per year of Nitrogen Oxides (NOx), Sulfur Oxides (SOx),

## EXPLANATION OF REVENUE SOURCES

Reactive Organic Compounds (ROC), or Particulate Matter (PM). The fees collected are used to develop and implement activities that promote the use of clean-burning fuels. These activities include assessing the cost effectiveness of emission reductions associated with clean fuels development and use of new clean fuels technologies, and other clean fuels related projects. The General Fund receives reimbursements from the Clean Fuels Program Fund for staff time and other program implementation/administration costs necessary to implement a Clean Fuels Program.

*FY 2019-20 Proposed Budget:* Revenue projections are based on anticipated reimbursable staff and other program costs to implement the Clean Fuels Program.

### **Transportation Programs**

In accordance with federal and state Clean Air Act requirements, South Coast AQMD's Rule 2202 – On-Road Vehicle Mitigation Options provides employers with various options to either reduce mobile source emissions generated from employee commutes or implement mobile source emission reduction programs. Employers with 250 or more employees at a worksite are subject to Rule 2202 and are required to submit an annual registration to implement an emission reduction program that will obtain emission reductions equivalent to a worksite specific emission reduction target. The revenue from this category is used to recover a portion of the costs associated with filing, processing, reviewing, and auditing the registrations and the ridesharing programs. Fees for indirect sources, which are sources that attract mobile sources, such as the large employers covered by Rule 2202, are authorized by Health & Safety Code §40522.5.

*FY 2019-20 Proposed Budget:* The projection is based on the anticipated number of registrations. A 3.5% CPI increase is included.

### **Toxic "Hot Spots"**

Health and Safety Code Section 44380 requires South Coast AQMD to assess and collect fees from facilities that emit toxic compounds. Fees collected are used to recover state and South Coast AQMD costs to collect and analyze data regarding air toxics and their effect on the public. Costs recovered include a portion of the administrative, outreach, plan processing, and enforcement costs to implement this program. Staff has also noticed a large number of Air Toxics Inventory Reports (ATIR) and Health Risk Assessments (HRA) which require substantial modifications or revisions that the facility is unable to perform without errors or delays. Therefore, the amendments to Rule 307.1 also include cost recovery for these efforts.

*FY 2019-20 Proposed Budget:* The revenue projection is based on estimated General Fund reimbursements from the Air Toxics Fund for staff time and other program and administrative expenditures.

### **Other**

Miscellaneous revenue includes revenue attributable to professional services South Coast AQMD renders to other agencies, reimbursements from special revenue funds (non-mobile source), vanpool revenue, fees from fitness center memberships, and Public Records Act requests. This revenue category also includes Rule 1180 payments from petroleum refineries for refinery-related community air monitoring and grant payments under the VW Mitigation Settlement.

*FY 2019-20 Proposed Budget:* The revenue projections are based on historical trend information and anticipated receipts.



**SOUTH COAST**

**AIR QUALITY MANAGEMENT DISTRICT**

South Coast AQMD Line Item Expenditure						
Major Object / Account # / Account Description		FY 2017-18 Actuals	FY 2018-19 Adopted Budget	FY 2018-19 Amended Budget	FY 2018-19 Estimate *	FY 2019-20 Adopted Budget
<b>Salary &amp; Employee Benefits</b>						
51000-52000	Salaries	\$ 76,378,242	\$ 84,908,295	\$ 86,501,594	\$ 83,011,215	\$ 89,957,250
53000-55000	Employee Benefits	39,046,777	47,960,025	47,983,285	46,094,402	51,710,462
Sub-total Salary & Employee Benefits		\$ 115,425,019	\$ 132,868,320	\$ 134,484,879	\$ 129,105,617	\$ 141,667,712
<b>Services &amp; Supplies</b>						
67250	Insurance	\$ 1,518,801	\$ 1,317,400	\$ 1,382,900	\$ 1,382,900	\$ 1,317,400
67300	Rents & Leases Equipment	245,890	214,280	254,139	254,139	212,280
67350	Rents & Leases Structure	298,687	546,791	560,434	560,434	299,543
67400	Household	654,730	763,800	763,800	763,800	817,322
67450	Professional & Special Services	9,109,521	8,256,242	11,599,026	11,599,026	8,066,737
67460	Temporary Agency Services	1,129,280	862,049	1,246,448	1,246,448	744,049
67500	Public Notice & Advertising	437,050	479,666	465,666	465,666	439,966
67550	Demurrage	102,728	161,430	178,430	178,430	161,930
67600	Maintenance of Equipment	1,058,595	864,664	1,174,278	1,174,278	822,864
67650	Building Maintenance	1,070,974	1,502,479	1,534,594	1,534,594	1,002,479
67700	Auto Mileage	144,273	130,627	250,562	250,562	95,627
67750	Auto Service	573,447	471,000	471,000	471,000	471,000
67800	Travel	389,673	338,818	386,189	386,189	364,696
67850	Utilities	1,398,700	1,959,620	2,147,788	2,147,788	1,959,620
67900	Communications	630,003	717,800	742,573	742,573	707,800
67950	Interest Expense	3,756,716	3,637,290	3,637,290	3,637,290	3,503,982
68000	Clothing	39,829	51,623	59,761	59,761	53,805
68050	Laboratory Supplies	532,896	332,000	544,877	544,877	307,000
68060	Postage	365,745	448,826	333,512	333,512	465,803
68100	Office Expense	1,762,951	1,068,950	1,576,407	1,576,407	1,459,260
68200	Office Furniture	244,470	4,000	16,127	16,127	14,000
68250	Subscriptions & Books	254,791	178,517	184,836	184,836	178,517
68300	Small Tools, Instruments, Equipment	205,370	135,045	438,082	438,082	109,736
68400	Gas and Oil	188,215	292,021	292,021	292,021	292,021
69500	Training/Conference/Tuition/ Board Exp.	884,139	975,257	1,140,714	1,140,714	976,357
69550	Memberships	162,986	68,428	72,288	72,288	68,678
69600	Taxes	33,379	59,000	64,685	64,685	59,000
69650	Awards	11,649	79,023	79,023	79,023	79,023
69700	Miscellaneous Expenses	142,893	204,725	220,349	220,349	255,525
69750	Prior Year Expense	(50,616)	-	-	-	-
69800	Uncollectable Accounts Receivable	410,438	-	-	-	-
89100	Principal Repayment	2,432,798	2,553,110	2,553,110	2,553,110	2,686,640
Sub-total Services & Supplies		\$ 30,141,002	\$ 28,674,481	\$ 34,370,909	\$ 34,370,909	\$ 27,992,660
77000	<b>Capital Outlays</b>	\$ 7,301,003	\$ 1,088,300	\$ 5,010,344	\$ 5,010,344	\$ 395,000
79050	<b>Building Remodeling</b>	\$ -	\$ -	\$ -	\$ -	\$ -
99950	<b>Transfers Out</b>	\$ 250,000	\$ -	\$ 2,063,229	\$ 2,063,229	\$ 841,353
Total Expenditures		\$ 153,117,023	\$ 162,631,101	\$ 175,929,361	\$ 170,550,099	\$ 170,896,725

\* Estimates based on July 2018 through February 2019 actual expenditures and March 2019 budget amendments.

**SALARIES & EMPLOYEE BENEFITS**

<b>Acct. #</b>	<b>Account Description</b>	<b>FY 2018-19 Adopted Budget</b>	<b>FY 2018-19 Amended Budget</b>	<b>FY 2018-19 Estimate</b>	<b>FY 2019-20 Proposed Budget</b>	<b>Increase/ (Decrease)<sup>(a)</sup></b>
<b>51000- 52000</b>	<b>SALARIES</b>	<b>\$ 84,908,295</b>	<b>\$ 86,501,594</b>	<b>\$ 84,026,356</b>	<b>\$ 89,957,250</b>	<b>\$5,048,955</b>
<p>These accounts include salaries and special pays such as: Call-Back, Hazard, Night Shift, Rideshare, Skill-Based, Stand-By and Overtime. Also, the FY 2019-20 Proposed Budget reflects a 10% vacancy rate (actual vacant positions are currently at 15%). The FY 2019-20 Proposed Budget does not include overtime amounts for federal grant work that is not expected to be awarded until mid-year and will not be appropriated until the grants are awarded. The main reason for the increase from the FY 2018-19 Adopted Budget is the addition of 62 positions mid-year in FY 2018-19 for the following programs: AB 617 (47 FTEs); VW Environmental Mitigation (5 FTEs), Career Interns (4 FTEs), China Partnership for Cleaner Shipping (2 FTEs) and Rule 1180 (4 FTEs). In addition, the increase from the FY 2018-19 Adopted Budget can be attributed to the costs associated with second year of a three year labor agreement that went into effect in the third quarter of FY 2017-18.</p>						
<b>53000</b>	<b>EMPLOYEE BENEFITS</b>	<b>\$ 3,620,875</b>	<b>\$ 3,620,875</b>	<b>\$ 3,611,072</b>	<b>\$ 3,774,162</b>	<b>\$ 153,287</b>
<p>This account includes the costs associated with State Disability Insurance, employer share of unemployment insurance, Social Security and Medicare. In addition, this account includes individual memberships and/or management physicals.</p>						
<b>54000</b>	<b>RETIREMENT</b>	<b>\$ 34,350,829</b>	<b>\$ 34,350,829</b>	<b>\$ 32,497,662</b>	<b>\$ 36,805,778</b>	<b>\$ 2,454,949</b>
<p>This account includes the employer's share of the employee retirement system contributions. The increase from the FY 2018-19 Adopted Budget is based on the contribution rates provided from the San Bernardino County Retirement Association (SBCERA) and adding 62 positions mid-year in Fiscal Year 2018-19.</p>						
<b>55000</b>	<b>INSURANCE</b>	<b>\$ 9,988,321</b>	<b>\$ 10,011,581</b>	<b>\$ 9,985,668</b>	<b>\$ 11,130,521</b>	<b>\$1,142,200</b>
<p>This account includes employer's share of health, life, dental, vision care and accident insurance.</p>						

<sup>(a)</sup> FY 2019-20 Proposed Budget vs. FY 2018-19 Adopted Budget.

<b>South Coast AQMD Personnel Summary – Authorized/Funded Positions</b>						
<b>Positions as of</b>	<b>Mid-Year Adjustments</b>		<b>Positions as of</b>	<b>FY 2019-20 Request</b>		<b>Positions as of</b>
June 30, 2018	Add	Delete	June 30, 2019	Add	Delete	July 1, 2018
876.4	72	(10.4)	938	8	(7)	939

SALARIES & EMPLOYEE BENEFITS

Fiscal Year 2018-19 Mid-Year Changes in Authorized/Funded Positions				
Office	Position	Add	Delete	Total
Administrative and Human Resources	Career Development Intern	4	-	4
Administrative and Human Resources	Office Assistant	-	(1)	(1)
Administrative and Human Resources	Senior Office Assistant	2	-	2
Compliance and Enforcement	Air Quality Inspector II	2	-	2
Compliance and Enforcement	Air Quality Inspector III	1	-	1
Finance	Financial Analyst	1	-	1
Information Management	Assistant Deputy Executive Officer/Information Management	-	(1)	(1)
Information Management	Assistant Deputy Executive Officer/Chief Information Officer	1	-	1
Information Management	Information Technology Specialist II	-	(1)	(1)
Information Management	Senior Information Technology Specialist	1	-	1
Information Management	Systems Analyst	1	-	1
Information Management	Systems & Programming Supervisor	2	-	2
Information Management	Technology Implementation Manager	-	(2)	(2)
Information Management	Information Technology Manager	2	-	2
Legal	Senior Deputy District Counsel	1	-	1
Legislative & Public Affairs/Media Office	Community Relations Manager	-	(1)	(1)
Legislative & Public Affairs/Media Office	Public Affairs Manager	1	-	1
Legislative & Public Affairs/Media Office	Senior Public Information Specialist	3	-	3
Planning, Rule Development, & Area Sources	Air Quality Engineer II	1	-	1
Planning, Rule Development, & Area Sources	Air Quality Specialist	7	-	7
Planning, Rule Development, & Area Sources	Planning & Rules Manager	1	-	1
Planning, Rule Development, & Area Sources	Program Supervisor	4	-	4
Planning, Rule Development, & Area Sources	Senior Air Quality Engineer	1	-	1
Science & Technology Advancement	Air Quality Chemist	2	-	2
Science & Technology Advancement	Air Quality Instrument Specialist I	4	-	4
Science & Technology Advancement	Air Quality Instrument Specialist II	8	-	8
Science & Technology Advancement	Air Quality Specialist	6	-	6
Science & Technology Advancement	Assistant Deputy Executive Officer/Science & Technology Advancement	-	(0.4)	(0.4)
Science & Technology Advancement	Contracts Assistant	2	-	2
Science & Technology Advancement	Laboratory Technician	1	-	1
Science & Technology Advancement	Monitoring Operations Manager	1	-	1
Science & Technology Advancement	Office Assistant	-	(3)	(3)
Science & Technology Advancement	Principal Air Quality Chemist	1	-	1
Science & Technology Advancement	Principal Air Quality Instrument Specialist	-	(1)	(1)



SALARIES & EMPLOYEE BENEFITS

Fiscal Year 2018-19 Mid-Year Changes in Authorized/Funded Positions (cont.)				
Office	Position	Add	Delete	Total
Science & Technology Advancement	Program Supervisor	2	-	2
Science & Technology Advancement	Senior Air Quality Chemist	1	-	1
Science & Technology Advancement	Senior Air Quality Engineer	2	-	2
Science & Technology Advancement	Senior Air Quality Instrument Specialist	3	-	3
Science & Technology Advancement	Senior Office Assistant	2	-	2
Science & Technology Advancement	Senior Staff Specialist	1	-	1
<b>Total Mid-Year Changes</b>		<b>72</b>	<b>(10.4)</b>	<b>61.6</b>

Fiscal Year 2019-20 Proposed Personnel Actions				
Office	Position	Add	Delete	Total
Administrative and Human Resources	Assistant Deputy Executive Officer/Administrative and Human Resources	-	(1)	(1)
Administrative and Human Resources	Deputy Executive Officer/Administrative and Human Resources	1	-	1
Engineering & Permitting	Principal Office Assistant	-	(1)	(1)
Engineering & Permitting	Supervising Office Assistant	1	-	1
Finance	Assistant Deputy Executive Officer/Finance	-	(1)	(1)
Finance	Chief Administrative Officer	-	(1)	(1)
Finance	Deputy Executive Officer/Chief Financial Officer	1	-	1
Information Management	Assistant Deputy Executive Officer/Chief Information Officer	-	(1)	(1)
Information Management	Deputy Executive Officer/Chief Information Officer	1	-	1
Information Management	Principal Office Assistant	-	(1)	(1)
Information Management	Supervising Office Assistant	1	-	1
Legislative & Public Affairs/Media Office	Administrative Secretary	1	-	1
Legislative & Public Affairs/Media Office	Program Supervisor	1	-	1
Planning, Rule Development & Area Sources	Health Effects Officer *	-	(1)	-
Planning, Rule Development & Area Sources	Director of Community Air Programs/Health Effects Officer*	1	-	1
<b>Total Fiscal Year 2019-20 Proposed Personnel Actions</b>		<b>8</b>	<b>(7)</b>	<b>1</b>

\* Title change only

**SERVICES & SUPPLIES**

<b>Acct. #</b>	<b>Account Description</b>	<b>FY 2018-19 Adopted Budget</b>	<b>FY 2018-19 Amended Budget</b>	<b>FY 2018-19 Estimate</b>	<b>FY 2019-20 Proposed Budget</b>	<b>Increase/ (Decrease)<sup>(a)</sup></b>
<b>67250</b>	<b>INSURANCE</b>	<b>\$1,317,400</b>	<b>\$1,382,900</b>	<b>\$1,382,900</b>	<b>\$1,317,400</b>	<b>\$ 0</b>
<p>This account is for insurance coverage for the following: commercial property (real and personal) with earthquake and flood coverage, boiler and machinery, public official liability, excess workers' compensation, and excess general liability. South Coast AQMD is self-insured for workers' compensation, general liability, and automobile liability. The amount requested reflects anticipated workers' compensation claims, insurance policy premiums, property losses above South Coast AQMD's insurance deductibles, and liability claim payments.</p>						
<b>67300</b>	<b>RENTS &amp; LEASES EQUIPMENT</b>	<b>\$214,280</b>	<b>\$254,139</b>	<b>\$254,139</b>	<b>\$212,280</b>	<b>(\$2,000)</b>
<p>This account is for lease agreements and/or rental of office equipment such as communication devices for emergency response inspectors, laboratory and atmospheric measurement equipment for special projects, audio visual equipment for outside meetings, printing equipment, and photocopiers. The decrease from the FY 2018-19 Adopted Budget reflects a decrease in equipment rentals for outside meetings.</p>						
<b>67350</b>	<b>RENTS &amp; LEASES STRUCTURE</b>	<b>\$546,791</b>	<b>\$560,434</b>	<b>\$560,434</b>	<b>\$299,543</b>	<b>(\$247,248)</b>
<p>This account is for expenditures associated with structures and lot leases, and off-site storage rentals:                      Long Beach field office - \$111,543;                      Conference and meeting rooms - \$9,000;                      Air monitoring sites/Wind Stations - \$171,000; and                      Public Meetings - \$8,000                      Free and low-cost public facilities are used whenever possible for public workshops and informational meetings. The decrease in FY 2019-20 reflects the decision to appropriate budget mid-year for the implementation of the Rule 1180 air monitoring program. The FY 2019-20 Proposed Budget does not include amounts for federally funded grant programs. An expenditure appropriation will occur mid-year when the grants are awarded.</p>						
<b>67400</b>	<b>HOUSEHOLD</b>	<b>\$763,800</b>	<b>\$763,800</b>	<b>\$763,800</b>	<b>\$817,322</b>	<b>\$ 53,522</b>
<p>This account is used for trash disposal, landscape maintenance, parking lot maintenance, janitorial supplies, and janitorial contracts. The increase from the FY 2018-19 Adopted Budget is due to an increase in the janitorial contract.</p>						
<b>67450</b>	<b>PROFESSIONAL &amp; SPECIAL SERVICES</b>	<b>\$8,256,242</b>	<b>\$11,599,026</b>	<b>\$11,599,026</b>	<b>\$8,066,737</b>	<b>(\$189,505)</b>
<p>This account is for services rendered to South Coast AQMD by outside contractors. The FY 2019-20 Professional &amp; Special Services supporting detail is located at the end of this section. The decrease from the FY 2018-19 Adopted Budget is a result of expenditures related to the Rule 1180 air monitoring program being included in the FY 2018-19 Adopted Budget but not in the FY 2019-20 Proposed Budget. Mid-year FY 2019-20 appropriations will be posted for Rule 1180 expenditures. The FY 2019-20 Proposed Budget also does not include amounts for federally funded grant programs. An expenditure appropriation will occur mid-year when the grants are awarded.</p>						

<sup>(a)</sup>FY 2019-20 Proposed Budget vs. FY 2018-19 Adopted Budget.

**SERVICES & SUPPLIES**

<b>Acct. #</b>	<b>Account Description</b>	<b>FY 2018-19 Adopted Budget</b>	<b>FY 2018-19 Amended Budget</b>	<b>FY 2018-19 Estimate</b>	<b>FY 2019-20 Proposed Budget</b>	<b>Increase/ (Decrease)<sup>(a)</sup></b>
<b>67460</b>	<b>TEMPORARY AGENCY SERVICES</b>	<b>\$862,049</b>	<b>\$1,246,448</b>	<b>\$1,246,448</b>	<b>\$744,049</b>	<b>(\$118,000)</b>
<p>Funds budgeted in this account are used for specialized temporary services that supplement staff in support of South Coast AQMD programs. Amounts are budgeted as a contingency for long-term absences and retirements/resignations. Also budgeted in this account is the student internship program that provides college students with the opportunity to gain experience in the workplace. The decrease from the FY 2018-19 Adopted Budget reflects an anticipated reduction in the use of temporary services. The FY 2019-20 Proposed Budget does not include amounts for federally funded grant programs. An expenditure appropriation will occur mid-year when the grants are awarded.</p>						
<b>67500</b>	<b>PUBLIC NOTICE &amp; ADVERTISING</b>	<b>\$479,666</b>	<b>\$465,666</b>	<b>\$465,666</b>	<b>\$439,966</b>	<b>(\$39,700)</b>
<p>This account is used for legally required publications such as Requests for Proposals, Requests for Quotations, personnel recruitment, public outreach, advertisement of South Coast AQMD Governing Board and Hearing Board meetings, and public notification of South Coast AQMD rulemaking activities. The decrease from the FY 2018-19 Adopted Budget is due to an anticipated decrease in legally required publications.</p>						
<b>67550</b>	<b>DEMURRAGE</b>	<b>\$161,430</b>	<b>\$178,430</b>	<b>\$178,430</b>	<b>\$161,930</b>	<b>\$500</b>
<p>This account is for various freight and cylinder charges as well as workspace reconfigurations and personnel moves. The increase from the FY 2018-19 Adopted Budget is based on anticipated needs due to increased staff. The FY 2019-20 Proposed Budget does not include amounts for federally funded grant programs. An expenditure appropriation will occur mid-year when the grants are awarded.</p>						
<b>67600</b>	<b>MAINTENANCE OF EQUIPMENT</b>	<b>\$864,664</b>	<b>\$1,174,278</b>	<b>\$1,174,278</b>	<b>\$822,864</b>	<b>(\$41,800)</b>
<p>This account is for maintenance costs of South Coast AQMD equipment such as the following: mainframe computer hardware, phone switch, air monitoring equipment, print shop equipment, copiers, and audio visual equipment. The decrease from the FY 2018-19 Adopted Budget is a result of expenditures related to the Rule 1180 air monitoring program being included in the FY 2018-19 Adopted Budget but not in the FY 2019-20 Proposed Budget. Mid-year FY 2019-20 appropriations will be posted for Rule 1180 expenditures. The FY 2019-20 Proposed Budget also does not include amounts for federally funded grant programs. An expenditure appropriation will occur mid-year when the grants are awarded.</p>						
<b>67650</b>	<b>BUILDING MAINTENANCE</b>	<b>\$1,502,479</b>	<b>\$1,534,594</b>	<b>\$1,534,594</b>	<b>\$1,002,479</b>	<b>(\$500,000)</b>
<p>This account reflects expenditures for maintaining South Coast AQMD offices and air monitoring stations. Also included are: a contingency amount for unplanned repairs; Gateway Association dues; elevator maintenance; energy management; and compressor services. The decrease from the FY 2018-19 Adopted Budget is due to a one-time project budgeted in FY 2018-19. The FY 2019-20 Proposed Budget does not include amounts for federally funded grant programs. An expenditure appropriation will occur mid-year when the grants are awarded.</p>						

<sup>(a)</sup>FY 2019-20 Proposed Budget vs. FY 2018-19 Adopted Budget.

**SERVICES & SUPPLIES**

<b>Acct. #</b>	<b>Account Description</b>	<b>FY 2018-19 Adopted Budget</b>	<b>FY 2018-19 Amended Budget</b>	<b>FY 2018-19 Estimate</b>	<b>FY 2019-20 Proposed Budget</b>	<b>Increase/ (Decrease)<sup>(a)</sup></b>
<b>67700</b>	<b>AUTO MILEAGE</b>	<b>\$130,627</b>	<b>\$250,562</b>	<b>\$250,562</b>	<b>\$95,627</b>	<b>(\$35,000)</b>
<p>This account is used to reimburse employees for the cost of using personal vehicles while on South Coast AQMD business. The requests include the mileage incurred for staff who are required to work on their scheduled days off and for employees who use their personal vehicles on South Coast AQMD-related business, conferences, and seminars and to attend various community, business and intergovernmental events. The decrease from the FY 2018-19 Adopted Budget is a result of expenditures related to the Rule 1180 air monitoring program being included in the FY 2018-19 Adopted Budget but not in the FY 2019-20 Proposed Budget. Mid-year FY 2019-20 appropriations will be posted for Rule 1180 expenditures. The FY 2019-20 Proposed Budget also does not include amounts for federally funded grant programs. An expenditure appropriation will occur mid-year when the grants are awarded.</p>						
<b>67750</b>	<b>AUTO SERVICE</b>	<b>\$471,000</b>	<b>\$471,000</b>	<b>\$471,000</b>	<b>\$471,000</b>	<b>\$0</b>
<p>This account is used for the maintenance, towing, repair, and expired CNG tank replacement of South Coast AQMD fleet vehicles.</p>						
<b>67800</b>	<b>TRAVEL</b>	<b>\$338,818</b>	<b>\$386,189</b>	<b>\$386,189</b>	<b>\$364,696</b>	<b>\$ 25,878</b>
<p>This account is for business travel, including lodging and meals paid pursuant to the Administrative Code, for participation in legislative hearings and meetings involving state, federal, and inter-agency issues that affect air quality in the South Coast Air Basin. The increase from the FY 2018-19 Adopted Budget is for expenditures under the China Partnership for Cleaner Shipping project. The FY 2019-20 Proposed Budget does not include amounts for federally funded grant programs. An expenditure appropriation will occur mid-year when the grants are awarded.</p>						
<b>67850</b>	<b>UTILITIES</b>	<b>\$1,959,620</b>	<b>\$2,147,788</b>	<b>\$2,147,788</b>	<b>\$1,959,620</b>	<b>\$0</b>
<p>This account is used to pay gas, water, and electricity costs at the South Coast AQMD's headquarters building, the Long Beach field office, and air monitoring stations.</p>						
<b>67900</b>	<b>COMMUNICATIONS</b>	<b>\$717,800</b>	<b>\$742,573</b>	<b>\$742,573</b>	<b>\$707,800</b>	<b>(\$10,000)</b>
<p>This account includes telephone and fax service, leased computer lines, video conferencing, wireless internet access for inspectors in the field, radio, and microwave services. The decrease from the FY 2018-19 Adopted Budget is a result of expenditures related to the Rule 1180 air monitoring program being included in the FY 2018-19 Adopted Budget but not in the FY 2019-20 Proposed Budget. Mid-year FY 2019-20 appropriations will be posted for Rule 1180 expenditures. The FY 2019-20 Proposed Budget also does not include amounts for federally funded grant programs. An expenditure appropriation will occur mid-year when the grants are awarded.</p>						
<b>67950</b>	<b>INTEREST EXPENSE</b>	<b>\$3,637,290</b>	<b>\$3,637,290</b>	<b>\$3,637,290</b>	<b>\$3,503,982</b>	<b>(\$113,308)</b>
<p>This account is for the interest due on the 1995 and 2004 Pension Obligation Bonds. The decrease from the FY 2018-19 Adopted Budget reflects scheduled payments for FY 2019-20.</p>						

<sup>(a)</sup>FY 2019-20 Proposed Budget vs. FY 2018-19 Adopted Budget.

**SERVICES & SUPPLIES**

<b>Acct. #</b>	<b>Account Description</b>	<b>FY 2018-19 Adopted Budget</b>	<b>FY 2018-19 Amended Budget</b>	<b>FY 2018-19 Estimate</b>	<b>FY 2019-20 Proposed Budget</b>	<b>Increase/ (Decrease)<sup>(a)</sup></b>
<b>68000</b>	<b>CLOTHING</b>	<b>\$51,632</b>	<b>\$59,761</b>	<b>\$59,761</b>	<b>\$53,805</b>	<b>\$2,173</b>
<p>This account is for the purchase of safety equipment and protective clothing used by source testing, laboratory, compliance, and stockroom personnel. The increase from the FY 2018-19 Adopted Budget reflects the anticipated level of expenditures for FY 2019-20.</p>						
<b>68050</b>	<b>LABORATORY SUPPLIES</b>	<b>\$332,000</b>	<b>\$544,877</b>	<b>\$544,877</b>	<b>\$307,000</b>	<b>(\$25,000)</b>
<p>This account is used to purchase various supplies such as chemicals, calibration gases and glassware for laboratory services. The FY 2019-20 Proposed Budget reflects the anticipated reduction in needs and does not include amounts for federally funded grant programs. Expenditure appropriations will occur mid-year for those programs.</p>						
<b>68060</b>	<b>POSTAGE</b>	<b>\$448,826</b>	<b>\$333,512</b>	<b>\$333,512</b>	<b>\$465,803</b>	<b>\$ 16,977</b>
<p>This account covers the cost of mailing out annual billings, permits, notifications to the Governing Board and Advisory groups, monthly newsletters, warrants, outreach materials to local governments, and Rule 2202 notifications. The FY 2019-20 Proposed Budget reflects the recent postal rate increases.</p>						
<b>68100</b>	<b>OFFICE EXPENSE</b>	<b>\$1,068,950</b>	<b>\$1,576,407</b>	<b>\$1,576,407</b>	<b>\$1,459,260</b>	<b>\$390,310</b>
<p>This account is used for the purchase of office supplies, computer hardware and software under \$5,000, photocopier supplies, print shop and artist supplies, and stationery and forms. The increase from the FY 2018-19 Adopted Budget reflects the cost of Office 365 licenses and services and Regional Modeling supplies. The FY 2019-20 Proposed Budget does not include amounts for federally funded grant programs. An expenditure appropriation will occur mid-year when the grants are awarded.</p>						
<b>68200</b>	<b>OFFICE FURNITURE</b>	<b>\$4,000</b>	<b>\$16,127</b>	<b>\$16,127</b>	<b>\$14,000</b>	<b>\$10,000</b>
<p>This account is for office furniture under \$5,000. The increase in the FY 2019-20 Proposed Budget reflects an anticipated increases in needs due to staffing changes.</p>						
<b>68250</b>	<b>SUBSCRIPTIONS &amp; BOOKS</b>	<b>\$178,517</b>	<b>\$184,836</b>	<b>\$184,836</b>	<b>\$178,517</b>	<b>\$0</b>
<p>This account is used to purchase reference materials, magazine subscriptions, books, and on-line database legal research services. The FY 2019-20 Proposed Budget reflects no anticipated change in costs.</p>						
<b>68300</b>	<b>SMALL TOOLS, INSTRUMENTS, EQUIPMENT</b>	<b>\$135,045</b>	<b>\$438,082</b>	<b>\$438,082</b>	<b>\$109,736</b>	<b>(\$25,309)</b>
<p>This account covers the purchase of small tools and equipment for air monitoring stations, laboratory, and headquarters building maintenance. The decrease from the FY 2018-19 Adopted Budget is a result of expenditures related to the Rule 1180 air monitoring program being included in the FY 2018-19 Adopted Budget but not in the FY 2019-20 Proposed Budget. The FY 2019-20 Proposed Budget also does not include amounts for federally funded grant programs. Expenditure appropriations will occur mid-year for these programs.</p>						

<sup>(a)</sup>FY 2019-20 Proposed Budget vs. FY 2018-19 Adopted Budget.

SERVICES & SUPPLIES

Acct. #	Account Description	FY 2018-19 Adopted Budget	FY 2018-19 Amended Budget	FY 2018-19 Estimate	FY 2019-20 Proposed Budget	Increase/ (Decrease) <sup>(a)</sup>
<b>68400</b>	<b>GAS &amp; OIL</b>	<b>\$292,021</b>	<b>\$292,021</b>	<b>\$292,021</b>	<b>\$292,021</b>	<b>\$0</b>
This account is for the purchase of gasoline, oil, and alternative fuels for the South Coast AQMD fleet. The FY 2019-20 Proposed Budget reflects no change in anticipated needs.						
<b>69500</b>	<b>TRAINING/CONF/ TUITION/BOARD EXP</b>	<b>\$975,257</b>	<b>\$1,140,714</b>	<b>\$1,140,714</b>	<b>\$976,357</b>	<b>\$1,100</b>
This account is used for tuition reimbursement, conference and training registrations, certain costs associated with South Coast AQMD's Governing and Hearing Boards and advisory groups, and training-related travel expenditures. The FY 2019-20 Proposed Budget reflects a slight increase for tuition reimbursement.						
<b>69550</b>	<b>MEMBERSHIPS</b>	<b>\$68,428</b>	<b>\$72,288</b>	<b>\$72,288</b>	<b>\$68,678</b>	<b>\$250</b>
This account provides for South Coast AQMD membership in in scientific, clean fuels, advanced technology, and related environmental business/policy organizations. Membership costs are anticipated to increase marginally from the FY 2018-19 Adopted Budget.						
<b>69600</b>	<b>TAXES</b>	<b>\$59,000</b>	<b>\$64,685</b>	<b>\$64,685</b>	<b>\$59,000</b>	<b>\$0</b>
This account is for unsecured property and use taxes, fuel taxes, and sales taxes. The FY 2019-20 Proposed Budget reflects no change in expenditures from the FY 2018-19 Adopted Budget.						
<b>69650</b>	<b>AWARDS</b>	<b>\$79,023</b>	<b>\$79,023</b>	<b>\$79,023</b>	<b>\$79,023</b>	<b>\$0</b>
This account covers employee service awards for continuous service, employee recognition programs, plaques/awards the South Coast AQMD may present to individuals/businesses/community groups for outstanding contributions towards air quality goals, and promotional items for community events. No change in the level of expenditures from the FY 2018-19 Adopted Budget is anticipated for FY 2019-20.						
<b>69700</b>	<b>MISCELLANEOUS EXPENSES</b>	<b>\$204,725</b>	<b>\$220,349</b>	<b>\$220,349</b>	<b>\$255,525</b>	<b>\$50,800</b>
This account is to record expenditures that do not fall in any other account such as South Coast AQMD advisory group per diems, meeting and event expenses, and sponsorships. The increase from the FY 2018-19 Adopted Budget reflects the addition of document conversion expenditures for FY 2019-20.						
<b>69750</b>	<b>PRIOR YEAR EXPENSE</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
This account is used to record actual expenditures attributable to prior year budgets. No amount is budgeted for this account due to the nature of the account.						

<sup>(a)</sup>FY 2019-20 Proposed Budget vs. FY 2018-19 Adopted Budget.

SERVICES & SUPPLIES

	Account Description	FY 2018-19 Adopted Budget	FY 2018-19 Amended Budget	FY 2018-19 Estimate	FY 2019-20 Proposed Budget	Increase/ (Decrease) <sup>(a)</sup>
<b>69800</b>	<b>UNCOLLECTIBLE ACCOUNTS RECEIVABLE</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
No amount is budgeted for this account due to the nature of the account.						
<b>89100</b>	<b>PRINCIPAL REPAYMENT</b>	<b>\$2,553,110</b>	<b>\$2,553,110</b>	<b>\$2,553,110</b>	<b>\$2,686,640</b>	<b>\$133,530</b>
This account reflects the principal due on pension obligation bonds. The increase from the FY 2018-19 Adopted Budget reflects scheduled payments for FY 2019-20.						

<sup>(a)</sup>FY 2019-20 Proposed Budget vs. FY 2018-19 Adopted Budget.

SERVICES & SUPPLIES

Proposed Fiscal Year 2019-20 Professional & Special Services Detail by Office			
Office	Program	Contract Description	Amount
<b>District General</b>	Dist. General Overhead	Administrative Fees for 1995 & 2004 Pension Obligation Bonds (POBs)	\$1,500
	Dist. General Overhead	Arbitration/Hearing Officer	9,400
	Dist. General Overhead	Benefits Administrator	13,000
	Dist. General Overhead	COBRA Administration Services	6,000
	Dist. General Overhead	Custodial Fees for 1995 & 2004 POBs	800
	Dist. General Overhead	Employee Assistance Program	13,995
	Dist. General Overhead	Employee Relations Litigation	200,000
	Dist. General Overhead	Health Reimbursement Arrangement Plan Administration	5,000
	Dist. General Overhead	Insurance Brokerage	50,000
	Dist. General Overhead	LACERA OPEB Actuary Services	20,000
	Dist. General Overhead	Modular Furniture Maintenance, Setup, and Moving Services	15,000
	Dist. General Overhead	Oracle Software Support	30,400
	Dist. General Overhead	PeopleSoft Maintenance	208,400
	Dist. General Overhead	Plans and Design Consulting Services	95,000
	Dist. General Overhead	Security Alarm Monitoring	1,980
	Dist. General Overhead	Security Guard Services	546,877
	Dist. General Overhead	Wellness Program	37,500
	<b>Sub-total District General</b>		<b>\$1,254,852</b>
<b>Governing Board</b>	Operational Support	Board Member Assistant/Consultants	\$807,784
	<b>Sub-total Governing Board</b>		<b>\$807,784</b>
<b>Executive Office</b>	Develop Programs	Professional & Special Services	\$75,000
	<b>Sub-total Executive Office</b>		<b>\$75,000</b>
<b>Finance</b>	Operational Support	Bank Service Charges/Los Angeles County Treasurer Office	\$60,000
	Ensure Compliance	Bank Services Fund 15, Hot Spots Lockbox	15,000
	Operational Support	Financial Audit	55,528
	Operational Support	Financial Consultant for Treasury Management	23,000
	Operational Support	LA County Treasurer Office - PGP Maintenance	1,650
	<b>Sub-total Finance</b>		<b>\$155,178</b>
<b>Legal</b>	Ensure Compliance	Experts/Court Reporters/Attorney Services	\$30,000
	Ensure Compliance	Litigation Counsel	131,001
	Ensure Compliance	Software Maintenance & Licensing	35,000
	Operational Support	Specialized Legal Services	50,000
	<b>Sub-total Legal</b>		<b>\$246,001</b>



SERVICES & SUPPLIES

Proposed Fiscal Year 2019-20 Professional & Special Services Detail by Office (cont.)				
Office	Program	Contract Description	Amount	
<b>Administrative &amp; Human Resources</b>	Operational Support	In-house Training Classes	\$4,000	
	Operational Support	Medical Services Provider	30,000	
	Operational Support	NEOGOV Multiple Contracts	51,750	
	Operational Support	Occupational Health Services	25,000	
	Customer Service & Business Assistance	Outside Binding Services	6,000	
	Operational Support	Test Development	15,000	
	Operational Support	Third-Party Claims Administrator for Workers Compensation	20,000	
<b>Sub-total Administrative &amp; Human Resources</b>			<b>\$151,750</b>	
<b>Clerk of the Boards</b>	Ensure Compliance	Court Reporting, Audio-visual, and/or Security Services	\$63,800	
	Ensure Compliance	Outside Legal Contract	15,000	
	Ensure Compliance	Professional Interpreter Services	6,400	
	<b>Sub-total Clerk of the Boards</b>			<b>\$85,200</b>
	<b>Information Management</b>	Operational Support	Action Works Metro System Software Support	\$20,000
	Operational Support	Adobe Creative Cloud Software Support	2,500	
	Operational Support	AER & R1113/314 Upgrade & Maintenance	15,000	
	Operational Support	AIS (Address Information System) Five Digit Subscription	1,200	
	Operational Support	Anti-Spam (MailShield) Maintenance/Support	15,000	
	Operational Support	ArcGIS Online Annual Subscription	1,000	
	Operational Support	Backup Software	50,000	
	Operational Support	Backup Utility Maintenance	11,500	
	Operational Support	CLASS System Maintenance	88,000	
	Operational Support	Component One Software Support	1,200	
	Operational Support	Computer-Based Training Software Support	1,800	
	Operational Support	CourtView/DPO Maintenance	10,000	

SERVICES & SUPPLIES

Proposed Fiscal Year 2019-20 Professional & Special Services Detail by Office (cont.)			
Office	Program	Contract Description	Amount
Information Management (cont.)	Operational Support	Crystal Reports Software Support	\$22,000
	Operational Support	Disaster Recovery Software	60,000
	Operational Support	Dundas Chart Software Support	700
	Operational Support	Dynamic Web Twain License Renewal	5,700
	Operational Support	Email Recovery Software (PowerControls) Maint/Support	2,750
	Operational Support	Email Reporting	4,000
	Operational Support	ERwin ERX & BPwin SW Support	26,000
	Operational Support	Faxcom FaxServer Support	15,000
	Operational Support	Imaging Software Support	145,000
	Operational Support	Infragistics Pro Software Support	1,000
	Operational Support	Ingres/OpenIngres Additional Licensing	72,000
	Operational Support	Ingres/OpenIngres Advanced Success Pack	140,000
	Operational Support	Installshield Software Support	3,800
	Operational Support	Internet Filtering (SmartFilter) Maintenance/Support	70,000
	Operational Support	Kronos Time Keeper	2,000
	Operational Support	Microsoft Developer Network - Application Development	15,196
	Operational Support	Microsoft Developer Network Premium Renewal	4,000
	Operational Support	Microsoft Technical Software Support (Server Applications)	15,000
	Operational Support	Microsoft Virtual Earth Maintenance/Support	15,000
	Operational Support	Network Analyzer (Sniffer) Maintenance/Support	4,500
	Operational Support	Network Backbone Support	15,000
	Operational Support	NT Software Support - Proactive	62,000
	Operational Support	Off-site Document Destruction Services	24,000
	Operational Support	Off-site Storage Nightly Computer Backup	22,000
	Operational Support	Online Filing Infrastructure	25,000
	Operational Support	PowerBuilder Software Support	24,000
	Operational Support	PreEmptive Analytics Software Support	7,000
	Operational Support	Proxy Reporting Support	3,250
	Operational Support	PVCS Software Support	4,900
	Operational Support	ScaleOut StateServer Maintenance	8,500

SERVICES & SUPPLIES

Proposed Fiscal Year 2019-20 Professional & Special Services Detail by Office (cont.)			
Office	Program	Contract Description	Amount
<b>Information Management (cont.)</b>	Operational Support	South Coast AQMD Web Application Modifications	\$20,000
	Operational Support	Secure Service Digital ID Services	2,000
	Operational Support	Secure Service Digital ID DEC Internet Server	850
	Operational Support	Sitefinity CMS Software Support	9,500
	Operational Support	Software Support for EOS.Web Enterprise	6,300
	Operational Support	Software Support for On-Line Catalog	2,050
	Operational Support	Swiftview Software Support	950
	Operational Support	Telephone Switchview Software Support	9,500
	Operational Support	Terminal Emulation (Reflection) Maintenance/Support	1,175
	Operational Support	Videoteleconferencing Maintenance & Support	20,000
	Operational Support	Virus Scan Support	15,000
	Operational Support	Visual Expert Software Support	6,000
	Operational Support	Web Consulting Support	64,300
	Operational Support	Web Core Technology Upgrade (.NET Upgrade)	10,000
	Operational Support	Website Evaluation & Improvement	200,000
<b>Sub-total Information Management</b>			<b>\$1,404,121</b>
<b>Planning, Rule Development, &amp; Area Sources</b>	Ensure Compliance	AER Printing and Mailing	\$5,000
	Monitoring Air Quality	Air Quality Forecast and Alert Notification Support	50,000
	Develop Programs	California Emissions Estimator Model (CalEEMod) Upgrades/Support	25,000
	Develop Programs	CEQA for AQMD Projects	125,000
	Develop Programs	CEQA Special Studies	50,000
	Timely Review of Permits	Dispersion Modeling Support	25,000
	Monitoring Air Quality	Maintain Wind Stations and Analyze Data	60,000
	Monitoring Air Quality	MATES V	10,000
	Monitoring Air Quality	Meteorological Data Services	7,500
	Develop Rules	Mobile Source Related Data Licenses and Subscriptions	75,000
	Develop Rules	PM and Ozone Model Consulting	50,000
	Develop Programs	Rule 2202 Computer System Maintenance	15,000
	Develop Programs	Rule 2202 EMOvers System Maintenance	20,000
	Customer Service & Business Assistance	Rule 2202 ETC On-Line Training	10,000

SERVICES & SUPPLIES

Proposed Fiscal Year 2019-20 Professional & Special Services Detail by Office (cont.)			
Office	Program	Contract Description	Amount
<b>Planning, Rule Development, &amp; Area Sources (cont.)</b>	Ensure Compliance	Rules 1118 and 1118.1 Notifications	\$61,000
	Develop Programs	SIP, AQMP and Rule Printing	8,000
	Develop Programs	Software, Data Products, and Technical Support for Economic Modeling	150,000
	Develop Rules	Technical Assessment in of Regional Modeling	20,000
	Ensure Compliance	Technology Assessment Studies	20,000
	Monitoring Air Quality	Weather Data Services Communications	7,500
	Ensure Compliance	Web-based Annual Emissions Reporting (AER) Program	100,000
	<b>Sub-total Planning, Rule Development &amp; Area Sources</b>		
<b>Legislative &amp; Public Affairs/Media Office</b>	Policy Support	After-hours Call Center Service	\$3,500
	Customer Service & Business Assistance	Clean Air Awards	12,600
	Customer Service & Business Assistance	Community Outreach	277,005
	Policy Support	Graphics & Printing	33,616
	Policy Support	Graphics, Printing & Outreach Materials	4,000
	Policy Support	Legislative Advocacy - Sacramento	365,000
	Policy Support	Legislative Advocacy - Washington DC	665,130
	Policy Support	Legislative Computer Services	10,000
	Customer Service & Business Assistance	Multi-Lingual Translation - Public Participation	20,000
	Policy Support	News Release Services	9,000
	Policy Support	Photographic and Video Services - MO	55,000
	Customer Service & Business Assistance	Promotion Marketing of Smart Phone Tools	50,000
	Policy Support	Radio/Television Monitoring	11,000
	<b>Sub-total Legislative &amp; Public Affairs/Media Office</b>		
<b>Science &amp; Technology Advancement</b>	Ensure Compliance	Laboratory Analytical Services	\$15,000
	Ensure Compliance	Source Testing Services	30,000
	Advanced Clean Air Technology	Technical Assistance, Expert Consultation, Outreach/Education – Clean Fuels	1,000,000
	Advanced Clean Air Technology	Technical Assistance, Expert Consultation, Outreach/Education – CMP, AB923	300,000

SERVICES & SUPPLIES

<b>Proposed Fiscal Year 2019-20 Professional &amp; Special Services Detail by Office (cont.)</b>			
<b>Office</b>	<b>Program</b>	<b>Contract Description</b>	<b>Amount</b>
<b>Science &amp; Technology Advancement (cont.)</b>	Develop Programs	Technical Assistance, Expert Consultation, Outreach/Education – Prop 1B	\$75,000
	Ensure Compliance	Technical Support for Air Monitoring and Community Complaint Resolution	35,000
	<b>Sub-total Science &amp; Technology Advancement</b>		<b>\$1,455,000</b>
<b>Engineering &amp; Permitting</b>	Operational Support	Workspace Reconfiguration	\$2,500
	<b>Sub-total Engineering &amp; Permitting</b>		<b>\$2,500</b>
<b>Compliance &amp; Enforcement</b>	Ensure Compliance	Compliance Notice Printing	\$3,000
	Ensure Compliance	Lab Analysis Services for R1176 and other air samples	12,000
	Operational Support	Workspace Reconfiguration	4,500
	<b>Sub-total Compliance &amp; Enforcement</b>		<b>\$19,500</b>
<b>Total Professional &amp; Special Services</b>			<b>\$8,066,737</b>

**CAPITAL OUTLAYS & BUILDING REMODELING**

Acct. #	Account Description	FY 2018-19 Adopted Budget	FY 2018-19 Amended Budget	FY 2018-19 Estimate	FY 2019-20 Proposed Budget	Increase/ (Decrease) <sup>(a)</sup>
<b>77000</b>	<b>CAPITAL OUTLAYS</b>	<b>\$1,088,300</b>	<b>\$5,010,344</b>	<b>\$5,010,344</b>	<b>\$395,000</b>	<b>(\$693,300)</b>

This account is for tangible asset expenditures with a value of at least \$5,000 and a useful life of at least three years and intangible asset expenditures with a value of at least \$5,000 and a useful life of at least one year. The FY 2019-20 Proposed Budget reflects projects that are either offset by revenue or critical for operational support. Depending on funding availability, budget will be requested mid-year for additional projects. The FY 2019-20 Proposed Budget does not include amounts for federally funded grant programs. An expenditure appropriation will occur mid-year when the grants are awarded.

A listing by office of the proposed Capital Outlays for FY 2019-20 is provided at the end of this section.

<sup>(a)</sup>FY 2019-20 Proposed Budget vs. FY 2018-19 Adopted Budget.

Acct. #	Account Description	FY 2018-19 Adopted Budget	FY 2018-19 Amended Budget	FY 2018-19 Estimate	FY 2019-20 Proposed Budget	Increase/ (Decrease) <sup>(a)</sup>
<b>79050</b>	<b>BUILDING REMODELING</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>

This account is used for minor remodeling projects which become necessary as a result of reorganizations or for safety reasons. No projects are anticipated in Fiscal Year 2019-20.

<sup>(a)</sup>FY 2019-20 Proposed Budget vs. FY 2018-19 Adopted Budget.

Acct. #	Account Description	FY 2018-19 Adopted Budget	FY 2018-19 Amended Budget	FY 2018-19 Estimate	FY 2019-20 Proposed Budget	Increase/ (Decrease) <sup>(a)</sup>
<b>99950</b>	<b>TRANSFERS OUT</b>	<b>\$0</b>	<b>\$2,063,229</b>	<b>\$2,063,229</b>	<b>\$841,353</b>	<b>\$841,353</b>

The FY 2019-20 Proposed Budget includes a transfer to the Health Effects Research Fund, pursuant to Governing Board policy.

<sup>(a)</sup>FY 2019-20 Proposed Budget vs. FY 2018-19 Adopted Budget.

CAPITAL OUTLAYS & BUILDING REMODELING

Fiscal Year 2019-20 Capital Outlays Detail				
Office	Program	Category	Description	Amount
District General	Operational Support	N/A	<u>Unbudgeted Capital Outlay</u> - This amount is set aside for unanticipated needs or emergency situations to avoid interruption of operations.	\$75,000
	<b>Sub-total District General</b>			<b>\$75,000</b>
Information Management	Operational Support	New	<u>Miscellaneous Telecommunication Upgrade/Enhancement</u> – To enable Telecommunications to meet unforeseen network needs/changes required to support South Coast AQMD staff.	\$35,000
	<b>Sub-total Information Management</b>			<b>\$35,000</b>
Science & Technology Advancement	Advance Clean Air Technology	New	<u>Clean Fuels</u> – For advanced technology vehicles and infrastructure.	\$285,000
	<b>Sub-total Science &amp; Technology Advancement</b>			<b>\$285,000</b>
	<b>Total Capital Outlays</b>			<b>\$395,000</b>

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT DRAFT  
GOALS AND PRIORITY OBJECTIVES FOR FY 2019-2020**

**MISSION STATEMENT**

“To clean the air and protect the health of all residents in the South Coast Air District through practical and innovative strategies.”

**GOALS AND PRIORITY OBJECTIVES**

The following Goals and Priority Objectives have been identified as being critical to meeting South Coast AQMD’s Mission in Fiscal Year 2019-20.

**GOAL I. Achieve Clean Air Standards.**

	Priority Objective	Performance Indicator	Performance Measurement
1	Implementation of the 2016 AQMP	Adherence to adoption and implementation schedules for rules, working groups, assessments and programs as adopted in the 2016 AQMP.	Complete 6 rule adoptions and/or actions that result in achievements towards AQMP emissions reductions.
2	Secure Incentive Funding for Emissions Reduction	Dollar amount of new funding sources for pollution reduction projects.	Secure \$300 Million of new funding sources.
3	AB 617 Implementation in Communities	Conduct air monitoring and implement Community Emission Reduction Plans for each of the three Year 1 communities, and conduct outreach to develop recommendations for Year 2 communities	Complete the development and begin implementation of the Community Emission Reduction Plans for each of the three Year 1 communities. Complete the first year of air monitoring for each of the three Year 1 communities.
4	Ensure Efficient Air Monitoring and Laboratory Operations	Achieve acceptable completion of valid data points out of the scheduled measurements in the South Coast AQMD air monitoring network for NAAQS pollutant before U.S. EPA deadline.	Achieve acceptable valid data completion submitted to U.S. EPA before deadline.
5	Ensure Timely Inspections of Facilities	Total number of Title V Inspections completed annually.	Complete 100% Title V Inspections.
6	Maintain progress in reducing the permit applications inventory	Number of pending permit applications.	Maintain pending permit applications inventory excluding Permits to Construct issued and RECLAIM transition applications at or near 3,000.
7	Support Development of Cleaner Advanced Technology	Amount of Clean Fuels Program projects funded.	Fund \$10 Million of Clean Fuels program projects with a 1:4 leveraging ratio.



**GOAL I. Achieve Clean Air Standards (cont.).**

	Priority Objective	Performance Indicator	Performance Measurement
8	Incentive Programs	% of grant money executed in contracts.	50% of grant money contracted within six months after receipt of funds.
9	Complete field study and begin data analysis for the fifth Multiple Air Toxics Exposure Study	Conduct monitoring and updates to emissions inventory for the evaluation of air toxics health impacts.	Finalize data for fixed-site monitoring at 10 sites, continue updating the emissions inventory, and complete deployment of 5 different advanced monitoring methods.

**GOAL II. Enhance Public Education and Equitable Treatment for All Communities.**

	Priority Objective	Performance Indicator	Performance Measurement
1	Evaluation of Low Cost Air Quality Sensors	Evaluation and posting of results of low cost air quality sensors that have reached the market.	Evaluate and post results of 75% of sensors that have reached the market.
2	Outreach	Number of large community outreach events conducted in each County and effective information distribution for major incidents.	Conduct 4 large community outreach events, including 1 in each County. Develop and implement SOPs to provide information to the public as quickly and accurately as possible.
3	Timely Investigation of Community Complaints	Initiate complaint investigation within 2 hours of complaint receipt.	During normal South Coast AQMD business hours, contact 90% of complainants within 2 hours of complaint receipt.
4	Social Media Efforts	Percentage increase in number of social media followers.	30% increase in social media followers.
5	High School Educational Outreach	Number of high schools participating in the air quality education program in environmental justice communities.	Outreach and conduct air quality education program in 100 high schools throughout the 4 Counties in environmental justice communities.

**GOAL III. Operate Efficiently and Transparently.**

Priority Objective		Performance Indicator	Performance Measurement
1	Ensure Transparent Governance	Percentage of Committee and Board meeting agendas with materials made available to the public one week prior to the meeting.	100% of Committee and Board meeting agendas with materials made available to the public one week prior to the meeting.
2	Ensure Transparent Governance	Percentage of Stakeholder and Working Group meeting agendas with materials made available prior to the meeting.	100% of Stakeholder and Working Group meeting agendas with materials made available to the public three days prior to the meeting.
3	Maintain a Well Informed Staff	Number of all staff information sessions offered and conducted.	Offer and conduct 10 information sessions/training for all staff.
4	Partner with Public Agencies, Stakeholder Groups, & Business	Number of meetings with Permit Streamlining Task Force subcommittee and stakeholders.	Conduct 2 meetings of the Permit Streamlining Task Force subcommittee and stakeholders.
5	Timely Financial Monitoring	Timely budgetary financial reporting.	Submit quarterly budgetary financial reports to the Governing Board within 6 working days of the end of the quarter.
6	Implement Cloud Office Suite	Percentage of staff migrated to a particular cloud office service.	Migrate 100% of staff to cloud office email service.

## **PROGRAM CATEGORIES**

### **ADVANCE CLEAN AIR TECHNOLOGY**

Identify technologies from anywhere in the world that may have application in reducing emissions from mobile and stationary sources in South Coast AQMD's jurisdiction. Suggest strategies to overcome any barriers and, when appropriate, implement those strategies.

- (A) Identify short-term and long-term technical barriers to the use of low-emission clean fuels and transportation technologies.
- (B) Promote development and assess the use of clean fuels and low-emitting technologies.
- (C) Work with industry to promote research and development in promising low-emission technologies and clean fuels.
- (D) Provide technical and program support to the Mobile Source Air Pollution Reduction Review Committee (MSRC).
- (E) Conduct source tests and analysis of samples to assess effectiveness of low-emissions technology.
- (F) Implement and administer state-funded programs such as the Carl Moyer program for retrofitting, re-powering, or replacing diesel engines with newer and cleaner engines and the Proposition 1B program that provides funding for projects to reduce air pollution associated with freight movement along California's trade corridors.

### **ENSURE COMPLIANCE WITH CLEAN AIR RULES**

Ensure compliance with South Coast AQMD rules for existing major and small stationary sources.

- (A) Verify compliance with South Coast AQMD rules through inspections, sample collections, Visible Emissions Evaluations, certification of Continuous Emission Monitoring Systems (CEMS), and emissions audits.
- (B) Issue Notices of Violation for major violations when discovered or a Notice to Comply for minor violations or to request records.
- (C) Respond to and resolve public complaints concerning air pollution.
- (D) Participate in Hearing Board cases, investigate breakdowns and notifications of demolitions or renovations of structures which may contain asbestos, conduct periodic monitoring, and observe source tests.
- (E) Respond to industrial and chemical emergencies when requested by other agencies.
- (F) Provide training classes for compliance with various South Coast AQMD rules such as Gasoline Transfer and Dispensing (Rule 461), Asbestos Demolition and Renovation (Rule 1403), Chrome Plating Operations (Rule 1469), Fugitive Dust Plans (Rule 403 & 403.1), Sump and Wastewater Separators (Rule 1176) and Combustion Gas Portable Analyzer Training & Certification (Rules 1146, 1146.1 & 1110.2).

## **PROGRAM CATEGORIES**

### **CUSTOMER SERVICE AND BUSINESS ASSISTANCE**

Support local government, businesses, and the general public.

- (A) Provide local government, business and the public with access and input into the regulatory and policy processes of South Coast AQMD.
- (B) Assist cities and others with AB 2766 projects.
- (C) Interact with local, state and federal agencies as well as others to share air quality information, resolve jurisdictional questions, and implement joint programs.
- (D) Support air pollution reduction through implementation of comprehensive public information and legislative and customer service programs.
- (E) Provide small business assistance services and support economic development and business retention activities.
- (F) Make presentations to and meet with regulated organizations, individuals, public agencies and the media.
- (G) Notify all interested parties of upcoming changes to air quality rules and regulations through public meetings, workshops, and printed and electronic information.
- (H) Resolve permit- and fee-related problems and provide technical assistance to industry.
- (I) Respond to Public Records Act requests.
- (J) Produce brochures, newsletters, television, radio and print media information and materials, and digital information.
- (K) Respond to letters and Internet inquiries from the public and to media inquiries and requests.

### **DEVELOP PROGRAMS TO ACHIEVE CLEAN AIR**

Develop a regional Air Quality Management Plan (AQMP) to achieve federal and state ambient air quality standards and to meet all other requirements of the federal and California Clean Air Acts.

- (A) Analyze air quality data and provide an estimation of pollutant emissions by source category.
- (B) Develop pollutant control strategies and project future air quality using computer models and statistical analysis of alternative control scenarios.
- (C) Analyze issues pertaining to air toxics, acid deposition, and potential socioeconomic and environmental impacts (CEQA) of South Coast AQMD plans and regulations.
- (D) Conduct outreach activities to solicit public input on proposed control measures.
- (E) Implement Rule 2202 On-Road Motor Vehicle Mitigation Options and process employee commute reduction program submittals and registrations. Provide one-on-one assistance to employers to ensure compliance with the rule.

## PROGRAM CATEGORIES

### DEVELOP PROGRAMS TO ACHIEVE CLEAN AIR (Cont.)

- (F) Develop and update emissions inventories; conduct in-house auditing of annual emission reports; conduct field audits.

### DEVELOP RULES TO ACHIEVE CLEAN AIR

Develop emission reduction regulations for sulfur dioxide, nitrogen dioxide, organic gases, particulate matter, toxics, and other pollutants to implement the regional AQMP, Tanner Air Toxics Process (AB 1807), National Emission Standards for Hazardous Air Pollutants (NESHAPS), and Prevention of Significant Deterioration (PSD) requirements.

- (A) Provide an assessment of control technologies, evaluation of control cost, source testing and analysis of samples to determine emissions.
- (B) Test and analyze products and processes to demonstrate pollution reduction potential.
- (C) Solicit public input through meetings and workshops.
- (D) Prepare rules to provide flexibility to industry, ensure an effective permit program and increase rule effectiveness.
- (E) Evaluate effectiveness of area source rules, evaluate area source emission inventories, and propose new rules or amendments to improve implementation of area source programs, including the certification/registration of equipment, and as necessary pursuant to statewide regulatory requirements.
- (F) Implement the AQMP. Develop feasibility studies and control measures.
- (G) Conduct research and analyze health effects of air pollutants and assess the health implications of pollutant reduction strategies.

### MONITORING AIR QUALITY

Operate and maintain within South Coast AQMD's jurisdiction a network of air quality monitoring sites for ozone, nitrogen oxides, sulfur oxides, particulate matter, carbon monoxide and other pollutants to obtain data regarding public exposure to air contaminants.

- (A) Analyze, summarize, and report air quality information generated from the monitoring sites.
- (B) Provide continuous records for assessment of progress toward meeting federal and state air quality standards.
- (C) Develop and prepare meteorological forecasts and models.
- (D) Respond to emergency requests by providing technical assistance to first-response public safety agencies.

## PROGRAM CATEGORIES

### MONITORING AIR QUALITY (Cont.)

- (E) Notify the public, media, schools, regulated industries and others whenever predicted or observed levels exceed the episode levels established under state law.
- (F) Conduct special studies such as MATES V, National Air Toxics Trends (NATTS), Near Road NO<sub>2</sub> Monitoring, and Photochemical Assessment Monitoring Stations (PAMS).
- (G) Conduct measurement activities to identify and monitor potential sources of all toxics including high-risk facilities under the Community Air Toxics Initiative (CATI).
- (H) Evaluate and deploy low-cost sensors to monitor air pollution within communities of the South Coast Air Basin.
- (I) Assess the ability of optical remote sensing technology to characterize and quantify emissions from refineries and other sources, and to serve as a useful tool for enhancing existing leak detection and repair programs.

### OPERATIONAL SUPPORT

Provide operational support to facilitate overall air quality improvement programs.

- (A) Provide services that enable South Coast AQMD offices to function properly. Services include facility administration, human resources and financial services.
- (B) Provide information management services in support of all South Coast AQMD operations, including automation of permitting and compliance records, systems analysis and design, computer programming and operations, records management, and library services.
- (C) Provide legal support and representation on all policy and regulatory issues and all associated legal actions.

### TIMELY REVIEW OF PERMITS

Ensure timely processing of permits for new sources based on compliance with New Source Review and other applicable local, state and federal air quality rules and regulations.

- (A) Process applications for Permits to Construct and/or to Operate for new construction, modification and change of conditions for major and non-major sources.
- (B) Process Title V permits (Initial, Renewal, and Revisions) and facility permits for RECLAIM sources.
- (C) Process applications for Administrative Changes, Change of Operator, Plans, Emission Reductions Credits (ERCs) and RECLAIM Trading Credits (RTCs).

## PROGRAM CATEGORIES

### TIMELY REVIEW OF PERMITS (Cont.)

- (D) Continue efforts to streamline and expedite permit issuance through:
  - (1) Equipment certification/registration programs
  - (2) Streamlined standard permits
  - (3) Enhancement of permitting systems (including electronic permitting)
  - (4) Expedited Permit Processing Program
  - (5) Maintaining adequate staff resources
  - (6) Improved training
  - (7) Revisiting policies and rules

### POLICY SUPPORT

Monitor, analyze and attempt to influence the outcome of state/federal legislation.

- (A) Track changes to the state/federal budgets that may affect South Coast AQMD.
- (B) Respond to Congressional and Senatorial inquiries regarding South Coast AQMD programs, policies or initiatives.
- (C) Assist South Coast AQMD consultants in identifying potential funding sources and securing funding for South Coast AQMD programs.
- (D) Provide support staff to the Governing Board, Board committees, and various advisory and other groups including but not limited to: the Air Quality Management Plan Advisory Group, the Environmental Justice Advisory Group, the Home Rule Advisory Group, the Local Government and Small Business Assistance Advisory Group, the Mobile Source Air Pollution Reduction Review Committee (MSRC) and MSRC Technical Advisory Committee, the Scientific, Technical and Modeling Peer Review Advisory Group, the Technology Advancement Advisory Group, as well as ad hoc committees established from time to time and various Rule working groups.

## REVENUE CATEGORIES

### I. **Allocatable**

A portion of South Coast AQMD revenue offsets operational support costs of the South Coast AQMD.

1a Allocatable South Coast AQMD: District-wide administrative and support services (e.g., Human Resources, Payroll, Information Management).

1b Allocatable Office: Administrative activities specific to a division/office.

### II. **Annual Operating Emissions Fees**

### III. **Permit Processing Fees**

### IV. **Annual Operating Permit Renewal Fees**

### V. **Federal Grants/Other Federal Revenue**

### VI. **Source Test/Sample Analysis Fees**

### VII. **Hearing Board Fees**

### VIII. **Clean Fuels Fees**

### IX. **Mobile Sources**

### X. **Air Toxics AB 2588**

### XI. **Transportation Programs**

XII - XIV. These revenue categories are no longer used.

### XV. **California Air Resources Board Subvention/State Grants**

XVI. This revenue category is no longer used.

### XVII. **Other Revenue**

### XVIII. **Area Sources**

### XIX. **Portable Equipment Registration Program (PERP)**

### XX. **State Grant**

For a description of the revenue categories listed above, please refer to the corresponding revenue account in the FUND BALANCE & REVENUES section, "Explanation of Revenue Sources" within this document.

Revised 4/25/2019



## WORK PROGRAM OVERVIEW

The Work Program is a management tool that allocates resources by Office, Program Category, and project. It is developed from Program Output Justification forms prepared during the budget process by each Office. Work Programs for each Office can be found in the OFFICE BUDGETS section of this document. Work Programs by Program Category are within the following pages. A glossary of terms and acronyms used in the Work Programs are at the end of this section.

Professional & Special Services, Temporary Agency Services, and Capital Outlays expenditures are assigned to specific Work Program Codes associated with the project the expenditures support. All other expenditures (Salaries and Benefits and most Services and Supplies line items) are distributed within an Office by Full-Time Equivalent (FTE). A prorated share of the District General Budget has been allocated to each line in the work program based on the number of FTEs reflected on the line.

The following is a brief description of each column in the Work Program:

The **#** column identifies each line in the Work Program in numerical order.

The **Program Code** is a five-digit code assigned to each program. The first two digits represent the Office. The last three digits are the Program.

The **Goal** column identifies which of the three Program Goals (defined in the Draft Goals and Priority Objectives) applies to that output. The Goals are:

**GOAL I**      **Achieve Clean Air Standards.**

**GOAL II**      **Enhance Public Education and Equitable Treatment for All Communities.**

**GOAL III**      **Operate Efficiently and Transparently.**

The **Office** column, which appears on the Work Program by Category document, identifies the Office responsible for performing the work.

The **Program Category** column, which appears on the Work Program by Office document, identifies one of the nine Program Categories associated with an activity.

The **Program** column identifies the Program associated with the work.

The **Activities** column provides a brief description of the work.

The **FTEs** column identifies the number of Full Time Equivalent staff positions in the current-year adopted budget, mid-year and proposed changes (+/-), and the proposed budget for the next fiscal year. An FTE position represents one person-year.

The **Expenditures** column, found in the Work Program by Category document, identifies the expenditures in the current-year adopted budget, proposed changes (+/-) and the proposed budget for the next fiscal year.

The **Revenue Category** column identifies the revenue that supports the work. Revenue Category titles can be found within this section and revenue descriptions are in the FUND BALANCE & REVENUES section, "Explanation of Revenue Sources" within this document.

**Advance Clean Air Technology  
Work Program by Category**

#	Program Code	Goal	Office	Program	Activities	FTEs FY 2018-19	+/-	FTEs FY 2019-20	Expenditures FY 2018-19	+/-	Expenditures FY 2019-20	Revenue Categories					
1	08 001	I	LEG	AB2766/Mob Src/Legal Advice	AB2766 Leg Adv: Trans/Mob Source	0.05	0.00	0.05	\$ 10,620	\$	112	10,732	IX				
2	04 003	III	FIN	AB2766/MSRC	MSRC Program Administration	0.35	0.00	0.35	52,379	(3)	52,376	IX					
3	08 003	I	LEG	AB2766/MSRC	Legal Advice: MSRC Prog Admin	0.10	0.00	0.10	21,239	224	21,464	IX					
4	44 003	I	STA	Advisory Group/Small Business	Mob Src Review Comm Prog Admin	0.50	0.00	0.50	86,636	(3,532)	83,103	IX					
5	44 004	I	STA	AB2766/MSRC/Contract Admin	AB2766 Admin Discretionary Prog	3.00	0.00	3.00	519,814	(21,194)	498,620	IX					
6	44 012	I	STA	AQMP/Control Tech Assessment	Tech Supp: Quantify Cost Effec	1.00	0.00	1.00	173,271	(7,065)	166,207	VIII					
7	04 030	I	FIN	AB 134	AB 134	2.00	0.00	2.00	299,306	(17)	299,289	IX					
8	08 030	I	LEG	AB 134	AB 134	2.00	-0.50	1.50	424,788	(102,830)	321,958	IX					
9	44 030	I	STA	AB 134	AB 134	6.00	-1.00	5.00	1,039,628	(208,595)	831,033	IX					
10	44 039	I	STA	Admin/Office Mgt/Tech Adv	Admin Support/Coordination	0.77	0.00	0.77	133,419	(5,440)	127,979	VIII					
11	44 048	I	STA	Admin/Prog Mgmt/Tech Advance	Overall TA Program Mgmt/Coord	1.55	0.00	1.55	268,570	(10,950)	257,620	VIII					
12	44 095	I	STA	CA Natural Gas Veh Partnership	CA Natural Gas Veh Partnership	0.10	0.00	0.10	17,327	(706)	16,621	VIII					
13	44 121	I	STA	China Clin Shipping	China Partnership Cleaner Shpng	0.00	0.90	0.90	-	149,586	149,586	IX					
14	04 130	III	FIN	Clean Fuels/Contract Admin	Clean Fuels Contract Admin/Monitor	0.15	0.00	0.15	22,448	(1)	22,447	VIII					
15	44 130	I	STA	Clean Fuels/Contract Admin	Admin/Project Supp for TA Cont	4.40	-0.50	3.90	762,394	(114,188)	648,206	VIII					
16	08 131	I	LEG	Clean Fuels/Legal Advice	Legal Advice: Clean Fuels	0.15	0.00	0.15	31,859	337	32,196	VIII					
17	44 132	I	STA	Clean Fuels/Mobile Sources	Dev/Impl Mobile Src Proj/Demo	1.50	-0.50	1.00	1,544,907	(93,700)	1,451,207	VIII					
18	44 134	I	STA	Clean Fuels/Stationary Combust	Dev/Demo Clean Combustion Tech	0.30	0.00	0.30	51,981	(2,119)	49,862	VIII					
19	44 135	I	STA	Clean Fuels/Stationary Energy	Dev/Demo Alt Clean Energy	0.55	0.00	0.55	95,299	(3,886)	91,414	VIII					
20	44 136	I	STA	Clean Fuels/Tech Transfer	Disseminate Low Emiss CF Tech	2.31	-0.51	1.80	400,257	(101,085)	299,172	VIII					
21	44 187	I	STA	DERA Sch Bus Repl	DERA Sch Bus Repl Admin/Impl	0.03	0.07	0.10	5,198	11,423	16,621	V					
22	44 188	I	STA	DERA FY13 Veh Repl	DERA Vehicle Repl Admin/Impl	0.10	0.00	0.10	17,327	(706)	16,621	XVII					
23	44 190	I	STA	Diesel Projects EPA	Diesel Projects EPA/Admin/Impl	0.11	0.09	0.20	19,060	14,181	33,241	V					
24	44 203	I	STA	EFMP Program Support	EFMP Program Support	5.00	0.00	5.00	866,356	(35,323)	831,033	XVII					
25	44 258	I	STA	FARMER Grant	Fund Ag Replacement Measures	0.00	2.50	2.50	-	415,517	415,517	XVII					
26	44 356	I	STA	GGRF ZEDT Demo	GGRF ZEDT Demo Admin	1.00	0.10	1.10	173,271	9,556	182,827	XVII					
27	44 453	I	STA	Mob Src: Emiss Inven Method	Rvw CARB/US EPA emissions inven methodology	1.50	0.00	1.50	259,907	(10,597)	249,310	VIII,IX					
28	04 457	III	FIN	Mobile Source/Moyer Adm	Carl Moyer: Contract/Fin Admin	1.02	0.00	1.02	152,646	(9)	152,637	IX					
29	08 457	I	LEG	Mob Src/C Moyer/Legal Advice	Moyer/implem/Program Dev	0.10	0.00	0.10	21,239	224	21,464	IX					
30	16 457	I	AHR	MS/Carl Moyer Admin	C Moyer/Contractor Compliance	0.10	0.00	0.10	18,454	(1,460)	16,994	IX					
31	44 457	I	STA	Mob Src/C Moyer Adm/Outreach	Carl Moyer: Impl/Admin Grant	12.15	0.95	13.10	2,180,246	297,061	2,477,307	IX					
32	44 459	I	STA	Mob Src/C Moyer/Impl/Prj Dev	Moyer/implem/Program Dev	3.00	0.00	3.00	519,814	(21,194)	498,620	IX					
33	44 460	I	STA	VIP Admin	VIP Admin/Outreach/Impl	0.50	0.00	0.50	86,636	(3,532)	83,103	IX					
34	44 533	I	STA	POLB AMECS Demo	POLB AMECS Demo-Admin/Impl	0.47	-0.37	0.10	81,437	(64,817)	16,621	XVII					
35	04 542	I	FIN	Prop 1B:Goods Movement	Contracts/Finance Admin	0.50	0.00	0.50	74,827	(4)	74,822	IX					
36	16 542	I	AHR	Prop 1B:Goods Movement	Prop 1B: Goods Movement	0.10	0.00	0.10	18,454	(1,460)	16,994	IX					
37	04 544	I	FIN	Prop 1B:Low Emiss Sch Bus	Grants/Finance Admin	0.05	0.00	0.05	7,483	(0)	7,482	IX					
38	44 677	I	STA	School Bus/Lower Emission Prog	School Bus Program Oversight	1.50	0.50	2.00	259,907	72,506	332,413	IX					
39	44 738	I	STA	Target Air Shed EPA	Targeted Air Shed Admin/Impl	0.50	0.00	0.50	86,636	(3,532)	83,103	V,XVII					
40	44 740	I	STA	Tech Adv/Commercialization	Assess CFs/Adv Tech Potential	0.25	0.00	0.25	43,318	(1,766)	41,552	VIII					
41	44 741	I	STA	Tech Adv/Non-Combustion	Dev/Demo Non-Combustion Tech	1.00	-0.40	0.60	173,271	(73,547)	99,724	VIII					
42	44 816	I	STA	Transportation Research	Transport Research/Adv Systems	0.50	-0.40	0.10	86,636	(70,015)	16,621	VIII					
43	44 827	I	STA	VW-Program Development	VW-Program Development	0.00	4.00	4.00	-	664,826	664,826	XVII					
<b>Total Advance Clean Air Technology</b>											56.26	4.93	61.19	\$ 11,108,263	\$	672,279	\$ 11,780,542

A prorated share of the District General Budget has been allocated to each line in the work program based on the number of FTEs reflected on the line.

**Customer Service and Business Assistance  
Work Program by Category**

#	Program Code	Goal	Office	Program	Activities	FTEs FY 2018-19	+/-	FTEs FY 2019-20	Expenditures FY 2018-19	+/-	Expenditures FY 2019-20	Revenue Categories
1	1 04 002	III	FIN	AB2766/Mobile Source	Prog Admin: Monitor/Dist/Audit	0.10	0.00	0.10	\$ 24,965	\$ (10,001)	\$ 14,964	IX
2	2 26 007	I	PRA	AB2766/MISRC	AB2766 Prov Tech Asst to Cities	1.20	-1.20	0.00	212,601	(212,601)	-	IX
3	3 35 037	I	LPA	AB 617-Outreach	AB 617-Outreach	2.00	3.00	5.00	352,644	538,476	891,120	XX
4	5 60 038	I	EP	Admin/Office Management	Dev/Coord Goals/Policies/Overs	3.00	0.00	3.00	528,349	2,548	530,896	lb
5	6 03 038	III	CE	Admin/Office Budget	Admin/Coord Goals/Policies/Overs	7.00	-1.00	6.00	1,081,925	(183,127)	898,798	lb
6	6 35 046	III	LPA	Admin/Prog Mgmt	Admin/Office/Units/SuppCoord Staff	4.02	1.00	5.02	708,815	178,645	887,461	lb
7	7 50 047	I	EP	Admin/Operations Support	Budget/Contracts/Reports/Projects	3.00	0.00	3.00	530,849	2,548	533,396	lb
8	8 60 047	I	CE	Admin/Operations Support	Budget/Contracts/Reports/Projects	4.90	0.00	4.90	760,447	(8,489)	751,959	lb
9	9 35 126	II	LPA	Clean Air Connections	Coord of region-wide community group	1.00	0.00	1.00	176,322	1,902	178,224	II,IX
10	10 04 170	I	FIN	Billing Services	Answer/Resp/Resolv Prob & Inq	8.00	0.00	8.00	1,212,725	(69)	1,212,656	II,III,IV
11	11 50 200	I	EP	Economic Dev/Bus Retention	Perm Proc/Public Participation	0.10	0.00	0.10	17,612	85	17,697	III
12	12 35 205	II	LPA	Environmental Education	Curriculum Dev/Project Coord	0.25	0.00	0.25	44,081	475	44,556	II,IX,XV
13	13 35 240	I	LPA	Environmental Justice	Impl Board's EJ Pgrms/Policies	2.00	0.00	2.00	352,644	3,804	356,448	II,IV
14	14 04 260	III	FIN	Fee Review	Cmte Mtg/Fee-Related Complaint	0.10	0.00	0.10	14,965	(1)	14,964	II,III,IV,XV
15	15 35 260	III	LPA	Fee Review	Cmte Mtg/Fee-Related Complaint	0.50	0.00	0.50	88,161	951	89,112	II,III,IV,XV
16	16 50 260	III	EP	Fee Review	Fee Review Committee	0.45	0.00	0.45	79,252	382	79,634	II,III,IV
17	17 04 355	III	FIN	Grants Management	Grant Anlyz/Eval/Negot/Acc/Rpt	1.00	0.00	1.00	149,653	(9)	149,644	IV,V,XV
18	18 35 381	III	LPA	Interagency Liaison	Interact Gov Agns/Promote SCAQMD	0.15	0.00	0.15	26,448	285	26,734	la,XV
19	19 35 390	I	LPA	Intergov/Geographic Deployment	Dev/Impl Local Govt Outreach	10.50	0.00	10.50	1,889,383	19,970	1,909,353	II,IX
20	20 08 404	I	LEG	Legal Rep/Legislation	Draft Legis/SCAQMD Position/Mtgs	0.25	-0.25	0.00	53,098	(53,098)	-	II,IX
21	21 50 425	I	EP	Lobby Permit Services	Supp Perm Proc/Customer Svc	1.00	0.00	1.00	176,116	849	176,965	III
22	22 27 481	III	IM	New System Development	Dev sys in supp of Dist-wide	1.75	0.00	1.75	371,644	573	372,217	la,III
23	23 03 490	II	EO	Outreach	Publ Awareness Clean Air Prog	0.97	0.00	0.97	301,935	1,950	303,886	la
24	24 35 491	II	LPA	Outreach/Business	Chambers/Business Meetings	1.00	0.00	1.00	176,322	1,902	178,224	II,IV
25	25 35 492	II	LPA	Public Education/Public Events	Pub Events/Conf/Rideshare Fair	1.00	1.00	2.00	453,327	1,902	455,229	II,V,IX,XV
26	26 60 492	II	CE	Outreach/Business	Pub Events/Conf/Rideshare Fair	0.20	0.00	0.20	30,855	(346)	30,509	IX
27	27 35 496	II	LPA	Outreach/Visiting Dignitary	Tours/Briefings-Dignitary	0.25	0.00	0.25	44,081	475	44,556	la
28	28 35 514	I	LPA	Permit: Expired Permit Program	Assist w Permit Reinstatement	0.30	0.00	0.30	52,897	571	53,467	IV
29	29 50 520	I	EP	Perm Proc/Pre-Appl Mtg Outreach	Pre-App Mtgs/Genl Prescreening	1.00	0.00	1.00	176,116	849	176,965	III
30	30 16 540	III	AHR	Print Shop	Printing/Collating/Binding	4.00	0.00	4.00	775,897	(90,152)	685,745	la
31	31 35 555	II	LPA	Public Information Center	Inform public of unhealthy air	1.00	0.00	1.00	266,322	1,902	268,224	II,V,IX
32	32 03 565	III	EO	Public Records Act	Comply w/ Public Req for Info	0.01	0.00	0.01	3,113	20	3,133	la
33	33 04 565	I	FIN	Public Records Act	Comply w/ Public Rec Requests	0.02	0.00	0.02	2,993	(0)	2,993	la
34	34 08 565	III	LEG	Public Records Act	Comply w/ Public Rec Requests	1.50	0.00	1.50	318,591	3,367	321,958	la
35	35 16 565	III	AHR	Public Records Act	Comply w/ Public Rec Requests	0.05	0.00	0.05	9,227	(730)	8,497	la
36	36 17 565	III	CB	Public Records Act	Comply w/ Public Rec Requests	0.02	0.00	0.02	4,796	11	4,807	la
37	37 26 565	III	PRA	Public Records Act	Comply w/ Public Rec Requests	0.82	-0.03	0.79	145,277	(4,742)	140,535	la
38	38 27 565	III	IM	Public Records Act	Comply w/ Public Req for Info	4.75	0.00	4.75	925,147	26,513	951,660	la
39	39 35 565	III	LPA	Public Records Act	Comply w/ Public Req for Info	0.10	0.00	0.10	17,632	190	17,822	la

**Customer Service and Business Assistance (Cont.)  
Work Program by Category**

#	Program Code	Goal	Office	Program	Activities	FTEs FY 2018-19	+/-	FTEs FY 2019-20	Expenditures FY 2018-19	+/-	Expenditures FY 2019-20	Revenue Categories
40	44 565	III	STA	Public Records Act	Comply w/ Public Req for Info	0.17	0.00	0.17	\$ 29,456	\$ (1,201)	\$ 28,255	la
41	50 565	III	EP	Public Records Act	Comply w/ Public Req for Info	0.25	0.00	0.25	44,029	212	44,241	la
42	60 565	III	CE	Public Records Act	Comply w/ Public Req for Info	3.00	0.00	3.00	462,825	(5,197)	457,628	la
43	04 631	III	FIN	Cash Mgmt/Refunds	Research/Doc/Prep/Proc Refunds	0.30	0.00	0.30	44,896	(3)	44,893	III,IV,XI
44	35 679	III	LPA	Small Business Assistance	Small Business/Financial Assistance	1.00	0.00	1.00	176,322	1,902	178,224	III
45	08 681	III	LEG	Small Business/Legal Advice	Legal Advice: SB/Fee Review	0.05	0.00	0.05	10,620	112	10,732	II,III
46	50 690	I	EP	Source Education	Prov Tech Asst To Industries	2.80	0.00	2.80	493,125	2,378	495,503	III,IV,V,XV
47	60 690	I	CE	Source Education	Prov Tech Asst To Industries	0.40	0.00	0.40	61,710	(693)	61,017	III,IV,V,XV
48	44 701	I	STA	Source Testing/Customer Svc	Conduct ST/Prov Data/Cust Svc	0.05	0.00	0.05	8,664	(353)	8,310	VI
49	44 709	I	STA	VOC Sample Analysis/SBA/Other	VOC Analysis & Reptg/Cust Svc	0.50	0.00	0.50	86,636	(3,532)	83,103	VI
50	35 710	I	LPA	Speakers Bureau	Coordinate/conduct speeches	0.10	0.00	0.10	17,632	190	17,822	la
51	16 720	I	AHR	Subscription Services	Rule & Gov Board Materials	1.70	-1.00	0.70	313,712	(194,757)	118,955	IV,XVII
52	26 788	I	PRA	AB2588 Mailing/Venue	AB2588 Mailing/Venue	0.00	0.05	0.05		8,895	8,895	XVII
53	35 791	I	LPA	Toxics/AB2588	Outreach/AB 2588 Air Toxics	0.01	0.00	0.01	1,763	19	1,782	X
54	26 833	II	PRA	Rule 2202 ETC Training	Rule 2202 ETC Training	0.95	0.20	1.15	188,309	26,267	214,576	XI

**Total Customer Service & Business Assistance**      80.54      1.77      82.31      \$ 14,496,926      \$ 62,021      \$ 14,558,947

**Develop Programs  
Work Program by Category**

#	Program Code	Goal	Office	Program	Activities	FTEs FY 2018-19	+/-	FTEs FY 2019-20	Expenditures FY 2018-19	+/-	Expenditures FY 2019-20	Revenue Categories
1	26 002	I	PRA	AB2766/Mobile Source	AB2766 Mobile Source Outreach	1.05	1.65	2.70	\$ 186,026	\$ 294,283	\$ 480,308	IX
2	04 009	I	FIN	AB 1318 Mitigation	AB 1318 Projects Admn/Impl	0.13	0.00	0.13	19,455	(1)	19,454	XVII
3	44 009	I	STA	AB 1318 Mitigation	AB 1318 Projects Admn/Impl	0.75	-0.50	0.25	129,953	(88,402)	41,552	XVII
4	03 010	I	EO	AQMP	Develop/Implement AQMP	0.05	0.00	0.05	15,564	101	15,664	II,IX
5	08 010	I	LEG	AQMP	AQMP Revision/CEQA Review	0.10	0.00	0.10	21,239	224	21,464	II,IV,IX
6	26 010	I	PRA	AQMP	AQMP Special Studies	0.10	1.50	1.60	25,717	266,910	292,627	IV,V,IX,XV
7	03 028	I	EO	Admin/SCAQMD Policy	Dev/Coord Goals/Policies/Overs	0.44	0.00	0.44	211,960	885	212,845	Ia
8	26 033	I	PRA	AB 617-Em Inventory	AB 617-Em Inventory	0.50	2.50	3.00	88,584	445,092	533,676	XX
9	26 034	I	PRA	AB 617-Em Reduc Plns	AB 617-Em Reduc Plns	0.50	9.65	10.15	88,584	1,717,020	1,805,603	XX
10	26 038	I	PRA	Admin/Office Management	Coordinate Off/Admin Activities	4.55	0.00	4.55	806,111	18,298	824,408	Ib
11	26 068	II	PRA	SCAQMD Projects	Prepare Environmental Assessments	3.35	0.00	3.35	768,510	2,428	770,938	II,IV,IX
12	44 069	I	STA	AQIP Evaluation	AQIP Contract Admn/Evaluation	0.50	0.00	0.50	86,636	(3,532)	83,103	IX
13	26 102	II	PRA	CEQA Document Projects	Review/Prepare CEQA Comments	3.75	0.00	3.75	664,377	2,718	667,095	II,IX
14	26 104	I	PRA	CEQA Policy Development	ID/Develop/Impl CEQA Policy	0.50	0.00	0.50	113,584	362	113,946	IV,IX
15	26 121	I	PRA	China Clin Shipping	China Partnership Cleaner Shpng	0.00	1.00	1.00	-	177,892	177,892	IX
16	26 128	I	PRA	Cln Communities Pln	Cln Communities Plan Admn/Impl	0.25	-0.25	0.00	44,292	(44,292)	-	II,IX
17	26 217	I	PRA	Emissions Inventory Studies	Dev Emiss DB/Dev/Update Emiss	0.50	0.25	0.75	88,584	44,835	133,419	II,V,IX,XV
18	26 218	I	PRA	AQMP/Emissions Inventory	Dev Emiss Inv: Forecasts/RFPs	0.74	0.51	1.25	131,104	91,261	222,365	II,IX
19	26 368	I	PRA	Incentive RFP Emiss Red Projs	Incentive Projects Admn	0.00	1.00	1.00	-	177,892	177,892	XVII
20	44 368	I	STA	Incentive RFP Emiss Red Projs	Incentive Projects Admn	0.00	3.00	3.00	-	498,620	498,620	XVII
21	44 396	I	STA	Lawnmower Exchange	Lawn Mower Admn/Impl/Outreach	0.30	0.00	0.30	51,981	(2,119)	49,862	XVII
22	26 397	II	PRA	Lead Agency Projects	Prep Envrmt Assmts/Perm Proj	2.50	0.00	2.50	442,918	1,812	444,730	III
23	26 451	I	PRA	Mob Src/CARB/EPA Monitoring	CARB/US EPA Mob Src Fuel Policies	0.50	0.00	0.50	88,584	362	88,946	IX
24	26 452	I	PRA	Mob Src/CEC/US DOE Monitoring	CEC/US DOE Mob Src rulemaking proposals	0.50	-0.30	0.20	88,584	(53,005)	35,578	IX,XVII
25	44 458	I	STA	Mobile Source Strategies	Implement Fleet Rules	1.00	0.00	1.00	173,271	(7,065)	166,207	VIII
26	26 503	I	PRA	PM Strategies	PM10 Plan/Analyze/Strategy Dev	3.40	-2.40	1.00	602,368	(424,476)	177,892	II,V,XV
27	44 542	I	STA	Prop 18:Goods Movement	Prop 18:Goods Movement	9.00	-7.00	2.00	1,859,441	(1,452,028)	407,413	IX
28	35 560	I	LPA	Public Notification	Public notif of rules/hearings	0.50	0.00	0.50	108,161	951	109,112	II,IV,IX
29	26 685	I	PRA	Socio-Economic	Apply econ models/Socio-econ	4.50	-0.50	4.00	1,058,552	(196,984)	861,568	II,IV
30	44 702	I	STA	ST Methods Development	Eval ST Methods/Validate	0.95	0.00	0.95	164,608	(6,711)	157,896	II
31	44 705	I	STA	ST Sample Analysis/Air Program	Analyze ST Samples/Air Prgrms	0.25	0.00	0.25	43,318	(1,766)	41,552	II
32	26 745	I	PRA	Rideshare	Dist Rideshare/Telecommute Prog	0.68	-0.13	0.55	120,474	(22,633)	97,841	IX
33	26 816	I	PRA	Transportation Regional Progs	Dev AQMP Meas/Coord w/Reg Agn	0.35	0.05	0.40	137,009	(60,852)	76,157	V,IX
34	26 834	I	PRA	Rule 2202 Implement	Rule 2202 Proc/Sub Plans/Tech Eval	2.67	-0.52	2.15	473,036	(90,569)	382,468	XI
35	26 836	I	PRA	Rule 2202 Support	R2202 Supt/Cmpt/Maint/WebSubmt	2.65	-0.60	2.05	484,493	(84,814)	399,679	V,XI
<b>Total Develop Programs</b>						47.51	8.91	56.42	\$ 9,387,075	\$ 1,202,696	\$ 10,589,771	

**Develop Rules  
Work Program by Category**

#	Program Code	Goal	Office	Program	Activities	FTEs FY 2018-19	+/-	FTEs FY 2019-20	Expenditures FY 2018-19	+/-	Expenditures FY 2019-20	Revenue Categories
1	26 031	I	PRA	AB 617-BARCT Rules	AB 617-BARCT Rules	1.1-4.0	4.80	16.20	\$ 2,019,706	\$ 862,144	\$ 2,881,850	XX
2	26 035	I	PRA	AB 617-General	AB 617-General	1.60	2.55	4.15	283,467	454,784	738,252	XX
3	50 035	I	EP	AB617-General	AB617-General	0.00	1.00	1.00	-	176,965	176,965	XX
4	44 043	I	STA	Admin/Office Mgmt/Rules	Rules: Assign/Manage/Supp	0.15	0.00	0.15	25,991	(1,060)	24,931	lb
5	26 050	I	PRA	Admin/Rule Dev/PRA	Admin: Rule Development	1.10	0.00	1.10	194,884	797	195,681	lb
6	26 071	I	PRA	Arch Ctgs - Admin	Rdev/Aud/DB/TA/SCAQMD/Rpts/AER	1.00	-0.50	0.50	177,167	(88,221)	88,946	XVIII
7	26 077	I	PRA	Area Sources/Rulemaking	Dev/Eval/Impl Area Source Prog	2.00	-1.50	0.50	354,334	(265,388)	88,946	II,IX
8	26 165	I	PRA	Conformity	Monitor Transp. Conformity	0.25	0.00	0.25	44,292	181	44,473	V,IX
9	26 257	I	PRA	Fac Based Mob Src	Facility Based Mobile Src Meas	5.00	1.25	6.25	885,836	300,989	1,186,825	IX
10	26 362	II	PRA	Health Effects	Study Health Effect/Toxicology	2.25	-1.55	0.70	398,626	(274,102)	124,524	II,III,IX
11	26 385	I	PRA	Criteria Pollutants/Mob Srcs	Dev/Impl Intercredit Trading	0.75	0.00	0.75	132,875	544	133,419	IV,IX
12	26 449	I	PRA	Mob Src/SCAQMD Rulemaking	Prepare SCAQMD Mob Src rulemaking proposals	2.30	1.30	3.60	407,484	232,927	640,411	IX
13	44 456	I	STA	MS & AQMP Control Strategies	AQMP Control Strategies	0.30	0.30	0.30	51,981	(2,119)	49,862	VIII
14	26 460	I	PRA	Regional Modeling	Rule Impact/Analyses/Model Dev	4.40	0.60	5.00	1,019,536	(60,076)	959,460	II,V,IX
15	26 646	I	PRA	R1180 Community Mon	R1180 Comm Monitoring Refinery	0.00	0.20	0.20	-	35,578	35,578	XVII
16	50 650	I	EP	Rulemaking	Dev/Amend/Impl Rules	0.25	0.00	0.25	44,029	212	44,241	II,XV
17	08 651	I	LEG	Rules/Legal Advice	Legal Advice: Rules/Draft Regs	1.20	0.00	1.20	254,873	2,694	257,567	II
18	44 653	I	STA	Rulemaking/BACT	Dev/Amend BACT Guidelines	1.50	-0.50	1.50	346,543	(97,233)	249,310	II
19	26 654	I	PRA	Rulemaking/NOX	Rulemaking/NOX	2.50	-1.60	0.90	442,918	(282,815)	160,103	II,IV,XV
20	26 655	I	PRA	NSR/Adm Rulemaking	Amend/Develop NSR & Admin Rules	2.50	-1.60	0.90	442,918	(282,815)	160,103	II,IV,V,XV
21	26 656	I	PRA	Rulemaking/VOC	Dev/Amend VOC Rules	3.25	-0.25	3.00	575,793	(42,117)	533,676	II,IV,XV
22	44 657	I	STA	Rulemaking/Support PRA	Assist PRA w/ Rulemaking	0.05	0.00	0.05	8,664	(353)	8,310	II
23	50 657	I	EP	Rulemaking/Support PRA	Provide Rule Development Supp	0.25	0.00	0.25	44,029	212	44,241	II,XV
24	60 657	I	CE	Rulemaking/Support PRA	Provide Rule Development Supp	1.00	0.00	1.00	154,275	(1,732)	152,543	IV,XV
25	26 659	I	PRA	Rulemaking/Toxics	Develop/Amend Air Toxic Rules	11.00	-2.25	8.75	1,948,839	(392,284)	1,556,555	II,XV
26	08 661	I	LEG	Rulemaking/RECLAIM	RECLAIM Legal Adv/Related Iss	0.50	0.00	0.50	106,197	1,122	107,319	II
27	26 661	I	PRA	Rulemaking/RECLAIM	RECLAIM Amend Rules/Related Is	2.50	-1.00	1.50	442,918	(176,080)	266,838	II
28	44 706	I	STA	ST Sample Analysis/Air Program	Analyze ST Samples/Rules	0.25	0.00	0.25	43,318	(1,766)	41,552	II
29	44 708	I	STA	VOC Sample Analysis/Rules	VOC Analysis & Rptg/Rules	0.25	0.00	0.25	43,318	(1,766)	41,552	II,XV
30	50 752	I	EP	Title III Rulemaking	Title III Dev/Implement Rules	0.25	0.00	0.25	44,029	212	44,241	II,V,XV
31	50 773	I	EP	Title V & NSR Rulemaking-Supp	Title V Rules Dev/Amend/Impl	0.25	0.00	0.25	44,029	212	44,241	II

<b>Total Develop Rules</b>	60.50	0.95	61.45	\$ 10,982,868	\$ 99,647	\$ 11,082,515
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Revised 4/25/2019

**Ensure Compliance  
Work Program by Category**

#	Program Code	Goal	Office	Program	Activities	FTEs FY 2018-19	+/-	FTEs FY 2019-20	Expenditures FY 2018-19	+/-	Expenditures FY 2019-20	Revenue Categories
1	44 015	I	STA	Acid Rain Program	Acid Rain CEMS Eval/Cert	0.50	0.00	0.50	\$ 86,636	\$ (3,532)	\$ 83,103	II,IV
2	60 032	I	CE	AB617-Compliance	AB617-Compliance	0.00	8.00	8.00	-	1,220,341	1,220,341	XX
3	44 042	I	STA	Admin/Office Mgmt/Compliance	Compliance: Assign/Manage/Supp	0.37	0.00	0.37	64,110	(2,614)	61,496	Ib
4	60 070	I	CE	CARB PERP Program	CARB Audits/Statewide Equip Reg	6.00	0.00	6.00	925,650	(10,394)	915,255	XIX
5	08 072	I	LEG	Arch Ctgs - End User	Case Dispo/Rvw, Track, Prep NOV's	0.05	0.00	0.05	10,620	112	10,732	XVIII
6	26 072	I	PRA	Arch Ctgs - End User	Compliance/Rpts/Rule Implementation	0.80	0.20	1.00	141,734	36,158	177,892	XVIII
7	44 072	I	STA	Arch Ctgs - End User	Sample Analysis/Rpts	2.00	0.00	2.00	346,543	(14,129)	332,413	XVIII
8	08 073	I	LEG	Arch Ctgs - Other	Case Dispo/Rvw, Track, Prep NOV's	0.05	0.00	0.05	10,620	112	10,732	XVIII
9	26 073	I	PRA	Arch Ctgs - Other	Compliance/Rpts/Rule Implementation	0.80	0.20	1.00	141,734	36,158	177,892	XVIII
10	26 076	I	PRA	Area Sources/Compliance	Area Source Compliance	4.50	0.00	4.50	897,252	(76,738)	820,514	III,IV,V,IX,XV
11	16 080	III	AHR	Auto Services	Vehicle/Radio Repair & Maint	3.00	0.00	3.00	553,610	(43,801)	509,809	Ia
12	44 105	I	STA	CEMS Certification	CEMS Review/Approval	6.15	0.00	6.15	1,065,618	(43,448)	1,022,171	II,III,VI
13	35 111	II	LPA	Call Center/CUT SMOG	Smoking Vehicle Complaints	8.00	0.00	8.00	1,410,578	15,215	1,425,793	IX,XV
14	08 115	I	LEG	Case Disposition	Trial/Dispo-Civil Case/Injunct	4.75	0.00	4.75	1,008,871	10,663	1,019,535	II,IV,V,VI,XV
15	60 152	III	CE	Compliance/IM Related Activiti	Assist IM: Design/Review/Test	0.50	0.00	0.50	80,137	(866)	79,271	IV
16	08 154	I	LEG	Compliance/NOV Administration	Review/Track/Prep NOV's/MSAs	0.75	0.00	0.75	159,295	1,684	160,979	IV
17	60 155	I	CE	Compliance Guidelines	Procedures/Memos/Manuals	1.50	0.00	1.50	231,412	(2,599)	228,814	IV
18	50 156	I	EP	Perm Proc/Info to Compliance	Prov Permit Info to Compliance	3.00	0.00	3.00	528,349	2,548	530,896	III,IV,XV
19	60 157	I	CE	Compliance/Special Projects	Prog Audits/Data Req/Brd Supp	3.00	0.00	3.00	462,825	(5,197)	457,628	II
20	60 158	I	CE	Compliance Testing	R461/Combustion Equip Testing	1.00	0.00	1.00	162,275	2,268	164,543	IV
21	44 175	I	STA	DB/Computerization	Develop Systems/Database	0.44	0.00	0.44	76,239	(3,108)	73,131	II,IV,VI
22	08 185	I	LEG	Database Management	Support IM/Dev Tracking System	1.00	0.00	1.00	242,394	7,245	249,639	IV
23	26 215	I	PRA	Annual Emission Reporting	Annl Des./Impl/Emiss Monitor Sys	11.00	0.00	11.00	1,953,839	107,973	2,061,812	II,V
24	08 235	I	LEG	Enforcement Litigation	Maj Prosecutions/Civil Actions	2.00	0.00	2.00	424,788	4,490	429,278	IV
25	50 240	I	EP	Environmental Justice	R461/Combustion Equip Testing	0.50	0.00	0.50	88,058	425	88,483	II,IV,XV
26	26 358	I	PRA	GHG Rules-Compl	Green House Gas Rules-Compliance	0.70	0.30	1.00	134,017	43,875	177,892	IV
27	17 364	I	CB	Hearing Board/Abatement Orders	Atnd/Recrd/Monitr Mtgs	0.10	0.00	0.10	23,979	57	24,036	IV
28	17 365	I	CB	Hearing Board/Variations/Appeal	Attend/Record/Monitor HB Mtgs	3.20	0.00	3.20	852,536	1,825	854,361	IV,V,VII
29	50 365	I	EP	Hearing Bd/Variations	Variations/Orders of Abatement	0.75	0.00	0.75	132,087	637	132,724	VII
30	60 365	I	CE	Hearing Bd/Variations	Variations/Orders of Abatement	2.00	0.00	2.00	308,550	(3,465)	305,085	VII
31	08 366	I	LEG	Hearing Board/Legal	Hear/Disp-Varian/Appeal/Rev	3.00	0.00	3.00	637,182	6,735	643,917	IV,V,XV
32	60 375	I	CE	Inspections	Compliance/Inspection/Follow-up	88.00	-3.00	85.00	13,576,198	(610,079)	12,966,118	II,V,XV
33	50 377	I	EP	Inspections/RECLAIM Audits	Audit/Compliance Assurance	6.00	0.00	6.00	1,056,697	5,095	1,061,792	II,IV
34	60 377	I	CE	Inspections/RECLAIM Audits	Audit/Compliance Assurance	14.00	0.00	14.00	2,159,850	(24,254)	2,135,596	II,IV
35	08 380	I	LEG	Interagency Coordination	Coordinate with Other Agencies	0.20	0.00	0.20	42,479	449	42,928	II,V
36	08 403	III	LEG	Legal Rep/Litigation	Prep/Hearing/Disposition	3.50	0.00	3.50	914,580	(2,343)	912,237	Ia,II
37	44 450	I	STA	Microscopic Analysis	Asbestos/PM/Metals Analysis	2.00	0.00	2.00	346,543	(14,129)	332,413	VI
38	08 465	I	LEG	Mutual Settlement	Mutual Settlement Program	1.50	0.00	1.50	318,591	3,367	321,958	IV
39	50 492	I	EP	Customer Service	Compliance/Inspection/Follow-up	0.50	0.00	0.50	88,058	425	88,483	II,V,IX,XV
40	44 500	I	STA	PM2.5 Program	Est/Operate/Maint PM2.5 Network	11.30	-1.00	10.30	1,957,965	(246,037)	1,711,928	II,V,IX
41	60 539	I	CE	Procedure 5 Review	Evaluate Proc 5 Asbestos Plans	0.40	0.00	0.40	61,710	(693)	61,017	XVII

**Ensure Compliance (Cont.)  
Work Program by Category**

#	Program Code	Goal	Office	Program	Activities	FTEs FY 2018-19	+/-	FTEs FY 2019-20	Expenditures FY 2018-19	+/-	Expenditures FY 2019-20	Revenue Categories
42	60	550	II	CE	Public Complaints/Breakdowns	10.00	-1.00	9.00	\$ 1,542,750	\$ (169,867)	\$ 1,372,883	II,IV,V,XV
43	50	605	I	EP	RECLAIM/Admin Support	6.50	0.00	6.50	1,144,755	5,520	1,150,275	II,III,IV,XV
44	60	605	I	CE	RECLAIM/Admin Support	0.50	0.00	0.50	77,137	(866)	76,271	II,III,IV,XV
45	26	620	I	PRA	Refinery Pilot Project	0.00	1.80	1.80	-	381,206	381,206	II
46	26	645	I	PRA	Rule 1610 Plan Verification	0.75	-0.25	0.50	132,875	(43,929)	88,946	V,IX
47	50	678	I	EP	School Siting	0.25	0.00	0.25	44,029	212	44,241	II
48	50	680	I	EP	Small Business Assistance	0.50	0.00	0.50	88,058	425	88,483	III,IV
49	44	700	I	STA	Source Testing/Compliance	2.25	0.00	2.25	419,860	(15,895)	403,965	VI
50	44	704	I	STA	ST/Sample Analysis/Compliance	4.00	0.00	4.00	693,085	(28,259)	664,826	VI
51	44	707	I	STA	VOC Sample Analysis/Compliance	7.00	0.00	7.00	1,249,899	(49,453)	1,200,446	IV,XV
52	44	716	I	STA	Special Monitoring	2.20	0.00	2.20	416,197	(15,542)	400,655	III,IV,IX,XV
53	60	771	I	CE	Title V	4.50	0.00	4.50	694,237	(7,796)	686,442	II,IV
54	04	791	III	FIN	Toxics/AB2588	0.15	0.00	0.15	37,448	(1)	37,447	X
55	08	791	I	LEG	Toxics/AB2588	0.05	0.00	0.05	10,620	112	10,732	X
56	27	791	III	IM	Toxics/AB2588	0.50	0.00	0.50	152,984	(13,807)	139,176	X
57	50	791	I	EP	Toxics/AB2588	0.25	0.00	0.25	44,029	212	44,241	X
58	60	791	I	CE	Toxics/AB2588	0.10	0.00	0.10	15,427	(173)	15,254	X
59	26	794	I	PRA	Toxics/AB2588	13.00	0.00	13.00	2,303,173	9,422	2,312,596	X
60	44	794	I	STA	Toxics/AB2588	4.25	-1.00	3.25	736,403	(196,231)	540,171	X
61	44	795	I	STA	Toxics/Engineering	0.05	0.00	0.05	8,664	(353)	8,310	VI,X
62	08	805	III	LEG	Training	0.75	0.00	0.75	159,295	1,684	160,979	Ib
<b>Total Ensure Compliance</b>						256.36	4.25	260.61	\$ 43,655,133	\$ 257,048	\$ 43,912,182	



**Monitoring Air Quality  
Work Program by Category**

#	Program Code	Goal	Office	Program	Activities	FTEs FY 2018-19	+/-	FTEs FY 2019-20	Expenditures FY 2018-19	+/-	Expenditures FY 2019-20	Revenue Categories
1	44 036	I	STA	AB 617-Monitoring	AB 617-Monitoring	12.00	27.00	39.00	\$ 2,079,255	\$ 4,402,803	\$ 6,482,058	XX
2	44 038	I	STA	Admin/Office Mgmt/Monitoring	Overall Program Mgmt/Coord	1.40	0.00	1.40	242,580	(9,891)	232,689	Ib
3	44 046	I	STA	Admin/Program Management	STA Program Administration	2.00	0.00	2.00	358,543	(14,129)	344,413	Ib
4	26 061	I	PRA	Air Quality Evaluation	Air Quality Evaluation	2.25	0.25	2.50	398,626	46,104	444,730	IX
5	44 063	I	STA	Ambient Air Analysis	Analyze Criteria/Tox/Pollutants	8.91	0.00	8.91	2,498,628	(1,017,727)	1,480,901	II,V,IX
6	44 064	I	STA	Ambient Network	Air Monitoring/Toxics Network	19.05	-1.00	18.05	3,630,917	(523,288)	3,107,629	II,V,V,IX
7	44 065	I	STA	Air Quality Data Management	AIM Audit/Validation/Reporting	1.00	0.00	1.00	173,271	(7,065)	166,207	II,V,IX
8	44 067	II	STA	Ambient Lead Monitoring	Lead Monitoring/Analysis/Reporting	0.50	0.00	0.50	86,636	(3,532)	83,103	IV
9	44 073	I	STA	Arch Cigs - Other	Sample Analysis/Rpts	2.00	0.00	2.00	346,543	(14,129)	332,413	XVIII
10	44 079	II	STA	AQ-SPEC	AQ-SPEC	3.00	3.19	6.19	519,814	509,005	1,028,819	XVII
11	44 081	I	STA	Air Filtration EPA	Air Filtration EPA/Admin/Impl	0.10	0.05	0.15	17,327	7,604	24,931	V
12	44 082	I	STA	Air Filtration Other	Air Filtration Other/Admin/Impl	0.48	-0.38	0.10	83,170	(66,550)	16,621	XVII
13	44 161	I	STA	Comm Air Tox Init	Community Air Toxics Initiative	2.19	-2.19	0.00	379,464	(379,464)	-	XVII
14	60 210	II	CE	Emergency Response	Emerg Tech Asst to Public Saf	0.10	0.00	0.10	15,427	(173)	15,254	IV,XV
15	44 240	I	STA	Environmental Justice	Implement Environmental Justice	0.45	0.00	0.45	77,972	(3,179)	74,793	II,IX
16	44 248	I	STA	EPA Community Scale AQ-SPEC	EPA Community Scale AQ-SPEC	1.00	0.00	1.00	173,271	(7,065)	166,207	V,XVII
17	26 443	I	PRA	MATES V	MATES V	0.30	0.00	0.30	103,150	(39,783)	63,368	XVII
18	26 444	I	PRA	MATES V Refinery	MATES V Refinery	0.00	0.10	0.10	-	17,789	17,789	XVII
19	26 445	I	PRA	Meteorology	ModelDev/Data Analysis/Forecast	2.45	0.05	2.50	584,060	(14,330)	569,730	II,V,IX
20	44 468	I	STA	NATTS(Natl Air Tox Trends Sta)	NATTS (Natl Air Tox Trends)	1.50	-0.50	1.00	259,907	(93,700)	166,207	II,V,IX
21	44 469	I	STA	Near Roadway Mon	Near Roadway Monitoring	1.50	0.00	1.50	259,907	(10,597)	249,310	IV,V,IX
22	44 505	I	STA	PM Sampling Program (EPA)	PM Sampling Program - Addition	8.41	0.00	8.41	1,457,211	(59,414)	1,397,798	V
23	44 507	I	STA	PM Sampling_Spec	PM Sampling_Special Events	0.10	0.00	0.10	17,327	(706)	16,621	V
24	26 530	I	PRA	Photochemical Assessment	Photochemical Assessment	0.25	-0.25	0.00	44,292	(44,292)	-	II,V
25	44 530	I	STA	Photochemical Assessment	Photochemical Assess & Monitor	3.00	0.00	3.00	519,814	(21,194)	498,620	V,IX
26	44 585	I	STA	Quality Assurance	Quality Assurance Branch	4.00	3.00	7.00	693,085	470,361	1,163,446	II,V,IX
27	44 646	I	STA	R1180 Community Mon	R1180 Comm Monitoring Refinery	5.00	4.00	9.00	-	1,495,860	1,495,860	XVII
28	44 663	I	STA	Salton Sea Monit	Mon/Analyze Hydrogen Sulfide	0.25	0.00	0.25	43,318	(1,766)	41,552	XVII
29	44 715	II	STA	Spec Monitoring/Emerg Response	Emergency Response	0.50	0.00	0.50	86,636	(3,532)	83,103	II

**Total Monitoring Air Quality**      83.69      33.32      117.01      \$ 15,150,150      \$ 4,614,020      \$ 19,764,170

**Operational Support  
Work Program by Category**

#	Program Code	Goal	Office	Program	Activities	FTEs FY 2018-19	+/-	FTEs FY 2019-20	Expenditures FY 2018-19	+/-	Expenditures FY 2019-20	Revenue Categories
1	04 020	III	FIN	Admin/SCAQMD Budget	Analyze/Prepare/Impl/Track WP	2.65	0.00	2.65	\$ 396,581	\$ (23)	\$ 396,558	la
2	04 021	III	FIN	Admin/SCAQMD Contracts	Contract Admin/Monitor/Process	3.20	0.00	3.20	478,890	(28)	478,862	la
3	04 023	III	FIN	Admin/SCAQMD Capital Assets	FA Rep/Reconcile/Inv/Acct	0.70	0.00	0.70	104,757	(6)	104,751	la
4	17 024	III	CB	Admin/SCAQMD/GB/HB Mgmt	Admin Governing/Hearing Brds	1.25	0.00	1.25	299,741	713	300,454	la,VII,XV
5	08 025	III	LEG	Admin/SCAQMD-Legal Research	Legal Research/Staff/Exec Mgmt	1.20	0.00	1.20	254,873	2,694	257,567	la
6	16 026	III	AHR	SCAQMD Mail	Posting/Mailing/Delivery	2.30	0.00	2.30	424,434	(33,581)	390,853	la
7	04 035	I	FIN	AB 617-General	AB 617-General	0.50	0.00	0.50	74,827	(4)	74,822	XX
8	08 035	I	LEG	AB 617-General	AB 617-General	1.00	1.50	2.50	212,394	324,203	536,597	XX
9	16 035	I	AHR	AB 617-General	AB 617-General	2.00	1.00	3.00	369,073	140,735	509,809	XX
10	27 035	I	IM	AB 617-General	AB 617-General	5.00	3.00	8.00	973,839	628,957	1,602,796	XX
11	03 038	III	EO	Admin/Office Management	Budget/Program Management	1.00	0.00	1.00	311,274	20,469	331,742	lb
12	04 038	III	FIN	Admin/Office Management	Fin Mgmt/Oversee Activities	3.75	-1.00	2.75	561,199	(273,542)	287,657	lb
13	08 038	III	LEG	Admin/Office Management	Attorney Timekeeping/Perf Eval	3.50	0.00	3.50	750,629	7,857	758,486	lb
14	16 038	III	AHR	Admin/Office Management	Reports/Proj/Budget/Contracts	3.85	0.00	3.85	727,466	(38,615)	688,852	lb
15	27 038	III	IM	Admin/Office Management	Overall Direction/Coord of IM	2.00	0.00	2.00	389,535	28,238	417,773	lb
16	04 045	III	FIN	Admin/Office Budget	Office Budget/Prep/Impl/Track	0.05	0.00	0.05	7,483	(0)	7,482	lb
17	16 060	III	AHR	Equal Employment Opportunity	Program Dev/Monitor/Reporting	0.10	0.00	0.10	18,454	(1,460)	16,994	la
18	04 071	I	FIN	Arch Ctgs - Admin	Cost Analysis/Payments	0.04	0.00	0.04	5,986	(0)	5,986	XVIII
19	08 071	I	LEG	Arch Ctgs - Admin	Rule Dev/TA/Reinterpretations	0.05	0.00	0.05	10,620	112	10,732	XVIII
20	27 071	I	IM	Arch Ctgs - Admin	Database Dev/Maintenance	0.25	0.00	0.25	48,692	1,395	50,087	XVIII
21	04 085	III	FIN	Building Corporation	Building Corp Act/Fin Reports	0.02	0.00	0.02	2,993	(0)	2,993	la
22	16 090	III	AHR	Building Maintenance	Repairs & Preventative Maint	7.00	1.00	8.00	1,301,757	57,733	1,359,490	la
23	16 092	III	AHR	Business Services	Building Services Admin/Contracts	2.55	0.00	2.55	470,569	(37,231)	433,337	la
24	08 102	II	LEG	CEQA Document Projects	CEQA Review	0.75	0.00	0.75	159,295	1,684	160,979	II,III,IX
25	27 160	III	IM	Computer Operations	Oper/Manage Host Computer Sys	5.25	0.00	5.25	1,431,481	46,704	1,478,185	la
26	27 184	III	IM	Database Information Support	Ad Hoc Reports/Bulk Data Update	1.00	0.00	1.00	214,768	(389)	214,379	la
27	27 185	III	IM	Database Management	Dev/Maintain Central Database	2.25	0.00	2.25	438,227	12,559	450,786	la
28	27 215	I	IM	Annual Emission Reporting	System Enhancements for GHG	0.50	0.00	0.50	97,384	2,791	100,175	II,XVII
29	16 225	III	AHR	Employee Benefits	Benefits Analysis/Orient/Records	1.50	0.00	1.50	276,805	(21,901)	254,904	la
30	16 226	III	AHR	Classification & Pay	Class & Salary Studies	0.30	0.00	0.30	55,361	(4,380)	50,981	la
31	08 227	III	LEG	Employee/Employment Law	Legal Advice: Employment Law	0.50	0.00	0.50	106,197	1,122	107,319	la
32	16 228	III	AHR	Recruitment & Selection	Recruit Candidates for SCAQMD	3.25	0.00	3.25	626,744	(3,701)	623,043	la
33	16 232	III	AHR	Position Control	Track Positions/Workforce Anlys	0.55	0.00	0.55	101,495	(8,030)	93,465	la
34	04 233	III	FIN	Employee Relations	Assist HR/Interpret Salary Res	0.10	0.00	0.10	14,965	(1)	14,964	la
35	16 233	III	AHR	Employee Relations	Meet/Confer/Labor-Mgmt/Grievance	2.20	0.00	2.20	405,981	(32,121)	373,860	la
36	16 255	III	AHR	Facilities Services	Phones/Space/Keys/Audio-Visual	1.00	0.00	1.00	186,537	(16,600)	169,936	la
37	04 265	III	FIN	Financial Mgmt/Accounting	Record Acts Rec & Pay/Rpts	6.20	0.00	6.20	981,759	1,565	983,324	la
38	04 266	III	FIN	Financial Mgmt/Fin Analysis	Fin/SCAQMD Stat Analysis & Audit	0.80	0.00	0.80	119,722	(7)	119,716	la
39	04 267	III	FIN	Financial Mgmt/Treasury Mgmt	Treas Mgt Anlyz/Trk/Proj/Invst	1.00	0.00	1.00	234,303	(9)	234,294	la
40	04 268	III	FIN	Financial Systems	CLASS/Rev/Acct/PR/Sys Anlyze	0.10	0.00	0.10	14,965	(1)	14,964	la
41	02 275	II	GB	Governing Board	Rep of Dist Meet/Conf/Testimony	0.00	0.00	0.00	1,783,687	59,900	1,843,587	la
42	08 275	III	LEG	Governing Board	Legal Advice:Attend Board/Cmte Mtgs	1.00	0.00	1.00	212,394	2,245	214,639	la
43	17 275	III	CB	Governing Board	Attend/Record/Monitor Meetings	1.40	0.00	1.40	335,709	799	336,508	la
44	35 350	III	LPA	Graphic Arts	Graphic Arts	2.00	0.00	2.00	352,644	3,804	356,448	la

**Operational Support (Cont.)  
Work Program by Category**

#	Program Code	Goal	Office	Program	Activities	FTEs FY 2018-19	+/-	FTEs FY 2019-20	Expenditures FY 2018-19	+/-	Expenditures FY 2019-20	Revenue Categories
45	27	370	III	IM	Information Technology Svcs	Enhance Oper Effic/Productivity	2.75	0.00	2.75	\$ 558,361	\$ 15,350	la
46	08	401	III	LEG	Legal Advice/SCAQMD Programs	General Advice: Contracts	2.00	0.00	2.00	474,788	4,490	la
47	27	420	III	IM	Library	General Library Svcs/Archives	0.25	0.00	0.25	57,042	1,395	la
48	04	447	I	FIN	Mobile Sources/Accounting	Record Act Rec & Pay/Special Funds	0.65	0.00	0.65	97,274	(6)	IX
49	27	470	III	IM	Network Operations/Telecomm	Operate/Maintain/Implem SCAQMD	9.25	0.00	9.25	2,052,263	87,469	la
50	27	480	III	IM	New System Development	Dev sys for special oper needs	2.50	0.00	2.50	554,115	(1,569)	II,IV
51	04	493	II	FIN	Outreach/SB/MB/DVBE	Outreach/Incr SB/DVBE Partic	0.05	0.00	0.05	7,483	(0)	la
52	04	510	III	FIN	Payroll	Ded/Ret Rpts/PR/St & Fed Rpts	4.10	0.00	4.10	661,078	(35)	la
53	04	570	III	FIN	Purchasing	Purch/Track Svcs & Supplies	2.50	0.00	2.50	449,933	(75,821)	la
54	04	571	III	FIN	Purchasing/Receiving	Receive/Record SCAQMD Purchases	1.20	0.00	1.20	179,584	(10)	la
55	04	572	III	FIN	Purchasing-Receiving/Stockroom	Track/Monitor SCAQMD Supplies	1.00	0.00	1.00	149,653	(9)	la
56	27	615	III	IM	Records Information Mgmt Plan	Plan/Imp/Dir/Records Mgmt plan	1.25	0.00	1.25	295,460	(1,382)	la
57	27	616	III	IM	Records Services	Records/Documents processing	3.75	0.00	3.75	861,379	34,932	la,III,IV
58	04	630	III	FIN	Cash Mgmt/Revenue Receiving	Receive/Post Pymts/Reconcile	5.25	0.00	5.25	785,679	(45)	II,III,IV,XI
59	16	640	III	AHR	Risk Management	Liab/Property/Wk Comp/Selfins	2.25	0.00	2.25	490,208	(32,851)	la
60	27	735	III	IM	Systems Maintenance	Maintain Existing Software Prog	4.50	0.00	4.50	1,329,668	17,109	II,III,IV
61	27	736	III	IM	Systems Implementation/Peoples	Fin/HR PeopleSoft Systems Impl	1.50	0.00	1.50	292,152	8,373	la
62	04	805	III	FIN	Training	Continuing Education/Training	0.20	0.00	0.20	29,931	(2)	la
63	26	805	III	PRA	Training	Training	0.25	0.29	0.54	44,292	51,770	lb
64	50	805	III	EP	Training	Dist/Org Unit Training	3.10	0.00	3.10	545,960	2,633	lb
65	60	805	III	CE	Training	Dist/Org Unit Training	2.00	0.00	2.00	308,550	(3,465)	lb
66	04	825	III	FIN	Union Negotiations	Official Labor/Mgmt Negotiate	0.02	0.00	0.02	2,993	(0)	la
67	26	825	III	PRA	Union Negotiations	Official Labor/Mgmt Negotiate	0.02	0.02	0.04	3,543	3,572	la
68	35	825	III	LPA	Union Negotiations	Official Labor/Mgmt Negotiate	0.01	0.00	0.01	1,763	19	la
69	44	825	III	STA	Union Negotiations	Labor/Mgmt Negotiations	0.05	0.00	0.05	8,664	(353)	la
70	50	825	III	EP	Union Negotiations	Official Labor/Mgmt Negotiate	0.05	0.00	0.05	8,806	42	la
71	60	825	III	CE	Union Negotiations	Official Labor/Mgmt Negotiate	0.10	0.00	0.10	15,427	(173)	la
72	04	826	III	FIN	Union Steward Activities	Rep Employees in Grievance Act	0.01	0.00	0.01	1,497	(0)	la
73	26	826	III	PRA	Union Steward Activities	Rep Employees in Grievance Act	0.02	0.06	0.08	3,543	10,688	la
74	35	826	III	LPA	Union Steward Activities	Union Steward Activities	0.01	0.00	0.01	1,763	19	la
75	44	826	III	STA	Union Steward Activities	Rep Employees in Grievance Act	0.05	0.00	0.05	8,664	(353)	la
76	50	826	III	EP	Union Steward Activities	Rep Employees in Grievance Act	0.05	0.00	0.05	8,806	42	la
77	60	826	III	CE	Union Steward Activities	Rep Employees in Grievance Act	0.10	0.00	0.10	15,427	(173)	la
78	04	827	I	FIN	VW-Program Development	VW-Program Development	0.00	1.00	1.00		149,644	XVII
79	03	855	II	EO	Web Tasks	Create/edit/review web content	0.03	0.00	0.03	9,338	60	la
80	04	855	II	FIN	Web Tasks	Create/edit/review web content	0.02	0.00	0.02	2,993	(0)	la
81	17	855	II	CB	Web Tasks	Create/edit/review web content	0.03	0.00	0.03	7,194	17	la
82	26	855	II	PRA	Web Tasks	Create/edit/review web content	0.50	-0.40	0.10	88,584	(70,794)	la
83	27	855	II	IM	Web Tasks	Create/edit/review web content	3.25	0.00	3.25	918,795	14,558	la
84	35	855	II	LPA	Web Tasks	Create/edit/review web content	0.40	0.00	0.40	70,529	761	la
85	50	855	II	EP	Web Tasks	Creation/Update of Web Content	0.25	0.00	0.25	44,029	212	la
86	60	855	II	CE	Web Tasks	Creation/Update of Web Content	1.50	0.00	1.50	311,412	(82,599)	la
<b>Total Operational Support</b>						132.38	6.47	138.85	\$ 28,105,108	\$ 1,008,165	\$ 29,113,274	

A prorated share of the District General Budget has been allocated to each line in the work program based on the number of FTEs reflected on the line.

**Policy Support  
Work Program by Category**

#	Program Code	Goal	Office	Program	Activities	FTEs FY 2018-19	+/-	FTEs FY 2019-20	Expenditures FY 2018-19	+/-	Expenditures FY 2019-20	Revenue Categories
1	44	I	STA	Admin/Office Mgmt/Policy Supp	Overall Policy Supp/Mgmt/Coord	0.49	0.00	0.49	\$ 84,903	\$ (3,462)	\$ 81,441	lb
2	03	083	EO	Hlth Effects Air Pollution Fou	Health Effects Air Poll Foundation Support	0.01	0.00	0.01	3,113	20	3,133	la
3	04	083	FIN	Hlth Effects Air Pollution Fou	Health Effects Air Poll Foundation Support	0.02	0.00	0.02	2,993	(0)	2,993	la
4	26	083	PRA	Hlth Effects Air Pollution Fou	Health Effects Air Poll Foundation Support	0.10	0.00	0.10	17,717	72	17,789	la,II,IV
5	26	148	I	Climate Change	GHG/Climate Change Policy Development	3.35	-1.35	2.00	593,510	(237,726)	355,784	IV,XVII
6	50	148	EP	Climate Change	GHG/Climate Change Support	0.50	0.00	0.50	88,058	425	88,483	II,IX
7	26	240	I	EJ-AQ Guidance Document	AQ Guidance Document	0.10	0.00	0.10	17,717	72	17,789	II,IX
8	03	275	I	Governing Board	Board/Committee Support	1.72	0.00	1.72	535,391	3,459	538,849	la
9	26	276	I	Advisory Group/Home Rule	Governing Board Advisory Group	0.30	0.20	0.50	53,150	35,796	88,946	la
10	44	276	I	Advisory Group/Technology Adva	Tech Adv Advisory Group Supp	0.10	0.00	0.10	17,327	(706)	16,621	VIII
11	50	276	I	Board Committees	Admin/Stationary Source Committees	0.25	0.00	0.25	44,029	212	44,241	la
12	60	276	I	Board Committees	Admin/Stationary Source Committee	0.15	0.00	0.15	23,141	(260)	22,881	la
13	26	277	I	Advisory Group/AQMP	Governing Board AQMP Advisory Group	0.05	0.00	0.05	8,858	36	8,895	II,IX
14	26	278	I	Advisory Group/Sci, Tech, Model	Scientific/Tech/Model Peer Rev	0.15	-0.05	0.10	26,575	(8,786)	17,789	II,IX
15	35	280	I	Advisory Group/Ethnic Comm	GB Ethnic Comm Advisory Group	0.40	0.00	0.40	70,529	761	71,290	II,IX
16	35	281	I	Advisory Group/Small Business	SBA Advisory Group Staff Support	0.50	0.00	0.50	88,161	951	89,112	IV,IX
17	35	283	I	Governing Board Policy	Brd sup/Respond to GB req	0.55	0.00	0.55	96,977	1,046	98,023	la
18	35	345	II	Goods Mvmt&Financial Incentive	Goods Movement & Financial Incentives Progr	1.00	0.00	1.00	176,322	1,902	178,224	IX
19	03	381	I	Interagency Liaison	Local/State/Fed Coord/Interact	0.71	0.00	0.71	221,004	1,428	222,432	la,IX
20	08	404	I	Legal Rep/Legislation	Draft Legis/SCAQMD Position/Mtgs	0.00	0.25	0.25	-	53,660	53,660	II,IX
21	03	410	I	Legislation	Testimony/Mtgs:New/Current Leg	0.03	0.00	0.03	9,338	60	9,399	la,IX
22	44	410	I	Legislation	Support Pollution Reduction thru Legislatio	0.50	0.00	0.50	86,636	(3,532)	83,103	IX
23	35	412	I	Legislation/Federal	Lobbying/Analyses/Tracking/Out	0.25	0.00	0.25	709,211	475	709,686	la
24	35	413	I	Legislation/Exec Office Suppor	Coord Legis w/ EO, EC, Mgmt	0.25	0.00	0.25	44,081	475	44,556	la
25	35	414	I	Legislation-Effects	Lobbying/Analyses/Tracking/Out	0.80	0.00	0.80	151,058	1,521	152,579	la,IX
26	03	416	I	Legislative Activities	Supp/Promote/Influence Legis/Adm	0.03	0.00	0.03	9,338	60	9,399	la
27	08	416	I	Legislative Activities	Lobbying: Supp/Promote/Influence legis/Adm	0.10	0.00	0.10	21,239	224	21,464	la
28	26	416	I	Legislative Activities	Supp/Promote/Influence Legis/Adm	0.50	0.00	0.50	88,584	362	88,946	la
29	35	416	I	Legislative Activities	Supp/Promote/Influence Legis/Adm	0.50	0.00	0.50	453,161	951	454,112	la
30	50	416	I	Legislative Activities	Legislative Activities	0.25	0.00	0.25	44,029	212	44,241	la
31	35	494	I	Outreach/Collateral/Media	Edits, Brds, Talk shows, Commercl	5.60	0.00	5.60	1,152,120	10,650	1,162,771	la
32	08	717	II	Student Interns	Gov Board/Student Intern Program	0.10	0.00	0.10	21,239	224	21,464	la
33	16	717	II	Student Interns	Gov Board/Student Intern Program	0.20	4.00	4.20	36,907	676,825	713,732	la
34	26	717	II	Student Interns	Gov Bd/Student Intern Program	0.25	0.25	0.50	44,292	44,654	88,946	la
35	35	717	II	Student Interns	Student Interns	0.10	0.00	0.10	17,632	190	17,822	la
36	60	717	II	Student Interns	Gov Board/Student Intern Program	0.05	0.00	0.05	7,714	(87)	7,627	la
<b>Total Policy Support</b>						19.96	3.30	23.26	\$ 5,066,054	\$ 582,168	\$ 5,648,222	

**Timely Review of Permits  
Work Program by Category**

#	Program Code	Goal	Office	Program	Activities	FTEs FY 2018-19	+/-	FTEs FY 2019-20	Expenditures FY 2018-19	+/-	Expenditures FY 2019-20	Revenue Categories
1	50	120	I	EP	Certification/Registration Pro	1.00	0.00	1.00	\$ 176,116	\$ 849	\$ 176,965	III
2	50	233	I	EP	ERC Appl Processing	3.50	0.00	3.50	616,407	2,972	619,379	III
3	50	367	I	EP	Hearing Board/Appeals	0.25	0.00	0.25	44,029	212	44,241	III
4	26	461	I	PRA	Permit & CEQA Modeling Review	1.30	-0.30	1.00	280,317	(77,425)	202,892	III
5	50	475	I	EP	NSR Implementation	2.50	0.00	2.50	440,290	2,123	442,413	II,III,V,XV
6	50	476	I	EP	NSR Data Clean Up	0.50	0.00	0.50	88,058	425	88,483	II
7	50	515	I	EP	Perm Proc/Non TV/Non RECLAIM	50.75	-0.50	50.25	9,027,895	(103,385)	8,924,511	III,XV
8	08	516	I	LEG	Permit Processing/Legal	0.10	0.00	0.10	21,239	224	21,464	III
9	50	517	I	EP	Permit Services	12.50	0.00	12.50	2,201,452	10,615	2,212,067	III,XV
10	50	518	I	EP	RECLAIM Non-Title V	4.50	-0.50	4.00	792,523	(84,661)	707,862	III,IV,XV
11	50	519	I	EP	Perm Proc/Title III (Non TV)	1.00	0.00	1.00	176,116	849	176,965	III
12	50	521	I	EP	Perm Proc/Expedited Permit	4.00	0.00	4.00	704,465	3,397	707,862	III
13	27	523	III	IM	Permit Streamlining	0.25	0.00	0.25	48,692	1,395	50,087	III
14	50	523	I	EP	Permit Streamlining	4.75	0.00	4.75	836,552	4,034	840,586	III
15	44	545	I	STA	Protocols/Reports/Plans	0.10	0.00	0.10	17,327	(706)	16,621	III,IV
16	44	546	I	STA	Protocols/Reports/Plans	6.15	0.00	6.15	1,065,618	(43,448)	1,022,171	IV,VI
17	50	607	I	EP	RECLAIM & Title V	18.40	0.00	18.40	3,240,537	15,626	3,256,163	III
18	50	643	I	EP	Rule 222 Filing Program	0.50	0.00	0.50	88,058	425	88,483	IV
19	35	680	I	LPA	Small Business/Permit Streamln	3.95	0.00	3.95	696,473	7,512	703,985	II,III,IV,V,XV
20	44	725	I	STA	Permit Processing/Support E&C	0.05	0.00	0.05	8,664	(353)	8,310	III
21	50	728	I	EP	Perm Proc/IM Programming	2.55	0.00	2.55	449,096	2,166	451,262	II,III,IV
22	08	770	I	LEG	Title V	0.05	0.00	0.05	10,620	112	10,732	II,IV
23	27	770	I	IM	Title V	1.50	0.00	1.50	292,152	8,373	300,524	III
24	08	772	I	LEG	Title V Permits	0.05	0.00	0.05	10,620	112	10,732	III
25	50	774	I	EP	TV/Non-RECLAIM	18.00	0.00	18.00	3,170,091	15,286	3,185,377	III
26	50	775	I	EP	Title V - Admin	1.00	0.00	1.00	176,116	849	176,965	III
						139.20	(1.30)	137.90	\$ 24,679,523	\$ (232,421)	\$ 24,447,102	
						876.40	62.60	939.00	\$ 162,631,101	\$ 8,265,624	\$ 170,896,725	

**Total Timely Review of Permits**

**Total South Coast AQMD**

## WORK PROGRAM GLOSSARY

**Below are descriptions of the activities related to the Work Program.**

**AB 134** – under the Community Air Protection Program, funding from CARB is distributed to air districts for the implementation of projects pursuant to the Carl Moyer Memorial Air Quality Standards Attainment Program. (See Carl Moyer Program).

**AB 617** – Community Air Protection Program to improve air quality in disadvantaged communities with high cumulative exposure through monitoring and emission reduction plans.

**AB 1318 Mitigation** - an eligible electrical generating facility shall pay mitigation fees for the transfer of emission credits from South Coast AQMD's internal emission credit accounts. Mitigation fees shall be used to finance emission reduction projects, pursuant to the requirements of AB 1318.

**AB 2766** (Mobile Sources, MSRC) - programs funded from motor vehicle registration revenues. The activities include: evaluation, monitoring, technical assistance, and tracking of AB2766 Subvention Fund Program progress reports including cost-effectiveness and emissions reductions achieved; supporting programs implemented by the Mobile Source Review Committee (MSRC); disbursing and accounting for revenues subvended to local governments; and performing South Coast AQMD activities related to reduction of emissions from mobile sources.

**Acid Rain Program** - developing and implementing the Continuous Emissions Monitoring (CEMS) Program in compliance with 40 CFR Part 75 of the Clean Air Act.

**Administration/South Coast AQMD** - supporting the administration of South Coast AQMD. Examples are tracking fixed assets, operating the mailroom, preparing and reviewing contracts, conducting oversight of South Coast AQMD activities, developing District-wide policies and procedures, preparing the South Coast AQMD budget, providing legal advice on South Coast AQMD programs and other activities, and performing activities in support of South Coast AQMD as a whole.

**Admin/South Coast AQMD Capital Assets (Asset Management)** – tracking of acquisitions, disposals/retirements and reconciliation of capital assets to the Capital Outlay account, and conducting annual lab and biennial asset inventories.

**Administration/Office Management** - supporting the administration of an organizational unit or a unit within an Office. This includes preparing Office budgets, tracking programs, providing overall direction and coordination, providing program management and integration, preparing policies and procedures manuals, and preparing special studies and projects.

**Advisory Group** – providing support to various groups such as: AQMP (Air Quality Management Plan), Environmental Justice, Home Rule, Local Government and Small Business Assistance, Technology Advancement, and Permit Streamlining Task Force.

## WORK PROGRAM GLOSSARY

**Air Filtration** - installation of high-efficiency air filtration devices in schools with the goal of reducing children's exposure to particulate matter in the classroom.

**Air Quality Evaluation** - analyzing air quality trends and preparing the Reasonable Further Progress (RFP) report.

**Ambient Air Analysis/Ambient Network** (Audit, Data Reporting, Special Monitoring) – complying with Federal regulations to monitor air quality for criteria pollutants at air monitoring stations to determine progress toward meeting the federal ambient air quality standards. This includes operating South Coast AQMD's air monitoring network and localized monitoring at landfill sites as well as conducting specialized monitoring in response to public nuisance situations. South Coast AQMD monitoring stations also collect samples which are analyzed by South Coast AQMD's laboratory. Also see Special Monitoring.

**Ambient Lead Monitoring** – maintaining the current ambient lead monitoring network to meet federal monitoring requirements.

**Annual Emission Reporting (AER)** – implementing the AER Program and tracking actual emissions reported by facilities, conducting audits of data, handling refunds, and preparing inventories and various reports.

**Annual Emission Reporting Program Public Assistance** - providing public assistance in implementing South Coast AQMD's AER program by conducting workshops, resolving fee-related issues, and responding to questions.

**AQIP Evaluation** – provides incentive funding for projects to meet VOC, NO<sub>x</sub>, and CO emission targets with funds generated from companies who pay fees in lieu of carpool programs. Projects are funded through a semi-annual solicitation process.

**AQMP** (Air Quality Management Plan) – Management Plan for the South Coast Air Basin and the Interagency AQMP Implementation Committee.

**Air Quality Sensor Performance Evaluation Center (AQ-SPEC)** - program to test commercially available, low-cost air quality sensors.

**Architectural Coatings** – Rule 314 requires architectural coatings manufacturers which distribute into and/or sell their manufactured architectural coatings within South Coast AQMD for use in the South Coast AQMD to submit an Annual Quantity and Emissions Report. To recover the cost of the program, a fee is assessed to these manufacturers. The fee is based on the quantity of coatings sold as well as the cumulative emissions from the quantity of coatings distributed or sold for use in the South Coast AQMD.

**Area Sources/Compliance** – developing rules and compliance programs, as well as alternatives to traditional permitting for smaller sources of emissions of VOCs and NO<sub>x</sub>.

## WORK PROGRAM GLOSSARY

**Auto Services** - maintaining South Coast AQMD's fleet of automobiles, trucks, and vans as well as providing messenger services as needed.

**Billing Services** - administering South Coast AQMD's permit billing system, responding to inquiries, and resolving issues related to fees billed.

**Board Committees** - participation in Governing Board committees by preparing materials, presenting information on significant or new programs and providing technical expertise.

**Building Corporation** - managing the South Coast Air Quality Management District Building Corporation. The Building Corporation issued Installment Sale Revenue Bonds in conjunction with the construction of South Coast AQMD's Diamond Bar headquarters facility.

**Building Maintenance** - maintaining and repairing the Diamond Bar Headquarters facility and South Coast AQMD air monitoring sites.

**Business Services** – overseeing operation of Facilities Services, Automotive Services, Print Shop and Mail/Subscriptions Services; negotiating and administering leases for the Diamond Bar facility, Long Beach Office, and air monitoring stations.

**California Natural Gas Vehicle Partnership** – strategic, non-binding partnership formed to work together in developing and deploying natural gas vehicles and implementing a statewide natural gas infrastructure.

**Call Center** - operates the 24-hour radio communication system via telephone between South Coast AQMD headquarters and the public/field staff.

**CARB PERP (Portable Equipment Registration Program)** – a program established by CARB allowing the operation of portable equipment in any air district throughout the state without individual local district permits. Amended to enhance enforceability and expand CARB's requirements for portable engines and equipment units, creating a more comprehensive and inclusive statewide registration program that now provides for triennial inspection and renewal of PERP registration.

**Carl Moyer Program** – provides incentive funding for the repower, replacement, or purchase of new heavy-duty vehicles and equipment beyond the emission limits mandated by regulations. Awards are granted through an annual solicitation process. Separate program announcements are also issued for pre-1990 diesel Class 7 or 8 truck fleet and ports truck fleet modernization programs. Also see Mobile Sources.

**Case Disposition** - resolving Notices of Violation (NOV) issued by South Coast AQMD inspectors. This includes preparing both civil and criminal cases and administering South Coast AQMD's Mutual Settlement Agreement Program.



## WORK PROGRAM GLOSSARY

**Cash Management** – receiving revenue, posting of payments, processing of refunds associated with South Coast AQMD programs, and bank and preparing cash reconciliations.

**CEMS Certification** (Continuous Emissions Monitoring System) - evaluating, approving, and certifying the continuous emissions monitoring systems installed on emissions sources to ensure compliance with South Coast AQMD rules and permit conditions.

**CEQA Document Projects/Special Projects** (California Environmental Quality Act) - reviewing, preparing, assessing, and commenting on projects which have potential air quality impacts.

**Certification/Registration Program** – manufacturers can voluntarily apply to have standard, off-the-shelf equipment certified by South Coast AQMD to ensure that it meets all applicable requirements.

**China Partnership for Cleaner Shipping** - initiative with China to get cleaner ships to come to the Ports.

**Classification and Pay** – maintaining the classification plan and conducting job analyses to ensure South Coast AQMD positions are allocated to the proper class, and conducting compensation studies to ensure classes are appropriately compensated and salaries remain competitive in the workforce.

**Clean Air Connections** – increase awareness of air quality issues and South Coast AQMD's programs and goals by developing and nurturing a region-wide group of community members with an interest in air quality issues.

**Clean Communities Plan (CCP)** – an update to the 2000 Air Toxics Control Plan (ATCP) and the 2004 Addendum. The objective of the 2010 CCP is to reduce the exposure to air toxics and air-related nuisances throughout South Coast AQMD, with emphasis on cumulative impacts.

**Clean Fuels Program** – accelerate the development and deployment of advanced, low emission technologies, including, but not limited to electric, hydrogen, and plug-in hybrid electric vehicles, low emission heavy-duty engines, after treatment for off-road construction equipment and identification of tailpipe emissions from biofuels.

**Climate Change** – developing and evaluating policy and strategy related to local, state, federal and international efforts on climate change. Seek to maximize synergies for criteria and toxic reduction and minimize and negative impacts.

**Compliance** – ensuring compliance of clean air rules and regulations through regular inspection of equipment and facilities, as well as responding to air quality complaints made by the public.

## WORK PROGRAM GLOSSARY

**Compliance/Notice of Violation (NOV) Administration** – NOV processing and review for preparation for assignment to Mutual Settlement Agreement (MSA), civil, or criminal handling.

**Computer Operations** - operating and managing South Coast AQMD's computer resources. These resources support South Coast AQMD's business processes, air quality data, and modeling activities and the air monitoring telemetry system. Also see Systems Maintenance.

**Conformity** - reviewing of federal guidance and providing input on conformity analysis for the Regional Transportation Improvement Program (RTIP). Staff also participates in various Southern California Association of Governments (SCAG) meetings, the Statewide Conformity Working group, and other meetings to address conformity implementation issues. Staff participates in the federal Conformity Rule revision process, and monitors and updates Rule 1902, Transportation Conformity, as needed.

**Credit Generation Programs** (Intercredit Trading) – rulemaking and developing and implementing a program that expands emission credit trading by linking South Coast AQMD's stationary and mobile source credit markets.

**Criteria Pollutants/Mobile Sources** – coordinating the implementation of the AQMP and conducting feasibility studies for mobile source categories; developing control measures and amended rules as warranted.

**1-800-CUT-SMOG** - The Call Center handles (1-800-CUT-SMOG) calls from drivers who identify a vehicle emitting excessive amounts of exhaust smoke.

**Database Information Support** – day-to-day support of ad hoc reports and bulk data updates required from South Coast AQMD's enterprise databases.

**Database Management** - developing and supporting the data architecture framework, data modeling, database services, and the ongoing administration of South Coast AQMD's central information repository.

**DB/Computerization** – developing laboratory instrument computer systems for data handling and control, evaluating the quality of the stored information. Further develop and maintain the Source Test Information Management System (STIMS).

**DERA (Diesel Emission Reduction Act)** – a U.S. EPA funded program to modernize diesel fleets by retrofitting and replacing diesel engines/vehicles with cleaner, more efficient options.

**Economic Development/Business Retention** – meeting with various governmental agencies to assist company expansion or retention in the Basin.

**EJ-AQ Guidance Document (Environmental Justice-Air Quality Guidance Document)** – providing outreach to local governments as they update their general plans and make land use

## WORK PROGRAM GLOSSARY

decisions. Providing updates to the reference document titled “Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning.”

**Emergency Response** - responding to emergency air pollution (toxic) incidents, providing air quality monitoring support to local authorities.

**Emission Reduction Credit Application Processing** – processing applications for Emission Reduction Credits (ERC).

**Emissions Field Audit** – conducting field audits at facilities that have reported through Annual Emissions Reporting (AER) to ensure accurate emission reporting and to improve the program.

**Emissions Inventory Studies** – developing major point source emissions data and area source emissions inventory, updating emissions factors, developing and updating control factors, performing special studies to improve emission data, and responding to public inquiries regarding emission data.

**Employee Benefits** – administering South Coast AQMD’s benefit plans, including medical, dental, vision, and life insurance, as well as State Disability Insurance, Section 125 cafeteria plan, Long Term Care and Long Term Disability plans, Section 457 Deferred Compensation Plan, and Consolidated Omnibus Budget Reconciliation Act (COBRA) program.

**Employee Relations** – managing the collective bargaining process, administering MOU’s, preparing disciplinary documents, and administering South Coast AQMD’s performance appraisal program, Family and Medical Leave Act (FMLA) requests, tuition reimbursement, and outside training requests.

**Employee/Employment Law** – handling legal issues dealing with employment law in coordination with outside counsel.

**Enhanced Fleet Modernization Program (Replace Your Ride) Admin Support** – CARB-funded voluntary car retirement and replacement incentive program. The goal is to incentivize lower-income motorists to scrap their older, high-emitting cars and replace them with newer, cleaner, and more fuel efficient cars to reduce smog-forming pollutants.

**Enforcement Litigation** – staff attorneys pursue enforcement litigation including actions for civil penalties or injunctions when violations have not been settled or circumstances otherwise dictate.

**Environmental Education** - informing and educating the public about air pollution and their role in bringing clean air to the basin.

**Environmental Justice (EJ)** - a strategy for equitable environmental policymaking and enforcement to protect the health of all persons who live or work in the South Coast District

## WORK PROGRAM GLOSSARY

from the health effects of air pollution regardless of age, culture, ethnicity, gender, race, socioeconomic status, or geographic location. The Environmental Justice Initiatives help to identify and address potential areas where citizens may be disproportionately impacted by air pollutants and ensure clean air benefits are afforded to all citizens and communities of the region.

**Equal Employment Opportunity** – ensuring non-discrimination and equal employment for employees and applicants through broad-based, targeted advertising; training interviewers to ensure fairness in evaluating candidates; ensuring that selection processes and testing instruments are appropriate and job-related; coaching supervisors and managers regarding hiring processes; and gathering data and preparing related staffing reports.

**Facilities Services** – monitoring service contracts, supporting tenants, overseeing conference center use, administering identification badges, overseeing building access control, maintaining key/lock systems, and configuring workspaces.

**Facility-Based Mobile Source Measures (FBMSMs)** – effort to begin implementation of the five FBMSMs (Warehouse Distribution Centers, Commercial Airports, New or Redevelopment Projects, Commercial Marine Ports, and Railyard & Intermodal Facilities) adopted in the 2016 AQMP to reduce emissions from facilities and ensure that these reductions are counted towards the region’s emissions budget.

**FARMER (Funding Agricultural Replacement Measures For Emission Reductions)** - CARB funding for projects that will reduce agricultural sector emissions by providing grants, rebates, and other financial incentives for agricultural harvesting equipment, heavy-duty trucks, agricultural pump engines, tractors, and other equipment used in agricultural operations.

**Fee Review** – activities relating to conducting Fee Review Committee hearings for businesses that contest South Coast AQMD fees (Rule 313).

**Financial Management** - managing the financial aspects of the South Coast AQMD. This includes cash management, treasury/investment, accounting, and program and financial audits. It also includes maintaining South Coast AQMD’s permit-related financial and accounting records as well as maintaining and enhancing South Coast AQMD's payroll and accounting systems.

**Goods Movement and Financial Incentives** – programs to evaluate the air quality issues associated with goods movement and traffic congestion, and for the identification of financial incentives for expedited facility modernization and diesel engine conversion.

**Governing Board** – supporting the operation of the Governing Board and advisory groups of the South Coast AQMD. These activities range from preparing the agenda and minutes to providing support services, legal advice, speeches, letters, and conference coordination.

**Grants Management** - coordinating, negotiating, monitoring, accounting, and reporting of South Coast AQMD's air pollution program and financial activities relating to grants, including U.S. EPA, DOE, CEC, DHS grants, and CARB Subvention.

## WORK PROGRAM GLOSSARY

**Graphics Arts** - designing and producing presentation materials and South Coast AQMD publications.

**Green House Gas Reporting (GHG)** - many of the businesses and facilities within South Coast AQMD's jurisdiction are required to report their GHG emissions to CARB under the regulation for Mandatory Reporting of Greenhouse Gases (state) and, beginning in 2011, to the U.S. EPA under their Mandatory Reporting Rule (federal).

**Green House Gas Reduction Fund** – CARB's Low Carbon Transportation Greenhouse Gas Reduction Fund (GGRF) Investment Program funds projects to demonstrate zero emission trucks.

**Health Effects** – conducting research and analyzing the health effects of air pollutants and assessing the health implications of pollutant reduction strategies; working with industry, trade associations, environmental groups, CARB and U.S. EPA and providing information to concerned citizens.

**Hearing Board** – supporting operation of South Coast AQMD's Hearing Board. These activities include accepting petitions filed; preparing and distributing notices; preparing minute orders, findings, and decisions of the Board; collecting fees; and general clerical support for the Board.

**Information Technology Services** - implementing new information technologies to enhance operational efficiency and productivity. Examples include developing workflow applications, training and supporting computer end users, and migrating network operating systems.

**Inspections** - inspecting facilities and equipment that emit or have the potential to emit air pollutants.

**Inspections/RECLAIM Audits** – conducting RECLAIM inspections and audits at facilities subject to Regulation XX (RECLAIM).

**Interagency Coordination/Liaison** - interacting with state, local, and federal control agencies and governmental entities.

**Intergovernmental/Geographic Deployment** - influencing local policy development and implementing a local government clean air program.

**Lawnmower Exchange** – residents of the South Coast Air Basin may trade in their gas-powered lawnmower and purchase a new zero-emission, battery electric lawnmower at a significant discount.

**Lead Agency Projects** – South Coast AQMD permitting and rule development projects where a CEQA document is prepared and the South Coast AQMD is the lead agency.

## WORK PROGRAM GLOSSARY

**Legal** - providing legal support to South Coast AQMD in the areas of liability defense, writs of mandate, injunctions, and public hearings. This activity also includes reviewing contracts, and advising staff on rules, fees and other governmental issues.

**Legislation** - drafting new legislation, analyzing and tracking proposed legislation, and developing position recommendations on legislation which impacts air quality.

**Library** - acquiring and maintaining reference materials and documentation that support the South Coast AQMD's programs.

**Lobby Permit Services** – providing information and support to applicants to expedite permit processing. Includes consolidating forms, prescreening review for completeness of applications, providing internet access of certain forms, and providing “over-the-counter” permits in the lobby of South Coast AQMD’s Diamond Bar headquarters.

**MATES V (Fifth Multiple Air Toxics Exposure Study)** – this study provides unique information on air toxics and their associated health risks based on long-term monitoring at ten fixed locations throughout the South Coast Air Basin (Basin) and a detailed emissions inventory and modeling analysis.

**Meteorology** - modeling, characterizing, and analyzing both meteorological and air quality data to produce the South Coast AQMD's daily air quality forecast.

**Microscopic Analysis** - analyzing, identifying, and quantifying asbestos for compliance with South Coast AQMD, state, and federal regulations.

**Mobile Sources** - transportation monitoring, strategies, control measures, demonstration projects, the Mobile Source Air Pollution Reduction Review Committee (MSRC), implementation of Fleet Rules, High Emitter Repair & Scrappage Program, and locomotive remote sensing.

**Mobile Source and AQMP (Air Quality Management Plan) Control Strategies** – provide technical assistance on the mobile source element of the AQMP.

**Moyer Program** – see Carl Moyer Program

**Mutual Settlement Program** - resolving civil penalties without court intervention; this program is a mechanism to resolve violations and avoid criminal proceedings.

**National Air Toxics Trends Stations (NATTS)** – through U.S. EPA funding, two sites in the monitoring network are utilized to collect ambient VOC and particulate samples. Samples are analyzed by the South Coast AQMD lab and reported to U.S. EPA where the data is used to determine toxic trends.

## WORK PROGRAM GLOSSARY

**Near Roadway (NO<sub>2</sub>) Monitoring** – federal monitoring requirement that calls for state and local air monitoring agencies to install near-road NO<sub>2</sub> monitoring stations at locations where peak hourly NO<sub>2</sub> concentrations are expected to occur within the near-road environment in larger urban areas.

**Network Operations/Telecommunications** – installing, maintaining, and providing operational support of South Coast AQMD's PC, voice, data, image, and radio networks; planning, designing, and implementing new network systems or services in response to South Coast AQMD's communications and business needs; and providing training, support, and application development services for end-users of voice and PC systems.

**New Systems Development** – providing support for computer systems development efforts.

**New Source Review (NSR)** - developing and implementing New Source Review rules; designing, implementing, and maintaining the Emission Reduction Credits and the NSR programs. These programs streamline the evaluation of permit renewal and emissions reporting.

**Outreach** - increasing public awareness of South Coast AQMD's programs, goals, permit requirements, and employment opportunities; interacting, providing technical assistance, and acting as liaison between South Coast AQMD staff and various sectors of private industry, local governments, small businesses, and visiting dignitaries.

**Outreach Media/Communications** - monitoring local and national press accounts, both print and broadcast media, to assess South Coast AQMD's outreach and public opinion on South Coast AQMD rules and activities. This also includes responding to media calls for informational background material on South Coast AQMD news stories.

**Payroll** - paying salaries and benefits to South Coast AQMD employees, withholding and remitting applicable taxes, and issuing W2s.

**Permit Processing** - inspecting, evaluating, auditing, analyzing, reviewing and preparing final approval or denial to operate equipment which may emit or control air contaminants.

**Permit Streamlining** – activities relating to reducing organizational costs and streamlining regulatory and permit requirements on businesses.

**Photochemical Assessment Monitoring Systems (PAMS)** - promulgating PAMS (a federal regulation), which requires continuous ambient monitoring of speciated hydrocarbons during smog season. Through U.S. EPA funding, ozone precursors are measured at seven stations and samples are collected.

**PM Sampling Program (U.S. EPA)** – daily collection of particulate samples

## WORK PROGRAM GLOSSARY

**Port of Long Beach (POLB) Advanced Maritime Emission Control System (AMECS) Demo** – funded by the Port of Long Beach, the proposed project will assess the performance and effectiveness of a barge-mounted emission control system to capture and treat hoteling emissions from ocean-going vessels (OGV) at berth at the Port of Long Beach.

**Portable Equipment Registration Program (PERP)** – see CARB PERP Program.

**Position Control** – tracking Board-authorized positions and South Coast AQMD workforce utilization, processing personnel transactions for use by Payroll, and preparing reports regarding employee status, personnel transactions, and vacant positions.

**Print Shop** – performing in-house printing jobs and contracting outside printing/binding services when necessary.

**Proposition 1B** - providing incentive funding for goods movement and lower emission school bus projects with funds approved by voters in November 2006.

**Protocols/Reports/Plans/LAP** - evaluating and approving protocols, source testing plans and reports submitted by regulated facilities as required by South Coast AQMD rules and permit conditions, New Source Review, state and federal regulations; and evaluating the capabilities of source test laboratories under the Laboratory Approval Program (LAP).

**Public Complaints/Breakdowns** - responding to air pollution complaints about odors, smoke, dust, paint overspray, or companies operating out of compliance; responding to industry notifications of equipment breakdowns, possibly resulting in emission exceedances.

**Public Education/Public Events** – implementing community events and programs to increase the public’s understanding of air pollution and their role in improving air quality.

**Public Information Center** - notifying schools and large employers of predicted and current air quality conditions on a daily basis and providing the public with printed South Coast AQMD information materials.

**Public Notification** – providing timely and adequate notification to the public of South Coast AQMD rulemaking workshops and public hearings, proposed rules, upcoming compliance dates, and projects of interest to the public.

**Public Records Act** - providing information to the public as requested and as required by Government Code, Section 6254.

**Purchasing** (Receiving, Stockroom) - procuring services and supplies necessary to carry out South Coast AQMD programs.



## WORK PROGRAM GLOSSARY

**Quality Assurance** – assuring the data quality from the Monitoring and Analysis Division meets or exceeds state and federal standards and also assuring the appropriateness of the data for supporting South Coast AQMD regulatory, scientific and administrative decisions.

**RECLAIM/Admin Support** – developing and implementing rules, and monitoring of emissions of the REgional Clean Air Incentives Market (RECLAIM) program, a market incentives trading program designed to help achieve federal and state ambient air quality standards in a cost-effective manner with minimal impacts to jobs or public health. The RECLAIM program will transition to a command and control regulatory structure.

**RECLAIM and Title V** – permit processing of applications from facilities that are both RECLAIM and Title V.

**RECLAIM Non-Title V** – permit processing of applications from RECLAIM facilities only.

**Records Information Management Plan** – providing the process to comply with internal and external requirements for the retention and retrieval of information pertinent to the mission and operation of the South Coast AQMD.

**Records Services** – maintaining South Coast AQMD’s central records and files, converting paper files to images, and operating the network image management system; providing for all off-site long-term storage of records and for developing and monitoring South Coast AQMD’s Records Retention Policy.

**Recruitment and Selection** – assisting South Coast AQMD management in meeting staffing needs by conducting fair and non-discriminatory recruitment and selection processes that result in qualified, diverse applicants for South Coast AQMD jobs; overseeing promotional and transfer processes, and reviewing proposed staff reassignments.

**Refinery Pilot Project** – pursuant to the AQMP, a working group was formed to examine the efficacy of an alternative regulatory approach to reducing refinery emissions beyond the current requirements by establishing a targeted emission reduction commitment for each refinery for a set period of time and allow the use of on-site or off-site reduction strategies with acceptable environmental justice attributes.

**Regional Modeling** – designing, performing, and reviewing modeling and risk assessment analysis to assess the air quality impacts of new or modified sources of air pollution. Also see Meteorology.

**Ridesharing** - implementing South Coast AQMD’s Rule 2202 Trip Reduction Plan.

**Risk Management** - developing and administering South Coast AQMD's liability, property, and workers’ compensation and safety programs.

## WORK PROGRAM GLOSSARY

**Rule 1180** - adopted in December 2017, this rule requires real-time fence-line air monitoring systems and establishes a fee schedule to fund refinery-related community air monitoring systems that will provide air quality information to the public about levels of various criteria air pollutants, volatile organic compounds, metals and other compounds at or near the property boundaries of petroleum refineries and in nearby communities.

**Rule 1610** – ensuring compliance with Rule 1610, Old-Vehicle Scrapping.

**Rule 2202 ETC Training** – administering and conducting monthly Rule 2202 implementation training classes, workshops and/or forums for the regulated public and other interested individuals.

**Rule 222 Implement/Support/Filing Program** – ensuring compliance with Rule 222 for equipment subject to a filing requirement with South Coast AQMD.

**Rulemaking/Rules** – developing new rules and evaluating existing South Coast AQMD and CARB rules and compliance information to assure timely implementation of the AQMP and its control measures.

**Salton Sea Monitoring** – maintaining the monitoring network for expected nuisance pollutants, primarily hydrogen sulfide, which are released from the Salton Sea area.

**School Bus Lower Emission Program** – funding to replace pre-1987 diesel school buses with new alternative fuel buses owned and operated by public school districts.

**South Coast AQMD Mail** – processing and delivering all incoming and outgoing mail.

**South Coast AQMD Projects** – South Coast AQMD permitting and rule development projects where a California Environmental Quality Act (CEQA) document is prepared and the South Coast AQMD is the lead agency.

**School Siting** – identifying any hazardous emission sources within one-quarter mile of a new school site as required by AB3205. District activities include reporting of criteria and toxic pollutant information and conducting inspections of permitted facilities within a quarter-mile radius of proposed schools.

**Small Business Assistance** - providing technical and financial assistance to facilitate the permit process for small businesses.

**Socio-Economic** - developing an economic database to forecast economic activity, analyzing economic benefits of air pollution control, and analyzing the social impact of economic activity resulting from air quality regulations and plans.

## WORK PROGRAM GLOSSARY

**Source Education** - providing classes to facility owners and operators to ensure compliance with applicable South Coast AQMD's rules and regulations.

**Source Testing (ST)** – conducting source tests as needed in support of permitting functions and to determine compliance with permit conditions and South Coast AQMD Rules. Additionally, data submitted by facilities is reviewed for protocol approval, CEMS certification, or test data acceptance.

**Speaker's Bureau** - training South Coast AQMD staff for advising local government and private industry on air quality issues.

**Special Monitoring** – performing special ambient air sampling at locations where public health, nuisance concern, or Rule 403 violations may exist; determining the impacts from sources emitting toxics on receptor areas; and performing special monitoring in support of the emergency response program and public complaints response. Also see Emergency Response.

**Sample Analyses** – analyzing samples submitted by inspectors to determine compliance with South Coast AQMD Rules. Samples are also analyzed in support of rule development activities.

**Student Interns** – providing mutually beneficial educational hands-on experience for high school and college students by providing them with the opportunity to engage in day-to-day work with mentoring professionals within South Coast AQMD.

**Subscription Services** - maintaining South Coast AQMD's rule subscription mailing list and coordinating the mailing of South Coast AQMD publications.

**Systems Implementation PeopleSoft** – implementing activities required to maintain an integrated Financial and Human Resources system, including additional features and functions introduced with scheduled software upgrades.

**Systems Maintenance** - routinely maintaining installed production data systems that support South Coast AQMD's business fluctuations, including minor modifications, special requests, fixes, and general maintenance.

**Targeted Air Shed** – funding from U.S. EPA to reduce air pollution in the nation's areas with the highest levels of ozone or particulate matter 2.5 (PM<sub>2.5</sub>) exposure.

**Technology Advancement** - supporting the development of innovative controls for mobile and stationary sources, reviewing promising control technologies, and identifying those most deserving of South Coast AQMD developmental support.

**Title III** - permitting equipment that emits hazardous air pollutants in compliance with the federal Clean Air Act.

## WORK PROGRAM GLOSSARY

**Title V** - developing and implementing a permit program in compliance with the federal Clean Air Act.

**Toxics/AB 2588** – evaluation of toxic inventories, risk assessments and risk reduction plans, with public notification as required. Analyzing, evaluating, reviewing, and making recommendations regarding toxic substances and processes and contributing input to District toxic rules and programs.

**Training** (Education, Organizational and Human Resources Development, Staff) - providing increased training in the areas of personnel education, computers, safety procedures, new programs, hazardous materials, and new technologies.

**Transportation Regional Programs/Research** – actively participating in Advisory Groups and Policy Committees involving the development and monitoring of South Coast AQMD's AQMP, Congestion Mitigation Air Quality Improvement Program (CMAQ), Safe Accountable Flexible Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), Transportation Control Measures (TCMs) and regional alternative commute mode programs.

**Union Negotiations/Union Steward Activities** – Union-related activities of union stewards including labor management negotiations and assisting in the filing of employee grievances.

**VOC Sample Analysis** - providing data and technical input for VOC rule development, performing analytical testing for compliance with South Coast AQMD rules regulating VOC content in coatings, inks, plastic foam, paint, adhesives, and solvents, and providing assistance and technical input to small businesses and other regulatory agencies, industry and the public.

**Volkswagen (VW) Environmental Mitigation Trust** – The Beneficiary Mitigation Plan for the Volkswagen (VW) Environmental Mitigation Trust identifies five funding categories for funded projects intended to mitigate the excess NOx emissions caused by VW vehicles.

**Voucher Incentive Program (VIP)** - incentive program designed to reduce emissions by replacing old, high-polluting vehicles with newer, lower-emission vehicles, or by installing a Verified Diesel Emission Control Strategy (VDECS).

**Web Tasks** – preparing and reviewing materials for posting to South Coast AQMD's internet and/or intranet website.

# WORK PROGRAM ACRONYMS

## ORGANIZATIONAL UNITS

AHR	Administrative & Human Resources
CB	Clerk of the Boards
CE	Compliance & Enforcement
DG	District General
EP	Engineering & Permitting
EO	Executive Office
FIN	Finance
GB	Governing Board
IM	Information Management
LEG	Legal
LPAM	Legislative & Public Affairs/Media Office
PRA	Planning, Rule Development & Area Sources
STA	Science & Technology Advancement

## PROGRAMS

AB 134	Community Air Protection Program (Carl Moyer)
AB 617	Community Air Protection Program
AB 1318	Offsets-Electrical Generating Facilities
AB 2588	Air Toxics (“Hot Spots”)
AB 2766	Motor Vehicle Subvention Program
APEP	Annual Permit Emissions Program
AQIP	Air Quality Investment Program
AQMP	Air Quality Management Plan
BACT	Best Available Control Technology
CEMS	Continuous Emissions Monitoring Systems
CEQA	California Environmental Quality Act
CF	Clean Fuels Program
CMP	Carol Moyer Program
DERA	Diesel Emission Reduction Act
EFMP	Enhanced Fleet Modernization Program
ERC	Emission Reduction Credit
FARMER	Funding Agricultural Replacement Measures For Emissions Reductions
GGRF	Greenhouse Gas Reduction Fund
MATES	Multiple Air Toxics Exposure Study
MS	Mobile Sources Program
NSR	New Source Review
PERP	Portable Equipment Registration Program
PR	Public Records Act
QA	Quality Assurance
RFP	Reasonable Further Progress
RECLAIM	REgional Clean Air Incentives Market
ST	Source Test
Title III	Federally Mandated Toxics Program
Title V	Federally Mandated Permit Program
VIP	Voucher Incentive Program
VW	Volkswagen

## GOVERNMENT AGENCIES

APCD	Air Pollution Control District (Generic)
CARB	California Air Resources Board
CEC	California Energy Commission
DHS	Department of Homeland Security
DOE	Department of Energy
EPA	Environmental Protection Agency
NACAA	National Association of Clean Air Agencies
SCAG	Southern California Association of Governments

## GENERAL

AA	Affirmative Action
AER	Annual Emissions Reporting
AM	Air Monitoring
AQSCR	Air Quality Standards Compliance Report
AQ-SPEC	Air Quality Sensor Performance Evaluation Center
ATIP	Air Toxics Inventory Plan
AVR	Average Vehicle Ridership
BARCT	Best Available Retrofit Control Technology
CLASS	Clean Air Support System
CNG	Compressed Natural Gas
CTC	County Transportation Commission
CTG	Control Techniques Guideline
DB	Database
EIR	Environmental Impact Report
EJ	Environmental Justice
ERC	Emission Reduction Credit
ETC	Employee Transportation Coordinator
EV	Electric Vehicle
FBMSMs	Facility-Based Mobile Source Measures
FY	Fiscal Year
GHG	Greenhouse Gas
HR	Human Resources
HRA	Health Risk Assessment
IAIC	Interagency AQMP Implementation Committee
IGA	Intergovernmental Affairs
ISR	Indirect Source Rules
LAER	Lowest Achievable Emissions Rate
LEV	Low Emission Vehicle
LNG	Liquefied Natural Gas
LS	Laboratory Services
MOU	Memorandum of Understanding
MSERCs	Mobile Source Emission Reduction Credits
MSRC	Mobile Source (Air Pollution Reduction) Review Committee
NATTS	National Air Toxics Trends Stations
NESHAPS	National Emission Standards for Hazardous Air Pollutants
NGV	Natural Gas Vehicle
NOV	Notice of Violation
NSR	New Source Review
PAMS	Photochemical Assessment Monitoring System
PAR	Proposed Amended Rule
PE	Program Evaluations
PR	Proposed Rule
RFP	Request for Proposal
RFQ	Request for Quotations
RTC	RECLAIM Trading Credit
SBA	Small Business Assistance
SIP	State Implementation Plan
STE	Source Testing Evaluations
SULEV	Super Ultra Low-Emission Vehicle
TCM	Transportation Control Measure
ULEV	Ultra- Low-Emissions Vehicle
VMT	Vehicle Miles Traveled
ZECT	Zero Emission Cargo Transport
ZEV	Zero-Emission Vehicle

## POLLUTANTS

CO	Carbon Monoxide
NO <sub>x</sub>	Oxides of Nitrogen
O <sub>3</sub>	Ozone
PM <sub>2.5</sub>	Particulate Matter <2.5 microns
PM <sub>10</sub>	Particulate Matter ≤ 10 microns
ROG	Reactive Organic Gases
SO <sub>x</sub>	Oxides of Sulfur
VOC	Volatile Organic Compound

## GOVERNING BOARD

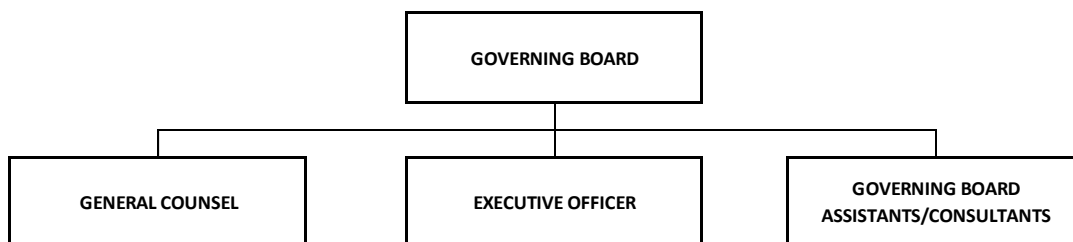
<b>At a Glance:</b>	
FY 2018-19 Adopted	\$1.8M
FY 2019-20 Budget	\$1.8M
% of FY 2019-20 Budget Total	1.1%
FTEs FY 2019-20 Budget	<b>N/A</b>

### DESCRIPTION OF MAJOR SERVICES:

The Governing Board is made up of 13 officials who meet monthly to establish policy and review new or amended rules for approval. The Governing Board appoints the South Coast AQMD Executive Officer and General Counsel, and members of the Hearing Board. Each Governing Board member is allocated funds to retain the services of Board Consultants and/or Assistants to provide support in their duties as Governing Board members.

Governing Board members include:

- One county Board of Supervisor’s representative each from the counties of Los Angeles, Orange, Riverside, and San Bernardino;
- One representative each from cities within Orange, Riverside, and San Bernardino counties, two representatives from cities within Los Angeles County, and one city representative from the City of Los Angeles;
- One representative appointed by the Governor, one by the Assembly Speaker, and one by the Senate Rules Committee.



**Governing Board  
Line Item Expenditure**

Major Object / Account # / Account Description		FY 2017-18 Actuals	FY 2018-19 Adopted Budget	FY 2018-19 Amended Budget	FY 2018-19 Estimate *	FY 2019-20 Adopted Budget
<b>Salary &amp; Employee Benefits</b>						
51000-52000	Salaries	\$ 318,469	\$ 462,913	\$ 462,913	\$ 280,194	\$ 462,913
53000-55000	Employee Benefits	20,288	261,190	261,190	115,885	284,590
Sub-total Salary & Employee Benefits		\$ 338,757	\$ 724,103	\$ 724,103	\$ 396,079	\$ 747,503
<b>Services &amp; Supplies</b>						
67250	Insurance	\$ -	\$ -	\$ -	\$ -	\$ -
67300	Rents & Leases Equipment	-	-	-	-	-
67350	Rents & Leases Structure	-	-	-	-	-
67400	Household	-	-	-	-	-
67450	Professional & Special Services	673,354	771,284	807,784	807,784	807,784
67460	Temporary Agency Services	-	-	-	-	-
67500	Public Notice & Advertising	77,976	52,000	52,000	52,000	52,000
67550	Demurrage	-	-	-	-	-
67600	Maintenance of Equipment	-	-	-	-	-
67650	Building Maintenance	-	-	-	-	-
67700	Auto Mileage	12,132	10,000	10,000	10,000	10,000
67750	Auto Service	-	-	-	-	-
67800	Travel	91,118	64,800	64,800	64,800	64,800
67850	Utilities	-	-	-	-	-
67900	Communications	18,719	20,000	20,000	20,000	20,000
67950	Interest Expense	-	-	-	-	-
68000	Clothing	-	-	-	-	-
68050	Laboratory Supplies	-	-	-	-	-
68060	Postage	1,823	10,000	8,640	8,640	10,000
68100	Office Expense	2,284	4,000	4,000	4,000	4,000
68200	Office Furniture	-	-	-	-	-
68250	Subscriptions & Books	-	-	-	-	-
68300	Small Tools, Instruments, Equipment	-	-	-	-	-
68400	Gas and Oil	-	-	-	-	-
69500	Training/Conference/Tuition/ Board Exp.	118,038	112,500	109,236	109,236	112,500
69550	Memberships	-	-	-	-	-
69600	Taxes	-	-	-	-	-
69650	Awards	-	-	-	-	-
69700	Miscellaneous Expenses	13,740	15,000	19,624	19,624	15,000
69750	Prior Year Expense	-	-	-	-	-
69800	Uncollectable Accounts Receivable	-	-	-	-	-
89100	Principal Repayment	-	-	-	-	-
Sub-total Services & Supplies		\$ 1,009,184	\$ 1,059,584	\$ 1,096,084	\$ 1,096,084	\$ 1,096,084
77000	<b>Capital Outlays</b>	\$ -	\$ -	\$ -	\$ -	\$ -
79050	<b>Building Remodeling</b>	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Total Expenditures</b>		<b>\$ 1,347,940</b>	<b>\$ 1,783,687</b>	<b>\$ 1,820,187</b>	<b>\$ 1,492,163</b>	<b>\$ 1,843,587</b>

\* Estimates based on July 2018 through February 2019 actual expenditures and March 2019 budget amendments.

**EXECUTIVE OFFICE**

**WAYNE NASTRI  
EXECUTIVE OFFICER**

<b>At a Glance:</b>	
FY 2018-19 Adopted	\$1.5M
FY 2019-20 Budget	\$1.6M
% of FY 2019-20 Budget Total	0.9%
FTEs FY 2019-20 Budget	5

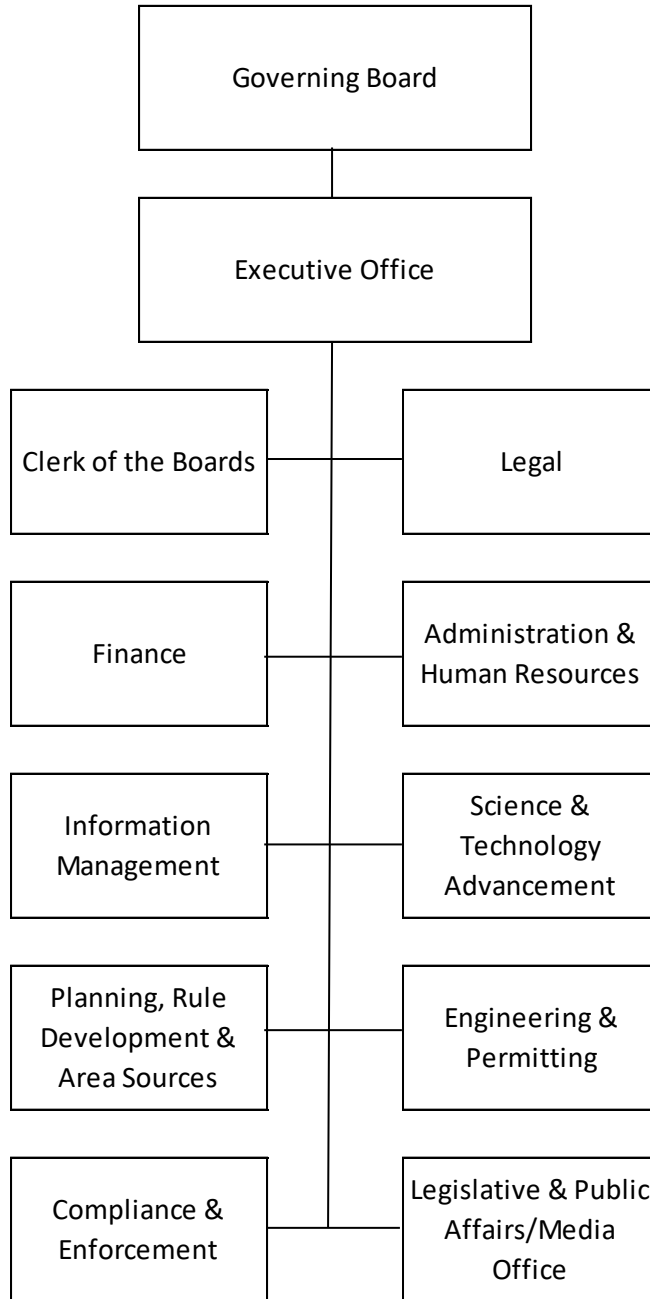
**DESCRIPTION OF MAJOR SERVICES:**

The Executive Office is responsible for the comprehensive management of the South Coast AQMD and the development and implementation of near-term and long-term strategies to attain ambient air quality standards. The Executive Office also translates set goals and objectives into effective programs and enforceable regulations that meet federal and state statutory requirements, while being sensitive to potential socioeconomic and environmental justice impacts in the South Coast Air Basin.

The Executive Office currently consists of the Executive Officer, Chief Operating Officer, and three support staff. The Executive Officer serves as Chief of Operations in implementing policy directed by the agency's 13-member Governing Board and in working proactively with state and federal regulatory officials. The Executive Officer also oversees all of the day-to-day administrative functions of staff and the annual operating budget.



**ORGANIZATIONAL CHART:**



**POSITION SUMMARY: 5 FTEs**

Executive Office Unit	Amended FY 2018-19	Change	Budget FY 2019-20
Administration	5	-	5

**POSITION DETAIL:**

<u>FTEs</u>	<u>Title</u>
1	Chief Operating Officer
1	Executive Officer
<u>3</u>	Executive Secretary
5	Total FTEs

**Executive Office  
Work Program by Office**

#	Program Code	Program Categories	Program	Activities	FTEs FY 2018-19	+/-	FTEs FY 2019-20	Revenue Categories
1	03 010	Develop Programs	AQMP	Develop/Implement AQMP	0.05	0.00	0.05	1j,X
2	03 028	Develop Programs	Admin/SCAQMD Policy	Dev/Coord Goals/Policies/Overs	0.44	0.00	0.44	la
3	03 038	Operational Support	Admin/Office Management	Budget/Program Management	1.00	0.00	1.00	1b
4	03 083	Policy Support	Hlth Effects Air Pollution Fou	Health Effects Air Poll Foundation Support	0.01	0.00	0.01	la
5	03 275	Policy Support	Governing Board	Board/Committee Support	1.72	0.00	1.72	la
6	03 381	Policy Support	Interagency Liaison	Local/State/Fed Coord/Interact	0.71	0.00	0.71	1a,X
7	03 410	Policy Support	Legislation	Testimony/Mtgs:New/Current Leg	0.03	0.00	0.03	1a,X
8	03 416	Policy Support	Legislative Activities	Supp/Promote/Influence Legis/Adm	0.03	0.00	0.03	la
9	03 490	Customer Service and Business Assistance	Outreach	Publ Awareness Clean Air Prog	0.97	0.00	0.97	la
10	03 565	Customer Service and Business Assistance	Public Records Act	Comply w/ Public Req for Info	0.01	0.00	0.01	la
11	03 855	Operational Support	Web Tasks	Create/edit/review web content	0.03	0.00	0.03	la

<b>Total Executive Office</b>	5.00	-	5.00
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Executive Office Line Item Expenditure						
Major Object / Account # / Account Description		FY 2017-18 Actuals	FY 2018-19 Adopted Budget	FY 2018-19 Amended Budget	FY 2018-19 Estimate *	FY 2019-20 Adopted Budget
<b>Salary &amp; Employee Benefits</b>						
51000-52000	Salaries	\$ 949,223	\$ 847,771	\$ 860,952	\$ 860,952	\$ 868,518
53000-55000	Employee Benefits	504,450	452,281	475,542	475,542	462,846
Sub-total Salary & Employee Benefits		\$ 1,453,674	\$ 1,300,052	\$ 1,336,494	\$ 1,336,494	\$ 1,331,364
<b>Services &amp; Supplies</b>						
67250	Insurance	\$ -	\$ -	\$ -	\$ -	\$ -
67300	Rents & Leases Equipment	-	-	-	-	-
67350	Rents & Leases Structure	-	-	-	-	-
67400	Household	-	-	-	-	-
67450	Professional & Special Services	4,490	75,000	150,000	150,000	75,000
67460	Temporary Agency Services	-	-	-	-	-
67500	Public Notice & Advertising	-	7,500	7,500	7,500	7,500
67550	Demurrage	-	-	-	-	-
67600	Maintenance of Equipment	-	400	400	400	400
67650	Building Maintenance	-	-	-	-	-
67700	Auto Mileage	606	800	800	800	800
67750	Auto Service	-	-	-	-	-
67800	Travel	60,739	77,000	77,000	77,000	77,000
67850	Utilities	-	-	-	-	-
67900	Communications	5,691	6,500	6,500	6,500	6,500
67950	Interest Expense	-	-	-	-	-
68000	Clothing	-	-	-	-	-
68050	Laboratory Supplies	-	-	-	-	-
68060	Postage	84	7,000	7,000	7,000	7,000
68100	Office Expense	1,024	6,300	6,300	6,300	6,300
68200	Office Furniture	-	-	-	-	-
68250	Subscriptions & Books	-	5,000	5,000	5,000	5,000
68300	Small Tools, Instruments, Equipment	-	-	-	-	-
68400	Gas and Oil	-	-	-	-	-
69500	Training/Conference/Tuition/ Board Exp.	3,695	1,000	1,000	1,000	1,000
69550	Memberships	38,000	26,000	26,000	26,000	26,000
69600	Taxes	-	-	-	-	-
69650	Awards	-	-	-	-	-
69700	Miscellaneous Expenses	361	25,000	25,000	25,000	25,000
69750	Prior Year Expense	-	-	-	-	-
69800	Uncollectable Accounts Receivable	-	-	-	-	-
89100	Principal Repayment	-	-	-	-	-
Sub-total Services & Supplies		\$ 114,690	\$ 237,500	\$ 312,500	\$ 312,500	\$ 237,500
77000	<b>Capital Outlays</b>	\$ -	\$ -	\$ -	\$ -	\$ -
79050	<b>Building Remodeling</b>	\$ -	\$ -	\$ -	\$ -	\$ -
Total Expenditures		\$ 1,568,363	\$ 1,537,552	\$ 1,648,994	\$ 1,648,994	\$ 1,568,864

\* Estimates based on July 2018 through February 2019 actual expenditures and March 2019 budget amendments.



**SOUTH COAST**

**AIR QUALITY MANAGEMENT DISTRICT**

## DISTRICT GENERAL

<b>At a Glance:</b>	
FY 2018-2019 Adopted	\$16.4M
FY 2019-20 Budget	\$16.7M
% of FY2019-20 Budget Total	9.8%
FTEs FY 2019-20 Budget	N/A

Accounts associated with general operations of the South Coast AQMD are budgeted and tracked in District General. Included are such items as retirement payouts, principal and interest payments, insurance, utilities, taxes, housekeeping, security, and building maintenance and improvements.

District General Line Item Expenditure						
Major Object / Account # / Account Description		FY 2017-18 Actuals	FY 2018-19 Adopted Budget	FY 2018-19 Amended Budget	FY 2018-19 Estimate *	FY 2019-20 Adopted Budget
<b>Salary &amp; Employee Benefits</b>						
51000-52000	Salaries	\$ -	\$ 1,785,964	\$ 1,758,644	\$ 1,758,644	\$ 1,785,964
53000-55000	Employee Benefits	261,663	480,000	480,000	393,271	480,000
Sub-total Salary & Employee Benefits		\$ 261,663	\$ 2,265,964	\$ 2,238,644	\$ 2,151,915	\$ 2,265,964
<b>Services &amp; Supplies</b>						
67250	Insurance	\$ 1,518,801	\$ 1,317,400	\$ 1,382,900	\$ 1,382,900	\$ 1,317,400
67300	Rents & Leases Equipment	32,263	117,000	117,000	117,000	117,000
67350	Rents & Leases Structure	-	-	-	-	-
67400	Household	654,326	755,866	755,866	755,866	809,388
67450	Professional & Special Services	1,060,050	1,215,975	1,215,975	1,215,975	1,254,852
67460	Temporary Agency Services	-	-	-	-	-
67500	Public Notice & Advertising	26,028	25,000	25,000	25,000	25,000
67550	Demurrage	-	100,000	100,000	100,000	100,000
67600	Maintenance of Equipment	280,350	403,654	403,654	403,654	403,654
67650	Building Maintenance	941,798	1,231,479	1,231,479	1,231,479	831,479
67700	Auto Mileage	16	-	-	-	-
67750	Auto Service	-	-	-	-	-
67800	Travel	-	-	-	-	-
67850	Utilities	1,397,050	1,959,620	2,147,788	2,147,788	1,959,620
67900	Communications	127,559	150,900	149,300	149,300	150,900
67950	Interest Expense	3,756,716	3,637,290	3,637,290	3,637,290	3,503,982
68000	Clothing	-	-	-	-	-
68050	Laboratory Supplies	-	-	-	-	-
68060	Postage	13,096	17,083	17,083	17,083	17,083
68100	Office Expense	315,598	288,200	278,200	278,200	288,200
68200	Office Furniture	3,990	4,000	4,000	4,000	4,000
68250	Subscriptions & Books	-	-	-	-	-
68300	Small Tools, Instruments, Equipment	353	-	-	-	-
68400	Gas and Oil	-	-	-	-	-
69500	Training/Conference/Tuition/ Board Exp.	-	-	-	-	-
69550	Memberships	-	-	-	-	-
69600	Taxes	32,876	56,000	56,000	56,000	56,000
69650	Awards	13,855	27,342	27,342	27,342	27,342
69700	Miscellaneous Expenses	15,080	14,375	14,375	14,375	14,375
69750	Prior Year Expense	(23,050)	-	-	-	-
69800	Uncollectable Accounts Receivable	410,438	-	-	-	-
89100	Principal Repayment	2,432,798	2,553,110	2,553,110	2,553,110	2,686,640
Sub-total Services & Supplies		\$ 13,009,992	\$ 13,874,294	\$ 14,116,362	\$ 14,116,362	\$ 13,566,915
77000	<b>Capital Outlays</b>	\$ 31,347	\$ 210,000	\$ 745,000	\$ 745,000	\$ 75,000
79050	<b>Building Remodeling</b>	\$ -	\$ -	\$ -	\$ -	\$ -
99950	<b>Transfers Out</b>	\$ 250,000	\$ -	\$ 2,063,229	\$ 2,063,229	\$ 841,353
Total Expenditures		\$ 13,553,003	\$ 16,350,258	\$ 19,163,235	\$ 19,076,506	\$ 16,749,232

\* Estimates based on July 2018 through February 2019 actual expenditures and March 2019 budget amendments.

## ADMINISTRATIVE & HUMAN RESOURCES

### A. JOHN OLVERA DEPUTY EXECUTIVE OFFICER

<b>At a Glance:</b>	
FY 2018-19 Adopted	\$6.5M
FY 2019-20 Budget	\$6.7M
% of FY 2019-20 Budget	3.9%
Total FTEs FY 2019-20 Budget	43

#### DESCRIPTION OF MAJOR SERVICES:

Administrative & Human Resources is comprised of several units: Employment & Labor Relations/Benefits & Records, Classification & Pay/Recruitment & Selection, Risk Management, Business Services, and Building Services. Human Resources units are responsible for planning and administering programs to maximize hiring, retention, and development of the highly-qualified employees necessary to meet South Coast AQMD's air quality goals. Risk Management is responsible for programs aimed at ensuring a healthful and safe work environment, including security, emergency preparedness, and business continuity programs; as well as programs to reduce liability and accident-related costs. Business Services oversees the administration of the South Coast AQMD headquarters facility services, its leases, the maintenance of fleet vehicles, and the management of Print Shop and Mail/Subscription services. Building Services is responsible for the maintenance and repair of the South Coast AQMD headquarters building, childcare center, field offices, air monitoring stations, and meteorological stations.

#### ACCOMPLISHMENTS:

##### RECENT:

- Administered employee benefits programs, including the successful transition to new online platforms for health insurance and the deferred compensation programs, and expanded wellness education programs.
- Conducted successful recruitment efforts for promotional opportunities and new hires.
- Completed reclassification studies; received Board approval for adoption or reclassification of 9 positions.
- Provided support and direction to management and staff with respect to adherence to relevant state and federal laws and South Coast AQMD policies, procedures and Memoranda of Understanding.
- Supported South Coast AQMD's Succession Planning program through the Executive Office.



## ADMINISTRATIVE & HUMAN RESOURCES (cont.)

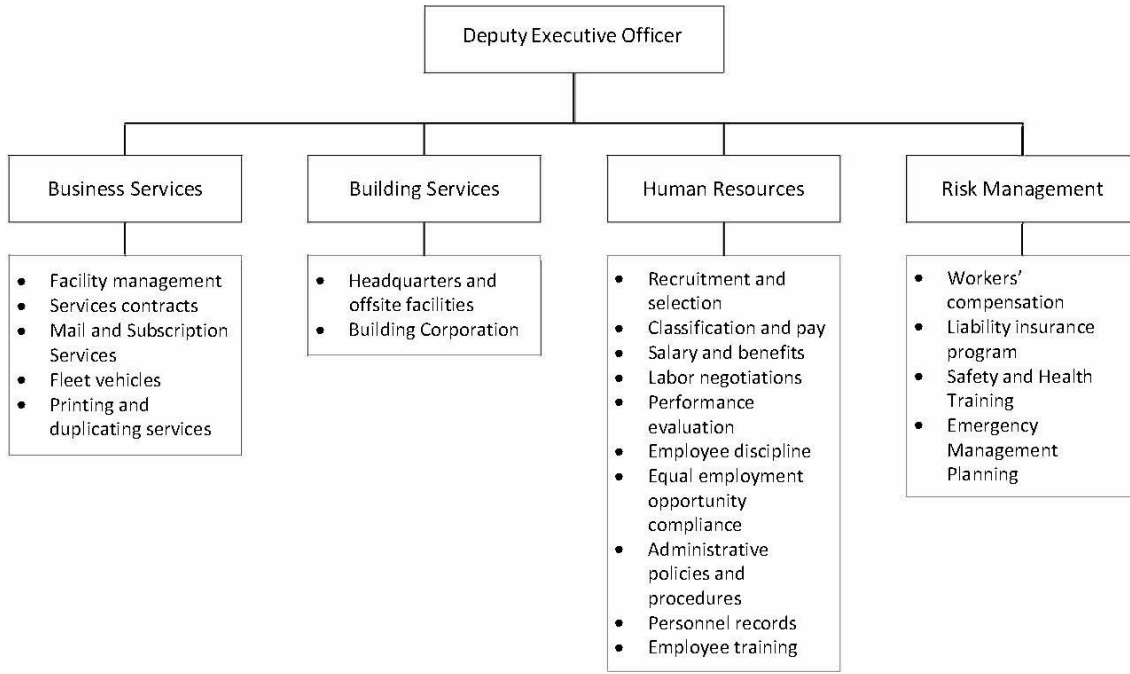
- Initiated a new District-wide mentoring program.
- Administered the Governing Board Summer Intern Program.
- Conducted ergonomic workspace evaluations and other safety training programs.
- Implemented a Teleworking Pilot Program for employees.
- Held training on sexual harassment prevention and anti-bullying policies, as well as programs for career development and workforce education.
- Completed a Continuity of Operations Plan and Emergency Operations Plan.
- Completed a comprehensive Site Security Assessment.
- Completed new office construction and conference room updates.
- Completed work space design and reconfiguration on several floors.

### **ANTICIPATED:**

- Continue to provide support and direction to management and staff with respect to adherence to relevant state and federal laws and South Coast AQMD policies, procedures and Memoranda of Understanding.
- Continue recruitment and selection efforts, and conduct classification studies.
- Provide training workshops for supervisors and managers.
- Implement the Continuity of Operations Plan and Emergency Operations Plan program.
- Implement the mentorship program.
- Transition from a pilot program to a fully adopted Teleworking Policy and Program.
- Conduct emergency preparedness drills.
- Continue updates and implementation of South Coast AQMD's Succession Planning program.
- Evaluate and plan for significant turnover of vehicle fleet due to CNG tank expiration.
- Install two 770-ton chillers at Diamond Bar headquarters.
- Install two 800-ton cooling towers at Diamond Bar headquarters.

ADMINISTRATIVE & HUMAN RESOURCES (cont.)

**ORGANIZATIONAL CHART:**



**POSITION SUMMARY: 43 FTEs**

Administrative & Human Resources Units	Amended FY 2018-19	Change	Budget FY 2019-20
Office Administration	2	-	2
Business Services	14	-	14
Building Services	8	-	8
Career Development Interns	6	-	6
Classification & Pay/Recruitment & Selection	5	-	5
Employee & Labor Relations/Benefits & Records	6	-	6
Risk Management	2	-	2
<b>Total</b>	<b>43</b>	<b>-</b>	<b>43</b>

ADMINISTRATIVE & HUMAN RESOURCES (cont.)

**POSITION DETAIL:**

<u>FTEs</u>	<u>Title</u>
1	Building Maintenance Manager
1	Building Supervisor
1	Business Services Manager
6	Career Development Intern
1	Deputy Executive Officer/Administrative & Human Resources
1	Facilities Services Technician
1	Fleet Services Supervisor
2	Fleet Services Worker II
5	General Maintenance Worker
5	Human Resources Analyst
2	Human Resources Manager
2	Human Resources Technician
2	Mail Subscription Services Clerk
1	Mail Subscription Services Supervisor
1	Office Assistant
1	Offset Press Operator
2	Print Shop Duplicator
1	Print Shop Supervisor
1	Risk Manager
2	Secretary
1	Senior Administrative Secretary
2	Senior Office Assistant
<u>1</u>	Staff Specialist
43	Total FTEs

**Administrative & Human Resources  
Work Program by Office**

#	Program Code	Program Categories	Program	Activities	FTEs FY 2018-19	+/-	FTEs FY 2019-20	Revenue Categories
1	16 1026	Operational Support	SCAQMD Mail	Posting/Mailing/Delivery	2.30	0.00	2.30	la
2	16 0035	Operational Support	AB 617-General	AB 617-General	2.00	1.00	3.00	XX
3	16 0038	Operational Support	Admin/Office Management	Reports/Proj/Budget/Contracts	3.85	0.00	3.85	lb
4	16 0060	Operational Support	Equal Employment Opportunity	Program Dev/Monitor/Reporting	0.10	0.00	0.10	la
5	16 0080	Ensure Compliance	Auto Services	Vehicle/Radio Repair & Maint	3.00	0.00	3.00	la
6	16 0090	Operational Support	Building Maintenance	Repairs & Preventative Maint	7.00	1.00	8.00	la
7	16 0092	Operational Support	Business Services	Building Services Admin/Contracts	2.55	0.00	2.55	la
8	16 225	Operational Support	Employee Benefits	Benefits Analysis/Orient/Records	1.50	0.00	1.50	la
9	16 226	Operational Support	Classification & Pay	Class & Salary Studies	0.30	0.00	0.30	la
10	16 228	Operational Support	Recruitment & Selection	Recruit Candidates for SCAQMD	3.25	0.00	3.25	la
11	16 232	Operational Support	Position Control	Track Positions/Workforce Analysis	0.55	0.00	0.55	la
12	16 233	Operational Support	Employee Relations	Meet/Confer/Labor-Mgmt/Grievance	2.20	0.00	2.20	la
13	16 255	Operational Support	Facilities Services	Phones/Space/Keys/Audio-Visual	1.00	0.00	1.00	la
14	16 457	Advance Clean Air Technology	MS/Carl Moyer Admin	C Moyer/Contractor Compliance	0.10	0.00	0.10	IX
15	16 540	Customer Service and Business Assistance	Print Shop	Printing/Collating/Binding	4.00	0.00	4.00	la
16	16 542	Advance Clean Air Technology	Prop 1B:Goods Movement	Prop 1B: Goods Movement	0.10	0.00	0.10	IX
17	16 565	Customer Service and Business Assistance	Public Records Act	Comply w/ Public Rec Requests	0.05	0.00	0.05	la
18	16 640	Operational Support	Risk Management	Liab/Property/Wk Comp/Selfins	2.25	0.00	2.25	la
19	16 717	Policy Support	Student Interns	Gov Board/Student Intern Program	0.20	4.00	4.20	la
20	16 720	Customer Service and Business Assistance	Subscription Services	Rule & Gov Board Materials	1.70	-1.00	0.70	IV,XVII

**Total Administrative & Human Resources**

38.00	5.00	43.00
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**Administrative & Human Resources  
Line Item Expenditure**

Major Object / Account # / Account Description		FY 2017-18 Actuals	FY 2018-19 Adopted Budget	FY 2018-19 Amended Budget	FY 2018-19 Estimate *	FY 2019-20 Adopted Budget
<b>Salary &amp; Employee Benefits</b>						
51000-52000	Salaries	\$ 3,051,947	\$ 3,291,547	\$ 3,350,913	\$ 3,297,111	\$ 3,413,047
53000-55000	Employee Benefits	1,731,417	1,987,321	1,987,320	1,987,320	2,122,658
Sub-total Salary & Employee Benefits		\$ 4,783,364	\$ 5,278,868	\$ 5,338,233	\$ 5,284,431	\$ 5,535,704
<b>Services &amp; Supplies</b>						
67250	Insurance	\$ -	\$ -	\$ -	\$ -	\$ -
67300	Rents & Leases Equipment	108,209	41,600	41,600	41,600	41,600
67350	Rents & Leases Structure	-	-	-	-	-
67400	Household	404	5,284	5,284	5,284	5,284
67450	Professional & Special Services	147,411	151,750	256,479	256,479	151,750
67460	Temporary Agency Services	61,837	17,000	67,000	67,000	17,000
67500	Public Notice & Advertising	63,638	12,066	12,066	12,066	12,066
67550	Demurrage	-	-	-	-	-
67600	Maintenance of Equipment	28,506	5,500	5,500	5,500	5,500
67650	Building Maintenance	2,297	-	-	-	-
67700	Auto Mileage	6,911	4,200	7,200	7,200	4,200
67750	Auto Service	573,247	470,000	470,000	470,000	470,000
67800	Travel	3,848	2,500	2,500	2,500	2,500
67850	Utilities	-	-	-	-	-
67900	Communications	15,878	21,900	21,900	21,900	21,900
67950	Interest Expense	-	-	-	-	-
68000	Clothing	13,142	10,808	10,808	10,808	10,808
68050	Laboratory Supplies	1,156	-	-	-	-
68060	Postage	3,355	5,469	5,469	5,469	5,469
68100	Office Expense	143,155	111,300	108,200	108,200	111,300
68200	Office Furniture	172,129	-	-	-	-
68250	Subscriptions & Books	654	2,520	2,520	2,520	2,520
68300	Small Tools, Instruments, Equipment	6,974	5,030	5,030	5,030	5,030
68400	Gas and Oil	188,215	292,021	292,021	292,021	292,021
69500	Training/Conference/Tuition/ Board Exp.	31,075	15,062	15,062	15,062	15,062
69550	Memberships	1,357	3,265	3,265	3,265	3,265
69600	Taxes	-	-	100	100	-
69650	Awards	342	-	-	-	-
69700	Miscellaneous Expenses	13,219	12,000	12,000	12,000	12,000
69750	Prior Year Expense	(962)	-	-	-	-
69800	Uncollectable Accounts Receivable	-	-	-	-	-
89100	Principal Repayment	-	-	-	-	-
Sub-total Services & Supplies		\$ 1,585,998	\$ 1,189,275	\$ 1,344,004	\$ 1,344,004	\$ 1,189,275
77000	<b>Capital Outlays</b>	\$ -	\$ -	\$ -	\$ -	\$ -
79050	<b>Building Remodeling</b>	\$ -	\$ -	\$ -	\$ -	\$ -
Total Expenditures		\$ 6,369,363	\$ 6,468,143	\$ 6,682,237	\$ 6,628,435	\$ 6,724,979

\* Estimates based on July 2018 through February 2019 actual expenditures and March 2019 budget amendments.

**CLERK OF THE BOARDS**

**DENISE GARZARO  
CLERK OF THE BOARDS**

<b>At a Glance:</b>	
FY 2018-19 Adopted	\$1.4M
FY 2019-20 Budget	\$1.4M
% of FY 2019-20 Budget Total	0.8%
FTEs FY 2019-20 Budget	6

**DESCRIPTION OF MAJOR SERVICES:**

Clerk of the Boards coordinates the activities, provides operational support, and maintains the official records for both the Governing Board and the Hearing Board. The Office is responsible for preparing the legal notices for hearings and meetings, and ensuring that such notices are published as required. Clerk of the Boards' staff assist petitioners and attorneys in the filing of petitions before the Hearing Board and explain the Hearing Board's functions and procedures. Staff prepares Minute Orders, Findings and Decisions of the Hearing Board, and Summary Minutes of Governing Board meetings. The Clerk acts as communication liaison for the Boards with South Coast AQMD staff and state and federal agencies.

**ACCOMPLISHMENTS:**

**RECENT**

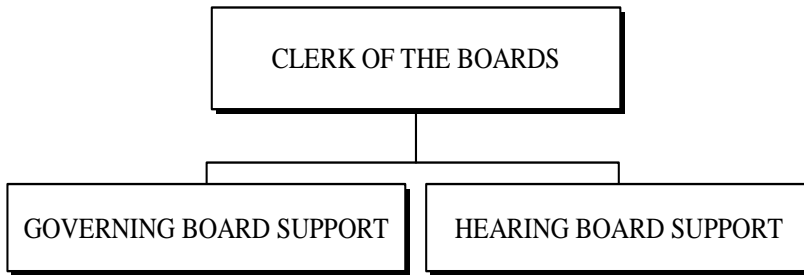
- Received and processed 77 subpoenas, public/administrative records requests, and claims against the South Coast AQMD.
- Provided support for 12 Governing Board meetings, including: preparing an agenda and minutes for each meeting; preparation, distribution, and publication of 28 meeting and public hearing notices; preparation of 26 Board Resolutions.
- Provided support for 85 hearings, pre-hearing conferences, and general meetings held by the Hearing Board, including: processing 80 petitions; preparation, distribution, and publication of 60 meeting and public hearing notices; preparation of 110 Minute Orders, Findings & Decisions, Pre-hearing Memoranda, and General Meeting Reports of Actions; and preparation and distribution of 100 daily agendas and monthly case calendars.
- Planned/coordinated efforts and provided clerical support for special offsite meetings, including: Governing Board – Mobile Board Meeting 10/6/2017 in Los Angeles, Board Retreat 5/10-5/11/18 in Indian Wells.

**CLERK OF THE BOARDS (cont.)**

**ANTICIPATED:**

- Provide support for approximately 75 hearings, pre-hearing conferences, and general meetings held by the Hearing Board, including: processing approximately 90 petitions; preparation, distribution, and publication of 100 meeting and public hearing notices; preparation of over 100 Minute Orders, Findings and Decisions, Pre-hearing Memoranda, and General Meeting Reports of Actions; and preparing and distributing more than 120 daily agendas and monthly case calendars. Provide support for 12 Governing Board meetings, including preparation of meeting agendas, minutes and Board Resolutions.

**ORGANIZATIONAL CHART:**



**POSITION SUMMARY: 6 FTEs**

Clerk of the Boards Unit	Amended FY 2018-19	Change	Budget FY 2019-20
Governing/Hearing Board Support	6	-	6

**POSITION DETAIL:**

<u>FTEs</u>	<u>Title</u>
1	Clerk of the Board
3	Deputy Clerk/Transcriber
1	Office Assistant
<u>1</u>	Senior Deputy Clerk
6	Total FTEs

**Clerk of the Boards  
Work Program by Office**

#	Program Code	Program Categories	Program	Activities	FTEs FY 2018-19	+/-	FTEs FY 2019-20	Revenue Categories
1	17 024	Operational Support	Admin/SCAQMD/GB/HB Mgmt	Admin Governing/Hearing Brds	1.25	0.00	1.25	la,VII,XV
2	17 275	Operational Support	Governing Board	Attend/Record/Monitor Meetings	1.40	0.00	1.40	la
3	17 364	Ensure Compliance	Hearing Board/Abatement Orders	Attnd/Recrd/Monitr Mtgs	0.10	0.00	0.10	IV
4	17 365	Ensure Compliance	Hearing Board/Variances/Appeal	Attend/Record/Monitor HB Mtgs	3.20	0.00	3.20	IV,V,VII
5	17 565	Customer Service and Business Assistance	Public Records Act	Comply w/ Public Rec Requests	0.02	0.00	0.02	la
6	17 855	Operational Support	Web Tasks	Create/edit/review web content	0.03	0.00	0.03	la

<b>Total Clerk of the Boards</b>				6.00	-	6.00
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**Clerk of the Boards  
Line Item Expenditure**

Major Object / Account # / Account Description		FY 2017-18 Actuals	FY 2018-19 Adopted Budget	FY 2018-19 Amended Budget	FY 2018-19 Estimate *	FY 2019-20 Adopted Budget
<b>Salary &amp; Employee Benefits</b>						
51000-52000	Salaries	\$ 408,637	\$ 397,406	\$ 404,908	\$ 404,908	\$ 408,778
53000-55000	Employee Benefits	276,675	294,250	294,249	294,249	291,875
Sub-total Salary & Employee Benefits		\$ 685,312	\$ 691,656	\$ 699,157	\$ 699,157	\$ 700,653
<b>Services &amp; Supplies</b>						
67250	Insurance	\$ -	\$ -	\$ -	\$ -	\$ -
67300	Rents & Leases Equipment	-	-	-	-	-
67350	Rents & Leases Structure	-	-	-	-	-
67400	Household	-	-	-	-	-
67450	Professional & Special Services	17,385	85,200	85,200	85,200	85,200
67460	Temporary Agency Services	-	-	-	-	-
67500	Public Notice & Advertising	21,879	40,000	40,000	40,000	40,000
67550	Demurrage	-	-	-	-	-
67600	Maintenance of Equipment	-	200	200	200	200
67650	Building Maintenance	-	-	-	-	-
67700	Auto Mileage	72	100	100	100	100
67750	Auto Service	-	-	-	-	-
67800	Travel	399	200	200	200	200
67850	Utilities	-	-	-	-	-
67900	Communications	154	500	500	500	500
67950	Interest Expense	-	-	-	-	-
68000	Clothing	-	-	-	-	-
68050	Laboratory Supplies	-	-	-	-	-
68060	Postage	424	1,200	1,200	1,200	1,200
68100	Office Expense	1,890	6,600	6,600	6,600	6,600
68200	Office Furniture	-	-	-	-	-
68250	Subscriptions & Books	-	-	-	-	-
68300	Small Tools, Instruments, Equipment	-	-	-	-	-
68400	Gas and Oil	-	-	-	-	-
69500	Training/Conference/Tuition/ Board Exp.	579,703	584,920	584,920	584,920	584,920
69550	Memberships	160	300	300	300	300
69600	Taxes	-	-	-	-	-
69650	Awards	-	-	-	-	-
69700	Miscellaneous Expenses	94	500	500	500	500
69750	Prior Year Expense	-	0	-	-	-
69800	Uncollectable Accounts Receivable	-	-	-	-	-
89100	Principal Repayment	-	-	-	-	-
Sub-total Services & Supplies		\$ 622,159	\$ 719,720	\$ 719,720	\$ 719,720	\$ 719,720
77000	<b>Capital Outlays</b>	\$ -	\$ -	\$ -	\$ -	\$ -
79050	<b>Building Remodeling</b>	\$ -	\$ -	\$ -	\$ -	\$ -
Total Expenditures		\$ 1,307,471	\$ 1,411,376	\$ 1,418,877	\$ 1,418,877	\$ 1,420,373

\* Estimates based on July 2018 through February 2019 actual expenditures and March 2019 budget amendments.

## COMPLIANCE & ENFORCEMENT

### MARIAN COLEMAN DEPUTY EXECUTIVE OFFICER

<b>At a Glance:</b>	
FY 2018-19 Adopted	\$20.7M
FY 2019-20 Budget	\$21.0M
% of FY 2019-20 Budget Total	12.3%
FTEs FY 2019-20 Budget	155

#### DESCRIPTION OF MAJOR SERVICES:

Compliance and Enforcement (C&E) ensures public health by conducting unannounced field inspections to verify compliance with South Coast AQMD, state and federal rules and regulations and investigating air quality complaints and equipment breakdowns. Title V and RECLAIM sources are inspected at least annually, with the exception of select industries targeted for more frequent evaluation (e.g., at least quarterly inspection of chrome plating facilities). All other 24,000 stationary sources and 13,000 PERP engines/equipment are inspected at least once every three years. Notices to Comply are issued when additional information is required of a source to determine compliance, and for minor administrative violations. Notices of Violation are issued for more serious, typically emissions-based violations. Other activities include participation in Emergency Response and joint inspection activities with other agencies, providing expert testimony before the South Coast AQMD Hearing Board, and conducting training classes for the public and regulated community.

#### ACCOMPLISHMENTS:

##### RECENT:

- Completed 219 inspections of chrome plating facilities (quarterly inspections of 108 facilities).
- Completed 99 Title V facility inspections.
- Completed 214 RECLAIM facility audits.
- Completed inspections of 3,131 other permitted stationary source facilities.
- Completed inspections of 1,504 PERP-registered engines/ equipment.
- Completed eight "Blue Sky" team inspections at refineries.
- Responded to 5,333 complaints (97% of those received).
- Responded to 434 breakdown notifications (79% of those received).
- Conducted 11 multi-agency targeted inspections.

## COMPLIANCE & ENFORCEMENT (cont.)

- Hosted and presented a compliance symposium on Title V requirements to the regulated community.
- Issued 1,579 Notices to Comply and 2,061 Notices of Violation.
- Conducted 29 training classes for members of the public and the regulated community.
- Promoted one AQ Inspector II to Staff Specialist and six AQ Inspectors II to AQ Inspector II, and hired 16 new AQ Inspectors.

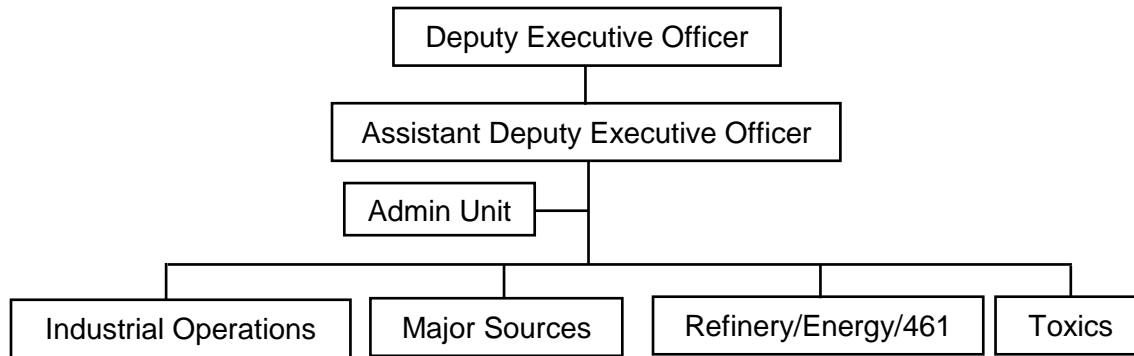
\*FY 2018-19, through December 31, 2018

### ANTICIPATED:

- Asbestos Strike Force
  - Double the number of asbestos notification inspections from 1,300 to 2,600.
- Marine Vessel & Terminal Inspection Program (Operation Sea Force)
  - Reduce the number of ships in South Coast AQMD waters that vent due to poor maintenance.
  - Attempt weekly inspection of ships for Rule 1142 compliance.
- Complaint Resolution Team Pilot Program
  - Cut the first contact complaint response time in half from the current average of 2 hours down to 1 hour.
  - Increase number of non-Title V/non-RECLAIM inspections from 5,000 annually (current frequency is once every 4 years) to 10,000 annually (proposed frequency once every 2 years).
  - Perform idling truck sweeps, residential burning sweeps and participate in AB 617 complaint investigations.
- Conduct additional multi-agency inspection sweeps to identify and confirm possible sources of excess Cr6 emissions in other communities.
- Reduce paperwork and streamline the report writing process to increase inspection efficiencies.
- Improve timeliness of complaint response.
- Efficiently move NOV reports to the General Counsel's office.
- Work closely with the General Counsel's office to address significant violations.
- Work closely with monitoring and rule-making staff to identify, assess, and address facilities with high emissions.
- Update policies and procedures governing enforcement actions.

**COMPLIANCE & ENFORCEMENT (cont.)**

**ORGANIZATIONAL CHART:**



**POSITION SUMMARY: 155 FTEs**

Office of Compliance and Enforcement Units	Amended FY 2018-19	Change	Budget FY 2019-20
Major Sources	22	-	22
Industrial Operations	52	-	52
Refinery/Energy/461	38	-	38
Toxics	35	-	35
Senior Admin/Staff	8	-	8
Total	155	-	155

**STAFFING DETAIL:**

<u>FTEs</u>	<u>Title</u>
6	AQ Analysis & Compliance Supervisor
91	AQ Inspector II
15	AQ Inspector III
1	Assistant Deputy Executive Officer
1	Deputy Executive Officer
10	Office Assistant
2	Senior Office Assistant
4	Senior Enforcement Manager
1	Staff Assistant
3	Staff Specialist
2	Senior Administrative Secretary
2	Secretary
<u>17</u>	Supervising AQ Inspector
155	Total Adopted Positions

**Compliance & Enforcement  
Work Program by Office**

Program Code	Program Categories	Program	Activities	FTEs FY 2018-19 +/-	FTEs FY 2019-20 +/-	Revenue Categories
1 60 1032	Ensure Compliance	AB617-Compliance	AB617- Compliance	0.00	8.00	XX
1 60 1038	Customer Service and Business Assistance	Admin/Office Budget	Dev/Coord Goals/Policies/Overs	7.00	-1.00	1b
2 60 1047	Customer Service and Business Assistance	Admin/Operations Support	Budget/Contracts/Reports/Projects	4.90	0.00	1b
3 60 1070	Ensure Compliance	CARB PERP Program	CARB Audits/Statewide Equip Reg	6.00	0.00	XIX
4 60 148	Policy Support	Climate Change	GHG/Climate Chg Support	0.00	0.00	IV,IX
5 60 152	Ensure Compliance	Compliance/IM Related Activiti	Assist IM: Design/Review/Test	0.50	0.00	IV
6 60 155	Ensure Compliance	Compliance/Guidelines	Procedures/Memos/Manuals	1.50	0.00	IV
7 60 157	Ensure Compliance	Compliance/Special Projects	Prog Audits/Data Req/Brd Supp	3.00	0.00	II
8 60 158	Ensure Compliance	Compliance Testing	R461/Combustion Equip Testing	1.00	0.00	IV
9 60 210	Monitoring Air Quality	Emergency Response	Emerg Tech Asst to Public Saf	0.10	0.00	0.10 IV,XV
10 60 276	Policy Support	Board Committees	Admin/Stationalary Source Committee	0.15	0.00	0.15 la
11 60 365	Ensure Compliance	Hearing Bd/Variations	Variations/Orders of Abatement	2.00	0.00	2.00 VII
12 60 375	Ensure Compliance	Inspections	Compliance/Inspection/Follow-up	88.00	-3.00	85.00 II,V,XV
13 60 377	Ensure Compliance	Inspections/RECLAIM Audits	Audit/Compliance Assurance	14.00	0.00	14.00 II,IV
14 60 416	Policy Support	Legislative Activities	Legislative Activities	0.00	0.00	0.00 la
15 60 492	Customer Service and Business Assistance	Outreach/Business	Pub Events/Conf/Rideshare Fair	0.20	0.00	0.20 IX
16 60 539	Ensure Compliance	Procedure 5 Review	Evaluate Proc 5 Asbestos Plans	0.40	0.00	0.40 XVII
17 60 550	Ensure Compliance	Public Complaints/Breakdowns	Complirtesp/Invflwup/Resolutn	10.00	-1.00	9.00 II,IV,V,XV
18 60 565	Customer Service and Business Assistance	Public Records Act	Comply w/ Public Req for info	3.00	0.00	3.00 la
19 60 605	Ensure Compliance	RECLAIM/Admin Support	Admin/Policy/Guidelines	0.50	0.00	0.50 II,III,IV,XV
20 60 657	Develop Rules	Rulemaking/Support PRA	Provide Rule Development Supp	1.00	0.00	1.00 IV,XV
21 60 678	Ensure Compliance	School Siting	Identify Haz. Emission Sources near Schools	0.00	0.00	0.00 IV
22 60 690	Customer Service and Business Assistance	Source Education	Prov Tech Asst To Industries	0.40	0.00	0.40 III,IV,V,XV
23 60 717	Policy Support	Student Interns	Gov Board/Student Intern Program	0.05	0.00	0.05 la
24 60 751	Ensure Compliance	Title III Inspections	Title III Comp/Insp/Follow Up	0.00	0.00	0.00 IV
25 60 771	Ensure Compliance	Title V	Title V Compl/Inspect/Follow Up	4.50	0.00	4.50 II,IV
26 60 791	Ensure Compliance	Toxics/AB2588	Risk Reduct Plan Rvw/Comm Mtgs	0.10	0.00	0.10 X
27 60 805	Operational Support	Training	Dist/Org Unit Training	2.00	0.00	2.00 1b
28 60 825	Operational Support	Union Negotiations	Official Labor/Mgmt Negotiate	0.10	0.00	0.10 la
29 60 826	Operational Support	Union Steward Activities	Rep Employees in Grievance Act	0.10	0.00	0.10 la
30 60 855	Operational Support	Web Tasks	Creation/Update of Web Conten	1.50	0.00	1.50 la

**Total Compliance & Enforcement**

152.00	3.00	155.00
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**Compliance & Enforcement  
Line Item Expenditure**

Major Object / Account # / Account Description		FY 2017-18 Actuals	FY 2018-19 Adopted Budget	FY 2018-19 Amended Budget	FY 2018-19 Estimate *	FY 2019-20 Adopted Budget
<b>Salary &amp; Employee Benefits</b>						
51000-52000	Salaries	\$ 11,708,324	\$ 12,786,732	\$ 13,000,474	\$ 12,281,680	\$ 13,046,309
53000-55000	Employee Benefits	5,874,708	7,439,606	7,439,607	6,909,922	7,574,368
Sub-total Salary & Employee Benefits		\$ 17,583,032	\$ 20,226,338	\$ 20,440,081	\$ 19,191,601	\$ 20,620,677
<b>Services &amp; Supplies</b>						
67250	Insurance	\$ -	\$ -	\$ -	\$ -	\$ -
67300	Rents & Leases Equipment	-	-	-	-	-
67350	Rents & Leases Structure	101,090	106,791	109,791	109,791	111,543
67400	Household	-	-	-	-	-
67450	Professional & Special Services	13,853	15,500	20,945	20,945	19,500
67460	Temporary Agency Services	17,260	2,000	2,000	2,000	2,000
67500	Public Notice & Advertising	-	-	-	-	-
67550	Demurrage	-	250	250	250	250
67600	Maintenance of Equipment	300	26,000	28,000	28,000	34,000
67650	Building Maintenance	-	-	-	-	-
67700	Auto Mileage	474	1,000	1,000	1,000	1,000
67750	Auto Service	-	1,000	1,000	1,000	1,000
67800	Travel	8,392	15,000	16,000	16,000	15,000
67850	Utilities	-	-	-	-	-
67900	Communications	59,169	117,350	117,350	117,350	117,350
67950	Interest Expense	-	-	-	-	-
68000	Clothing	13,691	30,685	36,185	36,185	31,297
68050	Laboratory Supplies	8,886	12,000	14,500	14,500	12,000
68060	Postage	10,911	3,000	3,000	3,000	11,645
68100	Office Expense	42,195	11,005	10,686	10,686	9,355
68200	Office Furniture	9,893	-	1,000	1,000	2,000
68250	Subscriptions & Books	150	400	1,600	1,600	400
68300	Small Tools, Instruments, Equipment	3,833	15,769	13,769	13,769	15,460
68350	Film	-	-	-	-	-
68400	Gas and Oil	-	-	-	-	-
69500	Training/Conference/Tuition/ Board Exp.	46,730	25,450	37,450	37,450	25,550
69550	Memberships	-	750	750	750	250
69600	Taxes	-	-	-	-	-
69650	Awards	-	-	-	-	-
69700	Miscellaneous Expenses	1,734	5,000	6,000	6,000	5,750
69750	Prior Year Expense	(298)	-	-	-	-
69800	Uncollectable Accounts Receivable	-	-	-	-	-
89100	Principal Repayment	-	-	-	-	-
Sub-total Services & Supplies		\$ 338,262	\$ 388,950	\$ 421,276	\$ 421,276	\$ 415,350
77000	<b>Capital Outlays</b>	\$ 564,579	\$ 80,000	\$ 200,000	\$ 200,000	\$ -
79050	<b>Building Remodeling</b>	\$ -	\$ -	\$ -	\$ -	\$ -
Total Expenditures		\$ 18,485,873	\$ 20,695,288	\$ 21,061,357	\$ 19,812,877	\$ 21,036,027

\* Estimates based on July 2018 through February 2019 actual expenditures and March 2019 budget amendments.



**SOUTH COAST**

**AIR QUALITY MANAGEMENT DISTRICT**

## ENGINEERING & PERMITTING

### LAKI TISOPULOS DEPUTY EXECUTIVE OFFICER

<b>At a Glance:</b>	
FY 2018-19 Adopted	\$25.4M
FY 2019-20 Budget	\$25.7M
% of FY 2019-20 Budget	15.0%
Total FTEs FY 2019-20 Budget	161

#### DESCRIPTION OF MAJOR SERVICES:

Engineering & Permitting (E&P) is responsible for processing applications for Permits to Construct & Operate, and special services. The permit processing activities involve nearly 400 major facilities that have been issued Title V Federal Operating permits, almost 300 facilities in the RECLAIM program, and over 27,000 large and small business operations. In addition, staff also participate in activities with other agencies, assist with Economic Development and Business Retention programs, provide engineering support to other divisions, and evaluate and implement permit backlog reduction and permit streamlining activities, including automation and other permit processing modernization efforts.

#### ACCOMPLISHMENTS:

##### RECENT:

- Successfully implemented the Action Plan to reduce the permit application backlog and total pending permit applications, improved permit processing efficiency and timely issuance of permits.
- Since the commencement of the backlog reduction effort in July 2016, reduced total pending applications by over 50%, from more than 7,300 to less than 3,800 pending applications by April 2018, ahead of the July 2018 target date.
- Completed the permit backlog reduction effort by meeting and exceeding the following goals:
  - Reduced pending applications to less than 3,800 by end of FY 2017-18 and less than 3,600 by October 2018 (reached goal in May 2018);
  - Processed more than 1,800 Permits to Construct and a total of 7,500 applications for Permits, Plans, and ERCs during FY 2017-18 (achieved 2,081 and 8,624 respectively, exceeding goals by 23% and 16%);
  - Focused on reducing last remaining aged permit applications to extent possible; and



## ENGINEERING & PERMITTING (cont.)

- Reduced pending applications beyond targets established in Action Plan to establish a cushion to help address additional incoming permit applications anticipated from RECLAIM program phase-out over the next one to three years.
- Excluding Permits to Construct issued, reduced pending application inventory to less than 2,400 meeting the 2,500 - 3,000 target for FY 2018-19.
- Reduced the permit application average residence time by over 33% following initiation of the backlog reduction effort.
- Improved the timely completion rate for new permit applications by nearly 10% over the past year and 30% since the initiation of the backlog reduction effort as determined by the number of new applications completed within 180 days of being deemed complete.
- Issued over 175 Title V renewal and modification permits in calendar year 2018.
- Continued program to recognize top performing individuals and teams to help maintain high morale and acknowledge performance.
- Continued development of Online Permit Processing tools and other automation efforts. Deployed online permitting tool for gasoline dispensing facilities and automotive refinishing spray booths and issued South Coast AQMD's first online permits for gasoline dispensing facilities, while continuing to support online permitting for dry cleaning equipment.
- Maintained Division's Permit Streamlining goal of application delivery to Permitting Teams within 4 business days.
- Continued implementation of EPA Title V Program Audit Findings Action Plan.
- Posted over 65% of the Title V permits to the internet for online public access.
- Participated in public meetings to address public concerns regarding high toxic risks and emissions.
- Supported Compliance and Enforcement staff in investigations and inspections of potential hexavalent chromium and other toxic air contaminant-emitting sources.
- Assisted in developing and amending South Coast AQMD Rules and Regulations such as Reg. III, Reg. XI, Reg. XIV, including Rule 1469, and other BARCT rules called for under AB 617, including Reg. XX.
- Provided Pre- and Post-application conferences to help permit applicants.
- Participated, reviewed and provided permit remedies to permit holders throughout Calendar Year 2018 from Fee Review cases.
- Provided technical support to IM to test and troubleshoot CLASS programs issues, including working to test and verify assessment of fees for new Reg. XX requirements under the Regulation III amendment.
- Successfully provided engineering support and/or expert testimony in Hearing Board cases throughout calendar year 2018.
- Organized and administered the annual Certified Permit Processing Professional (CPP) exam for 11 participants. Certified four new CPP holders as well as provided support to 161 existing CPP holders.
- Prepared Federal New Source Review (NSR) Equivalency Determination Reports pursuant to Rule 1315.
- Prepared annual report on the NO<sub>x</sub> and SO<sub>x</sub> RECLAIM Program in accordance with Rule 2015.

## ENGINEERING & PERMITTING (cont.)

### ANTICIPATED:

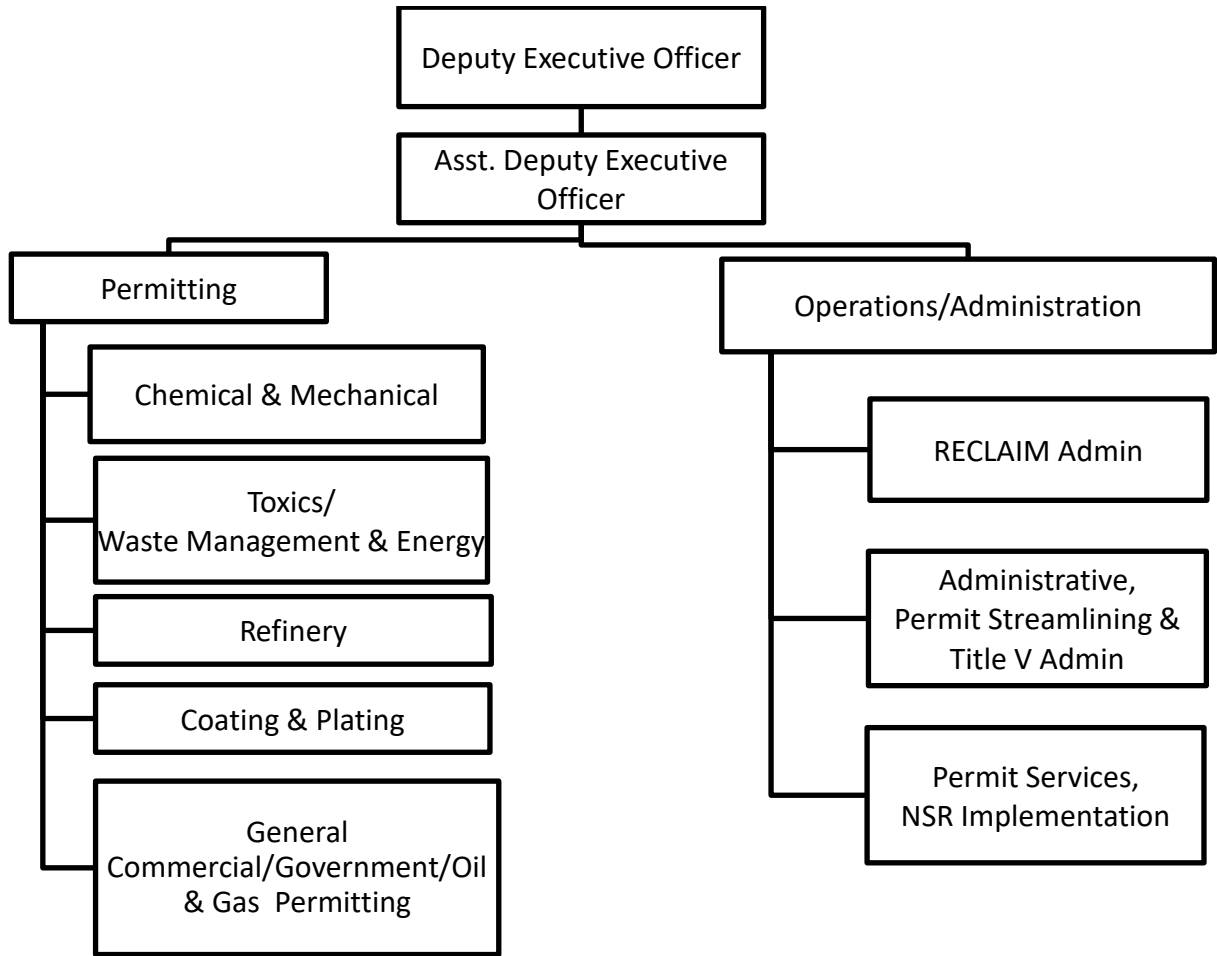
- Continue progress in reducing the permit applications inventory by maintaining pending permit applications inventory excluding Permits to Construct issued and RECLAIM transition applications between 2,000 and 2,500.
- Secure and maintain the timely completion rate for new permit applications by processing 75 to 80 percent of new permit applications within 180 days of being deemed complete.
- Monitor and reduce average permit application residence times.
- Complete timely renewal of Title V permits.
- Continue to implement action plan to further improve Title V program pursuant to EPA's recommendations:
  - a) Prepare expanded Statement of Basis (SOB) for all initial Title V permits, at least 10% of Title V renewals, and all De-Minimis and Significant Title V revisions,
  - b) Continue efforts to develop automated capability to publish Title V permits online,
  - c) Provide more detail account of applicable federal requirement in Title V permits,
  - d) Provide public with online access to all issued Title V permits, and
  - e) Develop formal policy for sources exiting the Title V program.
- Continue efforts to streamline and expedite permit issuance and reduce permit application backlog through:
  - a) Equipment certification/registration programs
  - b) Streamlined standard permits
  - c) Enhancement of permitting systems
  - d) Expedited Permit Processing Program.
- Complete the deployment of online permitting and permit automation tools for gasoline dispensing facilities and automotive spray booths, and establish eligibility criteria for identifying any additional candidate equipment/process suitable for online permitting based on lessons learned from Phase I.
- Continue the development and deployment of Phase II Online Permitting efforts:
  - a) On-line Dash Board tool for Permit Application Status Tracking that will allow public to track the status of individual permit applications,
  - b) Rule 222 Filing & Registration Forms,
  - c) Registration/Certification for Emergency Generators and Soil Vapor Extraction Systems,
  - d) 400-E-xx Permit Application Forms, and
  - e) Enhancements to Dry Cleaning, Gasoline Dispensing and Automotive Spray Booth modules.
- Continue permit processing modernization efforts through the development of a plan and business model that will facilitate transition to electronic permit application submittal and processing and can be deployed as soon as the development of electronic smart permit applications forms is complete.
- Continue implementation of the staff recognition program, recognizing top performing individuals and teams to help maintain high morale and acknowledge performance.

## ENGINEERING & PERMITTING (cont.)

- Continue to improve and monitor the operational and permitting efficiency of permitting teams by:
  - a) Streamlining workflow,
  - b) Enhancing permitting tools,
  - c) Standardizing permit conditions,
  - d) Reviewing and updating outdated Permitting Policies and Procedures, and
  - e) Standardizing time and processing status metrics for monitoring permit applications through completion.
- Continue soliciting stakeholder input on permit application backlog reduction and permit streamlining efforts through Permit Streamlining Task Force subcommittee meetings.
- Continue certification of CPPs.
- Continue to improve customer services and public outreach by:
  - a) Providing public education by attending public meetings and addressing public concerns,
  - b) Providing assistance to permit applicants through pre- and post-conferences, and
  - c) Providing permitting information for Public Record requests.
- Continue to evaluate the optional Expedited Permitting Program and propose improvements if warranted.
- Initiate the process to update and expand the South Coast AQMD's Permit Processing Handbook.
- Review and comment on Rule 1402 Risk Reduction Plans.
- Continue to provide critical input in developing and amending South Coast AQMD Rules.
- Continue to provide critical input in enforcing South Coast AQMD Rules.
- Continue to provide support in Fee Review cases and Hearing Board cases.
- Continue to prepare Federal NSR Equivalency Determination Reports pursuant to Rule 1315.
- Continue to prepare annual report on the NOx and SOx RECLAIM Program in accordance with Rule 2015.
- Develop a plan to re-issue permits to facilities that are opting out of NOx RECLAIM program.
- Continue to provide critical guidance to PRDAS in developing a streamlined NSR process for facilities exiting the RECLAIM program.

**ENGINEERING & PERMITTING (cont.)**

**ORGANIZATIONAL CHART:**



**POSITION SUMMARY: 161 FTEs**

Engineering & Permitting	Amended FY 2018-19	Change	Budget FY 2019-20
Administration	4	-	4
Engineering	130	-	130
Operations	27	-	27
Total	161	-	161

## ENGINEERING & PERMITTING (cont.)

### POSITION DETAIL:

<u>FTEs</u>	<u>Title</u>
92	Air Quality Engineer II
1	Air Quality Specialist
1	Assistant Deputy Executive Officer
2	Data Technician
1	Deputy Executive Officer
1	Office Assistant
1	Program Supervisor
5	Secretary
2	Senior Administrative Secretary
20	Senior Air Quality Engineer
6	Senior Air Quality Engineering Manager
17	Senior Office Assistant
2	Staff Specialist
8	Supervising Air Quality Engineer
<u>2</u>	Supervising Office Assistant
161	Total FTEs

**Engineering & Permitting  
Work Program by Office**

#	Program Code	Program Categories	Program	Activities	FTEs		Revenue Categories
					FY 2018-19	FY 2019-20 +/-	
1	50 035	Customer Service and Business Assistance	AB617-General	AB617-General	0.00	1.00	1.00 XX
1	50 038	Customer Service and Business Assistance	Admin/Office Management	Dev/Coord Goals/Policies/Overs	3.00	0.00	3.00 lb
2	50 047	Customer Service and Business Assistance	Admin/Operations Support	Budget/Contracts/Reports/Projects	3.00	0.00	3.00 lb
3	50 120	Timely Review of Permits	Certification/Registration Pro	Certification/Registration Prog	1.00	0.00	1.00 III
4	50 148	Policy Support	Climate Change	GHG/Climate Change Support	0.50	0.00	0.50 II,X
5	50 156	Ensure Compliance	Perm Proc/Info to Compliance	Prov Perm Info to Compliance	3.00	0.00	3.00 III,IV,XV
6	50 200	Customer Service and Business Assistance	Economic Dev/Bus Retention	Perm Proc/Public Participation	0.10	0.00	0.10 III
7	50 240	Ensure Compliance	Environmental Justice	R461/Combustion Equip Testing	0.50	0.00	0.50 II,IV,XV
8	50 253	Timely Review of Permits	ERC Appl Processing	Process ERC Applications	3.50	0.00	3.50 III
9	50 260	Customer Service and Business Assistance	Fee Review	Fee Review Committee	0.45	0.00	0.45 II,III,IV
10	50 276	Policy Support	Board Committees	Admin/Statioary Source Committees	0.25	0.00	0.25 la
11	50 365	Ensure Compliance	Hearing Bd/Variations	Variations/Orders of Abatement	0.75	0.00	0.75 VII
12	50 367	Timely Review of Permits	Hearing Board/Appeals	Appeals: Permits & Denials	0.25	0.00	0.25 III
13	50 377	Ensure Compliance	Inspections/RECLAIM Audits	Audit/Compliance Assurance	6.00	0.00	6.00 II,IV
14	50 416	Policy Support	Legislative Activities	Legislative Activities	0.25	0.00	0.25 la
15	50 425	Customer Service and Business Assistance	Lobby Permit Services	Supp Perm Proc/Customer Svc	1.00	0.00	1.00 III
16	50 475	Timely Review of Permits	NSR Implementation	Implement NSR/Allocate ERCs	2.50	0.00	2.50 II,III,V,XV
17	50 476	Timely Review of Permits	NSR Data Clean Up	Edit/Update NSR Data	0.50	0.00	0.50 II
18	50 492	Ensure Compliance	Customer Service	Compliance/Inspection/Follow-up	0.50	0.00	0.50 II,V,IX,XV
19	50 515	Timely Review of Permits	Perm Proc/Non TV/Non RECLAIM	PP: Non TitIV/TitIII/RECLAIM	50.75	-0.50	50.25 III,XV
20	50 517	Timely Review of Permits	Permit Services	Facility Data-Create/Edit	12.50	0.00	12.50 III,XV
21	50 518	Timely Review of Permits	RECLAIM Non-Title V	Process RECLAIM Only Permits	4.50	-0.50	4.00 III,IV,XV
22	50 519	Timely Review of Permits	Perm Proc/Title III (Non TV)	Process Title III Permits	1.00	0.00	1.00 III
23	50 520	Customer Service and Business Assistance	Perm Proc/Pre-App Mtg Outreac	Pre-App Mtgs/Genl Prescreening	1.00	0.00	1.00 III
24	50 521	Timely Review of Permits	Perm Proc/Expedited Permit	Proc Expedited Permits (301OT)	4.00	0.00	4.00 III
25	50 523	Timely Review of Permits	Permit Streamlining	Permit Streamlining	4.75	0.00	4.75 III
26	50 565	Customer Service and Business Assistance	Public Records Act	Comply w/ Public Req for Info	0.25	0.00	0.25 la
27	50 605	Ensure Compliance	RECLAIM/Admin Support	Admin/Policy/Guidelines	6.50	0.00	6.50 II,III,IV,XV
28	50 607	Timely Review of Permits	RECLAIM & Title V	Process RECLAIM & TV Permits	18.40	0.00	18.40 III
29	50 643	Timely Review of Permits	Rule 222 Filing Program	Rule 222 Filing Program	0.50	0.00	0.50 IV
30	50 650	Develop Rules	Rulemaking	Dev/Amend/Impl Rules	0.25	0.00	0.25 II,XV
31	50 657	Develop Rules	Rulemaking/Support PRA	Provide Rule Development Supp	0.25	0.00	0.25 II,XV
32	50 678	Ensure Compliance	School Siting	Identify Haz. Emission Sources near Schools	0.25	0.00	0.25 II
33	50 680	Ensure Compliance	Small Business Assistance	Asst sm bus w/ Permit Process	0.50	0.00	0.50 III,IV
34	50 690	Customer Service and Business Assistance	Source Education	Prov Tech Asst To Industries	2.80	0.00	2.80 III,IV,V,XV
35	50 728	Timely Review of Permits	Perm Proc/IM Programming	Assist IM: Design/Review/Test	2.55	0.00	2.55 II,III,IV
36	50 752	Develop Rules	Title III Rulemaking	Title III Dev/Implement Rules	0.25	0.00	0.25 II,V,XV
37	50 773	Develop Rules	Title V & NSR Rulemaking-Supp	Title V Rules Dev/Amend/Impl	0.25	0.00	0.25 II
38	50 774	Timely Review of Permits	TV/Non-RECLAIM	Process Title V Only Permits	18.00	0.00	18.00 III
39	50 775	Timely Review of Permits	Title V - Admin	Title V Administration	1.00	0.00	1.00 III
40	50 791	Ensure Compliance	Toxics/AB2588	AB2588 Rev Rpts/Risk Redplans	0.25	0.00	0.25 X
41	50 805	Operational Support	Training	Dist/Org Unit Training	3.10	0.00	3.10 lb
42	50 825	Operational Support	Union Negotiations	Official Labor/Mgmt Negotiate	0.05	0.00	0.05 la
43	50 826	Operational Support	Union Steward Activities	Rep Employees in Grievance Act	0.05	0.00	0.05 la
44	50 855	Operational Support	Web Tasks	Creation/Update of Web Content	0.25	0.00	0.25 la
<b>Total Engineering &amp; Permitting</b>					161.00	-	161.00

**Engineering & Permitting  
Line Item Expenditure**

Major Object / Appount # / Appount Description		FY 2017-18 Actuals	FY 2018-19 Adopted Budget	FY 2018-19 Amended Budget	FY 2018-19 Estimate *	FY 2019-20 Adopted Budget
<b>Salary &amp; Employee Benefits</b>						
51000-52000	Salaries	\$ 16,327,617	\$ 16,235,607	\$ 16,502,202	\$ 15,981,547	\$ 16,271,427
53000-55000	Employee Benefits	7,646,179	8,750,049	8,750,049	8,478,322	9,013,891
Sub-total Salary & Employee Benefits		\$ 23,973,796	\$ 24,985,656	\$ 25,252,251	\$ 24,459,869	\$ 25,285,319
<b>Services &amp; Supplies</b>						
67250	Insurance	\$ -	\$ -	\$ -	\$ -	\$ -
67300	Rents & Leases Equipment	2,984	10,000	10,000	10,000	8,000
67350	Rents & Leases Structure	-	10,000	10,000	10,000	8,000
67400	Household	-	-	-	-	-
67450	Professional & Special Services	5,564	2,500	28,914	28,914	2,500
67460	Temporary Agency Services	17,073	20,000	42,000	42,000	32,000
67500	Public Notice & Advertising	103,845	160,000	137,000	137,000	140,000
67550	Demurrage	-	250	250	250	250
67600	Maintenance of Equipment	-	-	-	-	-
67650	Building Maintenance	-	-	-	-	-
67700	Auto Mileage	36,376	35,000	35,000	35,000	35,000
67750	Auto Service	-	-	-	-	-
67800	Travel	10,392	17,555	17,555	17,555	18,433
67850	Utilities	-	-	-	-	-
67900	Communications	11,142	6,450	8,050	8,050	6,450
67950	Interest Expense	-	-	-	-	-
68000	Clothing	2,454	2,930	2,930	2,930	4,500
68050	Laboratory Supplies	(552)	-	-	-	-
68060	Postage	23,733	37,000	37,000	37,000	37,000
68100	Office Expense	72,186	56,336	56,336	56,336	59,296
68200	Office Furniture	3,584	-	-	-	3,500
68250	Subscriptions & Books	269	400	400	400	400
68300	Small Tools, Instruments, Equipment	-	-	-	-	-
68400	Gas and Oil	-	-	-	-	-
69500	Training/Conference/Tuition/ Board Exp.	4,639	4,500	4,500	4,500	5,500
69550	Memberships	470	750	1,750	1,750	1,500
69600	Taxes	-	-	-	-	-
69650	Awards	-	2,000	2,000	2,000	2,000
69700	Miscellaneous Expenses	544	5,000	5,000	5,000	5,000
69750	Prior Year Expense	-	-	-	-	-
69800	Uncollectable Accounts Receivable	-	-	-	-	-
89100	Principal Repayment	-	-	-	-	-
Sub-total Services & Supplies		\$ 294,703	\$ 370,671	\$ 398,685	\$ 398,685	\$ 369,329
77000	<b>Capital Outlays</b>	\$ -	\$ 70,000	\$ 90,000	\$ 90,000	\$ -
79050	<b>Building Remodeling</b>	\$ -	\$ -	\$ -	\$ -	\$ -
Total Expenditures		\$ 24,268,499	\$ 25,426,327	\$ 25,740,936	\$ 24,948,554	\$ 25,654,648

\* Estimates based on July 2018 through February 2019 actual expenditures and March 2019 budget amendments.

## FINANCE

### SUJATA JAIN CHIEF FINANCIAL OFFICER

At a Glance:	
FY 2018-19 Adopted	\$6.6M
FY 2019-20 Budget	\$6.4M
% of FY 2019-20 Budget	3.7%
Total FTEs FY 2019-20 Budget	48

#### DESCRIPTION OF MAJOR SERVICES:

Finance provides services to internal and external customers and stakeholders, including fee payers, internal divisions, employees, the Mobile Source Air Pollution Reduction Review Committee, the Building Corporation, and the Health Effects of Air Pollution Foundation. These services are provided through three distinct units: Controller, Financial Services, and Procurement. The Controller is responsible for accounting, financial reporting, accounts payable, payroll, state and federal tax reporting, revenue posting, and asset management. The Financial Services Manager is responsible for budget preparation, budgetary reporting, forecasting, grants management, billing services, and ad-hoc internal financial support/analysis. The Procurement Manager is responsible for the procurement of goods and services, contracting, proposal/bid solicitations and advertising, processing supplier deliveries, and controlling/dispensing/reconciling inventory.

#### ACCOMPLISHMENTS:

##### RECENT:

- Continued to expand electronic payment options to include Permit Processing Fee payments for asbestos, dry cleaners, spray booths and gas stations.
- Processed 701 contracts and modifications, issued 39 Request for Proposals/Quotes, and processed 586 proposals/quotations. Processed 1,544 purchase orders and 427 CalCard orders.
- Received the Government Finance Officer's Association's (GFOA) awards for the Annual Budget, Comprehensive Annual Financial Report (CAFR), and Popular Annual Financial Report (PAFR) for the most recent fiscal year.
- Implemented the new financial reporting requirements, as required by Governmental Accounting Standards Board (GASB) Statement Number 75 "Accounting and Financial Reporting for Postemployment Benefit Plans Other than Pension Plans," through coordination with Los Angeles County Employees' Retirement Association (LACERA), and external auditors.

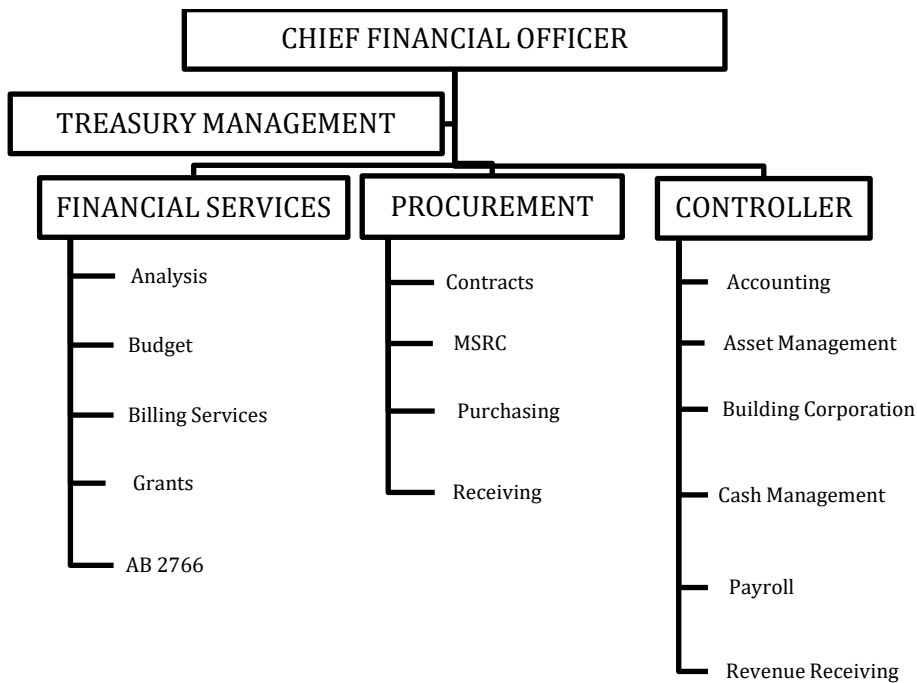


## FINANCE (cont.)

### ANTICIPATED:

- Continue to receive GFOA Awards for the Annual Budget, CAFR, and PAFR to ensure South Coast AQMD's financial reports meet the highest professional standards.
- Ensure compliance with all AB 617, AB 134, and VW Mitigation Settlement guidelines for financial reporting and tracking of revenue and expenditures.
- Start planning for the implementation of the new lease accounting standards required by Governmental Accounting Standards Board (GASB) Statement Number 87 for recognizing certain lease assets and liabilities for leases, which will impact South Coast AQMD starting with FY 2020-21.
- Continue to identify and implement additional opportunities for electronic payments.

### ORGANIZATIONAL CHART:



**FINANCE (cont.)**

**POSITION SUMMARY: 48 FTEs**

Finance Units	Amended FY 2018-19	Change	Budget FY 2019-20
Office Administration	4	(1)	3
Controller	20	-	20
Financial Services	15	-	15
Procurement	10	-	10
<b>Total</b>	<b>49</b>	<b>(1)</b>	<b>48</b>

**POSITION DETAIL:**

<u>FTEs</u>	<u>Title</u>
2	Accounting Technician
1	Chief Financial Officer
2	Contracts Assistant
1	Controller
1	District Storekeeper
4	Financial Analyst
1	Financial Services Manager
7	Fiscal Assistant
3	Payroll Technician
1	Procurement Manager
2	Purchasing Assistant
1	Purchasing Supervisor
2	Secretary
3	Senior Accountant
1	Senior Administrative Secretary
2	Senior Fiscal Assistant
9	Senior Office Assistant
1	Staff Assistant
1	Staff Specialist
1	Stock Clerk
1	Supervising Office Assistant
<u>1</u>	Supervising Payroll Technician
<b>48</b>	<b>Total FTEs</b>

**Finance  
Work Program by Office**

Program Code	Program Categories	Program	Activities	FTEs FY 2018-19	+/-	FTEs FY 2019-20	Revenue Categories
1 04 002	Customer Service and Business Assistance	AB2766/Mobile Source	Prog Admin: Monitor/Dist/Audit	0.10	0.00	0.10	IX
2 04 003	Advance Clean Air Technology	AB2766/MSRC	MSRC Program Administration	0.35	0.00	0.35	IX
3 04 009	Develop Programs	AB 1318 Mitigation	AB 1318 Projects Admn/Impl	0.13	0.00	0.13	XVII
4 04 020	Operational Support	Admin/SCAQMD Budget	Analyze/Prepare/Impl/Track WP	2.65	0.00	2.65	la
5 04 021	Operational Support	Admin/SCAQMD Contracts	Contract Admin/Monitor/Process	3.20	0.00	3.20	la
6 04 023	Operational Support	Admin/SCAQMD Capital Assets	FA Rep/Reconcile/Inv/Acct	0.70	0.00	0.70	la
7 04 030	Advance Clean Air Technology	AB 134	AB 134	2.00	0.00	2.00	IX
8 04 035	Operational Support	AB 617-General	AB 617-General	0.50	0.00	0.50	XX
9 04 038	Operational Support	Admin/Office Management	Fin Mgmt/Oversee Activities	3.75	-1.00	2.75	lb
10 04 045	Operational Support	Admin/Office Budget	Office Budget/Prep/Impl/Track	0.05	0.00	0.05	lb
11 04 071	Operational Support	Arch Ctgs - Admin	Cost Analysis/Payments	0.04	0.00	0.04	XVIII
12 04 083	Policy Support	Hlth Effects Air Pollution Fou	Health Effects Air Poll Foundation Support	0.02	0.00	0.02	la
13 04 085	Operational Support	Building Corporation	Building Corp Acct/Fin Reports	0.02	0.00	0.02	la
14 04 130	Advance Clean Air Technology	Clean Fuels/Contract Admin	Clean Fuels Contract Admin/Monitor	0.15	0.00	0.15	VIII
15 04 170	Customer Service and Business Assistance	Billing Services	Answer/Resp/Resolv Prob & Inq	8.00	0.00	8.00	II,III,IV
16 04 233	Operational Support	Employee Relations	Assist HR/Interpret Salary Res	0.10	0.00	0.10	la
17 04 260	Customer Service and Business Assistance	Fee Review	Crnte Mtg/Fee-Related Complaint	0.10	0.00	0.10	II,III,IV,XV
18 04 265	Operational Support	Financial Mgmt/Accounting	Record Accts Rec & Pay/Rpts	6.20	0.00	6.20	la
19 04 266	Operational Support	Financial Mgmt/Fin Analysis	Fin/SCAQMD Stat Analysis & Audit	0.80	0.00	0.80	la
20 04 267	Operational Support	Financial Mgmt/Treasury Mgmt	Treas Mgt Anlyz/Trk/Proj/Invst	1.00	0.00	1.00	la
21 04 268	Operational Support	Financial Systems	CLASS/Rev/Acct/PR/Sys Analyze	0.10	0.00	0.10	la
22 04 355	Customer Service and Business Assistance	Grants Management	Grant Anlyz/Eval/Negot/Acc/Rpt	1.00	0.00	1.00	IV,V,XV
23 04 447	Operational Support	Mobile Sources/Accounting	Record Acct Rec & Pay/Special Funds	0.65	0.00	0.65	IX
24 04 457	Advance Clean Air Technology	Mobile Source/Moyer Adm	Carl Moyer: Contract/Fin Admin	1.02	0.00	1.02	IX
25 04 493	Operational Support	Outreach/SB/MB/DVBE	Outreach/Incr SB/DVBE Partic	0.05	0.00	0.05	la
26 04 510	Operational Support	Payroll	Ded/Ret Rpts/PR/St & Fed Rpts	4.10	0.00	4.10	la
27 04 542	Advance Clean Air Technology	Prop 1B: Goods Movement	Contracts/Finance Admin	0.50	0.00	0.50	IX
28 04 544	Advance Clean Air Technology	Prop 1B: Low Emiss Sch Bus	Grants/Finance Admin	0.05	0.00	0.05	IX
29 04 565	Customer Service and Business Assistance	Public Records Act	Comply w/ Public Rec Requests	0.02	0.00	0.02	la
30 04 570	Operational Support	Purchasing	Purch/Track Svcs & Supplies	2.50	0.00	2.50	la
31 04 571	Operational Support	Purchasing/Receiving	Receive/Record SCAQMD Purchases	1.20	0.00	1.20	la
32 04 572	Operational Support	Purchasing-Receiving/Stockroom	Track/Monitor SCAQMD Supplies	1.00	0.00	1.00	la
33 04 630	Operational Support	Cash Mgmt/Revenue Receiving	Receive/Post Pymts/Reconcile	5.25	0.00	5.25	II,III,IV,XI
34 04 631	Customer Service and Business Assistance	Cash Mgmt/Refunds	Research/Doc/Prep/Proc Refunds	0.30	0.00	0.30	III,IV,XI
35 04 791	Ensure Compliance	Toxics/AB2588	AB2588 Toxics HS Fee Collection	0.15	0.00	0.15	X
36 04 805	Operational Support	Training	Continuing Education/Training	0.20	0.00	0.20	lb
37 04 825	Operational Support	Union Negotiations	Official Labor/Mgmt Negotiate	0.02	0.00	0.02	la
38 04 826	Operational Support	Union Steward Activities	Rep Employees in Grievance Act	0.01	0.00	0.01	la
39 04 827	Operational Support	VW-Program Development	VW-Program Development	0.00	1.00	1.00	XVII
40 04 855	Operational Support	Web Tasks	Create/edit/review web content	0.02	0.00	0.02	la

<b>Total Finance</b>	48.00	-	48.00
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Finance Line Item Expenditure						
Major Object / Account # / Account Description		FY 2017-18 Actuals	FY 2018-19 Adopted Budget	FY 2018-19 Amended Budget	FY 2018-19 Estimate *	FY 2019-20 Adopted Budget
<b>Salary &amp; Employee Benefits</b>						
51000-52000	Salaries	\$ 3,697,964	\$ 3,683,948	\$ 3,749,688	\$ 3,634,201	\$ 3,634,399
53000-55000	Employee Benefits	2,139,797	2,390,069	2,390,068	2,301,418	2,335,967
Sub-total Salary & Employee Benefits		\$ 5,837,761	\$ 6,074,016	\$ 6,139,756	\$ 5,935,618	\$ 5,970,366
<b>Services &amp; Supplies</b>						
67250	Insurance	\$ -	\$ -	\$ -	\$ -	\$ -
67300	Rents & Leases Equipment	-	-	-	-	-
67350	Rents & Leases Structure	-	-	-	-	-
67400	Household	-	900	900	900	900
67450	Professional & Special Services	126,834	163,560	193,029	193,029	155,178
67460	Temporary Agency Services	57,010	63,000	63,000	63,000	63,000
67500	Public Notice & Advertising	3,828	7,000	7,000	7,000	7,000
67550	Demurrage	-	780	780	780	780
67600	Maintenance of Equipment	647	1,860	1,860	1,860	1,860
67650	Building Maintenance	-	-	-	-	-
67700	Auto Mileage	2,525	4,468	4,468	4,468	4,468
67750	Auto Service	-	-	-	-	-
67800	Travel	2,105	6,000	6,000	6,000	6,000
67850	Utilities	-	-	-	-	-
67900	Communications	1,438	9,000	9,000	9,000	9,000
67950	Interest Expense	-	-	-	-	-
68000	Clothing	1,056	1,200	1,200	1,200	1,200
68050	Laboratory Supplies	-	-	-	-	-
68060	Postage	143,199	102,706	102,706	102,706	111,038
68100	Office Expense	28,672	36,120	36,120	36,120	36,120
68200	Office Furniture	175	-	-	-	-
68250	Subscriptions & Books	2,408	3,470	3,470	3,470	3,470
68300	Small Tools, Instruments, Equipment	-	-	-	-	-
68400	Gas and Oil	-	-	-	-	-
69500	Training/Conference/Tuition/ Board Exp.	7,529	27,250	27,250	27,250	27,250
69550	Memberships	1,590	2,793	2,793	2,793	2,793
69600	Taxes	-	-	-	-	-
69650	Awards	-	-	-	-	-
69700	Miscellaneous Expenses	3,339	5,150	5,150	5,150	5,200
69750	Prior Year Expense	-	-	-	-	-
69800	Uncollectable Accounts Receivable	-	-	-	-	-
89100	Principal Repayment	-	-	-	-	-
Sub-total Services & Supplies		\$ 382,356	\$ 435,257	\$ 464,726	\$ 464,726	\$ 435,257
77000	<b>Capital Outlays</b>	\$ -	\$ 75,800	\$ 75,800	\$ 75,800	\$ -
79050	<b>Building Remodeling</b>	\$ -	\$ -	\$ -	\$ -	\$ -
Total Expenditures		\$ 6,220,117	\$ 6,585,073	\$ 6,680,282	\$ 6,476,144	\$ 6,405,623
* Estimates based on July 2018 through February 2019 actual expenditures and March 2019 budget amendments.						



**SOUTH COAST**

**AIR QUALITY MANAGEMENT DISTRICT**

## INFORMATION MANAGEMENT

**RON MOSKOWITZ**  
**CHIEF INFORMATION OFFICER**

<b>At a Glance:</b>	
FY 2018-19 Adopted	\$11.3M
FY 2019-20 Budget	\$12.2M
% of FY 2019-20 Budget	7.1%
Total FTEs FY 2019-20 Budget	57

### DESCRIPTION OF MAJOR SERVICES:

Information Management (IM) provides a wide range of information management systems and services in support of all South Coast AQMD operations. In addition to IM's administrative unit which provides for overall planning, administration and coordination of all IM activities, IM is comprised of two Information Technology (IT) units, and a Special Projects unit. The two IT units are distinguished from each other in that one is primarily concerned with hardware and network issues (while acquiring and applying software to integrate systems and functions), whereas the other focuses on system development (while integrating communication functions and the latest computer technologies). Due to the increasing convergence between hardware, software and digital technologies, the work performed by the two IT units often overlaps and requires close coordination. Areas where the two units overlap include workflow automation, imaging, automatic system messaging (e.g., through email), GIS, etc. The Special Projects unit performs project management functions, processes all of the public records requests and handles day-to-day updates and additions to the South Coast AQMD website along with other projects as they arise.

### ACCOMPLISHMENTS:

#### RECENT:

- South Coast AQMD Mobile Application for Apple devices
- FIND System Replacement: Replacement of the existing Facility Information Detail system to provide updated user interface, responsive design, and better search and reporting capabilities for staff and the public.
- Geographic Information Systems Implementation: Completed Phase II including Open Data Portal, FIND Map replacement, and GEO coding services and tooling
- Permit Application Status Dashboard

## INFORMATION MANAGEMENT (cont.)

- PeopleSoft Upgrades, Customizations and Module Implementations: Benefits Administration BCC Module implementation and labor negotiation customization and implementation
- Air Quality Index calculation migration to NowCast method
- R1415 Refrigerant Filing System
- Bank of America transmission platform migration
- Request To Speak web application developed for public comments at Governing Board Meetings
- Information Technology Review: Evaluated the information technologies and processes in place and those needed to support the South Coast AQMD's goals and objectives.
- New Website, Website Facelift
- OnBase Version Upgrade
- Enterprise GIS Infrastructure on-line and on-premise
- Fiber network cable replacement and closet uplink upgrade
- Internet bandwidth upgrade
- Wi-Fi Deployment
- End Point Virus Protection Upgrade
- Desktop Upgrades
- Permitting Automation New System Development: Automated 400A form filing and permit processing of dry cleaner, gas station and spray booth operations and online Facility ID generation.
- Security Portal Lite Registration Implementation: Core infrastructure for all web applications including login and registration, user and application management, reporting copy of record, and application administration
- "Replace Your Ride" (RZR) New System Development: Developed web-based application that supports the implementation of a program providing monetary incentives to eligible individuals to retire their older vehicle and purchase a cleaner burning, more fuel efficient vehicle.
- Financial Services Web Services Upgrade: Converted all major financial subsidiary functions to 64-bit web services including Finance daily report, refunds sweep, Bank of America Link Reporting Services, on-line payment processing, and PeopleSoft to CLASS link.
- GIS Services Implementation and Migration to ESRI: Map layer conversion and spatial query/web services for 400A and RZR system support
- On-line training system implementation: Support registration for on-line and leader-lead classes and on-line training

### ANTICIPATED:

- South Coast AQMD Mobile Application Android

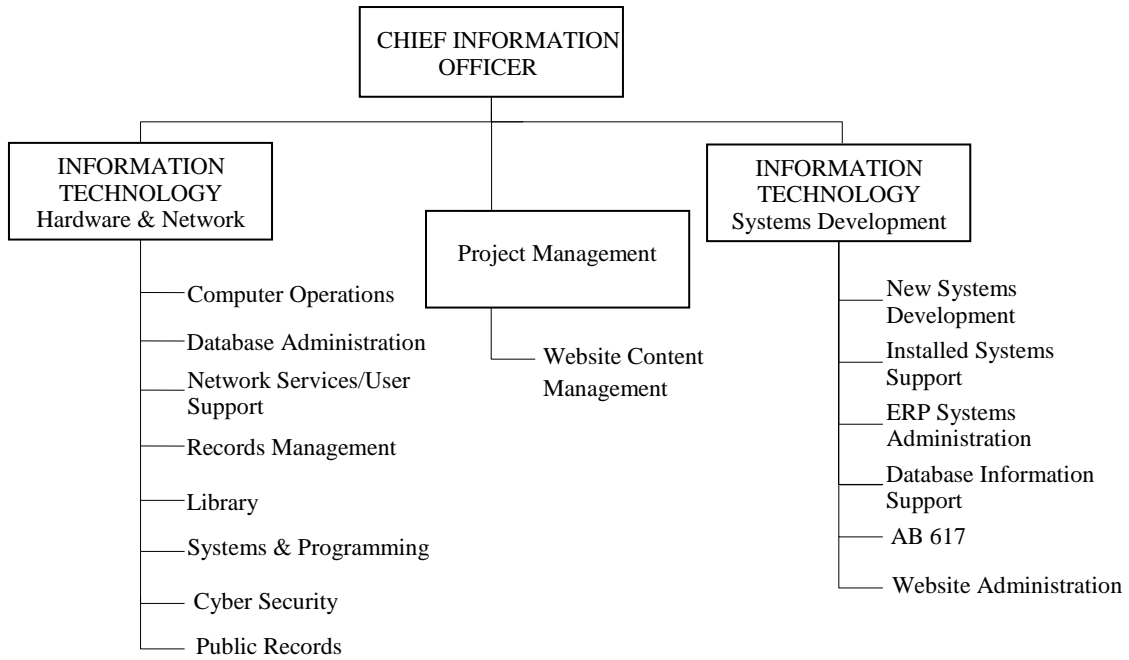
## INFORMATION MANAGEMENT (cont.)

- South Coast AQMD Mobile Application enhancements for filing complaints, notifications, facility search, etc.
- PeopleSoft implementation for electronic requisition processing
- AQ-SPEC data management system
- Implementation of selected recommendations from IT Review
- Website Upgrade
- Database Administration: CLASS database upgraded and high availability
- Records: Agenda Tracking System Application Upgrade, E-Discovery implementation
- IT Services and Operations: Enterprise GIS applications implementation (web mapping), HF Monitoring System replacement, and RECLAIM Electronic Reporting System replacement (electronic reporting systems)
- Network and Hardware: Cloud based email and file sharing (Office 365), internet bandwidth upgrade, vertical network fiber upgrade, Wi-Fi deployment outdoors, virtualization and storage upgrades, server migration to the Cloud, Windows 10 Version upgrade, laptop disk encryption, and Desktop replacement with laptops
- Permitting Automation Phase II New System Development: 400 E Series form filing, on-line permits IC engine/vapor recovery, equipment registration form processing, internal workflow automation, and paperless permit equipment evaluation
- Annual Emission Reporting (AER) System Migration: Evaluation and upgrade and/or replacement of the existing AER system for better support and integration with South Coast AQMD's enterprise database and programs.
- Legal Division New System Development: Replacement of existing Courtview Case Management Solution with a more robust solution that integrates with the CLASS system.
- Flare Notification New System Development: Replacement of existing Flare Notification System with a more robust solution that integrates with the CLASS system and supports recent rule changes.
- Title V Compliance Form Filing: New web-based outward facing application to support the filing of Title V Compliance forms
- Compliance System Replacement: New web-based application to replace the aging client/server desktop application for the tracking and processing of complaints, inspections, notifications, breakdowns, Notices of Violation, and Notices to Comply
- Transportation Plan Form Filing on the Web: New outward-facing web application to allow the online filing of Transportation Plans



## INFORMATION MANAGEMENT (cont.)

### ORGANIZATIONAL CHART:



### POSITION SUMMARY: 57 FTEs

Information Management Units	Amended FY 2018-19	Change	Budget FY 2019-20
Office Administration	2	-	2
Hardware & Network	28	-	28
Systems Development	20	-	20
Special Projects	3	-	3
Public Records	4	-	4
<b>Total</b>	<b>57</b>	<b>-</b>	<b>57</b>

## INFORMATION MANAGEMENT (cont.)

### POSITION DETAIL:

<u>FTEs</u>	<u>Title</u>
1	Assistant Database Administrator
3	Assistant Information Technology Specialist
1	Chief Information Officer
1	Database Administrator
1	Information Technology Specialist I
1	Information Technology Specialist II
3	Information Technology Supervisor
4	Office Assistant
1	Public Affairs Specialist
2	Secretary
1	Senior Administrative Secretary
5	Senior Information Technology Specialist
4	Senior Office Assistant
2	Supervising Office Assistant
14	Systems Analyst
11	Systems and Programming Supervisor
<u>2</u>	Information Technology Manager
57	Total FTEs

**Information Management  
Work Program by Office**

#	Program Code	Program Categories	Program	Activities	FTEs FY 2018-19	+/-	FTEs FY 2019-20	Revenue Categories
1	27 1035	Operational Support	AB 617-General	AB 617-General	5.00	3.00	8.00	XX
2	27 1038	Operational Support	Admin/Office Management	Overall Direction/Coord of IM	2.00	0.00	2.00	1b
3	27 071	Operational Support	Arch Ctgs - Admin	Database Dev/Maintenance	0.25	0.00	0.25	XVIII
4	27 160	Operational Support	Computer Operations	Oper/Manage Host Computer Sys	5.25	0.00	5.25	1a
5	27 184	Operational Support	Database Information Support	Ad Hoc Reports/Bulk Data Update	1.00	0.00	1.00	1a
6	27 185	Operational Support	Database Management	Dev/Maintain Central Database	2.25	0.00	2.25	1a
7	27 215	Operational Support	Annual Emission Reporting	System Enhancements for GHG	0.50	0.00	0.50	II,XVII
8	27 370	Operational Support	Information Technology Svcs	Enhance Oper Effic/Productivity	2.75	0.00	2.75	1a
9	27 420	Operational Support	Library	General Library Svcs/Archives	0.25	0.00	0.25	1a
10	27 470	Operational Support	Network Operations/Telecomm	Operate/Maintain/Implem SCAQMD	9.25	0.00	9.25	1a
11	27 480	Operational Support	New System Development	Dev sys for special oper needs	2.50	0.00	2.50	II,IV
12	27 481	Customer Service and Business Assistance	New System Development	Dev sys in supp of Dist-wide	1.75	0.00	1.75	1a,III
13	27 523	Timely Review of Permits	Permit Streamlining	Permit Streamlining	0.25	0.00	0.25	III
14	27 565	Customer Service and Business Assistance	Public Records Act	Comply w/ Public Req for Info	4.75	0.00	4.75	1a
15	27 615	Operational Support	Records Information Mgmt Plan	Plan/impl/Dir/Records Mgmt plan	1.25	0.00	1.25	1a
16	27 616	Operational Support	Records Services	Records/Documents processing	3.75	0.00	3.75	1a,III,IV
17	27 735	Operational Support	Systems Maintenance	Maintain Existing Software Prog	4.50	0.00	4.50	II,III,IV
18	27 736	Operational Support	Systems Implementation/Peoples	Fin/HR PeopleSoft Systems Impl	1.50	0.00	1.50	1a
19	27 770	Timely Review of Permits	Title V	Dev/Maintain Title V Program	1.50	0.00	1.50	III
20	27 791	Ensure Compliance	Toxics/AB2588	AB2588 Database Software Supp	0.50	0.00	0.50	X
21	27 855	Operational Support	Web Tasks	Create/edit/review web content	3.25	0.00	3.25	1a

<b>Total Information Management</b>				54.00	3.00	57.00
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**Information Management  
Line Item Expenditure**

Major Object / Account # / Account Description		FY 2017-18 Actuals	FY 2018-19 Adopted Budget	FY 2018-19 Amended Budget	FY 2018-19 Estimate *	FY 2019-20 Adopted Budget
<b>Salary &amp; Employee Benefits</b>						
51000-52000	Salaries	\$ 5,380,449	\$ 5,458,597	\$ 5,554,305	\$ 5,554,305	\$ 5,889,051
53000-55000	Employee Benefits	2,916,262	3,433,500	3,433,500	3,433,500	3,567,551
Sub-total Salary & Employee Benefits		\$ 8,296,711	\$ 8,892,097	\$ 8,987,805	\$ 8,987,805	\$ 9,456,602
<b>Services &amp; Supplies</b>						
67250	Insurance	\$ -	\$ -	\$ -	\$ -	\$ -
67300	Rents & Leases Equipment	-	1,880	1,880	1,880	1,880
67350	Rents & Leases Structure	-	-	-	-	-
67400	Household	-	1,250	1,250	1,250	1,250
67450	Professional & Special Services	1,340,927	1,404,121	1,646,358	1,646,358	1,404,121
67460	Temporary Agency Services	122,462	347,199	347,199	347,199	347,199
67500	Public Notice & Advertising	-	-	-	-	-
67550	Demurrage	-	650	650	650	650
67600	Maintenance of Equipment	100,621	157,750	190,613	190,613	157,750
67650	Building Maintenance	-	-	-	-	-
67700	Auto Mileage	3,578	1,250	1,250	1,250	1,250
67750	Auto Service	-	-	-	-	-
67800	Travel	18,905	2,160	2,160	2,160	2,160
67850	Utilities	-	-	-	-	-
67900	Communications	12,508	36,900	36,900	36,900	36,900
67950	Interest Expense	-	-	-	-	-
68000	Clothing	-	-	-	-	-
68050	Laboratory Supplies	-	-	-	-	-
68060	Postage	1,376	5,500	5,500	5,500	5,500
68100	Office Expense	731,974	323,912	766,161	766,161	673,912
68200	Office Furniture	19,310	-	5,959	5,959	-
68250	Subscriptions & Books	88,922	30,000	30,000	30,000	30,000
68300	Small Tools, Instruments, Equipment	-	2,000	2,000	2,000	2,000
68350	Film	-	-	-	-	-
68400	Gas and Oil	-	-	-	-	-
69500	Training/Conference/Tuition/ Board Exp.	29,718	46,575	46,575	46,575	46,575
69550	Memberships	527	1,320	1,320	1,320	1,320
69600	Taxes	-	1,000	1,000	1,000	1,000
69650	Awards	-	-	-	-	-
69700	Miscellaneous Expenses	-	-	-	-	-
69750	Prior Year Expense	(8,658)	-	-	-	-
69800	Uncollectable Accounts Receivable	-	-	-	-	-
89100	Principal Repayment	-	-	-	-	-
Sub-total Services & Supplies		\$ 2,462,171	\$ 2,363,467	\$ 3,086,775	\$ 3,086,775	\$ 2,713,467
77000	<b>Capital Outlays</b>	\$ 2,895,652	\$ 35,000	\$ 1,954,486	\$ 1,954,486	\$ 35,000
79050	<b>Building Remodeling</b>	\$ -	\$ -	\$ -	\$ -	\$ -
Total Expenditures		\$ 13,654,534	\$ 11,290,564	\$ 14,029,066	\$ 14,029,066	\$ 12,205,069

\* Estimates based on July 2018 through February 2019 actual expenditures and March 2019 budget amendments.



**SOUTH COAST**

**AIR QUALITY MANAGEMENT DISTRICT**

**LEGAL**

**BAYRON T. GILCHRIST  
GENERAL COUNSEL**

<b>At a Glance:</b>	
FY 2018-19 Adopted	\$6.8M
FY 2019-20 Budget	\$7.1M
% of FY 2019-20 Budget	4.2%
Total FTEs FY 2019-20 Budget	35

**DESCRIPTION OF MAJOR SERVICES:**

The General Counsel’s Office is responsible for advising the South Coast AQMD Board and staff on all legal matters and enforcing South Coast AQMD rules and state laws related to air pollution control. Attorneys review and assist in the drafting of South Coast AQMD rules and regulations to ensure they are within South Coast AQMD’s authority, and are written in a clear and enforceable manner. Attorneys ensure that all legal requirements for noticing, public workshop, CEQA analysis, and socioeconomic analysis of proposed rules and air quality management plans are satisfied.

The General Counsel’s Office is also responsible for representing the South Coast AQMD Board and staff in court proceedings and administrative hearings related to matters arising out of staff’s performance of official duties as South Coast AQMD officers and employees.

The Office is responsible for the enforcement of all South Coast AQMD rules and regulations and applicable state law. In addition, staff attorneys represent the Executive Officer in all matters before the South Coast AQMD Hearing Board, including variances, permit appeals, and abatement orders. Staff investigators support civil penalty and litigation and settlement efforts, including the minor source penalty program which is handled by investigators.

**ACCOMPLISHMENTS:**

**RECENT:**

- Staff negotiated an award of \$547 thousand in attorneys’ fees as a prevailing party in Fast Lane Transportation, et al. v. City of Los Angeles, et al. (SCIG). In this case the Court of Appeal agreed with South Coast AQMD’s position that the Environmental Impact Report (EIR) for a BNSF railyard project to be located in an environmental justice area did not adequately analyze air quality impacts over the 50-year life of the project.
- The Superior Court upheld the South Coast AQMD’s EIR for the Tesoro Los Angeles Refinery Integration & Compliance project, which will reduce localized pollution in the Wilmington-Carson area due to the shutdown of a fluid catalytic cracking unit. The plaintiffs, Communities for a Better Environment, unsuccessfully argued that the project

## LEGAL (cont.)

would increase the use of higher-sulfur crude oil and higher volatility crude oil which would adversely affect the environment.

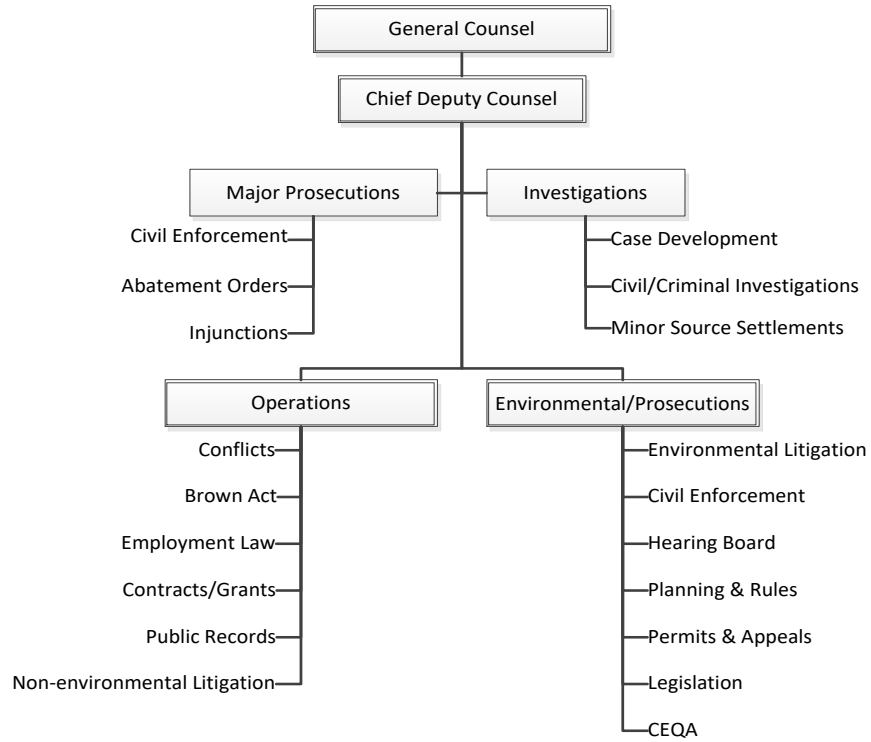
- Staff helped reduce the backlog of Public Records Act requests by 78% between June and November 2018.
- Staff obtained over \$15 million in civil penalties for air pollution violations in 2018.
- Processed \$157 million in incentive contracts, implementing the 2016 AQMP Funding Plan, and reducing NOx pollution in South Coast AQMD by three (3) tons/day.
- Drafted and implemented guidance on personal devices used for South Coast AQMD business being subject to the Public Records Act.
- Updated key portions of Rule Development Manual.

### **ANTICIPATED:**

- Provide training for staff on Public Records Act.
- Provide legal advice for priority projects such as AB 617, BARCT rules, AQMP rules, RECLAIM phase-out, and promotion of legislation for sales tax.
- Update additional chapters of Rule Development Manual.
- Provide legal advice for implementation of AB 617, including community emission reduction plans and potential enforcement actions.
- Implement first phases of new document management systems including assignment tracking and searchable database for briefs, memos, etc.

**LEGAL (cont.)**

**ORGANIZATIONAL CHART:**



**POSITION SUMMARY: 35 FTEs**

Legal Units	Amended FY 2018-19	Change	Budget FY 2019-20
Office Administration	4	-	4
General Counsel	25	-	25
Investigations	6	-	6
<b>Total</b>	<b>35</b>	<b>-</b>	<b>35</b>



LEGAL (cont.)

POSITION DETAIL:

<u>FTEs</u>	<u>Title</u>
4	Administrative Secretary/Legal
1	Assistant Chief Deputy – Major Prosecutions
1	Chief Deputy Counsel
1	General Counsel
4	Investigator
3	Legal Secretary
1	Office Assistant
2	Paralegal
4	Principal Deputy District Counsel
10	Senior Deputy District Counsel
1	Senior Office Assistant
1	Senior Paralegal
1	Staff Specialist
<u>1</u>	Supervising Investigator
35	Total FTEs

Legal Work Program by Office						
#	Program Code	Program Categories	Program	Activities	FTEs FY 2018-19 +/-	Revenue Categories
1	08 1001	Advance Clean Air Technology	AB2766/Mob Src/Legal Advice	AB2766 Leg Adv: Trans/Mob Source	0.05	IX
2	08 1003	Advance Clean Air Technology	AB2766/MSRC	Legal Advice: MSRC Prog Admin	0.10	IX
3	08 1009	Develop Programs	AB 1318 Mitigation	AB 1318 Projects Adm/Impl	0.00	XVII
4	08 1010	Develop Programs	AQMP	AQMP Revision/CEQA Review	0.10	II,IV,IX
5	08 1025	Operational Support	Admin/SCAQMD-Legal Research	Legal Research/Staff/Exec Mgmt	1.20	la
6	08 1030	Advance Clean Air Technology	AB 134	AB 134	2.00	IX
7	08 1035	Operational Support	AB 617-General	AB 617-General	1.00	XX
8	08 1038	Operational Support	Admin/Office Management	Attorney Timekeeping/Perf Eval	3.50	lb
9	08 071	Operational Support	Arch Ctgs - Admin	Rule Dev/TA/Reinterpretations	0.05	XVIII
10	08 072	Ensure Compliance	Arch Ctgs - End User	Case Dispo/Rvw, Track, Prep NOV's	0.05	XVIII
11	08 073	Ensure Compliance	Arch Ctgs - Other	Case Dispo/Rvw, Track, Prep NOV's	0.05	XVIII
12	08 102	Operational Support	CEQA Document Projects	CEQA Review	0.75	II,III,IX
13	08 115	Ensure Compliance	Case Disposition	Trial/Dispo-Civil Case/Injunct	4.75	II,IV,V,VII,XV
14	08 131	Advance Clean Air Technology	Clean Fuels/Legal Advice	Legal Advice: Clean Fuels	0.15	VIII
15	08 154	Ensure Compliance	Compliance/NOV Administration	Review/Track/Prep NOV's/MSAs	0.75	IV
16	08 185	Ensure Compliance	Database Management	Support IM/Dev Tracking System	1.00	IV
17	08 227	Operational Support	Employee/Employment Law	Legal Advice: Employment Law	0.50	la
18	08 235	Ensure Compliance	Enforcement Litigation	Maj Prosecutions/Civil Actions	2.00	IV
19	08 275	Operational Support	Governing Board	Legal Advice:Attend Board/Cmte Mtgs	1.00	la
20	08 366	Ensure Compliance	Hearing Board/Legal	Hear/Disp-Variant/Appeal/Rev	3.00	IV,V,XV
21	08 380	Ensure Compliance	Interagency Coordination	Coordinate with Other Agencies	0.20	II,V
22	08 401	Operational Support	Legal Advice/SCAQMD Programs	General Advice: Contracts	2.00	la
23	08 403	Ensure Compliance	Legal Rep/Litigation	Prep/Hearing/Disposition	3.50	la,II
24	08 404	Customer Service and Business Assistance	Legal Rep/Legislation	Draft Legis/SCAQMD Position/Mtgs	0.25	II,IX
25	08 416	Policy Support	Legislative Activities	Lobbying: Supp/Promote/Influence legis/Adm	0.10	la
26	08 457	Advance Clean Air Technology	Mob Src/C Moyer/Leg Advice	Moyer/Implem/Program Dev	0.10	IX
27	08 465	Ensure Compliance	Mutual Settlement	Mutual Settlement Program	1.50	IV
28	08 516	Timely Review of Permits	Permit Processing/Legal	Legal Advice: Permit Processing	0.10	III
29	08 565	Customer Service and Business Assistance	Public Records Act	Comply w/ Public Rec Requests	1.50	la
30	08 651	Develop Rules	Rules/Legal Advice	Legal Advice: Rules/Draft Regs	1.20	II
31	08 661	Develop Rules	Rulemaking/RECLAIM	RECLAIM Legal Adv/Related Iss	0.50	II
32	08 681	Customer Service and Business Assistance	Small Business/Legal Advice	Legal Advice: SB/Fee Review	0.05	II,III
33	08 717	Policy Support	Student Interns	Gov Board/Student Intern Program	0.10	la
34	08 770	Timely Review of Permits	Title V	Leg Advice: Title V Prog/Perm Dev	0.05	II,IV
35	08 772	Timely Review of Permits	Title V Permits	Leg Advice: New Source Title V Permit	0.05	III
36	08 791	Ensure Compliance	Toxics/AB2588	AB2588 Legal Advice: Plan & Impl	0.05	X
37	08 805	Ensure Compliance	Training	Continuing Education/Training	0.75	lb
38	08 825	Operational Support	Union Negotiations	Legal Adv: Union Negotiations	0.00	la
39	08 826	Operational Support	Union Steward Activities	Rep Employees in Grievance Act	0.00	la

34.00	1.00	35.00
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Total Legal

Legal Line Item Expenditure						
Major Object / Account # / Account Description		FY 2017-18 Actuals	FY 2018-19 Adopted Budget	FY 2018-19 Amended Budget	FY 2018-19 Estimate *	FY 2019-20 Adopted Budget
<b>Salary &amp; Employee Benefits</b>						
51000-52000	Salaries	\$ 4,076,449	\$ 4,032,051	\$ 4,102,377	\$ 3,992,032	\$ 4,282,146
53000-55000	Employee Benefits	2,073,147	2,361,693	2,361,693	2,261,553	2,411,122
Sub-total Salary & Employee Benefits		\$ 6,149,596	\$ 6,393,744	\$ 6,464,070	\$ 6,253,584	\$ 6,693,269
<b>Services &amp; Supplies</b>						
67250	Insurance	\$ -	\$ -	\$ -	\$ -	\$ -
67300	Rents & Leases Equipment	-	-	-	-	-
67350	Rents & Leases Structure	-	-	-	-	-
67400	Household	-	-	-	-	-
67450	Professional & Special Services	1,035,096	251,201	284,000	284,000	246,001
67460	Temporary Agency Services	-	7,250	7,250	7,250	7,250
67500	Public Notice & Advertising	194	2,500	2,500	2,500	2,500
67550	Demurrage	893	3,500	3,500	3,500	4,000
67600	Maintenance of Equipment	-	300	300	300	500
67650	Building Maintenance	-	-	-	-	-
67700	Auto Mileage	282	1,600	1,600	1,600	1,600
67750	Auto Service	-	-	-	-	-
67800	Travel	20,088	15,000	15,000	15,000	15,000
67850	Utilities	-	-	-	-	-
67900	Communications	3,062	10,300	10,300	10,300	10,300
67950	Interest Expense	-	-	-	-	-
68000	Clothing	168	500	500	500	500
68050	Laboratory Supplies	-	-	-	-	-
68060	Postage	3,913	4,750	4,750	4,750	4,750
68100	Office Expense	15,945	16,000	16,000	16,000	16,000
68200	Office Furniture	7,801	-	-	-	4,500
68250	Subscriptions & Books	119,538	115,000	115,000	115,000	115,000
68300	Small Tools, Instruments, Equipment	-	-	-	-	-
68400	Gas and Oil	-	-	-	-	-
69500	Training/Conference/Tuition/ Board Exp.	15,078	17,500	17,500	17,500	17,500
69550	Memberships	943	750	750	750	750
69600	Taxes	-	-	-	-	-
69650	Awards	-	-	-	-	-
69700	Miscellaneous Expenses	1,213	2,000	2,000	2,000	2,000
69750	Prior Year Expense	-	-	-	-	-
69800	Uncollectable Accounts Receivable	-	-	-	-	-
89100	Principal Repayment	-	-	-	-	-
Sub-total Services & Supplies		\$ 1,224,215	\$ 448,151	\$ 480,950	\$ 480,950	\$ 448,151
77000	<b>Capital Outlays</b>	\$ -	\$ -	\$ -	\$ -	\$ -
79050	<b>Building Remodeling</b>	\$ -	\$ -	\$ -	\$ -	\$ -
Total Expenditures		\$ 7,373,811	\$ 6,841,895	\$ 6,945,020	\$ 6,734,534	\$ 7,141,420

\* Estimates based on July 2018 through February 2019 actual expenditures and March 2019 budget amendments.

**LEGISLATIVE & PUBLIC AFFAIRS/MEDIA OFFICE**

**DERRICK ALATORRE  
DEPUTY EXECUTIVE OFFICER**

<b>At a Glance:</b>	
FY 2018-19 Adopted	\$9.5M
FY 2019-20 Budget	\$10.1M
% of FY 2019-20 Budget	5.9%
Total FTEs FY 2019-20 Budget	55

**DESCRIPTION OF MAJOR SERVICES:**

Legislative & Public Affairs/Media Office provides a broad range of services to internal and external stakeholders. These services include:

**Legislative/Communications**

**State and Federal Relations**

State and Federal Relations works with all levels of elected officials and their staff, agencies, and other stakeholders to support South Coast AQMD’s legislative priorities. Efforts are focused on policy and funding issues that support South Coast AQMD’s Air Quality Management Plan to meet state and federal clean air standards. This unit also works to defend against legislative activities by others detrimental to the goals and priorities of clean air.

**Local Government/Community Relations**

Local Government and Community Relations works in all four counties of South Coast AQMD’s jurisdiction, including 86 cities in Los Angeles County, 34 cities in Orange County, 27 cities in Riverside County and 16 cities in San Bernardino County. Activities include monitoring government actions on all levels (local, state and federal); facilitating a two-way flow of communication between South Coast AQMD and stakeholders; assisting with inquiries from government offices, community members, health and environmental justice organizations, and business organizations; and, promoting and providing information on South Coast AQMD programs and initiatives.

**Communications & Public Information Center**

The Communications & Public Information Center serves and assists members of the public who wish to report air quality complaints, contact District staff or acquire additional information regarding South Coast AQMD programs. The Communications Center and its associated toll-free numbers, along with South Coast AQMD’s main telephone line, provide easy access to the public for reporting of a wide variety of air quality related concerns. The Public Information Center (PIC), which is located in the South Coast AQMD lobby, serves as a walk-up resource for all visitors to South Coast AQMD. The PIC assists with other inquiries made by the public, which can range from requests for information to consultations on South Coast AQMD programs and regulations.

## LEGISLATIVE & PUBLIC AFFAIRS/MEDIA OFFICE (cont.)

### **Small Business Assistance**

The Small Business Assistance (SBA) program is required under Section 40448 of the California Health and Safety Code to provide administrative, technical services and information to small businesses and the public.

### **Environmental Justice**

South Coast AQMD's Environmental Justice initiatives focus on a wide variety of programs to partner with disadvantaged communities to address air pollution related issues. Specific programs such as the Environmental Justice Community Partnership program and the Environmental Justice Advisory Group seek to build community capacity to empower residents and to reduce air pollution in areas of cumulative impact.

### **AB 617**

The South Coast AQMD is actively conducting comprehensive community-based efforts that focus on improving air quality and public health in environmental justice communities. For Year 1 of the program, AB 617 implementation efforts continue in three (3) South Coast AQMD communities: Wilmington/Carson/West Long Beach, San Bernardino/Muscoy and Boyle Heights/East Los Angeles/West Commerce.

### **Media**

The Media Relations Office serves as the agency's official liaison with news media in its many forms, including the Internet; newspapers and radio; broadcast, cable and satellite TV; books, magazines and newsletters; digital and social media. The Media Relations Office also supports programs and policies of South Coast AQMD and its Board with a wide range of proactive media and public relations programs. The Office provides strategic counsel to the Executive Officer, Board members and their staff and Executive Council members on sensitive, high-profile media relations issues as well as building public awareness of air quality issues.

### **Social Media**

South Coast AQMD's Social Media program maintains, builds awareness, and monitors South Coast AQMD's social media websites. The agency is active on Facebook, Twitter and Instagram on a daily basis.

### **Graphics**

The Graphics Department is responsible for providing all graphic services for the agency, from conceptual design to final design and completion of projects.

## LEGISLATIVE & PUBLIC AFFAIRS/MEDIA OFFICE (cont.)

### ACCOMPLISHMENTS:

#### RECENT:

##### State Legislative

- Assisted with efforts to secure \$50 million statewide to air districts to implement AB 617, Community Air Toxics Program.
- Actively worked to garner \$245 million statewide to air districts for incentives to accelerate turnover to cleaner vehicles & equipment.
- Worked to secure \$132 million statewide to air districts for reducing agricultural emissions through diesel engine replacement & upgrades.
- South Coast AQMD Sponsored Bill, SB 1502, to modernize the public notice requirement to allow for electronic communications, signed into law.
- Secured amendments to SB 1260 (Jackson) to allow South Coast AQMD to issue controlled burn permits for open fires in mechanized burners within Los Angeles County, to promote fire hazard mitigation and reduce air pollution, signed into law.
- Prevented diversion of \$26 million in statewide tire fee revenue from Carl Moyer Program.

##### Federal Legislative

- Worked with the Administration and Members of Congress to move forward the U.S. Environmental Protection Agency (EPA) Clean Trucks Initiative which focuses on a proposed rule for an Ultra-Low NOx Emission Standard for Heavy Duty Trucks.
- Organized and staffed four trips to Washington, D.C. with Governing Board and Executive Council Members to educate the Administration and Members of Congress on South Coast AQMD and our specific air quality-related issues.
- Worked with our Congressional Delegation to increase and/or protect funding for:
  - The Diesel Emission Reductions Act (DERA) grew from \$75 million in Fiscal Year (FY) 2018 to \$87 million in FY 2019
  - Targeted Airshed (TAS) grants grew from \$40 million in FY 2018 to \$53 million in FY 2019; and,
  - Section 103/105 funding remained level at \$228.2 million despite the Administration's initial budget proposal to significantly decrease this account.
- A visit and tour of the South Coast Air Basin by Assistant EPA Administrator Bill Wehrum and key staff.
- Chairman of the House Subcommittee on Interior, Environmental, and Related Agencies, Congressman Ken Calvert visited South Coast AQMD for meetings, a tour of the laboratory and a display of near-zero and zero emission medium and heavy-duty vehicles.

##### Communications & Public Information Center

- Assisted the Small Business Assistance Unit by performing nearly 1,300 initial calls to businesses with expired permits to remind them about the expired status of the permits, and to encourage them to bring the permits current.
- Processed 2,650 walk-up inquiries through the PIC in the South Coast AQMD Lobby.

## **LEGISLATIVE & PUBLIC AFFAIRS/MEDIA OFFICE (cont.)**

- Assisted in the updating/publishing of about 230 web pages, including specific web pages relating to: 1) the Aliso Canyon Natural Gas Leak; 2) ongoing air monitoring activities in Paramount and Compton; 3) Sunshine Canyon Landfill; 4) Torrance Refinery; and 5) the Exide lead battery recycling facility.

### **Local Government/Community Affairs**

- Regular attendance at regional and community meetings throughout the four (4) counties including League of California Cities, the Councils of Governments, and Chambers of Commerce and business organizations.
- Assisted with communications, outreach and issue management for high profile items such as the Special Toxics Investigations in Paramount and Compton, Torrance Refinery (formerly ExxonMobil), SoCalGas Aliso Canyon Storage Facility, Sunshine Canyon Landfill, Coastal Odors and several other facilities.
- Organized logistics, conducted outreach and staffed for 15 public meetings such as Town Hall/Community Meetings, Rule-related meetings, Hearings; and Committees.
- Participated in and represented South Coast AQMD throughout the four-county region at 52 community events such as health and environmental justice resources fairs, Council of Government General Assemblies, and air quality related forums and conferences.
- Planned, organized and produced the 2019 “Martin Luther King, Jr. Day of Service Forum” which had more than 400 attendees.
- Planned, organized and produced the 2019 “Cesar Chavez Day of Remembrance” which had more than 350 attendees.
- Planned, organized and produced the 2018 “Clean Air Awards” which honored ten individuals, businesses, and organizations. Over 400 attended the event.
- Completed 32 Visiting Dignitaries and Speakers Bureau presentations and tours.
- On an administrative level, the team met on a regular weekly basis to share information on administrative business, rule-related activity, high profile topics, and events, programs and initiatives, including specific items of interest in each of the counties. These meetings included the Environmental Justice staff as well to better facilitate programs and share information across the department.

### **Environmental Justice**

- Organized and staffed four Environmental Justice Advisory Group meetings.
- Held three Environmental Justice Community Partnership Advisory Council meetings.
- Hosted an Inter-Agency Task Force Summit to facilitate coordination between agencies within Los Angeles County process their environmental complaints, and to discuss ways in which environmental complaints can be processed more collaboratively and efficiently.
- Held the 4th Annual Environmental Justice Conference: “Technology’s Role in the Future of Environmental Justice.”
- Organized, conducted outreach for and staffed four Environmental Justice Community Partnership (EJCP) Workshops.
- Held meetings of the Young Leaders Advisory Council (YLAC), which will educate and engage young adults regarding the region’s clean air issues.

## LEGISLATIVE & PUBLIC AFFAIRS/MEDIA OFFICE (cont.)

### AB 617

- Organized and staffed the kick-off meetings for the AB 617 program including 13 Meetings attended by 525 stakeholders.
- Assisted with the process to identify the first-year AB 617 communities through an extensive scientific and outreach process. The three communities approved by CARB are:
  - Boyle Heights, East Los Angeles, West Commerce
  - Wilmington, West Long Beach, Carson
  - San Bernardino, Muscoy
- Coordinated with other South Coast AQMD Departments to form three Community Steering Committees including 91 total Community Steering Committee Members.
- Held six Steering Committee meetings attended by approximately 450 Stakeholders.

### Media

- Implemented the Google and YouTube campaign for “The Right to Breathe” including the completion of an updated video.
- Developed AB 617/134 hot topics webpage as well as monitored and update other major issue webpages.
- Participated and implemented web improvements such as the streamlining of the “All Videos” webpage and the production of home page announcement banners.
- Oversaw the implementation of the Check Before You Burn program including AMC movie ads, Power106 radio promotion spots, and three videos for social media.
- Provided media relations services and strategic counsel for high-profile media issues through press releases, media advisories, talking points, in-person and on-camera interviews, and opinion pieces and letters to the editor.
- Handled 987 media interactions on behalf of South Coast AQMD.
- Wrote and issued 39 news releases; issued a total of 34 Smoke Advisories, Odor Advisories, and No-burn Alerts.

### Small Business Assistance

- Conducted 83 on-site consultations.
- Provided assistance to businesses relating to 2,556 permit applications.
- Approved and processed 728 Air Quality Permit Checklist submittals.
- Provided technical support to 255 businesses to understand South Coast AQMD rules and regulations.
- Provided 10 businesses with recordkeeping training.
- Issued four dry cleaning grants.
- Assisted three businesses file variances before the South Coast AQMD Hearing Board.
- Participated in 12 small business-related events.
- Outreached to 588 facilities as part of the Expired Permit Program.

### Social Media

- Increased followers:
  - Facebook – approximately 20 percent;



## LEGISLATIVE & PUBLIC AFFAIRS/MEDIA OFFICE (cont.)

- Twitter – approximately 36 percent; and
- Instagram – over 75 percent.
- Began streaming community meetings on Facebook Live including all AB 617 meetings.
- Continued event coverage (Clean Air Awards, MLK Day of Service, Cesar Chavez Day of Remembrance Day, EJ Conference and other EJ events) utilizing live tweets/quotes, photo and video.
- Timely reaction to publishing news/advisories resulting in extended news media and outside government agency exposure.

### Graphics

- Created approximately 500 major graphics projects/assignments including:
  - 2017 Annual Report;
  - Collateral Brochures and Promotional Items;
  - Bi-Monthly Advisor Publication;
  - Quarterly Governing Board Member Newsletters;
  - Annual Clean Car Buying Guide;
  - Program Announcements;
  - Educational Materials;
  - Advertisements;
  - Signage;
  - Video projects;
  - Newspaper Advertorials; and,
  - Informational materials for Town Hall Meetings, Community Meetings and Events (including the Clean Air Awards, the Martin Luther King Jr. Day event, the Cesar Chavez Day event, the Environmental Justice Conference, multiple environmental justice workshops and senior events).

### ANTICIPATED:

#### State Legislative

- Sponsor Voter District Authorization Legislation for South Coast AQMD.
- Seek \$50 million statewide to continue implementation of the AB 617 program.
- Work to secure \$500 million statewide to accelerate turnover to cleaner vehicles & equipment.
- Strengthen our state legislative outreach and communication by increased engagement with the Governor's Office and state legislators and Capitol staff (members and committees), to promote South Coast AQMD's legislative priorities, sponsored legislation, and to support 2016 AQMP efforts.
- Strengthen our educational outreach related to legislation to build increased engagement with all stakeholders, including, but not limited to, government entities, business, environmental groups and the community, to promote South Coast AQMD's legislative priorities, sponsored legislation, and to support 2016 AQMP efforts.
- Continue to work with South Coast AQMD departments to improve efficiency and ease with which existing data can be extracted on a recurring basis for specified, approved

## LEGISLATIVE & PUBLIC AFFAIRS/MEDIA OFFICE (cont.)

purposes for the benefit of public outreach and governmental relations. (CLASS and PeopleSoft.)

### Federal Legislative

- Work with U.S. EPA, Members of Congress and stakeholders to ensure the rule-making process for the Ultra-Low NOx Emissions Standard is transparent with equitable stakeholder participation.
- Support and secure funding for air quality issues through existing and new opportunities – Infrastructure, Climate Change, and other types of incentives (tax benefits).
- Participate in the administrative and legislative process to educate policy-makers on climate change initiatives and other air quality related policies as they relate to and impact the South Coast region.
- Support legislation and/or administrative efforts to protect science-driven and health-based determinations of the National Ambient Air Quality Standards (NAAQS).
- Work to ensure that the federal government does its fair share to reduce air pollution by:
  - Providing funding or regulatory authority adequate for nonattainment areas to attain NAAQS by upcoming federal deadlines, and in particular, South Coast AQMD to implement the 2016 AQMP and attain federal ozone and particulate matter standards by upcoming federal deadlines;
  - Reauthorizing and expanding funding for Diesel Emission Reduction Act (DERA);
  - Increasing funding for the TAS program;
  - Authorizing and funding new programs which will reduce air pollution through the adoption and deployment of zero and near-zero emission technologies, fuels and recharging/refueling infrastructure;
  - Establishing programs or policies that incentivize the federal government to purchase and use advanced clean technologies and eliminate the use of technologies generating NOx and particulate matter emissions; and
  - Incentivizing individuals, businesses, states, and local governments to purchase and use advanced clean technologies and eliminate the use of technologies generating NOx and particulate matter emissions.
- Partner with stakeholders on educational outreach efforts, including, but not limited to, government entities, business, environmental groups and health advocacy groups, on federal legislation (such as the Transportation Infrastructure bill and the Energy bill) to support clean air and engage with regional issues related to clean air.

### Local Government/Community Relations

- Continue to build and maintain relationships with stakeholders to foster two-way flow of communication in support of South Coast AQMD's mission.
- Support with educational and informational outreach on regional, state and federal Initiatives, such as, but not limited to:
  - Voter District Authorization legislation;
  - U.S. EPA Rule for Ultra-Low NOx Emissions Standard for Heavy-Duty Trucks; and,
  - Funding & Policy Issues.

## **LEGISLATIVE & PUBLIC AFFAIRS/MEDIA OFFICE (cont.)**

- Elevate awareness on South Coast AQMD and air quality issues through participation in community events region wide, the Visiting Dignitaries and Speaker's Bureau program and hosting signature and major events.
- Oversee the contract for and implement the High School Air Quality Education program.
- Facilitate interaction with stakeholders on high profile issues such as Paramount, Torrance Refinery and coastal odors.
- Conduct outreach, issues management and community meetings on various South Coast AQMD programs and mission-centered efforts.
- Increase relationship building with all levels of government, community, health, environmental, business and other stakeholder groups. A focused subset of this outreach will be on environmental justice.
- Enhance database and list management to increase successful communications.
- Work with Small Business Assistance (SBA) to provide information on their programs and services. Support SBA efforts by facilitating relationships with cities/counties, business organizations, and community groups. Improve community access to SBA programs through outreach efforts as directed by the Public Advisor and SBA Supervisor.
- Collaborate and assist other South Coast AQMD Departments on major initiatives and projects including, but not limited to, Title V permits and other permits, compliance and enforcement issues, rule making process, AQMP, AB2588 Toxic Hot Spots program, AB2766 outreach to cities, incentive programs, "Check Before You Burn," and other projects.
- Partner with environmental education organizations, develop and implement an educational outreach program to reach children and their families. It is possible that South Coast AQMD can provide technical expertise to an existing educational program that is being implemented.
- Build relationships with organizations to expand air quality awareness among young adults and professionals.

### **Communications Center & Public Information**

- Increase role for Communications and Public Information staff to provide excellent customer service.
- Receive and process about 48,000 – 52,000 main line calls from the public in the form of Cut Smog calls, after hour calls, Spanish line calls, and Clean Air Connection calls. These calls also include air quality complaints, reports of equipment breakdowns, and emergency response requests.
- Assist the Small Business Assistance Unit by contacting about 1,400 businesses with expired permits to remind them about the expired status of the permits, and to encourage them to bring the permits current.
- Process 2,900-3,200 walk-up inquiries via the PIC in the South Coast AQMD Lobby.
- Assist in updating / publishing web pages, including specific web pages relating to various key issues/items, including ongoing air monitoring activities in various communities within the South Coast region.
- Implement TTY software system for the hearing impaired in the Communication Center.

## LEGISLATIVE & PUBLIC AFFAIRS/MEDIA OFFICE (cont.)

### Environmental Justice

- Further develop and implement the Los Angeles Inter-Agency Task Force and Task Force Steering Committee focused on EJ complaint issues including a complaint resource guide for stakeholders.
- Develop and implement the Environmental Justice Community Partnership Student Assembly Air Quality Educational Program targeting elementary schools.
- Environmental Justice Community Partnership Advisory Council: South Coast AQMD will host four Environmental Justice Community Partnership Advisory Council meetings to discuss how South Coast AQMD can better implement environmental justice efforts. Members of this group include community group leaders, scholars, lawyers, activists, residents, business owners, and public health professionals.
- Organize and hold four Environmental Justice Advisory Group meetings.
- Coordinate and implement two Environmental Justice Student Bus Tours for high school and college students.

### AB 617

- Convene monthly Steering Committee meetings for each of the three communities which will include more than 30 meetings from January through October.
- Organize and implement additional AB 617 meetings including the Technical Advisory Group meetings and community updates.
- Implement Year 2 AB 617 Communities including the initial outreach process and formation of the Community Steering Committees.
- Assist with the process to support first year AB 617 plans presentation to South Coast AQMD Board in July and work related to submitting to CARB in September.

### Small Business Assistance

- Expand the awareness of South Coast AQMD's Small Business Assistance Program by outreaching to trade organizations, municipalities, and other agencies to inform them about our services.
- Provide timely and accurate information to all persons seeking information from the Small Business Assistance Program.
- Provide easy to understand information about compliance, permit application requirements, and incentive programs offered to small businesses, to business in general and the general public.
- Develop, collect and coordinate information concerning air quality compliance methods and technologies for small businesses by actively participating in South Coast AQMD rulemaking workshops and hearings.
- Assist small businesses in determining applicable requirements, applying for permits, and petitioning for variances.
- Conduct more "no-fault" inspections to provide compliance audits on the operations of small businesses.

## LEGISLATIVE & PUBLIC AFFAIRS/MEDIA OFFICE (cont.)

- Assist small businesses with air pollution control and air pollution prevention by providing information concerning alternative technologies, process changes, products, and methods of operation that reduce air pollution.
- Conduct outreach for the dry-cleaner program and work with cities on permit issues.

### Media

- Develop a strategic communications plan for overall agency messaging and critical issues and crisis management communications.
- Provide media relations services and strategic counsel for high-profile media issues as well as ongoing South Coast AQMD programs and projects through press releases, media advisories, talking points, in-person and on-camera interviews, opinion pieces and letters to the editor.
- Review requests from partner agencies, organizations and firms for quotes from South Coast AQMD officials for articles and press releases.
- Continue the implementation of Google ad campaign for “The Right to Breathe.”
- Implement story maps on South Coast AQMD website and continue to update and maintain hot topics webpages.
- Produce videos for AB 617.
- Implement South Coast AQMD photo library.
- Design and implement the FY 2019-20 Check Before You Burn program.
- Continue to help focus/narrow Public Records Requests (PRR) from news media; review PRR documents provided to news media and advise management of potential news stories that could result from them.
- Write advertorials for newspapers as part of South Coast AQMD sponsorships.

### Social Media

- Continue follower growth (goal of 30% increase for 2019).
- Streamline the Advisory publishing process to ensure the public gets content in a timely manner.
- Utilize more original South Coast AQMD content, including new up-to-date photos and content from various South Coast AQMD departments.

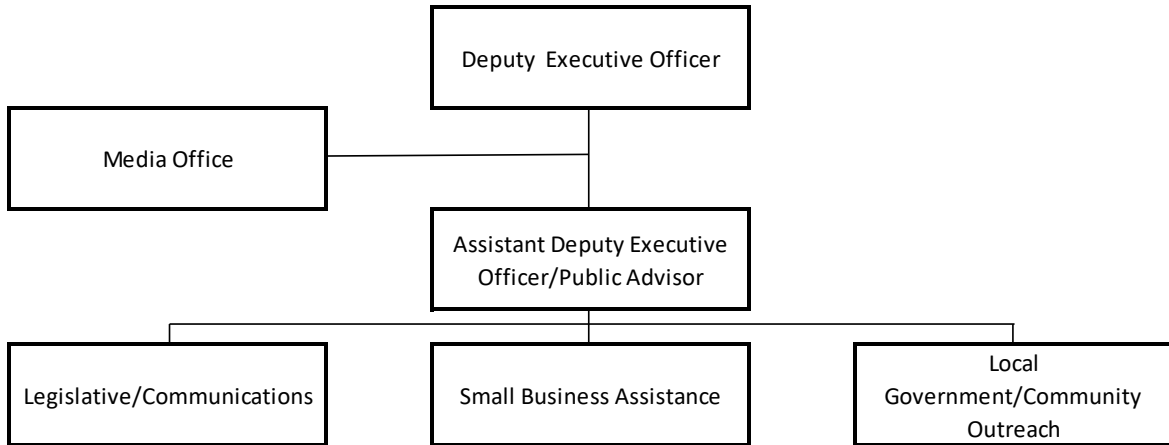
### Graphics

- Complete graphics projects/assignments, including: 1) collateral brochures and promotional items; 2) Bi-Monthly Advisor publication; 3) Quarterly Governing Board Member Newsletters; 4) Yearly Clean Car Buying Guide; 5) signage, and informational materials for Town Hall Meetings, community meetings and events, etc.; 6) educational materials; 7) advertisements; 8) Program Announcements; and 9) video projects.
- In coordination with a Director of Communications, redesign and redevelop South Coast AQMD core collaterals and electronic and social media content to ensure consistent themes and messaging and to create focused and clear branding of South Coast AQMD throughout all South Coast AQMD collateral materials and electronic content provided to

**LEGISLATIVE & PUBLIC AFFAIRS/MEDIA OFFICE (cont.)**

elected officials, agency staff, stakeholders, impacted communities and the public at large.

**CURRENT ORGANIZATIONAL CHART:**



**POSITION SUMMARY: 55 FTEs**

Legislative & Public Affairs/Media Office Units	Amended FY 2018-19	Change	Budget FY 2019-20
Administration	6	1	7
Legislative & Public Affairs	42	1	43
Media Office	5	-	5
Total	53	2	55

## LEGISLATIVE & PUBLIC AFFAIRS/MEDIA OFFICE (cont.)

### POSITION DETAIL:

<u>FTEs</u>	<u>Title</u>
1	Administrative Secretary
2	Air Quality Engineer
2	Air Quality Inspector
1	Assistant Deputy Executive Officer
1	Community Relations Manager
1	Deputy Executive Officer
1	Director of Communications
3	Graphic Illustrator II
1	Legislative Assistant
1	Office Assistant
3	Public Affairs Manager
1	Program Supervisor
1	Public Affairs Specialist
7	Radio Telephone Operator
3	Secretary
2	Senior Administrative Secretary
2	Senior Office Assistant
1	Senior Public Affairs Manager
17	Senior Public Information Specialist
1	Senior Staff Specialist
1	Staff Assistant
1	Staff Specialist
<u>1</u>	Supervising Radio Telephone Operator
55	Total FTEs

**Legislative & Public Affairs/Media Office  
Work Program by Office**

Program Code	Program Categories	Program	Activities	FTEs FY 2018-19	+/-	FTEs FY 2019-20	Revenue Categories
1 35 1037	Customer Service and Business Assistance	AB 617-Outreach	AB 617-Outreach	2.00	3.00	5.00	XX
2 35 1046	Customer Service and Business Assistance	Admin/Prog Mgmt	Admin Office/Units/SuppCoord Staff	4.02	1.00	5.02	Ib
3 35 111	Ensure Compliance	Call Center/CUT-SMOG	Smoking Vehicle Complaints	8.00	0.00	8.00	IX,XV
4 35 126	Customer Service and Business Assistance	Clean Air Connections	Coord of region-wide community group	1.00	0.00	1.00	II,IX
5 35 205	Customer Service and Business Assistance	Environmental Education	Curriculum Dev/Project Coord	0.25	0.00	0.25	II,IX,XV
6 35 240	Customer Service and Business Assistance	Environmental Justice	Impl Board's EJ Pgrms/Policies	2.00	0.00	2.00	II,IV
7 35 260	Customer Service and Business Assistance	Fee Review	Cnte Mtg/Fee-Related Complaint	0.50	0.00	0.50	II,III,IV,XV
8 35 280	Policy Support	Advisory Group/Ethnic Comm	GB Ethnic Comm Advisory Group	0.40	0.00	0.40	II,IX
9 35 281	Policy Support	Advisory Group/Small Business	SBA Advisory Group Staff Support	0.50	0.00	0.50	IV,IX
10 35 283	Policy Support	Governing Board Policy	Brd sup/Respond to GB req	0.55	0.00	0.55	Ia
11 35 345	Policy Support	Goods Mvmt&Financial Incentive	Goods Movement & Financial Incentives Progr	1.00	0.00	1.00	IX
12 35 350	Operational Support	Graphic Arts	Graphic Arts	2.00	0.00	2.00	Ia
13 35 381	Customer Service and Business Assistance	Interagency Liaison	Interact Gov Agns/Promote SCAQMD	0.15	0.00	0.15	Ia,XV
14 35 390	Customer Service and Business Assistance	Intergov/Geographic Deployment	Dev/Impl Local Govt Outreach	10.50	0.00	10.50	II,IX
15 35 412	Policy Support	Legislation/Federal	Lobbying/Analyses/Tracking/Out	0.25	0.00	0.25	Ia
16 35 413	Policy Support	Legislation/Exec Office Support	Coord Legis w/ EO, EC, Mgmt	0.25	0.00	0.25	Ia
17 35 414	Policy Support	Legislation-Effects	Lobbying/Analyses/Tracking/Out	0.80	0.00	0.80	Ia,IX
18 35 416	Policy Support	Legislative Activities	Supp/Promote/Influence Legis/Adm	0.50	0.00	0.50	Ia
19 35 491	Customer Service and Business Assistance	Outreach/Business	Chambers/Business Meetings	1.00	0.00	1.00	II,IV
20 35 492	Customer Service and Business Assistance	Public Education/Public Events	Pub Events/Conf/Rideshare Fair	1.00	1.00	2.00	II,V,IX,XV
21 35 494	Policy Support	Outreach/Collateral/Media	Edits, Brds, Talk shows, Commercl	5.60	0.00	5.60	Ia
22 35 496	Customer Service and Business Assistance	Outreach/Visiting Dignitary	Tours/Briefings-Dignitary	0.25	0.00	0.25	Ia
23 35 514	Customer Service and Business Assistance	Permit: Expired Permit Program	Assist w Permit Reinstatement	0.30	0.00	0.30	IV
24 35 555	Customer Service and Business Assistance	Public Information Center	Inform public of unhealthy air	1.00	0.00	1.00	II,V,IX
25 35 560	Develop Programs	Public Notification	Public notif of rules/hearings	0.50	0.00	0.50	II,IV,IX
26 35 565	Customer Service and Business Assistance	Public Records Act	Comply w/ Public Req for Info	0.10	0.00	0.10	Ia
27 35 679	Customer Service and Business Assistance	Small Business Assistance	Small Business/Financial Assistance	1.00	0.00	1.00	III
28 35 680	Timely Review of Permits	Small Business/Permit Streamlin	Asst sm bus to comply/SCAQMD req	3.95	0.00	3.95	II,III,IV,V,XV
29 35 710	Customer Service and Business Assistance	Speakers Bureau	Coordinate/conduct speeches	0.10	0.00	0.10	Ia
30 35 717	Policy Support	Student Interns	Student Interns	0.10	0.00	0.10	Ia
31 35 791	Customer Service and Business Assistance	Toxics/AB2588	Outreach/AB 2588 Air Toxics	0.01	0.00	0.01	X
32 35 825	Operational Support	Union Negotiations	Official Labor/Mgmt Negotiate	0.01	0.00	0.01	Ia
33 35 826	Operational Support	Union Steward Activities	Union Steward Activities	0.01	0.00	0.01	Ia
34 35 855	Operational Support	Web Tasks	Create/edit/review web content	0.40	0.00	0.40	Ia

**Total Legislative & Public Affairs/Media Office**

50.00	5.00	55.00
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**Legislative & Public Affairs/Media Office  
Line Item Expenditure**

Major Object / Account # / Account Description		FY 2017-18 Actuals	FY 2018-19 Adopted Budget	FY 2018-19 Amended Budget	FY 2018-19 Estimate *	FY 2019-20 Adopted Budget
<b>Salary &amp; Employee Benefits</b>						
51000-52000	Salaries	\$ 4,138,322	\$ 4,535,475	\$ 4,615,263	\$ 4,444,281	\$ 4,915,612
53000-55000	Employee Benefits	2,285,220	2,845,044	2,845,045	2,718,194	3,087,636
Sub-total Salary & Employee Benefits		\$ 6,423,542	\$ 7,380,520	\$ 7,460,308	\$ 7,162,476	\$ 8,003,247
<b>Services &amp; Supplies</b>						
67250	Insurance	\$ -	\$ -	\$ -	\$ -	\$ -
67300	Rents & Leases Equipment	2,843	7,000	19,781	19,781	7,000
67350	Rents & Leases Structure	12,332	9,000	11,100	11,100	9,000
67400	Household	-	-	-	-	-
67450	Professional & Special Services	2,164,661	1,515,851	2,220,464	2,220,464	1,515,851
67460	Temporary Agency Services	160,200	114,000	114,000	114,000	114,000
67500	Public Notice & Advertising	5,850	26,600	35,600	35,600	26,600
67550	Demurrage	959	-	-	-	-
67600	Maintenance of Equipment	-	9,000	6,000	6,000	9,000
67650	Building Maintenance	-	-	-	-	-
67700	Auto Mileage	17,053	24,800	24,800	24,800	24,800
67750	Auto Service	-	-	-	-	-
67800	Travel	51,380	45,200	45,200	45,200	45,200
67850	Utilities	-	-	-	-	-
67900	Communications	36,115	47,000	47,000	47,000	47,000
67950	Interest Expense	-	-	-	-	-
68000	Clothing	-	-	-	-	-
68050	Laboratory Supplies	-	-	-	-	-
68060	Postage	40,772	137,800	23,800	23,800	137,800
68100	Office Expense	56,193	45,300	55,980	55,980	45,300
68200	Office Furniture	-	-	-	-	-
68250	Subscriptions & Books	31,336	18,200	23,200	23,200	18,200
68300	Small Tools, Instruments, Equipment	-	-	-	-	-
68400	Gas and Oil	-	-	-	-	-
69500	Training/Conference/Tuition/ Board Exp.	2,071	8,500	8,500	8,500	8,500
69550	Memberships	22,170	26,250	29,250	29,250	26,250
69600	Taxes	-	-	-	-	-
69650	Awards	(2,549)	49,681	49,681	49,681	49,681
69700	Miscellaneous Expenses	34,651	43,100	43,100	43,100	43,100
69750	Prior Year Expense	(4,266)	-	-	-	-
69800	Uncollectable Accounts Receivable	-	-	-	-	-
89100	Principal Repayment	-	-	-	-	-
Sub-total Services & Supplies		\$ 2,631,773	\$ 2,127,282	\$ 2,757,456	\$ 2,757,456	\$ 2,127,282
77000	<b>Capital Outlays</b>	\$ -	\$ -	\$ -	\$ -	\$ -
79050	<b>Building Remodeling</b>	\$ -	\$ -	\$ -	\$ -	\$ -
Total Expenditures		\$ 9,055,315	\$ 9,507,802	\$ 10,217,764	\$ 9,919,932	\$ 10,130,529

\* Estimates based on July 2018 through February 2019 actual expenditures and March 2019 budget amendments.

## PLANNING, RULE DEVELOPMENT & AREA SOURCES

### PHILIP FINE DEPUTY EXECUTIVE OFFICER

At a Glance:	
FY 2018-19 Adopted	\$22.4M
FY 2019-20 Budget	\$24.6M
% of FY 2019-20 Budget	14.4%
Total FTEs FY 2019-20 Budget	148

#### DESCRIPTION OF MAJOR SERVICES:

Planning, Rule Development and Area Sources (PRDAS) is responsible for the majority of South Coast AQMD's air quality planning functions, including State Implementation Plan (SIP)-related activities, air quality management and maintenance plans, reporting requirements and other state and federal Clean Air Act requirements. Key functions include:

- Developing proposals for new rules and amendments to existing rules to implement the SIP obligations and to reduce air toxic emissions/exposures.
  - Conducts socioeconomic impact analyses and California Environmental Quality Act (CEQA) environmental assessments for rulemaking efforts.
  - Comments on CEQA projects throughout the air Basin and acts as the Lead or Responsible Agency for South Coast AQMD permitting projects.
- Developing and implementing mobile source policy.
  - Implements fleet rules to reduce emissions from public fleets.
  - Develops facility-based measures aimed at achieving emission reductions from the indirect mobile sources associated with ports, airports, railyards, and warehouses.
- Coordinating closely with Legislative & Public Affairs/Media Office and the Technology Advancement Office on state and federal legislative and regulatory issues and on avenues for funding for the air quality programs and grants.
- Conducting air quality evaluations and forecasting, inventories of area sources, and compliance activities related to area sources.
- Assisting in the implementation of AB 617 by establishing steering committees for the priority community locations and developing the emission reduction plans in coordination with the air monitoring plans in those communities.
- Leading the assessment, dissemination, and communication of air quality data.
  - Develops the Multiple Air Toxics Exposure Study (MATES).
  - Develops air quality forecasts, advisories, and alerts.
  - Provides input and guidance on health effects associated with air quality policies and other air quality-related issues that arise from individual facilities or communities.
- Implementing several programs, including the state Toxics "Hot Spots" program (AB 2588), Annual Emissions Reporting program (AER), Employee Commute Trip Reduction (Rule 2202) and the AB 2766 Subvention fund program.
- Developing District policy for climate change and energy.

## PLANNING, RULE DEVELOPMENT & AREA SOURCES (cont.)

### ACCOMPLISHMENTS:

#### RECENT:

##### AB 617

- Completed the community identification and selection process for the implementation of AB 617, with the Governing Board adoption of Year 1 communities. This process included hosting 10 dedicated community meetings, one technical workshop, two Environmental Justice Community Partnership (EJCP) meetings, and presenting at dozens of other community and agency meetings hosted by others. Submitted three reports to the California Air Resources Board (CARB), and received approval for the implementation of AB 617 community air monitoring and emissions reduction plans in three South Coast AQMD communities.
  - Convened Community Steering Committees for each of the three communities selected for Year 1 implementation, and conducted a kick-off meeting and the initial meeting for each of these committees in 2018. These steering committees will continue to work on AB 617 implementation in 2019 and beyond, until the community plans are adopted and implemented.
  - Participated in AB 617 conference calls and meetings with CARB, other air agencies and stakeholders.

##### AB 2588

- Completed the review of Air Toxic Inventory Reports (ATIR), and Health Risk Assessments (HRA) for the two Potentially High-Risk Level facilities (Anaplex & Aerocraft) in Paramount.
  - Conducted a Public Notification meeting (70,000 notices sent) for both facilities.
  - Completed review of Risk Reduction Plans for both facilities.
- Completed 2017 Annual Report (September 7, 2018).
- Revised and updated the following Procedures and Guidelines (September 7, 2018)
  - Facility Prioritization Procedure;
  - AB 2588 and Rule 1402 Supplemental Guidelines; and
  - Guidelines for Participating in the Rule 1402 Voluntary Risk Reduction Program (VRRP).
- Conducted 130 facility audits of quadrennial emissions inventories.
- Calculated priority scores for 260 facilities, which is also in support of AB 617.
- Reviews of the following documents:
  - Air Toxic Inventory Reports: Reviewed 19 and approved 13;
  - Health Risk Assessments: Reviewed 11 and approved six;
  - Risk Reduction Plans: Reviewed and approved two;
  - Voluntary Risk Reduction Plans: Reviewed 11 and approved two; and
  - Public Notices: Conducted four.

##### Air Quality Assessment

- Implemented software enhancements to improve the efficacy and streamline implementation for:

## PLANNING, RULE DEVELOPMENT & AREA SOURCES (cont.)

- Air quality forecasting, allowing for more accurate forecasts to be issued in less time; Weekly summaries of ozone concentrations allowing with a single click to notify staff of exceedances, and produce the air quality summary card; and
  - Issuing air quality advisories including automation of Check Before You Burn advisories.
  - Transferred all operational forecasts and data to a modern Linux server and modern PCs from the recently-retired FORTRAN computer machine.
  - Incorporated prognostic bias-corrected PM2.5 predictions from National Oceanic Atmospheric Administration (NOAA) into our forecasting system to improve accuracy.
  - Wrote software to calculate PM2.5 design values with and without potential exceptional events to aid in the preparation of U.S. EPA Initial Notification Forms and evaluate the effect of exceptional events on air quality.
  - Worked with Sonoma Tech, Inc. to implement the Hydrogen Sulfide (H<sub>2</sub>S) monitoring and public website in the Salton Sea area.
  - Provided programmatic support (meteorology), including daily air quality forecasting, issuing no-burn alerts for the Check Before You Burn program (22 days in 2018), issuing Smoke Advisories (32 days in 2018), issuing H<sub>2</sub>S odor advisories (one day in 2018), issuing special advisories (10 days in 2018) and windblown dust and ash advisories (six days in 2018).
  - Provided programmatic support (point source modeling), including completing 24 permit modeling requests. Six of the 24 permit modeling requests were completed by an outside contractor.
  - Worked with Information Management (IM) to implement NowCast on the Air Quality Index (AQI) map and enhance other areas of the South Coast AQMD website to better communicate air quality data to the public.
  - Answered over 100 air quality related emails and phone calls in 2018.
  - Created community-facing interactive maps to support AB 617 efforts.
- Air Quality Modeling/Emissions Inventory*
- Continued developing the Net Emissions Analysis Tool (NEAT) to estimate NO<sub>x</sub> and Green House Gas (GHG) emission reductions from implementing zero to near-zero residential appliances and the cost effectiveness associated with the conversion.
  - Developed emissions inventory of Toxic Air Contaminants to estimate cancer exposure risk.
  - Analyzed community-level data for use in the AB 617 program, such as cancer risk, socio-economic data and other demographic factors.
  - Developed AB 617 community-based emissions inventory and preliminary source apportionment.
  - Continued collaboration with NASA and other academic and research agencies to utilize satellite retrieved data in air quality modeling and analysis.
  - Continued improving air quality model predictability to be the state-of-the-science and appropriate for Air Quality Management Plan (AQMP) attainment demonstrations.
  - Continued refining AQMP/SIP emissions inventory to assist the implementation of AQMP control measures.

## PLANNING, RULE DEVELOPMENT & AREA SOURCES (cont.)

- Reviewed General Conformity requirements for the projects submitted to South Coast AQMD to be accommodated by the SIP set aside account.
- Continued assisting inter- and intra- divisional projects that utilize Geographical Information Systems.

### Annual Emissions Reporting

- Updated the Annual Emissions Reporting (AER) web tool software.
- Identified and notified 2,400 facilities subject to South Coast AQMD's AER program out of approximately 26,000 facilities with active permits within the South Coast AQMD jurisdiction.
- Reviewed submitted AER reports which ultimately generated \$16.3 million in annual emission fees.
- Audited 300+ Emission Reports (including a five-year audit of a local cement plant resulting in \$2.5 million in under-reported emission fees and surcharges).
- Assisted facilities with emission reporting process through three multi-hour workshops and AER hotline during the first quarter of 2018.
- Compiled and submitted 2018 device level emission data to CARB.
- Continued providing input to CARB and coordinating with CAPCOA regarding drafting their Criteria Pollutant and Toxics Emissions Reporting (CTR) regulation section of AB 617.

### AQMP/SIP

- Updated 1979 1-hour ozone standard attainment demonstration for U.S. EPA without relying on CAA 182(e)5 measures (so-called 'Black Box' measures).
- Continued the implementation of the 2016 AQMP to assist in the attainment of the 8-hour and 1-hour ozone federal standards as well as the 24 hour and annual PM2.5 federal standards for both the South Coast Air Basin and Coachella Valley.
- Submitted a quantitative milestone report for year 2017, demonstrating that all measures in the PM2.5 serious area plan are being implemented.
- Issued a Request for Proposals (RFP) to solicit stationary and mobile source incentive projects for reducing emission/toxic exposure and technology demonstration and deployment, evaluated 80 proposals received and provided recommendations to fund 26 emission reduction projects.

### CEQA

- Conducted environmental assessments for 12 South Coast AQMD rule projects and oversaw the preparation of the environmental assessments for seven ongoing permit projects.
- Reviewed and commented on over 1,000 CEQA documents prepared by other lead agencies.
- Provided technical consultation for local ongoing development projects including the I-710 corridor, Inglewood Basketball and Entertainment Center, Santa Susana Laboratory and California High Speed Rail.

### Facility Based Mobile Source Measures

- Conducted 17 working group meetings covering airports, marine ports, new and redevelopment projects, rail yards, and warehouses as part of the implementation of several 2016 AQMP control measures.
- Worked closely with the Ports of Los Angeles (LA) and Long Beach (LB) through conference calls and meetings to develop the Memorandum of Understanding (MOU) principles and framework as

## PLANNING, RULE DEVELOPMENT & AREA SOURCES (cont.)

well as the MOU development process, including establishment of a technical work group to develop methodologies to quantify baseline inventories and emissions reductions benefits and forecast through implementation of Clean Air Action Plan measures.

- Hosted a technology forum on retrofit technologies for ocean going vessels (OGVs) in collaboration with U.S. EPA, CARB, Ports of LA and LB, shipping lines, engine manufacturers as well as Chinese port authorities. The forum focused on promising OGV retrofit technologies and to discuss strategies to develop incentive-based programs to accelerate deployment and re-routing of Tier 3 vessels and upgrading OGVs to Tier 2+ standards.
- Worked closely with the five commercial airports and their consultants through conference calls and meetings to develop the emissions inventory protocol and MOU framework as part of the airports MOU development which will be based on each airport's Air Quality Improvement Plan.
- Initiated an economic impacts study to evaluate potential impacts of different rule scenarios for warehouses.
- Initiated the Pacific Rim Initiative for Maritime Emission Reductions to partner with Asian ports to incentivize cleaner vessels that will call at the Ports of LA and LB.

### Health Effects

- Established the groundwork for the Aliso Canyon Health Study by conducting public outreach and convening the Health Study Technical Advisory Group. The RFP for the study was released in November 2018.
- Participated in inter-agency environmental justice efforts, including the LA County Public Health Industrial Use Task Force and Green Zones initiatives, the Southern California Association of Governments (SCAG), Environmental Justice Working Group, and the Department of Toxics and Substances Control (DTSC) working group, for implementation of SB 673.
- Continued implementation of the MATES V study including an extensive advanced monitoring component.
- Provided input and support for the Community Air Toxics Initiative projects in Paramount and Compton, including presenting at public meetings, participating on update phone calls with the city, agencies, elected officials and the public, addressing public inquiries, coordinating closely with other agencies to ensure appropriate follow-up, and providing input and support for the investigation and reporting of results.
- Completed more than 14 public presentations or panel presentations for the Environmental Justice Community Partnership, and other academic, professional, and community audiences.
- Completed 11 media interviews on air pollution and health-related topics.

### Fleet Rules

- Completed a comprehensive fleet survey of all public entities within our jurisdiction to better understand the type, age and number of vehicles owned and operated by public fleets and their contractors in order to support future rule-making efforts.

## PLANNING, RULE DEVELOPMENT & AREA SOURCES (cont.)

### Rule Development

- Adopted Rule 1118.1 to implement the Best Available Retrofit Control Technology (BARCT) emission limits for non-refinery flares, achieving 0.18 tpd of NO<sub>x</sub> and 0.014 tpd of VOC reductions.
- Amended Rule 1325 to correct a SIP deficiency requested by the U.S. EPA by clarifying PM<sub>2.5</sub> precursors in a definition.
- Amended Rules 1146, 1146.1 and 1146.2 to implement BARCT emission limits for applicable boilers, steam generators, and process heaters, achieving 0.27 tpd of NO<sub>x</sub> reductions by 2023.
- Adopted Rule 1100 to establish a compliance schedule for transitioning NO<sub>x</sub> Regional Clean Air Incentives Market (RECLAIM) facilities.
- Amended Rule 1469 to require air pollution controls for tanks that are currently unregulated and require periodic source testing, require building enclosures, and to enhance housekeeping and best management practices to better control point and fugitive hexavalent chromium emissions from for hexavalent chromium plating and anodizing facilities.
- Amended Rule 1135 to implement BARCT NO<sub>x</sub> and ammonia emission limits for electricity generating facilities achieving 1.7 tpd of NO<sub>x</sub> reductions.
- Amended Rules 2001 and 2002 to provide RECLAIM facilities the option to exit the program if they meet certain criteria and to provide the option to remain in RECLAIM for a limited time upon receiving an initial determination notification.
- Amended Rule 1111 to extend and increase the mitigation fee period end dates for condensing furnaces, non-condensing furnaces, weatherized furnaces, and mobile home furnaces.
- Amended Rule 1178 to allow the use of a flexible enclosure for slotted guidepoles for petroleum storage tanks under certain conditions. Amended Rule 219 to exempt from permitting slotted guidepoles that meet specific emission control configurations specified in Rule 1178.
- The following rule development projects were initiated before or during the fiscal year and are expected to be adopted or amended in the next fiscal year:
  - Proposed Amended Rule 1134 (gas turbines),
  - Proposed Amended Rule 1110.2 (Emissions from IC Engines)
  - Proposed Rule 1109.1 (refinery equipment)
  - Proposed Rule 1410 (HF use at refineries)
  - Proposed Rule 1480 (ambient monitoring of toxic metals)
  - Proposed Amended Rule 1407 (non-chromium metal melting)
  - Proposed Rule 1407.1 (chromium metal melting)
- Conducted monthly RECLAIM meetings and held over 50 individual facility or industry-specific meetings. The RECLAIM general working group meetings have shifted focus to address New Source Review issues for the transition.
- Other rule-related projects
  - Issued an RFP for a third party independent engineering consultant to assist in reviewing BARCT analysis for Proposed Rule 1109.1 development.
  - Initiated Request for Proposals for Proposed Rule 1407.1 (Toxic Air Contaminants from Chromium Alloy Melting Operations) source testing laboratories.

## PLANNING, RULE DEVELOPMENT & AREA SOURCES (cont.)

- Finalized Rule 1168 Guidance Document which provides the test methods required for specific adhesives or sealants.

### Socioeconomic Impacts

- Completed eight Socioeconomic Impact Assessments for amendments to Rules 2001/2002 (twice; January & October), 1111 (twice; March & July), 408, 1135, 1469, 1146/1146.1/1146.2 (amended) plus 1100 (new rule).
- Continued managing two Requests for Proposals to implement recommendations by Abt Associates to enhance evaluating public welfare benefits of clean air for future AQMPs. Such benefits include recreational visibility, agriculture, ecology, and materials benefits.
- Expanded small-business analysis in proposed amendments to Rule 1469, which was subsequently reviewed and approved by independent contractor, Industrial Economics, Incorporated.
- Updated Reg III, the South Coast AQMD's fee rule.
- Received training on disaggregated input/output Economic Modeling (EMSI) model, which provides economic detail of industries at a more granular level than previously considered by the Socioeconomic Team.
- Received and implemented training on updated Regional Economic Modeling Inc. (REMI) model, providing greater clarity in Socioeconomic Impact Assessments of economic results predicted by REMI model.
- Developed beta version of cost database of common compliance costs for rule staff reference.

### Transportation Programs

- Assisted local governments with the implementation of AB 2766 funds to reduce mobile source emissions. Staff worked with 162 eligible cities, and provided guidance on projects with quantified mobile emission reductions.
- Assisted regulated employers in the development of their Rule 2202 plans. Evaluated and processed over 1,350 Rule 2202 plan submittals.
- Conducted 24 Rule 2202 Employee Transportation Coordinator (ETC) certification classes.

### Other

- Developed comment letters on key U.S. EPA initiatives, including the proposed glider kits, Corporate Average Fuel Economy (CAFE) standards, and transparency in regulatory science rules, as well as successfully advised U.S. EPA to take action on revising the heavy-duty NOx emission standard.
- Completed contract management for three PM control related projects funded by AB 1318.
- Continued working with stakeholders to develop protocols and conduct NOx characterization study of residential and commercial food service equipment (ovens, fryers, griddles, etc.).
- Completed underfired charbroiler PM control testing at UCR CE-CERT.
- Continued inventory, implementation and enforcement of rules for area sources of emissions.
- Initiated audits for approved Rule 1111 alternate compliance plans.



## **ANTICIPATED:**

### AB 617

- Conduct public outreach and develop recommendations for the selection and prioritization of communities for AB 617 community emissions reduction plans and/or community air monitoring for Year 2 implementation.
- Complete AB 617 Community identification process and begin development of Community Emission Reduction Plans where appropriate.
- Adopt and begin implementation of community emission reduction plans for Year 1 communities.
- Launch Technical Advisory Group meetings to discuss modeling approaches, emissions data and numerical methodologies in depth.
- Participate in AB 617 conference calls and meetings with CARB, other air agencies and stakeholders.

### AB 2588

- Update the Industry-Wide AB 2588 Health Risk Assessments for gas stations using new health risk guidelines from Office of Environmental Health Hazard Assessment (OEHHA) (pending adoption) and revised emission factors and Industry-Wide HRA Guidelines from CARB. The CARB Industry-Wide HRA Guidelines is estimated to be released mid-2019.
- Work with consultants to allow quicker verification of priority scores, approval of ATIRs, HRAs, and VRRPs.
- Continue updating the Rule 1402 & AB 2588 Guidelines as necessary.

### Air Quality Assessment

- Prepare exceptional events demonstrations for PM2.5 and PM10 in the South Coast Air Basin and PM10 in the Coachella Valley portion of the Salton Sea Air Basin.
- Continue to improve the dissemination of forecasts and advisories through the South Coast AQMD website, AirNOW, Enviroflash, and the South Coast AQMD app.
- If feasible, develop and provide the public with hourly and higher-spatial resolution predictions of PM2.5, PM10, and O3 throughout South Coast AQMD's jurisdiction.
- Improve forecast products with the integration of bias-corrected chemical transport models and machine learning techniques.
- Develop software to preemptively notify South Coast AQMD staff of PM10 dust events and to notify staff of wildfire smoke impacts to allow for more timely and accurate advisories.
- Provide more detailed air quality advisories to the public. Investigate the use of graphics or videos to convey additional information.
- Continue to pursue efforts to increase awareness of Check Before You Burn Advisories by establishing partnerships with the Weather Company and the National Weather Service.
- Continue the development of interactive maps and GIS data analysis to support AB 617 efforts.
- Continue supporting program functions through air quality forecasting, issuing advisories, calculating air quality trends, responding to public inquiries via phone and email, and conducting point-source permit modeling.

### Air Quality Modeling/Emissions Inventory

- Complete the development of the Net Emissions Analysis Tool (NEAT) for residential applications.
- Continue to develop detailed Toxic Air Contaminant emissions inventory to estimate cancer exposure risk.
- Continue technical assistance to the AB 617 program, especially to identify the sources of major air contaminants for each community.

## PLANNING, RULE DEVELOPMENT & AREA SOURCES (cont.)

- Continue collaboration with regulatory agencies, academic institutes and research laboratories to improve air quality model's predictability to be the state-of-the-science and appropriate for AQMP attainment demonstrations.
- Continue refining AQMP/SIP emissions inventory to assist the implementation of AQMP control measures.
- Continue reviewing General Conformity requirements of the projects submitted to South Coast AQMD to be accommodated in the SIP set aside account and tacking the usage of SIP/ South Coast AQMD General Conformity account.
- Continue assisting inter and intra divisional projects that require regional modeling, SIP emissions inventory and Geographical Information System (GIS) based geospatial analysis.

### Annual Emissions Reporting

- Continue evaluating submissions of emissions inventories and annual emissions fees.
- Conduct AER audits.
- Improve AER on-line reporting system to facilitate data entry for users and incorporate changes to facilitate emission reporting required under AB 617.
- Continue to work with CARB and CAPCOA on the development and implementation of the Criteria Pollutant and Toxics Emissions Reporting (CTR) regulation section of AB 617.
- Improve AER mailing list generator program to facilitate inclusion of facilities subject to AB 617 for emissions reporting.
- Conduct training for new and existing staff, inclusive of the new AB 617 requirements and emissions reporting regulation.

### AQMP/SIP

- Begin Preparation of 2022 AQMP to address 2015 8-hour ozone standard.
- Begin Preparation of emissions inventory and Reasonably Available Control Technology/ Reasonably Available Control Measures for the 2022 AQMP.
- Prepare a SIP update for the 1997 8-hr ozone standard for Coachella Valley.
- Prepare a SIP update to define CAA § 182 (e)(5) measures for the 1997 8-hr ozone standard for the South Coast Air Basin.
- Evaluate PM<sub>2.5</sub> design values for attainment status of the 2006 24-hr PM<sub>2.5</sub> standard for the South Coast Air Basin.
- Continue working on developing funding to implement the incentive control measures in the 2016 AQMP.
- Execute contracts for stationary source projects that reduce emissions and toxic exposure.
- Develop a tracking system for emission reductions achieved as a co-benefit to existing climate change programs.
- Develop a webpage for the solar initiative.

### CEQA

- Initiate working group process to establish guidelines to reflect the 2015 Revised OEHHA Guidelines for estimating health risk and current air quality standards.

## PLANNING, RULE DEVELOPMENT & AREA SOURCES (cont.)

- Revisit how greenhouse gas (GHG) impacts are analyzed and mitigated under CEQA; and revise how transportation impacts are evaluated for determining significance based on the newly adopted vehicle miles traveled (VMT) metric, in lieu of the previous level of service (LOS) metric.
- Update air quality mitigation measures for stationary sources, mobile on-road vehicles and off-road equipment.
- Update South Coast AQMD's localized significance thresholds (LSTs) to reflect the latest vehicle emissions factor model (EMFAC) and health data.
- Establish guidance as to how to address and disclose the health effects from significant adverse air quality impacts pursuant to the court decision in the Friant Ranch CEQA case.
- Continue developing and reviewing CEQA lead agency projects (rules and permitting projects) and commenting on CEQA documents through the South Coast AQMD's Intergovernmental Review program.
- Issue RFPs for CEQA assistance in preparing the required CEQA documents for AB 617.  
Facility-Based Mobile Source Measures
- Continue work to develop voluntary and regulatory approaches for achieving further emission reductions from airports, marine ports, new and redevelopment projects, rail yards, and warehouses.
- Continue working with Commercial Airports to develop airport specific Air Quality Improvement Plans (AQIP) and MOUs.
- Estimate SIP credits that can be achieved from the AQIP and MOU with airports.
- Continue working with the Ports of Los Angeles and Long Beach to develop an MOU and estimate SIP credits that can be achieved through its implementation.
- Continue collaborations with international ports, including Chinese ports, to develop incentive-based programs to accelerate deployment of cleaner vessel technologies.
- Continue collaborations with engine manufacturers and shipping lines to identify and demonstrate promising retrofit technologies for ocean going vessels.  
Health Effects
- Work with Monitoring and Analysis staff to complete MATES V, with deployment of fixed site monitors in January 2018, and the planning and implementation of the Advanced Monitoring and community outreach components.
- Perform health risk modeling to estimate long-term cancer risks based on toxics inventory data.  
Mobile Source
- Continue working on implementation of existing fleet rules including compliance verification activities, implement mobile source 2016 AQMP measures, such as facility-based measures and fleet rule amendments.
- Secure SIP credits for mobile source incentive projects working with CARB and U.S. EPA.  
Rule Development
- Continue monthly RECLAIM Working Group Meetings to discuss the transition of RECLAIM facilities to a command and control regulatory structure consistent with the 2016 AQMP control measure CMB-05 and AB 617, as well as New Source Review issues pertaining to the transition and adopt/amend the following proposed or proposed amended rules for the RECLAIM transition:

## PLANNING, RULE DEVELOPMENT & AREA SOURCES (cont.)

- Amend Rule 1134 to establish NO<sub>x</sub> Best Available Retrofit Control Technology requirements for stationary turbines.
- Rule 1110.2 (Emissions from IC Engines) will be amended to incorporate provisions for facilities that are transitioning from NO<sub>x</sub> RECLAIM to command and control.
- Develop Proposed Rule 113 to establish monitoring, reporting, and recordkeeping requirements for facilities with Continuous Emissions Monitoring (CEMS) exiting RECLAIM and transitioning to a command-and-control regulatory structure.
- Adopt Proposed Rule 1109.1 that will establish BARCT requirements for refineries that are transitioning from RECLAIM to command and control.
- Amend Rule 1147 to implement BARCT for miscellaneous combustion sources at RECLAIM facilities that will transition to command-and-control.
- Adopt Proposed Rules 1147.1 (large miscellaneous combustion sources) that will establish requirements for facilities that are transitioning from RECLAIM to command and control.
- Amend Rule 1117 to update the emission standard to incorporate Best Available Retrofit Control Technology for glass melting equipment and incorporate provisions for facilities that are transitioning from NO<sub>x</sub> RECLAIM to command and control.
- Amend Rule 1100 that will establish the implementation schedule for specific NO<sub>x</sub> RECLAIM facilities that are transitioning to command and control.
- Amend Regulation XIII (New Source Review) and Regulation XX (RECLAIM) to revise New Source Review provisions to address facilities that are transitioning from RECLAIM to command-and-control. Proposed amendments to Regulation XX also are needed to coordinate amendments to Regulation XIII.
- Adopt/Amend the following Proposed or Proposed Amended Rules:
  - Proposed Amended Rule 1403 includes specific requirements when conducting asbestos-emitting demolition/renovation activities at schools, daycare centers, and possibly establishments that have sensitive populations. Amendments may include other provisions to improve the implementation of the rule.
  - Proposed Amended Rules 110, 212, 301, 303, 306, 307.1, 309, 315, 510, 515, 518.2, 812, 1309, 1310, 1605, 1610, 1612, 1620, 1623, 1710, 1714, and 3006 to expand noticing options to include email and webpage display for public notices for Title V permit programs, rulemaking activities, and hearing board cases and to also include the option to deliver invoices to permit holders by email.
  - Proposed Amended Rule 1407 will reduce toxic air contaminants emissions from non-chromium alloy melting operations for Rule 1407.
  - Proposed Rule 1407.1 to reduce toxic air contaminant emissions from chromium alloy melting operations.
  - Proposed Amended Rule 1106 to revise VOC content limits for Marine Coating operations.
  - Proposed Rule 1410 or develop an MOU to address hydrogen fluoride use at refineries.
  - Proposed Amended Regulation III-Fees to incorporate the CPI adjustment to keep pace with inflation pursuant to Rule 320 and make any other needed adjustments.
  - Proposed Amended Regulations IX and X to incorporate by reference new and amended federal performance standards enacted by U.S. EPA for stationary sources.

## PLANNING, RULE DEVELOPMENT & AREA SOURCES (cont.)

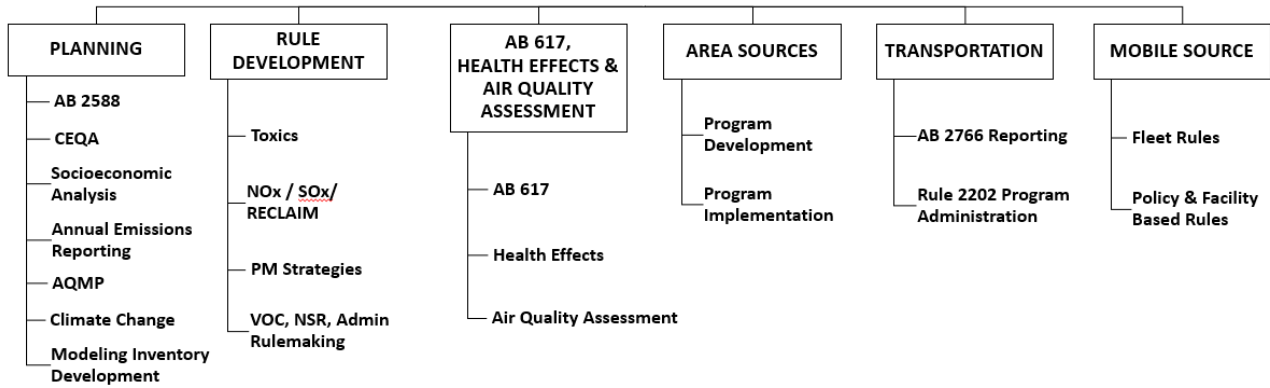
- Proposed Rule 1480 to address ambient air monitoring requirements for toxics.
- Proposed Amended Rule 461 to address provisions from CARB for gasoline dispensing facilities.
- Proposed Rules 1150.3 (landfills) and 1179.1 (Publicly Owned Treatment Works) to establish NOx emission requirements for facility-specific combustion equipment.
- Initiate rulemaking on the following rule projects:
  - Proposed Rule 1138 to regulate emissions from restaurant operations.
  - Proposed Rule 1450 to reduce exposure to methylene chloride from furniture stripping.
  - Proposed Amended Rule 1426 to reduce toxic air contaminants from metal finishing operations.
  - Proposed Rule 1147.2 (Metal Melting and Heat-Treating Furnaces) and 1147.3 (Aggregate Facilities) to establish NOx BARCT requirements for the RECLAIM transition.
  - Proposed Amended Rule 1142 for VOC emissions from marine vessel operations.
- Continue working with stakeholders to assess implementation of Rule 1111.
- Socioeconomic Impacts
- Begin enhancing Socioeconomic Impact Assessments by utilizing more granular industry detail as made available by the disaggregated input/output EMSI model and updated REMI model.
- Continue managing contract with University of California, Riverside, on distributional impacts and fund generation of potential 0.25%-0.50% sales-tax increase.
- Issue two Request for Proposals (RFPs) or sole-source contracts to update South Coast AQMD understanding of health-benefit valuation and environmental-justice analysis continuing Abt recommendations in preparation for 2022 AQMP.
- Continue managing two RFPs to implement recommendations by Abt Associates to enhance evaluating public welfare benefits of clean air for future AQMPs. Such benefits include recreational visibility, agriculture, ecology, and materials benefits.
- Improve compliance-cost database through rule staff internal review.
- Conduct socioeconomic analyses for rules and other special projects.
- Transportation Programs
- Continue conducting Employee Transportation Coordinator training sessions and review and analyze Rule 2202 annual program submittals.
- Work towards the development of an on-line Rule 2202 plan submittal process.
- Continue compliance verification activities.
- Other
- Continue implementation of rules and compliance verification activities, inclusive of Rule 317 accounting.
- Establish two technical assessments for Rule 1118.1 (beneficial use of gas handling and impacts from food waste diversion) and others as needed.
- Continue development of the new web-based Flare Event Notification System (FENS) to assist refineries in complying with Rule 1118 and provide new public portal regarding current, upcoming and past flaring events.
- Develop incentive program guidelines for SIP credit.

## **PLANNING, RULE DEVELOPMENT & AREA SOURCES (cont.)**

- Complete development and launch on-line Rule 1415 registration.
- Continue compliance verification and rule development for area sources of emissions.
- Work with the Science & Technology Advancement Office to develop process and review Rule 1180 refinery monitoring plans, conduct outreach and develop process for data evaluation.
- Finalize scope and initiate contract for the health study of the Aliso Canyon gas leak.

**PLANNING, RULE DEVELOPMENT & AREA SOURCES (cont.)**

**ORGANIZATIONAL CHART:**



**POSITION SUMMARY: 148 FTEs**

Planning, Rule Development and Area Sources Units	Amended FY 2018-19	Change	Budget FY 2019-20
Office Administration	9	-	9
Planning	60	-	60
Rule Development	21	-	21
Area Sources	8	-	8
Transportation Programs	11	-	11
Health Effects	3	-	3
Mobile Source	9	-	9
AB 617	27	-	27
<b>Total</b>	<b>148</b>	<b>-</b>	<b>148</b>

## PLANNING, RULE DEVELOPMENT & AREA SOURCES (cont.)

### POSITION DETAIL:

<u>FTEs</u>	<u>Title</u>
2	Administrative Secretary
10	Air Quality Engineer II
4	Air Quality Inspector II
1	Air Quality Inspector III
63	Air Quality Specialist
2	Assistant Deputy Executive Officer
1	Contracts Assistant
1	Deputy Executive Officer - Planning, Rule Development & Area Sources
1	Director of Strategic Initiatives
1	Director of Community Air Programs/Health Effects Officer
4	Office Assistant
8	Planning and Rules Manager
26	Program Supervisor
9	Secretary
3	Senior Administrative Secretary
4	Senior Air Quality Engineer
1	Senior Meteorologist
4	Senior Office Assistant
<u>3</u>	Senior Staff Specialist
148	Total FTEs



**Planning, Rule Development & Area Sources  
Work Program by Office**

Program Code	Program Categories	Program	Activities	FTEs FY 2018-19	+/-	FTEs FY 2019-20	Revenue Categories
1 26 002	Develop Programs	AB2766/Mobile Source	AB2766 Mobile Source Outreach	1.05	1.65	2.70	IX
2 26 007	Customer Service and Business Assistance	AB2766/MSRC	AB2766 Prov Tech Asst to Cities	1.20	-1.20	0.00	IX
3 26 010	Develop Programs	AQMP	AQMP Special Studies	0.10	1.50	1.60	IV,V,IX,XV
4 26 031	Develop Rules	AB 617-BARCT Rules	AB 617-BARCT Rules	11.40	4.80	16.20	XX
5 26 033	Develop Programs	AB 617-Em Inventory	AB 617-Em Inventory	0.50	2.50	3.00	XX
6 26 034	Develop Programs	AB 617-Em Reduc Plns	AB 617-Em Reduc Plns	0.50	9.65	10.15	XX
7 26 035	Develop Rules	AB 617-General	AB 617-General	1.60	2.55	4.15	XX
8 26 038	Develop Programs	Admin/Office Management	Coordinate Off/Admin Activities	4.55	0.00	4.55	lb
9 26 050	Develop Rules	Admin/Rule Dev/PRA	Admin: Rule Development	1.10	0.00	1.10	lb
10 26 061	Monitoring Air Quality	Air Quality Evaluation	Air Quality Evaluation	2.25	0.25	2.50	IX
11 26 068	Develop Programs	SCAQMD Projects	Prepare Environmental Assessments	3.35	0.00	3.35	II,IV,IX
12 26 071	Develop Rules	Arch Ctgs - Admin	Rdev/Aud/DB/TA/SCAQMD/Rpts/AER	1.00	-0.50	0.50	XVIII
13 26 072	Ensure Compliance	Arch Ctgs - End User	Compliance/Rpts/Rule Implementation	0.80	0.20	1.00	XVIII
14 26 073	Ensure Compliance	Arch Ctgs - Other	Compliance/Rpts/Rule Implementation	0.80	0.20	1.00	XVIII
15 26 076	Ensure Compliance	Area Sources/Compliance	Area Source Compliance	4.50	0.00	4.50	II,IV,V,IX,XV
16 26 077	Develop Rules	Area Sources/Rulemaking	Dev/Eval/Impl Area Source Prog	2.00	-1.50	0.50	II,IX
17 26 083	Policy Support	Hlth Effects Air Pollution Fou	Health Effects Air Poll Foundation Support	0.10	0.00	0.10	Ia,II,IV
18 26 102	Develop Programs	CEQA Document Projects	Review/Prepare CEQA Comments	3.75	0.00	3.75	II,IX
19 26 104	Develop Programs	CEQA Policy Development	ID/Develop/Impl CEQA Policy	0.50	0.00	0.50	IV,IX
20 26 121	Develop Programs	China Cln Shipping	China Partnership Cleaner Shpng	0.00	1.00	1.00	IX
21 26 128	Develop Programs	Cln Communities Pln	Cln Communities Plan Adm/Impl	0.25	-0.25	0.00	II,IX
22 26 148	Policy Support	Climate Change	GHG/Climate Change Policy Development	3.35	-1.35	2.00	IV,XVII
23 26 165	Develop Rules	Conformity	Monitor Transp. Conformity	0.25	0.00	0.25	V,IX
24 26 215	Ensure Compliance	Annual Emission Reporting	Annl Des/Impl/Emiss Monitor Sys	11.00	0.00	11.00	II,V
25 26 217	Develop Programs	Emissions Inventory Studies	Dev Emiss DB/Dev/Update Emiss	0.50	0.25	0.75	II,V,IX,XV
26 26 218	Develop Programs	AQMP/Emissions Inventory	Dev Emiss Inv: Forecasts/RFPs	0.74	0.51	1.25	II,IX
27 26 240	Policy Support	EJ-AQ Guidance Document	AQ Guidance Document	0.10	0.00	0.10	II,IX
28 26 257	Develop Rules	Fac Based Mob Src	Facility Based Mobile Src Meas	5.00	1.25	6.25	IX
29 26 276	Policy Support	Advisory Group/Home Rule	Governing Board Advisory Group	0.30	0.20	0.50	Ia
30 26 277	Policy Support	Advisory Group/AQMP	Governing Board AQMP Advisory Group	0.05	0.00	0.05	II,IX
31 26 278	Policy Support	Advisory Group/Sci,Tech,Model	Scientific/Tech/Model Peer Rev	0.15	-0.05	0.10	II,IX
32 26 358	Ensure Compliance	GHG Rules-Compl	Green House Gas Rules-Compliance	0.70	0.30	1.00	IV
33 26 362	Develop Rules	Health Effects	Study Health Effect/Toxicology	2.25	-1.55	0.70	II,III,IX
34 26 368	Develop Programs	Incentive RFP Emiss Red Projs	Incentive Projects Admin	0.00	1.00	1.00	XVII
35 26 385	Develop Rules	Criteria Pollutants/Mob Srce	Dev/Impl Intercrredit Trading	0.75	0.00	0.75	IV,IX
36 26 397	Develop Programs	Lead Agency Projects	Prep Envrnmt Assmts/Perm Proj	2.50	0.00	2.50	III
37 26 416	Policy Support	Legislative Activities	Supp/Promote/Influence Legis/Adm	0.50	0.00	0.50	Ia
38 26 443	Monitoring Air Quality	MATES V	MATES V	0.30	0.00	0.30	XVII
39 26 444	Monitoring Air Quality	MATES V Refinery	MATES V Refinery	0.00	0.10	0.10	XVII
40 26 445	Monitoring Air Quality	Meteorology	ModelDev/Data Analysis/Forecast	2.45	0.05	2.50	II,V,IX

**Planning, Rule Development & Area Sources (Cont.)  
Work Program by Office**

#	Program Code	Program Categories	Program	Activities	FTEs FY 2018-19	+/-	FTEs FY 2019-20	Revenue Categories
41	26 1449	Develop Rules	Mob Src/SCAQMD Rulemaking	Prepare SCAQMD Mob Src rulemaking proposals	2.30	1.30	3.60	IX
42	26 1451	Develop Programs	Mob Src/CARB/EPA Monitoring	CARB/US EPA Mob Src Fuel Policies	0.50	0.00	0.50	IX
43	26 1452	Develop Programs	Mob Src/CEC/US DOE Monitoring	CEC/US DOE Mob Src rulemaking proposals	0.50	-0.30	0.20	IX,XVII
44	26 1460	Develop Rules	Regional Modeling	Rule Impact/Analyses/Model Dev	4.40	0.60	5.00	II,V,IX
45	26 1461	Timely Review of Permits	Permit & CEQA Modeling Review	Review Model Permit/Risk Assmt	1.30	-0.30	1.00	III
46	26 1503	Develop Programs	PM Strategies	PM10 Plan/Analyze/Strategy Dev	3.40	-2.40	1.00	II,V,XV
47	26 1530	Monitoring Air Quality	Photochemical Assessment	Photochemical Assessment	0.25	-0.25	0.00	II,V
48	26 1565	Customer Service and Business Assistance	Public Records Act	Comply w/ Public Rec Requests	0.82	-0.03	0.79	la
49	26 1620	Ensure Compliance	Refinery Pilot Project	Refinery Pilot Project	0.00	1.80	1.80	II
50	26 1643	Timely Review of Permits	Rule 222 Filing Program	Rule 222 Filing Program	0.00	0.00	0.00	IV
51	26 1645	Ensure Compliance	Rule 1610 Plan Verification	Rule 1610 Plan Verification	0.75	-0.25	0.50	V,IX
52	26 1646	Develop Rules	R1180 Community Mon	R1180 Comm Monitoring Refinery	0.00	0.20	0.20	XVII
53	26 1654	Develop Rules	Rulemaking/NOX	Rulemaking/NOX	2.50	-1.60	0.90	II,IV,XV
54	26 1655	Develop Rules	NSR/Adm Rulemaking	Amend/Develop NSR & Admin Rules	2.50	-1.60	0.90	II,IV,V,XV
55	26 1656	Develop Rules	Rulemaking/VOC	Dev/Amend VOC Rules	3.25	-0.25	3.00	II,IV,XV
56	26 1659	Develop Rules	Rulemaking/Toxics	Develop/Amend Air Toxic Rules	11.00	-2.25	8.75	II,XV
57	26 1661	Develop Rules	Rulemaking/RECLAIM	RECLAIM Amend Rules/Related Is	2.50	-1.00	1.50	II
58	26 1685	Develop Programs	Socio-Economic	Apply econ models/Socio-econ	4.50	-0.50	4.00	II,IV
59	26 1717	Policy Support	Student Interns	Gov Bd/Student Intern Program	0.25	0.25	0.50	la
60	26 1745	Develop Programs	Rideshare	Dist Rideshare/Telecommute Prog	0.68	-0.13	0.55	IX
61	26 1788	Customer Service and Business Assistance	AB2588 Mailing/Venue	AB2588 Mailing/Venue	0.00	0.05	0.05	XVII
62	26 1794	Ensure Compliance	Toxics/AB2588	AB2588 Core, Tracking, IWS	13.00	0.00	13.00	X
63	26 1805	Operational Support	Training	Training	0.25	0.29	0.54	lb
64	26 1816	Develop Programs	Transportation Regional Progs	Dev AQMP Meas/Coord w/Reg Agn	0.35	0.05	0.40	V,IX
65	26 1825	Operational Support	Union Negotiations	Official Labor/Mgmt Negotiate	0.02	0.02	0.04	la
66	26 1826	Operational Support	Union Steward Activities	Rep Employees in Grievance Act	0.02	0.06	0.08	la
67	26 1833	Customer Service and Business Assistance	Rule 2202 ETC Training	Rule 2202 ETC Training	0.95	0.20	1.15	XI
68	26 1834	Develop Programs	Rule 2202 Implement	Rule 2202 Proc/Sub Plans/Tech Eval	2.67	-0.52	2.15	XI
69	26 1836	Develop Programs	Rule 2202 Support	R2202 Supt/CmptrMaint/WebSubmt	2.65	-0.60	2.05	V,XI
70	26 1855	Operational Support	Web Tasks	Create/edit/review web content	0.50	-0.40	0.10	la

**Total Planning, Rule Development, and Area Sources**

134.00	14.00	148.00
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**Planning, Rule Development & Area Sources  
Line Item Expenditure**

Major Object / Account # / Account Description		FY 2017-18 Actuals	FY 2018-19 Adopted Budget	FY 2018-19 Amended Budget	FY 2018-19 Estimate *	FY 2019-20 Adopted Budget
<b>Salary &amp; Employee Benefits</b>						
51000-52000	Salaries	\$ 10,966,947	\$ 13,374,271	\$ 13,694,528	\$ 13,017,088	\$ 14,726,917
53000-55000	Employee Benefits	5,372,228	7,350,375	7,350,375	7,083,251	8,299,872
Sub-total Salary & Employee Benefits		\$ 16,339,175	\$ 20,724,646	\$ 21,044,903	\$ 20,100,340	\$ 23,026,789
<b>Services &amp; Supplies</b>						
67250	Insurance	\$ -	\$ -	\$ -	\$ -	\$ -
67300	Rents & Leases Equipment	-	-	-	-	-
67350	Rents & Leases Structure	3,547	2,000	2,000	2,000	2,000
67400	Household	-	-	-	-	-
67450	Professional & Special Services	931,212	974,300	1,360,672	1,360,672	894,000
67460	Temporary Agency Services	139,598	100,000	73,013	73,013	20,000
67500	Public Notice & Advertising	107,837	125,000	125,000	125,000	105,300
67550	Demurrage	1,505	1,000	1,000	1,000	1,000
67600	Maintenance of Equipment	(1,633)	5,000	5,000	5,000	5,000
67650	Building Maintenance	2,090	1,000	1,000	1,000	1,000
67700	Auto Mileage	5,237	3,500	5,500	5,500	8,500
67750	Auto Service	-	-	-	-	-
67800	Travel	36,510	45,000	60,000	60,000	70,000
67850	Utilities	-	-	-	-	-
67900	Communications	46,969	50,000	50,000	50,000	50,000
67950	Interest Expense	-	-	-	-	-
68000	Clothing	1,341	1,500	2,968	2,968	1,500
68050	Laboratory Supplies	-	-	-	-	-
68060	Postage	99,988	100,000	100,000	100,000	100,000
68100	Office Expense	161,608	61,484	95,934	95,934	161,484
68200	Office Furniture	-	-	-	-	-
68250	Subscriptions & Books	10,130	2,000	2,000	2,000	2,000
68300	Small Tools, Instruments, Equipment	-	-	-	-	-
68400	Gas and Oil	-	-	-	-	-
69500	Training/Conference/Tuition/ Board Exp.	11,862	25,000	25,000	25,000	25,000
69550	Memberships	398	4,000	4,000	4,000	4,000
69600	Taxes	-	-	-	-	-
69650	Awards	-	-	-	-	-
69700	Miscellaneous Expenses	44,193	75,000	75,000	75,000	125,000
69750	Prior Year Expense	(1,589)	-	-	-	-
69800	Uncollectable Accounts Receivable	-	-	-	-	-
89100	Principal Repayment	-	-	-	-	-
Sub-total Services & Supplies		\$ 1,600,802	\$ 1,575,784	\$ 1,988,087	\$ 1,988,087	\$ 1,575,784
77000	<b>Capital Outlays</b>	\$ 15,971	\$ 110,000	\$ 110,000	\$ 110,000	\$ -
79050	<b>Building Remodeling</b>	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Total Expenditures</b>		<b>\$ 17,955,948</b>	<b>\$ 22,410,430</b>	<b>\$ 23,142,990</b>	<b>\$ 22,198,427</b>	<b>\$ 24,602,573</b>

\* Estimates based on July 2018 through February 2019 actual expenditures and March 2019 budget amendments.

## SCIENCE & TECHNOLOGY ADVANCEMENT

### MATT MIYASATO DEPUTY EXECUTIVE OFFICER

At a Glance:	
FY 2018-19 Adopted	\$32.3
FY 2019-20 Budget	\$35.4M
% of FY 2019-20 Budget	20.7%
Total FTEs FY 2019-20 Budget	226

#### DESCRIPTION OF MAJOR SERVICES:

Science & Technology Advancement is responsible for three key areas of operation: monitoring and analysis; technology research and development; and technology implementation. The Monitoring & Analysis Division maintains the South Coast AQMD's air monitoring network, operates the analytical laboratory and conducts source tests and evaluation, responds to local community monitoring requests, implements quality assurance programs, evaluates low cost sensors, evaluates and implements optical remote sensing (ORS) technologies for emission measurements, and provides meteorological, sampling and analytical support as part of the South Coast AQMD's emergency response program and special monitoring projects for the agency. The Technology Advancement Office (TAO) implements the Clean Fuels Program to commercialize advanced low- and zero-emission technologies and fund incentive programs such as the Carl Moyer, Lower-Emission School Bus, and Proposition 1B-Goods Movement programs. TAO will also provide support for the Enhanced Fleet Modernization Program (EFMP) and the Mobile Source Air Pollution Reduction Review Committee (MSRC).

#### ACCOMPLISHMENTS:

##### RECENT:

- Continued the implementation of the Carl Moyer, Surplus Off-Road Opt-In for NOx (SOON), Lower-emission School Bus, AB 134 Community Air Protection Funds, Enhanced Fleet Modernization Program and the Proposition 1B-Goods Movement programs with total funding exceeding \$185 million. Implemented the Voucher Incentive Program (VIP) for replacement of on-road trucks on a first-come-first-served basis.
- Continued the Clean Fuels program, which is the research, development, demonstration and early deployment program for the South Coast AQMD. Executed over \$25 million in contracts, comprising \$13 million in Clean Fuels funds and \$12 million in awards from federal and state solicitations recognized into the Clean Fuels fund, with \$70 million in total project costs (1:5 leveraging). Projects in key technical areas include heavy-duty electric drive technologies, near-zero emission heavy-duty engines, in-use emissions testing of heavy-duty trucks, local renewable natural gas production, and refueling infrastructure for alternative fuels (natural gas, electricity and hydrogen).

## SCIENCE & TECHNOLOGY ADVANCEMENT (cont.)

- Continued implementation of incentive programs for old vehicle scrapping, off-road equipment repowers and replacement of Tier 0 locomotives with Tier 4 locomotives.
- Updated Best Available Control Technology (BACT) Guidelines in 12/2/16, 2/2/18 and 2/1/19. These amendments included updates to major and minor source policy and procedures in addition to Lowest Achievable Emission Rate (LAER)/BACT determinations.
- Participated and provided input in the development of CARB's AB 617 BACT/Best Available Retrofit Control Technology (BARCT) Clearinghouse web-based portal.
- Continued research, development, demonstration and deployment of in-basin renewable energy projects such as fuel cells, solar photovoltaic, energy storage and low NOx combustion technologies.
- Provide database support to Enhance Fleet Modernization Program and Source Testing Engineering, and provide support to rule development staff.
- Continued to assess ambient air quality in the Basin, operated and maintained approximately 43 air monitoring sites resulting in 70,000 valid pollutant data points per month, collected and analyzed of 3,800 canisters for ambient Volatile Organic Compounds (VOCs) and toxics and over 15,000 filters for components including mass, ions, carbon and metals. The monitoring network and analysis is in support of federal programs including those for National Air Toxics Trends Stations (NATTS), Photochemical Assessment Monitoring Stations (PAMS), National Core (NCORE) PM2.5 Speciation, and Near-Road Monitoring. Data from this monitoring and analysis provides the basis for the compliance with the national ambient air quality standards (NAAQS) along with verifying emission models and understanding source contributions for future control measures.
- Continued special monitoring efforts to respond to community concerns and better characterize emissions from oil reclamation activities, metal finishing, metal forging and recycling, battery recycling facilities, oil and gas operations, and metals from various forging, grinding, and heat treating operations. Continued PM2.5 monitoring to assess potential impacts from mining operations in the City of Duarte. Also maintained monitoring efforts near the Salton Sea measuring hydrogen sulfide and PM10 to provide information to alert the public of potential dust and/or odor events.
- Performed technology demonstration study to conduct real-time mobile monitoring for toxic metals, including Cr (VI) using novel advanced monitoring techniques. Supported and verified compliance with current rules and regulations, analyzed over 2,100 samples for asbestos from demolition sites based on complaints and concerns about fallout (deposition), analyzed approximately 500 products for VOC and Hazardous Air Pollutants (HAP) content; and conducted over 1,800 Source Test (ST) protocol and report evaluations, Continuous Emissions Monitoring System (CEMS) certifications, Laboratory Approval Program (LAP) application reviews and ST observations.
- Performed audit of laboratory test methods in support of federal programs including those for NATTS, PAMS and PM2.5 Speciation; performed field audits of monitoring stations in support of federal programs including those for NCORE, NATTS, PAMS, Criteria Pollutants, and PM2.5 Speciation; Performed 2017 data certification and review.
- Continued South Coast AQMD's audit program to improve quality assurance by including "in-house" audits for air toxics, Total Suspended Particulate (TSP), PM10 and PM2.5 performed by South Coast AQMD staff.

## SCIENCE & TECHNOLOGY ADVANCEMENT (cont.)

- Conducted air toxic monitoring for the Multiple Air Toxics Exposure Study (MATES V) at ten fixed locations to characterize and spatially identify hazardous air pollutant exposure in the Basin. Developed plan for air monitoring in and around communities neighboring refineries using a combination of standardized, advanced and low cost methods to assess air pollution levels that may be related to refinery emissions.
- Evaluated approximately 55 "low-cost" air quality sensors in the field and laboratory within the AQ-SPEC program since the July 2014 inception. Substantially enhanced the AQ-SPEC website ([www.aqmd.gov/aq-spec](http://www.aqmd.gov/aq-spec)) which now includes detailed information about the sensor testing program, technical information on the use of commercially available air quality sensors, reports and tables summarizing all available testing results, and other useful information for people interested in the use and applications of air quality sensors.
- Deployed different particle and gas sensors in small networks for specific applications. A network of nine particle sensors has been operating at the fenceline of Rainbow Environmental in Huntington Beach to monitor fugitive emissions of PM<sub>2.5</sub> and PM<sub>10</sub> from this facility in real time. Also, a network of 24 particle sensors has been maintained in the Redlands/Mentone/Highland/Yucaipa region to test the performance and durability of these devices, increase the spatial distribution of PM measurements in that area, and test cloud platform data management service. An additional 68 sensors have been installed throughout the Los Angeles Air Basin for the NASA Citizen Science project. Data collected by these sensors will assist NASA scientists to improve our understanding of relationship between satellite aerosol optical depth (AOD) and surface PM, ultimately leading to better observations of air quality from space. As part of the U.S. EPA Science to Achieve Results (STAR) Grant project, approximately 300 sensors have already been installed to monitor and measure particulate matter at the community level in West Los Angeles, Alhambra, El Monte USD, Seal Beach, South Gate, Temescal Valley, Sycamore Canyon, Redlands, Riverside USD, Brawley, Nipomo, Paso Robles, Oakland, Richmond. In addition, a network of more than 100 multi-sensor units measuring ozone, nitrogen dioxide, and particulate matter have been installed in the South Coast Basin. The community recruitment and sensor deployment phases have been completed.
- Supported AB 617 community outreach efforts and community steering group orientation by participating in over 10 community meetings. Provided input to the CARB AB 617 air monitoring guidelines.
- Continued quarterly implementation of optical remote sensing technologies for emission measurements and community monitoring, specifically in Carson/Wilmington/Long Beach areas to characterize and quantify emissions from refineries and to assess their impact on surrounding communities.
- Continued federal programs efforts to maintain a network of 31 samplers for the Department of Homeland Security operating 7 days a week 24 hours a day. Approximately 12,000 samples were delivered to the LA County Department of Public Health in support of the program.
- Continued to provide sampling, monitoring, and laboratory analyses in support of South Coast AQMD Incident and Nuisance Response efforts, including recent wildfire smoke incidents and coastal odor investigations. This involved the use of state-of-the-science

## SCIENCE & TECHNOLOGY ADVANCEMENT (cont.)

conventional sampling and analysis techniques and low-cost sensors, as well as advanced optical remote sensing as part of the coastal odor investigation.

- Conducted survey PM measurements of a pilot agricultural burn method to assess how it compares to traditional burning.
- Developed advanced platform for conducting mobile surveys of PM, BC, Ultrafine PM, NOx.
- Reviewed and provided initial feedback to Rule 1180 Refinery Fenceline monitoring plans.

### ANTICIPATED:

- Continue the development and demonstration of heavy-duty zero emission cargo transport trucks and off-road equipment, and initiate the development and demonstration of a zero emission goods movement corridors.
- Continue the implementation of the VIP on a first-come-first-served basis; solicit and complete contracting on- and off-road projects, including marine vessel engine repowering projects, under the Carl Moyer Program, identify and obtain community support for eligible projects to be funded by AB 134 and SB 586 and initiate contracting for these projects, and obligate all remaining Proposition 1B-Goods Movement Program funds awarded to South Coast AQMD. Also, issue grants for the replacement of school buses with lower emission buses under the Lower Emission School Bus Program. Develop and implement the Zero-Emissions Class 8 Truck and Combustion categories under CARB's VW Beneficiary Mitigation Plan.
- Continue periodic updates to the BACT Guidelines specifically major and minor source policy and procedures and LAER/BACT determinations.
- Conduct a BACT technical assessment for flares receiving biogas derived from advanced digestion and/or organic waste digestion or codigestion that considers costs, review of the current scientific literature, existing measurement methods, technology achieved in-practice, reliability issues, and if necessary, field testing. Report back to the Stationary Source Committee within 12 months of rule adoption to present findings; potential recommendations; and amend the BACT Guidelines and Rule 1118.1, if necessary.
- Continue to participate in the development of CARB's AB 617 BACT/BARCT Clearinghouse web-based portal.
- Continue research, development, demonstration and deployment of low NOx combustion technologies and renewable energy projects.
- Continue database support to Enhance Fleet Modernization Program and Source Testing Engineering, and support to rule development staff.
- Increase deployment of cleaner construction equipment, locomotives, marine, and on-road heavy-duty vehicles through the continued implementation of funding incentive programs, compliance with South Coast AQMD Clean Fleet Vehicle Rules, and identification of future mobile source strategies for implementing the 2016 AQMP.
- Provide monitoring, source testing, and analysis for rule development related to upcoming amendments for Rules 1407 and 1420.2.
- Conduct source test evaluation of polyfluoroalkyl substances (PFAS) as a follow up to Rule 1469.
- Continue source test protocol and report evaluations, CEMS certifications, LAP application reviews and source test observations. Increase throughput on source test

## SCIENCE & TECHNOLOGY ADVANCEMENT (cont.)

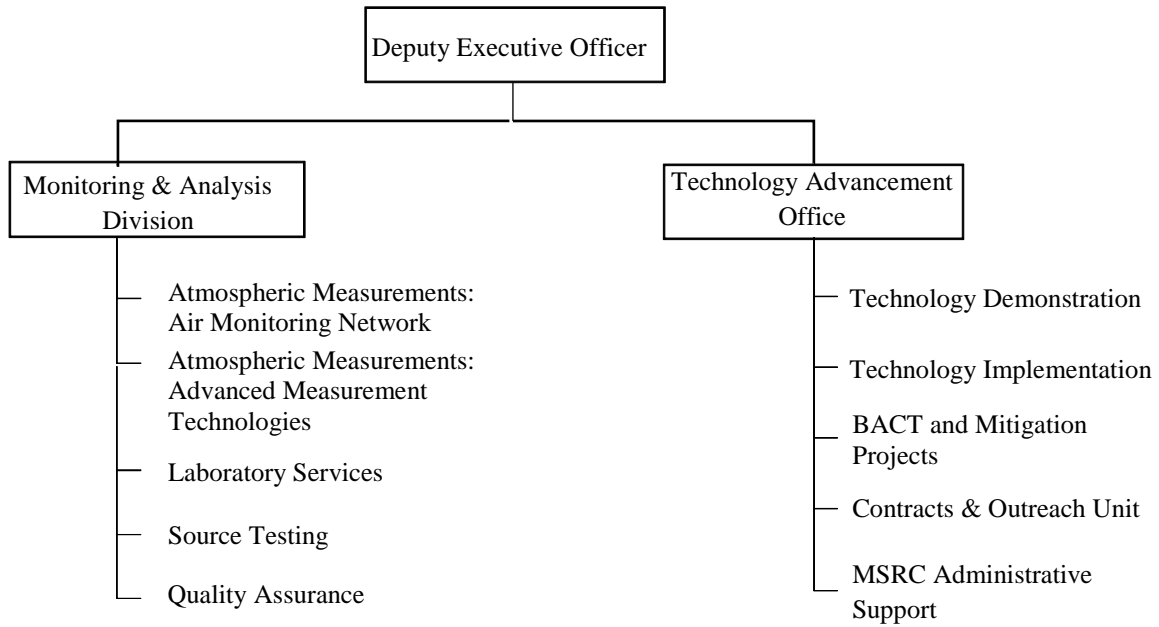
evaluations anticipated due to RECLAIM (Regional Clean Air Incentives Market) sunset and permit streamlining efforts.

- Develop air monitoring plans for the three approved communities of AB 617 and begin implementation of those plans by July. Participate in outreach meetings for the “Year Two” communities.
- Continue to evaluate refinery fenceline air monitoring plans, and develop and implement refinery-related community air monitoring as required under Rule 1180.
- Continue with the implementation of air monitoring network and special monitoring and analysis efforts critical to the South Coast AQMD operations, including compliance verification efforts and rule development, including Paramount and Compton. Survey other industrialized areas to assess toxic metal levels.
- Implement enhanced ozone monitoring strategy for the U.S. EPA Photochemical Assessment Monitoring Station program to provide more relevant and robust data sets for VOCs that are ozone precursors. Develop concepts for additional specialized studies or ongoing measurements that would provide information to guide future pollution reduction efforts.
- Continue to enhance and modernize the laboratory instrumentation, methodologies, and analysis capabilities to help with special monitoring projects, incident and wildfire response. Continue operational efficiency improvement by investing in latest software, automated instruments and equipment and other workflow streamlining efforts.
- Continue to enhance and modernize South Coast AQMD’s telemetry system and data management system that receives and validates the incoming data from the air monitoring stations and special monitoring locations to additionally include AB 617 data.
- Continue to assess and oversee operational integrity, efficiency and quality assurance through monthly internal audits of laboratory and field monitoring stations. Participate in the U.S. EPA Technical System Audit being conducted this year.
- Continue with full-scale testing of air quality sensors in AQ-SPEC and share testing results with the public. Develop concept for certification program of low-cost particle and gaseous sensors.
- Deploy and pilot several air quality sensor networks for the purposes of developing new low-cost monitoring capabilities for South Coast AQMD, regulated entities, and the public. Continue to implement the goals and objectives of the U.S. EPA STAR grant to engage, educate, and empower California communities on the use and applications of “low-cost” air monitoring sensors and complete the deployment of sensor networks throughout California in collaboration with CAPCOA agencies and environmental justice groups and communities.
- Continue and expand the operation and development of the PM sensor network around/near Rainbow Environmental to study the correlation between fugitive PM emissions and activity information at the facility (e.g., truck traffic, recycling operations).
- Continue with the implementation of the remote sensing technology projects and experimentation with other next generation monitoring technologies and formulate appropriate recommendations to best integrate into the South Coast AQMD’s current measurement toolbox.



**SCIENCE & TECHNOLOGY ADVANCEMENT (cont.)**

**ORGANIZATIONAL CHART:**



**POSITION SUMMARY: 226 FTEs**

Science & Technology Advancement Units	Amended FY 2018-19	Change	Budget FY 2019-20
Office Administration	14	-	14
Monitoring & Analysis	155	-	155
Technology Advancement	57	-	57
Total	226	-	226

## SCIENCE & TECHNOLOGY ADVANCEMENT (cont.)

### POSITION DETAIL:

<u>FTEs</u>	<u>Title</u>
27	Air Quality Chemist
10	Air Quality Engineer II
3	Air Quality Inspector II
22	Air Quality Instrument Specialist I
27	Air Quality Instrument Specialist II
29	Air Quality Specialist
2	Assistant Deputy Executive Officer/Science & Technology Advancement
3	Atmospheric Measurement Manager
14	Contracts Assistant
1	Deputy Executive Officer/Science & Technology Advancement
6	Laboratory Technician
1	Meteorologist Technician
1	Monitoring Operations Manager
5	Office Assistant
2	Planning and Rules Manager
4	Principal Air Quality Chemist
2	Principal Air Quality Instrument Specialist
18	Program Supervisor
6	Secretary
3	Senior Administrative Secretary
11	Senior Air Quality Chemist
4	Senior Air Quality Engineer
11	Senior Air Quality Instrument Specialist
1	Senior Enforcement Manager
3	Senior Office Assistant
1	Senior Public Information Specialist
2	Senior Staff Specialist
1	Source Test Manager
2	Staff Assistant
2	Staff Specialist
1	Supervising Air Quality Engineer
<u>1</u>	Technology Implementation Manager
226	Total FTEs

**Science & Technology Advancement  
Work Program by Office**

Program #	Program Code	Program Categories	Program	Activities	FTEs FY 2018-19	+/-	FTEs FY 2019-20	Revenue Categories
1	44 003	Advance Clean Air Technology	Advisory Group/Small Business	Mob Src Review Comm Prog Admin	0.50	0.00	0.50	IX
2	44 004	Advance Clean Air Technology	AB2766/MSRC/Contract Admin	AB2766 Admin Discretionary Prog	3.00	0.00	3.00	IX
3	44 009	Develop Programs	AB 1318 Mitigation	AB 1318 Projects Admn/Impl	0.75	-0.50	0.25	XVII
4	44 012	Advance Clean Air Technology	AQMP/Control Tech Assessment	Tech Supp: Quantify Cost Effec	1.00	0.00	1.00	VIII
5	44 015	Ensure Compliance	Acid Rain Program	Acid Rain CEMS Eval/Cert	0.50	0.00	0.50	II,IV
6	44 030	Advance Clean Air Technology	AB 134	AB 134	6.00	-1.00	5.00	IX
7	44 036	Monitoring Air Quality	AB 617-Monitoring	AB 617-Monitoring	12.00	27.00	39.00	XX
8	44 038	Monitoring Air Quality	Admin/Office Mgmt/Monitoring	Overall Program Mgmt/Coord	1.40	0.00	1.40	lb
9	44 039	Advance Clean Air Technology	Admin/Office Mgt/Tech Adv	Admin Support/Coordination	0.77	0.00	0.77	VIII
10	44 041	Policy Support	Admin/Office Mgmt/Policy Supp	Overall Policy Supp/Mgmt/Coord	0.49	0.00	0.49	lb
11	44 042	Ensure Compliance	Admin/Office Mgmt/Compliance	Compliance: Assign/Manage/Supp	0.37	0.00	0.37	lb
12	44 043	Develop Rules	Admin/Office Mgmt/Rules	Rules: Assign/Manage/Supp	0.15	0.00	0.15	lb
13	44 046	Monitoring Air Quality	Admin/Program Management	STA Program Administration	2.00	0.00	2.00	lb
14	44 048	Advance Clean Air Technology	Admin/Prog Mgmt/Tech Advance	Overall TA Program Mgmt/Coord	1.55	0.00	1.55	VIII
15	44 063	Monitoring Air Quality	Ambient Air Analysis	Analyze Criteria/Tox/Pollutants	8.91	0.00	8.91	II,V,IX
16	44 064	Monitoring Air Quality	Ambient Network	Air Monitoring/Toxics Network	19.05	-1.00	18.05	II,IV,V,IX
17	44 065	Monitoring Air Quality	Air Quality Data Management	AM Audit/Validation/Reporting	1.00	0.00	1.00	II,V,IX
18	44 066	Advance Clean Air Technology	AQIP Marine SCR DPF	AQIP Marine SCR DPF/Admin/Impl	0.00	0.00	0.00	IX
19	44 067	Monitoring Air Quality	Ambient Lead Monitoring	Lead Monitoring/Analysis/Reporting	0.50	0.00	0.50	IV
20	44 069	Develop Programs	AQIP Evaluation	AQIP Contract Admin/Evaluation	0.50	0.00	0.50	IX
21	44 072	Ensure Compliance	Arch Ctgs - End User	Sample Analysis/Rpts	2.00	0.00	2.00	XVIII
22	44 073	Monitoring Air Quality	Arch Ctgs - Other	Sample Analysis/Rpts	2.00	0.00	2.00	XVIII
23	44 079	Monitoring Air Quality	AQ SPEC	AQ SPEC	3.00	3.19	6.19	XVII
24	44 081	Monitoring Air Quality	Air Filtration EPA	Air Filtration EPA/Admn/Impl	0.10	0.05	0.15	V
25	44 082	Monitoring Air Quality	Air Filtration Other	Air Filtration Other/Admn/Impl	0.48	-0.38	0.10	XVII
26	44 095	Advance Clean Air Technology	CA Natural Gas Veh Partnership	CA Natural Gas Veh Partnership	0.10	0.00	0.10	VIII
27	44 105	Ensure Compliance	CEMS Certification	CEMS Review/Approval	6.15	0.00	6.15	II,III,VI
28	44 121	Advance Clean Air Technology	China Cln Shipping	China Partnership Cleaner Shpng	0.00	0.90	0.90	IX
29	44 130	Advance Clean Air Technology	Clean Fuels/Contract Admin	Admin/Project Supp for TA Cont	4.40	-0.50	3.90	VIII
30	44 132	Advance Clean Air Technology	Clean Fuels/Mobile Sources	Dev/Impl Mobile Src Proj/Demo	1.50	-0.50	1.00	VIII
31	44 134	Advance Clean Air Technology	Clean Fuels/Stationary Combust	Dev/Demo Clean Combustion Tech	0.30	0.00	0.30	VIII
32	44 135	Advance Clean Air Technology	Clean Fuels/Stationary Energy	Dev/Demo Alt Clean Energy	0.55	0.00	0.55	VIII
33	44 136	Advance Clean Air Technology	Clean Fuels/Tech Transfer	Disseminate Low Emiss CF Tech	2.31	-0.51	1.80	VIII
34	44 161	Monitoring Air Quality	Comm Air Tox Init	Community Air Toxics Initiative	2.19	-2.19	0.00	XVII
35	44 175	Ensure Compliance	DB/Computerization	Develop Systems/Database	0.44	0.00	0.44	II,IV,VI
36	44 187	Advance Clean Air Technology	DERA Sch Bus Repl	DERA Sch Bus Repl Admin/Impl	0.03	0.07	0.10	V
37	44 188	Advance Clean Air Technology	DERA FY 13 Veh Repl	DERA Vehicle Repl Admin/Impl	0.10	0.00	0.10	XVII
38	44 190	Advance Clean Air Technology	Diesel Projects EPA	Diesel Projects EPA/Admin/Impl	0.11	0.09	0.20	V
39	44 203	Advance Clean Air Technology	EFMP Program Support	EFMP Program Support	5.00	0.00	5.00	XVII
40	44 240	Monitoring Air Quality	Environmental Justice	Implement Environmental Justice	0.45	0.00	0.45	II,IX

**Science & Technology Advancement (Cont.)  
Work Program by Office**

#	Program Code	Program Categories	Program	Activities	FTEs		+/-	FTEs	Revenue Categories
					FY 2018-19	FY 2019-20			
41	44	248	Monitoring Air Quality	EPA Community Scale AQ-SPEC	EPA Community Scale AQ-SPEC	1.00	0.00	1.00	V,XVII
42	44	258	Advance Clean Air Technology	FARMER Grant	Fund Ag Replacement Measures	0.00	2.50	2.50	XVII
43	44	276	Policy Support	Advisory Group/Technology Adva	Tech Adv Advisory Group Supp	0.10	0.00	0.10	VIII
44	44	356	Advance Clean Air Technology	GGRF ZEDT Demo	GGRF ZEDT Demo Admin	1.00	0.10	1.10	XVII
45	44	368	Develop Programs	Incentive RFP Emis Red Projs	Incentive Projects Admin	0.00	3.00	3.00	XVII
46	44	396	Develop Programs	Lawnmower Exchange	Lawn Mower Admin/Impl/Outreach	0.30	0.00	0.30	XVII
47	44	410	Policy Support	Legislation	Support Pollution Reduction thru Legislatio	0.50	0.00	0.50	IX
48	44	450	Ensure Compliance	Microscopic Analysis	Asbestos/PM/Metals Analysis	2.00	0.00	2.00	VI
49	44	453	Advance Clean Air Technology	Mob Src: Emiss Inven Method	Rvw CARB/US EPA emissions inven methodology	1.50	0.00	1.50	VIII,IX
50	44	456	Develop Rules	MS & AQMP Control Strategies	AQMP Control Strategies	0.30	0.00	0.30	VIII
51	44	457	Advance Clean Air Technology	Mob Src/C Moyer Adm/Outreach	Carl Moyer: Impl/Admin Grant	12.15	0.95	13.10	IX
52	44	458	Develop Programs	Mobile Source Strategies	Implement Fleet Rules	1.00	0.00	1.00	VIII
53	44	459	Advance Clean Air Technology	Mob Src/C Moyer/Impl/Prg Dev	Moyer/Implery/Program Dev	3.00	0.00	3.00	IX
54	44	460	Advance Clean Air Technology	VIP Admin	VIP Admin/Outreach/Impl	0.50	0.00	0.50	IX
55	44	468	Monitoring Air Quality	NATTS(Natl Air Tox Trends Sta)	NATTS (Natl Air Tox Trends)	1.50	-0.50	1.00	II,V,IX
56	44	469	Monitoring Air Quality	Near Roadway Mon	Near Roadway Monitoring	1.50	0.00	1.50	IV,V,IX
57	44	500	Ensure Compliance	PM2.5 Program	Est/Operate/Maint PM2.5 Network	11.30	-1.00	10.30	II,V,IX
58	44	505	Monitoring Air Quality	PM Sampling Program (EPA)	PM Sampling Program - Addition	8.41	0.00	8.41	V
59	44	507	Monitoring Air Quality	PM Sampling Spec	PM Sampling Special Events	0.10	0.00	0.10	V
60	44	530	Monitoring Air Quality	Photochemical Assessment	Photochemical Assess & Monitor	3.00	0.00	3.00	V,IX
61	44	533	Advance Clean Air Technology	POLB AMECS Demo	POLB AMECS Demo-Admin/Impl	0.47	-0.37	0.10	XVII
62	44	542	Develop Programs	Prop 1B:Goods Movement	Prop 1B:Goods Movement	9.00	-7.00	2.00	IX
63	44	545	Timely Review of Permits	Protocols/Reports/Plans	Eval Test Protocols/Cust Svc	0.10	0.00	0.10	III,IV
64	44	546	Timely Review of Permits	Protocols/Reports/Plans	Eval Test Protocols/Compliance	6.15	0.00	6.15	IV,VI
65	44	565	Customer Service and Business Assistance	Public Records Act	Comply w/ Public Req for Info	0.17	0.00	0.17	Ia
66	44	585	Monitoring Air Quality	Quality Assurance	Quality Assurance Branch	4.00	3.00	7.00	II,V,IX
67	44	646	Monitoring Air Quality	R1180 Community Mon	R1180 Comm Monitoring Refinery	5.00	4.00	9.00	XVII
68	44	653	Develop Rules	Rulemaking/BACT	Dev/Amend BACT Guidelines	2.00	-0.50	1.50	II
69	44	657	Develop Rules	Rulemaking/Support PRA	Assist PRA w/ Rulemaking	0.05	0.00	0.05	II
70	44	663	Monitoring Air Quality	Salton Sea Monit	Mon/Analyze Hydrogen Sulfide	0.25	0.00	0.25	XVII
71	44	677	Advance Clean Air Technology	School Bus/Lower Emission Prog	School Bus Program Oversight	1.50	0.50	2.00	IX
72	44	700	Ensure Compliance	Source Testing/Compliance	Conduct ST/Prov Data/Compl	2.25	0.00	2.25	VI
73	44	701	Customer Service and Business Assistance	Source Testing/Customer Svc	Conduct ST/Prov Data/Cust Svc	0.05	0.00	0.05	VI
74	44	702	Develop Programs	ST Methods Development	Eval ST Methods/Validate	0.95	0.00	0.95	II
75	44	704	Ensure Compliance	ST/Sample Analysis/Compliance	Analyze ST Samples/Compliance	4.00	0.00	4.00	VI
76	44	705	Develop Programs	ST Sample Analysis/Air Program	Analyze ST Samples/Air Prgrms	0.25	0.00	0.25	II
77	44	706	Develop Rules	ST Sample Analysis/Air Program	Analyze ST Samples/Rules	0.25	0.00	0.25	II
78	44	707	Ensure Compliance	VOC Sample Analysis/Compliance	VOC Analysis & Rptg/Compliance	7.00	0.00	7.00	IV,XV
79	44	708	Develop Rules	VOC Sample Analysis/Rules	VOC Analysis & Rptg/Rules	0.25	0.00	0.25	II,XV
80	44	709	Customer Service and Business Assistance	VOC Sample Analysis/SBA/Other	VOC Analysis & Reptg/Cust Svc	0.50	0.00	0.50	VI
81	44	715	Monitoring Air Quality	Spec Monitoring/Emerg Response	Emergency Response	0.50	0.00	0.50	II

**Science & Technology Advancement (Cont.)  
Work Program by Office**

#	Program Code	Program Categories	Program	Activities	FTEs FY 2018-19	+/-	FTEs FY 2019-20	Revenue Categories
82	44 716	Ensure Compliance	Special Monitoring	Rule 403 Compliance Monitoring	2.20	0.00	2.20	III,IV,IX,XV
83	44 725	Timely Review of Permits	Permit Processing/Support E&C	Assist EAC w/ Permit Process	0.05	0.00	0.05	III
84	44 738	Advance Clean Air Technology	Target Air Shed EPA	Targeted Air Shed Admin/Impl	0.50	0.00	0.50	V,XVII
85	44 740	Advance Clean Air Technology	Tech Adv/Commercialization	Assess CFs/Adv Tech Potential	0.25	0.00	0.25	VIII
86	44 741	Advance Clean Air Technology	Tech Adv/Non-Combustion	Dev/Demo Non-Combustion Tech	1.00	-0.40	0.60	VIII
87	44 794	Ensure Compliance	Toxics/AB2588	Eval Protocols/Methods/ST	4.25	-1.00	3.25	X
88	44 795	Ensure Compliance	Toxics/Engineering	R1401 Toxics/HRA Prot/Rpt Eval	0.05	0.00	0.05	VI,X
89	44 816	Advance Clean Air Technology	Transportation Research	Transport Research/Adv Systems	0.50	-0.40	0.10	VIII
90	44 825	Operational Support	Union Negotiations	Labor/Mgmt Negotiations	0.05	0.00	0.05	la
91	44 826	Operational Support	Union Steward Activities	Rep Employees in Grievance Act	0.05	0.00	0.05	la
92	44 827	Advance Clean Air Technology	VW-Program Development	VW-Program Development	0.00	4.00	4.00	XVII

194.40	31.60	226.00
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**Total Science & Technology Advancement**

**Science & Technology Advancement  
Line Item Expenditure**

Major Object / Account # / Account Description		FY 2017-18 Actuals	FY 2018-19 Adopted Budget	FY 2018-19 Amended Budget	FY 2018-19 Estimate *	FY 2019-20 Adopted Budget
<b>Salary &amp; Employee Benefits</b>						
51000-52000	Salaries	\$ 15,353,894	\$ 18,016,014	\$ 18,444,427	\$ 17,504,272	\$ 20,252,169
53000-55000	Employee Benefits	7,944,743	9,914,647	9,914,647	9,641,976	11,778,087
Sub-total Salary & Employee Benefits		\$ 23,298,636	\$ 27,930,661	\$ 28,359,074	\$ 27,146,248	\$ 32,030,256
<b>Services &amp; Supplies</b>						
67250	Insurance	\$ -	\$ -	\$ -	\$ -	\$ -
67300	Rents & Leases Equipment	99,589	36,800	63,878	63,878	36,800
67350	Rents & Leases Structure	181,718	419,000	427,543	427,543	169,000
67400	Household	-	500	500	500	500
67450	Professional & Special Services	1,588,685	1,630,000	3,329,206	3,329,206	1,455,000
67460	Temporary Agency Services	553,840	191,600	530,986	530,986	141,600
67500	Public Notice & Advertising	25,975	22,000	22,000	22,000	22,000
67550	Demurrage	99,371	55,000	72,000	72,000	55,000
67600	Maintenance of Equipment	649,804	255,000	532,751	532,751	205,000
67650	Building Maintenance	124,789	270,000	302,115	302,115	170,000
67700	Auto Mileage	59,013	43,909	158,844	158,844	3,909
67750	Auto Service	199	-	-	-	-
67800	Travel	85,797	48,403	79,774	79,774	48,403
67850	Utilities	1,650	-	-	-	-
67900	Communications	291,597	241,000	265,773	265,773	231,000
67950	Interest Expense	-	-	-	-	-
68000	Clothing	7,978	4,000	5,170	5,170	4,000
68050	Laboratory Supplies	523,406	320,000	530,377	530,377	295,000
68060	Postage	23,070	17,318	17,364	17,364	17,318
68100	Office Expense	190,216	102,393	135,890	135,890	41,393
68200	Office Furniture	27,587	-	5,168	5,168	-
68250	Subscriptions & Books	1,385	1,527	1,646	1,646	1,527
68300	Small Tools, Instruments, Equipment	194,210	112,246	417,283	417,283	87,246
68400	Gas and Oil	-	-	-	-	-
69500	Training/Conference/Tuition/ Board Exp.	34,000	107,000	263,721	263,721	107,000
69550	Memberships	97,370	2,250	2,110	2,110	2,250
69600	Taxes	504	2,000	7,585	7,585	2,000
69650	Awards	-	-	-	-	-
69700	Miscellaneous Expenses	14,725	2,600	12,600	12,600	2,600
69750	Prior Year Expense	(11,793)	-	-	-	-
69800	Uncollectable Accounts Receivable	-	-	-	-	-
89100	Principal Repayment	-	-	-	-	-
Sub-total Services & Supplies		\$ 4,864,685	\$ 3,884,546	\$ 7,184,284	\$ 7,184,284	\$ 3,098,546
77000	<b>Capital Outlays</b>	\$ 3,793,453	\$ 507,500	\$ 1,835,058	\$ 1,835,058	\$ 285,000
79050	<b>Building Remodeling</b>	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Total Expenditures</b>		<b>\$ 31,956,775</b>	<b>\$ 32,322,707</b>	<b>\$ 37,378,416</b>	<b>\$ 36,165,590</b>	<b>\$ 35,413,802</b>

\* Estimates based on July 2018 through February 2019 actual expenditures and March 2019 budget amendments.



**SOUTH COAST**

**AIR QUALITY MANAGEMENT DISTRICT**

## South Coast AQMD Quick Facts

- Created by the 1977 Lewis Air Quality Management Act; amended by 1988 Lewis-Presley Air Quality Management Act (Health & Safety Code §40400-40540).
  - Regional governmental agency (Special District)
- Jurisdiction for comprehensive air pollution control over all of Orange County, all of Los Angeles County except for the Antelope Valley, the non-desert portion of western San Bernardino County and the western and Coachella Valley portion of Riverside County
  - 10,743 Square Miles; Population of 17,063,249 (2017)
  - Boundaries are Pacific Ocean to the west; San Gabriel, San Bernardino and San Jacinto Mountains to the north and east, and the San Diego County line to the south
  - Vehicle Registrations - 13,756,321 (2017); Average Daily Miles Traveled Per Vehicle – 28 (2017)
  - Two of the world’s busiest seaports are within its boundaries, Port of Los Angeles and Port of Long Beach, who combined handle almost 4,000 vessel calls (2017) and more than 17 million 20-foot long container units or 20-foot equivalent units (TEUs) annually (2018)
- Responsibilities include:
  - Monitoring air quality - 43 air monitoring stations
  - Planning, implementing, and enforcing programs to attain and maintain state and federal ambient air quality standards
    - Developing air quality rules and regulations that regulate stationary source emissions from such facilities as oil refineries, power plants, paint spray booths, incinerators, manufacturing plants, dry cleaners, and service stations
    - Establishing permitting requirements and issuing permits for stationary sources (26,983 operating locations with 68,732 permits)
- Decision-making body is a 13 member Governing Board
  - Ten elected officials with four appointed by the Board of Supervisors from each of the four counties and six appointed by cities within the South Coast AQMD
  - Three members appointed by the Governor, the Speaker of the State Senate, and the Rules Committee of the State Senate



**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT**  
**Operating Indicators by Function**  
**Last Ten Fiscal Years**

	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>
<b>Program Category</b>										
<b>Advance Clean Air Technology</b>										
Contracts awarded	292	530	526	556	938	523	1,047	421	403	357
Total Funding awarded (\$M)	\$89.4	\$180.7	\$131.4	\$82.5	\$207.2	\$216.1	\$123.2	\$153.9	\$137.4	\$170.4
<b>Ensure Compliance with Clean Air Rules</b>										
Inspections	40,558	33,735	33,560	34,191	32,535	29,501	22,871	24,037	21,419	24,695
Notices of Violations	1,908	1,530	1,254	1,211	965	956	811	499	632	1,626
Hearing Board Orders for Abatement	36	35	47	93	51	46	411	23	27	24
Hearing Board Appeals	19	20	2	7	3	7	-	3	3	1
<b>Customer Service</b>										
Public Information Requests	4,962	3,821	3,410	3,543	3,460	4,505	4,012	4,958	5,282	4,676
Community/Public Meetings attended	198	202	190	274	294	264	217	239	210	156
Small Business Assistance Contacts	2,662	2,578	2,497	2,574	2,266	1,850	1,711	1,865	2,834	4,073
<b>Develop Programs to Achieve Clean Air</b>										
Transportation Plans processed	1,412	1,372	1,385	1,392	1,371	1,333	1,329	1,337	1,348	1,356
Emission Inventory Updates	586	703	521	530	408	460	336	356	244	343
<b>Develop Rules to Achieve Clean Air</b>										
Rules Developed	32	15	40	8	20	24	24	16	15	28
<b>Monitoring Air Quality</b>										
Samples Analyzed by the Laboratory	25,400	29,685	28,915	29,520	32,520	29,340	30,824	32,400	38,541	36,342
Source Testing Analyses/Evaluations/Review	718	740	1,030	952	1,035	968	996	936	952	714
<b>Timely Review of Permits</b>										
Applications Processed	11,564	9,627	13,044	12,225	14,153	13,217	9,495	10,116	11,780	10,913
Applications Received-Small Business	627	694	798	732	615	514	629	594	535	605
Applications Received-All Others	10,954	10,941	10,769	11,682	11,709	11,156	9,961	9,894	8,376	9,172
<b>Policy Support</b>										
News releases	76	69	64	57	61	62	76	89	86	120
Media Calls	334	313	252	520	1,131	774	532	1,450	1,201	-
Media Inquiries Completed	334	313	252	520	1,131	774	532	1,450	1,201	-
News Media Interactions*	-	-	-	-	-	-	-	-	-	1,235

\*Tracking of News Media Interactions began in 2018

## FINANCIAL POLICIES

South Coast AQMD is required to follow specific sections of the California Health & Safety Code, which guide South Coast AQMD's overall financial parameters. The Governing Board also provides financial direction to South Coast AQMD staff through the adoption of various financial-related policies. In addition, the Administrative Policies and Procedures offer further financial guidance. Below is an overview of the guidelines and procedures for the applicable financial-related policies.

### California Health & Safety Code (CA H&SC)

- District Budget Adoption – CA H&SC §40130

The South Coast AQMD shall prepare, and make available to the public at least 30 days prior to public hearing, a summary of its budget and any supporting documents, including, but not limited to, a schedule of fees to be imposed by the South Coast AQMD to fund its programs. The South Coast AQMD shall notify each person who was subject to fees imposed by the South Coast AQMD in the preceding year of the availability of information. The South Coast AQMD shall notice and hold a public hearing for the exclusive purpose of reviewing the budget and of providing the public with the opportunity to comment upon the proposed South Coast AQMD budget.

- Fees Assessed on Stationary Sources – CA H&SC §40500.1

Fees assessed on stationary sources shall not exceed, for any fiscal year, the actual costs of District programs for the immediately preceding fiscal year with an adjustment not greater than the change in the California Consumer Price Index (CPI), for the preceding calendar year, from January 1 of the prior year to January 1 of the current year. Unless specifically authorized by statute, the total amount of all of the fees collected from stationary sources of emissions in the 1995-96 fiscal year, and in each subsequent fiscal year, shall not exceed the level of expenditure in the 1993-94 fiscal year, except that the total fee amount may be adjusted annually by not more than the percentage increase in the California CPI. Any new state or federal mandate that is applicable to the South Coast AQMD on and after January 1, 1994 shall not be subject to this section.

- Limitation on Increase in Permit Fees – CA H&SC §40510.5

Existing permit fees shall not increase by a percentage greater than any percentage increase in the California CPI for the preceding calendar year, unless the board makes a finding, based upon relevant information in a rulemaking record, that the fee increase is necessary and will result in an apportionment of fees that is equitable. Any fee increase above CPI shall be phased in over a period of at least two years.

## FINANCIAL POLICIES (cont.)

### South Coast AQMD Governing Board Policy

- Administrative Code

The Administrative Code of Rules and Procedures prescribes the responsibilities, conduct and specified reimbursements of v employees and South Coast AQMD Board members. Sections include, but are not limited to, mileage reimbursement, travel expenses, tuition reimbursement, professional licenses and memberships, and bilingual pay.

- Annual Investment Policy

The Annual Investment Policy sets forth the investment guidelines for all general, special revenue, trust, agency and enterprise funds of the South Coast AQMD. The purpose of this policy is to ensure all of South Coast AQMD's funds are prudently invested to preserve principal and provide necessary liquidity, while earning a market average rate of return. The South Coast AQMD Annual Investment Policy conforms to the California Government Code as well as customary standards of prudent investment management.

The objectives of the policy, in priority order, are Safety of Principal, Liquidity, and Market Rate of Return. The policy establishes and defines investable funds, authorized instruments, credit quality requirements, maximum maturities and concentrations, collateral requirements, and qualifications of brokers, dealers, and financial institutions doing business with or on behalf of the South Coast AQMD.

The policy provides the Governing Board, the Treasurer, the Assistant Deputy Executive Officer of Finance, and the Investment Oversight Committee with set duties and responsibilities to execute the policy.

- Budget Advisory Committee

Established by the South Coast AQMD Governing Board, the Budget Advisory Committee serves in an advisory capacity to the South Coast AQMD on budgeting and financial planning matters. The committee, made up of members from the business and environmental community, provides additional insight during the annual budget process by reviewing and commenting on the proposed budget. The Budget Advisory Committee's comments are required to be provided to the Governing Board by April 15<sup>th</sup> of each year pursuant to South Coast AQMD Rule 320.

## FINANCIAL POLICIES (cont.)

- Fund Balance Use

When both restricted and unrestricted resources are available for use, it is South Coast AQMD's policy to use restricted resources first and then unrestricted resources as they are needed. When using unrestricted fund balance amounts, South Coast AQMD's Governing Board approved policy is to use committed amounts first, followed by assigned and then unassigned.

- Procurement Policy and Procedure

The Procurement Policy and Procedure provides the guidelines for the contracting and/or purchasing of services, material, equipment, supplies and fixed assets (i.e. capital outlays) by the South Coast AQMD under the direction of the Procurement Manager. These guidelines include, but are not limited to, purchasing methods, bidding procedures, signature authorization levels, fixed asset acquisition and disposition, and publication requirements for advertised procurements.

Procedures are in place to ensure that all businesses including minority business enterprises, women business enterprises, disabled veteran business enterprises and small businesses have a fair and equitable opportunity to compete for and participate in South Coast AQMD contracts and that South Coast AQMD utilizes, when necessary, the most highly qualified outside consultants/contractors to carry out the organization's responsibilities.

- Rule 320 - Automatic Fee Adjustment

Rule 320 provides that all Regulation III fees, with specified exceptions, are automatically adjusted July 1 of each year by the California Consumer Price Index for the preceding calendar year unless the Governing Board decides not to implement a fee adjustment, or to implement a different adjustment for a given year, either for all fees or for a specified fee or fees. The Executive Officer is directed to prepare annually a socioeconomic impact of the effect of the fee adjustment for review by stakeholders and the Governing Board and to hold a public hearing on the automatic fee adjustment to receive any public comments. Public comments and any responses, along with recommendations by the Budget Advisory Committee, are to be forwarded to the Governing Board by April 15 of each year.

- Treasury Operations Contingency Plan and Procedures

The Treasury Operations Contingency Plan and Procedures states the course of action that may be implemented by the South Coast AQMD to protect the safety and liquidity of the South Coast AQMD funds and to protect South Coast AQMD from disruptions to ongoing operations if: 1) the financial stability of Los Angeles County may jeopardize South Coast

## FINANCIAL POLICIES (cont.)

AQMD funds invested through the Los Angeles County Treasurer; and/or 2) the Los Angeles County Treasurer, as Treasurer of South Coast AQMD, can no longer provide the treasury services currently provided in a satisfactory manner.

Under authority granted by Resolution 97-32, the Executive Officer can appoint either the Assistant Deputy Executive Officer of Finance or Controller as Acting Treasurer to immediately begin implementing the defined procedures to safeguard South Coast AQMD funds.

- Unreserved Fund Balance Policy

The Unreserved Fund Balance Policy, originally adopted by the Board in June 2005 and adjusted in June 2014, states that the Unreserved Fund Balance in the General Fund should be maintained at a minimum of 20% of revenues. GFOA Recommended Best Practices prescribe a minimum 17% reserve amount plus an additional amount based on the organization's reliance on revenue over which it has no control. The 20% reserve amount is derived from the minimum 17% plus an additional 3% to account for South Coast AQMD's reliance on state subvention (\$4M), U.S. EPA Section 103/105 grants (\$5M), and one-time penalties and settlements (\$5M).

### Executive Officer Administrative Policies and Procedures

- Contracting for Consulting and Professional Services

Contracting for Consulting and Professional Services policy provides guidance in contracting for consulting and professional services in both a competitive and sole source environment as addressed in Section VIII of the South Coast AQMD Procurement Policy and Procedure document.

- Fixed Assets and Controlled Items

The Fixed Assets and Controlled Items policy provides guidance on the receipt, transfer, inventory, accountability, and disposal of fixed assets and controlled items.

- Purchasing of Non-Consultant Services and Supplies

The Purchasing of Non-Consultant Services and Supplies policy provides guidance in implementing the purchase of non-consultant services and supplies as addressed in Section IV of the South Coast AQMD Procurement Policy and Procedure document.

- Travel

The Travel Policy provides guidance on allowable travel expenses, travel advances, and documentation requirements.

## BUDGET GLOSSARY

<b>Adopted Budget</b>	The annual budget for the General Fund that has been approved by South Coast AQMD's Governing Board.
<b>Amended Budget</b>	The adopted budget plus any modifications approved by South Coast AQMD's Governing Board during the fiscal year.
<b>Appropriation</b>	A specific amount of money authorized by South Coast AQMD's Governing Board which permits the South Coast AQMD to incur obligations and to make expenditures of resources.
<b>Assigned Fund Balance</b>	The portion of the fund balance that has been allocated by South Coast AQMD's Governing Board for a specific purpose.
<b>Budget Advisory Committee</b>	A committee made up of representatives from the business and environmental communities who review and provide feedback on South Coast AQMD's financial performance and proposed budget.
<b>Budgetary Basis of Accounting</b>	A form of accounting used in the budget where encumbered amounts are recognized as expenditures.
<b>Balanced Budget</b>	A budget in which planned expenditures do not exceed planned revenues.
<b>Capital Asset</b>	Tangible asset with an initial individual cost of \$5,000 or more and a useful life of at least three years or intangible assets with an individual cost of \$5,000 or more and a useful life of at least one year.
<b>Capital Outlays</b>	Expenditures for capital assets; A Major Object, or classification of expenditures, within South Coast AQMD's budget.
<b>Committed Fund Balance</b>	The portion of the fund balance that includes amounts that can be used only for specific purposes as determined by the South Coast AQMD Governing Board.
<b>CPI-Based Fee Increase</b>	Increases to fees (emission, annual operating, permit processing, Hot Spots, area sources, transportation, source test/analysis, and Hearing Board) based on the change in the Consumer Price Index for the preceding calendar year as reported for California Department of Finance—All Urban Consumer Series. This is in accordance with the California Health and Safety Code §40510.5.

## BUDGET GLOSSARY (cont.)

<b>Debt Service</b>	The cost to cover the repayment of interest and principal on a debt for a particular period of time.
<b>Debt Structure</b>	The make-up of long-term debt. South Coast AQMD's long-term debt has been taken on to fund building and pension obligations.
<b>Designation</b>	A portion of the Fund Balance that has been assigned for specific purposes by actions of South Coast AQMD's Governing Board.
<b>Encumbrance</b>	An amount of money committed for the payment of goods and services that have not yet been received or paid for.
<b>Expenditures</b>	Charges incurred for goods and services.
<b>Fee Schedule</b>	The State Legislature has authorized air districts to levy fees to support industry related programs which improve air quality. The schedule of fees levied by South Coast AQMD is approved by South Coast AQMD's Governing Board as part of the annual budget process. (Also see Regulation III.)
<b>Fiscal Year</b>	A period of 12 consecutive months selected to be the budget year. South Coast AQMD's fiscal year runs from July 1 to June 30.
<b>FTE</b>	Full Time Equivalent; A measure of the level of staffing. One FTE equates to 2,080 hours of paid time within a 12 month period.
<b>Fund Balance</b>	The accumulation of revenues less expenditures within a fund for a specific year. South Coast AQMD's fund balance is broken out into Reserves (nonspendable and committed) and Unreserved Designations. Unreserved Designations is further broken out into Assigned and Unassigned Fund Balance. This terminology is in accordance with GASB 54.
<b>GASB 54</b>	A standard issued by the Government Accounting Standards Board (GASB) to guide fund balance reporting.
<b>General Fund</b>	The primary operating fund for South Coast AQMD where expenditures and revenues associated with the daily operations of South Coast AQMD are accounted for.
<b>Grant</b>	A sum of money given by an organization for a particular purpose. The grants which provide funding to South Coast AQMD's General Fund are primarily received from the U. S. Environmental Protection Agency (EPA),

## BUDGET GLOSSARY (cont.)

the Department of Homeland Security (DHS), and the Department of Energy (DOE).

<b>Inventory</b>	Value at cost of office, computer, cleaning and laboratory supplies at year-end.
<b>Major Object</b>	South Coast AQMD has four expenditure classifications: Salaries and Employee Benefits, Services and Supplies, Capital Outlays, and Building Remodeling. Transfers between Major Objects must be approved by the South Coast AQMD Governing Board.
<b>Mobile Source Revenues</b>	Revenues received from motor vehicle registrations and from the administration of motor vehicle programs aimed at reducing air pollution from motor vehicles.
<b>Nonspendable Fund Balance</b>	Amounts in the fund balance that are not in a spendable form. In South Coast AQMD's General Fund, inventory makes up the nonspendable balance.
<b>Pension Obligation Bonds (POBs)</b>	A method of financing used by South Coast AQMD to refinance its obligations to its employees' pension fund.
<b>Proposed Budget</b>	The annual budget that has been developed by South Coast AQMD and made available to the public for review before being presented to the South Coast AQMD Governing Board for approval.
<b>Regulation III</b>	The rule that establishes the fee rates and schedules associated with permitting, annual renewals, emissions and other activities that help fund most of South Coast AQMD's regulatory programs and services. (Also see Fee Schedule.)
<b>Reserves</b>	Funding within the Fund Balance that is set aside for a specific future use and not available for any other purpose. It consists of both nonspendable amounts (inventory of supplies) and committed amounts (encumbrances).
<b>Revenue</b>	Monies the South Coast AQMD receives as income. South Coast AQMD's revenue is mainly from fees charged to control or regulate emissions.
<b>SBCERA</b>	San Bernardino County Employment Retirement System manages the retirement plan for South Coast AQMD employees.



## BUDGET GLOSSARY (cont.)

<b>Salaries and Employee Benefits</b>	Expenditures for Salary expenses, employee benefits, retirement and insurance benefits. It is a Major Object, or classification of expenditures, within South Coast AQMD's budget.
<b>Services and Supplies</b>	Expenditures for items and services needed for the daily operations of the South Coast AQMD including professional services, utilities, office expenses, maintenance, and debt service. It is a Major Object, or classification of expenditures, within South Coast AQMD's budget.
<b>Special Revenue Fund</b>	A fund used to account for revenues and expenditures from specific sources earmarked for specific purposes. South Coast AQMD's main fund is its General Fund. All other funds are designated as Special Revenue Funds. The South Coast AQMD does not adopt a budget for Special Revenue Funds. Board action is required for all expenditures.
<b>State Subvention</b>	The state of California provides assistance to air districts for on-going operations to perform mandated functions such as compliance and enforcement, planning, and rule development.
<b>Stationary Source Fees</b>	Revenues collected from emission fees, permit fees, and annual operating fees to support activities for improving air quality.
<b>Transfer In/Out</b>	A transfer between different funds within South Coast AQMD's accounting system. For example, a transfer of cash from the General Fund to a Special Revenue Fund would be a Transfer Out for the General Fund and a Transfer In for the Special Revenue Fund.
<b>Unassigned Fund Balance</b>	The residual fund balance of the General Fund. It is not designated for a specific purpose and can only be used upon approval of South Coast AQMD's Governing Board.
<b>Unreserved Designations</b>	The portion of the Fund Balance that has not been committed by South Coast AQMD's Governing Board or is nonspendable due to specific Board constraints. It is further broken down into either amounts assigned by the Governing Board for specific purposes or an unassigned amount that can only be used upon approval of the Governing Board.
<b>Work Programs</b>	Activities carried out by South Coast AQMD staff. Work Programs are classified into nine Work Program Categories according to the nature of the activity being performed.



# Ten Things South Coast AQMD is Doing to Help Clean the Air

**Eliminating** dirty diesels by requiring fleets of school buses, transit buses, street sweepers, trash trucks and airport taxis to phase in clean-burning vehicles.



**Responding** to residents' air pollution complaints through **1-800-CUT-SMOG**.

**Conducting** Town Hall meetings to solicit residents' air quality concerns that help shape clean air policy.



**Carrying** out environmental justice initiatives to ensure cleaner air for all Southland residents.



**Conducting** special air monitoring studies in communities with the greatest air quality concerns.

**Providing** more than \$100 million in state and local funding to help convert diesel tugboats, construction equipment and heavy-duty trucks to lower-emission and clean fuel models, and establish on-shore electric power systems to provide electricity to ships docked at area ports.



**Co-sponsoring** research that helps us understand how air pollution impacts the public's health, especially children, athletes, and individuals with respiratory illnesses.

**Continuing** to develop new regulations to further reduce pollution from all sources – from dry cleaners to oil refineries to cement plants.



**Helping** fund research to develop zero-emission fuel cells, and hybrid technology to power cars, buses and other vehicles.

**Working** with clean air agencies worldwide to be part of a comprehensive solution to air pollution problems.



To learn more about what South Coast AQMD is doing to help clean the air, visit our website

[www.aqmd.gov](http://www.aqmd.gov)



South Coast Air Quality Management District: 21865 Copley Dr., Diamond Bar, CA 91765



South Coast  
Air Quality Management District

21865 Copley Drive  
Diamond Bar, CA 91765-4178

[www.aqmd.gov](http://www.aqmd.gov)

March 2019

# Clean Fuels Program

## 2018 Annual Report & 2019 Plan Update

### Technology Advancement Office

*Leading the way to zero and near-zero emission technologies*



South Coast  
Air Quality  
Management District

## **Cover Photo Credits**

### Top Row:

- Cummins' ultra-low emissions 12-liter natural gas engine for on-road heavy-duty vehicles
- Pre-pilot Hyster® 1150-CH electric container top handler being demonstrated at the ports
- Hyundai Nexo fuel cell SUV fueling up at SCAQMD's Diamond Bar hydrogen station

### Middle Row:

- Propane Bluebird school bus
- Daimler Freightliner Class 8 electric truck, part of their Class 6-8 battery electric truck and fast charging demonstration project
- Volvo Class 8 truck with all electric range developed under GGRF, precursor to electric truck development under the ZANZEFF-funded Volvo LIGHTS project
- Mobile monitoring van deployed by SCAQMD contractor FluxSense for the Multiple Air Toxics Exposure Study V (MATES V)

### Bottom Row:

- EVgo fast charging unit at SCAQMD's Diamond Bar headquarters
- TransPower Class 8 CNG hybrid truck developed under the Zero Emission Cargo Transport (ZECT) demonstration

## South Coast Air Quality Management District

### Governing Board

#### ***Chairman***

William A. Burke, Ed.D.  
Assembly Speaker Appointee

#### ***County Representatives***

Janice Hahn\*  
Supervisor, Los Angeles County

Lisa Bartlett  
Supervisor, Orange County

V. Manuel Perez\*  
Supervisor, Riverside County

Janice Rutherford  
Supervisor, San Bernardino County

#### ***State Representatives***

Joseph K. Lyou, Ph.D.  
Governor's Appointee

#### ***Vice Chairman***

Dr. Clark E. Parker, Sr.  
Senate Rules Committee Appointee

#### ***Cities Representatives***

Ben Benoit  
Council Member, City of Wildomar  
Riverside County Cities

Joe Buscaino\*\*  
Council Member, City of Los Angeles  
City of Los Angeles

Michael Cacciotti  
Council Member, City of South Pasadena  
Los Angeles County, Eastern Region  
Cities

Larry McCallon\*  
Mayor Pro Tem, City of Highland  
San Bernardino County Cities

Judith Mitchell\*  
Mayor, City of Rolling Hills Estates  
Los Angeles County, Western Region  
Cities

Dwight Robinson\*  
Council Member, City of Lake Forest  
Orange County Cities

#### ***Executive Officer***

Wayne Nastri

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\*Technology Committee Members (as of 2/15/19)

\*\*Technology Committee Chairman

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*This year's Annual Report and Plan Update  
are dedicated to*

## **Dr. Fritz R. Kalhammer**

**Founding Member of the SB 98 Clean Fuels Advisory Group  
Serving from 1999 to 2018,  
As a scientific community representative.**

Dr. Kalhammer has been an independent consultant in energy and process technology since 1995, prior to which he worked at EPRI and served on the National Research Council Committee. A native of West Germany, he recently relocated permanently to Germany and resigned from the Advisory Group. We thank him for his nearly 20 years of dedicated service and input to our program.



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## South Coast Air Quality Management District

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## EXECUTIVE SUMMARY

### Introduction

The South Coast Air Quality Management District (SCAQMD) is the air pollution control agency for all of Orange County and the urban portions of Los Angeles, Riverside and San Bernardino counties. This region, which encompasses all of the South Coast Air Basin plus small portions of the Mojave Desert and Salton Sea Air Basins, historically experiences the worst air quality in the nation due to the natural geographic and atmospheric conditions of the region, coupled with the high population density and associated mobile and stationary source emissions.

Last year marked the 30th year of the Clean Fuels Program. It was in 1988 that SB 2297 (Rosenthal) was signed into law (Chapter 1546). It initially established a “five-year program to increase the use of clean fuels,” but subsequent legislation extended and eventually removed the sunset clause for the Program. That legislation also reaffirmed existence of the Technology Advancement Office (TAO) to administer the Clean Fuels Program. The TAO Clean Fuels Program is an integral part of the SCAQMD’s effort to achieve the significant NOx reductions called for in the 2016 AQMP because it affords the SCAQMD the ability to fund research, development, demonstration and accelerated deployment of clean fuels and transformative transportation technologies.

Last year also marked another significant milestone for TAO, the 20th year of the Carl Moyer Program. The two programs produce a unique synergy, with the Carl Moyer Program (and other incentive programs) providing the necessary incentives to push market penetration of the technologies developed and demonstrated by the Clean Fuels Program. This synergy enables the SCAQMD to act as a leader in both technology development and commercialization efforts targeting reduction of criteria pollutants.

Using funding received through a \$1 motor vehicle registration fee, the Clean Fuels Program encourages, fosters and supports clean fuels and transportation technologies, such as hydrogen and fuel cells, natural gas engines and infrastructure, battery electric vehicles, plug-in hybrid electric vehicles and related fueling infrastructure including renewable fuels. A key strategy of the Program, which allows significant leveraging of the Clean Fuels funding (typically \$3-\$4 to every \$1 of Clean Fuels funds), is its public-private partnership with private industry, technology developers, academic institutions, research institutions and government agencies. From 1988 to 2018, the Clean Fuels Program leveraged \$321 million into \$1.5 billion in projects.

While SCAQMD aggressively seeks to leverage funds to accomplish more with every dollar, it also strives to be a leader in technology development and commercialization to accelerate the reduction of criteria pollutants. As a result, the TAO Clean Fuels Program has traditionally supported a portfolio of technologies, in different stages of maturity, to provide a continuum of emissions reductions and health benefits over time. This approach provides the greatest flexibility and enhances the region’s chances to achieve the National Ambient Air Quality Standards (NAAQS).

California Code, Health and Safety Code (H&SC) 40448.5(e), calls for the Clean Fuels Program to consider, among other factors, the current and projected economic costs and availability of fuels, the cost-effectiveness of emissions reductions associated with clean fuels compared with other pollution control alternatives, the use of new pollution control technologies in conjunction with traditional fuels as an alternative means of reducing emissions, potential effects on public health, ambient air quality, visibility within the region, and other factors determined to be relevant by the south coast district. The



Legislature recognized the need for flexibility that allows focus on a broad range of technology areas, including cleaner fuels, which can help SCAQMD in achieving its clean air goals.

H&SC 40448.5.1 requires the SCAQMD to prepare, and submit to the Legislative Analyst each year, a Clean Fuels Annual Report and Plan Update. The Clean Fuels Annual Report looks at what the Program accomplished in the prior calendar year (CY) and the Clean Fuels Plan Update looks ahead at proposed projects for the next CY, essentially re-calibrating the technical emphasis of the Program. Preliminary review and comment by SCAQMD’s Governing Board, advisory groups, technical experts and other interested parties are incorporated into the final Plan Update, along with the Clean Fuels Annual Report, which are due to the Legislative Analyst by March 31 of every year.

## Setting the Stage

The overall strategy of TAO’s Clean Fuels Program is based, in large part, on emissions reduction technology needs identified in the Air Quality Management Plan (AQMP) and the SCAQMD Governing Board’s directives to protect the health of the approximately 17 million residents (nearly half the population of California) in the South Coast Air Basin (Basin). The AQMP, which is updated approximately every four years, is the long-term regional “blueprint” that relies on fair-share emissions reductions from all jurisdictional levels (e.g., federal, state and local). The 2016 AQMP, which was adopted by the SCAQMD Governing Board in March 2017, is composed of stationary and mobile source emissions reductions from traditional regulatory control measures, incentive-based programs, projected co-benefits from climate change programs, mobile source strategies and reductions from federally regulated sources (e.g., aircraft, locomotives and ocean-going vessels).

The emissions reductions and control measures in the 2016 AQMP rely on a mix of currently available technologies as well as the expedited development and commercialization of lower-emitting mobile and stationary advanced technologies in the Basin to achieve health-based air quality standards. The 2016 AQMP projects that an approximate 45 percent reduction in NO<sub>x</sub> is required by 2023 and an additional 55 percent reduction by 2031. Figure 1 illustrates these needed NO<sub>x</sub> reductions in the Basin. The majority of these NO<sub>x</sub> reductions must come from mobile sources, both on-road and off-road. Notably, the SCAQMD is currently only one of two regions in the nation designated as an extreme ozone nonattainment area (the other is San Joaquin Valley). Ground level ozone (a key component of smog) is created by a chemical reaction between NO<sub>x</sub> and volatile organic compound (VOC) emissions in sunlight. This is especially noteworthy because in the South Coast Air Basin the primary driver for ozone formation is NO<sub>x</sub> emissions, and mobile sources contribute approximately 88 percent of the NO<sub>x</sub> emissions in this region, as shown in Figure 2. Furthermore, NO<sub>x</sub> emissions, along with VOC emissions, also lead to the formation of PM<sub>2.5</sub> [particulate matter measuring 2.5 microns or less in size, expressed as micrograms per cubic meter (µg/m<sup>3</sup>)].

## Basin Total NO<sub>x</sub> Emissions

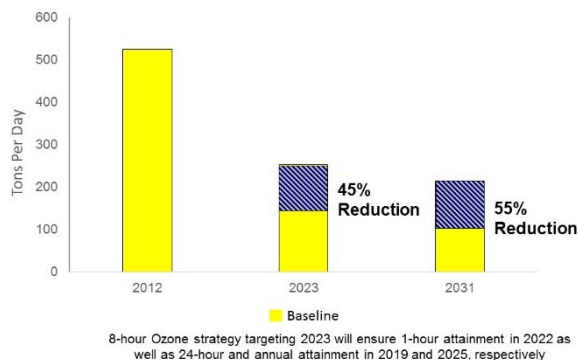
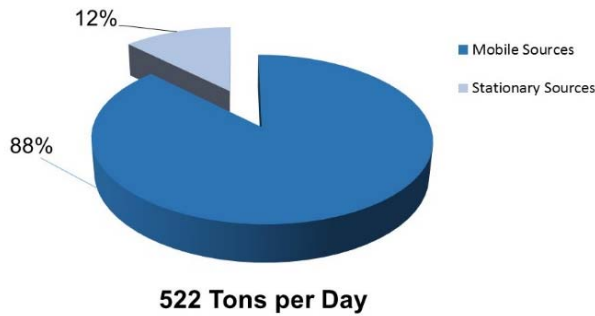


Figure 1: Total NO<sub>x</sub> Reductions Needed

## Sources of NOx: Mobile and Stationary (2012)



For the first time, the 2016 AQMP identified a means to achieving the federal standards through regulations and heavy incentives for near-zero and zero emissions technologies that are commercial or nearing commercialization. This strategy however, requires a national, lower heavy-duty truck emissions standard, significant additional financial resources, and accelerated fleet turnover on a massive scale.

Figure 2: Sources of NOx 2012 Base Year

## Clean Fuels Program

Due to these daunting challenges to reduce NOx and PM2.5 to meet health-based air quality standards, the Clean Fuels Program is more important than ever to encourage and accelerate the advancement and commercialization of clean fuel and transportation technologies, especially with Original Equipment Manufacturers (OEMs).

Figure 3 provides a conceptual design of the wide scope of the Clean Fuels Program and the relationship with incentive programs. As mentioned in the Core Technologies section (page 6), various stages of technology projects are funded not only to provide a portfolio of emissions technology choices but to achieve emissions reduction benefits in the nearer as well as over the longer term. The SCAQMD Clean Fuels Program typically funds projects in the Technology Readiness Level (TRL) ranging between 3-8.

Figure 3: Stages of Clean Fuels Program Funding



Below is a brief summary of the contents of the 2018 Clean Fuels Program Annual Report and 2019 Plan Update. Every Plan Update is reviewed by two advisory groups--the Clean Fuels Advisory Group and the Technology Advancement Advisory Group. These two groups meet approximately every six months to provide expert analysis and feedback on potential projects and areas of focus. They are also briefed and comment on the accomplishments of the prior year in the context of the annual report. The membership of these two bodies is in Appendix A. For more information on this review process, refer to Program Review (page 2). Further review of the Clean Fuels Program is detailed under the Strategy and Impact section (page 15).

## 2018 Annual Report

In CY 2018, the SCAQMD Clean Fuels Program executed 74 new contracts, projects or studies and modified 1 continuing project adding dollars toward research, development, demonstration and deployment (RD<sup>3</sup>) projects as well as technology assessment and transfer of alternative fuel and clean fuel technologies.

Table 2 (page 32) lists the 75 projects or studies, which are further described in this report. The SCAQMD Clean Fuels Program contributed nearly \$27 million in partnership with other governmental organizations, private industry, academia and research institutes, and interested parties, with total project costs of more than \$85 million. The \$27 million includes \$12.3 million recognized into the Clean Fuels Fund as pass-through funds from project partners to facilitate project administration by the Clean Fuels Program. This \$12.3 million, which is about double the typical amount recognized into Clean Fuels on an average year, included \$3.1 million from a U.S. EPA Airshed Grant for near-zero CNG school buses, with the remaining incoming revenue from a U.S. EPA DERA Grant, CEC and the Ports as stakeholder partners. Table 3 (page 35) provides information on this outside funding received into the Clean Fuels Fund. Additionally, in CY 2018, the Clean Fuels Program continued to leverage other outside funding opportunities, securing new awards totaling \$54.5 million from federal, state and local funding opportunities. Table 4 (page 35) provides a comprehensive summary of these federal, state and local revenues awarded to the SCAQMD during CY 2018. Similar to the last couple of years, the significant project scope of a few key contracts executed in 2018 resulted in higher than average leveraging of Clean Fuels dollars. Typical leveraging is \$3-\$4 for every \$1 in Clean Fuels funding. In 2017, leveraging was more than \$1:\$6; in 2018, SCAQMD continued this upward trend with nearly \$6 leveraged for every \$1 in Clean Fuels funds. Leveraging dollars and aggressively pursuing funding opportunities are more important than ever given the magnitude of needed funding identified in the 2016 AQMP to achieve federal ozone air quality standards.

The projects or studies executed in 2018 included a diverse mix of advanced technologies. The following core areas of technology advancement for 2018 executed contracts (in order of funding percentage) include:

1. Electric and Hybrid Vehicle Technologies and Related Infrastructure (emphasizing electric and hybrid electric trucks developed by OEMs and container transport technologies with zero emission operations);
2. Engine Systems/Technologies (emphasizing alternative and renewable fuels for truck and rail applications);
3. Fueling Infrastructure and Deployment (predominantly natural gas and renewable fuels);
4. Technology Assessment and Transfer/Outreach;
5. Fuel/Emissions Studies;
6. Hydrogen and Mobile Fuel Cell Technologies and Infrastructure; and
7. Emissions Control Technologies.

The pie chart on page 30 shows the distribution by percentage of executed agreements in 2018 across these core technologies.

During CY 2018, the SCAQMD supported a variety of projects and technologies, ranging from near-term to long-term RD<sup>3</sup> activities. This “technology portfolio” strategy provides the SCAQMD the ability and flexibility to leverage state and federal funding while also addressing the specific needs of the Basin. Projects included significant electric and hybrid electric technologies and infrastructure to develop and demonstrate medium- and heavy-duty vehicles in support of transitioning to a near-zero and zero emissions goods movement industry; development, demonstration and deployment of large displacement natural gas and ultra-low emissions engines; and demonstration of emissions control

technologies for heavy-duty engines; and natural gas and renewable natural gas deployment and support.

In addition to the 75 executed contracts and projects, 21 RD<sup>3</sup> projects or studies and 24 technology assessment and transfer contracts were completed in 2018, as listed in Table 5 (page 54). Appendix C comprises two-page summaries of the technical projects completed in 2018. As of January 1, 2019, there were 106 open contracts in the Clean Fuels Program; Appendix B lists these open contracts by core technology.

In accordance with California H&SC Section 40448.5.1(d), this annual report must be submitted to the state legislature by March 31, 2019, after approval by the SCAQMD Governing Board.

## 2019 Plan Update

Every year, staff re-evaluates the Clean Fuels Program to develop a Plan Update based on a reassessment of the technology progress and direction for the agency. The Program continually seeks to support the development and deployment of lower-emitting technologies with an increasing collaboration with OEMs. The design and implementation of the Program Plan must balance the needs in the various technology sectors with technology readiness, emissions reduction potential and cofunding opportunities. As the state continues to focus a great deal of its attention to climate change and petroleum reduction goals, the SCAQMD has necessarily remained committed to developing, demonstrating and commercializing technologies that reduce criteria pollutants, specifically NO<sub>x</sub> and toxic air contaminants (TACs). Fortunately, many, if not the majority, of these technologies that address the Basin's need for NO<sub>x</sub> and TAC reductions also garner reductions in greenhouse gases (GHG) and petroleum use. Due to these "co-benefits," the SCAQMD has been successful in partnering with the state, which allows the Clean Fuels Program to leverage its funding extensively.

To identify technology and project opportunities where funding can make a significant difference in deploying progressively cleaner technologies in the Basin, the SCAQMD employs a number of outreach and networking activities. These activities range from close involvement with state and federal collaboratives, partnerships and industrial coalitions, to the issuance of Program Opportunity Notices to solicit project ideas and concepts as well as issuance of Requests for Information (RFIs) to determine the state of various technologies and the development and commercialization challenges faced by those technologies. Potential development, demonstration and certification projects resulting from these outreach and networking activities are included conceptually within the Draft 2019 Plan Update.

The Plan Update includes projects to develop, demonstrate and commercialize a variety of technologies, from near-term to long-term commercialization, that are intended to provide solutions to the emissions control needs identified in the 2016 AQMP. Given the need for significant reductions over the next five to ten years, near-zero and zero emissions technologies are emphasized. Areas of focus include:

- reducing emissions from port-related activities, such as cargo handling equipment and container movement technologies, including demonstration and deployment of zero emissions drayage trucks;
- developing and demonstrating ultra-low emissions liquid fuel larger displacement engines and zero emissions heavy-duty vehicles;
- developing, demonstrating and deploying advanced (increased efficiency) natural gas engines and vehicles as well as near-zero and zero emissions technologies for high horsepower applications;
- mitigating criteria pollutant increases from renewable fuels, such as renewable natural gas, diesel and hydrogen as well as other renewable fuels and waste streams;

- producing transportation fuels and energy from renewable and waste stream sources;
- developing and demonstrating electric-drive (fuel cell, battery, plug-in hybrid and hybrid) technologies across light-, medium- and heavy-duty platforms; and
- establishing large-scale hydrogen refueling and EV charging infrastructures to help accelerate the introduction of zero emissions vehicles into the market.

Table 6 (page 71) lists the potential projects across nine core technologies by funding priority:

1. Hydrogen/Mobile Fuel Cell Technologies and Infrastructure;
2. Electric/Hybrid Vehicle Technologies and Related Infrastructure (emphasizing electric and hybrid electric trucks and container transport technologies with zero emission operations);
3. Engine Systems/Technologies (emphasizing alternative and renewable fuels for truck and rail applications);
4. Fueling Infrastructure and Deployment (predominantly natural gas and renewable fuels);
5. Fuel and Emissions Studies;
6. Stationary Clean Fuels Technologies (including renewables);
7. Health Impacts Studies;
8. Emissions Control Technologies; and
9. Technology Assessment and Transfer/Outreach.

These potential projects for 2019 total \$16.9 million, with anticipated leveraging of more than \$4 for every \$1 of Clean Fuels funding for total project costs of \$73.7 million. Some of the proposed projects may also be funded by revenue sources other than the Clean Fuels Program, especially VOC and NOx mitigation and incentive projects.

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# CLEAN FUELS PROGRAM

## Background and Overview

### Program Background

The South Coast Air Basin, which comprises all of Orange County and the urban portions of Los Angeles, San Bernardino and Riverside counties, has the worst air quality in the nation due to a combination of factors, including high vehicle population, high vehicle miles traveled within the region and geographic and atmospheric conditions favorable for photochemical oxidant (smog) formation. This region, which encompasses all of the South Coast Air Basin plus small portions of the Mojave Desert and Salton Sea Air Basins, is home to approximately 17 million people (nearly half the population of California). Due to these confluence of factors which present unique challenges, the state legislature enabled the SCAQMD to implement the Clean Fuels Program to accelerate the implementation and commercialization of clean fuels and advanced mobile source technologies.

California H&SC section 40448.5(e) calls for the Clean Fuels Program to consider, among other factors, the current and projected economic costs and availability of fuels, the cost-effectiveness of emissions reductions associated with clean fuels compared with other pollution control alternatives, the use of new pollution control technologies in conjunction with traditional fuels as an alternative means of reducing emissions, potential effects on public health, ambient air quality, visibility within the region, and other factors determined to be relevant by the south coast district. The Legislature recognized the need for flexibility that allows focus on a broad range of technology areas, including cleaner fuels, which can help SCAQMD in achieving its clean air goals.

Last year marked the 30th year of the Clean Fuels Program. It was in 1988 that SB 2297 (Rosenthal) was signed into law (Chapter 1546). It initially established a “five-year program to increase the use of clean fuels,” but subsequent legislation extended and eventually removed the sunset clause for the Program. That legislation also reaffirmed existence of the Technology Advancement Office (TAO) to administer the Clean Fuels Program. The TAO Clean Fuels Program is an integral part of the SCAQMD’s effort to achieve the significant NO<sub>x</sub> reductions called for in the 2016 AQMP. From 1988 to 2018, the Clean Fuels Program leveraged \$321 million into \$1.5 billion in projects. This approach has enabled the SCAQMD to historically leverage public funds with outside investment in a ratio of about \$4 of outside funding to every dollar of Clean Fuels funding.

In 1999, further state legislation was passed which amended the Clean Fuels Program. Specifically, as stated in the H&SC section 40448.5.1(d), the SCAQMD must submit to the Legislature, on or before March 31 of each year, an annual report that includes:

1. A description of the core technologies that the SCAQMD considers critical to ensure attainment and maintenance of ambient air quality standards and a description of the efforts made to overcome barriers to commercialization of those technologies;
2. An analysis of the impact of the SCAQMD’s Clean Fuels Program on the private sector and on research, development and commercialization efforts by major automotive and energy firms, as determined by the SCAQMD;
3. A description of projects funded by the SCAQMD, including a list of recipients, subcontractors, cofunding sources, matching state or federal funds and expected and actual results of each project advancing and implementing clean fuels technology and improving public health;

4. The title and purpose of all projects undertaken pursuant to the Clean Fuels Program, the names of the contractors and subcontractors involved in each project and the amount of money expended for each project;
5. A summary of the progress made toward the goals of the Clean Fuels Program; and
6. Funding priorities identified for the next year and relevant audit information for previous, current and future years covered by the project.

Furthermore, H&SC section 40448.5.1(a)(2) requires the SCAQMD to find that the proposed program and projects funded as part of the Clean Fuels Program will not duplicate any other past or present program or project funded by the state board and other government and utility entities. This finding does not prohibit funding for programs or projects jointly funded with another public or private agency where there is no duplication. Concurrent with adoption and approval of the annual report and plan update every year, the Board will consider the efforts TAO has undertaken in the prior year to ensure no such duplication has occurred then make a finding through a Resolution attesting such.

The following section describes the various panels of external experts that helps review the Clean Fuels Program every year.

## Program Review

In 1990, the SCAQMD initiated an annual review of its technology advancement program by an external panel of experts. That external review process has evolved, in response to SCAQMD policies and legislative mandates, into two external advisory groups. The Technology Advancement Advisory Group (one of six standing Advisory Groups that make up the SCAQMD Advisory Council) is made up of stakeholders representing industry, academia, regulatory agencies, the scientific community and environmental impacts. The Technology Advancement Advisory Group serves to:

- Coordinate the SCAQMD program with related local, state and national activities;
- Review and assess the overall direction of the program; and
- Identify new project areas and cost-sharing opportunities.

In 1999, the second advisory group was formed as required by SB 98 (Alarcon). Under H&SC Section 40448.5.1(c), this advisory group must comprise 13 members with expertise in clean fuels technology and policy or public health and appointed from the scientific, academic, entrepreneurial, environmental and public health communities. This legislation further specified conflict-of-interest guidelines prohibiting members from advocating expenditures towards projects in which they have professional or economic interests. The objectives of the SB 98 Clean Fuels Advisory Group are to make recommendations regarding projects, plans and reports, including consulting with regarding approval of the required annual report prior for submittal to the SCAQMD Governing Board. Also in 1999, in light of the formation of the SB 98 Clean Fuels Advisory Group, the SCAQMD also revisited the charter and membership of the Technology Advancement Advisory Group to ensure their functions would complement each other.

On an as-needed basis, changes to the composition of the Clean Fuels Advisory Group are reviewed by the SCAQMD Board while changes to the Technology Advancement Advisory Group are reviewed by the SCAQMD Board's Technology Committee.

The charter for the Technology Advancement Advisory Group calls for approximately 12 technical experts representing industry, academia, state agencies, the scientific community and environmental interests. Traditionally, there has been exactly 12 members on this advisory group, but this year staff is recommending to the Board's Technology Committee that it add representatives from the Ports of Long Beach and Los Angeles, as both entities have been integral players and stakeholders in demonstrating

near-zero and zero emissions technologies in and around the ports and surrounding environmental justice communities.

As needed, current membership changes to both advisory groups will be considered by the SCAQMD Board and its Technology Committee, respectively, as part of consideration of the 2018 Annual Report and 2019 Plan Update. The current members of the SB 98 Clean Fuels Advisory Group and Technology Advancement Advisory Group are listed in Appendix A, with proposed changes duly noted, subject to either SCAQMD Board approval or the Board's Technology Committee, per the advisory group's charters.

The review process of the Clean Fuels Program now includes, at minimum: 1) two full-day retreats of the both Advisory Groups, typically in the summer and winter; 2) review by other technical experts; 3) occasional technology forums or roundtables bringing together interested parties to discuss specific technology areas; 4) review by the Technology Committee of the SCAQMD Board; 5) a public hearing of the Annual Report and Plan Update before the full SCAQMD Board, along with adoption of the Resolution finding that the proposed program and projects funded as part of the Clean Fuels Program will not duplicate any other past or present program or project funded by the state board and other government and utility entities, as required by the H&SC; and 6) finally submittal of the Clean Fuels Program Annual Report and Plan Update to the Legislature by March 31 of every year.

## The Need for Advanced Technologies & Clean Fuels

Achieving federal and state clean air standards in Southern California will require emissions reductions from both mobile and stationary sources beyond those expected using current technologies. The need for advanced mobile source technologies and clean fuels is best illustrated by Figure 1 below, which identifies just how far NO<sub>x</sub> emissions must be reduced to meet federal standards by 2023 and 2031.

To fulfill near -and long-term emissions reduction targets, the 2016 AQMP relies on a mix of currently available technology as well as the expedited development and demonstration of advanced technologies that are not yet ready for commercial use. Significant reductions are anticipated from implementation of advanced control technologies for both on-road and off-road mobile sources. In addition, the air quality standards for ozone (70 ppb, 8-hour average) and fine particulate matter, promulgated by the U.S. EPA, are projected to require additional long-term control measures for both NO<sub>x</sub> and VOC.

The 2016 AQMP's estimate of needed NO<sub>x</sub> reductions will require the SCAQMD Clean Fuels Program to encourage and accelerate advancement of clean transportation technologies that are used as control strategies in the AQMP. Of note is another significant milestone in 2018 for TAO, the 20th year anniversary of the Carl Moyer Program. The two programs produce a unique synergy, with the Carl Moyer Program (and other incentive programs) providing the necessary incentives to push market penetration of the technologies developed and demonstrated by the Clean Fuels Program. This synergy enables the SCAQMD to act as a leader in both technology development and commercialization efforts targeting reduction of criteria pollutants. Health studies also indicate a greater need to reduce NO<sub>x</sub> emissions and toxic air contaminant emissions. For example, the goal of SCAQMD's Multiple Air

### Basin Total NO<sub>x</sub> Emissions

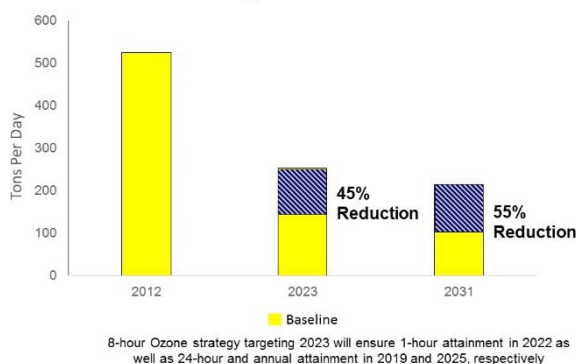


Figure 1: Total NO<sub>x</sub> Reductions Needed



Toxics Exposure Study (MATES) IV, completed in 2015, like the prior three MATES efforts, was to assess air toxic levels, update risk characterization, and determine gradients from selected sources. However, MATES IV added ultrafine PM and black carbon monitoring components as well. The study found a dramatic decrease in ambient levels of diesel particulate matter and other air toxics. Diesel PM was still the major driver of air toxics health risks. While the levels and exposures decreased, a revision to the methods used to estimate cancer risk from toxics developed by the California Office of Health Hazard Identification increased the calculated risk estimates from these exposures by a factor of up to three. In 2017, SCAQMD initiated MATES V to update the emissions inventory of toxic air contaminants and modeling to characterize risks, including measurements and analysis of ultrafine particle concentrations typically emitted or converted from vehicle exhaust, and the carcinogenic risk from exposure of air toxics.

### Sources of NOx: Mobile and Stationary (2012)

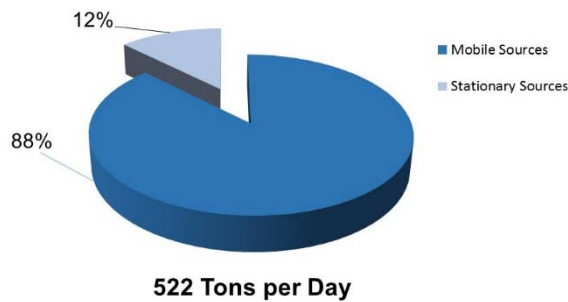


Figure 2: Sources of NOx 2012 Base Year

In the South Coast Air Basin, the primary driver for ozone formation is NOx emissions, and mobile sources contribute approximately 88 percent of the NOx emissions in this region, as shown in Figure 2. Given this contribution, significant cuts in pollution from these sources are needed, therefore the proposed mobile source strategy calls for establishing requirements for cleaner technologies (both near-zero and zero) and deploying these technologies into the fleet, requiring cleaner and renewable fuels, and ensuring continued clean performance in use.

In summary, advanced, energy efficient and renewable technologies are needed not only for attainment, but also to protect the health of those who reside within the SCAQMD’s jurisdiction; to reduce long-term dependence on petroleum-based fuels; and to support a more sustainable energy future. Conventional strategies and traditional supply and consumption need to be retooled in order to achieve the federal air quality goals. To help meet this need for advanced, clean technologies, the SCAQMD Board continues to aggressively carry out the Clean Fuels Program and promote alternative fuels through its Technology Advancement Office.

The Clean Fuels Program is intended to assist in the accelerated development and deployment of progressively lower-emitting technologies and fuels through innovative public-private partnership. As previously noted, since its inception, SCAQMD’s TAO has cofunded projects in cooperative partnerships with private industry, technology developers, academic and research institutions and local, state and federal agencies. In 2018, with projects initiated with two of the largest heavy-duty truck OEMs on electric trucks, this process is well underway to not only demonstrating these technologies with local fleets, but to scale the commercialization of these technologies.

The following sections describe program funding, provide a 2018 overview and describe core technologies of the Clean Fuels Program.

## Program Funding

The Clean Fuels Program is established under California H&SC Sections 40448.5 and 40512 and Vehicle Code Section 9250.11. This legislation establishes mechanisms to collect revenues from mobile and stationary sources to support the program objectives and identifies the constraints on the use of

funds. In 2008, these funding mechanisms were reauthorized under SB 1646 (Padilla), which removed the funding sunset of January 1, 2010, and established the five percent administrative cap instead of the previous cap of two-and-half percent.

Specifically, the Program is funded through a \$1 fee on motor vehicles registered in the SCAQMD. Revenues collected from these motor vehicles must be used to support mobile source projects. Stationary source projects are funded by an emission fee surcharge on stationary sources emitting more than 250 tons of pollutants per year within the SCAQMD. This revenue is typically about \$13.5 million and \$350,000, respectively, every year. For CY 2018, the funds available through each of these mechanisms were as follows:

- |   |              |
|---|--------------|
| • Mobile sources (DMV revenues)               | \$13,644,642 |
| • Stationary sources (emission fee surcharge) | \$344,198    |

The SCAQMD Clean Fuels Program also receives grants and cost-sharing revenue contracts from various agencies, on a project-specific basis, that supplement the SCAQMD program. Historically, such cooperative project funding revenues have been received from CARB, the CEC, the U.S. EPA, the U.S. Department of Energy (DOE) and the U.S. Department of Transportation (DOT). These supplemental revenues depend in large part on the originating agency, its budgetary and planning cycle and the specific project or intended use of the revenues.

Table 3 (page 35) lists the supplemental grants and revenues totaling \$12.3 million for contracts executed in CY 2018.

Table 4 (page 35) lists the federal and state revenue totaling nearly \$54.5 million awarded to the SCAQMD in 2018 for projects that will be part of the overall Clean Fuels Program's RD<sup>3</sup> efforts, even if for financial tracking purposes the revenue is recognized into another special revenue fund other than the Clean Fuels Fund (Fund 31).

The final and perhaps most significant funding source can best be described as an indirect source, i.e., funding not directly received by the SCAQMD. This indirect source is the cost-sharing provided by private industry and other public and private organizations. Historically, the Technology Advancement Office has been successful in leveraging its available public funds with \$3 to \$4 of outside funding for each \$1 of SCAQMD funding. For 2018, the Clean Fuels Program leveraged each \$1 to nearly \$6 of outside funding. Similar to last year, this atypical leverage was the result of a few key contracts with significant project scopes executed in 2018, such as the \$31 million project with Daimler Trucks North America, the Southern California Sustainable Freight demonstrations, and the opposed piston engine development project with CALSTART funded in large part by CARB (see the Project Summaries by Core Technologies for more information on these key projects, as well as the project highlights in the Strategy and Impact section starting on page 16). Through these public-private partnership, the SCAQMD has shared the investment risk of developing new technologies along with the benefits of expedited development and commercial availability, increased end-user acceptance, reduced emissions from the demonstration projects and ultimately increased use of clean technologies in the Basin. While the SCAQMD aggressively seeks leverage funds to accomplish more with every dollar, it also strives to be a leader in technology development and commercialization in an effort to accelerate the reduction of criteria pollutants. Leveraging dollars and aggressively applying for additional funds whenever funding opportunities arise is more important than ever given the magnitude of additional funding identified in the 2016 AQMP to achieve federal ozone air quality standards. The SCAQMD's Clean Fuels Program has also avoided duplicative efforts by coordinating and jointly funding projects with major funding agencies and organizations. The major funding partners for 2018 are listed in Table 1 (page 16).

## 2018 Overview

This report summarizes the progress of the SCAQMD Clean Fuels Program for CY 2018. The SCAQMD Clean Fuels Program cost-shares projects to develop and demonstrate low, near-zero and zero emissions clean fuels and advanced technologies, to push the state-of-the-technology, and to promote commercialization and deployment of promising or proven technologies in Southern California. As noted, these projects are conducted through public-private partnerships with industry, technology developers, academic and research institutes and local, state and federal agencies.

This report also highlights achievements and summarizes project costs of the SCAQMD Clean Fuels Program in CY 2018. During the period between January 1 and December 31, 2018, the SCAQMD executed 74 new contracts/agreements, projects or studies and modified 1 continuing project adding dollars during CY 2018 that support clean fuels and advanced zero, near-zero and low emission technologies. The SCAQMD Clean Fuels Program contribution for these projects was approximately \$27 million, inclusive of \$12.3 million received into the Clean Fuels Fund as cost-share for contracts executed in this reporting period. Total project costs exceed \$85 million. These projects address a wide range of issues with a diverse technology mix including near-term emissions reductions and long-term planning efforts. The report not only provides information on outside funding received into the Clean Fuels Fund as cost-share for contracts executed in this period (summarized in Table 3, page 35), but also funds awarded to the SCAQMD for projects that fall within the scope of the Clean Fuels Program's RD<sup>3</sup> efforts but may have been recognized (received) in another special revenue fund for financial tracking purposes (\$54.5 million in 2018, see Table 4). Notably, the SCAQMD was awarded \$44 million by CARB as project partner with Volvo on their Low Impact Green Heavy Transportation Solutions (LIGHTS) Project, which has a total project cost of over \$100 million and will advance and hopefully commercialize electric truck technology. More details on this financial summary can be found later in this report. The SCAQMD will continue to pursue federal, state and private funding opportunities in 2019 to amplify leverage, while acknowledging that support of a promising technology is not contingent on outside cost-sharing and affirming that SCAQMD will remain committed to being a leader in developing advanced technologies that lower criteria pollutants.

## Core Technologies

Given the diversity of sources that contribute to the air quality problems in the Basin, there is no single technology or “Silver Bullet” that can solve all of the problems. A number of technologies are required and these technologies represent a wide range of applications, with full emissions benefit “payoffs,” i.e., full commercialization and mass deployment occurring at different times. The broad technology areas of focus – the “Core Technologies” – for the Clean Fuels Program are as follows:

- Hydrogen/Fuel Cell Technologies and Infrastructure (especially large-scale refueling facilities)
- Electric/Hybrid Vehicle Technologies and Infrastructure (emphasizing electric and hybrid electric trucks and container transport technologies with zero emission operation)
- Engine Systems/Technologies (emphasizing heavy-duty alternative and renewable fuel engines for truck and rail applications)
- Fueling Infrastructure and Deployment (predominantly natural gas and renewable fuels)
- Fuel and Emissions Studies
- Stationary Clean Fuels Technologies
- Emission Control Technologies
- Health Impacts Studies, and
- Technology Assessment and Transfer/Outreach

At its January 2019 retreat, the Technology Advancement and SB-98 Clean Fuels Advisory Groups asked staff to take another look at these core technologies to determine if they still fit within the strategy of the Clean Fuels Program. That effort will be undertaken in 2019.

The SCAQMD continually seeks to support the deployment of lower-emitting technologies. The Clean Fuels Program is shaped by two basic factors:

1. Low, near-zero and zero emission technologies needed to achieve clean air standards in the Basin; and
2. Available funding to support technology development within the constraints imposed by that funding.

The SCAQMD strives to maintain a flexible program to address dynamically evolving technologies and the latest progress in the state of the technology while balancing the needs in the various technology sectors with technology readiness, emissions reduction potential and cofunding opportunities. Although the SCAQMD program is significant, national and international activities affect the direction of technology trends. As a result, the SCAQMD program must be flexible in order to leverage and accommodate these changes in state, national and international priorities. Nonetheless, while the state and federal governments have in recent years turned a great deal of their attention to climate change, SCAQMD has remained committed to developing, demonstrating and commercializing near-zero and zero emission technologies. Fortunately, many, if not the majority, of technology sectors that address our need for NO<sub>x</sub> reductions also garner greenhouse gas (GHG) reductions. Due to these “co-benefits,” the SCAQMD has been successful in partnering with the state and federal government. Even with the leveraged funds, the challenge for the SCAQMD remains the need to identify project or technology opportunities in which its available funding can make a difference in achieving progressively cleaner air in the Basin.

To achieve this, the SCAQMD will need to continue to employ a number of outreach and networking activities as well as evaluate new ways to expand these activities. Typical activities range from intimate involvement with state and federal collaboratives, partnerships and industrial coalitions, to the issuance of Program Opportunity Notices to solicit project ideas and concepts as well as the issuance of Requests for Information to determine the state of various technologies and the challenges faced by those technologies for commercialization. While employing a number of creative outreach and networking activities to try to overcome these challenges, SCAQMD’s TAO annually develops a comprehensive plan to encourage and accelerate the development and demonstration of cleaner technologies. Every year TAO staff re-evaluates the Clean Fuels Program to develop a comprehensive plan (referred to as the 2019 Plan Update within this document) to essentially re-assess the technology progress and direction for the agency.

Historically, mobile source projects have targeted low-emission developments in automobiles, transit buses, medium- and heavy-duty trucks and non-road applications. These vehicle-related efforts have focused on advancements in engine design, electric power-trains and energy storage/conversion devices (e.g., fuel cells and batteries); and implementation of clean fuels (e.g., natural gas, propane and hydrogen) including their infrastructure development. Stationary source projects have included a wide array of advanced low NO<sub>x</sub> technologies and clean energy alternatives such as fuel cells, solar power and other renewable and waste energy systems. The focus on recent years has been on near-zero and zero emission technologies to reduce emissions from mobile sources, which contribute to more than 80 percent of the current NO<sub>x</sub> emissions in this region. However, while mobile sources include both on- and off-road vehicles as well as aircraft and ships, only the federal government has the authority to regulate emissions from aircraft and ships. The SCAQMD is exploring opportunities to expand its authority in ways that would allow the agency to do more to foster technology development for ship and train activities as well as locomotives as they relate to goods movement.

Specific projects are selected for cofunding from competitive solicitations, cooperative agency agreements and unsolicited proposals. Criteria considered in project selection include emissions reduction potential, technological innovation, potential to reduce costs and improve cost effectiveness, contractor experience and capabilities, overall environmental impacts or benefits, commercialization and business development potential, cost sharing and cost-sharing partners, and consistency with program goals and funding constraints. The core technologies for the SCAQMD programs that meet both the funding constraints as well as 2016 AQMP needs for achieving clean air are briefly described below.

## **Hydrogen/Mobile Fuel Cell Technologies and Infrastructure**

Toyota and Hyundai commercialized light-duty fuel cell vehicles in 2015, Honda started delivering their Fuel Cell Clarity in 2016, and numerous others have plans to commercialize their own in the near future. As automakers continue to collaborate on development efforts (e.g., Honda and GM) and commercialize fuel cell vehicles, in the interim plug-in hybrid technology could help enable fuel cells by using larger capacity batteries until fuel cell components mature. For example, Mercedes-Benz announced production of a plug-in fuel cell model GLC for 2018, with U.S. availability approximately late 2019. However, the greatest challenge for the viability of fuel cell vehicles remains the installation and operations of hydrogen fueling stations. AB 8 requires the CEC to allocate \$20 million annually from the Alternative and Renewable Fuel and Vehicle Technology Program until there are at least 100 publicly accessible hydrogen stations in operation in California. Of the 65 stations funded by CEC and CARB by the end of 2018, partially funded by SCAQMD for those in our region, there are four non-retail and 39 retail operational in California, but most if not all 65 are expected to be operational by the end of 2019 with capacity for more than 10,000 fuel cell vehicles. AB 8 also requires CARB to annually assess current and future FCVs and hydrogen stations in the marketplace. *The Joint Agency Staff Report on Assembly Bill 8: 2018 Annual Assessment of Time and Cost Needed to Attain 100 Hydrogen Refueling Stations in California*<sup>1</sup> released in July 2018 reporting on 2018 findings states that there were 4,411 fuel cell vehicles registered in California by May 2018. However, CARB's 2017 Annual Evaluation projects 13,400 FCEVs in California by 2020 and 37,400 by the end of 2023. Additionally, CaFCP's *The California Fuel Cell Revolution, A Vision For Advancing Economic, Social, and Environmental Priorities (Vision 2030)* includes the need for up to 1,000 refueling stations statewide as well as identifying the need to expand the market with heavy-duty technologies and their infrastructure. Clearly, the SCAQMD must continue to support the infrastructure required to refuel retail fuel cell vehicles and the nexus to medium- and heavy-duty trucks including their lower cost fueling infrastructure. To that end, SCAQMD is also actively engaged in finding alternatives to reducing the cost of hydrogen (e.g., large-scale hydrogen refueling stations) and potential longer term fuel cell power plant technology.

## **Electric/Hybrid Vehicle Technologies and Infrastructure**

There has been an increased level of activity and attention on electric and hybrid vehicles due to a confluence of factors, including the highly successful commercial introductions of hybrid passenger vehicles and more recently plug-in electric vehicles (PEVs) by almost all of the automakers and increased public attention on global warming, as well as several Executive Orders issued by Governor Brown over the last couple of years. The Governor's most recent Executive Order, which was issued on January 26, 2018, calls for 5 million ZEVs by 2030.

EV adoption surpassed a huge milestone in 2017, selling more than 360,000 cumulative electric vehicles in California, according to Veloz (formerly the PEV Collaborative), with increasingly more announcements by international automakers (e.g., Mercedes-Benz, Volkswagen-Audi-Porsche,

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<sup>1</sup> <http://www.energy.ca.gov/2017publications/CEC-600-2017-011/CEC-600-2017-011.pdf>

Hyundai/Kia, Ford, GM and several growing Chinese brands) on a variety of electrification plans, including some with extended zero emissions range. Joining the trend with Tesla Model 3 to longer electric ranges and faster charging, the 2017 Chevy Bolt EV, with an estimated EPA range of 238 miles and an affordable price after incentives, was a best seller. However, what is now needed is technology transfer to the medium- and heavy-duty vocations. As with hydrogen and fuel cell technologies SCAQMD is actively pursuing research, development and demonstration projects for medium and heavy-duty electric vehicles and their commercialization.

## **Engine Systems/Technologies**

Medium- and heavy-duty on-road vehicles contributed approximately 33 percent of the Basin's NOx based on 2016 AQMP data. More importantly, on-road heavy-duty diesel trucks account for 33 percent of the on-road mobile source PM2.5, a known TAC. Furthermore, according to CARB, trucks and buses are responsible for 37 percent of California's greenhouse gases and criteria emissions. Furthermore, while MATES IV found a dramatic decrease in ambient levels of diesel PM and other air toxics, diesel PM is still the major driver of air toxics health risks. Clearly, significant emission reductions will be required from mobile sources, especially from the heavy-duty sector, to attain the federal clean air standards.

The use of alternative fuels in heavy-duty vehicles can provide significant reductions in NOx and particulate emissions. The current NOx emissions standard for heavy-duty engines is 0.2 g/bhp-hr. The SCAQMD, along with various local, state and federal agencies, continues to support the development and demonstration of alternative-fueled low emission heavy-duty engine technologies, using natural gas, renewable natural gas or hydrogen, renewable diesel and potentially other renewable or waste stream fuels, for applications in heavy-duty trucks, transit and school buses, rail operations, and refuse collection and delivery vehicles to meet future federal emission standards.

In connection with the challenge to develop cleaner engine systems, on June 3, 2016, SCAQMD petitioned the EPA to initiate rulemaking for a lower NOx national standard for heavy-duty engines. The EPA has since acknowledged a need for additional NOx reductions through a harmonized and comprehensive national NOx reduction program for heavy duty on-highway engines and vehicles. The EPA announced the Cleaner Truck Initiative on November 13, 2018, to reduce NOx emissions from on-road heavy-duty trucks, but the proposed NOx rule is anticipated in early 2020. Although welcome news, this timing is still too late to help the SCAQMD meet its 2023 federal attainment deadline. So despite progress, commercialization and deployment of near-zero engines are still needed in the interim.

## **Fueling Infrastructure and Deployment (NG/Renewable Fuels)**

A key element for increased use of alternative fueled vehicles and resulting widespread acceptance is the availability of the supporting refueling infrastructure. The refueling infrastructure for gasoline and diesel fuel is well established and accepted by the driving public. Alternative, clean fuels such as alcohol-based fuels, propane, hydrogen, and even electricity are much less available or accessible, whereas natural gas and renewable fuels have recently become more readily available and cost-effective. Nonetheless, to realize emissions reduction benefits, alternative fuel infrastructure, especially fuels from renewable feedstocks, must be developed in tandem with the growth in alternative fueled vehicles. While California appears to be on track to meet its Renewable Portfolio Standard targets of 33% by 2020 and 50% by 2030 as required by SB 350 (chaptered October 2015), the objectives of the SCAQMD are to expand the infrastructure to support near-zero and zero emission vehicles through the development, demonstration and installation of alternative fuel vehicle refueling technologies. However, this category is predominantly targeted at natural gas and renewable natural gas (RNG) infrastructure and deployment (electric and hydrogen fueling are included in their respective technology categories). The Clean Fuels Program will continue to examine opportunities where current incentive funding is either absent or insufficient.

## **Health Impacts, Fuel and Emissions Studies**

The monitoring of pollutants in the Basin is extremely important, especially when focused on (1) a particular sector of the emissions inventory (to identify the responsible technology) or (2) exposure to pollution (to assess the potential health risks). Several studies indicate that areas with high levels of air pollution can produce irreversible damage to children's lungs. This information highlights the need for further emissions and health studies to identify the emissions from high polluting sectors as well as the health effects resulting from these technologies. As we transition to new fuels and forms of transportation, it is important to understand the impacts that changing fuel composition will have on exhaust emissions and in turn on ambient air quality. This area focuses on exhaust emission studies, with a focus on NO<sub>x</sub> and PM<sub>2.5</sub> emissions and a detailed review of other potential toxic tailpipe emissions, for alternative fuel and diesel engines. These types of in-use emissions studies have found significantly higher emissions than certification values for heavy-duty diesel engines, depending on the duty-cycle.

## **Stationary Clean Fuel Technologies**

Given the limited funding available to support low emission stationary source technology development, this area has historically been limited in scope. To gain the maximum air quality benefits in this category, higher polluting fossil fuel-fired electric power generation needs to be replaced with clean, renewable energy resources or other advanced near zero-emission technologies, such as solar, wind, geo-thermal energy, bio-mass conversion and stationary fuel cells. Although combustion sources are lumped together as stationary, the design and operating principles vary significantly and thus also the methods and technologies for control of their emissions. Included in the stationary category are boilers, heaters, gas turbines and reciprocating engines. The key technologies for this category focus on using advanced combustion processes, development of catalytic add-on controls, alternative fuels and technologies and stationary fuel cells in novel applications.

## **Emissions Control Technologies**

This broad category refers to technologies that could be deployed on existing mobile sources, aircraft, locomotives, marine vessels, farm and construction equipment, cargo handling equipment, industrial equipment, and utility and lawn-and-garden equipment. The in-use fleet comprises the majority of emissions, especially the older vehicles and non-road sources, which are typically uncontrolled and unregulated, or controlled to a much lesser extent than on-road vehicles. The authority to develop and implement regulations for retrofit on-road and non-road mobile sources lies primarily with the U.S. EPA and CARB.

Low-emission and clean-fuel technologies that appear promising for on-road mobile sources should be effective at reducing emissions from a number of non-road sources. For example, immediate benefits are possible from particulate traps and selective catalytic reduction (SCR) that have been developed for on-road diesel applications although retrofits are often hampered by physical size and visibility constraints. Clean fuels such as natural gas, propane, hydrogen and hydrogen-natural gas mixtures may also provide an effective option to reduce emissions from some non-road applications. Reformulated gasoline, ethanol and alternative diesel fuels, such as biodiesel and gas-to-liquid (GTL), also show promise when used in conjunction with advanced emissions controls and new engine technologies.

## **Technology Assessment and Transfer/Outreach**

Since the value of the Clean Fuels Program depends on the deployment and adoption of the demonstrated technologies, technology assessment and transfer efforts are essential to its success. This core area encompasses assessment of advanced technologies, including retaining outside technical assistance as needed, efforts to expedite the implementation of low emission and clean fuels

technologies, and coordination of these activities with other organizations. Technology transfer efforts also include support for various clean fuel vehicle incentive programs. The other spectrum of this core technology is information dissemination to educate the end user and increase awareness. While SCAQMD's Public Affairs office oversees and carries out the majority of such education and awareness efforts on behalf of the entire agency, TAO cosponsors and occasionally hosts various technology-related events to complement their efforts. These efforts range from general outreach and partnerships to convening or cosponsoring events. Some examples include: 1) SCAQMD's Making Sense of Sensors International Conference in September 2017; 2) the annual spring ACT Expo, which SCAQMD cosponsors and attends; 3) the inaugural Electrification 2018 International Conference held in summer 2018 at which SCAQMD was a speaker and exhibitor; 4) CALSTART's 2030 Summit on clean transportation this past fall; 5) partnerships for national events such as Drive Electric Week; and 6) hosting tours of SCAQMD's clean fuel vehicle fleet and their respective fueling platforms.



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# CLEAN FUELS PROGRAM

## Barriers, Scope and Impact

### Overcoming Barriers

Commercialization and implementation of advanced technologies come with a variety of challenges and barriers. A combination of real-world demonstrations, education, outreach and regulatory impetus and incentives is necessary to bring new, clean technologies to market. To reap the maximum emissions benefits from any technology, widespread deployment and user acceptance must occur. The product manufacturers must overcome technical and market barriers to ensure a competitive and sustainable business. Barriers include project-specific issues as well as general technology concerns.

#### Technology Implementation Barriers

- Viable commercialization Path
- Technology price/performance parity with convention technology
- Consumer acceptance
- Fuel availability/convenience issues
- Certification, safety and regulatory barriers
- Quantifying emissions benefits
- Sustainability of market and technology

#### Project-Specific Issues

- Identifying a committed demonstration site
- Overall project cost and cost-share using public monies
- Securing the fuel
- Identifying and resolving real and perceived safety issues
- Quantifying the actual emissions benefits
- Viability of the technology provider

Other barriers include reduced or shrinking research budgets, infrastructure and energy uncertainties and risks, sensitivity to multi-media environmental impacts and the need to find balance between environmental needs and economic constraints. The SCAQMD seeks to address these barriers by establishing relationships through unique public-private partnerships with key stakeholders; e.g., industry, end-users and other government agencies with a stake in developing clean technologies. Partnerships that involve all the key stakeholders have become essential to address these challenges in bringing advanced technologies from development to commercialization.

Each of these stakeholders and partners contributes more than just funding. Industry, for example, can contribute technology production expertise as well as the experience required for compatibility with process operations. Academic and research institutes bring state-of-the- technology knowledge and testing proficiency. Governmental and regulatory agencies can provide guidance in identifying sources with the greatest potential for emissions reduction, assistance in permitting and compliance issues, coordinating of infrastructure needs and facilitation of standards setting and educational outreach. Often, there is considerable synergy in developing technologies that address multiple goals of public and private bodies regarding the environment, energy and transportation.

### Scope and Benefits of the Clean Fuels Program

Since the time needed to overcome barriers can be long and the costs high, both manufacturers and end-users tend to be discouraged from considering advanced technologies. The Clean Fuels Program addresses these needs by cofunding research, development, demonstration and deployment projects to share the risk of emerging technologies with their developers and eventual users.

Figure 3 provides a conceptual design of the wide scope of the Clean Fuels Program. As mentioned in the Core Technologies section, various stages of technology projects are funded not only to provide a portfolio of emissions technology choices but to achieve emission reduction benefits in the nearer as well as over the longer term. The SCAQMD Clean Fuels Program funds projects in the Technology Readiness Level ranging between 3-8.



**Figure 3: Stages of Clean Fuels Program Projects**

Due to the nature of these advanced technology research, development, demonstration and deployment projects, the benefits are difficult to quantify since their full emission reduction potential may not be realized until sometime in the future, or perhaps not at all if displaced by superior technologies. Nevertheless, a good indication of the impact and benefits of the Clean Fuels Program overall is provided by this selective list of sponsored projects that have resulted in commercialized products or helped to advance the state-of-the-technology.

- CNG Engine Development for Heavy-Duty Vehicles
  - Cummins Westport: low-NO<sub>x</sub> natural gas ISL G 8.9L and 12L engines (0.2 & 0.02 g/bhp-hr);
  - Detroit Diesel: Series 60G (CNG/LNG), Series 50G (CNG/LNG); and
  - Clean Air Partners/Power Systems (Caterpillar): 3126B (Dual Fuel), C-10 (Dual Fuel), C-12 (Dual Fuel).
  - Kenworth CNG Hybrid Electric Drayage Truck project;
- Fuel Cell Development and Demonstrations
  - Kenworth Fuel Cell Range Extended Electric Drayage Truck project;
  - Ballard Fuel Cell Bus (first of its kind);
  - Retail light-duty passenger fuel cell vehicles (Toyota Mirai, Hyundai Tucson, Honda Clarity);
  - Orange County Transportation Authority GGRF Fuel Cell Bus project;
  - SunLine Transit Agency Advanced Fuel Cell Bus projects;
  - Commercial stationary fuel cell demonstration with UTC and SoCalGas (first of its kind);
  - Orange County Sanitation District hydrogen and combined heat and power generation from biogas using molten carbonate fuel cell technology (as well as their renewable hydrogen station);
  - New Flyer and El Dorado Transit Bus at OCTA;
  - UPS demonstration of fuel cell delivery trucks; and
  - Fuel cell Class 8 trucks under Zero Emission Cargo Transport (ZECT) II Program
- Electric and Hybrid Electric Vehicle Development and Demonstrations
  - Hybrid electric delivery trucks with NREL, FedEx and UPS;
  - Siemens Catenary Electric Truck project;

- Proterra battery electric transit bus and fast charging system;
  - South Bay City Council of Governments' electric vehicle project;
  - EVI/UPS electric truck;
  - Plug-in hybrid work truck with Odyne Systems;
  - Plug-in hybrid van and pickup with VIA Motors;
  - BYD all-electric transit bus and trucks (yard hostlers and drayage);
  - LACMTA battery electric buses;
  - Blue Bird Electric School Bus with Vehicle to Grid (V2G) capability;
  - TransPower Electric school buses, including V2G capability;
  - TransPower/US Hybrid battery electric heavy-duty truck and yard hostlers; and
  - PACCAR (Kenworth and Peterbilt) battery-electric and plug-in hybrid electric drayage trucks.
- Aftertreatment Technologies for Heavy-Duty Vehicles
- Johnson Matthey and Engelhard trap demonstrations on buses and construction equipment;
  - Johnson Matthey SCRT and SCCRT NO<sub>x</sub> and PM reduction control devices on heavy-duty on-road trucks; and
  - Southwest Research Institute development of aftertreatment for medium-duty diesel engines

SCAQMD played a leading or major role in the development of these technologies, but their benefits could not have been achieved without all stakeholders (i.e., manufacturer, end-users and government) working collectively to overcome the technology, market and project-specific barriers encountered at every stage of the research, development, demonstration and deployment process.

## Strategy and Impact

In addition to the feedback and input detailed in Program Review (page 2), the SCAQMD actively seeks additional partners for its program through participation in various working groups, committees and task forces. This participation has resulted in coordination of the SCAQMD program with a number of state and federal government organizations, including CARB, CEC, U.S. EPA and DOE/DOT and several of the national laboratories. Coordination also includes the AB 2766 Discretionary Fund Program administered by the Mobile Source Air Pollution Reduction Review Committee (MSRC), various local air districts, National Association of Fleet Administrators (NAFA), major local transit districts, local gas and electric utilities, the San Pedro Bay Ports and several universities with research facilities, including but limited to California State University Los Angeles, Purdue University, Universities of California Berkeley, Davis, Irvine, Los Angeles and Riverside, and University of West Virginia. The list of organizations with which the SCAQMD coordinates research and development activities also includes organizations specified in H&SC Section 40448.5.1(a)(2).

In addition, the SCAQMD holds periodic meetings with several organizations specifically to review and coordinate program and project plans. For example, the SCAQMD staff meets with CARB staff to review research and development plans, discuss project areas of mutual interest, avoid duplicative efforts and identify potential opportunities for cost-sharing. Periodic meetings are also held with industry-oriented research and development organizations, including but not limited to the California Fuel Cell Partnership (CaFCP), the California Stationary Fuel Cell Collaborative, the California Natural Gas Vehicle Partnership (CNGVP), the Electric Power Research Institute (EPRI), Veloz (formerly the PEV Collaborative), the Los Angeles Cleantech Incubator's Regional Transportation Partnership, the California Hydrogen Business Council (CHBC), the SoCalEV Collaborative and the West Coast Collaborative, which is part of the National Clean Diesel Campaign. The coordination efforts with these various stakeholders have resulted in a number of cosponsored projects.

Descriptions of some of the key contracts executed in CY 2018 are provided in the next section of this report. It is noteworthy that most of the projects are cosponsored by various funding organizations and include the active involvement of original equipment manufacturers (OEMs). Such partnerships are essential to address commercialization barriers and to help expedite the implementation of advanced low emission technologies. Table 1 below lists the major funding agency partners and manufacturers actively involved in SCAQMD projects for this reporting period. It is important to note that, although not listed, there are many other technology developers, small manufacturers and project participants who make important contributions critical to the success of the SCAQMD program. These partners are identified in the more detailed 2018 Project Summaries by Core Technologies (beginning page 37) contained within this report.

**Table 1: SCAQMD Major Funding Partners in CY 2018**

<b>Research Funding Organizations</b>	<b>Major Manufacturers/Providers</b>
California Air Resources Board	Achates Power, Inc.
California Energy Commission	Clean Energy
Department of Energy	Cummins Westport, Inc.
Environment Canada	Daimler Trucks North America
National Renewable Energy Laboratory	Hyster-Yale Group, Inc.
U.S. Environmental Protection Agency	Peterbuilt Motors Company
<b>Local Air Districts &amp; Utilities</b>	Ports of Los Angeles & Long Beach
San Joaquin APCD	Rail Propulsion Systems
Sacramento Metropolitan AQMD	University of California Riverside/CE-CERT
Southern California Edison	Velocity Vehicle Group
Southern California Gas Company	Volvo Technology of America LLC

The following two subsections broadly address the SCAQMD's impact and benefits by describing specific examples of accomplishments including commercial or near-commercial products supported by the Clean Fuels Program in CY 2018. Such examples are provided in the following sections on the Technology Advancement Office's Research, Development and Demonstration projects and Technology Deployment and Commercialization efforts.

## **Research, Development and Demonstration**

Important examples of the impact of the SCAQMD research and development coordination efforts in 2018 include: (a) Clean Fuels Program Strategy for Commercialization of Zero Emissions Drayage Trucks; (b) Demonstration of Near-Zero and Zero Emissions Drayage Trucks and Cargo Handling Equipment; and (c) Development of Alternative Heavy-Duty Diesel Engine Technologies.

### **Clean Fuels Program Strategy for Commercialization of Zero Emissions Drayage Trucks**

The Clean Fuels Program strategy for the commercialization of zero emissions technology in the heavy-duty truck sector emerged around 2010. A key element of the strategy was to engage major original equipment manufacturers (OEMs) in the development and demonstration and eventual commercialization of zero emissions technologies. The heavy-duty truck OEMs have the ability to

design, develop, manufacture, market and service large volumes of vehicles, and large volume is the key to meeting the Basin's emissions reduction goals. SCAQMD initially engaged small startups and vehicle integrators interested in developing and demonstrating zero emissions technologies. Most of the Clean Fuels projects were a small number of proof-of-concept trucks like the first ZECT project that developed and demonstrated battery electric and hybrid electric trucks. The second ZECT project included Kenworth, a major truck OEM, as a partner developing two vehicles—a fuel cell range extended truck and a CNG-hybrid drayage truck.

With an award of approximately \$4.2 million in 2012 from DOE's first ZECT solicitation, coupled with some cost-share from Clean Fuels, SCAQMD contracted with two local EV integrators, TransPower and US Hybrid, to develop and demonstrate a total of 11 zero and near-zero emissions capable heavy-duty drayage trucks (Figure 4), based on two different architectures, consisting of battery electric vehicles and plug-in hybrid electric drivetrains with all electric range capability. These trucks were deployed in real-world drayage operations with fleet partners operating at the Ports of Los Angeles and Long Beach for demonstration up to two years. Vehicle performance and operational data is being collected and analyzed by NREL to evaluate both technical feasibility and market viability of the technologies to support drayage operations.



**Figure 4: TransPower & US Hybrid ZECT 1 Trucks**

vehicle integrators. The TransPower ElecTruck™ design, which was first deployed in ZECT I successfully performing short-haul drayage operations, was converted with a fuel cell range-extender in ZECT II.

In 2016, SCAQMD received an award of approximately \$23.6 million to develop and demonstrate zero emissions drayage trucks under CARB's California Climate Initiative's Low Carbon Transportation Greenhouse Gas Reduction Fund (GGRF). In this project, TransPower teamed up with Peterbilt/TransPower taking the ElecTruck™ design and productionizing it, bringing it a step closer to commercialization. Peterbilt and TransPower are in the process of building 12 battery electric drayage trucks and will demonstrate them across a variety of real-world drayage applications in and around the Ports of Long Beach, Los Angeles, Oakland, Stockton and San Diego.



**Figure 5: Kenworth CNG-Hybrid Truck**



**Figure 6: Kenworth Fuel Cell Truck**

Kenworth Trucks, along with BAE Systems and other partners, developed a CNG hybrid and fuel cell powered truck for the ZECT II Project, and it is now in demonstration at the San Pedro ports. Kenworth and BAE Systems developed a plug-in hybrid electric truck (PHET) with a CNG-range extender. The technology is capable of providing a well-balanced blend of all electric and CNG-based hybrid operations. The electric drivetrain is based on BAE Systems HybriDrive® Series (HDS) propulsion system hardware currently used in transit buses. Kenworth will continue to develop that truck platform and bring it closer to commercialization in the SCAQMD's GGRF project.

The fuel cell truck that Kenworth and BAE Systems demonstrated in ZECT 2 (Figure 6) will be further developed with Toyota and their partner the Port of Los Angeles and an award from CARB's California Climate Initiative with SCAQMD cofounding. The project will demonstrate Kenworth's fuel cell drayage truck and will include Toyota's fuel cell integrated into ten of their trucks along with hydrogen infrastructure to support the demonstration.

Another OEM, BYD, a global company with over \$9 billion in revenue and 180,000 employees, including an assembly plant in Lancaster, CA, will develop 25 T9 battery electric drayage trucks for SCAQMD's GGRF project. The T9 truck is optimized to serve near-dock and short regional drayage routes within a range of 100 miles, supported by 300 kWh batteries on hand. The truck is designed to provide similar operating experience compared to equivalent diesel and CNG trucks with matching or exceeding power and torque. The T9 is a Class 8 truck with 80,000 pounds Gross Combined Weight Rating, powered by two 180 kW traction motors. BYD will utilize 200 kW AC on-board charger for these trucks.



**Figure 7: Volvo Hybrid Electric Truck**

In July 2012, SCAQMD was awarded \$1.2 million from the DOE Office of Science to develop a diesel hybrid drayage truck with Volvo Technologies of America (Figure 7). Coupled with cost-share from Clean Fuels, the objective of this project was to develop, build and demonstrate a prototype Class 8 heavy-duty plug-in hybrid drayage truck with significantly reduced emissions and fuel use. Volvo's approach leveraged the group's global knowledge and experience in designing and deploying electro-mobility products. The proprietary hybrid driveline selected for this proof of concept was integrated with multiple enhancements to the complete vehicle



**Figure 8: Volvo's Battery Electric Truck**

in order to maximize the emissions and energy impact of electrification. Volvo then teamed up with Siemens and SCAQMD for another project to develop and demonstrate overhead catenary electric trucks. A pantograph that allows a truck to connect to overhead power lines was integrated into the Volvo hybrid. The Volvo truck was successfully demonstrated on the Siemens eHighway in Carson, CA. To bring the hybrid vehicle architecture closer to the commercial stage,

Volvo then joined SCAQMD in the GGRF project funded by CARB and key air districts across California to further develop its hybrid and their emissions reduction technologies.

In October 2018, SCAQMD was awarded \$44.8 million from CARB's California Climate Initiative under their ZANZEFF (zero and near-zero efficient freight facilities) solicitation for our OEM partner Volvo to take the next step in electrification of its heavy duty trucks with the Volvo LIGHTS Project. Along with CARB funds, SCAQMD's Clean Fuels Program provided \$4 million with Volvo and partners providing over \$41 million for a total project cost of nearly \$90 million to develop, demonstrate and commercialize electric heavy-duty trucks. The project will feature a system of moving cargo from the ports to customers with zero emissions. Volvo's battery-electric drayage truck will haul containers from the San Pedro Bay Ports to the Inland Empire where they will be staged by an electric yard tractor and then unpacked by zero emissions forklifts. When the cargo is repacked, a portion of it will be delivered locally by Volvo's battery-electric urban distribution trucks and the remainder will be hauled regionally by another Volvo electric truck. The warehouses will also have solar energy to provide charging via smart charging infrastructure that minimizes grid impacts and cost. At the end of the project, Volvo intends to produce a commercial vehicle.

Daimler Trucks North America LLC (DTNA), the world's leader in heavy-duty truck sales, proposes to implement the Daimler Zero Emission Trucks and EV Infrastructure Project. Under the project, DTNA will develop battery-electric heavy-duty trucks and demonstrate them in real-world commercial fleet operations in and around environmental justice communities within the SCAQMD's jurisdiction to gather data and information from the end-users including performance under specific duty-cycle applications. DTNA will utilize the data and information to move toward commercial production. DTNA will supply ten Class 6 trucks with a gross vehicle weight rating (GVWR) up to 26,000 pounds and ten Class 8 trucks with a GVWR up to 80,000 pounds, including associated EV charging infrastructure. (Figure 9 & 10). Fleet partners, including Penske Leasing, will be identified and the trucks integrated into a range of services and applications to gather operational data to improve each charging and utilization scheme, with seven of the Class 8 trucks to be used in port drayage operations.

Having two of the largest truck manufacturers in the world--Daimler and Volvo--developing heavy-duty electric trucks in the South Coast Air Basin, an effort that was formulated nearly ten years ago, demonstrates the impact and strategy of SCAQMD's Clean Fuels Program. As the trucks that these OEMs are developing and demonstrating become commercial, SCAQMD's involvement will move to facilitate market penetration of these technologies through incentive programs administered by SCAQMD's Technology Advancement Office.

### **Demonstrate Near-Zero and Zero Emissions Drayage Trucks and Cargo Handling Equipment**

Mobile sources in goods movement sectors make up the large portion of NO<sub>x</sub> and PM<sub>2.5</sub> emissions in the Basin. Cargo handling equipment and drayage trucks have been identified as two of the most significant sources with adverse impact on air quality and public health, particularly in Environmental Justice communities adjacent to the Ports of Los Angeles and Long Beach that are disproportionately impacted by goods movement operations and activities, and resultant emissions of ozone precursors, toxic air contaminants and greenhouse gases. In order to mitigate these port-related emissions, SCAQMD strongly supports accelerated deployment of zero and near-zero emissions technologies in cargo transport and handling operations. Both the Ports of Los Angeles and Long Beach have also supported these technologies pursuant to a Zero Emissions Technologies Roadmap with an established plan for technologies to pursue to advance zero emissions technology development.

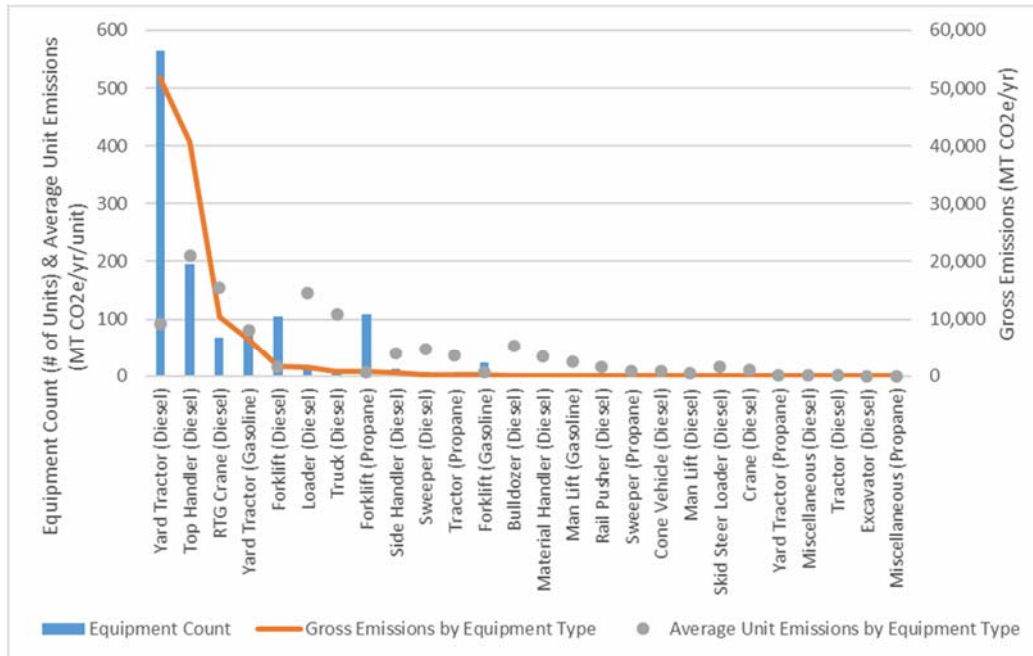
In partnership with key industry partners, SCAQMD will demonstrate zero and near-zero emissions technologies in cargo handling and drayage applications. Under this project, SCAQMD will demonstrate a zero emissions "top handler" using a wireless charging system in cargo handling operations. In addition, SCAQMD will deploy and demonstrate four drayage trucks, three units using



a natural gas engine certified at the 0.02 g NOx/bhp-hr in a plug-in hybrid platform, and one battery electric platform.

Electric Top Handler Development, Integration and Demonstration

This battery electric cargo handling demonstration project is specifically targeting top handler equipment. With the continued growth of global container cargo, there is a commensurate growth in cargo handling equipment. Top handlers represent the largest size class of mobile cargo handling equipment (CHE) at California ports and therefore represent one of the highest remaining sources of emissions, particularly NOx and PM. Top handlers themselves represent the highest emissions source of mobile equipment per unit, and second highest equipment volumes, at the San Pedro Ports. With more than 360 units, they exceed the emissions of all other equipment for NOx and PM, and are second only to yard hostlers in carbon emissions (Figure 10). And, on a per-unit basis, they actually emit much more pollution given the large size of their engines and high utilization duty cycles.



**Figure 10: Emissions Profile of Cargo Handling Equipment: Gross Emissions and Average Unit Emissions (Source: PCEVB Research Report)**

Hyster-Yale Group, Inc. (HYG), is a world leader in electrified mobile lift equipment. Together with project partners, WAVE and CALSTART, HYG will scale their already prototyped modular electrified power systems to validate and demonstrate a pre-pilot Hyster® 1150-CH electric container handler – known as a Top Handler - at POLA’s APM Terminals (Figure 9). The equipment will be driven via electric power and all lifting functions will be powered by electric motors engaging hydraulic pumps. The 384 kWh battery will use high-powered wireless opportunity charging to match terminal operations. While retrofits have been performed, fully electrified off-road heavy cargo handling equipment is not available today in this weight class from a major OEM. The introduction of such equipment represents a major step forward in emissions-free options for port operators. Top Handlers are one of the largest



**Figure 9: Hyster Top Handler**

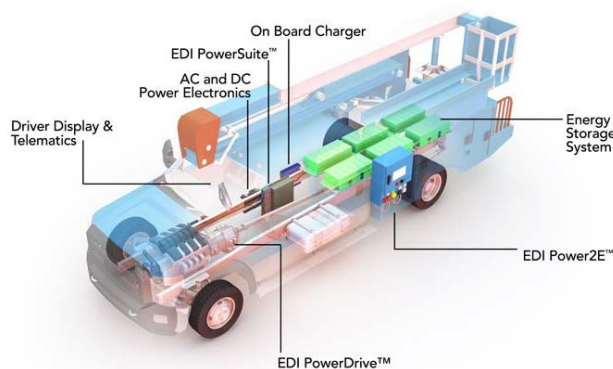
contributors of NOx and greenhouse gas emissions from mobile source goods movement equipment used at the San Pedro Bay Ports.

### Southern California Advanced Sustainable Freight Demonstration

The zero emissions electric trucks and near-zero natural gas hybrid trucks demonstrated in this project will target the heavy-duty Class 8 truck market--and specifically trucks in short-haul and regional applications, which will be and will continue to be one of the highest sources of NOx emissions.

These trucks generally operate for port drayage, food and beverage processing and distribution, wholesale and retail and less-than-truckload. In California, they represent only 8 percent of the total truck population of the state, but are responsible for significant NOx and about 18 percent of medium- and heavy-duty greenhouse gas emissions because of their high daily mileage and low fuel economy. In the South Coast Air Basin, it is estimated that the heavy-duty diesel truck and off-road mobile equipment comprise about 200,000 and 150,000 units, respectively. This segment of the truck market is an excellent target for electrification as it covers operation in dense urban areas where pollution is concentrated and has the most negative impact. The average duty cycle is also well suited for this project, with a higher percentage of stops and idle compared to over-the-road Class 8 trucks. Lastly, trucks usually return to the same location at the end of the day, which is convenient for recharging.

In this project, Velocity Vehicle Group, one of the nation's largest truck dealerships, will partner with Freightliner Trucks, the leading truck OEM for Class 8 trucks, and Efficient Drivetrains, Inc. (EDI),



**Figure 11: EDI PowerDrive™ Powertrain System**

which was recently acquired by Cummins Inc., a global leader and innovator of advanced, high-efficiency plug-in hybrid electric vehicles (PHEVs) and full battery electric vehicle (EV) drivetrains, to develop and demonstrate three PHEV Class 8 drayage trucks and one EV Class 8 drayage truck. EDI's PowerDrive™ 8000 technology is based on an intelligent four-mode, series-parallel drivetrain and provides full performance in both EV and PHEV configurations and no range limitations in PHEV configuration. The EDI PowerDrive™ 8000 EV drivetrain (Figure 11) can drive up to 100 miles in all-electric and zero emissions operation for short-haul vocations. The range extended plug-in hybrid version, the EDI PowerDrive™ 8000 PHEV drivetrain, delivers up to 35 miles of all-electric driving and a 300-plus mile series-parallel hybrid driving range before refueling is required. Successful demonstration of these technologies could provide significant benefits to the region in the form of reduced NOx and diesel PM emissions from the goods movement sector. The primary project locations are all located in disadvantaged communities. Each of these locations suffers from elevated levels of PM2.5 and other diesel-related emissions connected with goods movement activity. The project will displace activity of diesel-fueled equipment and replace it with technologies that completely eliminate diesel consumption and provide zero or near-zero emissions performance in these communities. In addition, the on-road drayage truck projects will reduce diesel-related emissions in the many other communities throughout the South Coast Air Basin that these trucks travel through.

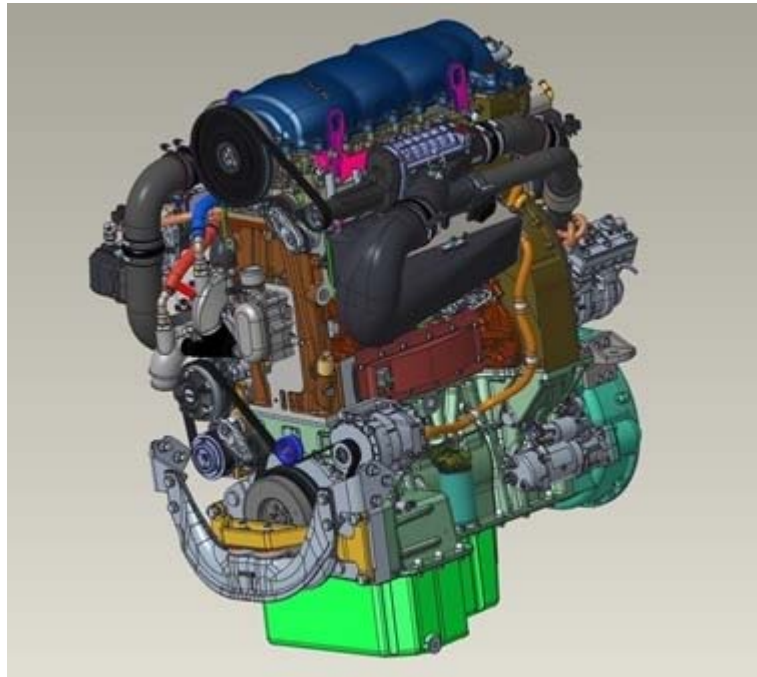
### **Development of Alternative Heavy-Duty Diesel Engine Technologies**

Heavy-duty vehicles still dominate the total basin-wide NOx and PM emissions. An increase in available heavy-duty engine technologies is needed to reach attainment. This project is intended to

accelerate the adoption and commercial deployment of heavy-duty near-zero emissions technologies by developing and deploying opposed piston engine (OP) technology trucks for long-haul applications. Project partners include Achates Power, Inc. (API), Peterbilt Motors Company, Walmart Logistics, Tyson Foods, Inc., San Joaquin Valley Air Pollution Control District, Sacramento Metropolitan Air Quality Management District, and SCAQMD. Walmart and Tyson Foods will demonstrate the trucks in revenue service regional long haul routes within California, including disadvantaged communities located in Sacramento, San Joaquin Valley, SCAQMD, and San Diego County. CALSTART and API received a grant award under a CARB issued grant solicitation for the Fiscal Year 2016-17 Low Carbon Transportation and Fuels Investments and the Air Quality Improvement Programs for On-Road Advanced Technology Demonstrations. CALSTART, which will administer and provide oversight for this project, has previously worked with numerous manufacturers and fleets engaged in publicly funded programs to develop and deploy near-zero and zero emissions heavy-duty vehicles. SCAQMD's Clean Fuels Program is providing \$1 million in cost-share for this \$15.55 million project.

The OP engine Class 8 demonstration will deploy and validate an engine design that will demonstrate near-zero NO<sub>x</sub> levels (0.02 g/bhp-hr), while simultaneously providing equivalent torque and power and a 15-20 percent increase in fuel efficiency compared to existing larger displacement engines. This will be the first demonstration in the U.S. of a high-efficiency and low-NO<sub>x</sub> engine powertrain vehicle in Classes 7-8 applications.

Specifically, API will develop four 10.6-liter OP engines (Figure 12), including three aftertreatment systems, and install them into two Class 8 trucks provided by Peterbilt. Peterbilt will also perform integration services and support and perform vehicle calibration and testing. Subsequently, the trucks will be placed in revenue service with Walmart and Tyson Foods for a minimum of three months as part of the field demonstration, which will include the use of renewable diesel.



**Figure 12: Heavy-Duty Opposed Piston Diesel Engine**

The overall goal of the project is to realize near- and long-term certification and commercialization goals and establish higher efficiency, near-zero emissions, liquid fueled engines as an industry standard.

## **Technology Deployment and Commercialization**

One function of the Clean Fuels Program is to help expedite the deployment and commercialization of low and zero emission technologies and fuels needed to meet the requirements of the AQMP control measures. In many cases, new technologies, although considered “commercially available,” require assistance to fully demonstrate the technical viability to end-users and decision-makers.

It is important to note here that SCAQMD's Technology Advancement Office (TAO) administers not only the Clean Fuels Program but also the Carl Moyer Program. While the Clean Fuels Program marked

its 30<sup>th</sup> year in 2018, the Carl Moyer Program<sup>2</sup> also achieved a milestone in 2018, marking its 20<sup>th</sup> year. These two programs produce a unique synergy, with the Carl Moyer Program (and other incentive programs) providing the necessary incentives to push market penetration of the technologies developed and demonstrated by the Clean Fuels Program. This synergy enables the SCAQMD to act as a leader in both technology development and commercialization efforts targeting reduction of criteria pollutants.

This report, however, is required to detail the accomplishments and achievements of the Clean Fuels Program. (1) One example during CY 2018 is the deployment of near-zero emissions CNG school buses, which resulted from SCAQMD's Clean Fuels Program investing in development and demonstration of an ultra-low NOx emissions 8.9-liter natural gas engine. (2) Another example is Clean Fuels Program support of efforts by the California Department of Food & Agriculture, Division of Measurement Standards, Energy Independence Now, the California Fuel Cell Partnership and other hydrogen fuel cell stakeholders towards opening commercial retail hydrogen stations.

### **Near-Zero Emissions CNG School Buses**

The Lower-Emission School Bus Program, which began in 2001, replaces dirty diesel school buses with cleaner alternative fuel school buses and retrofits newer diesel buses with PM traps. To date, SCAQMD has provided more than \$280 million in state and local funds to replace over 1,600 pre-1994 publicly owned diesel school buses and retrofit 3,400 newer diesel school buses.

In 2015, the SCAQMD awarded funding to Cummins Westport Inc. (CWI) to develop and demonstrate an ultra-low NOx emissions 8.9-liter natural gas engine. CARB and U.S. EPA certified the engine at CARB's Optional Low NOx 0.02 gram standard, although actual results were lower than CARB's Optional Low NOx standard. The resulting engine has a reduction of over 90 percent NOx from current federal standards. This was a game changer for this engine class. Since then, CWI has put the engine into full production. To help accelerate market penetration of this engine as well as reduce local exposure to students and the communities they live in, SCAQMD applied for U.S. EPA Airshed grant funding to replace the large Type D diesel school buses with the 8.9-liter natural gas engine, targeting disadvantaged communities or environmental justice (EJ) areas. The SCAQMD was successful in its application and was awarded \$3.1 million.

In May 2018, the SCAQMD Board approved awards to 42 school districts for a total of 206 school buses in the amount of \$35,638,000. Of these awards, 79 school buses for 18 (of the 42) school districts included funds allocated from the U.S. EPA Airshed grant. The U.S. EPA Airshed funds, which were recognized into the Clean Fuels Fund, totaled \$3,104,700, with the Carl Moyer Program (AB 923 funds) providing \$32,533,300. Additionally, school districts had to provide a \$15,000 match for each CNG school bus.

Using CalEPA's CalEnviroScreen mapping tool, which helps identify disadvantaged communities in California, over 76 percent of the school districts that were awarded funds for school bus replacements were in disadvantaged communities. The 2018 awards overall will fund 115 Type D CNG school buses certified to meet the optional low NOx standard of 0.02 g/bhp-hr and 91 Type C propane school buses certified to meet the optional low NOx standard of 0.05 g/bhp-hr for a total of 206 replacements.

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<sup>2</sup>For more information about the Carl Moyer Program and other SCAQMD incentive programs, visit this link: <http://www.aqmd.gov/home/programs/business/business-detail?title=heavy-duty-engines&parent=vehicle-engine-upgrades>

The table below summarizes the grants partially funded with the U.S. EPA Airshed grant:

School District	No. of CNG Buses	U.S. EPA Funds Allocated	School District (Match)
ABC USD	3	\$117,900	\$45,000
Alta Loma SD	2	\$78,600	\$30,000
Bellflower USD	1	\$39,300	\$15,000
Chaffey Joint Union HSD	6	\$235,800	\$90,000
Cypress SD	1	\$39,300	\$15,000
Downey USD	4	\$157,200	\$60,000
Fountain Valley SD	1	\$39,300	\$15,000
Fullerton Joint Union HSD	4	\$157,200	\$60,000
Hemet USD	5	\$196,500	\$75,000
Huntington Beach UHSD	15	\$589,500	\$225,000
Orange USD	1	\$39,300	\$15,000
Placentia-Yorba Linda USD	6	\$235,800	\$90,000
Pupil Transportation Coop.	5	\$196,500	\$75,000
Rialto USD	13	\$510,900	\$195,000
Rim of the World USD	3	\$117,900	\$45,000
Rowland USD	3	\$117,900	\$45,000
San Jacinto USD	2	\$78,600	\$30,000
Upland USD	4	\$157,200	\$60,000
<b>Total</b>	<b>79</b>	<b>\$3,104,700</b>	<b>\$1,185,000</b>

The above 79 buses collectively are estimated to reduce annual emissions of 0.8 tons per year of PM2.5, 17.7 tons per year of NOx and 4.1 tons per year of CO emissions through replacement with CNG-powered buses (Figure 13). Use of renewable natural gas to fuel these buses can significantly increase the CO2 reductions also achieved. This project achieves immediate and ongoing improvement in air quality and public health, particularly in communities where the residents are disproportionately impacted by the adverse effects of high levels of emissions, and the U.S. EPA Airshed grant accelerated and increased volume of replacements to eligible EJ communities.



**Figure 13: CNG Type D bus certified at 0.02 g/bhp-hr NOx**

The successful implementation of this Program provides less polluting and safer transportation for school children and reduces public exposure to toxic diesel PM emissions. Also, it will reduce air pollution in low-income, high-diesel and high-PM10 exposure areas as well as enhance the objectives of the Environmental Justice and Children’s Health Initiatives adopted by the SCAQMD Board. In addition, the reduction of NOx and PM through deployment of these buses will enable us to take another step forward in meeting the goals called out in our AQMP.

The 2016 AQMP seeks to achieve and maintain all state and federal air quality

standards within attainment deadlines by the earliest date achievable to comply with federal Clean Air Act requirements. In order to meet these goals, the 2016 AQMP includes an integrated control strategy addressing multiple objectives for a more efficient path in meeting all clean air standards. Deployment and commercialization projects like this one will be crucial to help reduce costs for near-zero emission technologies and reduce emissions in impacted areas.

### **Progress for Hydrogen Infrastructure and Fuel Cell Vehicles**

Support for the California Department of Food & Agriculture, Division of Measurement Standards (DMS) Metrology testing is one valuable component to opening commercial retail hydrogen (H<sub>2</sub>) stations.

Certificates of Approval allow the specific dispenser design type and model to be placed in service at multiple hydrogen stations throughout the state as an approved device, which has facilitated the growth of retail hydrogen fueling stations.

The National Conference on Weights and Measures has adopted a single accuracy class for hydrogen gas measuring devices, incorporating input from DMS. This single class with increased acceptance tolerance of 5.0 percent and increased maintenance tolerance of 7.0 percent supports the early adoption of expanding accuracy classes by California. With the new tolerances published in the National Institute of Standards and Technology Handbook 44, California can now align its specifications with this new national model standard and facilitate marketplace consistency across the country.

Clean Fuels Program cofunding continues to support DMS for retail hydrogen station equipment performance (HyStEP) testing to ensure safe, fast and complete hydrogen fills before retail stations are open for customers.

Energy Independence Now (EIN) released the Renewable Hydrogen Roadmap<sup>3</sup>, which explores strategies that are currently most cost-effective and scalable, including production technologies and feedstocks, and lays out the eight high priority policy and stakeholder recommendations for California. The EIN Renewable Hydrogen Roadmap is one of several efforts that helped set the stage for changes to the CARB's LCFS regulation in 2018 that are expected to encourage renewable hydrogen production.

Former California Governor Jerry Brown issued an executive order (#B-48-18 dated 1/16/18) calling for increasing the deployment of zero emission vehicles and developing 200 hydrogen refueling stations. While public cofunding for additional hydrogen stations was not included in the latest California budget, recent changes to CARB's LCFS regulation should help to facilitate larger capacity stations.

For 2018, numerous fuel and hydrogen programs include:

- More than 5,000 consumers and fleets have purchased or leased passenger category fuel cell vehicles from Hyundai, Toyota and Honda since they entered the commercial market starting in 2015. Fuel cell passenger vehicle deployment is dependent on increasing coverage and capacity of retail hydrogen stations.
- Transit agency members have 25 fuel cell electric buses currently in operation and more than 27 additional buses are funded for future deployment.
- There are 39 retail and four other non-retail hydrogen fueling stations in operation in California, an additional 25 in development, with the majority in the Southern California area (Figure 14).

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<sup>3</sup> Energy Independence Now (EIN) *Renewable Hydrogen Roadmap* <https://einow.org/rh2roadmap/>, May 17, 2018.

- Staff and members of the California Fuel Cell Partnership (CaFCP) continue to conduct outreach and education in communities throughout California.
- The CaFCP, the Governor’s Office of Business and Economic Development (GO-Biz) and the California Energy Commission continue advising and responding to city staff across the state of California to optimize station permitting.
- The CaFCP created and maintains the Station Operational Status System (SOSS) that hydrogen stations in the U.S. use to report status. This data, in turn, feeds real-time information (address, availability, etc.) to consumers through a CaFCP mobile-friendly website and several other apps and systems that support consumers.

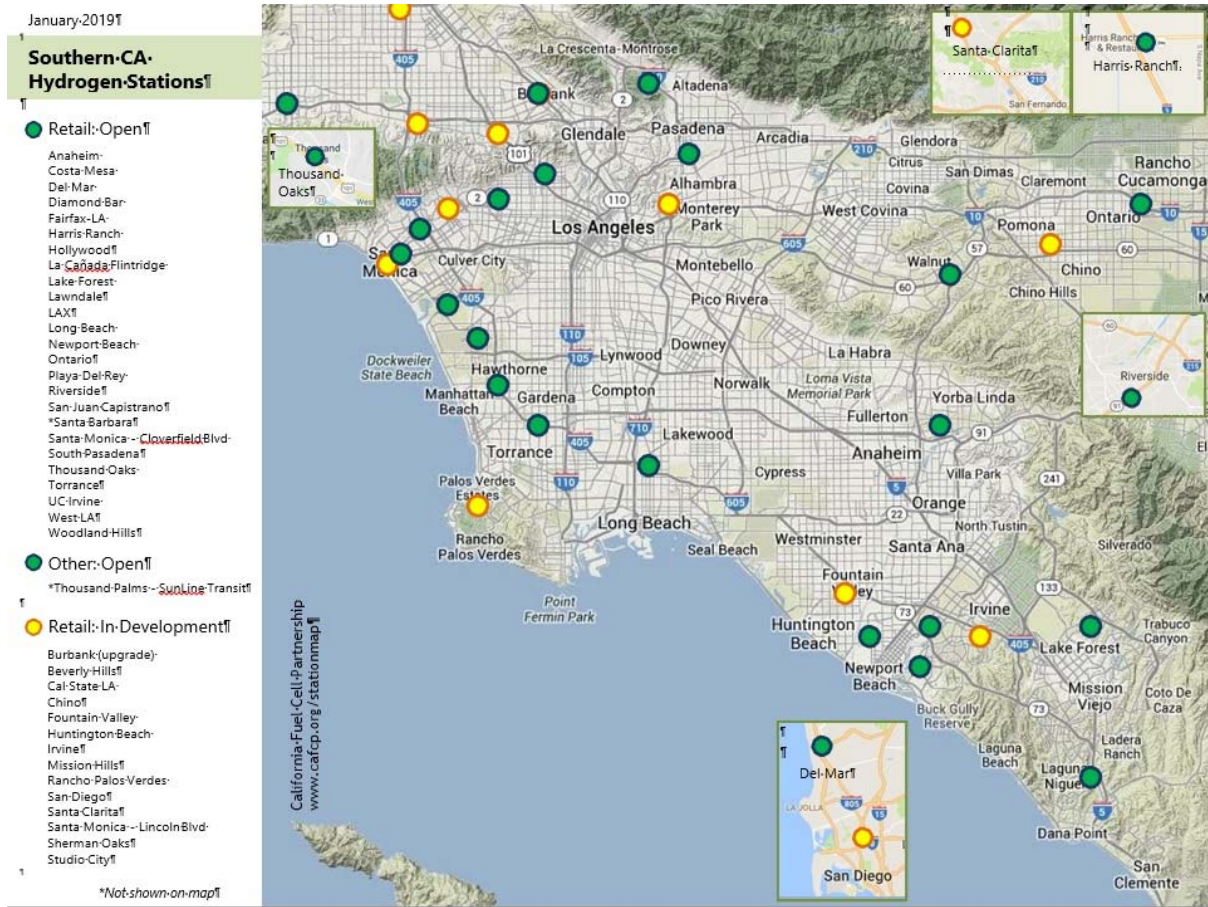


Figure 14: SoCal Hydrogen Stations (Source: CaFCP)

Since 1999, the CaFCP and its public and private members have jointly and separately worked to accelerate many aspects of fuel cell vehicle and hydrogen station development and commercialization. Building on many collaborative documents, such as the CaFCP Roadmap, Bus Roadmap and Medium & Heavy-Duty Fuel Cell Electric Vehicle Action Plan, the CaFCP released *The California Fuel Cell Revolution, A Vision for Advancing Economic, Social and Environmental Priorities*<sup>4</sup> (Vision 2030) in 2018. These roadmaps and other studies provided technical support for public cofunding of hydrogen fueling stations, including heat maps for placement of stations that can support heavy-duty fuel cell

<sup>4</sup> CaFCP’s *The California Fuel Cell Revolution, A Vision For Advancing Economic, Social, and Environmental Priorities* (Vision 2030), September 4, 2018.

vehicles. Vision 2030 goes beyond current requirements, but builds on several of Former Governor Brown's Executive Orders.

The CaFCP is pursuing a network of 1,000 hydrogen stations to support a fuel cell vehicle population upwards of 1,000,000 vehicles in 2030, and the CaFCP is developing implementation strategies to enable Vision 2030. While adoption of fuel cell light duty vehicles is dependent on the deployment of hydrogen stations yet station operators find it difficult to execute a successful business plan without the load of increased vehicles. Now access to CARB's LCFS credits by station operators can help them get over the periods of low utilization; and of course more viable stations equals more vehicles. The CaFCP's goals relate to preparing for and supporting market launch through coordinated individual and collective effort. While research by multiple entities will be needed to reduce the cost of fuel cells and improve fuel storage, transport and infrastructure, the CaFCP has played a vital role in demonstrating fuel cell vehicle reliability and durability, fueling infrastructure and storage options, and increasing public knowledge and acceptance of the vehicles and fueling. The next couple of years should continue to achieve huge strides in fuel cell vehicle technology and hydrogen infrastructure growth, supporting a variety of vehicles.

The SCAQMD's 2016 AQMP and Clean Fuels Program 2019 Plan Update identify fuel cells for on- and off-road applications as a core technology for attaining and maintaining cleaner air quality. SCAQMD plans to continue to be a leader in this core technology area.



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## CLEAN FUELS PROGRAM

### 2018 Funding & Financial Summary

The SCAQMD Clean Fuels Program supports clean fuels and technologies that appear to offer the most promise in reducing emissions, promoting energy diversity, and in the long-term, providing cost-effective alternatives to current technologies. In order to address the wide variety of pollution sources in the Basin and the need for reductions now and in the future, using revenue from a \$1 motor vehicle registration fee (see Program Funding on page 4), the SCAQMD seeks to fund a wide variety of projects to establish a diversified technology portfolio to proliferate choices with the potential for different commercial maturity timing. Given the evolving nature of technology and changing market conditions, such a representation is only a “snapshot-in-time,” as reflected by the projects approved by the SCAQMD Board.

As projects are approved by the SCAQMD Governing Board and executed into contracts throughout the year, the finances may change to reflect updated information provided during the contract negotiation process. As such, the following represents the status of the Clean Fuels Fund as of December 31, 2018.

### Funding Commitments by Core Technologies

The SCAQMD continued its successful leveraging of public funds with outside investment to support the development of advanced clean air technologies. During the period from January 1 through December 31, 2018, a total of 75 contracts/agreements, projects or studies that support clean fuels were executed or amended, as shown in Table 2 (page 32). The major technology areas summarized are listed in order of funding priority. The distribution of funds based on technology area is shown graphically in Figure 15 (page 30). This wide array of technology support represents the SCAQMD’s commitment to researching, developing, demonstrating and deploying potential near-term and longer-term technology solutions.

The project commitments that were contracted or purchased for the 2018 reporting period are shown below with the total projected project costs:

- |  |              |
|--|--------------|
| • SCAQMD Clean Fuels Fund Contribution | \$26,939,641 |
| • Total Cost of Clean Fuels Projects   | \$85,373,116 |

Traditionally every year, the SCAQMD Governing Board approves funds to be transferred to the General Fund Budget for Clean Fuels administration. For 2018, the fund transfer from Clean Fuels to the General Fund was handled through the annual budget process. Thus, when the Board approved the SCAQMD’s FY 2018-19 Budget on June 1, 2018, it included \$1 million from Clean Fuels recognized in TAO’s budget for technical assistance, workshops, conferences, cosponsorships and outreach activities, as well as postage, supplies and miscellaneous costs; another \$285,000 is transferred from the Clean Fuels Fund to Capital Outlays for alternative fuel vehicle purchases for TAO’s Alternative Fuel Demonstration Program as well as supporting vehicle and energy infrastructure. Only the funds committed by December 31, 2018, are included within this report. Any portion of the Clean Fuels Funds not spent by the end of Fiscal Year 2018-19 ending June 30, 2019, will be returned to the Clean Fuels Fund.

Partially included within the SCAQMD contribution are supplemental sponsorship revenues from various organizations that support these technology advancement projects. This supplemental revenue for pass-through contracts executed in 2018 totaling \$12.3 million is listed within Table 3 (page 35). This \$12.3 million, which is about double the typical amount recognized into Clean Fuels on an average

year, included \$3.1 million from a U.S.EPA Airshed Grant for near-zero CNG school buses, with the remaining incoming revenue from a U.S. EPA DERA Grant, CEC and the Ports as stakeholder partners.

Appendix B lists the 106 Clean Fuels Fund contracts that were open and active as of January 1, 2019.

For Clean Fuels executed and amended contracts, projects and studies in 2018, the average SCAQMD contribution is approximately 17 percent of the total cost of the projects, identifying that each dollar from the SCAQMD was leveraged with nearly \$6 of outside investment. The typical leverage amount is \$3-\$4 for every \$1 of SCAQMD Clean Fuels funds, but from 2016 to 2018 there were several significant contracts, significant both in funding and in the impact they hopefully will make in strides toward developing and commercializing clean transportation technologies.

During 2018, the distribution of funds for SCAQMD executed contracts, purchases and contract amendments with additional funding for the Clean Fuels Program totaling approximately \$27 million are shown in the figure below.

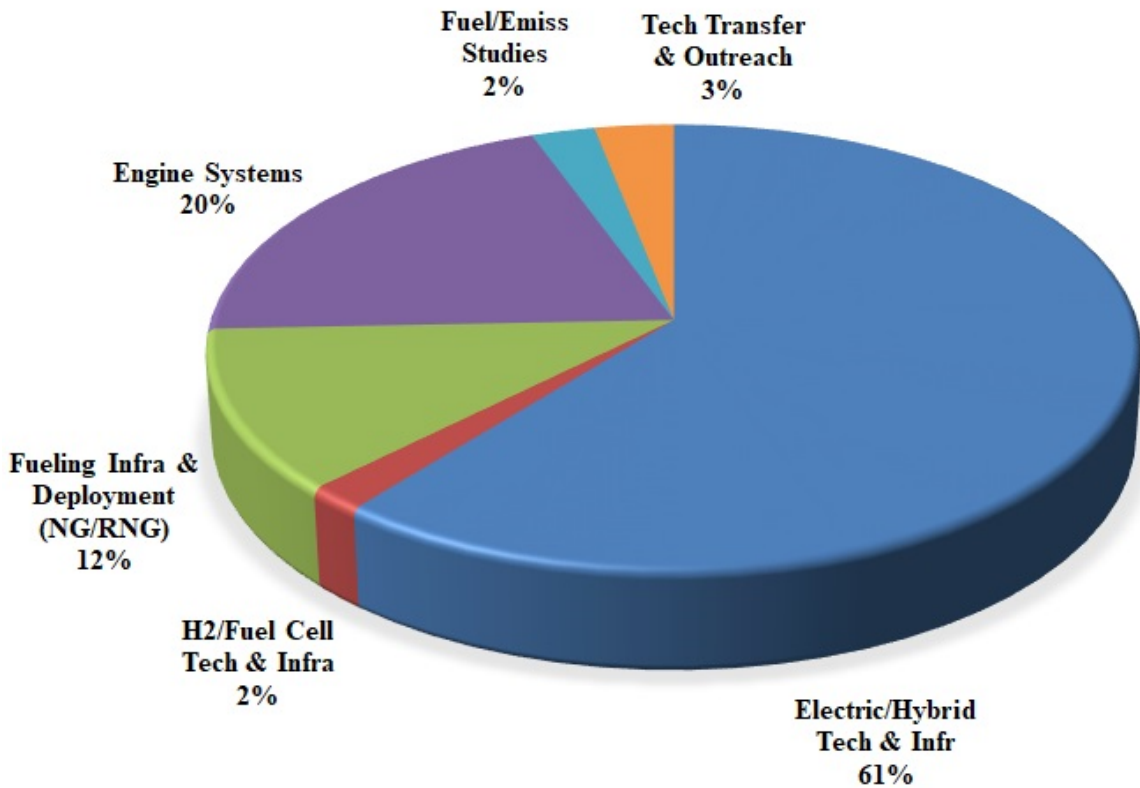


Figure 15: Distribution of Funds for Executed Clean Fuels Projects CY 2018 (\$27M)

Table 2 (page 32) provides a breakdown of this \$27 million in executed contracts. Table 3 (page 35) provides information on outside funding recognized and received into the Clean Fuels Fund (\$12.3 million) for contracts executed in CY 2018. Additionally, the SCAQMD continued to seek funding opportunities and Table 4 (page 35) lists the additional \$54.5 million awarded in 2018 for RD<sup>3</sup> projects.

## Review of Audit Findings

State law requires an annual financial audit after the closing of each SCAQMD’s fiscal year. The financial audit is performed by an independent Certified Public Accountant selected through a competitive bid process. For the fiscal year ended June 30, 2018, the firm of BCA Watson Rice, LLP,

conducted the financial audit. As a result of this financial audit, a Comprehensive Annual Financial Report (CAFR) was issued. There were no adverse internal control weaknesses with regard to SCAQMD financial statements, which include the Clean Fuels Program revenue and expenditures. BCA Watson Rice, LLP, gave the SCAQMD an “unmodified opinion,” the highest obtainable. Notably, the SCAQMD has achieved this rating on all prior annual financial audits.

## **Project Funding Detail by Core Technologies**

The 75 new and continuing contracts/agreements, projects and studies that received SCAQMD funding in 2018 are summarized in Table 2, together with the funding authorized by the SCAQMD and by the collaborating project partners.

**Table 2: Contracts Executed or Amended (w/\$) between Jan. 1 & Dec. 31, 2018**

Contract	Contractor	Project Title	Start Term	End Term	SCAQMD \$	Project Total \$
<b>Hydrogen/Mobile Fuel Cell Technologies and Infrastructure</b>						
18150	California Department of Food & Agriculture, Division of Measurement Standards	Conduct Hydrogen Station Site Evaluations for Hydrogen Station Equipment Performance (HyStEP) Project	06/28/18	02/27/20	100,000	805,000
18158	Alliance for Sustainable Energy, LLC (on behalf of National Renewable Energy Laboratory)	Participate in California Hydrogen Infrastructure Research Consortium H2 @ Scale Initiative	08/31/18	03/30/20	100,000	760,000
19172	Longo Toyota	Three-Year Lease of Two 2018 Toyota Mirai Fuel Cell Vehicles	10/28/18	10/27/21	35,108	35,108
19213	Frontier Energy Inc.	Participate in California Fuel Cell Partnership for CY 2018 and Provide Support for Regional Coordinator	01/01/18	07/01/19	245,000	1,253,491
<b>Electric/Hybrid Technologies and Infrastructure</b>						
14062	Siemens Industry Inc.	Develop and Demonstrate Catenary Zero Emissions Goods Movement System and Develop and Demonstrate Diesel Catenary Hybrid Electric Trucks	07/14/14	12/31/18	430,000	430,000
14184	Clean Fuel Connection Inc.	DC Fast Charging Network Provider	04/04/14	06/30/20	350,000	350,000
18072	Electric Power Research Institute	Study Electrification Options of Energy Services for Environmental Justice Communities and Non-Attainment	06/08/18	06/07/20	150,000	1,558,657
18129	Electric Power Research Institute	Versatile Plug-In Auxiliary Power System Demonstration	06/28/28	06/27/20	125,000	273,000
18151	Rail Propulsion System	Develop and Demonstrate Battery Electric Switcher Locomotive	04/05/18	12/30/19	210,000	925,000
18232	Hyster-Yale Group Inc.	Electric Top-Pick Development, Integration and Demonstration	09/14/18	09/13/21	2,931,805	3,678,008
18277	Velocity Vehicle Group DBA Los Angeles Truck Centers LLC	Southern California Advanced Sustainable Freight Demonstration	09/07/18	03/06/22	3,568,300	4,198,000
18280	Honda of Pasadena	Three-Year Lease of One Honda 2018 Clarity Plug-In Vehicle	02/07/18	02/96/21	18,359	18,359
18287	EVgo Services LLC	Charging Station and Premises Agreement for Installation of One DC Fast Charger at SCAQMD Headquarters	06/27/18	06/26/28	0	0

**Table 2: Contracts Executed or Amended (w/\$) between Jan. 1 & Dec. 31, 2018 (cont'd)**

Contract	Contractor	Project Title	Start Term	End Term	SCAQMD \$	Project Total \$
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**Electric/Hybrid Technologies and Infrastructure (cont'd)**

19190	Daimler Trucks North America	Zero Emission Trucks and EV Infrastructure Project	12/18/18	06/20/22	8,230,072	31,340,144
Purchase Order	Zeco Systems, Inc., dba Greenlots	Procure Greenlots SKY Enterprise Software License with Load Management for One Year	12/13/18	12/13/18	55,200	55,200
Direct Pay	Clean Fuel Connection Inc.	Install DC Fast Charger at SCAQMD Headquarters	05/29/18	05/29/18	59,134	59,134

**Engine Systems/Technologies**

17393	Southwest Research Institute	Development of an Ultra-Low Emissions Diesel Engine for On-Road Heavy-Duty Vehicles	05/30/18	07/31/19	575,000	1,325,000
18194	CALSTART Inc.	Develop and Demonstrate Near-Zero Emissions Opposed Piston Engine	09/30/18	07/31/20	1,000,000	15,550,000
18122	Clean Energy	Southern California Trucking Demonstration of Near-Zero ISX12N Beta Engines	01/05/18	01/04/20	3,459,000	5,995,000
18211	West Virginia University Innovation Corporation	Develop Thermal Management Strategy using Cylinder Deactivation for Heavy-Duty Diesel Engines	06/08/18	06/07/20	250,000	700,000

**Fueling Infrastructure and Deployment (NG/Renewable Fuels)**

Transfer	California Natural Gas Vehicle Partnership	Participation in the California Natural Gas Vehicle Partnership for Fiscal Years 2018-19 and 2019-20	07/06/18	07/05/20	25,000	170,000
18336	ABC Unified School District	Replace Diesel School Buses with Near-Zero Emissions CNG Buses	10/05/18	11/30/34	117,900	162,900
18337	Alta Loma School District	Replace Diesel School Buses with Near-Zero Emissions CNG Buses	10/05/18	11/30/34	78,600	108,600
18344	Bellflower Unified School District	Replace Diesel School Buses with Near-Zero Emissions CNG Buses	09/07/18	11/30/34	39,300	54,300
18346	Chaffey Joint Union High School District	Replace Diesel School Buses with Near-Zero Emissions CNG Buses	10/05/18	11/30/34	235,800	325,800
18348	Cypress School District	Replace Diesel School Buses with Near-Zero Emissions CNG Buses	09/07/18	11/30/34	39,300	54,300
18349	Downey Unified School District	Replace Diesel School Buses with Near-Zero Emissions CNG Buses	09/14/18	11/30/34	157,200	217,200
18350	Fountain Valley School District	Replace Diesel School Buses with Near-Zero Emissions CNG Buses	09/07/18	11/30/34	39,300	54,300
18351	Fullerton Joint Union High School District	Replace Diesel School Buses with Near-Zero Emissions CNG Buses	10/05/18	11/30/34	157,200	217,200
18354	Hemet Unified School District	Replace Diesel School Buses with Near-Zero Emissions CNG Buses	10/05/18	11/30/34	196,500	271,500

**Table 2: Contracts Executed or Amended (w/\$) between Jan. 1 & Dec. 31, 2018 (cont'd)**

Contract	Contractor	Project Title	Start Term	End Term	SCAQMD \$	Project Total \$
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**Fueling Infrastructure and Deployment (NG/Renewable Fuels) (cont'd)**

18355	Huntington Beach Union High School	Replace Diesel School Buses with Near-Zero Emissions CNG Buses	10/05/18	11/30/34	589,500	814,500
18363	Orange Unified School District	Replace Diesel School Buses with Near-Zero Emissions CNG Buses	09/14/18	11/30/34	39,300	54,300
18364	Placentia-Yorba Linda Unified School District	Replace Diesel School Buses with Near-Zero Emissions CNG Buses	10/05/18	11/30/34	235,800	325,800
18365	Pupil Transportation Cooperative	Replace Diesel School Buses with Near-Zero Emissions CNG Buses	10/05/18	11/30/34	235,800	325,800
18367	Rialto Unified School District	Replace Diesel School Buses with Near-Zero Emissions CNG Buses	10/05/18	11/30/34	510,900	705,900
18368	Rim of the World Unified School District	Replace Diesel School Buses with Near-Zero Emissions CNG Buses	10/05/18	11/30/34	117,900	162,900
18369	Rowland Unified School District	Replace Diesel School Buses with Near-Zero Emissions CNG Buses	11/02/18	11/30/34	117,900	162,900
18370	San Jacinto Unified School District	Replace Diesel School Buses with Near-Zero Emissions CNG Buses	09/14/18	11/30/34	78,600	108,600
18374	Upland Unified School District	Replace Diesel School Buses with Near-Zero Emissions CNG Buses	10/12/18	11/30/34	157,200	217,200

**Fuel/Emissions Studies**

18206	University of California Irvine	Assess Air Quality and Greenhouse Gas Impacts of a Microgrid-Based Electricity System	04/06/18	04/05/20	660,000	1,300,000
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**Emissions Control Technologies**

17367	Southwest Research Institute	Develop and Evaluate Aftertreatment Systems for Large Displacement Diesel Engines	02/28/18	06/30/19	400,000	480,00
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**Technology Assessment and Transfer/Outreach**

16262	University of California Davis-Institute of Transportation Studies	Support Sustainable Transportation Energy Pathways (STEPS)	01/05/18	01/04/22	240,000	5,520,000
18253	Three Squares Inc.	Identify and Secure a "Futurist" Clean Transportation or Goods Movement Technologies Expert	04/05/18	05/31/18	11,845	11,845
19078	Clean Fuel Connection Inc.	Technical Assistance with Alternative Fuels, EVs, Charging and Infrastructure, and Renewable Energy	09/07/18	09/06/20	100,000	100,000
Direct Pay	Various	Cosponsor 26 Conferences, Workshops & Events plus 5 Memberships	01/01/18	12/31/18	470,118	4,192,470

**Table 3: Supplemental Grants/Revenue Received into the Clean Fuels Fund (31) in CY 2018**

Revenue Agreement #	Revenue Source	Project Title	Contractor	SCAQMD Contract #	Award Total \$
#17055	US EPA CATI	Develop and Evaluate Aftertreatment Systems for Large Displacement Diesel Engines	Southwest Research Institute	#17367	290,000
#17055	US EPA CATI	Develop and Demonstrate Battery Electric Switcher Locomotive	Rail Propulsion System	#18151	210,000
#18022	Port of Angeles	Develop Ultra-Low Emissions Diesel Engine for On-Road Heavy-Duty Vehicle	Southwest Research Institute	#17393	287,500
#18098	California Energy Commission	Demonstrate Zero and Near-Zero Emissions Drayage Trucks and Cargo Handling Equipment	Clean Energy	#18122	2,845,000
#18098	California Energy Commission	Demonstrate Zero and Near-Zero Emissions Drayage Trucks and Cargo Handling Equipment	Hyster-Yale Nederland BV	#18232	2,564,004
#18098	California Energy Commission	Demonstrate Zero and Near-Zero Emissions Drayage Trucks and Cargo Handling Equipment	Velocity Vehicle Group	#18277	2,985,995
#19165	US EPA Air Shed Grant	Near-Zero CNG School Buses	18 School Districts	Various	3,104,700
Table 3 lists revenue <u>received</u> by SCAQMD into the Clean Fuels Fund (31) <u>only</u> if the SCAQMD pass-through contract was executed during the reporting CY (2018).					<b>\$12,287,199</b>

**Table 4: Summary of Federal, State and Local Funding Awarded or Recognized in CY 2018**

Awarding Entity or Program	Award(*) or Board Date	Purpose	Contractors	Award Total/ Fund
U.S. EPA Air Shed Grant	*07/09/18	Near-Zero Emissions School Bus Replacement Project	18 School Districts	\$3,184,875 Fund 31
U.S. EPA Air Shed Grant	*7/09/18	Battery Electric Shuttle Bus Replacement Project	Phoenix Motorocars #19166	\$3,184,875 Fund 31
San Pedro Bay Ports	07/06/18	Develop and Demonstrate Zero Emissions Trucks and EV Infrastructure	Daimler Trucks North America #19190	\$2,000,000 Fund 61
U.S. EPA FY 18 Section 105 CATI	*09/14/18	Develop and Demonstrate Zero Emissions Trucks and EV Infrastructure	Daimler Trucks North America #19190	\$500,000 Fund 61



**Table 4: Summary of Federal, State and Local Funding Awarded or Recognized in CY 2018  
(cont'd)**

<b>Awarding Entity or Program</b>	<b>Award(*) or Board Date</b>	<b>Purpose</b>	<b>Contractors</b>	<b>Award Total/ Fund</b>
Schneider National, Inc.	*10/23/18	Install Air Filtration Systems at Schools	IQ Air North America #19169	\$350,000 Fund 75
Old Dominion Freight Line, Inc.	*09/27/18	Install Air Filtration Systems at Schools	IQ Air North America #19170	\$225,000 Fund 75
CARB ZANZEFF	*10/08/18	Zero and Near-Zero Emissions Freight Facilities (ZANZEFF) Project: Develop and Demonstrate Zero Emissions Heavy-Duty Trucks, Freight Handling Equipment, EV Infrastructure and Renewable Energy (LIGHTS Project including Data Analysis)	Volvo Technology of America, LLC/ University of California Riverside/CE-CERT #TBD	\$44,839,686 Fund 67
Rainbow Transfer/Recycling, Inc.	11/02/18	Install Air Filtration Systems at Schools	IQ Air North America #19188	\$250,000 Fund 75
<i>Table 4 provides a comprehensive summary of revenue awarded to or recognized by SCAQMD during the reporting CY (2018) if it will be considered part of, or complementary to, the Clean Fuels Program, regardless of whether the SCAQMD pass-through contract has been executed.</i>				<b>\$54,534,436</b>

## Project Summaries by Core Technologies

The following represents summaries of the contracts, projects and studies executed, or amended with additional dollars, in CY 2018. They are listed in the order found in

Table 2 by category and contract number. As required by H&SC Section 40448.5.1(d), the following project summaries provide the project title; contractors and if known at the time of writing key subcontractors or project partners; SCAQMD cost-share, cosponsors and their respective contributions; contract term; and a description of the project.

### *Hydrogen/Mobile Fuel Cell Technologies and Infrastructure*

#### **18150: Conduct Hydrogen Station Site Evaluations for Hydrogen Station Equipment Performance (HyStEP) Project**

Contractor: California Dept. of Food & Agriculture, Division of Measurement Standards	SCAQMD Cost-Share	\$ 100,000
	Cosponsors	
	California Fuel Cell Partnership	100,000
	California Air Resources Board (cash & in-kind)	405,000
	California Energy Commission	100,000
	Other Partners (cash and/or in-kind)	100,000
Term: 06/28/18 – 02/27/20	Total Cost:	\$ 805,000

The HyStEP equipment, which is owned by Sandia National Laboratories, was assembled, mounted on a trailer by Powertech, and was validation tested by NREL in Phase I, which was separately funded. Phase II, California implementation, overseen by a California task force, includes representatives from CARB, CEC, Division of Measurement Standards (DMS), the California Fuel Cell Partnership (CaFCP), SCAQMD, Toyota, Mercedes, BMW, Air Liquide, NREL and Sandia. The equipment validation device will be loaned for the California implementation portion. The total cost for Phase II is estimated to be approximately \$805,000, with \$100,000 each in cofunding already committed from both the CaFCP and the CEC. CARB is contributing \$100,000 for a tow vehicle and in-kind assistance for a staff Air Resources Engineer. Successful testing in California may ultimately lead to certification and/or listing by nationally recognized testing laboratories, reduced time for hydrogen station commissioning and increased deployment of zero emissions vehicles in our region. Some automakers may still choose to conduct their own additional hydrogen station test program, especially in the early years of station development.

#### **18158: Participate in California Hydrogen Infrastructure Research Consortium H2 @ Scale Initiative**

Contractor: Alliance for Sustainable Energy, LLC (on behalf of National Renewable Energy Laboratory)	SCAQMD Cost-Share	\$ 100,000
	Cosponsors	

	National Renewable Energy Laboratory	540,000
	California Energy Commission	100,000
	GO-Biz/California Governor's Office of Economic Development (in-kind)	20,000
Term: 08/31/18 – 03/30/20	Total Cost:	\$ 760,000

U.S. leadership for hydrogen technologies is rooted in California, a location for implementing many DOE H2@Scale pathways, such as reducing curtailment and stranded resources, reducing petroleum use and emissions, and developing and creating jobs. The technical research capability of the national laboratories can be used to assist California in decisions and evaluations, as well as to verify solutions to problems impacting the industry. Because these challenges cannot be addressed by one agency or one laboratory, a hydrogen research consortium has been organized to combine and collaborate. The proposed joint tasks include data collection from operational stations, component failure fix verification (i.e., nozzle freeze lock), analysis of data to optimize new fueling methods for medium- and heavy-duty applications, and ensuring hydrogen quality is maintained. These projects will also be managed in detail (e.g., schedule, budget, roles, milestones, tasks, reporting requirements) in a hydrogen research consortium project management plan. The joint application to the DOE H2 @ Scale Program to leverage national lab capabilities was not fully funded, so CARB and CEC also have separate agreements for those tasks.

**19172: Three-Year Lease of Two 2018 Toyota Mirai Fuel Cell Vehicles**

Contractor: Longo Toyota	SCAQMD Cost-Share	\$ 35,108
Term: 10/28/18 – 10/27/21	Total Cost:	\$ 35,108

The SCAQMD operates a number of alternative fuel vehicles, including electric vehicles, fuel cell vehicles and plug-in hybrid-electric vehicles. The primary objective of having these vehicles as part of the SCAQMD demonstration fleet is to continue to support the use of zero emissions vehicles. The Toyota Mirai fuel cell vehicles provide about 312 miles total range refueling with gaseous hydrogen.

**19213: Participation in California Fuel Cell Partnership for CY 2018 and Provide Support for Regional Coordinator**

Contractor: Frontier Energy, Inc. (formerly BKi)	SCAQMD Cost-Share	\$ 245,000
	Cosponsors	
	7 automakers, 4 public agencies, 2 industry stakeholders, 28 Full & Associate Members	\$ 1,008,491
Term: 01/01/18 – 07/01/19	Total Cost:	\$ 1,253,491

In April 1999, the CaFCP was formed with eight members; SCAQMD joined and has participated since early 2000. The CaFCP and its members are demonstrating and deploying fuel cell passenger cars and transit buses with associated hydrogen fueling infrastructure in California. Since the CaFCP is a voluntary collaboration, each participant contracts with Frontier Energy Inc. (previously Bevilacqua-Knight, Inc. or BKi) for their portion of the CaFCP's administration. In 2018, SCAQMD contributed

\$70,000 for Executive membership, \$50,000 to continue support for a Regional Coordinator and \$125,000 for support of fuel cell truck and bus codes and standards coordination, such as SAE J2600, J2601-2 revision sponsorship, first responder training updates, and truck and bus task force facilitation and outreach.

### ***Electric/Hybrid Technologies and Infrastructure***

#### **14062: Develop and Demonstrate Catenary Zero Emissions Goods Movement System and Develop and Demonstrate Diesel Catenary Hybrid Electric Trucks**

Contractor: Siemens Industry Inc.	SCAQMD Cost-Share	\$ 430,000
Term: 07/14/14 – 12/31/18	Total Cost:	\$ 430,000

Siemens Industry Inc. designed and demonstrated a catenary truck technology, eHighway, in Germany on a European truck chassis. For this project with SCAQMD, Siemens brought the eHighway technology to Southern California with their partner Volvo and developed and demonstrated a catenary plug-in hybrid electric truck technology. The hybrid drive system extended the operating range of the truck beyond the all-electric range of the catenary system, enabling the truck to perform regional drayage operations and bridge gaps in catenary infrastructure as it is deployed on a regional level. The additional costs added to the contract through this contract modification were to cost-share safety barriers required by the City of Carson for the above-ground foundations for the catenary poles. Further details on this catenary truck technology project are available in the Key Projects Completed section.

#### **14184: DC Fast Charging Network Provider**

Contractor: Clean Fuel Connection Inc.	SCAQMD Cost-Share	\$ 350,000
Term: 04/04/14 – 06/30/20	Total Cost:	\$ 350,000

This contract was previously funded using CEC funds recognized into the Clean Fuels Fund (31). However in June 2018, CEC issued a stop work order and reversed a previous decision to allow for installation costs to be funded by the CEC grant. Staff received approval by the Governing Board in October 2018 to substitute Clean Fuels funds for CEC revenue funds towards installation costs. In June and July 2018, Clean Fuel Connection, Inc. (CFCI) installed 10 DC fast chargers at seven sites including the Hollywood & Highland red line metro stop, Little Tokyo gold line metro stop, Westwood LADOT parking garage, La Kretz Center for Innovation, Victoria Gardens shopping mall in Rancho Cucamonga, and Mel's Diner in Santa Monica. These chargers are part of the EVgo network and are provided needed public charging to fill gaps in corridor charging in Los Angeles and San Bernardino counties.

#### **18072: Study Electrification Options of Energy Services for Environmental Justice Communities and Non-Attainment Areas**

Contractor: Electric Power Research Institute	SCAQMD Cost-Share	\$ 150,000
	Cosponsors	
	California Energy Commission	799,444
	Electric Power Research Institute	609,213
Term: 06/08/18 – 06/07/19	Total Cost:	\$ 1,558,657

This study is to model the effects on air quality of a scenario that aggressively pursues GHG emissions reductions through electrification, including passenger vehicles, heavy-duty trucks, residential and commercial heat pumps, and industrial electrification. Air quality modeling has shown that electrification has significant potential to improve air quality, above emissions reductions expected from current regulations. Electrification of on-road and off-road vehicles leads to widespread reductions in smog in summer and winter throughout the South Coast Air Basin. The electrification study is in its final stages of completion, and a draft final report will be available early 2019. The current study results found some pollutants increased in coastal areas near the Los Angeles/Long Beach port complex, but this increase was offset by decreases in other pollutants. This is due to an effect similar to the ‘weekend effect,’ where a reduction in emissions can lead to an increase in some pollutants. The study results to date also found that residential space heating and water heating is a very significant opportunity for improvement in winter pollution. This is due to two factors: 1) emissions intensity for wood-fired sources is high and 2) current regulations do not address remaining sources for space and water heating. Overall, the study has indicated that electrification provides a cost-effective opportunity to simultaneously address GHG and air quality targets.

### 18129: Versatile Plug-In Auxiliary Power System Demonstration

Contractor: Electric Power Research Institute, Inc.	SCAQMD Cost-Share	\$ 125,000
	Cosponsors	
	Southern California Edison (in-kind)	128,000
	Invited Partners: Utility/Military/Police/Fire	20,000
Term: 06/28/18 – 06/27/20	Total Cost:	\$ 273,000

In December 2015, the Board awarded a contract to the Electric Power Research Institute, Inc., (EPRI) to cosponsor development and demonstration of a Versatile Plug-In Auxiliary (VAP) System. Based on the Phase I testing results, systems from alternative suppliers were evaluated and the scope of the project has expanded to include systems for portable power and portable DC fast charging. EPRI will use the previously approved cost-share for the second phase of the VAP System demonstration to evaluate the emissions and fuel usage benefits and impacts of electric auxiliary power in various on-board and stationary applications. Up to three units will undergo baseline tests at Southern California Edison’s EV Technical Center prior to field demonstration within SCAQMD.

### 18151: Develop and Demonstrate Battery Electric Switcher Locomotive

Contractor: Rail Propulsion System	SCAQMD Cost-Share (received as pass-through funds)	\$ 210,000
	Cosponsor	
	Rail Propulsion Systems (in-kind)	715,000
Term: 04/05/18 – 12/30/19	Total Cost:	\$ 925,000

This project is to develop and demonstrate a zero emission, battery electric switcher locomotive. Rail Propulsion Systems will perform the following: 1) design and fabricate a battery pack and rack system; 2) modify an existing switcher locomotive to integrate the battery pack and rack system as well as electronic control systems; 3) install charging infrastructure for the locomotive; and 4) perform substantial validation and durability testing to confirm the robustness of their design. Once the locomotive is developed, Rail Propulsion Systems will test and optimize the locomotive in preparation

for a field demonstration. The project will ultimately conclude after the locomotive has been placed in a typical switcher locomotive operation at the Coast Rail Services rail yard to fully validate its performance, durability and reliability. The technology transfer will be the valuable information gathered in order to develop pathways to the needs and type of charging structures which will be required in a rail yard. The project supports the implementation of advanced alternative fuel technology that could potentially be used to further reduce NOx emissions from locomotives. In addition, the development and successful deployment of these zero emission switcher locomotives will promote their acceptance by railroads and facilitate their deployment at rail yards in the South Coast Air Basin as well as assist the SCAQMD to attain its clean air goals. This contract is fully funded through a U.S. EPA CATI grant the SCAQMD is administering.

### 18232: Electric Top-Pick Development, Integration and Demonstration

Contractor: Hyster-Yale Group Inc.	SCAQMD Cost-Share <i>(partially received as pass-through funds)</i>	\$ 2,931,805
	Cosponsor	
	Hyster-Yale Group Inc.	746,203
Term: 09/14/18- 09/13/21	Total Cost:	\$ 3,678,008

Hyster-Yale in partner with WAVE and CALSTART will scale their already prototyped modular electrified power systems to validate and demonstrate a pre-pilot Hyster® 1150-CH electric container handler – known as a Top Handler - at POLA’s APM Terminals (APM). The equipment will be driven via electric power and all lifting functions will be powered by electric motors engaging hydraulic pumps. The 384 kWh battery will use high-powered wireless opportunity charging to match terminal operations. While retrofits have been performed, fully electrified off-road heavy cargo handling equipment is not available today in this weight class from a major OEM. The introduction of such equipment represents a major step forward in emissions-free options for port operators. Top Handlers are one of the largest contributors of NOx and greenhouse gas (GHG) emissions from mobile source goods movement equipment used at the San Pedro Bay Ports. This contract includes \$2,564,004 in pass-through revenue from CEC.

### 18277: Southern California Advanced Sustainable Freight Demonstration

Contractor: Velocity Vehicle Group DBA Los Angeles Truck Centers LLC	SCAQMD Cost-Share <i>(partially received as pass-through funds)</i>	\$ 3,568,300
	Cosponsor	
	Velocity Vehicle Group DBA Los Angeles Truck Centers LLC	629,700
Term: 09/07/18 – 03/06/22	Total Cost:	\$ 4,198,000

Velocity Vehicle Group will partner with Freightliner Trucks, the leading truck OEM for Class 8 trucks, and Efficient Drivetrains, Inc. (EDI), a global leader and innovator of advanced, high-efficiency plug-in hybrid electric vehicle (PHEV) and full battery electric vehicle (EV) drivetrains, to develop and demonstrate three PHEV Class 8 drayage trucks and one EV Class 8 drayage truck. EDI’s PowerDrive™ 8000 technology is based on an intelligent four-mode, series-parallel drivetrain and provides full performance in both EV and PHEV configurations and no range limitations in PHEV configuration. The EDI PowerDrive™ 8000 EV drivetrain can drive up to 100 miles in all-electric and zero-emission operation for short-haul vocations. The range extended plug-in hybrid version, the EDI

PowerDrive™ 8000 PHEV drivetrain, delivers up to 35 miles of all-electric driving, and a 300+ mile series-parallel hybrid driving range before refueling is required. This contract includes \$2,985,995 in pass-through revenue from CEC.

### 18280: Three-Year Lease of One Honda 2018 Clarity Plug-In Vehicle

Contractor: Honda of Pasadena	SCAQMD Cost-Share	\$ 18,359
Term: 02/07/18 – 02/06/21	Total Cost:	\$ 18,359

The SCAQMD operates a number of alternative fuel vehicles, including electric vehicles, fuel cell vehicles and plug-in hybrid-electric vehicles. The primary objective of having these vehicles as part of the SCAQMD demonstration fleet is to continue to support the use of zero emissions vehicles. The Honda Clarity Plug-In Hybrid provide up to 47 miles all electric range with about 340 miles total range including gasoline.

### 18287: Charging Station and Premises Agreement for Installation of One DC Fast Charger at SCAQMD Headquarters

Contractor: EVgo Services LLC	SCAQMD Cost-Share	\$ 0
Term: 06/08/18 – 06/07/19	Total Cost:	\$ 0

Through a CEC-funded project to install DC fast chargers throughout the South Coast Air Basin, EVgo and Clean Fuel Connection Inc. were tasked with installing a DC fast charger at SCAQMD's headquarters. This no-cost agreement provided access to the headquarters' premises for installation of the charger. The 50 kW fast charger has CHAdeMO and CCS connectors to charge the majority of American, European and Asian fast charging vehicles. The fast charger has been installed in the parking lot close to the front lobby entrance and adjacent to a cluster of Level 2 charging stations. These charging stations serve the needs of staff (78 registered EV drivers), visitors and the general public. EVgo will continue to operate and maintain the fast charger for a minimum of five years.

### 19190: Zero Emission Trucks and EV Infrastructure Project

Daimler Trucks North America	SCAQMD Cost-Share (transferred from Clean Fuels into Fund 61)	\$ 8,230,072
	Cosponsors	
	State Emissions Mitigation Fund (transferred to Advanced Technology Goods Movement Fund 61)	4,440,000
	Daimler Trucks North America	15,670,072
	San Pedro Bay Port (received into Fund 61)	2,000,000
	U.S. EPA (received into Fund 61)	500,000
Term: 12/18/18 – 6/19/22	Total Cost:	\$ 31,340,144

Daimler Trucks North America (DTNA) will develop battery-electric heavy-duty trucks and demonstrate them in real-world commercial fleet operations in and around environmental justice communities for a period of two years within SCAQMD's jurisdiction. DTNA will gather data and

information from the end-users including performance under specific duty-cycle applications during the demonstration. DTNA will utilize the data and information to move toward the commercial production and sales phase. DTNA will supply five Class 6 trucks with a gross vehicle weight rating (GVWR) up to 26,000 pounds and fifteen Class 8 trucks with a GVWR up to 80,000 pounds, including associated EV charging infrastructure. Fleet partners will be identified and the trucks integrated into a range of services and applications to gather operational data to improve each charging and utilization scheme, with seven of the Class 8 trucks to be used in port drayage operations, supporting the goods movement industry.

**Purchase Order: Procure Greenlots SKY Enterprise Software License with Load Management for One Year**

Contractor: Zeco Systems, Inc., dba Greenlots	SCAQMD Cost-Share	\$ 55,200
Term: 12/13/18 – 12/13/18	Total Cost:	\$ 55,200

The second phase of SCAQMD's EV charger project is to implement load management capabilities to manage demand from the EV chargers at SCAQMD headquarters in order to minimize facility demand charges from electricity bills for the building. The purchase order covers an annual subscription for the Greenlots load management and networking software. The networking software handles payment transactions for collection of EV charging revenue. The purchase order also covers the cost of meters and site controllers to meter the demand from the EV chargers, and enable the load management software to ramp down or turn off power to the EV chargers based on overall facility demand for peak demand shaving.

**Direct Pay: Install DC Fast Charger at SCAQMD Headquarters**

Contractor: Clean Fuel Connection Inc.	SCAQMD Cost-Share	\$ 59,134
Term: 05/29/18 – 05/29/18	Total Cost:	\$ 59,134

As part of a CEC funded project to install ten DC Fast Chargers in the South Coast Air Basin to further support a public fast charging network, these fast chargers were located in Los Angeles and San Bernardino counties. The CEC grant covered the cost of hardware and required cost-share covered the five year operation and maintenance costs, but did not cover installation costs. The direct pay covers the cost of installation for one fast charger at SCAQMD headquarters on the EVgo network, which serves staff, visitors and the general public.

***Engine Systems/Technologies***

**17393: Development of an Ultra-Low Emissions Diesel Engine for On-Road Heavy-Duty Vehicles**

Contractor: Southwest Research Institute	SCAQMD Cost-Share <i>(partially received as pass-through funds)</i>	\$ 575,000
	Cosponsor	
	California Air Resources Board	750,000
Term: 05/30/18 – 07/31/19	Total Cost:	\$ 1,325,000



This is Stage 3 of a comprehensive project to develop the low load cycles and application of aftertreatment and engine controls to mitigate emissions in the most critical areas of a heavy-duty engine cycle typical in the Los Angeles basin. Cylinder deactivation (CDA) hardware, in combination with a modified aftertreatment system, have shown potential in modeling to reach 0.02 NO<sub>x</sub> per bhp-hr. A heavy-duty 15-liter engine will be modified and tested with the CDA and extensive engine control algorithms will be investigated. The aftertreatment will include components, such as a mini burner and a passive-NO<sub>x</sub> adsorber, as well as a possible close coupled catalyst to reach the desired near-zero NO<sub>x</sub>. This contract includes \$287,500 in pass-through revenue from the Port of Los Angeles.

#### **18194: Develop and Demonstrate Near-Zero Emissions Opposed Piston Engine**

Contractor: CALSTART Inc.	SCAQMD Cost-Share	\$ 1,000,000
	Cosponsors	
	California Air Resources Board	7,000,000
	Achates Power, Inc.	6,550,000
	San Joaquin Air Pollution Control District	1,000,000
Term: 05/30/18 – 07/31/120	Total Cost:	\$ 15,550,000

This project takes an old concept to launch a new beginning. The opposed piston engine in combination with modern computer modeling and aftertreatment systems shows potential to be an entirely new option in internal combustion engines. Lower emissions and higher efficiency is expected. This project is for the complete development of a heavy-duty diesel engine and demonstration in class 8 trucks. The engine will have the same power rating requirements as the conventional engine of similar displacement. This project offers another pathway to providing a near-zero NO<sub>x</sub> engine for use in class 8 trucks.

#### **18211: Develop Thermal Management Strategy using Cylinder Deactivation for Heavy-Duty Diesel Engines**

Contractor: West Virginia University Innovation Corporation	SCAQMD Cost-Share	\$ 250,000
	Cosponsors	
	Environment Canada	100,000
	U.S. Environmental Protection Agency	250,000
	Jacobs Vehicle Systems, Inc. (in-kind)	50,000
	Cummins Inc. (in-kind)	50,000
Term: 06/08/18 – 06/07/20	Total Cost:	\$ 700,000

This project is to study the potential benefits of cylinder deactivation on a heavy-duty diesel engine. The benefits of NO<sub>x</sub> s and possible GHG reductions make this an important study in the pathway to near-zero emissions for heavy-duty diesel engines. The hardware will be installed and tested for noise, vibration, harshness and reliability as well as emissions on the dynamometer in a lab setting.

### 18122: Southern California Trucking Demonstration of Near-Zero ISX12N Beta Engines

Contractor: Clean Energy	SCAQMD Cost-Share <i>(partially received as pass-through funds)</i>	\$ 3,495,000
	Cosponsor	
	Clean Energy (in-kind)	2,500,000
Term: 01/05/18 – 01/04/20	Total Cost:	\$ 5,995,000

The SCAQMD and Clean Energy partnered to develop a project that was awarded CEC funds under the 2016 Sustainable Freight Transportation Grant Funding Opportunity. The project scope includes repowering 20 existing 12-liter heavy-duty (HD) natural gas-powered vehicles with the new Beta version of Cummins-Westport's ISX12N engine and demonstrating this technology with seven local freight movement fleets. Each fleet operator is deploying their demonstration vehicle into routine service, thereby allowing operators and fleet managers the opportunity to get "first-hand" experience with the new HD natural gas engines. The expected outcome is to alter the negative perception of prior HD natural gas engines. Upon completion of the one year demonstration each vehicle's engine and exhaust treatment systems will undergo minimal changes from the Beta version to the fully commercialized version and will be certified to CARB's optional low NOx standard of 0.02g NOx/bhp-hr. Demonstrations are expected to conclude in Q3 2019. Fleet operator are expected to continue operating each vehicle in the South Coast Air Basin for their normal useful life. This contract includes \$2,845,000 in pass-through revenue from CEC and \$650,000 in cost-share funds from SCAQMD.

### *Fueling Infrastructure and Deployment (NG/Renewable Fuels)*

#### **Transfer: Participation in the California Natural Gas Vehicle Partnership for Fiscal Year 2018-19 and 2019-20**

Contractor: California Natural Gas Vehicle Partnership	SCAQMD Cost-Share	\$ 25,000
	Cosponsor	
	CNGVP Participating Members	145,000
Term: 07/06/18 – 07/05/20	Total Cost:	\$ 170,000

The California Natural Gas Vehicle Partnership (CNGVP) was formed to accelerate the development of advanced natural gas vehicle technologies to provide a benchmark for lowering emissions from petroleum-based engines and to provide a pathway to hydrogen fuel cell use in the next two decades. The SCAQMD spearheaded the formation of this strategic alliance, which comprises state and federal air quality, transportation and energy agencies, vehicle and engine manufacturers, fuel providers, and transit and refuse hauler organizations. Partnership Steering Committee members contribute monies to fund specific projects intended to achieve the goal of the Partnership. In July 2018 the SCAQMD approved \$25,000 for the SCAQMD's participation in the Steering Committee for the next two years. Projects or efforts funded by the Partnership include event sponsorships such as the ACT Expo and the ReThink

Methane Symposia; enhancing and maintaining the Partnership's website; and, co-funding a white paper study to assess the business case of renewable natural gas with new near zero emission natural gas powered heavy-duty vehicles.

**Various: Replace Diesel School Buses with Near-Zero Emissions CNG Buses**

Contractor: 18 School Districts	SCAQMD Cost-Share (received as pass-through funds)	\$ 3,104,700
	Cosponsor	
	School Districts (match)	1,185,000
Term: Varies (all executed in CY 2018)	Total Cost:	\$ 4,289,700

In 2018, SCAQMD executed grants with 18 school districts to replace a total of 79 old pre-1994 diesel school buses with Type D CNG school buses certified to meet the optional low NOx, near-zero standard of 0.02 g/bhp-hr. The awards will provide up to \$192,000 for each Type D CNG school bus including sales tax. These school buses are partially funded by a U.S. EPA Airshed grant, the funds from which were recognized into the Clean Fuels Fund. Out of the \$192,000 per bus provided under the grant, \$39,300 is provided by the U.S. EPA Airshed grant. The remaining funds were provided by SCAQMD's AB 923 funds totaling \$13,286,800 (not listed in the table above). School districts are also required to provide a match of \$15,000 per CNG bus.

***Fuel/Emissions Studies***

**18206: Assess Air Quality and Greenhouse Gas Impacts of a Microgrid-Based Electricity System**

Contractor: University of California Irvine	SCAQMD Cost-Share	\$ 660,000
	Cosponsors	
	University of California Irvine, in partnership with U.S. Department of Energy, Southern California Gas Company and National Science Foundation (in-kind)	640,000
Term: 04/06/18 – 04/05/20	Total Cost:	\$ 1,300,000

The University of California Irvine (UCI) through its Advanced Power and Energy Program proposes to perform three projects to evaluate air quality and greenhouse gas impacts. These projects will focus on potential fuel cell technology applications for industrial operations and petroleum refineries, assess impacts of renewable hydrogen blending in existing natural gas infrastructure and equipment, and compare economic performance of a fuel cell and battery-electric bus operating in a microgrid.

***Emissions Control Technologies***

**17367: Develop and Evaluate Aftertreatment Systems for Large Displacement Diesel Engines**

Contractor: Southwest Research Institute	SCAQMD Cost-Share (partially received as pass-through funds)	\$ 400,000
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	Cosponsor	
	Manufacturers of Emission Controls Association	80,000
Term: 02/28/18 – 06/30/19	Total Cost:	\$ 480,000

This project is in response to a request to continue a CARB-funded project developing new test cycles for emissions certification. Complications were discovered in the original project aftertreatment and the data was found inconclusive. Therefore, project partners agreed to run the test again to get definitive results from the aged aftertreatment system. The aftertreatment was aged for 1,000 hours and data collected and analyzed at different load cycles similar to that which would be found in the Los Angeles air basin. This contract includes \$290,000 in pass-through revenue from the U.S. EPA.

### ***Technology Assessment and Transfer/Outreach***

#### **16262: Support Sustainable Transportation Energy Pathways (STEPS)**

Contractor: University of California Davis-Institute of Transportation Studies	SCAQMD Cost-Share	\$ 240,000
	Cosponsors	
	7 Energy Companies	1,680,000
	10 Automotive Companies	2,400,000
	5 Government Agencies	1,200,000
Term: 01/05/18 – 01/04/22	Total Cost:	\$ 5,520,000

The Sustainable Transportation Energy Pathways (STEPS) Program at the U.C. Davis-Institute of Transportation Studies is continuing their multidisciplinary research consortium that brings together the world's leading automotive manufacturers, energy companies and government agencies to understand sustainable vehicle and energy solutions. The four explicit program goals of the STEPS 2015-2018 Program are to: 1) optimize scenarios for mass transition to alternative fuels and vehicles in California, 2) model evolving relationships between future sources of mobile energy and the existing oil and gas industry, 3) describe current trends and inform policymakers of strategies for Global Urban Sustainable Transport, and 4) continue development of a wide range of models in order to progress research and improve trend recognition.

#### **18253: Identify and Secure a “Futurist” Clean Transportation or Goods Movement Technologies Expert**

Contractor: Three Squares Inc.	SCAQMD Cost-Share	\$ 11,845
Term: 04/05/18 – 05/31/18	Total Cost:	\$ 11,845

Three Squares Inc. (TSI), one of the nation's leading green event production and marketing firms specializing in producing environmentally sustainable high profile events, assisted SCAQMD in identifying and securing a recognized leading expert in clean transportation and technologies. TSI has experience leading large-scale event production efforts across the globe and has demonstrated the capacity to secure event speakers to attract international audiences of environmental leaders, corporate executives, academic researchers, technology developers and clean tech financiers. Through these events, TSI has established a wide network of contacts and prestigious speakers. This expert identified as a ‘futurist’ presented at the SCAQMD Board Retreat on May 10, 2018.

### 19078: Technical Assistance with Alternative Fuels, EVs, Charging and Infrastructure, and Renewable Energy

Contractor: Clean Fuel Connection, Inc.	SCAQMD Cost-Share	\$ 100,000
Term: 09/07/08 – 09/06/20	Total Cost:	\$ 100,000

SCAQMD relies on expert input, consultation and support to manage a number of programs conducted under the Clean Fuels Program and incentive programs. Clean Fuel Connection, Inc., is providing technical assistance with alternative fuels, renewable energy and electric vehicles as well as outreach activities to promote, assess, expedite and deploy the development and demonstration of advanced, low and zero emissions mobile and stationary technologies. This contract is for technical and administrative support to enable the range of activities involved in implementing the Clean Fuels Program and associated complimentary programs as needed.

### Direct Pay: Cosponsor 26 Conferences, Workshops & Events plus 5 Memberships

Contractor: Various	SCAQMD Cost-Share	\$ 470,118
	Cosponsors	
	Various	3,722,352
Term: 01/01/18 – 12/31/18	Total Cost:	\$ 4,192,470

The SCAQMD regularly participates in and hosts or cosponsors conferences, workshops and miscellaneous events. In CY 2018, SCAQMD provided funding for 26 conferences, workshops and events and 5 memberships in key stakeholder organizations, as follows: Hydrogen and Fuel Cells Ports Briefing in December 2017 (executed in 2018); Clean Fuels Advisory Group Retreats in September 2017 and January 2018; Rethink Methane in February 2018; NREL's Natural Gas Vehicle Technology Forum in February 2018; ICEPAG in March 2018; CALSTART Clean Transportation Summit "California:2030" in March 2018; 28<sup>th</sup> Real-World Emissions Workshop in March 2018; Portable Emissions Measurement Systems Conference & Workshop in March 2018; ACT Expo in April 2018; Hydrogen and Fuel Cell On-Road Freight Workshop in April 2018; California Passenger Rail Summit in April 2018; Special Awards at the California State Science Fair in April 2018; CARB's 50<sup>th</sup> Anniversary Technology Symposium and Showcase in May 2018; Advanced Transportation Symposium & Expo in June 2018; Women in Green Forum in August 2018; Electrification 2018 International Conference & Expo in August 2018; 2018 Air Sensors International Conference in September 2018; Los Angeles National Drive Electric Week "ChargeUp LA" in September 2018; Santa Monica AltCar Expo & Conference in October 2018; CALSTART's 26<sup>th</sup> Annual Symposium in November 2018; CalETC 2018 Los Angeles Auto Show events in November 2018; West Coast Collaborative Partners Meeting in October 2018; Power of Waste: Renewable Natural Gas (RNG) for California Workshop in October 2018; Annual Women in Trade Event in November 2018; and Mobile Source Air Toxics Workshop in February 2019. Additionally, for 2018, four memberships were renewed for participation in the California Hydrogen Business Council, California Stationary Fuel Cell Collaborative; CALSTART Board; and Veloz (subsumed California PEV Collaborative). SCAQMD also joined a new organization, the Los Angeles Cleantech Incubator's Transportation Electrification Partnership, which issued the ZE 2028 Roadmap in fall 2018.

# CLEAN FUELS PROGRAM

## Progress and Results in 2018

### Key Projects Completed

A large number of emission sources contribute to the air quality problems in the South Coast Air Basin. Given the diversity of these sources, there is no single technology or “silver bullet” that can solve all of the region’s problems. Accordingly, the SCAQMD continues to support a wide range of advanced technologies, addressing not only the diversity of emissions sources, but also the time frame to commercialization of these technologies. Projects cofunded by the SCAQMD’s Clean Fuels Program include emission reduction demonstrations for both mobile and stationary sources, although legislative requirements limit the use of available funds primarily to on-road mobile sources.

Historically, mobile source projects have targeted low emissions technology developments in automobiles, transit buses, medium- and heavy-duty trucks and off-road applications. The last few years the focus has shifted to near-zero and zero emissions technologies for medium- and heavy-duty trucks, especially those in the goods movement industry.

Table 5 (page 54) provides a list of 45 projects and contracts completed in 2018. Summaries of the completed technical projects are included in Appendix C. Selected projects completed in 2018 which represent a range of key technologies from near-term to long-term are highlighted below: (a) Develop, Integrate and Demonstrate Ultra-Low Emissions 12-Liter Natural Gas Engine for On-Road Heavy-Duty Vehicles; (b) Demonstrate Catenary Zero Emissions Goods Movement System; and (c) Secondary Organic Aerosol Forming Potential from Light-Duty Gasoline Direct Injection Vehicles.

#### **Develop, Integrate and Demonstrate Ultra-Low Emissions 12-Liter Natural Gas Engine for On-Road Heavy-Duty Vehicles**

The 12-liter (12L) natural gas engine project was a follow-on to the 8.9L natural gas engine development and certification project to address needs of larger displacement engines. The 12L natural gas engine was certified at near-zero NO<sub>x</sub> achieving a 0.02 gram bhp-hr rating and went into full production in February 2018. The Cummins Westport ISX12N (the “N” designation is for near-zero emissions) is a larger-displacement natural gas engine suitable for a variety of heavy-duty vehicles, including regional-haul truck/tractor, vocational and refuse applications. With a displacement of 11.9 liters and up to 400 horsepower and 1,450 lbs. per foot of torque, the ISX12N operates on 100 percent natural gas, which can be carried on the vehicle in either compressed (CNG) or liquefied (LNG) form. The ISX12N can also run on renewable natural gas (RNG). Sales have been increasing nationally with over 2 million miles tested on the road.

An extensive process was undertaken to design and develop the 12L natural gas engine and aftertreatment to meet the 0.02 gram NO<sub>x</sub> level. Utilizing learnings from previous technology development, the existing stoichiometric-cooled EGR spark-ignited combustion was selected as the platform to complement with the following additions/changes:

- Implementation of a closed crankcase ventilation (CCV) system with additional pressure sensor;
- Aftertreatment size increased, improved formulation and O<sub>2</sub> sensor location changed;
- Redesigned fuel system for improved fuel delivery accuracy and responsiveness; and
- Improved software with various emissions optimizing control strategies and addition of heavy-duty on-board diagnostics (OBD).

The combination of increased aftertreatment size and improved formulation increases the overall conversion efficiency of the catalyst and thereby reduces emissions.

The recommended maximum gross container vehicle weight (GCVW) for line-haul applications is 80,000 lbs. (36,287 kg). The recommended gearing to optimize fuel economy is 1,400-1,475 rpms at cruise speed for line-haul applications and 1,450-1,600 rpms for vocational applications.

The ISX12 N engine has been certified at 0.02 g/bhp-hr current 2010 CARB optional low NOx standards and the U.S. EPA GHG and U.S. Department of Transportation fuel consumption regulations. The figure below shows the first Class 8 truck with a ISX12 engine delivered to a customer.



**Figure 16: Class 8 Tractor with 12-Liter NG Engine**

### **Demonstrate Catenary Zero Emissions Goods Movement System**

Siemens Industry Inc. has designed and demonstrated a catenary truck technology, eHighway, in Germany on a European truck chassis. For this project with SCAQMD, Siemens proposed to bring the eHighway technology to Southern California with their partner Volvo and develop and demonstrate a catenary plug-in hybrid electric truck technology. The hybrid drive system will extend the operating range of the truck beyond the all-electric range of the catenary system, enabling the truck to perform regional drayage operations and bridge gaps in catenary infrastructure as it is deployed on a regional level.

For SCAQMD, the infrastructure portion of the project was built along Alameda Street in the City of Carson. The approximate one mile segment extends north to south from East Lomita Blvd to the Dominguez Channel. Corresponding with the operational range of the pantographs, two parallel catenary wires were installed above the roadway one mile in each direction. The height of the system was designed to be above standard vehicle dimensions and clearances. The horizontal position of the overhead contact line along the roadway is supported by tensioning devices installed inside the poles supporting the overhead catenary system. The connection to the grid occurred at the middle of the system where a power supply was placed.

The Alameda Corridor where the eHighway system was demonstrated is a highly congested urban industrial area with several refineries, railyards and facilities associated with petroleum refining. Nearly two years of delays were encountered for the construction portion of the project. Because of the many underground utilities, some known on city maps and others not identified in any city or county records, placement of the planned pole foundations was affected. The obstructions prevented Siemens from

going forward with their original design and they had to redesign the foundations to above ground. The design change caused further delays due to requirements by the City of Carson to install safety barriers and the encroachment onto the roadway of the foundations (Figure 17). Additional delays prior to the start of demonstration were encountered because the system power supply was placed over a high pressure gas line.

The demonstration period had to be reduced from one year to six months because of the issues outlined above. The demonstration was successful in proving out the operation of the vehicles and infrastructure. At the end of the six-month demonstration, Siemens decommissioned the system and returned the area to its original condition.

The SCAQMD conducted several independent studies that included: Determining Owner Operator for Catenary System; Total Cost of Ownership: Catenary Trucks vs Battery Electric Trucks; and Grid Impact Study and Business Case for eHighway. The studies were presented to the funding partners in the project and discussions of the technology and the project were conducted. The recommendations of the viability of the technology are as follows:

- Catenary systems may work in specific duty cycles with high concentrations of traffic on specific routes;
- Vehicles are tied to catenary technology and route;
- Having dual propulsion technologies on a vehicle is complex and expensive for limited utilization;
- Technologies not tied to wayside power are more versatile and flexible in their application for multiple duty cycles;
- Further R&D work and steps towards higher technology readiness level (TRL) must be taken;
- Commercialization and robustness of the pantographs is needed and optimized electric hybrid drivetrains; and
- Technology improvements and lower costs are needed for vehicles and infrastructure to impact economic feasibility.

In addition to the findings of the results of the catenary demonstration, other zero emissions technologies, such as battery and fuel cells, have improved dramatically in durability, reliability, energy density and lower costs.



**Figure 17: eHighway Infrastructure on Alameda Street**



**Figure 18: Volvo Truck Operating on eHighway**



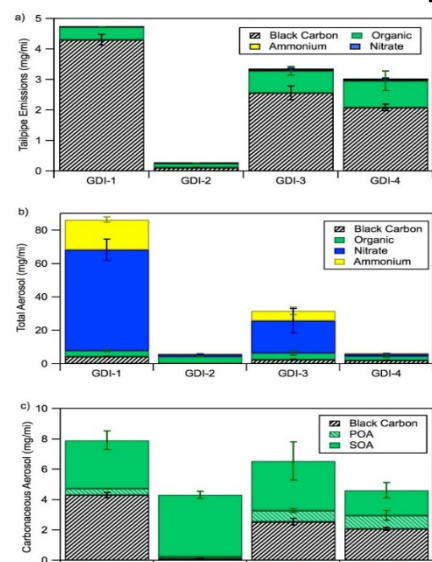
Lesson learned and benefits of this project:

- Wayside power for zero emissions cargo transportation was difficult to implement in an urban industrial environment where it is needed most for reducing criteria pollutants. Sweden did a similar project but the system was constructed in a “green field” without utilities or obstructions to interfere with the construction; the Swedish objective was GHG reductions. The catenary technology may be viable in environments where it is being implemented in Sweden and Germany.
- Siemens was able to design and develop other alternatives for constructing their system infrastructure.
- Constructing infrastructure in the public right of way has many challenges and obstacles to overcome. Implementing such infrastructure, whether it is EV, hydrogen or wayside power, requires a more intensive site survey and risk analyses and risk mitigation plans need to be conducted before putting a shovel to the ground.
- Truck technologies, such as Volvo’s hybrid electric platform, continue development of what was used in the Siemens project in two other major projects SCAQMD is administering: 1) the GGRF drayage truck project, and most recently: 2) the Volvo LIGHTS project. In these projects, we are seeing Volvo transition from diesel hybrid to battery electric trucks. SCAQMD’s work with Volvo on these projects contributed to the realization of the benefits and viability of zero emissions transportation.

## Secondary Organic Aerosol Forming Potential from Light-Duty Gasoline Direct Injection Vehicles

Gasoline direct injection (GDI) vehicles are known for higher fuel efficiency and power output but the PM emissions profile is not well understood, especially on secondary organic aerosol (SOA) formation potential. As manufacturers introduce more GDI models in the market to meet new fuel economy standards, it is important to understand the SOA forming potential from these vehicles as it could lead to further impact on the ambient PM concentration in the South Coast Air Basin (Basin).

The University of California Riverside (UCR)/CE-CERT evaluated the primary emissions and SOA production from eight current technology GDI vehicles over the LA92 test cycle. This program had three distinct goals (or separate exercises): 1) evaluate primary emissions and SOA formation from conventional GDI vehicles; 2) evaluate particulate emissions, toxic pollutants and SOA formation from GDI vehicles with and without gasoline particle filters (GPFs); and 3) examine the impact of fuel composition on the tailpipe emissions and SOA formation from GDI flexible fuel vehicles (FFVs). For the first exercise, four 2015 to 2016 model year GDI vehicles were tested. Results showed that PM, black carbon (BC) and particle number (PN) emissions increased markedly during accelerations and the cold-start phase. PN and BC emissions showed large reductions during the urban and hot-start phases. Aged exhaust emissions resulted in distinct secondary aerosol emissions that varied significantly in physical and chemical structure. Two of the four vehicles produced considerable



**Figure 19: Chemical composition of primary organic aerosol (a-top panel), secondary organic aerosol after irradiation (b-middle panel), and primary and secondary carbonaceous aerosol (c-bottom panel).**

amounts of inorganic aerosol, thereby modifying secondary aerosol volatility and hygroscopicity (Figure 19b). Primary PM emissions from all vehicles in this study met their certification requirements for their respective model years (Figure 19a); however, all vehicles exhibited potential to form a considerable amount of secondary aerosol with different composition (Figure 19c).

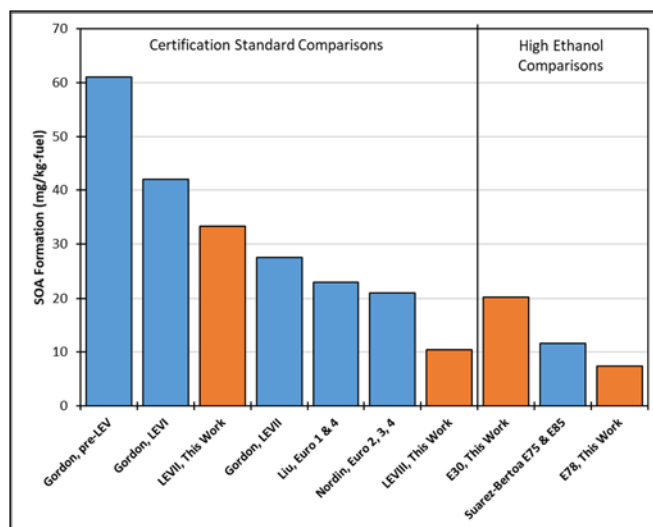
For the second exercise, two 2016 model year GDI vehicles were evaluated for the effects of catalyzed GPF addition to GDI vehicles. The use of catalyzed GPFs greatly reduced the toxic polycyclic aromatic hydrocarbons and their nitrated derivatives (nitro-PAHs), as well as dramatically reduced PM, PN and BC emissions. Gaseous emissions of NO<sub>x</sub>, total hydrocarbons (THC) and non-methane hydrocarbons (NMHC), and production of SOA was reduced with GPF addition.

For the third exercise, two GDI FFVs were tested with four fuels of different ethanol blend levels: E10 with high aromatics, E10 with low aromatics, intermediate E30 and high E78 blend. Vehicles fueled with E30 and E78 exhibited reductions in THC, NMHC, CO and NO<sub>x</sub> emissions compared to the high aromatics E10. As the ethanol content increased, the secondary aerosol formation potential decreased in both FFVs, due to reduction in SOA precursors (i.e., NMHC). In general, this study found that high ethanol content is not only effective in the reduction of tailpipe PM, but also has the potential to greatly decrease SOA formation potential of the emitted exhaust.

As shown in Figure 20, results from this study were compared to earlier peer-reviewed studies exploring SOA formation from gasoline vehicles. The comparison showed that SOA formation dropped as the emissions certification standards became more stringent.

In summary, this study showed that higher aromatics will increase SOA, while higher ethanol blends will reduce SOA formation. The results also showed that SOA formation increased with increasing NMHC emissions, suggesting that further reductions in NMHC emissions are necessary from current technology GDI vehicles. Catalyzed GPFs may help to reduce SOA productions from GDI vehicles.

This study will enhance our ability to model the formation of SOA from GDI vehicles, helping to close the gap between atmospheric measurements and model predictions of PM concentrations. Models equipped with these SOA formation processes could then be used to help formulate science-based policy for the reduction of ambient PM concentrations.



**Figure 20: Comparison of SOA formation from GDI vehicles in this study and from gasoline vehicles in earlier peer-reviewed studies**

**Table 5: Projects Completed between January 1 & December 31, 2018**

<b>Contract</b>	<b>Contractor</b>	<b>Project Title</b>	<b>Date</b>
<b>Hydrogen/Mobile Fuel Cell Technologies and Infrastructure</b>			
12057	Linde, LLC	Expand Hydrogen Fueling Infrastructure	Oct-2018
14684	California Department of Food and Agriculture, Division of Measurement Standards	Conduct Hydrogen Station Site Evaluations for Site Certifications for Commercial Sale of Hydrogen	Feb-2018
15641†	Hardin Hyundai	Three-Year Lease of 2015 Tucson Fuel Cell Vehicle	Jun-2018
16171†	Longo Toyota	Three-Year Lease of 2015 Toyota Mirai Fuel Cell Vehicle	Dec-2018
17394	Energy Independence Now	Provide Analysis of Renewable Hydrogen Pathways, Economics and Incentives	Mar-2018
<b>Electric/Hybrid Technologies and Infrastructure</b>			
13426	Transportation Power, Inc.	Develop and Demonstrate Catenary Class 8 Trucks (1 Electric & 1 CNG Platform)	Jul-2018
13439†	City of Carson	MOU for Catenary Zero Emissions Goods Movement Project	Jul-2018
14062	Siemens Industry Inc.	Develop and Demonstrate Catenary Zero Emissions Goods Movement System and Develop and Demonstrate Diesel Catenary Hybrid Electric Trucks	Dec-2018
15382	ChargePoint, Inc.	Install Electric Charging Infrastructure	Jan-2018
15650	University of California San Diego	Develop and Demonstrate Warehouse Rooftop Solar System with Storage and EV Charging	Jan-2018
16047	US Hybrid Corporation	ZECT I: Develop and Demonstrate Three Class 8 LNG Plug-In Hybrid Electric Drayage Trucks	Sep-2018
<b>Engine Systems/Technologies</b>			
15632	Gas Technology Institute	Develop Ultra-Low Emission Natural Gas Engine for On-Road Medium-Duty Vehicles	Jun-2018
16205	Cummins Westport, Inc.	Develop, Integrate and Demonstrate Ultra-Low Emission 12-Liter Natural Gas Engines for On-Road Heavy-Duty Vehicles	Jun-2018
<b>Fueling Infrastructure and Deployment (NG/Renewable Fuels)</b>			
09364†	Rim of the World Unified School District	Construct and Install a CNG Fueling Station and Perform Garage Upgrades	Oct-2018
12851	Clean Energy	Install, Operate and Maintain Three Natural Gas Fueling Stations	Dec-2018

**Table 5: Projects Completed between January 1 & December 31, 2018 (cont'd)**

<b>Contract</b>	<b>Contractor</b>	<b>Project Title</b>	<b>Date</b>
<b>Fueling Infrastructure and Deployment (NG/Renewable Fuels) (cont'd)</b>			
12852	City of Corona	Upgrade Existing CNG Fueling Station at City Corporate Yard	Jan-2018
12853	Rainbow Disposal Co., Inc.	Upgrade CNG Fueling Station	Dec-2018
12854	Waste Management, Inc.	Upgrade LNG Fueling Station at Baldwin Park Facility	Dec-2018
15438	United Parcel Service (UPS)	Refurbish Ontario LCNG Fueling Facility	Jun-2018
<b>Fuel/Emissions Studies</b>			
15625	University of California Riverside/CE-CERT	Evaluate SOA Formation Potential from Light-Duty GDI Vehicles	Jun-2018
17060†	University of California Riverside	Bailment Agreement – Equipment Use for In-Use Emissions Testing of Heavy-Duty Inspection and Maintenance Program	Oct-2018
<b>Technology Assessment and Transfer/Outreach</b>			
12381†	Integra Environmental Consulting Inc.	Technical Assistance Related to Emissions Inventories, Goods Movement and Off-Road Sources	Apr-2018
14185	Three Squares Inc.	Conduct Education Outreach for the Basin DC Fast Charging Network Project	Jun-2018
15516†	Cordoba Corporation	Technical Assistance with Construction of Zero Emissions Goods Movement Demonstration Project	Mar-2018
17037†	Clean Fuel Connection, Inc.	Technical Assistance with Alternative Fuels, Electric Vehicles, Charging and Fueling Infrastructure and Renewable Energy	Nov-2018
17282†	CALSTART, Inc.	Cosponsor CALSTART's 25 <sup>th</sup> Anniversary Symposium	Jan-2018
17336	Three Squares Inc.	Conduct Education Outreach for the Basin DC Fast Charging Network Project	Jun-2018
18120†	Burke Rix Communications	Cosponsor the Southern California Energy Water + Green Living Summit 2018	Feb-2018
18145†	Gladstein, Neandross & Associates LLC	Cosponsor Rethink Methane 2018	Feb-2018
18155†	University of California Davis-Institute of Transportation Studies	Cosponsor 2018 Air Sensors International Conference	Oct-201
18163†	CALSTART, Inc.	Cosponsor the CALSTART 2018 Clean Transportation Summit <i>California: 2030</i>	Apr-2018
18199†	National Renewable Energy Lab	Cosponsor NREL's Natural Gas Vehicle Technology Forum	Apr-2018

**Table 5: Projects Completed between January 1 & December 31, 2018 (cont'd)**

<b>Contract</b>	<b>Contractor</b>	<b>Project Title</b>	<b>Date</b>
<b>Technology Assessment and Transfer/Outreach (cont'd)</b>			
18219†	Coordinating Research Council, Inc.	Cosponsor the 28th Real World Emissions Workshop	Apr-2018
18235†	Southwest Rail Passenger Association	Cosponsor 2018 California Passenger Rail Summit	Apr-2018
18245†	University of California Riverside	Cosponsor the 2018 Portable Emissions Measurement Systems Conference & Workshop	Apr-2018
18249†	University of California Riverside	Cosponsor CARB's 50 <sup>th</sup> Anniversary Technology Symposium and Showcase	May-2018
18253†	Three Squares Inc.	Identify and Secure a 'Futurist' Clean Transportation or Goods Movement Technologies Expert	May-2018
18282†	California Hydrogen Business Council	Cosponsor the Hydrogen and Fuel Cell On-Road Freight Workshop	May-2018
18290†	Sustain OC	Cosponsor the 2018 Advanced Transportation Symposium & Expo	Jul-2018
18382†	Three Squares Inc.	Cosponsor the 2018 Women in Green Forum	Nov-2018
19040†	Plug In America	Cosponsor the Los Angeles National Drive Electric Week 2018	Sep-2018
19041†	Green Technology (Foundation for Advancements in Science and Education)	Cosponsor Green California Schools and Community Colleges Summit and Exhibition	Dec-2018
19090†	Electric Power Research Institute	Exhibit at Electrification 2018 International Conference & Exposition	Aug-2018
19112†	Platia Productions	Cosponsor the 2018 Santa Monica AltCar Expo & Conference	Nov-2018
19154†	California Electric Transportation Coalition	Cosponsor the CalETC 2018 Los Angeles Auto Show Events	Dec-2018

†Two-page summary reports (as provided in Appendix C) are not required for level-of-effort technical assistance contracts, leases or cosponsorships; or it was unavailable at time of printing this report.

## **CLEAN FUELS PROGRAM 2019 Plan Update**

As noted earlier, 2018 marked the 30<sup>th</sup> year of the SCAQMD's Clean Fuels Program. The funding source for the Clean Fuels Program is a \$1 motor vehicle registration surcharge that, like the Program, was originally approved for a limited five-year period, but legislation eventually extended both the Program and surcharge indefinitely. The Clean Fuels Program has evolved over the years, but has continued to fund a broad array of technology applications spanning near- and long-term implementation. More recently, the focus has been and will continue to be to support the development and deployment of zero and near-zero emissions technologies. Similarly, planning has been and will remain an ongoing activity for the Program, which must remain flexible to address evolving technologies as well as the latest progress in the state-of-technologies, new research areas and data.

Every year the SCAQMD re-evaluates the Clean Fuels Program to develop a Plan Update based on a reassessment of the technology progress and direction of the SCAQMD's Board. This Plan Update for CY 2019 targets several projects to help achieve near-term emissions reductions needed for the South Coast to meet health-based air quality standards.

### **Overall Strategy**

The overall strategy of the TAO's Clean Fuels Program is based, in large part, on emissions reduction technology needs identified through the AQMP process and the SCAQMD Board's directives to protect the health of the approximately 17 million residents (nearly half the population of California) in the South Coast Basin. The AQMP, which is updated approximately every four years, is the long-term regional "blueprint" that relies on fair-share emission reductions from all jurisdictional levels (e.g., federal, state and local). The 2016 AQMP is composed of stationary and mobile source emissions reductions from traditional regulatory control measures, incentive-based programs, projected co-benefits from climate change programs, mobile source strategies and reductions from federally regulated sources (e.g., aircraft, locomotives and ocean-going vessels).

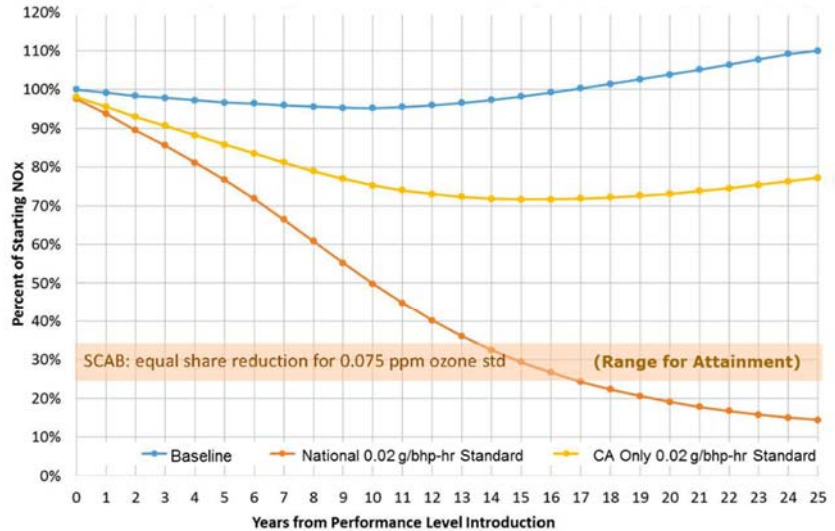
The emissions reductions and control measures in the 2016 AQMP rely on commercial adoption of a mix of currently available technologies as well as the expedited development and commercialization of lower-emitting mobile and stationary advanced technologies in the Basin to achieve air quality standards. The 2016 AQMP projects that an approximate 45 percent reduction in oxides of nitrogen (NO<sub>x</sub>) is required by 2023 and an additional 55 percent reduction by 2031. The majority of these NO<sub>x</sub> reductions must come from mobile sources, both on- and off-road. Notably, the SCAQMD is currently only one of two regions in the nation designated as an extreme ozone nonattainment area (the other is San Joaquin Valley). Ground level ozone (a key component of smog) is created by a chemical reaction between NO<sub>x</sub> and volatile organic compound (VOC) emissions in the presence of sunlight. This is especially noteworthy because in the South Coast Air Basin the primary driver for ozone formation is NO<sub>x</sub> emissions, and mobile sources contribute approximately 88 percent of the NO<sub>x</sub> emissions in this region. Furthermore, NO<sub>x</sub> emissions, along with VOC emissions, also lead to the formation of PM<sub>2.5</sub> [particulate matter measuring 2.5 microns or less in size, expressed as micrograms per cubic meter (μg/m<sup>3</sup>)].

In June 2016, SCAQMD and 10 co-petitioners requested the U.S. EPA Administrator to undertake rulemaking to revise the national on-road heavy-duty engine exhaust NO<sub>x</sub> emission standard from 0.2 g/bhp-hr to 0.02 g/bhp-hr. It was recommended that the regulation be implemented by January 2022 or if not feasible, by January 2024, with a phase-in starting in January 1, 2022. A national standard (as opposed to only a California standard) is estimated to result in NO<sub>x</sub> emission reductions from this

source category from 70 to 90 percent in 14 to 25 years, respectively. Given that the Basin must attain the 75 ppb ozone NAAQS by 2031 (within the next 13 years), a new on-road heavy-duty engine exhaust emissions standard for NOx is critical given the time needed for such standards to be adopted, for manufacturers to develop and produce compliant vehicles, and for national fleet turnover to occur. In November 2018, U.S. EPA initiated the process to update the existing heavy-duty engine standards to lower NOx emissions.

Figure 21 shows the difference in NOx reductions from heavy-duty trucks between baseline emissions (no new regulations) in blue, a low NOx standard adopted only in California in yellow, and lastly, the orange line shows reductions if the same low NOx standard is implemented nationally.

The findings from the MATES IV<sup>5</sup> (released May 2015), which included local scale studies near large sources such as ports and freeways, reinforce the importance of the need for transformative transportation technologies, especially near the goods movement corridor to reduce NOx emissions. In recognition of these impacts, the SCAQMD added as a key element to its strategy a concerted effort to develop and demonstrate zero and near-zero emissions' goods



Source: Presentation by Mr. Cory Palmer, ARB at the Symposium on California's Development of its Phase 2 Greenhouse Gas Emission Standards for On-Road Heavy-Duty Vehicles (April 22, 2015)

Figure 21: NOx Reduction Comparison: No New Regulations vs Low NOx Standard in California only vs National Standard

movement technologies, including electric trucks, plug-in hybrid trucks with all-electric range, zero emission container transport technologies. In 2017, SCAQMD initiated MATES V to update the emissions inventory of toxic air contaminants and modeling to characterize risks, including measurements and analysis of ultrafine particle concentrations typically emitted or subsequently formed from vehicle exhaust. CARB is also updating its EMFAC model, which assesses emissions from on-road vehicles including cars, trucks and buses.

California currently has several incentive programs to help implement cleaner technologies, and while some additional financial resources have also recently been identified to offset the higher procurement costs of emerging clean technologies (i.e., Volkswagen Environmental Mitigation Trust which allocated \$423 million to California), significant additional resources are still needed for the scale necessary to achieve the air quality standards for this region. This is where the Clean Fuels Program can help make a significant impact. A key strategy of the Clean Fuels Program is its public-private partnership with private industry, technology developers, academic institutions, research institutions and government agencies. This public-private partnership has allowed the Program to leverage its

<sup>5</sup> <http://www.aqmd.gov/docs/default-source/air-quality/air-toxic-studies/mates-iv/mates-iv-final-draft-report-4-1-15.pdf?sfvrsn=7>

funding on average with \$3-\$4 of spending on R&D projects to every \$1 of SCAQMD funds. The SCAQMD aggressively seeks leverage funds to accomplish more with every dollar. Over its 30-year life, from 1988 to 2018, the Clean Fuels Program provided \$320.5 million toward projects totaling \$1.5 billion. TAO's RD<sup>3</sup> and implementation programs have helped develop and commercialize numerous technologies, subsequently providing incentives to offset the incremental cost of the technologies. With the success of this process, the 2016 AQMP included control measures to develop indirect source regulations and strengthen the fleet rules that can take advantage of incentives provided, as a method of compliance to further accelerate the emissions reductions.

CY 2018 also marked another milestone in TAO—the 20<sup>th</sup> year of the Carl Moyer Program. The Carl Moyer Program (CMP) provides partial funding to owners of diesel engines and equipment to go beyond regulatory requirements by retrofitting, repowering or replacing their engines with newer and cleaner models. The CMP has been a successful and popular statewide air pollution reduction program enacted through legislation and plays a complementary role to California's regulatory program by providing incentives to expedite the transition to cleaner technology to obtain early or extra NO<sub>x</sub>, PM and ROG emissions reductions. The Carl Moyer Program provides the necessary incentives to facilitate penetration of the technologies developed and demonstrated by the Clean Fuels Program. Together these two synergistic programs allow the SCAQMD to be a leader in technology development and implementation to accelerate the reduction of criteria pollutants.

Figure 22 provides a conceptual design of the wide scope of the Clean Fuels Program and the relationship with incentive programs, as well as the regulatory approaches included in the 2016 AQMP. The SCAQMD's Clean Fuels Program funds various stages of technology projects, typically ranging from Technology Readiness Levels 3-8, to provide a portfolio of emissions technology choices but to achieve emissions reduction benefits in the nearer as well as over the longer term.



**Figure 22: Technology Readiness Level Stages**

While the state continues to focus their attention to climate change (CO<sub>2</sub> reductions), the SCAQMD remains committed to being a leader in achieving NO<sub>x</sub> reductions. Toward this end, SCAQMD focuses on developing, demonstrating and commercializing zero and near-zero emissions technologies and renewable fuels that provide concurrent CO<sub>2</sub> reduction benefits. Fortunately, many of the technologies that address the South Coast Basin's needed NO<sub>x</sub> reductions align with the state's GHG reduction efforts. Furthermore, the U.S. EPA noted that the transportation sector contributed 28 percent of overall GHG emissions in 2016. Given this, coupled with their Cleaner Trucks Initiative in development, the SCAQMD is confident it can successfully partner on state and federally funded projects that promise NO<sub>x</sub> and GHG co-benefit emissions reductions.



## Program and Funding Scope

This 2019 Plan Update includes projects to develop, demonstrate and commercialize a variety of technologies, from near-term to long-term, that are intended to address the following challenges:

- 1) implementation of new and changing federal requirements, such as the more stringent federal 8-hour ozone standard of 70 ppb promulgated by U.S. EPA in late 2015;
- 2) implementation of new technology measures by including accelerated development of technologies getting ready for commercialization and deploying ready technologies; and
- 3) continued development of near-term cost-effective approaches and longer-term technology development.

The overall scope of projects in the 2019 Plan Update also needs to remain sufficiently flexible to address new challenges and measures that are identified in the 2016 AQMP, consider dynamically evolving technologies, and take into account new research and data. The latter, for example, might include initial findings from MATES V and revised inventories in EMFAC 2017.

Within the core technology areas defined later in this section, project objectives range from near-term to long-term. The SCAQMD Clean Fuels Program concentrates on supporting development, demonstration and technology commercialization and deployment efforts rather than fundamental research. The nature and typical time-to-product for the Program's projects is described below, from near-term to longer-term.

- *Deployment* or technology commercialization efforts focus on increasing the utilization of clean technologies in conventional applications, promising immediate and growing emissions reduction benefits. It is often difficult to transition users to a non-traditional technology or fuel due to higher costs or required changes to user behaviors, even if such a technology or fuel offers significant societal benefits. As a result, in addition to government's role to reduce risk by funding technology development and testing, one of government's roles is to support and offset any incremental cost through incentives to help accelerate the transition and use of the cleaner technology. The increased use and proliferation of these cleaner technologies often depends on this initial support and funding as well as efforts intended to increase confidence of stakeholders that these technologies are real, cost-effective in the long term and will remain applicable.
- Technologies ready to begin field *demonstration* in 2019 are expected to result in a commercial product in the 2022-2024 timeframe, and technologies being field demonstrated generally are in the process of being certified. The field demonstrations provide a controlled environment for manufacturers to gain real-world experience and address any end-user issues that may arise prior to the commercial introduction of the technology. Field demonstrations provide real-world evidence of a technology's performance to help allay any concerns by potential early adopters.
- Finally, successful technology *development* projects are expected to begin during 2019 with durations of at least two or more years. Additionally, field demonstrations to gain longer-term verification of performance may also be needed prior to commercialization. Certification and ultimate commercialization would be expected to follow. Thus, development projects identified in this plan may result in technologies ready for commercial introduction as soon as 2023-2025. Projects are also proposed that may involve the development of emerging technologies that are considered longer term and, perhaps higher risk, but with significant emission reduction potential. Commercial introduction of such long-term technologies would not be expected until 2026 or later.

## Core Technologies

The following technologies have been identified as having the greatest potential to enable the emissions reductions needed to achieve NAAQS and thus form the core of the Program.

The goal is to fund viable projects in all categories. However, not all project categories will be funded in 2019 due to funding limitations, and focus will remain on control measures identified in the 2016 AQMP, with consideration for availability of suitable projects. The project categories identified below are appropriate within the context of the current air quality challenges and opportunities for technology advancement.

Within these areas, there is significant opportunity for SCAQMD to leverage its funds with other funding agencies to expedite the demonstration and eventual implementation of cleaner alternative technologies in the Basin. A concerted effort is continually made to form public private partnerships to leverage Clean Fuels funds. Two prime examples of this effort in 2018 are projects with Daimler and Volvo. The first is a \$31.3 million project with Daimler, with SCAQMD providing 28 percent of the cost-share, to develop 20 heavy-duty electric trucks with EV infrastructure that includes energy storage systems to demonstrate the trucks in real-world commercial fleet operations in and around environmental justice communities. The second is a \$44.8 million award from CARB's Greenhouse Gas Reduction Fund (GGRF) Program to conduct a wide-scale Volvo battery electric truck and off-road vehicle and infrastructure demonstration; SCAQMD has committed \$4 million in cost-share for this nearly \$90 million project from the Clean Fuels Program.

Several of the core technologies discussed below are synergistic. For example, a heavy-duty vehicle such as a transit bus or drayage truck, may utilize a hybrid electric drive train with a fuel cell operating on hydrogen fuel or an internal combustion engine operating on an alternative fuel as a range extender. Elements of the core hybrid electric system may overlap.

Priorities may shift during the year in keeping with the diverse and flexible "technology portfolio" approach. Priorities may also shift to address specific technology issues which affect residents within the SCAQMD's jurisdiction. AB 617, signed by the Governor in mid-2017, will require planning initially focused on three disadvantaged communities in our region, and additional flexibility will be needed to develop new strategies and technologies. Changes in priority may also occur to leverage opportunities such as cost-sharing by the state government, the federal government or other entities.

The following nine core technology areas are listed by current SCAQMD priorities based on the goals for 2019.

### ***Hydrogen/Fuel Cell Technologies and Infrastructure***

The SCAQMD supports hydrogen infrastructure and fuel cell technologies as one option in the technology portfolio. It is dedicated to assisting federal and state government programs to deploy light-duty fuel cell vehicles (FCVs) by supporting the required fueling infrastructure.

Calendar Years 2015-2019 have been a critical timeframe for the introduction of hydrogen fueling infrastructure. In 2014, Hyundai introduced the Tucson FCV for lease. In 2015, Toyota commercialized the Mirai, the first FCV available to consumers for purchase. In December 2016, Honda started delivering its 2017 Honda Clarity Fuel Cell. Hyundai announced plans for a new 2019 model, Nexa, available for lease or purchase at three dealerships in California. Mercedes-Benz's announcement of the EQC platform GLC F-cell plug-in hybrid fuel cell have similarly disclosed plans to introduce FCVs in 2019. Since hydrogen fueling stations need 18-36 month lead times for permitting, construction and commissioning, plans for stations need to be implemented now. While coordination efforts with the California Division of Measurement Standards (DMS) to establish standardized measurements for hydrogen fueling started in 2014, additional efforts to offer hydrogen for sale in higher volumes to

general consumers are still needed. In addition, SCAQMD continues to review the market to understand new business models and new sources of funding besides grants for construction necessary to enable the station operations to remain solvent during the early years until vehicle numbers ramp up. Lastly, a deliberate and coordinated effort is necessary to ensure that the retail hydrogen stations are developed with design flexibility to address specific location limitations, robust hydrogen supply, and with refueling reliability matching those of existing gasoline and diesel fueling stations.

In January 2018, Governor Brown issued Executive Order (EO) B-48-18. Among other provisions, the order sets an additional hydrogen station network development target of 200 stations by 2025. This is double the current target in Assembly Bill 8 (Perea), chaptered in September 2013, but set its target goal for only two years earlier (end of 2023). Meeting this new ambitious target clearly requires accelerated effort on the part of the State to ensure its achievement. The EO additionally sets a target for 5 million ZEVs by 2030; FCEVs are expected to comprise a significant portion of this future ZEV fleet.

Fuel cells can also play a role in medium- and heavy-duty applications where battery recharging time is insufficient to meet operational requirements. The California Fuel Cell Partnership's (CaFCP) 2030 Vision<sup>6</sup> released in July 2018 provides a broader framework for the earlier Medium- and Heavy-Duty Fuel Cell Electric Truck Action Plan completed in October 2016, which focused on Class 4 parcel delivery trucks and Class 8 drayage trucks with infrastructure development and establishes metrics for measuring progress. Toyota Motors has displayed a second Class 8 fuel cell truck prototype with planned demonstrations at Port of Long Beach, fueling at a new 1,000 kg/day truck fueling station with Equilon, cofunded by CEC and SCAQMD, using hydrogen produced by a new tri-generation system under development. Also, SCAQMD is cofunding GGRF projects with the San Pedro Bay Ports, including one project with POLA and Kenworth for fuel cell powered trucks and hydrogen infrastructure. Kenworth will continue development on a vehicle it demonstrated in SCAQMD's ZECT 2 project. Toyota will integrate its fuel cells into ten Kenworth trucks and the project will build hydrogen fueling stations to support the demonstration and future heavy-duty hydrogen powered trucks.

The 2019 Plan Update identifies key opportunities while clearly leading the way for pre-commercial demonstrations of OEM vehicles. Future projects may include the following:

- continued development and demonstration of distributed hydrogen production and fueling stations, including energy stations with electricity and hydrogen co-production and higher pressure (10,000 psi) hydrogen dispensing and scalable/higher throughput;
- development and demonstration of cross-cutting fuel cell applications (e.g. plug-in hybrid fuel cell vehicles);
- development and demonstration of fuel cells in off-road, locomotive and marine applications such as port cargo handling equipment, switcher locomotives and tugs;
- demonstration of fuel cell vehicles in controlled fleet applications in the Basin;
- development and implementation of strategies with government and industry to build increasing scale and renewable content in the hydrogen market including certification and testing of hydrogen as a commercial fuel to create a business case for investing as well as critical assessments of market risks to guide and protect this investment; and
- coordination with fuel cell vehicle OEMs to develop an understanding of their progress in overcoming the barriers to economically competitive fuel cell vehicles and develop realistic scenarios for their large scale introduction.

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<sup>6</sup>CaFCP's *The California Fuel Cell Revolution, A Vision For Advancing Economic, Social, and Environmental Priorities (Vision 2030)*, September 4, 2018.

- repurpose of fuel cells and hydrogen tanks for other, secondary energy production and storage uses, as well as reusing fuel cells and hydrogen tanks, and approaches to recycle catalysts and other metals.

### ***Electric/Hybrid Technologies and Infrastructure***

In an effort to meet the federal standards for PM2.5 and ozone, a primary focus must be on zero and near-zero emission technologies. A key strategy to achieve these goals is the wide-scale electrification of transportation technologies. With that in mind, the SCAQMD supports projects to address the main concerns regarding cost, battery lifetime, travel range, charging infrastructure and OEM commitment. Integrated transportation systems can encourage further reduction of emissions by matching the features of electric vehicles (zero emissions, zero start-up emissions, all electric range) to typical consumer demands for mobility by linking them to transit. Additionally, the impact of fast charging on battery life and infrastructure costs needs to be better understood. This is especially important today when every month roughly 36,000<sup>7</sup> new plug-in vehicles are sold or leased in the U.S. This number will increase significantly with the introduction of vehicles with 200-plus mile ranges, such as the Chevy Bolt, launched in December 2016, the Tesla Model 3 which came out in mid-2017, and Hyundai Kona, Nissan Leaf and more to come in 2019-20.

The development and deployment of zero emission goods movement systems remains one of the top priorities for the SCAQMD to support a balanced and sustainable growth in the port complex. The SCAQMD continues to work with our regional partners, in particular the Ports of Los Angeles and Long Beach, the Southern California Association of Governments (SCAG) and Los Angeles County Metropolitan Transportation Authority (Metro) to identify technologies that could be beneficial to all stakeholders. Specific technologies include zero emissions trucks (using batteries and/or fuel cells), or plug-in hybrid powertrains, locomotives with near-zero emissions (e.g., 90% below Tier 4), electric locomotives using battery tender cars and catenary, and linear synchronous motors for locomotives and trucks. Additionally, the California Sustainable Freight Action Plan outlines a blueprint to transition the state's freight system to an environmentally cleaner, more efficient and more economical one than it is today, including a call for a zero and near-zero emissions vehicle pilot project in Southern California. The Port of Los Angeles's Sustainable City Plan corroborates this effort, setting a goal of 15 percent of zero emission goods movement trips by 2025 and 35 percent by 2035. More recently, the Clean Air Action Plan 2017 Update adopted by Ports of Los Angeles and Long Beach call for zero emissions cargo handling equipment by 2030 and zero emissions drayage trucks by 2035. SCAQMD is cost-sharing a project with the Port of Long Beach (the START Project) to develop and demonstrate 102 near-zero and zero emissions vehicles, vessels and cargo handling equipment including charging infrastructure, across an intermodal freight network spanning three California seaports and three California air districts.

There are now over 17 light-duty PHEVs certified to California's cleanest ATPZEV or TZEV standards and 16 pure battery electric vehicles (BEVs) commercially available in California. All of these vehicles offer the benefits of higher fuel economy and range, as well as lower emissions. Continued technology advancements in the light-duty infrastructure, particularly in the arena of codes and standards, have helped facilitate the development of corresponding codes and standards for medium- and heavy-duty vehicle infrastructure. Additional traction may be gained in this area as a result of the Transportation Electrification Partnership release in September 2018 of their Zero Emissions 2028 Roadmap, which sets a goal to move toward an additional 25 percent reduction in GHGs and air pollution beyond current commitments through accelerating transportation electrification. Additionally, SCE's Charge Ready Program will include funds for medium- and heavy-duty vehicles and EVSE.

<sup>7</sup>[https://insideevs.com/december-2018-u-s-ev-sales-recap/?utm\\_source=feedburner&utm\\_medium=email&utm\\_campaign=Feed%3A+InsideEvs+%28InsideEVs%29](https://insideevs.com/december-2018-u-s-ev-sales-recap/?utm_source=feedburner&utm_medium=email&utm_campaign=Feed%3A+InsideEvs+%28InsideEVs%29)

Opportunities to develop and demonstrate technologies that could enable expedited widespread use of electric and hybrid-electric vehicles in the Basin include the following:

- demonstration of electric and fuel cell electric technologies for cargo container transport operations, e.g., heavy-duty battery electric or plug-in electric drayage trucks with all electric range;
- demonstration of medium-duty electric and fuel cell electric vehicles in package delivery operations, e.g., electric walk-in vans with fuel cell or CNG range extender;
- development and demonstration of CNG hybrid vehicle technology;
- development of hybrid vehicles and systems for ocean-going vessels and other off-road vehicles;
- demonstration of niche application battery and fuel cell electric medium- and heavy-duty vehicles, including school and transit buses and refuse trucks with short-distance fixed service routes;
- demonstration of integrated programs that make best use of electric drive vehicles through interconnectivity between fleets of electric vehicles and mass transit, and rideshare services that cater to multiple users;
- development of eco-friendly intelligent transportation system (ITS) strategies, demonstrations that encourage electric drive vehicle deployment in autonomous applications, optimized load-balancing strategies for cargo freight and market analysis for zero emission heavy-duty trucks;
- demonstration and installation of infrastructure to support battery electric and fuel cell electric vehicle light-, medium- and heavy-duty fleets currently on the roads or soon entering the market, and to reduce cost, improve convenience and integrate with battery energy storage, renewable energy and energy management strategies (e.g., vehicle-to-grid or vehicle-to-building functionality, demand response, load management);
- repurpose of EV batteries for other or second energy storage uses, as well as reusing battery packs and approaches to recycle lithium, cobalt and other metals;
- development of a methodology to increase understanding of the capability to accept fast-charging and the resultant life cycle and demonstration of the effects of fast-charging on battery life and vehicle performance; and
- deployment of infrastructure corresponding to codes and standards specific to light-, medium- and heavy-duty vehicles, including standardized connectors, fuel quality, communication, and open standards and demand response protocols for EV chargers to communicate across charging networks.

### ***Engine Systems/Technologies***

In order to achieve the emissions reductions required for the South Coast Air Basin, the internal combustion engines (ICEs) used in the heavy-duty sector will require emissions that are 90% lower than the 2010 standards. In 2016, commercialization of the Cummins 8.9 liter (8.9L) natural gas engine achieving 90% below the existing federal standard was a game changer. The 8.9L engine works well in refuse and other vocational trucks as well as transit and school buses. In 2017, Cummins Westport Inc. with SCAQMD and other project partners also achieved certification of the 12L natural gas engine. The 12L engine in Class 8 drayage trucks and 60-foot articulated transit buses is a further game changer. CARB and U.S. EPA certified both engines at 0.02 g/ bhp-hr for NOx. For smaller and long-haul trucks that cannot utilize the 8.9L and 12L near-zero engines, the 2019 Plan Update includes potential projects to develop, demonstrate and certify engines in the 6-7L and larger 13-15L displacement. The Plan Update continues to incorporate pursuit of cleaner engines for the heavy-duty sector. Future projects will support the development, demonstration and certification of engines that can achieve these massive emissions reductions using an optimized systems approach. In December 2018, SCAQMD participated in the Natural Gas Engine & Vehicle R&D Source Review Panel meeting in Sacramento to review, discuss and prioritize several natural gas engine and vehicle technology projects that increase efficiencies using advanced engines or hybrid drive trains. The 2019 Plan includes potential projects

that the SCAQMD might participate in with federal and state agencies towards these efforts. Specifically, these projects are expected to target the following:

- development of ultra-low emissions and improved higher efficiency natural gas engines for heavy-duty vehicles and high horsepower applications projects that move these technologies to a higher technology readiness level and eventual commercialization;
- continued development and demonstration of gaseous- and liquid-fueled, advanced fuels or alternative fuel medium-duty and heavy-duty engines and vehicles;
- development and demonstration of alternative fuel engines for off-road applications;
- evaluation of alternative engine systems such as hydraulic plug-in hybrid vehicles;
- development and demonstration of engine systems that employ advanced engine design features, cylinder deactivation, improved exhaust or recirculation systems, and aftertreatment devices; and
- development of low load and cold start technologies for hybrids and diesels where high level emissions occur

The EPA's recent initiation to create a rule for a national low NOx standard for all on highway heavy duty engines will further motivate manufacturers to develop lower-NOx emitting technologies.

### ***Fueling Infrastructure and Deployment (NG/Renewable Fuels)***

Significant demonstration and commercialization efforts funded by the Clean Fuels Program as well as other local, state and federal agencies are underway to: 1) support the upgrade and buildup of public and private infrastructure projects, 2) expand the network of public-access and fleet fueling stations based on the population of existing and anticipated vehicles, and 3) put in place infrastructure that will ultimately be needed to accommodate transportation fuels with very low gaseous emissions.

Compressed and liquefied natural gas (CNG and LNG) refueling stations are being positioned to support both public and private fleet applications. Upgrades and expansions are also needed to refurbish or increase capacity for some of the stations installed five or more years ago as well as standardize fueling station design, especially to ensure growth of alternative fuels throughout the South Coast Air Basin and beyond. There is also growing interest for partial or complete transition to renewable natural gas delivered through existing natural gas pipelines. Funding has been provided at key refueling points for light-, medium- and heavy-duty natural gas vehicle users traveling from the local ports, along I-15 and The Greater Interstate Clean Transportation Corridor (ICTC) Network. SB 350 (De León) further established a target to double the energy efficiency in electricity and natural gas end uses by 2030.

Some of the projects expected to be developed and cofunded for infrastructure development are:

- development and demonstration of renewable natural gas as a vehicle fuel from renewable feedstocks and biowaste;
- development and demonstration of advanced, cost effective methods for manufacturing synthesis gas for conversion to renewable natural gas;
- enhancement of safety and emissions reductions from natural gas refueling equipment;
- expansion of fuel infrastructure, fueling stations, and equipment; and
- expansion of infrastructure connected with existing fleets, public transit, and transportation corridors, including demonstration and deployment of closed loop systems for dispensing and storage.

### ***Health Impacts, Fuel and Emissions Studies***

The monitoring of pollutants in the Basin is extremely important, especially when linked to (1) a particular sector of the emissions inventory (to identify the responsible source or technology) and/or (2) exposure to pollution (to assess the potential health risks). In fact, studies indicate that smoggy areas can produce irreversible damage to children's lungs. This information highlights the need for further

emissions and health studies to identify the emissions from high polluting sectors as well as the health effects resulting from these technologies.

Over the past few years, the SCAQMD has funded emission studies to evaluate the impact of tailpipe emissions of biodiesel and ethanol fueled vehicles mainly focusing on criteria pollutants and greenhouse gas (GHG) emissions. These studies showed that biofuels, especially biodiesel in some applications and duty cycles, can contribute to higher NO<sub>x</sub> emissions while reducing other criteria pollutant emissions. Furthermore, despite recent advancements in toxicological research related to air pollution, the relationship between particle chemical composition and health effects is still not completely understood, especially for biofuels. SCAQMD funded studies in 2015 to further investigate the toxicological potential of emissions, such as ultrafine particles and vapor phase substances, and to determine whether or not other substances such as volatile or semi-volatile organic compounds are being emitted in lower mass emissions that could pose harmful health effects. In addition, as the market share for gasoline direct injection (GDI) vehicles has rapidly increased from 4% of all vehicle sales in the U.S. in 2009 to an estimated 60% by 2016, it is important to understand the impact on air quality from these vehicles. As such, SCAQMD has funded studies to investigate both physical and chemical composition of tailpipe emissions, focusing on PM from GDI vehicles as well as secondary organic aerosol formation formed by the reaction of gaseous and particulate emissions from natural gas and diesel heavy-duty vehicles. In 2017, SCAQMD initiated an in-use real-world emissions study, including fuel usage profile characterization as well as an assessment of the impact of current technology and alternative fuels on fuel consumption.

In recent years, there has also been an increased interest both at the state and national level on the use of alternative fuels including biofuels to reduce petroleum oil dependency, GHG emissions and air pollution. In order to sustain and increase biofuel utilization, it is essential to identify feedstocks that can be processed in a more efficient, cost-effective and sustainable manner. More recently, based on higher average summer temperatures noted over the past few years, there is interest on how the higher temperatures are impacting ozone formation. These types of studies may be beneficial to support the Clean Air Protection Program being developed under AB 617.

Some areas of focus include:

- demonstration of remote sensing technologies to target different high emission applications and sources;
- studies to identify the health risks associated with ultrafine and ambient particulate matter including their composition to characterize their toxicity and determine specific combustion sources;
- in-use emission studies using biofuels, including renewable diesel, to evaluate in-use emission composition;
- in-use emission studies to determine the impact of new technologies, in particular PEVs on local air quality as well as the benefit of telematics on emissions reduction strategies;
- lifecycle energy and emissions analyses to evaluate conventional and alternative fuels;
- analysis of fleet composition and its associated impacts on criteria pollutants; and
- evaluation of the impact of higher ambient temperatures on emissions of primary and secondary air pollutants.

### ***Stationary Clean Fuel Technologies***

Although stationary source NO<sub>x</sub> emissions are small compared to mobile sources in the South Coast Air Basin, there are applications where cleaner fuel technologies or processes can be applied to reduce NO<sub>x</sub>, VOC and PM emissions. For example, a recent demonstration project funded in part by the SCAQMD at a local sanitation district consisted of retrofitting an existing biogas engine with a digester gas cleanup system and catalytic exhaust emission control. The retrofit system resulted in significant

reductions in NO<sub>x</sub>, VOC and CO emissions. This project demonstrated that cleaner, more robust renewable distributed generation technologies exist that could be applied to not only improve air quality, but enhance power quality and reduce electricity distribution congestion.

Additionally, alternative energy storage could be achieved through vehicle-to-grid or vehicle-to-building technologies, as well as Power-to-Gas that could allow potentially stranded renewable electricity stored as hydrogen fuel. The University of California Riverside's (UCR's) Sustainable Integrated Grid Initiative and University of California Irvine's (UCI's) Advanced Energy and Power Program, funded in part by the SCAQMD, for example could assist in the evaluation of these technologies.

Projects conducted under this category may include:

- development and demonstration of reliable, low emission stationary technologies (e.g., new innovative low NO<sub>x</sub> burners and fuel cells);
- exploration of renewables, waste gas and produced gas sources for cleaner stationary technologies;
- evaluation, development and demonstration of advanced control technologies for stationary sources; and
- vehicle-to-grid or vehicle-to-building, or other stationary energy demonstration projects to develop sustainable, low emission energy storage alternatives.

### ***Emissions Control Technologies***

Although engine technology and engine systems research is required to reduce the emissions at the combustion source, dual fuel technologies and post-combustion cleanup methods are also needed to address the current installed base of on-road and off-road technologies. Existing diesel emissions can be greatly reduced with introduction of natural gas into the engine or via aftertreatment controls such as PM traps and catalysts, as well as lowering the sulfur content or using additives with diesel fuel. Gas-to-Liquid (GTL) fuels, formed from natural gas or other hydrocarbons rather than petroleum feedstock and emulsified diesel, provide low emission fuels for use in diesel engines. As emissions from engines become lower and lower, the lubricant contributions to VOC and PM emissions become increasingly important. The most promising of these technologies will be considered for funding, specifically:

- evaluation and demonstration of new emerging liquid fuels, including alternative and renewable diesel and GTL fuels;
- development and demonstration of renewable-diesel engines and advanced aftertreatment technologies for mobile applications (including diesel particulate traps and selective catalytic reduction catalysts) as well as non-thermal regen technology; and
- development and demonstration of low-VOC and PM lubricants for diesel and natural gas engines.

### ***Technology Assessment and Transfer/Outreach***

Since the value of the Clean Fuels Program depends on the deployment and adoption of the demonstrated technologies, outreach and technology transfer efforts are essential to its success. This core area encompasses assessment of advanced technologies, including retaining outside technical assistance as needed, efforts to expedite the implementation of low emissions and clean fuels technologies, coordination of these activities with other organizations and information dissemination to educate the end user. Technology transfer efforts include support for various clean fuel vehicle incentive programs as well cosponsorship of technology-related conferences, workshops and other events.



## Target Allocations to Core Technology Areas

The figure below presents the potential allocation of available funding, based on SCAQMD projected program costs of \$16.7 million for all potential projects. The expected actual project expenditures for 2019 will be less than the total SCAQMD projected program cost since not all projects will materialize. The target allocations are based on balancing technology priorities, technical challenges and opportunities discussed previously and near-term versus long-term benefits with the constraints on available SCAQMD funding. Specific contract awards throughout 2019 will be based on this proposed allocation, the quality of proposals received and evaluation of projects against standardized criteria and ultimately SCAQMD Board approval.

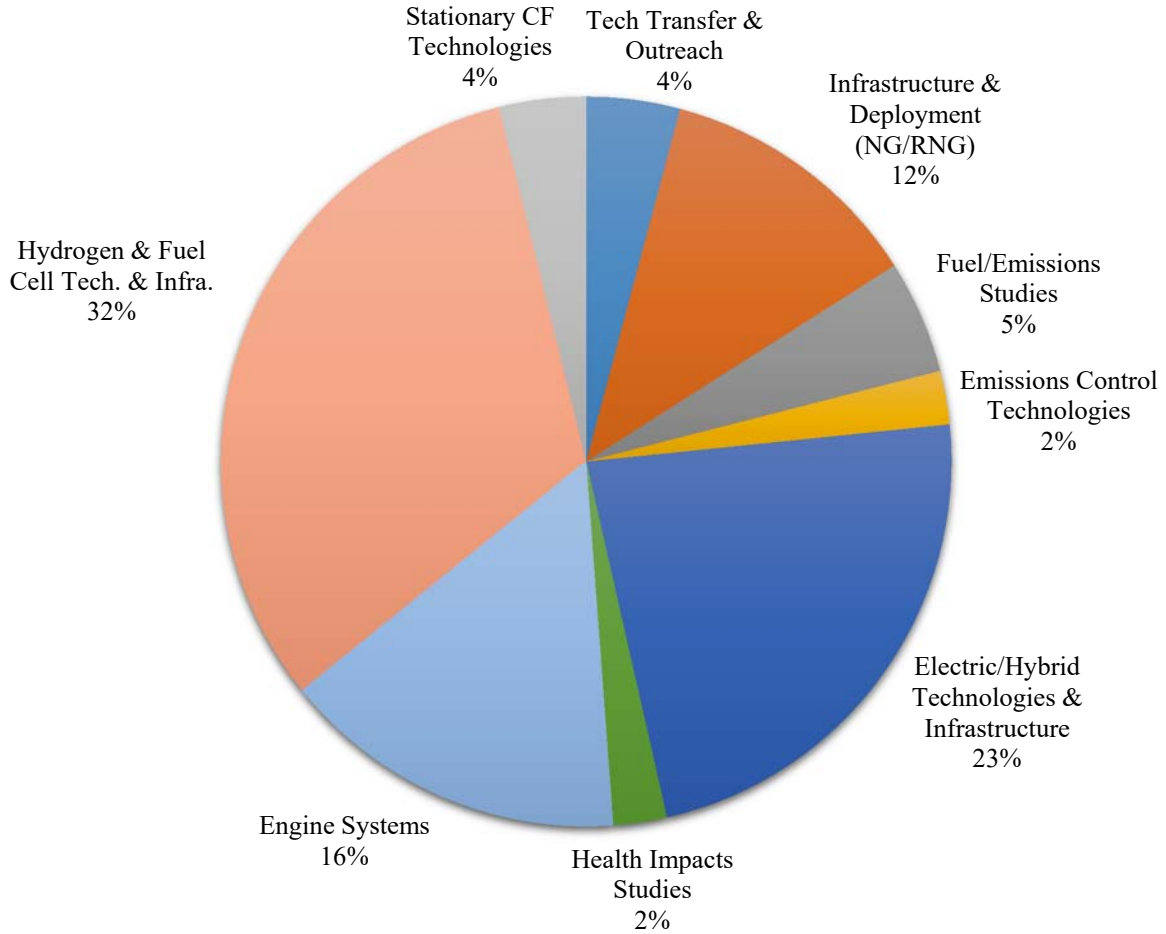


Figure 23: Projected Cost Distribution for Potential SCAQMD Projects in 2019 (\$16.9M)

## CLEAN FUELS PROGRAM Program Plan Update for 2019

This section presents the Clean Fuels Program Plan Update for 2019. The proposed projects are organized by program areas and described in further detail, consistent with the SCAQMD budget, priorities and the best available information on the state-of-the-technology. Although not required, this Plan also includes proposed projects that may be funded by revenue sources other than the Clean Fuels Program, specifically related to VOC and incentive projects.

Table 6 (page 71) summarizes potential projects for 2019 as well as the distribution of SCAQMD costs in some areas as compared to 2018. The funding allocation continues the focus on development and demonstration of zero and near-zero emission technologies including the infrastructure for such technologies. For the 2019 Draft Plan, there is a small increase for hydrogen and fuel cell technologies to incentivize large-scale hydrogen infrastructure projects at the Ports and in the Inland Empire and in light of current and projected roll out of fuel cell vehicles in 2016-2019. The SCAQMD shifted some resources to electric and hybrid-electric technologies in light of two large projects and grant awards the SCAQMD received in mid-July 2018 for a Daimler project and in September 2018 for Volvo's project which includes \$44.8 million from the GGRF Program to demonstrate vehicles in this technology area. Small funding shift to Engine Systems and Fueling Infrastructure and Deployment (natural gas and renewable fuels) is also recommended in light of large projects last year and for biogas production, respectively. The other areas will continue with similar allocations for 2019. As in prior years, the funding allocations again align well with the SCAQMD's FY 2018-19 Goals and Priority Objectives. Overall, the Program is designed to ensure a broad portfolio of technologies and leverage state and federal efforts, and maximize opportunities to leverage technologies in a synergistic manner.

Each of the proposed projects described in this Plan, once fully developed, will be presented to the SCAQMD Governing Board for approval prior to contract initiation. This Plan Update reflects the maturity of the proposed technology and identifies contractors to perform the projects, participating host sites, and securing sufficient cost-sharing needed to complete the project and other necessary factors. Recommendations to the SCAQMD Governing Board will include descriptions of the technology to be demonstrated and in what application, the proposed scope of work of the project and the capabilities of the selected contractor and project team, in addition to the expected costs and expected benefits of the projects as required by H&SC 40448.5.1.(a)(1). Based on communications with all of the organizations specified in H&SC 40448.5.1.(a)(2) and review of their programs, the projects proposed in this Plan do not appear to duplicate any past or present projects.

### Funding Summary of Potential Projects

The remainder of this section contains the following information for each of the potential projects summarized in Table 6 (page 71).

**Proposed Project:** A descriptive title and a designation for future reference.

**Expected SCAQMD Cost:** The estimated proposed SCAQMD cost share as required by H&SC 40448.5.1.(a)(1).

**Expected Total Cost:** The estimated total project cost including the SCAQMD cost share and the cost share of outside organizations expected to be required to complete the proposed project. This is an indication of how much SCAQMD public funds are leveraged through its cooperative efforts.

**Description of Technology and Application:** A brief summary of the proposed technology to be developed and demonstrated, including the expected vehicles, equipment, fuels, or processes that could benefit.

**Potential Air Quality Benefits:** A brief discussion of the expected benefits of the proposed project, including the expected contribution towards meeting the goals of the AQMP, as required by H&SC 40448.5.1.(a)(1). In general, the most important benefits of any technology research, development and demonstration program are not necessarily realized in the near-term. Demonstration projects are generally intended to be proof-of-concept for an advanced technology in a real-world application. While emission benefits, for example, will be achieved from the demonstration, the true benefits will be seen over a longer term, as a successfully demonstrated technology is eventually commercialized and implemented on a wide scale.

**Table 6: Summary of Potential Projects for 2019**

<b>Proposed Project</b>	<b>Expected SCAQMD Cost \$</b>	<b>Expected Total Cost \$</b>
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**Hydrogen/Fuel Cell Technologies and Infrastructure**

Develop and Demonstrate Operation and Maintenance Business Case Strategies for Hydrogen Stations	300,000	3,500,000
Develop and Demonstrate Hydrogen Production and Fueling Stations	2,000,000	6,000,000
Develop and Demonstrate Medium- and Heavy-Duty Fuel Cell Vehicles	3,000,000	12,000,000
Demonstrate Light-Duty Fuel Cell Vehicles	100,000	100,000
Subtotal	\$5,400,000	\$21,600,000

**Electric/Hybrid Technologies and Infrastructure**

Develop and Demonstrate Electric and Hybrid Vehicles	2,000,000	8,000,000
Develop and Demonstrate Electric Charging Infrastructure	500,000	3,000,000
Demonstrate Alternative Energy Storage	200,000	1,500,000
Develop and Demonstrate Electric Container Transport Technologies	1,200,000	4,000,000
Subtotal	\$3,900,000	\$16,500,000

**Engine Systems/Technologies**

Develop and Demonstrate Advanced Gaseous- and Liquid-Fueled Medium- and Heavy-Duty Engines & Vehicle Technologies to Achieve Ultra-Low Emissions	2,000,000	8,000,000
Develop and Demonstrate Alternative Fuel and Clean Conventional Fueled Light-Duty Vehicles	200,000	1,000,000
Develop and Demonstrate Low Load and Cold-Start Technologies	200,000	1,000,000
Develop and Demonstrate Low Emissions Locomotive Technologies	200,000	1,000,000
Subtotal	\$2,600,000	\$11,000,000

**Fueling Infrastructure and Deployment (NG/Renewable Fuels)**

Deploy Natural Gas Vehicles in Various Applications	500,000	2,000,000
Develop, Maintain & Expand Natural Gas Infrastructure	500,000	2,000,000
Demonstrate Natural Gas Manufacturing and Distribution Technologies Including Renewables	1,000,000	10,000,000
Subtotal	\$2,000,000	\$14,000,000

**Fuel/Emissions Studies**

Conduct In-Use Emissions Studies for Advanced Technology Vehicle Demonstrations	300,000	800,000
Conduct Emissions Studies on Biofuels, Alternative Fuels and Other Related Environmental Impacts	300,000	1,000,000
Identify and Demonstrate In-Use Fleet Emissions Reduction Technologies & Opportunities	250,000	1,000,000
Subtotal	\$850,000	\$2,800,000

**Table 6: Summary of Potential Projects for 2019 (cont'd)**

<b>Proposed Project</b>	<b>Expected SCAQMD Cost \$</b>	<b>Expected Total Cost \$</b>
<b>Stationary Clean Fuel Technologies</b>		
Develop and Demonstrate Reliable, Advanced Emission Control Technologies, and Low Emission Monitoring Systems and Test Methods	100,000	250,000
Develop and Demonstrate Clean Stationary Technologies	250,000	750,000
Develop and Demonstrate Renewables-Based Energy Generation Alternatives	300,000	1,000,000
Subtotal	\$650,000	\$2,000,000
<b>Emissions Control Technologies</b>		
Develop and Demonstrate Advanced Aftertreatment Technologies	200,000	2,000,000
Demonstrate On-Road Technologies in Off-Road and Retrofit Applications	200,000	800,000
Subtotal	\$400,000	\$2,800,000
<b>Health Impacts Studies</b>		
Evaluate Ultrafine Particle Health Effects	100,000	1,000,000
Conduct Monitoring to Assess Environmental Impacts	150,000	500,000
Assess Sources and Health Impacts of Particulate Matter	150,000	300,000
Subtotal	\$400,000	\$1,800,000
<b>Technology Assessment and Transfer/Outreach</b>		
Assess and Support Advanced Technologies and Disseminate Information	400,000	800,000
Support Implementation of Various Clean Fuels Vehicle Incentive Programs	300,000	400,000
Subtotal	\$700,000	\$1,200,000
<b>TOTALS FOR POTENTIAL PROJECTS</b>	<b>\$16,900,000</b>	<b>\$73,700,000</b>

## Technical Summaries of Potential Projects

### Hydrogen/Fuel Cell Technologies and Infrastructure

**Proposed Project:** Develop and Demonstrate Operation and Maintenance Business Case Strategies for Hydrogen Stations

**Expected SCAQMD Cost:** \$300,000

**Expected Total Cost:** \$3,500,000

#### Description of Technology and Application:

California regulations require automakers to place increasing numbers of zero emission vehicles into service every year. By 2050, CARB projects that 87% of light-duty vehicles on the road will be zero emission battery and fuel cell vehicles with fuel cell electric becoming the dominant powertrain.

In 2013, cash-flow analysis resulting in a Hydrogen Network Investment Plan and fuel cell vehicle development partnership announcements by major automakers enabled the passage of AB 8 which provides \$20 million per year for hydrogen infrastructure cofunding through the CEC. This resulted in fuel cell vehicle production announcements by Hyundai, Toyota and Honda in 2014-2015.

In October 2016, the CaFCP released its Medium- and Heavy-Duty Fuel Cell Electric Truck Action Plan focusing on Class 4 parcel delivery trucks and Class 8 drayage trucks with infrastructure development and establishing metrics for measuring progress. More recently, in July 2018, the CaFCP released a Vision 2030 document establishing a roadmap for future fuel cell vehicle and hydrogen refueling stations, including barriers that need to be overcome.

In 2015, Hyundai and Toyota introduced fuel cell vehicles, with Honda initiating delivery in 2016 and others following in 2017 or soon thereafter. Government actions over the last couple of years, coupled with early adopter response, is helping to establish demand and thus a business case model for hydrogen stations.

Additional work in this project category includes (1) developing a plan to secure long-term funding to complete the hydrogen fueling network build-out; (2) providing details how funding can be invested; (3) assessing alternative revenue streams such as renewable incentives; (4) proposing alternative financing structures to leverage/extend CEC funding; and (5) supporting station operation during the transition to commercial viability, including optimizing designs with flexibility to address individual site characteristics, as well as ensuring higher levels of dispensing availability and reliability.

Furthermore, in the next couple of years an evaluation of actual market penetration of FCVs should be conducted to guide and protect local and state investments in the hydrogen market.

#### Potential Air Quality Benefits:

The 2016 AQMP identifies the use of alternative fuels and zero emission transportation technologies as necessary to lower NOx and VOC emissions, in an effort to meet federal air quality standards. One of the major advantages of Fuel Cell vehicles (FCEVs) is the fact that they use hydrogen, a fuel that can be domestically produced from a variety of resources such as natural gas (including biogas), electricity (stationary turbine technology, solar or wind) and biomass. The technology and means to produce hydrogen fuel to support FCEVs are available now. The deployment of large numbers of FCEVs, which is one strategy to attain air quality goals, requires a well-planned and robust hydrogen fueling infrastructure. This SCAQMD project, with significant additional funding from other governmental and private entities, will provide the hydrogen fueling infrastructure that is necessary in the South Coast Air Basin. The deployment of FCEVs and the development of the necessary fueling infrastructure

**Proposed Project:** Develop and Demonstrate Distributed Hydrogen Production and Fueling Stations

**Expected SCAQMD Cost:** \$2,000,000

**Expected Total Cost:** \$6,000,000

**Description of Technology and Application:**

Alternative fuels, such as hydrogen and the use of advanced technologies, such as fuel cell vehicles, are necessary to meet future clean air standards. A key element in the widespread acceptance and resulting increased use of alternative fuel vehicles is the development of a reliable and robust infrastructure to support the refueling of vehicles, cost-effective production and distribution and clean utilization of these new fuels.

A challenge to the entry and acceptance of direct-hydrogen fuel cell vehicles is the limited number and scale of hydrogen refueling and production sites. This project would support the development and demonstration of hydrogen refueling technologies. Proposed projects would address:

*Fleet and Commercial Refueling Stations:* Further expansion of the hydrogen fueling network based on retail models, providing renewable generation, adoption of standardized measurements for hydrogen refueling, other strategic refueling locations and dispensing pressure of up to 10,000 psi and compatibility with existing CNG stations may be considered.

*Energy Stations:* Multiple-use energy stations that can produce hydrogen for fuel cell vehicles or for stationary power generation are considered an enabling technology with the potential for costs competitive with large-scale reforming. System efficiency, emissions, hydrogen throughput, hydrogen purity and system economics will be monitored to determine the viability of this strategy for hydrogen fueling infrastructure deployment and as a means to produce power and hydrogen from renewable feedstocks (e.g., biomass, digester gas).

*Innovative Refueling Appliances:* Home or small scale refueling/recharging is an attractive advancement for alternative clean fuels due to the limited conventional refueling infrastructure. This project would evaluate a hydrogen innovative refueler for cost, compactness, performance, durability, emission characteristics, ease of assembly and disassembly, maintenance and operations. Other issues such as setbacks, building permits, building code compliance and UL ratings for safety would also be evaluated.

Projections for on-the-road FCEV counts now exceed 23,000 in 2021 and 47,000 in 2024 in California and the majority of these do not include medium- and heavy-duty vehicles that may be deployed in the South Coast Air Basin. To provide fuel for these vehicles, the hydrogen fueling infrastructure needs to be significantly increased and become more reliable in terms of availability. SCAQMD will seek additional funding from CEC and CARB to construct and operate hydrogen fueling stations and take advantage of funding opportunities that may be realized by any momentum created by the Governor's 2018 Executive Order to establish 200 stations by 2025.

**Potential Air Quality Benefits:**

The 2016 AQMP identifies the use of alternative clean fuels in mobile sources as a key attainment strategy. Pursuant to AQMP goals, the SCAQMD has in effect several fleet rules that require public and certain private fleets to purchase clean-burning alternative-fueled vehicles when adding or replacing vehicles to their vehicle fleets. Fuel cell vehicles constitute some of the cleanest alternative-fuel vehicles today. Since hydrogen is a key fuel for fuel cell vehicles, this project would address some of the barriers faced by hydrogen as a fuel and thus assist in accelerating its acceptance and ultimate commercialization. In addition to supporting the immediate deployment of the demonstration fleet, expanding the hydrogen fuel infrastructure should contribute to the market acceptance of fuel cell technologies in the long run, leading to substantial reductions in NO<sub>x</sub>, VOC, CO, PM and toxic compound emissions from vehicles.

**Proposed Project:** Develop and Demonstrate Medium- and Heavy-Duty Fuel Cell Vehicles

**Expected SCAQMD Cost:** \$3,000,000

**Expected Total Cost:** \$12,000,000

**Description of Technology and Application:**

This proposed project would support evaluation including demonstration of promising fuel cell technologies for applications using direct hydrogen with proton exchange membrane (PEM) fuel cell technology. Battery dominant fuel cell hybrids are another potential technology as a way of reducing costs and potentially enhancing performance of fuel cell vehicles.

The California ZEV Action Plan specifies actions to help deploy an increasing number of zero emission vehicles, including medium- and heavy-duty ZEVs. CARB recently adopted Innovative Clean Transit Bus Regulation as another driver. Fleets are useful demonstration sites because economies of scale exist in central refueling, in training skilled personnel to operate and maintain the vehicles, in the ability to monitor and collect data on vehicle performance and for manufacturer technical and customer support. In some cases, medium- and heavy-duty fuel cell vehicles could leverage the growing network of hydrogen stations, providing an early base load of fuel consumption until the number of passenger vehicles grows. These vehicles could include hybrid-electric vehicles powered by fuel cells and equipped with batteries capable of being charged from the grid and even supplying power to the grid.

In 2012, the DOE awarded SCAQMD funds to demonstrate Zero Emission Container Transport (ZECT) technologies. In 2015, the DOE awarded SCAQMD additional funds to develop and demonstrate additional fuel cell truck platforms and vehicles under ZECT II. More recently, the Clean Fuels Program cost-shared the development of transit buses at OCTA and will cost-share the demonstration of trucks and hydrogen stations to support the Port of Los Angeles project. More projects like these are anticipated as the OEMs come on board.

This category may include projects in the following applications:

<p><b>On-Road:</b> Transit Buses Shuttle Buses Medium- &amp; Heavy-Duty Trucks</p>	<p><b>Off-Road:</b> Vehicle Auxiliary Power Units Construction Equipment Lawn and Garden Equipment Cargo Handling Equipment</p>
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**Potential Air Quality Benefits:**

The 2016 AQMP identifies the need to implement zero emission vehicles. SCAQMD adopted fleet regulations require public and some private fleets within the Basin to acquire alternatively fueled vehicles when making new purchases. In the future, such vehicles could be powered by zero emission fuel cells operating on hydrogen fuel. The proposed projects have the potential to accelerate the commercial viability of fuel cell vehicles. Expected immediate benefits include the establishment of zero- and near-zero emission proof-of-concept vehicles in numerous applications. Over the longer term, the proposed projects could help foster wide-scale implementation of zero emission fuel cell vehicles in the Basin. The proposed projects could also lead to significant fuel economy improvements, manufacturing innovations and the creation of high-tech jobs in Southern California, besides realizing the air quality benefits projected in the AQMP as well as GHG emissions reductions.



**Proposed Project:** Demonstrate Light-Duty Fuel Cell Vehicles

**Expected SCAQMD Cost:** \$100,000

**Expected Total Cost:** \$100,000

**Description of Technology and Application:**

This proposed project would support the demonstration of limited production and early commercial fuel cell passenger vehicles using gaseous hydrogen with proton exchange membrane (PEM) fuel cell technology, mainly through showcasing this technology. Recent designs of light-duty fuel cell vehicles include hybrid batteries to recapture regenerative braking and improve overall system efficiency.

With the implementation of the California ZEV Action Plan, supplemented by the existing and planned hydrogen refueling stations in the Southern California area, light-duty fuel cell limited-production vehicles are planned for retail deployment in early commercial markets near hydrogen stations by several automakers. Fleets are useful demonstration sites because economies of scale exist in central refueling, in training skilled personnel to operate and maintain the vehicles, in the ability to monitor and collect data on vehicle performance and for manufacturer technical and customer support. SCAQMD has included fuel cell vehicles as part of its demonstration fleet since our first hydrogen station began operation in 2005; strengthening support, education, and outreach regarding fuel cell vehicle technology on an on-going basis. In addition, demonstration vehicles could include hybrid-electric vehicles powered by fuel cells and equipped with larger batteries capable of being charged from the grid and even supplying power to the grid.

Hyundai, Toyota and Honda have commercialized fuel cell vehicles in California, but the first commercial FCV leases are ending, and solo carpool lane access extends only for MY 2017 and later, encouraging new replacements. Mercedes-Benz announced its pre-production of GLC F-Cell plug-in fuel cell model to be introduced at the end of 2019. Hyundai also has announced its Nexso, their next-Generation Fuel Cell SUV, which was delivered to the first customer in California before the end of 2018. Innovative strategies and demonstration of dual fuel, zero emission vehicles could expand the acceptance of battery electric vehicles and accelerate the introduction of fuel cells in vehicle propulsion.

**Potential Air Quality Benefits:**

The 2016 AQMP identifies the need to implement zero emission vehicles. SCAQMD adopted fleet regulations require public and some private fleets within the Basin to acquire alternatively fueled vehicles when making new purchases. In the future, such vehicles could be powered by zero emission fuel cells operating on hydrogen fuel. The proposed projects have the potential to accelerate the commercial viability of fuel cell vehicles. Expected immediate benefits include the deployment of zero-emission vehicles in SCAQMD's demonstration fleet. Over the longer term, the proposed projects could help foster wide-scale implementation of zero emission fuel cell vehicles in the Basin. The proposed projects could also lead to significant fuel economy improvements, manufacturing innovations and the creation of high-tech jobs in Southern California, besides realizing the air quality benefits projected in the AQMP.

## Electric/Hybrid Technologies and Infrastructure

**Proposed Project:** Develop and Demonstrate Electric and Hybrid Vehicles

**Expected SCAQMD Cost:** \$2,000,000

**Expected Total Cost:** \$8,000,000

### Description of Technology and Application:

The significance of transportation in overall carbon emissions is increasing as energy utilities move toward cleaner and more sustainable ways to generate electricity. In the United States, the EPA estimated that in 2016, transportation was responsible for about 28% of the nation's carbon emissions, while electricity sector emissions declined from 31% to 28%.

The global light-duty vehicle market is changing rapidly in response to government-led initiatives to improve fuel economy and market demand for alternative transportation options. These changes are being driven primarily by the adoption of vehicles with various levels of drivetrain electrification. The SCAQMD has long supported the concept of using increased battery power to allow a portion of the driving cycle to occur in all-electric mode for true zero emission miles. This battery dominant strategy is accomplished by incorporating an advanced battery pack initially recharged from the household grid or EV chargers. This "plug-in" hybrid EV strategy allows reduced emissions and improved fuel economy. Most automobile manufacturers have announced production plans for a range of electrified vehicle powertrains, including "blended" plug-in hybrid electric, extended-range electric vehicles (E-rEV), or battery electric vehicles (BEVs). Electric utilities refer to PHEVs, E-rEVs and BEVs as plug-in electric drive vehicles (PEVs) and are working with automakers to support PEVs. Long-range BEVs are now becoming price competitive after subsidies and affordable 200+ mile BEVs should have a big impact on the vehicle market. Plug-in hybrids (PHEVs) are also making incremental advances. Competition between automakers should also help improve technology and bring down costs. Recently, for example, Volkswagen teamed up with Ford to develop an EV to compete against Tesla's significant market share. Continued market expansion is likely to result as OEMs have announced significant investment in PEVs together with a shift in their product mix from sedans to the larger vehicles consumers are demanding, including crossovers, SUVs, and light-duty trucks.

The SCAQMD has long been a leader in promoting early demonstrations of next generation light-duty vehicle propulsion technologies (and fuels). However, given the current and planned market offerings in this category, priorities have shifted. Nevertheless, the SCAQMD will continue to evaluate market offerings and proposed technologies in light-duty vehicles to determine if any future support is required.

Medium- and heavy-trucks make up 4.3% of vehicles in the United States and drive 9.3% of all miles driven each year, yet are responsible for more than 25% of all the fuel burned annually. Hybrid technologies have gained momentum in the light-duty sector with commercial offerings by most of the automobile manufacturers. Unfortunately, the medium- and heavy-duty platforms require the greatest emissions reductions, especially for the fleets due to low turnover.

CARB's Low Carbon Transportation programs, local support and federal funds have collectively accelerated the development and demonstration of medium-duty plug-in hybrid electric truck platforms. Analysis of project data and use profiles will help optimize drive systems, target applications for early commercialization and fill gaps in product offerings.

The SCAQMD has investigated the use of hybrid technologies to achieve similar performance as the conventional-fueled counterparts while achieving both reduced emissions and improved fuel economy. Development and validation of emission test procedures is needed, but is complicated due to the low volume and variety of medium- and heavy-duty vehicles.

Platforms to be considered include utility trucks, delivery vans, shuttle buses, transit buses, waste

haulers, construction equipment, cranes and other off-road vehicles. Innovations that may be considered for demonstration include: advancements in the auxiliary power unit, either ICE or other heat engine; battery-dominant hybrid systems utilizing off-peak re-charging, with advanced battery technologies. Alternative fuels are preferred in these projects, e.g., natural gas, especially from renewable sources, LPG, hydrogen, GTL and hydrogen-natural gas blends, but conventional fuels such as gasoline, renewable diesel, or even modified biodiesel may be considered if the emissions benefits can be demonstrated as equivalent or superior to alternative fuels. Both new designs and retrofit technologies and related charging infrastructure will be considered.

This project category will develop and demonstrate:

- various PEV architectures;
- anticipated costs for such architectures;
- customer interest and preferences for each alternative;
- integration of the technologies into prototype vehicles and fleets;
- evaluation of any new promising light-duty vehicle propulsion technologies or fuels; and
- electric and hybrid-electric medium- and heavy-duty vehicles (e.g., utility trucks, delivery vans, shuttle buses, transit buses, waste haulers, construction equipment, cranes and other off-road vehicles)

**Potential Air Quality Benefits:**

The 2016 AQMP identifies zero or near-zero emitting vehicles as a key attainment strategy. Plug-in HEV technologies have the potential to achieve near-zero emissions while retaining the range capabilities of a conventionally gasoline-fueled combustion engine vehicle, a key factor expected to enhance broad consumer acceptance. Given the variety of PEV systems under development, it is critical to determine the true emissions and performance utility compared to conventional vehicles. Successful demonstration of optimized prototypes would promise to enhance the deployment of near-ZEV and ZEV technologies.

Expected benefits include the establishment of criteria for emissions evaluations, performance requirements, and customer acceptability of the technology. This will help both regulatory agencies and OEMs to expedite introduction of zero and near-zero emitting vehicles in the South Coast Basin, which is a high priority of the AQMP.

**Proposed Project:** Develop and Demonstrate Electric Charging Infrastructure**Expected SCAQMD Cost:** \$500,000**Expected Total Cost:** \$3,000,000**Description of Technology and Application:**

There is a critical need to address gaps in EV charging infrastructure availability. Almost half (48%) of the 1,064,346 EVs sold in the U.S. since 2011 were in California, and of those sales in California, it is estimated that almost half (43%) of CVRP rebates issued to date were issued in SCAQMD. In addition, the California ZEV Action Plan, which was updated in 2018, calls for 5 million ZEVs and supporting infrastructure by 2030.

The recent adoption of revised recommended practice SAE J1772 enables passenger vehicles to charge from 240V AC (Level 2) and 480V DC charging using a common conductive connector in 30 minutes for 90 miles of range (50 kW fast charger) or 40 minutes for 200 miles of range (135 kW Tesla fast charger). Together with the growing adoption of long range EVs above 200 mile electric range, the technology and infrastructure of three fast charging systems (CCS, CHAdeMO and Tesla) are developing as well, although China recently adopted a standard based on CHAdeMO. Technological developments improving the driving range of EVs, as well as increasing availability and speed of charging infrastructure, could change the need for charging infrastructure in the future. However, a study of fast-charging impact on battery life and degradation is very limited. The research and demonstration to increase understanding of the degradation effects of fast-charging will have implications on what types of charging EV owners will leverage and what EVSE stakeholders will bring to market. SCAQMD is committed to continuing to support the successful deployment of EV charging infrastructure as well as demonstration of fast-charging effect on battery life, leveraging funds from the state and the Volkswagen settlement.

The SCAQMD is actively pursuing development of intelligent transportation systems to improve traffic efficiency of battery electric and fuel cell electric cargo container trucks. This system provides truck drivers real-time vehicle operation advice based on changing traffic and road conditions where trucks can dynamically change their speed to better flow through intersections. A truck eco-routing system can provide the most eco-friendly travel route based on truck engine/emission control characteristics, loaded weight, road grade and real-time traffic conditions. Integrated programs can interconnect fleets of electric drive vehicles with mass transit via Web-based reservation systems that allow multiple users. These integrated programs can match the features of EVs (zero emissions, zero start-up emissions, short range) to typical consumer demands for mobility in a way that significantly reduces emissions of pollutants and greenhouse gases.

This project category is one of SCAQMD's continued efforts to:

- deploy a network of DC fast charging infrastructure (up to 350kW) and rapidly expand the existing network of public plug-in EV charging stations including energy storage systems;
- support investigation of fast-charging impact on battery life;
- develop intelligent transportation system strategies for cargo containers; and
- develop freight load-balancing strategies as well as to conduct market analysis for zero emission heavy-duty trucks in goods movement.

**Potential Air Quality Benefits:**

The 2016 AQMP identifies zero emissions vehicles as a key attainment strategy. This proposed project category will reduce PM pollution along major roadways through the expansion of the public EV charging infrastructure network by allowing drivers to shift away from petroleum-fueled vehicles to battery and fuel cell electric vehicles. In addition, this project will assist in achieving improved fuel economy and lower tailpipe emissions, further helping the region to achieve federal ambient air quality

standards and protect public health. Expected benefits include the establishment of criteria for emissions evaluations, performance requirements and customer acceptability of the technology. This will help both regulatory agencies and OEMs to expedite introduction of zero emissions vehicles in the South Coast Basin, which is a high priority of the AQMP.

**Proposed Project:** Demonstrate Alternative Energy Storage

**Expected SCAQMD Cost:** \$200,000

**Expected Total Cost:** \$1,500,000

**Description of Technology and Application:**

The SCAQMD has been involved in the development and demonstration of energy storage systems for electric and hybrid-electric vehicles, mainly lithium ion chemistry battery packs. Over the past few years, new technologies, especially lithium-ion batteries have shown robust performance. Other technology manufacturers have also developed energy storage devices including beyond lithium-ion batteries, flywheels, hydraulic systems and ultracapacitors. Energy storage systems optimized to combine the advantages of ultracapacitors and high-energy but low-power advanced batteries could yield benefits. Beyond lithium-ion batteries (e.g., lithium-sulfur, lithium-oxygen, sodium-ion, flow, and solid-state batteries) also have opportunities to achieve higher energy density, longer cycle life, and lower cost.

This project category is to apply these advanced storage technologies in vehicle platforms to identify best fit applications, demonstrate their viability (reliability, maintainability and durability), gauge market preparedness, evaluate costs relative to current lithium-ion batteries and provide a pathway to commercialization.

The long-term objective of this project is to decrease fuel consumption and resulting emissions without any changes in performance compared to conventional vehicles. This effort will support several projects for development and demonstration of different types of low emission hybrid vehicles using advanced energy storage strategies and conventional or alternative fuels. The overall net emissions and fuel consumption of these types of vehicles are expected to be much lower than traditional engine systems. Both new and retrofit technologies will be considered.

Additionally, this project will also assess potential for repurposing of electric vehicle batteries for storage as well as the longer term more cost-effective recycling approaches currently in a nascent “pilot” stage, especially for metals such as Lithium and Cobalt.

**Potential Air Quality Benefits:**

Certification of low emission vehicles and engines and their integration into the Basin’s transportation sector is a high priority under the 2016 AQMP. This project is expected to further efforts to develop alternative energy storage technologies that could be implemented in medium- and heavy-duty trucks, buses and other applications. Benefits will include proof of concept for the new technologies, diversification of transportation fuels and lower emissions of criteria, toxic pollutants and greenhouse gases.

**Proposed Project:**     Develop and Demonstrate Electric Container Transport Technologies

**Expected SCAQMD Cost:**     \$1,200,000

**Expected Total Cost:**         \$4,000,000

**Description of Technology and Application:**

Advanced transportation systems can be used to transfer cargo containers from ports to both local and “distant” intermodal facilities, thereby significantly reducing emissions from on-road trucks and locomotives and also reducing traffic congestion in local transportation corridors. Some solutions involve using wayside power such as fixed dedicated guideways to move containers powered by magnetic levitation or catenary electric lines. While these types of solutions are elegant and futuristic, they are expensive and difficult to implement in industrial urban environments where they are needed. Previous efforts, including one project with Siemens eHighway catenary hybrid truck system has highlighted complications of building a new infrastructure within an existing infrastructure. Wayside power systems are not excluded in the solutions for addressing the air quality issues we face, though until cost and implementation challenges are addressed, there are more viable technologies that exist and are being pursued.

There are other options for electric container applications such as dual-mode locomotives, hybrid electric technologies with battery storage, a battery tender car and fuel cell propulsion systems. This technical review will evaluate all available technology options to determine whether their systems can be successfully developed and deployed, financially viable, and reliably operated on a long-term basis.

**Potential Air Quality Benefits:**

On-road heavy-duty diesel truck travel is an integral part of operations at the ports moving cargo containers into the Basin and beyond. The 2016 AQMP proposes to reduce emissions from this activity by modernizing the fleet and retrofitting NOx and PM emission controls on older trucks. To modernize the fleet, SCAQMD’s approach is to engage OEMs to develop advanced heavy-duty trucks with battery electric, fuel cell electric and hybrid electric propulsion for transporting containers on roadways. The emissions benefits have not yet been estimated because the fate of the displaced trucks has not been determined.

## Engine Systems/Technologies

**Proposed Project:** Develop and Demonstrate Advanced Gaseous- and Liquid-Fueled Medium- and Heavy-Duty Engines and Vehicles Technologies to Achieve Ultra-Low Emissions

**Expected SCAQMD Cost:** \$2,000,000

**Expected Total Cost:** \$8,000,000

### Description of Technology and Application:

The objective of this proposed project would be to support development and certification of near commercial prototype low-emission medium- and heavy-duty gaseous- and liquid-fueled engine technologies, as well as and integration and demonstration of these technologies in on-road vehicles. The NO<sub>x</sub> emissions target for this project area is 0.02 g/bhp-hr and lower and the PM emissions target is below 0.01 g/bhp-hr. To achieve these targets, an effective emission control strategy must employ advanced fuel system and engine design features, aggressive engine calibration and improved thermal management, improved exhaust gas recirculation systems, and aftertreatment devices that are optimized using a system approach. This effort is expected to result in several projects, including:

- development and demonstration of advanced engines in medium- and heavy-duty vehicles and high horsepower applications;
- development of durable and reliable retrofit technologies to partially or fully convert engines and vehicles from petroleum fuels to alternative fuels; and
- field demonstrations of advanced technologies in various fleets operating with different classes of vehicles. Anticipated fuels for these projects include but are not limited to alternative fuels (fossil fuel-based and renewable natural gas, propane, hydrogen blends, electric and hybrid), conventional and alternative diesel fuels, ultra-low sulfur diesel, renewable diesel, dimethyl ether and gas-to-liquid fuels.

The use of alternative fuel in heavy-duty trucking applications has been demonstrated in certain local fleets within the Basin. These vehicles typically require 200-400 horsepower engines. Higher horsepower alternative fuel engines are beginning to be introduced. However, vehicle range, lack or limited accessible public infrastructure, lack of experience with alternative fuel engine technologies and limited selection of appropriate alternative fuel engine products have made it difficult for more firms to consider significant use of alternative fuel vehicles. For example, in recent years, several large trucking fleets have expressed interest in using alternative fuels. However, at this time the choice of engines over 400 HP or more is limited. Continued development of cleaner dedicated alternative gaseous- or diesel-fueled engines over 400 HP with lower NO<sub>x</sub> emissions, would increase availability to end-users and provide additional emission reductions.

### Potential Air Quality Benefits:

This project is intended to expedite the commercialization of near zero emission gaseous- and liquid-fueled medium- and heavy-duty engine technology both in the Basin and in intrastate operation. The emission reduction benefit of replacing one 4.0 g/bhp-hr heavy-duty engine with a 0.2 g/bhp-hr engine in a vehicle that consumes 10,000 gallons of fuel per year is about 1,400 lb/yr of NO<sub>x</sub>. A heavy-duty 8.9L and 11.9L engines using natural gas and achieving NO<sub>x</sub> emissions of 0.02 g/bhp-hr have been certified and commercialized, with larger displacement and advanced technology (e.g. opposed piston) engines undergoing development. Further, neat or blended alternative fuels can also reduce heavy-duty engine particulate emissions by over 90 percent compared to current diesel technology. This project is expected to lead to increased availability of low-emission alternative fuel heavy-duty engines. Fleets can use the engines and vehicles emerging from this project to comply with SCAQMD fleet regulations and towards implementation of the 2016 AQMP control measures.



**Proposed Project:**      Develop and Demonstrate Alternative Fuel and Clean Conventional Fueled Light-Duty Vehicles

**Expected SCAQMD Cost:**      \$200,000

**Expected Total Cost:**      \$1,000,000

**Description of Technology and Application:**

Although new conventionally fueled vehicles are much cleaner than their predecessors, not all match the lowest emissions standards often achieved by alternative fuel vehicles. This project would assist in the development, demonstration and certification of both alternative-fueled and conventional-fueled vehicles to meet the strictest emissions requirements by the state, e.g., SULEV for light-duty vehicles. The candidate fuels include CNG, LPG, ethanol, GTL, clean diesel, modified bio-diesel and ultra low-sulfur diesel, and other novel technologies. The potential vehicle projects may include:

- certification of CNG light-duty sedans and pickup trucks used in fleet services;
- assessment of “clean diesel” vehicles, including hybrids and their ability to attain SULEV standards; and
- assessment of other clean technologies.

Other fuel and technology combinations may also be considered under this category.

**Potential Air Quality Benefits:**

The 2016 AQMP identifies the use of alternative clean fuels in mobile sources as a key attainment strategy. Pursuant to AQMP goals, the SCAQMD has in effect several fleet rules that require public and certain private fleets to purchase clean-burning alternative-fueled vehicles when adding or replacing vehicles to their vehicle fleets. This project is expected to lead to increased availability of low emission alternative-and conventional-fueled vehicles for fleets as well as consumer purchase.

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**Proposed Project:** Develop and Demonstrate Low Load and Cold-Start Technologies

**Expected SCAQMD Cost:** \$200,000

**Expected Total Cost:** \$1,000,000

**Description of Technology and Application:**

Cold starts and low loads of internal combustion engines have a negative impact on the environment. The thermal efficiency of the internal combustion engine is significantly lower at cold-starts and lower loads. Exhaust aftertreatment systems require a temperature of 250 degrees Celsius or higher to operate at the highest level of emissions reduction efficiency. Diesel engines at cold start increase emissions as much as 10% compared to spark-ignited CNG engines. At low loads, an aftertreatment system often may operate at 150 degrees Celsius. It is also now known that the smaller hybrid engines are experiencing similar warm-up issues due to the on-off drive cycles. The need for thermal efficiency at start-up has led to a variety of suggestions and trials. The primary goal is to reduce energy losses so that systems and components such as the catalytic converter system reach and maintain their intended operating temperature range as soon as possible after engine start. In most cases, adaptation of algorithms associated with fuel injection timing, cylinder deactivation, EGR fraction, turbo control, lubrication warming, SCR pre-heaters and close coupled catalysts can be used to keep the catalyst at the correct operating temperature. This project is to investigate technology to improve catalyst temperature at start-up and low loads with minimal economic impact and time. This technology could be applied to a range of vehicles from hybrid-electric light-duty vehicles to heavy-duty trucks. Emphasis should be on steady temperature control at optimal degrees already proven and established through significant research. The following items are the most recently developed best practices with respect to cost and functionality.

- design and prove cylinder activation technology;
- develop control algorithms to ensure the catalyst maintains temperature throughout the duty cycle.

The project would be implemented, and fleet tested, and recorded over a minimum twelve month period. Further projects can develop from this technology and should be tested in regards to other liquid fuel burning engines.

**Potential Air Quality Benefits:**

The technology to reduce emissions at cold starts and low loads is beneficial to a broad spectrum of vehicles from hybrid electric, light-duty and heavy-duty engines in drayage long haul trucks. The advancement in this technology will directly contribute toward low NOx required as a result of U.S. EPA's heavy-duty engine standard and the current attainment policies in effect. Eliminating cold starting engine issues also directly creates a co-benefit of reducing fuel consumption.

**Proposed Project:** Develop and Demonstrate Low Emissions Locomotive Technologies

**Expected SCAQMD Cost:** \$200,000

**Expected Total Cost:** \$1,000,000

**Description of Technology and Application:**

The objective of this project is to support the development and demonstration of gaseous and liquid fueled locomotive engines. The requirements of locomotive engines as primary generators of electricity to power the locomotive poses serious challenges. Locomotives operate at a specific duty cycle different than conventional on-road engines. The engines often run at low speed and have extended periods of idle time. The durability requirements also surpass other forms of transportation.

Large displacement gaseous fueled engines do not currently exist to power locomotives. The early stages of development of engines and systems to fill this need is currently on-going. Engines are expected to be below the current 0.2g/bhp-hr low NOx standard. The adaptation of alternative fueled locomotives in coordination with required infrastructure improvement by leading manufacturers in the industry shows great potential for further research and cost savings with less maintenance costs and better reliability.

**Potential Air Quality Benefits:**

This project is expected to reduce emissions around 97 tons per year of NOx for each locomotive. The reduction of PM and CO2 also shows great potential mitigation in environmental justice communities.

## **Fueling Infrastructure and Deployment (NG/Renewable Fuels)**

**Proposed Project:** Deploy Natural Gas Vehicles in Various Applications

**Expected SCAQMD Cost:** \$500,000

**Expected Total Cost:** \$2,000,000

### **Description of Technology and Application:**

Natural gas vehicles (NGVs) have been very successful in reducing emissions in the South Coast Air Basin due to the deployment of fleets and heavy-duty vehicles utilizing this clean fuel. In order to maintain the throughput, utility and commercial potential of the natural gas infrastructure and the corresponding clean air benefits, deploying additional models of NGVs in existing applications are needed. This technology category seeks to support the implementation of early-commercial vehicles in a wide variety of applications, such as taxis, law enforcement vehicles, shuttle buses, delivery vans, transit buses, waste haulers, Class 8 tractors and off-road equipment such as construction vehicles and yard hostlers. It also seeks to deploy low-emission natural gas vehicles using renewable fuels to achieve further emission reductions.

### **Potential Air Quality Benefits:**

Natural gas vehicles have inherently lower engine criteria pollutant emissions than conventional vehicles, especially in the heavy-duty applications where older diesel engines are being replaced. Incentivizing these vehicles in city fleets, goods movement applications and transit bus routes help to reduce the local emissions and exposure to nearby residents. Natural gas vehicles also can have lower greenhouse gas emissions and increase energy diversity depending on the feedstock and vehicle class. Deployment of additional NGVs is consistent with SCAQMD's AQMP as well as the state's Alternative Fuels Plan as part of AB 1007 (Pavley).

**Proposed Project:** Develop, Maintain & Expand Natural Gas Infrastructure

**Expected SCAQMD Cost:** \$500,000

**Expected Total Cost:** \$2,000,000

**Description of Technology and Application:**

This project supports the development, maintenance and expansion of natural gas fueling station technologies to increase the overall number of such fueling stations in strategic locations throughout the Basin including the Ports. The intent is to develop and demonstrate advanced technologies to reduce the cost of natural gas equipment, develop and demonstrate closed loop systems for dispensing and storage, standardize fueling station design and construction and help with the implementation of SCAQMD's fleet rules. As natural gas fueling equipment begins to age or has been placed in demanding usage, components will deteriorate. This project offers facilities to replace worn-out equipment or to upgrade existing fueling and/or garage and maintenance equipment to offer increased fueling capacity to public agencies, private fleets and school districts.

**Potential Air Quality Benefits:**

The AQMP identifies the use of alternative clean fuels in mobile sources as a key attainment strategy. NGVs have significantly lower emissions than gasoline vehicles and represent the cleanest internal combustion engine powered vehicles available today. The project has the potential to significantly reduce the installation and operating costs of NGV refueling stations, besides improving the refueling time. While new or improved NGV stations have an indirect emissions reduction benefit, they help facilitate the introduction of low emission, NGVs in private and public fleets in the area, which have a direct emissions reduction benefit. The increased exposure and fleet and consumer acceptance of NGVs would lead to significant and direct reductions in NO<sub>x</sub>, VOC, CO, PM and toxic compound emissions from mobile sources. Such increased penetration of NGVs will provide direct emissions reductions of NO<sub>x</sub>, VOC, CO, PM and air toxic compounds throughout the Basin.

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**Proposed Project:** Demonstrate Natural Gas Manufacturing and Distribution Technologies Including Renewables

**Expected SCAQMD Cost:** \$1,000,000

**Expected Total Cost:** \$10,000,000

**Description of Technology and Application:**

Lack of sufficient statewide LNG production results in increased fuel costs and supply constraints. The cost of transporting LNG from out-of-state production facilities increases the fuel cost from 15 to 20 cents per gallon of LNG and subjects users to the reliability of a single supply source. High capital costs prevent construction of local, large-scale liquefaction facilities. Small-scale, distributed LNG liquefaction systems may provide 25 percent lower capital costs than conventional technology per gallon of LNG produced. Because these smaller plants can be sited near fleet customers, costs for transporting the LNG to end-users are much lower than those for remote larger plants. Beyond these cost reductions, the smaller plants offer key benefits of much smaller initial capital investment and wider network of supply than the larger plant model.

The project category will also consider the development and demonstration of technologies for the production of Renewable Natural Gas (RNG) from various feed stocks including landfill gas, green waste, and anaerobic digester gases.

The main objectives of this project are to investigate, develop and demonstrate:

- commercially viable methods for converting renewable feed stocks into CNG or LNG (e.g., production from biomass);
- economic small-scale natural gas liquefaction technologies;
- utilization of various gaseous feed stocks locally available;
- commercialize incentives for fleets to site, install and use LNG and L/CNG refueling facilities; and
- strategic placement of LNG storage capacity sufficient to provide supply to users in the event of a production outage.

**Potential Air Quality Benefits:**

The SCAQMD relies on a significant increase in the penetration of zero- and low-emission vehicles in the South Coast Basin to attain federal clean air standards by 2023 and 2032. This project would help develop a number of small-scale liquefaction technologies that can reduce LNG costs to be competitive with diesel fuel. Such advances are expected to lead to greater infrastructure development. Additionally, this project could support the state's goal of redirecting landfill waste for local fuel production.

## Fuel/Emissions Studies

**Proposed Project:** Conduct In-Use Emissions Studies for Advanced Technology Vehicle Demonstrations

**Expected SCAQMD Cost:** \$300,000

**Expected Total Cost:** \$800,000

### **Description of Technology and Application:**

Hybrid electric, hybrid hydraulic, plug-in electric hybrid and pure EVs will all play role in the future of transportation. Each of these transportation technologies has attributes that could provide unique benefits to different transportation sectors. Identifying the optimal placement of each transportation technology will provide the co-benefits of maximizing the environmental benefit and return on investment for the operator.

The environmental benefit for each technology class is duty-cycle and application specific. Identifying the attributes of a specific application or drive cycle that would take best advantage of a specific transportation technology would speed the adoption and make optimal use of financial resources in the demonstration and deployment of a technology. The adoption rates would be accelerated since the intelligent deployment of a certain technology would ensure that a high percentage of the demonstration vehicles showed positive results, which would spur the adoption of this technology in similar applications, as opposed to negative results derailing the further development or deployment of a certain technology.

The proposed project would review and potentially coordinate application specific drive cycles to for specific applications. The potential emissions reductions and fossil fuel displacement for each technology in a specific application would be quantified on a full-cycle basis. This information could be used to develop a theoretical database of potential environmental benefits of different transportation technologies when deployed in specific applications.

Another proposed project would be the characterization of intermediate volatility organic compound (IVOC) emissions which is critical in assessing ozone and SOA precursor production rates. Diesel vehicle exhaust and unburned diesel fuel are major sources of and contribute to the formation of urban ozone and secondary organic aerosol (SOA), which is an important component of PM2.5.

Finally, while early developments in autonomous and vehicle-to-vehicle controls are focused on light-duty passenger vehicles, the early application of this technology to heavy-duty, drayage and container transport technologies is more likely. The impact on efficiency and emissions could be substantial. A project to examine this technology to assess its effect on goods movement and emissions associated with goods movement could be beneficial at this time.

### **Potential Air Quality Benefits:**

The development of an emissions reduction database, for various application specific transportation technologies, would assist in the targeted deployment of new transportation technologies. This database coupled with application specific vehicle miles traveled and population data would assist in intelligently deploying advanced technology vehicles to attain the maximum environmental benefit. These two data streams would allow vehicle technologies to be matched to an application that is best suited to the specific technology, as well as selecting applications that are substantial enough to provide a significant environmental benefit. The demonstration of a quantifiable reduction in operating cost through the intelligent deployment of vehicles will also accelerate the commercial adoption of the various technologies. The accelerated adoption of lower emitting vehicles will further assist in attaining SCAQMD's air quality goals.

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**Proposed Project:** Conduct Emissions Studies on Biofuels, Alternative Fuels and Other Environmental Impacts

**Expected SCAQMD Cost:** \$300,000

**Expected Total Cost:** \$1,000,000

**Description of Technology and Application:**

The use of biofuels can be an important strategy to reduce petroleum dependency, air pollution and greenhouse gas emissions. Biofuels are in fact receiving increased attention due to national support and state activities resulting from SB 32, AB 1007 and the Low-Carbon Fuel Standard. With an anticipated increase in biofuel use, it is the objective of this project to further analyze these fuels to better understand their benefits and impacts not only on greenhouse gases but also on air pollution and associated health effects.

In various diesel engine studies, replacement of petroleum diesel fuel with biodiesel fuel has demonstrated reduced PM, CO and air toxics emissions. Biodiesel also has the potential to reduce greenhouse gas emissions because it can be made from renewable feedstocks, such as soy and canola. However, certain blends of biodiesel have a tendency to increase NOx emissions for certain engines and duty cycles, which exacerbates the ozone and PM2.5 challenges faced in the Basin. In addition, despite recent advancements in toxicological research in the air pollution field, the relationship between biodiesel particle composition and associated health effects is still not completely understood.

Ethanol is another biofuel that is gaining increased national media and state regulatory attention. CARB's reformulated gasoline regulation to further increase the ethanol content to 10% as a means to increase the amount of renewable fuels in the state. It is projected that the state's ethanol use will increase from 900 million gallons in 2007 to 1.5 billion gallons by 2012 as a result. As in the case of biodiesel, ethanol has demonstrated in various emission studies to reduce PM, CO and toxic emissions; however, the relationship between particle composition and associated health effects from the combustion of ethanol is not well understood either.

CARB recently proposed a regulation on the commercialization of alternative diesel fuels, including biodiesel and renewable diesel, while noting that biodiesel in older heavy-duty vehicles can increase NOx and the need for emerging alternative diesel fuels to have clear ground rules for commercialization. The impact of natural gas fuel composition on emissions from heavy-duty trucks and transit buses is also being studied.

In order to address these concerns on potential health effects associated with biofuels, namely biodiesel and ethanol blends, this project will investigate the physical and chemical composition and associated health effects of tailpipe PM emissions from light- to heavy-duty vehicles burning biofuels in order to ensure public health is not adversely impacted by broader use of these fuels. This project also supports future studies to identify mitigation measures to reduce NOx emissions for biofuels. Additionally, a study of emissions from well-to-wheel for the extraction and use of shale gas might be considered.

Lastly, in an effort to evaluate the contribution of meteorological factors to high ozone and PM2.5 episodes occurring in the South Coast air Basin, mainly as a result of higher summer time temperatures and increased air stagnation following the drought years, a comprehensive study is necessary to evaluate the trends of meteorological factors that may adversely impact air quality in the Basin. The study will assist staff to better understand the potential impact of recent weather trends on criteria pollutant emissions and potentially develop more effective strategies for improving air quality in the future.

**Potential Air Quality Benefits:**

If renewable diesel, biodiesel and biodiesel blends can be demonstrated to reduce air pollutant emissions with the ability to mitigate any NOx impact, this technology will become a viable strategy to



assist in meeting air pollutant standards as well as the goals of SB 32 and the Low-Carbon Fuel Standard. The use of biodiesel is an important effort for a sustainable energy future. Emission studies are critical to understanding the emission benefits and any tradeoffs (NO<sub>x</sub> impact) that may result from using this alternative fuel. With reliable information on the emissions from using biodiesel and biodiesel blends, the SCAQMD can take actions to ensure the use of biodiesel will obtain air pollutant reductions without creating additional NO<sub>x</sub> emissions that may exacerbate the Basin's ozone problem. Additionally, understanding meteorological factors on criteria pollutant emissions may help identify ways to mitigate them, possibly through targeted advanced transportation deployment.

**Proposed Project:** Identify and Demonstrate In-Use Fleet Emissions Reduction Technologies and Opportunities

**Expected SCAQMD Cost:** \$250,000

**Expected Total Cost:** \$1,000,000

**Description of Technology and Application:**

New technologies, such as alternative fueled heavy-duty engines, are extremely effective at reducing emissions because they are designed to meet the most stringent emissions standards while maintaining vehicle performance. In addition, many new vehicles are now equipped with telematics enabling motorists to obtain transportation information such as road conditions to avoid excessive idling and track information about the vehicle maintenance needs, repair history, tire pressure and fuel economy. Telematics have been shown to reduce emissions from new vehicles. Unfortunately, the in-use fleet lacks telematic systems--particularly heavy-duty engines in trucks, buses, construction equipment, locomotives, marine vessels and cargo handling equipment--have fairly long working lifetimes (up to 20 years due to remanufacturing in some cases). Even light-duty vehicles routinely have lifetimes exceeding 200,000 miles and 10 years. And it is the in-use fleet, especially the oldest vehicles, which are responsible for the majority of emissions.

This project category is to investigate near-term emissions control technologies that can be cost-effectively applied to reduce emissions from the in-use fleet. The first part of the project is to identify and conduct proof-of-concept demonstrations of feasible candidate technologies, such as:

- remote sensing for heavy-duty vehicles;
- annual testing for high mileage vehicles (>100,000 miles);
- replace or upgrade emissions control systems at 100,000 mile intervals;
- on-board emission diagnostics with remote notification;
- low-cost test equipment for monitoring and identifying high emitters;
- test cycle development for different class vehicles (e.g. four wheel drive SUVs);
- electrical auxiliary power unit replacements;
- development, deployment and demonstration of smart vehicle telematic systems; and
- low NOx sensor development

**Potential Air Quality Benefits:**

Many of the technologies identified can be applied to light and heavy-duty vehicles to identify and subsequently remedy high-emitting vehicles in the current fleet inventory. Estimates suggest that 5 percent of existing fleets account for up to 80 percent of the emissions. Identification of higher emitting vehicles would assist with demand-side strategies, where higher emitting vehicles have correspondingly higher registration charges.

## Stationary Clean Fuel Technologies

**Proposed Project:** Develop and Demonstrate Reliable, Advanced Emission Control Technologies, and Low-Emission Monitoring Systems and Test Methods

**Expected SCAQMD Cost:** \$100,000

**Expected Total Cost:** \$250,000

### **Description of Technology and Application:**

Currently, the inability of air/fuel ratio control (AFRC) systems to keep rich-burn engines in compliance contributes significantly to air pollution in the basin. Reliable, low-cost emission monitoring systems are needed for small-to-intermediate size combustion devices, including stationary engines, boilers, heaters, furnaces and ovens that are not large enough to justify a continuous emission monitoring system (CEMS). This class of combustion device is often permitted on the basis of a single demonstration or periodic demonstrations of NO<sub>x</sub> and CO emissions meeting SCAQMD rule requirements or a RECLAIM concentration limit. However, SCAQMD-unannounced tests on engines and boilers have found that in many cases NO<sub>x</sub> and/or CO levels have increased significantly above levels that have been initially or periodically demonstrated due to equipment malfunction and/or inadequate operator attention. It is suspected that the same may be true of heaters, furnaces and ovens.

A demonstration project funded in part by the SCAQMD consisted of retrofitting a biogas engine with a digester gas clean up system and catalytic oxidizer at the exhaust followed by SCR which resulted in significant reductions of NO<sub>x</sub>, VOC and CO. Based on the successful deployment of this project, further emission reductions may be achieved by other biogas combustion sources such as gas turbines and boilers by the continued development of specialized low cost biogas clean up systems that will allow for the use of catalytic after control systems.

Demonstrations of newer technologies in recent years could result in a commercially viable alternative to CEMS that is both reliable and feasible in terms of lower costs. For example, manufacturers of flue gas analyzers have, in recent years, developed low-cost multi-gas analyzers suitable for portable or stack-mounted use. Some preliminary testing of a new type of AFRC, which uses a different type of O<sub>2</sub> sensor known as a wide-band O<sub>2</sub> sensor, is another alternative that can be analyzed. Another technical approach might be to deploy technology utilizing the O<sub>2</sub> signature of a post-catalyst O<sub>2</sub> sensor and additional control concepts being developed by manufacturers. Since an underlying problem has been that engine, catalyst and AFRC manufacturers have developed systems independently, a system being co-developed to perform continuous diagnostics to assist operators in keeping rich-burn engines in compliance is possibly another alternative for demonstration.

### **Potential Air Quality Benefits:**

Stationary engines, boilers, heaters, furnaces and ovens account for approximately 11 percent of total NO<sub>x</sub> emissions and about 6 percent of total CO emissions. There has been a long-standing compliance problem with rich-burn IC engines in the basin and evidence indicates that many of these devices are operating with NO<sub>x</sub> and/or CO emissions above levels required in their permits. Projects could potentially reduce a significant class of NO<sub>x</sub> and CO emissions that are in excess of the assumptions in the AQMP and further enhance SCAQMD's ability to enforce full-time compliance.

**Proposed Project:** Develop and Demonstrate Clean Stationary Technologies**Expected SCAQMD Cost:** \$250,000**Expected Total Cost:** \$750,000**Description of Technology and Application:**

Stationary sources, including VOC sources such as large printing facilities and furniture manufacturers, have become cleaner and cleaner due to the regulatory requirements for low emissions and the advancements in technology to meet those requirements. Best Available Control Technology (BACT) regulations, however, are only required for new, modified, or relocated sources that may result in an emissions increase of a non-attainment air contaminant, any ozone depleting compound or ammonia. This project category is to develop and demonstrate new technologies that can provide emissions reductions in new installations or as retrofit modifications. Possible technology examples include:

- low NOx technologies (burners, thermal and ICEs);
- low-Btu gas technologies (e.g., digester, landfill, or dairy gases);
- alternative fuels and hydrogen blends;
- alternative diesel fuels (emulsified, gas-to-liquids, biodiesel with aftertreatment);
- low emission refinery flares;
- catalytic combustion;
- cost-effective fuel cell and fuel cell hybrid distributed generation;
- fumes-to-fuel technology to replace thermal oxidizers and capture VOC emissions for electricity generation while ensuring no emission of air toxics; and
- boiler optimization design and strategies to improve efficiencies.

Depending on the technology, a proof-of-concept project, demonstration, or pre-commercial deployment would be considered to garner further information on the technology. Issues to investigate include viability (reliability, maintainability and durability) of the technology, cost-effectiveness and operator ease-of-use in order to assess commercialization.

**Potential Air Quality Benefits:**

The SCAQMD has a substantial number of older, small, stationary source technologies within its jurisdiction. Since these devices are not subject to continuous emissions monitoring system requirements, evidence suggests that these devices may not be operating at their permitted NOx, CO, hydrocarbon and PM emissions levels. Replacing these devices with cleaner and more reliable technologies or technology/fuel combinations can have dramatic reductions in all of these criteria pollutants. VOC emission reductions may also be achieved at larger stationary VOC sources to achieve the new federal ozone and PM2.5 standards.

**Proposed Project:** Develop and Demonstrate Renewables-Based Energy Generation Alternatives

**Expected SCAQMD Cost:** \$300,000

**Expected Total Cost:** \$1,000,000

**Description of Technology and Application:**

The objective of this proposed project is to support the development and demonstration of clean energy, renewable alternatives in stationary applications. The technologies to be considered include thermal, photovoltaic and other solar energy technologies; wind energy systems; energy storage potentially including vehicle to grid or vehicle to building functionalities for alternative energy storage; biomass conversion; and other renewable energy and recycling technologies. Innovative solar technologies, such as solar thermal air conditioning and photovoltaic-integrated roof shingles, are of particular interest. Also, in the agricultural sections of the Basin, wind technologies could potentially be applied to drive large electric motor-driven pumps to replace highly polluting diesel-fired pumps. Besides renewable technologies, electrolyzer technology could be used to generate hydrogen, a clean fuel. Hydrogen, when used in regular engines, can potentially reduce tail-pipe emissions, while in fuel cells the emissions are reduced to zero.

The project is expected to result in pilot-scale production demonstrations, scale-up process design and cost analysis, overall environmental impact analysis and projections for ultimate clean fuel costs and availability. This project is expected to result in several projects addressing technological advancements in these technologies that may improve performance and efficiency, potentially reduce capital and operating costs, enhance the quality of natural gas generated from renewable sources for injection into natural gas pipelines, improve reliability and user friendliness and identify markets that could expedite the implementation of successful technologies.

**Potential Air Quality Benefits:**

The 2016 AQMP identifies the development and ultimately the implementation of non-polluting power generation. To gain the maximum air quality benefit, polluting fossil fuel-fired electric power generation needs to be replaced with clean renewable energy resources or other advanced zero emission technologies, such as hydrogen fuel cells, particularly in a distributed generation context.

The proposed project is expected to accelerate the implementation of advanced zero emission energy sources. Expected benefits include directly reducing the emissions by the displacement of fossil generation; proof-of-concept and potential viability for such zero emission power generation systems; increased exposure and user acceptance of the new technology; reduced fossil fuel usage; and the potential for increased use, once successfully demonstrated, with resulting emission benefits, through expedited implementation. These technologies would also have a substantial influence in reducing global warming emissions.

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## Emissions Control Technologies

**Proposed Project:** Develop and Demonstrate Advanced Aftertreatment Technologies

**Expected SCAQMD Cost:** \$200,000

**Expected Total Cost:** \$2,000,000

**Description of Technology and Application:**

There are a number of aftertreatment technologies which have shown substantial emissions reductions in diesel engines. These technologies include diesel particulate filters (DPFs), oxidation catalysts, selective catalytic reduction (SCR) systems and NOx adsorbers. This project category is to develop and demonstrate these aftertreatment technologies alone or in tandem with an alternative fuel to produce the lowest possible PM, ultrafine particles, nanoparticles, NOx, CO, carbonyl and hydrocarbon emissions in retrofit and new applications. With the increasing focus on zero and near-zero emissions goods movement technologies, this category should examine idle reduction concepts and technologies that can be employed at ports and airports.

Possible projects include advancing the technologies for on-road retrofit applications, such as heavy-duty line-haul and other large displacement diesel engines, street sweepers, waste haulers and transit buses. Applications for non-road may include construction equipment, yard hostlers, gantry cranes, locomotives, marine vessels, ground support equipment and other similar industrial applications. Potential fuels to be considered in tandem are low-sulfur diesel, emulsified diesel, biodiesel, gas-to-liquids, hydrogen and natural gas. This project category will also explore the performance, economic feasibility, viability (reliability, maintainability and durability) and ease-of-use to ensure a pathway to commercialization.

**Potential Air Quality Benefits:**

The transfer of mature emission control technologies, such as DPFs and oxidation catalysts, to the off-road sector is a potentially low-risk endeavor that can have immediate emissions reductions. Further development and demonstration of other technologies, such as SCR and NOx adsorbers, could also have NOx reductions of up to 90%.

**Proposed Project:** Demonstrate On-Road Technologies in Off-Road and Retrofit Applications

**Expected SCAQMD Cost:** \$200,000

**Expected Total Cost:** \$800,000

**Description of Technology and Application:**

Heavy-duty on-road engines have demonstrated progress in meeting increasingly stringent Federal and state requirements. New heavy-duty engines have progressed from 2 g/bhp-hr NO<sub>x</sub> in 2004 to 0.2 g/bhp-hr NO<sub>x</sub> in 2010, which is an order of magnitude decrease in just six years. Off-road engines, however, have considerably higher emissions limits depending on the engine size. For example, Tier-3 standards for heavy-duty engines require only 3 g/bhp-hr NO<sub>x</sub>. There are apparent opportunities to implement cleaner on-road technologies in off-road applications. There is also an opportunity to replace existing engines in both on-road and off-road applications with the cleanest available technology. Current regulations require a repower (engine exchange) to only meet the same emissions standards as the engine being retired. Unfortunately, this does not take advantage of recently developed clean technologies.

Exhaust gas cleanup strategies, such as SCR, electrostatic precipitators, baghouses and scrubbers, have been used successfully for many years on stationary sources. The exhaust from the combustion source is routed to the cleaning technology, which typically requires a large footprint for implementation. This large footprint has made installation of such technologies on some mobile sources prohibitive. However, in cases where the mobile source is required to idle for long periods of time, it may be more effective to route the emissions from the mobile source to a stationary device to clean the exhaust stream.

Projects in this category will include utilizing proven clean technologies in novel applications, such as:

- demonstrating certified LNG and CNG on-road engines in off-road applications including yard hostlers, switcher locomotives, gantry cranes, waste haulers and construction equipment;
- implementing lower emission engines in repower applications for both on-road and off-road applications; and
- applying stationary best available control technologies, such as SCR, scrubbers, baghouses and electrostatic precipitators, to appropriate on- and off-road applications, such as idling locomotives, marine vessels at dock and heavy-duty line-haul trucks at weigh stations.

**Potential Air Quality Benefits:**

The transfer of mature emission control technologies, such as certified engines and SCR, to the non-road and retrofit sectors offers high potential for immediate emissions reductions. Further development and demonstration of these technologies will assist in the regulatory efforts which could require such technologies and retrofits.

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## Health Impacts Studies

**Proposed Project:** Evaluate Ultrafine Particle Health Effects

**Expected SCAQMD Cost:** \$100,000

**Expected Total Cost:** \$1,000,000

### **Description of Technology and Application:**

Reducing diesel exhaust from vehicles has become a high priority in the South Coast Air Basin since CARB identified the particulate phase of diesel exhaust as a surrogate for all of the toxic air contaminant emitted from diesel exhaust. Additionally, health studies indicate that the ultrafine portion of particulate matter may be more toxic on a per-mass basis than other fractions. Several technologies have been introduced and others are under development to reduce diesel emissions. These include among others low-sulfur diesel fuel, particulate matter traps and heavy-duty engines operating on alternative fuel such as CNG and LNG. Recent studies have shown that control technologies applied to mobile sources have been effective in reducing the mass of particulates emitted. However, there is also evidence that the number of ultrafine particles on and near roadways has increased, even while the mass of particulates has decreased. To have a better understanding of changes in ultrafine particulate emissions from the application of the new technologies and the health effects of these emissions, an evaluation and comparison of ultrafine particulate matter and the potential impacts on community exposures are necessary.

In this project, measurements and chemical composition of ultrafine particulates will be done, as well as studies conducted to characterize their toxicity. The composition of the particulates can further be used to determine the contribution from specific combustion sources. Additionally, engine or chassis dynamometer testing may be conducted on heavy-duty vehicles to measure, evaluate and compare ultrafine particulate matter, PAH and other relevant toxic emissions from different types of fuels such as CNG, low-sulfur diesel, biofuels and others. This project needs to be closely coordinated with the development of technologies for alternative fuels, aftertreatment and new engines in order to determine the health benefits of such technologies.

Furthermore, gasoline direct injection (GDI) vehicles are known for higher efficiency and power output but the PM emissions profile is not well understood especially on secondary organic aerosol (SOA) formation potential. As manufacturers introduce more GDI models in the market to meet new fuel economy standards, it is important to understand the SOA potential from these vehicles as it could lead to further impact on the ambient PM concentration in our region. Consequently, in 2015 a project was initiated with UCR/CE-CERT to investigate the physical and chemical composition of aerosols from GDI vehicles using a mobile environmental chamber that has been designed and constructed to characterize secondary emissions. Based on this initial results indicating an increase in particle numbers, follow-up in-use studies to assess PM emissions including with and without particle filters will be beneficial.

### **Potential Air Quality Benefits:**

The AQMP for the South Coast Basin relies on significant penetration of low emission vehicles to attain federal clean air standards. Reduction of particulate emissions from the combustion of diesel and other fuels is a major priority in achieving these standards. This project would help to better understand the nature and amount of ultrafine particulates generated by different types of fuels and advanced control technologies as well as provide information on potential health effects of ultrafine particles. Such an understanding is important to assess the emission reduction potentials and health benefits of these technologies. In turn, this will have a direct effect on the policy and regulatory actions for commercial implementation of alternative fuel vehicles in the Basin.



**Proposed Project:** Conduct Monitoring to Assess Environmental Impacts

**Expected SCAQMD Cost:** \$150,000

**Expected Total Cost:** \$500,000

**Description of Technology and Application:**

Facilities, buildings, structures, or highways which attract mobile sources of pollution are considered “indirect” sources. Ambient and saturation air monitoring near sources such as ports, airports, rail yards, distribution centers and freeways is important to identify the emissions exposure to the surrounding communities and provide the data to then conduct the health impacts due to these sources. This project category would identify areas of interest and conduct ambient air monitoring, conduct emissions monitoring, analyze the data and assess the potential health impacts from mobile sources. The projects would need to be at least one year in duration in order to properly assess the air quality impacts in the area.

**Potential Air Quality Benefits:**

The proposed project will assist in the evaluation of adverse public health impacts associated with mobile sources. The information will be useful in (a) determining whether indirect sources have a relatively higher impact on residents living in close proximity; and (b) providing guidance to develop some area-specific control strategies in the future should it be necessary.

**Proposed Project:** Assess Sources and Health Impacts of Toxic Air Contaminants**Expected SCAQMD Cost:** \$150,000**Expected Total Cost:** \$300,000**Description of Technology and Application:**

Previous studies of ambient levels of toxic air contaminants, such as the MATES series of studies, have found that diesel exhaust is the major contributor to health risk from air toxics. Analyses of diesel particulate matter in ambient samples have been based on measurements of elemental carbon. While the bulk of particulate elemental carbon in the South Coast Air Basin is thought to be from combustion of diesel fuels, it is not a unique tracer for diesel exhaust.

The MATES III study collected particulate samples at ten locations in the South Coast Air Basin. Analysis of particulate bound organic compounds was utilized as tracers to estimate levels of ambient diesel particulate matter as well as estimate levels of particulate matter from other major sources. Other major sources that were taken into consideration include automobile exhaust, meat charbroiling, road dust, wood smoke and fuel oil combustion. Analyzing for organic compounds and metals in conjunction with elemental carbon upon collected particulate samples was used to determine contributing sources.

MATES IV, completed in 2015, included an air monitoring program, an updated emissions inventory of toxic air contaminants and a to air toxics, MATES IV also measured ultrafine particle concentrations and black carbon at the monitoring sites as well as near sources such as airports, freeways, rail yards, busy intersections and warehouse operations.

MATES V was launched in 2017 to update the emissions inventory of toxic air contaminants and modeling to characterize risks, including measurements and analysis of ultrafine particle concentrations typically emitted or converted from vehicle exhaust. Based on preliminary results of MATES V, further assessment may need to be performed to assess secondary organic aerosols; including installation of sensors and additional monitoring activities.

This project category would include other related factors, such as toxicity assessment based on age, source (heavy-duty, light-duty engines) and composition (semi-volatile or non-volatile fractions) to better understand the health effects and potential community exposures. Additionally, early identification of new health issues could be of considerable value and could be undertaken in this project category.

**Potential Air Quality Benefits:**

Results of this work will provide a more robust, scientifically sound estimate of ambient levels of diesel particulate matter as well as levels of particulate matter from other significant combustion sources, including gasoline and diesel generated VOCs. This will allow a better estimation of potential exposures to and health effects from toxic air contaminants from diesel exhaust in the South Coast Air Basin. This information in turn can be used to determine the health benefits of promoting clean fuel technologies.

## Technology Assessment and Transfer/Outreach

**Proposed Project:** Assess and Support Advanced Technologies and Disseminate Information

**Expected SCAQMD Cost:** \$400,000

**Expected Total Cost:** \$800,000

### Description of Project:

This project supports the assessment of clean fuels and advanced technologies, their progress towards commercialization and the dissemination of information on demonstrated technologies. The objective of this project is to expedite the transfer of technology developed as a result of Technology Advancement Office projects to the public domain, industry, regulatory agencies and the scientific community. This project is a fundamental element in the SCAQMD's outreach efforts to expedite the implementation of low emission and clean fuels technologies and to coordinate these activities with other organizations.

This project may include the following:

- technical review and assessment of technologies, projects and proposals;
- support for alternative fuel refueling and infrastructure;
- advanced technology curriculum development, mentoring and outreach to local schools;
- emissions studies and assessments of zero emission alternatives;
- preparation of reports, presentations at conferences, improved public relations and public communications of successful demonstrations of clean technologies;
- participation in and coordination of workshops and various meetings;
- support for training programs related to fleet operation, maintenance and refueling of alternative fuel vehicles;
- publication of technical papers, reports and bulletins; and
- production and dissemination of information, including web sites.

These objectives will be achieved by consulting with industry, scientific, health, medical and regulatory experts and co-sponsoring related conferences and organizations, resulting in multiple contracts. In addition, an ongoing outreach campaign will be conducted to encourage decision-makers to voluntarily switch to alternatively fueled vehicles and train operators to purchase, operate and maintain these vehicles and associated infrastructure.

### Potential Air Quality Benefits:

SCAQMD adopted fleet regulations requiring public and private fleets within the Basin to acquire alternatively fueled vehicles when making new purchases. Expected benefits of highlighting success stories in the use of advanced alternatively fueled vehicles could potentially expedite the acceptance and commercialization of advanced technologies by operators seeking to comply with the provisions of the recently adopted SCAQMD fleet rules. The resulting future emissions benefits will contribute to the goals of the AQMP.

**Proposed Project:** Support Implementation of Various Clean Fuels Vehicle Incentive Programs

**Expected SCAQMD Cost:** \$300,000

**Expected Total Cost:** \$400,000

**Description of Project:**

This project supports the implementation of zero emission vehicle incentive programs, the Carl Moyer incentives program and the school bus incentives program. Implementation support includes application approval, grant allocation, documentation to the CARB, verification of vehicle registration and other support as needed. Information dissemination is critical to successful implementation of a coordinated and comprehensive package of incentives. Outreach will be directed to vehicle dealers, individuals and fleets.

**Potential Air Quality Benefits:**

As described earlier, the SCAQMD will provide matching funds to implement several key incentives programs to reduce diesel emissions in the Basin. Furthermore, the SCAQMD recently adopted fleet regulations requiring public and private fleets within the Basin to acquire alternatively fueled vehicles when making new purchases. Expected benefits of highlighting zero emission vehicle incentives could potentially expedite the acceptance and commercialization of advanced technologies by operators seeking to comply with the provisions of the recently adopted SCAQMD fleet rules. The resulting future emissions benefits will contribute to the goals of the AQMP. The school bus program and the Carl Moyer incentives program will also reduce large amounts of NO<sub>x</sub> and PM emissions in the basin in addition to reducing toxic air contaminants.

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**Appendix A**  
**SCAQMD Advisory Groups**

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## Technology Advancement Advisory Group

Dr. Matt Miyasato, Chair ..... SCAQMD

Don Anair ..... Union of Concerned Scientists

\*Chris Cannon ..... Port of Los Angeles

\*Steve Cliff..... California Air Resources Board

Dr. John Froines..... Professor Emeritus  
University of California, Los Angeles

\*Yuri Freedman ..... Southern California Gas Company

\*Jodean Giese ..... Los Angeles Department of Water and Power

\*Phil Heirigs ..... Western States Petroleum Association

Randall Lewis ..... Lewis Group of Companies

Tim Olson ..... California Energy Commission

David Pettit ..... Natural Resources Defense Council

Dr. Sunita Satyapal ..... Department of Energy

\*Heather Tomley ..... Port of Long Beach

Dawn Wilson ..... Southern California Edison

\*Newly appointed members



## SB 98 Clean Fuels Advisory Group

Dr. Matt Miyasato, Chair .....	SCAQMD
Robert Bienenfeld .....	American Honda Motor Company Inc.
*Dr. John Budroe .....	California Environmental Protection Agency, Office of Environmental Health Hazard Assessment
Dr. Stephen Charlton .....	Independent Consultant in Combustion Technology
*Dr. Mark Duvall.....	Electric Power Research Institute
Dr. Mridul Gautam .....	West Virginia University, Adjunct Professor, & University of Nevada-Reno
Dr. Wayne Miller .....	University of California, Riverside, College of Engineering, Center for Environmental Research and Technology
<i>Vacant</i> .....	Academic Community
Dr. Scott Samuelson.....	University of California, Irvine, Combustion Laboratory/National Fuel Cell Research Center
Dr. Robert Sawyer .....	Sawyer Associates
Andreas Truckenbrodt .....	Independent Consultant in Fuel Cell Technologies
Kevin Walkowicz .....	National Renewable Energy Laboratory
Michael Walsh .....	Independent Consultant in Motor Vehicle Pollution Control

\*Newly appointed members

## **Appendix B**

### **Open Clean Fuels Contracts as of January 1, 2019**

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Contract	Contractor	Project Title	Start Term	End Term	SCAQMD \$	Project Total \$
<b>Hydrogen and Mobile Fuel Cell Technologies and Infrastructure</b>						
11555	University of California Los Angeles	Construct Hydrogen Fueling Infrastructure	12/07/12	12/31/19	400,000	2,589,990
15150	Air Products and Chemicals Inc.	Install and Upgrade Eight Hydrogen Fueling Stations Throughout SCAB (including SCAQMD's Diamond Bar Hydrogen Station)	10/10/14	04/09/19	1,000,000	17,335,439
15366	EPC LLC	Operate and Maintain Publicly Accessible Hydrogen Fueling Station at SCAQMD's Headquarters	10/10/14	04/09/19	0	0
15609	ITM Power, Inc.	Installation of Riverside Renewable Hydrogen Fueling Station	10/06/15	10/05/19	200,000	2,325,000
15611	Ontario CNG Station, Inc.	Installation of Ontario Renewable Hydrogen Fueling Station	07/10/15	07/09/20	200,000	2,325,000
15618	FirstElement Fuel, Inc.	Installation of Eight Hydrogen Stations in Various Cities (two renewable, six delivered)	02/05/16	02/04/21	1,000,000	16,442,000
15619	H2 Frontier Inc.	Installation of Chino Renewable Hydrogen Station	12/04/15	12/03/20	200,000	4,558,274
15635	Center for Transportation and Environment	ZECT II: Develop and Demonstrate One Class 8 Fuel Cell Range-Extended Electric Drayage Truck	04/27/16	10/26/20	821,198	7,109,384
16025	Center for Transportation and Environment	Develop and Demonstrate Fuel Cell Hybrid Electric Medium-Duty Trucks	02/05/16	08/04/20	980,000	7,014,000
16251	H2 Frontier, Inc.	Develop and Demonstrate Commercial Mobile Hydrogen Fueler	05/06/16	05/05/21	200,000	1,665,654
17059	Calstart Inc.	Develop and Demonstrate Fuel Cell Extended-Range Powertrain for Parcel Delivery Trucks	10/27/16	05/31/19	589,750	1,574,250
17312	Hydrogenics USA Inc.	ZECT II: Develop Fuel Cell Range-Extended Drayage Truck	11/20/17	05/19/21	125,995	2,433,553
17316	Center for Transportation and Environment	Develop and Demonstrate Ten Zero Emission Fuel Cell Electric Buses	06/09/17	04/30/20	1,000,000	45,328,859
17317	American Honda Motor Company, Inc.	Three Year Lease of One Honda 2017 Clarity Fuel Cell Vehicle for TAO's Fleet Demonstration Program	03/22/17	03/21/20	17,304	17,304
17343	American Honda Motor Company, Inc.	Three Year Lease of One Honda 2017 Clarity Fuel Cell Vehicle for TAO's Fleet Demonstration Program	02/21/17	02/20/20	17,328	17,328
17385	American Honda Motor Company, Inc.	Three Year Lease of One Honda 2017 Clarity Fuel Cell Vehicle for TAO's Fleet Demonstration Program	05/17/17	05/16/20	17,304	17,304
18150	California Department of Food and Agriculture, Division of Measurement Standards	Conduct Hydrogen Station Site Evaluations for Hydrogen Station Equipment Performance (HyStEP) Project	06/28/18	02/27/20	100,000	805,000

Contract	Contractor	Project Title	Start Term	End Term	SCAQMD \$	Project Total \$
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**Hydrogen and Mobile Fuel Cell Technologies and Infrastructure (cont'd)**

18158	Alliance for Sustainable Energy, LLC (on behalf of National Renewable Energy Laboratory)	California Hydrogen Infrastructure Research Consortium H2 @ Scale Initiative	08/31/18	03/30/20	100,000	760,000
19172	Longo Toyota	Three-Year Lease of Two 2018 Toyota Mirai Fuel Cell Vehicles	10/28/18	10/27/21	35,108	35,108
19213	Frontier Energy Inc.	Participate in California Fuel Cell Partnership for CY 2018 and Provide Support for Regional Coordinator	01/01/18	07/01/19	245,000	1,253,491

**Electric/Hybrid Technologies and Infrastructure**

08063	Quantum Fuel Systems LLC	Develop & Demonstrate 20 Plug-In Hybrid Electric Vehicles	01/22/08	01/31/19	2,165,613	2,899,057
13058	Capstone Turbine Corporation	Develop Microturbine Series Hybrid System for Class 7 Heavy-Duty Vehicle Applications	08/12/13	12/31/19	360,000	1,210,000
13433	U.S. Hybrid Corporation	Develop and Demonstrate Two Class 8 Zero-Emission Electric Trucks	06/26/13	12/31/19	75,000	150,000
14052	Altec Capital Services, LLC	Lease of Two Plug-In Hybrid Electric Vehicles	01/02/15	01/01/20	61,302	61,302
14184	Clean Fuel Connection Inc.	DC Fast Charging Network Provider	04/04/14	06/30/20	920,000	1,220,000
14222	Odyne Systems, LLC	Develop and Demonstrate Plug-In Hybrid Electric Retrofit System for Class 6 to 78 Trucks	04/24/14	03/31/19	389,000	2,226,571
14256	National Strategies LLC	Develop and Demonstrate Vehicle-2-Grid Technology	09/05/14	01/31/19	250,000	3,377,689
16022	Gas Technology Institute	ZECT II: Develop and Demonstrate One Class 8 CNG Hybrid Electric Drayage Truck	12/04/15	06/30/20	1,578,802	5,627,319
16046	Transportation Power, Inc.	ZECT: Develop and Demonstrate Two Class 8 CNG Plug-In Hybrid Electric Drayage Trucks	12/04/15	12/31/19	195,326	2,103,446
16081	Broadband TelCom Power, Inc.	Provide EV Hardware and Control System at SCAQMD Headquarters including Installation Support, Warranty and Networking	04/27/16	04/26/22	367,425	367,425
16200	California State University Los Angeles	Cost-Share Regional Universities for U.S. DOE EcoCAR 3 Competition	04/14/16	04/15/20	100,000	300,000
16227	Selman Chevrolet Company	Lease One 2016 Chevrolet Volt Extended-Range Electric Vehicle for Three Years	02/01/16	01/31/19	15,677	15,677
17029	University of California Irvine	Demonstrate and Evaluate Plug-In Smart Charging at Multiple Electric Grid Scales	06/29/17	06/28/20	250,000	750,000
17065	Clean Fuel Connection, Inc.	EV Infrastructure Installer	12/02/16	12/31/21	805,219	805,219
17105	BYD Motors Inc.	Develop and Demonstrate Up to 25 Class 8 Battery Electric Drayage Trucks	04/14/17	10/13/23	794,436	8,942,400

Contract	Contractor	Project Title	Start Term	End Term	SCAQMD \$	Project Total \$
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**Electric/Hybrid Technologies and Infrastructure (cont'd)**

17207	Peterbilt Motors	Develop and Demonstrate Up to 12 Class 8 Battery Electric Drayage Trucks	04/07/17	10/06/23	642,436	11,006,340
17225	Volvo Technology of America LLC	Develop and Demonstrate Up to Two Class 8 Battery Electric Drayage Trucks	06/09/17	06/08/20	1,741,184	9,458,446
17244	Kenworth Truck Company	Develop and Demonstrate Up to Two Class 8 Battery Electric Drayage Trucks	09/08/17	01/08/20	2,823,475	9,743,739
17353	Odyne Systems, LLC	Develop and Demonstrate Medium-Heavy-Duty (Class 5-7) Plug-In Hybrid Electric Vehicles for Work Truck Applications	06/09/17	09/08/20	900,000	6,955,281
18072	Electric Power Research Institute	Study Electrification Options of Energy Services for EJ Communities and Non-Attainment Areas	06/08/18	06/07/19	150,000	1,558,657
18075	Selman Chevrolet Company	Lease Two 2017 Chevrolet Bolt All-Electric Vehicles for Three Years for TAO's Fleet Demonstration Program	08/18/17	08/17/20	26,824	26,824
18129	Electric Power Research Institute	Versatile Plug-In Auxiliary Power System Demonstration	06/28/18	06/27/20	125,000	273,000
18151	Rail Propulsion System	Develop and Demonstrate Battery Electric Switcher Locomotive	04/05/18	12/30/19	210,000	925,000
18232	Hyster-Yale Group Inc.	Electric Top-Pick Development, Integration and Demonstration	09/14/18	09/13/21	2,931,805	3,678,008
18277	Velocity Vehicle Group DBA Los Angeles Truck Centers LLC	Southern California Advanced Sustainable Freight Demonstration	09/07/18	03/06/22	3,568,300	4,198,000
18280	Honda of Pasadena	Three-Year Lease of One Honda 2018 Clarity Plug-In Vehicle	02/07/18	02/06/21	18,359	18,359
18287	EVgo Services LLC	Charging Station and Premises Agreement for Installation of One DC Fast Charger at SCAQMD Headquarters	06/27/18	06/26/28	0	0
19190	Daimler Trucks North America	Zero Emissions Trucks and EV Infrastructure Project	12/18/18	06/20/22	8,230,072	31,340,144

**Engine Systems and Technologies**

17197	VeRail Technologies Inc.	Develop and Demonstrate Ultra-Low Emission Natural Gas Switcher Locomotive	03/03/17	09/02/19	1,000,000	5,100,000
17393	Southwest Research Institute	Develop Ultra-Low Emissions Diesel Engine for On-Road Heavy-Duty Vehicles	05/30/18	07/31/19	575,000	1,325,000
18018	North American Repower LLC	Develop High Efficiency Near-Zero Emission Natural Gas Engines for Heavy-Duty Vehicles	12/14/17	12/12/19	200,000	1,958,096
18194	CALSTART Inc.	Develop and Demonstrate Near-Zero Emissions Opposed Piston Engine	05/30/18	07/31/20	1,000,000	15,500,000

Contract	Contractor	Project Title	Start Term	End Term	SCAQMD \$	Project Total \$
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**Engine Systems and Technologies (cont'd)**

18122	Clean Energy	Southern California Trucking Demonstration of Near-Zero ISX12N Beta Engines	01/05/18	01/04/20	3,495,000	5,995,000
18211	West Virginia University Innovation Corporation	Develop Thermal Management Strategy Using Cylinder Deactivation for Heavy-Duty Diesel Engines	06/08/18	06/07/20	250,000	700,000

**Fueling Infrastructure and Deployment (NG/RNG)**

12667	West Covina Unified School District	Upgrade CNG Fueling Facility	10/12/12	03/01/20	60,000	60,000
14219	City of West Covina	Upgrade CNG Station at City Yard	05/15/14	08/01/19	200,000	618,429
15541	Foundation for California Community Colleges	Implement Enhanced Fleet Modernization Program	05/07/15	01/30/19	21,270	30,000
16075	City of Desert Hot Springs	Purchase One Heavy-Duty CNG-Powered Truck	03/11/16	03/10/20	38,000	63,000
16076	Coachella Valley Association of Governments	Purchase and Deploy One Heavy-Duty CNG Paratransit Vehicle	12/01/15	11/20/19	140,000	140,000
16244	CR&R, Inc.	Renewable Natural Gas Production and Vehicle Demonstration Project	09/03/16	03/02/20	900,000	55,000,000
16333	Ontario CNG Station, Inc.	Implement Alternative Fuel Station Expansion	05/13/16	11/12/19	200,000	798,535
17092	Kore Infrastructure, LLC	Construct RNG Production Facility and Demonstrate RNG with Next Generation Natural Gas Engine	10/14/16	10/13/21	2,500,000	25,500,000
17349	University of California Riverside/CE-CERT	Establish Renewable Natural Gas Center	08/03/17	02/02/19	100,000	261,110
18336	ABC Unified School District	Replace Diesel School Buses with Near-Zero Emissions CNG Buses	10/05/18	11/30/34	117,900	162,900
18337	Alta Loma School District	Replace Diesel School Buses with Near-Zero Emissions CNG Buses	10/05/18	11/30/34	78,600	108,600
18344	Bellflower Unified School District	Replace Diesel School Buses with Near-Zero Emissions CNG Buses	09/07/18	11/30/34	39,300	54,300
18346	Chaffey Joint Union High School District	Replace Diesel School Buses with Near-Zero Emissions CNG Buses	10/05/18	11/30/34	235,800	325,800
18348	Cypress School District	Replace Diesel School Buses with Near-Zero Emissions CNG Buses	09/07/18	11/30/34	39,300	54,300
18349	Downey Unified School District	Replace Diesel School Buses with Near-Zero Emissions CNG Buses	09/14/18	11/30/34	157,200	217,200
18350	Fountain Valley School District	Replace Diesel School Buses with Near-Zero Emissions CNG Buses	09/07/18	11/30/34	39,300	54,300
18351	Fullerton Joint Union High School District	Replace Diesel School Buses with Near-Zero Emissions CNG Buses	10/05/18	11/30/34	157,200	217,200
18354	Hemet Unified School District	Replace Diesel School Buses with Near-Zero Emissions CNG Buses	10/05/18	11/30/34	196,500	271,500
18355	Huntington Beach Union High School District	Replace Diesel School Buses with Near-Zero Emissions CNG Buses	10/05/18	11/30/34	589,500	814,500

Contract	Contractor	Project Title	Start Term	End Term	SCAQMD \$	Project Total \$
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**Fueling Infrastructure and Deployment (NG/RNG) (cont'd)**

18363	Orange Unified School District	Replace Diesel School Buses with Near-Zero Emissions CNG Buses	09/14/18	11/30/34	39,300	54,300
18364	Placentia-Yorba Linda Unified School District	Replace Diesel School Buses with Near-Zero Emissions CNG Buses	10/05/18	11/30/34	235,800	325,800
18365	Pupil Transportation Cooperative	Replace Diesel School Buses with Near-Zero Emissions CNG Buses	10/05/18	11/30/34	235,800	325,800
18367	Rialto Unified School District	Replace Diesel School Buses with Near-Zero Emissions CNG Buses	10/05/18	11/30/34	510,900	705,700
18368	Rim of the World Unified School District	Replace Diesel School Buses with Near-Zero Emissions CNG Buses	10/05/18	11/30/34	117,900	162,900
18369	Rowland Unified School District	Replace Diesel School Buses with Near-Zero Emissions CNG Buses	11/02/18	11/30/34	117,900	162,900
18370	San Jacinto Unified School District	Replace Diesel School Buses with Near-Zero Emissions CNG Buses	09/14/18	11/30/34	78,600	108,600
18374	Upland Unified School District	Replace Diesel School Buses with Near-Zero Emissions CNG Buses	10/12/18	11/30/34	157,200	217,200

**Fuel/Emissions Studies**

15607	University of California Riverside/CE-CERT	Innovative Transportation System Solutions for NOx Reductions in Heavy-Duty Fleets	12/19/15	01/31/19	79,980	139,980
15636	University of California Riverside/CE-CERT	Evaluate PEV Utilization Through Advanced Charging Strategies in a Smart Grid System	12/15/15	12/31/19	170,000	270,000
15680	National Renewable Energy Laboratory	ComZEV: Develop Detailed Technology and Economics-Based Assessment for Heavy-Duty Advanced Technology Development	08/25/15	06/30/19	520,000	540,000
17245	West Virginia University Research Corporation	Conduct In-Use Emissions Testing and Fuel Usage Profile on On-Road Heavy-Duty Vehicles	06/09/17	06/08/21	1,625,000	1,625,000
17276	University of California Riverside/CE-CERT	Develop ECO-ITS Strategies for Cargo Containers	08/03/17	08/02/20	543,000	2,190,233
17277	University of Southern California	Conduct Market Analysis for Zero Emission Heavy-Duty Trucks in Goods Movement	11/03/17	11/02/19	350,000	524,000
17278	University of Southern California	Develop Freight Loading Strategies for Zero Emissions Heavy-Duty Trucks in Goods Movement	11/03/17	11/02/19	200,000	1,001,000
17286	University of California Riverside/CE-CERT	Conduct In-Use Emissions Testing and Fuel Usage Profile on On-Road Heavy-Duty Vehicles	06/09/17	06/08/21	1,625,000	1,625,000
17331	University of California Riverside/CE-CERT	Conduct In-Use PM Emissions Study for Gasoline Direct Injection Vehicles	07/14/17	01/31/19	222,000	273,000



Contract	Contractor	Project Title	Start Term	End Term	SCAQMD \$	Project Total \$
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**Fuel/Emissions Studies (cont'd)**

17352	California State University Maritime Academy	Develop and Demonstrate Vessel Performance Management Software and Vehicles	06/09/17	06/08/21	50,086	195,195
18090	University of California Riverside/CE-CERT	Study Secondary Organic Aerosol Formation from Heavy-Duty Diesel and Natural Gas Vehicles	12/05/17	06/30/20	85,000	85,000
18206	University of California Irvine	Assess Air Quality and Greenhouse Gas Impacts of a Microgrid-Based Electricity System	04/06/18	04/05/20	660,000	1,300,000

**Stationary Clean Fuels Technology**

13045	ClearEdge (novated from UTC Power Corp.)	Energy Supply and Services Agreement to Install One 400 kW Phosphoric Acid Fuel Cell at SCAQMD Headquarters	09/28/12	09/27/22	450,000	4,252,680
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**Emissions Control Technologies**

17367	Southwest Research Institute	Develop and Evaluate Aftertreatment Systems for Large Displacement Diesel Engines	02/28/18	6/30/19	400,000	480,000
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**Technology Assessment and Transfer/Outreach**

08210	Sawyer Associates	Technical Assistance on Mobile Source Control Measures and Future Consultation on TAO Activities	02/22/08	02/28/20	10,000	10,000
09252	JWM Consulting Services	Technical Assistance with Review and Assessment of Advanced Technologies, Heavy-Duty Engines, and Conventional and Alternative Fuels	12/20/08	06/30/20	30,000	30,000
12376	University of California Riverside	Technical Assistance with Alternative Fuels, Biofuels, Emissions Testing and Zero-Emission Transportation Technology	06/13/14	05/31/20	75,000	75,000
12453	Tech Compass	Technical Assistance with Alternative Fuels, Fuel Cells, Emissions Analysis and Aftertreatment Technologies	06/21/12	05/31/20	75,000	75,000
15380	ICF Resources LLC	Technical Assistance with Goods Movement, Alternative Fuels and Zero Emissions Transportation Technologies	12/12/14	12/11/20	30,000	30,000
16262	University of California Davis-Institute of Transportation Studies	Support Sustainable Transportation Energy Pathways (STEPs)	01/05/18	01/04/22	240,000	5,520,000
17097	Gladstein, Neandross & Associates, LLC	Technical Assistance with Alternative Fuels and Fueling Infrastructure, Emissions Analysis and On-Road Sources	11/04/16	06/30/19	200,000	200,000
17358	AEE Solutions, LLC	Technical Assistance with Heavy-Duty Vehicle Emissions Testing, Analysis and Engine Development	06/09/17	09/08/19	100,000	100,000

<b>Contract</b>	<b>Contractor</b>	<b>Project Title</b>	<b>Start Term</b>	<b>End Term</b>	<b>SCAQMD \$</b>	<b>Project Total \$</b>
<b>Technology Assessment and Transfer/Outreach (cont'd)</b>						
18019	Ricardo Inc.	Technical Assistance with Heavy-duty Vehicle Emissions Testing, Analysis, and Engine Development and Applications	09/01/17	08/31/19	50,000	50,000
18253	Three Squares Inc.	Identify and Secure a "Futurist" Clean Transportation or Goods Movement Technologies Expert	04/05/18	05/31/18	11,845	11,845
19078	Clean Fuel Connection Inc.	Technical Assistance with Alternative Fuels, EVs, Charging and Infrastructure, and Renewable Energy	09/07/18	09/06/20	100,000	100,000
19160	Coordinating Research Council	Cosponsor 2019 Mobile Source Air Toxics Workshop on 2/4-6/19	11/07/18	02/28/19	5,000	75,000

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## **Appendix C**

### **Final Reports for 2018**

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## Expand Hydrogen Fueling Infrastructure

### Contractor

Linde LLC

### Cosponsors

California Energy Commission  
SCAQMD

### Project Officer

Joseph Impullitti

### Background

Hydrogen fuel cell electric drive technology offers tremendous potential for the light-duty passenger vehicle market and medium- and heavy-duty truck and bus markets. Fuel Cell Electric Vehicles (FCEV) can drive more than 300 miles on a tank of hydrogen and be refueled in 3 to 5 minutes. FCEVs have zero tailpipe emissions and the carbon footprint of these vehicles using hydrogen from reformed natural gas is similar to plug-in electric vehicles. A benefit of hydrogen technology is its ability to be scaled up to handle larger numbers and sizes of vehicles without requiring vast electric grid upgrades. FCEVs require a new network of refueling stations which this project supports. This project also validated liquid hydrogen storage at a typical 7-11 gas station. An advantage of using liquid hydrogen is that a greater amount can be stored at the station as opposed to the more common high pressure hydrogen gas storage method. Liquid hydrogen also offers the benefit of being able to use the stored cold temperatures to increase station throughput and reduce station refrigeration needs to perform -40C fast cold fills as required by the fueling protocol J2601.

### Project Objective

The objective of this project was to develop a public retail hydrogen fuel station (HFS) capable of filling hydrogen vehicles, according to fueling protocol J2601 (2010 version), using most major credit cards by means of liquid hydrogen storage and ionic compression.

### Technology Description

In this HFS, liquid hydrogen is delivered to the station and stored in a Linde cryogenic liquid

hydrogen tank. Hydrogen is drawn from the tank and compressed by the Linde IC90, ionic compressor, and stored at high pressure to be readily supplied to a car. A temperature control unit is held at -40 C to cool the high pressure hydrogen as it enters the car tank. This is required to meet the J2601 (2010 version) fuel protocol which stipulates that the fill can be done in about three minutes without overheating the car hydrogen tank. The process Linde uses has the unique advantage that the cold hydrogen from the liquid hydrogen tank is cooled by the thermal storage temperature control unit (TCU) during each compression cycle, which reduces the electrical energy from refrigeration to maintain the TCU at -40 C.

### Status

The San Juan Capistrano hydrogen fuel station is open to the public, having been commissioned in October 2015. The station is certified by the California Division of Measurement Standards to sell hydrogen by the kilogram and has multiple FCV OEM letters of support assuring the station meets all the J2601 fuel protocol requirements. The completed HFS is shown below. This station has been operated and maintained by Linde for the past three years and is currently in the process of being sold to a third party. This station will continue to operate and service FCVs in the area under the new ownership. Linde will work with the prospective buyers for a smooth transition.



Figure 1: External View of Equipment Yard

### Results

The following reflects results for the San Juan Capistrano Linde H2 Fuel Station from 10/1/15 through 9/30/18:

Description	Value
Total kg of Hydrogen Dispensed, kg	30,312
Average kg/day	80.1
Approximate % of H70	94
Approximate % of H35	6
Total Sales, \$	501,361
Number of Days Vehicles Filled	1096
# of Transactions (~Vehicles Filled)	10,520
Average fill (kg)	3.1
Average Transactions per day	28
Total Gallons of Gasoline Equivalent displaced, GGE (1 gal = 0.997 kg)	30,403

### Benefits

From station commissioning to the end of September 2018, 30,312 kg of hydrogen was dispensed. Assuming a FCEV delivers 60 miles/kg of hydrogen, there was a GHG emissions reduction of 436 metric tons. This assumes the difference in emissions between gasoline and hydrogen is 240 gCO<sub>2</sub>e/mi, as taken from the CaFCP report based on the Argonne National Lab GREET V1\_2013 model. This station, and others like it, will lead the transition of personal transportation energy from gasoline to hydrogen, ultimately leading to a renewable transportation energy system and cleaner air for all of California.

### Project Costs

Originally the proposed location for this station was in Orange County within the city of Laguna Niguel because it would extend the Irvine cluster to the south into neighborhoods that are a target market of the OEMs. Unfortunately, the original site could not be completed and a new site in the city of San Juan Capistrano was chosen because it offered similar attributes to the original site. Consequently, costs for Task 3-Site Installation were higher than planned. The City of San Juan Capistrano required the design of the HFS to match that of the existing site. The additional scope encompassed the installation of stonework and various other architectural elements to enhance the site appearance. They also required the addition of louvers to screen equipment. Bringing in 480V electrical service required additional equipment and re-design to accommodate the needs of the site. The actual cost for the Task 3-Site Installation project was \$330,000 higher than originally budgeted. SCAQMD’s original co-funding was

\$250,000 but they provided another \$80,000 to cover the site location change cost increases.

Funding Source	Amount
CEC Funding	\$2,056,029
SCAQMD Funding	\$ 330,000
Linde Match Funding	\$ 425,108
<b>Total Project Cost</b>	<b>\$2,811,137</b>

### Commercialization and Applications

Linde is now operating two, high-capacity, liquid hydrogen based fueling stations to supply light-duty vehicles in California, in addition to the bus and light-duty vehicle fueling stations at AC Transit in Emeryville and Oakland. This is a great step forward for California, and Linde, in leading the nation with hydrogen zero emissions vehicle infrastructure and technology deployment. This project has contributed to the commercialization of the IC90 ionic compressor, which is becoming the industry standard for station developers. It has also facilitated real-world verification of liquid hydrogen supply storage and 350 bar and 700 bar gaseous dispensing as a valid hydrogen pathway for this market. This project has made possible the real application of liquid hydrogen supply and storage for retail stations, which is fundamental to understanding how most effectively to scale the hydrogen economy. The data from this entire effort will be significant in shaping the future hydrogen economy. Based on lessons learned the Linde liquid hydrogen storage and IC90 compressor are ready for widespread commercial adoption. It was determined that the hydrogen dispenser should be improved to reduce operations and maintenance costs and increase station reliability. Linde has developed a new hydrogen dispenser for future applications that has been determined to be a significant improvement over the current generation of dispensers used for this HFS. Linde plans to continue its internal efforts to design and implement a cost-effective and reliable hydrogen production, transportation, storage and dispensing solution to enable market growth, increase gasoline replacement and facilitate the integration of renewable energy.

# Conduct Hydrogen Station Site Evaluations for Site Certifications for Commercial Sale of Hydrogen

## Contractor

California Department of Food and Agriculture,  
Department of Measurement Standards

## Cosponsors

California Fuel Cell Partnership  
California Air Resources Board  
California Energy Commission  
SCAQMD

## Project Officer

Lisa Mirisola

## Project Objective

California Department of Food and Agriculture, Department of Measurement Standards (DMS), in cooperation with California Air Resources Board (CARB), proposed a project to collect accuracy data from hydrogen-gas dispensers to determine current dispenser capabilities and provide certification for retail sale of hydrogen fuel. DMS signed an agreement with the National Renewable Energy Laboratory (NREL) to develop a reference standard device for the measurement of compressed gaseous hydrogen in California. The device developed was used to collect data at a number of existing hydrogen fueling stations and allow them to be certified for commercial sale.

## Background

Hydrogen fueling station (HFS) operators need to be able to sell hydrogen fuel by the kilogram, and consumers need to be able to accurately purchase the fuel. In order to enable such commercial sales, California regulations need to be established that allow appropriate dispenser accuracy tolerances.

The specifications and tolerances for hydrogen dispensers are designated in the National Institute of Standards and Technology (NIST) Handbook 44 (HB 44) Section 3.39. Hydrogen Gas-Measuring Devices – Tentative Code. Industry representatives have expressed concern that the HB 44 Acceptance Tolerance of 1.5% and Maintenance Tolerance of 2.0% are too restrictive for the current state of hydrogen measuring and dispensing technology. As such, and prior to the Department’s work through interagency funding agreements, no entity has submitted their hydrogen dispenser for the full testing and approval process required for type evaluation and approval of a commercial hydrogen gas weighing and measuring device. To help encourage an earlier transition to commercialization of this zero-emission fuel dispensing technology, the requirements specified in NIST HB 44 have been adopted with modifications in the California Code of Regulations (CCR) Title 4, Division 9, § 4002.9. Hydrogen Gas-Measuring Devices (3.39).

## Technology Description

The Gas Technology Institute (GTI) in Des Plaines, Illinois began work on the evaluation of hydrogen dispenser accuracy in 2007 and developed a standard testing device for hydrogen dispensers. In 2010, the CEC funded research and development by DMS to develop a transportable field standard for testing and validating hydrogen dispenser performance at retail stations. Three metrological methods (gravimetric, pressure-volume-temperature (pvt), and master meter) were evaluated. DMS defined the general requirements and specifications for a field standard, and contracted with NREL for its development and construction, leading to the current HFS.



Figure 1: DMS staff testing a hydrogen dispenser



## Status

Selected stations utilized variations of both pressure-volume-temperature (PVT) and Coriolis measurement technology and incorporated variations in technology from different dispenser manufacturers. Following testing, owner-operators of the hydrogen dispensers were provided with the raw test data for their specific device, an accuracy assessment, and a Report of Test letter that summarized their device’s conformance to established specifications. Follow-up consultation was provided to each station operator and device manufacturer to determine, if needed, any corrective actions necessary to support retesting and eventual type approval for the commercial use of their dispenser.

## Results

The HFS incorporates into a single test standard all three proposed metrological methods (gravimetric, pressure-volume-temperature (pvt), and master meter). The HFS was subject to a validation period at NREL. The gravimetric method was the only procedure that could be directly traced to the kilogram reference standard. To meet the fundamental considerations for a reference standard, the expanded uncertainty must be less than 10 grams (0.5% of tolerance). The gravimetric procedure is less than one third or less than 10 grams for the acceptance tolerance of the device under test, while the PVT and master meter failed this criterion. As a result, the HFS gravimetric standard has become the material and method in use for verification that hydrogen dispensers conform to established tolerance requirements.

Of the eight dispensers that qualified for temporary use permits, six manufacturers applied for formal type evaluation; five of these dispenser design types successfully passed permanence testing and were, or are currently being issued a California Type Evaluation Program Certificate of Approval for weighing and measuring devices. Certificates of Approval allow the specific dispenser design type and model to be placed in service at multiple hydrogen stations throughout the state as an approved device. To date, the issued type-approval certificates have facilitated the growth of retail hydrogen fueling stations from zero in 2014 to 31 as of March 31, 2018. The Division also has one additional type evaluation ongoing through second quarter 2018.



**Figure 2: Examples of Type Approved hydrogen dispensers**

## Benefits

SCAQMD’s Clean Fuels Program has been active in funding the development and demonstration of low- and zero-emission technologies. Hydrogen fueling stations are necessary to facilitate the introduction and deployment of zero-emission fuel cell vehicles, and this effort will help the SCAQMD to meet its clean air goals, and also better align with CARB’s Zero Emission Vehicle and Zero Emission Bus regulations.

## Project Costs

Agreements	Cash Budget
CARB (plus in-kind)	\$100,000.00
California Energy Commission (CEC)	\$100,000.00
California Fuel Cell Partnership (CaFCP)	\$150,000.00
SCAQMD	\$100,000.00
<b>TOTAL</b>	<b>\$450,000.00</b>

## Commercialization and Applications

The CEC continues to co-fund the installation of a network of hydrogen fueling stations in the state. Continuing collaboration with public and private stakeholders will be required to facilitate Division testing and type evaluation of these newer dispenser designs as they become available for use. The National Conference on Weights and Measures has adopted a single accuracy class for hydrogen gas measuring devices. This single class with increased acceptance tolerance of 5.0% and increased maintenance tolerance of 7.0% supports the early adoption of expanding accuracy classes by California. With the new tolerances published in the National Institute of Standards and Technology Handbook 44, California can now align its specifications with this new national model standard and facilitate marketplace consistency across the country.

SCAQMD Contract #17394

March 2018

## Provide Analysis of Renewable Hydrogen Pathways, Economics and Incentives

### Contractor

Energy Independence Now

### Cosponsors

California Hydrogen Business Council  
 Fuel Cell Energy  
 Honda Motor Company  
 Hydrogenics Corporation  
 ITM Power  
 Leonardo DiCaprio Foundation  
 The Linde Group  
 Nel Hydrogen  
 Pacific Gas & Electric Company  
 Proton OnSite  
 SCAQMD  
 Southern California Gas Company  
 Toyota Motor Corporation

### Project Officer

Lisa Mirisola

### Background

Energy Independence Now (EIN) developed the Renewable Hydrogen Roadmap which explores decarbonized or carbon-free hydrogen production, primarily through the lens of California's zero emissions transportation goals and its Renewables Portfolio Standard (RFS). This Renewable Hydrogen Roadmap explores the most cost-effective and scalable production technologies and feedstocks, such as renewable electricity or biogas, to present viable pathways for industry, government and consumers.

### Project Objective

EIN studied renewable hydrogen pathways, economics initiatives and policy that is conducive for renewable hydrogen. With the findings, EIN produced a white paper and a presentation to engage the broader stakeholder community to support renewable hydrogen education and outreach. It lays out policy and action recommendations to help California achieve its ambitious energy, climate and air quality goals by dramatically reducing pollution and GHG emissions from the energy generation and transportation sectors.

### Technology Description

Hydrogen is produced primarily from two technologies: steam methane reforming and electrolysis. A third technology, called Tri-generation, uses natural gas or biogas as a feedstock to produce electricity, heat and hydrogen. Hydrogen can also be produced using direct solar water-splitting and biological processes; however, these processes are in early stages of research or commercialization.

### Status

The final version of Renewable Hydrogen Roadmap was completed in May 2018 and subsequently made publicly available on EIN's website and distributed as a resource for multiple state agencies.

### Results

The Renewable Hydrogen Roadmap identifies the opportunities and challenges for renewable hydrogen to provide zero emissions or even carbon-negative transportation fuel as well as critical energy storage for renewable electricity. It considers the many aspects of the current hydrogen ecosystem and identifies the steps and policy decisions that are necessary to stimulate growth in the renewable hydrogen marketplace.

Renewable hydrogen presents a near best-case scenario for clean energy storage and zero emissions transportation. Today, in California and across the world, hydrogen is already produced at scale for industrial processes, such as oil refining and ammonia production. Industrial hydrogen is commonly produced through the reformation of natural gas, but there are many ways to produce hydrogen renewably. This roadmap explores those that are currently most cost-effective and scalable, including production technologies and feedstocks, and lays out the following series of eight high priority policy and stakeholder recommendations for California:

1. Begin the journey to 100 percent renewable hydrogen now;
2. Fund scalable projects for 100 percent renewable hydrogen production;

3. Improve low carbon fuel standard (LCFS) incentives;
4. Promote tools to lower the cost of electricity for renewable hydrogen producers;
5. Address hydrogen distribution and storage challenges;
6. Expand US EPA's RFS Program;
7. Incentivize consumers and stakeholders; and
8. Broaden the hydrogen community through education and outreach.

While the roadmap illustrates the case for renewable hydrogen through the lens of transportation, it truly transcends the entire energy sector, enveloping agriculture, waste management and urban planning. Even with the projected number of FCEVs in California surpassing 40,000 by 2022, hydrogen demand by the transportation sector will still only amount to roughly one percent of California's overall need for this vital energy carrier. If all the hydrogen in California (approximately 550 million kg annually at this time) were produced renewably, it would have a truly massive economic and environmental impact.

### **Benefits**

This zero emissions approach puts California on track to achieve its GHG goals and significantly reduce pollution levels. Californians will benefit from cleaner air and reductions in pollution-related health issues while combatting climate change, catalyzing innovation and creating new economic opportunities.

A roughly \$120 million investment would be necessary to fully meet FCEV fuel demand in this short time frame. Without including compression storage distribution and feedstock development, this investment would create approximately 1,725 jobs in the next five years using the American Recovery and Reinvestment Act methodology, or approximately 1,620 jobs using the methodology of the Bay Area Council Economic Institute.

### **Project Costs**

The Renewable Hydrogen Roadmap required extensive research and field interviews with industry, policymakers and energy stakeholders as well as graphic design and copy editing. It cost approximately \$182,500 to produce, with the majority of the funding and support coming from automobile industry, hydrogen sector, and utility companies. SCAQMD funding of \$25,000 was also provided.

### **Commercialization and Applications**

As of late 2017, there were approximately 3,500 light-duty FCEVs in California and 31 publicly accessible hydrogen fueling stations, compared to approximately 25 million total registered automobiles and about 10,000 gas stations. The market for FCEVs and hydrogen fuel are in their infancy and near-term consumer demand for renewable hydrogen likely will not be enough to make an economic case for developers to invest in renewable production infrastructure. Currently, the SB 1505 33.3 percent renewable requirement, coupled with LCFS credits and emerging consumer demand for hydrogen fuel are the only revenue drivers for renewable hydrogen in the transportation market.

As California continues the rollout of hydrogen stations and infrastructure development to support FCEVs, demand for hydrogen by the transportation sector will increase. CARB estimates that by 2019 there will be 13,500 FCEVs on the road, and by 2022, there may be as many as 43,600 FCEVs. Using a "business-as-usual" scenario, CARB projects that by 2022 the capacity of the statewide hydrogen station network will be 16,580 kg/day (assuming only 180 kg/day station capacity for new stations). However, CARB created an "expected" scenario that assumes lower station costs, higher station capacity and private investment not assumed in the "business-as-usual" scenario. The expected scenario splits stations into two groups: those receiving state funding to meet the AB 8 goal of 100 stations; and additional stations funded privately or funded by a new state program. For the first expected scenario, the capacity of stations needed to meet demand would increase to 18,473 kg/day, a nearly 2,000 kg/day increase. For the second expected scenario, the station capacity would need to increase to 46,550kg/day.

Using the "business-as-usual" scenario, the most conservative of CARB's projections, California FCEV drivers will consume over 6 million kilograms of hydrogen annually, and of that figure, over 2 million kilograms will need to be produced renewably in order to meet the SB 1505 requirement. While this is only a fraction of California's current overall hydrogen production, the state currently produces very little renewable hydrogen without the use of offsetting renewable energy certificates to provide a renewable designation.

## Develop and Demonstrate Catenary Class 8 Trucks (1 Electric and 1 CNG Platform)

### Contractor

Transportation Power, Inc.

### Cosponsors

SCAQMD

### Project Officer

Joe Impullitti

### Background

SCAQMD has identified the development and deployment of zero emissions goods movement transportation systems as one of the agency's top priorities in order to attain federal air quality standards. This project, *Development of Electric and CNG Hybrid Trucks for the Zero Emission Truck & Electric Catenary Highway (ECT-ZETECH)*, initiated the development and demonstration of a catenary, zero emissions goods movement corridor that includes one mile of catenary system and catenary accessible trucks. The primary goal of this project was to promote the implementation of zero emission goods movement technologies, and the secondary goal was to demonstrate the most viable technology to be adopted for a future, regional zero-emissions corridor. Although this project was for a one-mile demonstration, the potential next phase is to build out the remaining route from the ports to the near-dock rail yard which is approximately 5 miles.

### Project Objective

The primary objective of this project was to demonstrate the feasibility of using overhead catenary power lines to extend the range of a variety of zero and near zero emission trucks. Transportation Power, Inc. ("TransPower") proposed to deliver two trucks with catenary accessibility. The project approach was to build on the battery-electric drive technology TransPower had been developing for the previous two years, first by converting an existing truck that utilizes a TransPower drive system into a version that can be operated on the catenary, and then by

developing a CNG hybrid truck that incorporates components into a new series-hybrid architecture that uses energy generated by a CNG engine and generator to augment both stored battery energy and energy obtained from the catenary. The battery-electric truck would have an operating range of about 30-40 miles on battery power only, but with a catenary power line, the truck would need battery power only to get to and from the roadway(s) equipped with catenary power. The CNG hybrid truck (pictured below) would have similar battery-electric range, but would also be capable of driving for 100 miles or more using power produced by an onboard natural gas generator, enabling it to operate away from catenary power lines for much longer distances.



Figure 1: TransPower Electric Truck

### Technology Description

The core TransPower ElecTruck™ drive system used in both trucks employs a unique combination of two 150 kW permanent magnet motors that were originally developed for the Fisker Karma hybrid passenger car. The demonstration vehicles were equipped with Inverter-Charger Units (ICUs) that combine the functions of the vehicle inverter and battery charger. An Automated Manual Transmission uses proprietary software to control a transmission shift mechanism, enabling operation in multiple gears to maximize vehicle efficiency. The battery modules installed on both

trucks used lithium iron phosphate cells. A proprietary vehicle control system optimizes vehicle efficiency, maximizes battery life, and protects key components such as batteries and power electronics from excessive temperatures, voltage spikes, or current surges.

This core ElecTruck™ system was augmented with large pantograph power pick-up devices built by Siemens and installed onto the trucks by TransPower. This device can be seen in the preceding photo extending over the truck cab to make contact with the overhead catenary line. TransPower also installed DC-to-DC converters on both trucks to convert the higher voltage of the catenary system (up to 750 volts DC) to the 400 volts used by the ElecTruck™ system, along with special electronics to assure safe interaction between the catenary system and the truck's onboard drive system.

## Status

The project was completed at the end of 2017. By that time, the battery-electric test truck had been tested intermittently for more than two years and the CNG hybrid truck had undergone more than a year of testing. Testing of the trucks on catenary power was initiated near the end of 2015 on a short catenary test segment in Carson that was a few hundred feet long. Catenary testing was limited to this site until 2017 due to delays in building a longer 1-mile catenary segment along Alameda Avenue. Testing on the 1-mile segment was finally initiated in mid-2017, using the two trucks built under this project and a third hybrid truck built by Volvo under a separate contract. The majority of catenary and off-catenary testing was achieved with TransPower's two trucks, which were completed earlier than the Volvo truck and which performed very reliably. In fact, TransPower's CNG hybrid truck made several trips on its own power from TransPower's headquarters in San Diego County to the Carson test sites, accumulating nearly 1,500 miles of operation over the course of the project. The battery-electric truck accumulated approximately 750 miles of total operation, on top of more than 4,000 miles accumulated prior to its conversion to a catenary-compatible truck.

## Results

The project successfully demonstrated the proof of concept of using overhead catenary power to move large Class 8 trucks. A number of new

technologies and components were developed to support this end goal, including the DC-to-DC converter and a new, customized battery management system (BMS) capable of operating at higher voltages than previously available BMS products. In addition, the CNG hybrid truck developed for this project was one of the first Class 8 CNG hybrid trucks with sufficient operating range to make intercity trips. Of the mileage figures cited above, the battery-electric truck was driven for a total of 610 miles on the main catenary test segment, achieving a maximum of 65 miles of testing in a single day, and the CNG hybrid truck was driven for 912 miles on this segment, achieving a daily maximum of 80 miles.

## Benefits

TransPower believes that catenary technology can further the adoption of electric trucks by increasing vehicle range without adding more battery energy storage capacity. Based on the test results of this project, TransPower has calculated that each minute of operation on a catenary power line can extend the operating range of a Class 8 truck by 2 miles and displace approximately 5 kilowatt-hours (kWh) of onboard battery capacity. With integrated battery systems likely to cost at least \$300/kWh for the foreseeable future, the availability of catenary power can potentially reduce onboard battery costs by thousands of dollars. However, this benefit must be compared against the incremental cost of the pantograph power pickup system and other truck additions required for catenary operation, along with the cost of the catenary infrastructure itself.

## Project Costs

The total cost of the TransPower catenary project was just under \$3.2 million, with a SCAQMD funding contribution of just over \$2.1 million, EPA funding of \$500,000 and TransPower contribution of almost \$600,000. The project was completed within budget.

## Commercialization and Applications

The potential size of the U.S. electric Class 8 truck market is in the tens of thousands of trucks per year, signifying great market potential for catenary powered trucks, if net benefits can be proven.

# Develop and Demonstrate Catenary Zero Emissions Goods Movement System and Develop and Demonstrate Diesel Catenary Hybrid Electric Trucks

**Contractor**

Siemens Industry Inc.

**Cosponsors**

China Shipping Fund  
 California Energy Commission  
 SCAQMD  
 Port of Long Beach  
 L.A. Metro  
 Siemens Industry Inc.

**Project Officer**

Joseph Impulitti

**Background**

While innovations for transitioning combustion trucks to lower emissions are progressing, the increasing road traffic volume is currently over-riding those improvements.

There is the need of a rapid and practicable solution to freeze and sustainably lower all emissions including locally harmful exhausts and greenhouse gases. Taking the increasing demand for renewable electrical energy in all sectors into account, it will be essential to apply solutions with maximum efficiency. At the same time the technical and operational limitations of energy storage systems such as batteries must be taken into consideration. For heavy-duty trucks a high degree of efficiency can best be achieved by a conductive supply of electrical energy by means of an electric road system (ERS).

**Project Objective**

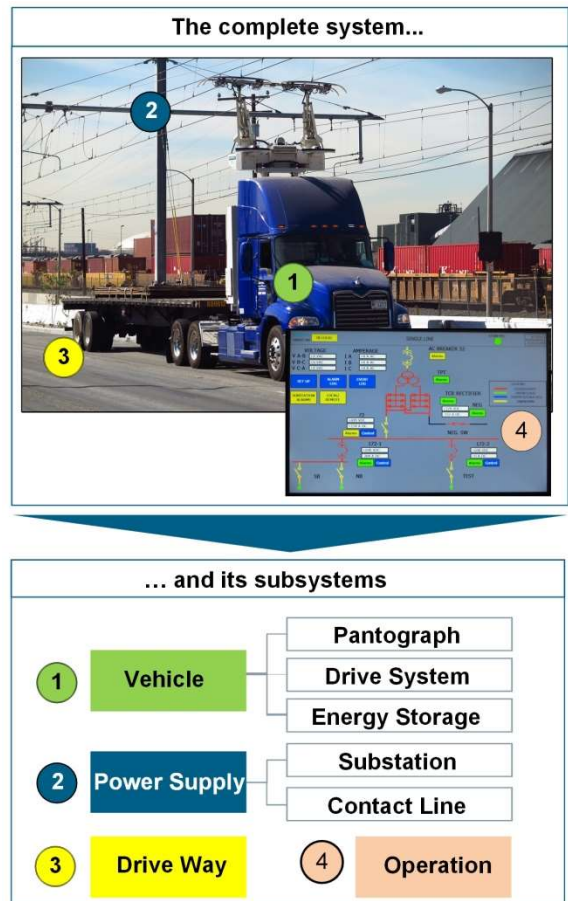
Heavy-duty trucks are the number one source of smog-forming emissions in Southern California. Developing a zero- or near-zero emission goods transport system at the ports will reduce smog-forming, toxic and greenhouse gas emissions in communities around the ports, which are heavily impacted by air pollution.

The primary goal of this project was to promote the implementation of zero emission goods movement

technologies, and the secondary goal was to demonstrate the most viable ERS technology to be adopted for a future, regional zero emissions corridor. This was accomplished through the installation and testing of a one mile overhead contact line based electric road system with trucks from different original equipment manufacturers (OEM) utilizing three different drive technologies.

**Technology Description**

Catenary ERS comprise four subsystems.



**Figure 1: Siemens eHighway System**

The core of the system is an active controlled pantograph installed on a hybridized tractor truck. The electrical energy is supplied via an overhead catenary system running over the electrified lanes of the chosen corridor.

The road testing of the catenary based zero emission technology required two inter-related work strings. First, all planning, design and implementation works of the subsystems including their technical interfaces and adaption to the local specifics had to be carried out. Second, the external stakeholders and technical interfaces, e. g. to energy suppliers and road administration, required intense collaboration.

### Status

Four active pantographs were produced of which three were integrated into hybridized tractor trucks. The whole system was successfully planned, installed, commissioned and tested. In the course of the project the design of the infrastructure had to be adapted to unforeseen ground conditions. To achieve the initial goal of the project the decision was made to go for a solution which included compromises in the design to increase the speed of realization. Consequently the resulting infrastructure included aspects which are of a rather temporary nature (e.g. type of footings, location of substation).

Testing ended by December 31, 2017 and decommissioning started as foreseen in the scope of work. A full project report on all tasks and test items was provided by February 28, 2018.

### Results

During the system testing phase from June 30 to December 31, 2017 the trucks accumulated the following test days and mileages.

Truck	Testing days	Total mileage**	Catenary mileage***
ECAT*	60	980 km	230 km
CCAT*	45	1,460 km	200 km
MACK	50	1,260 km	370 km
	~ 150	~ 3,700 km (2,300 miles)	~ 800 km (500 miles)

\* catenary trucks by Transpower (ECAT full electric with battery; CCAT with CNG range extender)

\*\* including turnarounds, battery/CNG/Diesel drives

\*\*\* with PAN connected, traction power transfer active

After commissioning, the system ran stable and all required test items were successfully accomplished and demonstrated. During the testing phase the pantographs accumulated 2,380 connect and

disconnect cycles. As a key result the expected average power consumption of a loaded truck-trailer combination in electric mode of 2.5 kWh per mile (at 45 mph and 66,000 lbs. combined vehicle weight) can be confirmed.

### Benefits

Based on the demonstration results the eHighway system supplying hybrid trucks via an overhead catenary system can be considered as a valid option for zero emission road freight transports. Additional key benefits include:

- Considerable reduction of emissions in comparison with combustion engines
- High efficacy of locally limited infrastructure measure compared to other ZE technologies
- Increased lifequality of residents at truck routes in conurbations
- Overhead catenary can be installed and integrated without pavement interference
- Successful proof of concept in a representative application environment.
- Ready for next ramp-up steps towards industrialization.

### Project Costs

The original project budget was \$14,780,000 including \$1,280,000 of Siemens in-kind contributions. Unplanned additional costs for crash protection on the median increased overall project costs to \$15,210,000.

Funding Source	Amount
China Shipping Fund	\$4,000,000
CEC	\$3,000,000
SCAQMD	\$2,930,000
Metro	\$2,000,000
POLB	\$2,000,000
Siemens (in-kind)	\$1,280,000
Total Project Costs	\$15,210,000

### Commercialization and Applications

In order to support commercialization, two business cases for different scales of applications were analyzed and presented.

For the I-710 corridor, the economic savings could exceed \$660 million and would yield reductions in criteria pollutants worth \$450 million. Such potential gains should motivate increased action in exploring catenary systems further. An accelerated implementation plan in the South Coast air basin could start with smaller shuttle applications, that prove the business models.

## Install Electric Charging Infrastructure

**Contractor**

ChargePoint

**Cosponsors**

SCAQMD

**Project Officer**

Patricia Kwon

**Technology Description**

ChargePoint’s CT4000, a Level 2 charging station capable of charging vehicles at 7.2kW, was the EVSE installed at all sites. This station comes in a single-port or dual-port configuration, and can be wall or pedestal mounted. This station complies with SAE J1772 standard and is UL certified and ENERGY STAR certified. Stations utilize the ChargePoint network, allowing station owners to set pricing, access controls, and obtain utilization data.

**Background**

There are approximately 1,800 PEV chargers in need of being upgraded in the South Coast Air Basin. These sites are ideal locations for upgrading EV infrastructure to Level 2 charging stations and can be done at a lower cost than installing new site locations. Leveraging the DOE and/or CEC funding received by two major Electric Vehicle Support Equipment (EVSE) manufacturers—Chargepoint and ECotality—SCAQMD executed contracts with these manufacturers to install new or upgraded Level 2 EVSE at high usage site locations. These site locations were identified by SCAQMD and the manufacturers. Chargepoint received a combination of DOE and CEC funding to pay for hardware and partial installation costs for Level 2 infrastructure at 70 site locations. SCAQMD is providing co-funding of \$1,000 per charger to offset installation costs at these locations. Data will be collected from these chargers and provided to SCAQMD to assist in SCAQMD’s PEV infrastructure planning process for the DOE and CEC PEV infrastructure grants covering the South Coast region.

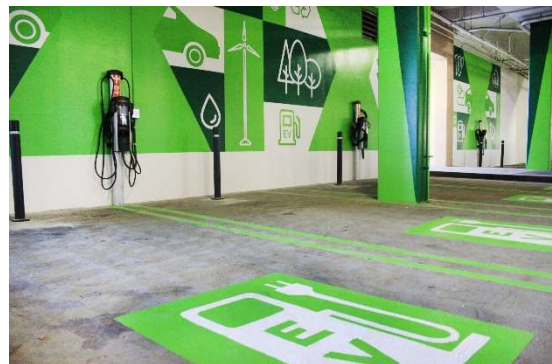
**Status**

This project has been successfully completed with all 155 Level 2 charging ports installed at various sites throughout the South Coast Air Basin. The last stations were installed in December 2017.

The project began in December 2014 and was completed in January 2018. Customer recruitment proved to be more difficult than anticipated due to the requirement for stations to be publicly accessible, and the prevailing wage requirement for site hosts and their installation contractor. In addition, the \$1,000 per port rebate only covered a small portion of the equipment, networking, and installation costs.

**Project Objective**

The objective of this project was to install 155 Level 2 charging ports in the South Coast Air Basin. The charging stations had to be public access and located in high utilization areas. Examples of site hosts are amusement parks, community colleges, shopping centers, and municipalities.



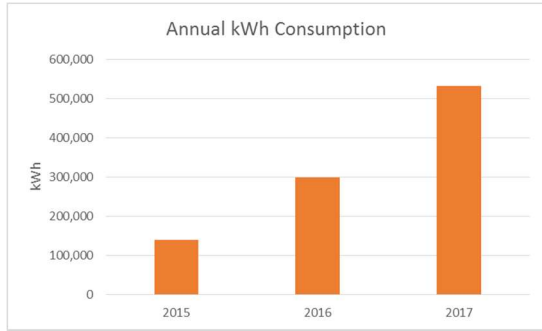
**Figure 1: EV Charging Stations: Westfield Santa Anita Mall, Arcadia**

**Results**

From January 2015 to December 2017, 155 charging stations dispensed 1,012,318 kWh of electricity.



As a result of increased utilization each year in addition to more charging stations coming online, consumption (kWh) steadily increased, with over 500,000 kWh dispensed in 2017. The chart below shows annual kWh consumption for the three years of this project.



**Figure 2: Annual kWh consumption between 2015 and 2017**

With the rise in EV adoption rates and all electric range of vehicles, utilization of the charging stations and associated environmental benefits is anticipated to increase.

### Benefits

Electric vehicles play an increasingly important role in reducing emissions and greenhouse gases. Transportation is the largest source of greenhouse gases in California, accounting for roughly 40% of the total, with most of that coming from light duty passenger vehicles and SUVs. EV charging stations are going to play a critical role in EV adoption, providing EV drivers with charging and thereby reducing range anxiety.

This project installed 155 publicly accessible charging ports, which over a three year period saved approximately 425 tons of CO2 and avoided the use of roughly 127,046 gallons of gasoline.

### Project Costs

A fixed \$1,000 per port rebate was provided to sites that installed EVSE. The grant was provided to sites after station installation and activation was successfully completed. Sites were responsible for selecting their own installation contractor. Depending on the contractor and the complexity of the installation, such as the need for trenching or electrical infrastructure upgrades, costs varied greatly. Average hardware costs were approximately \$7,000 per dual charger and installation costs varied from \$500 per charging

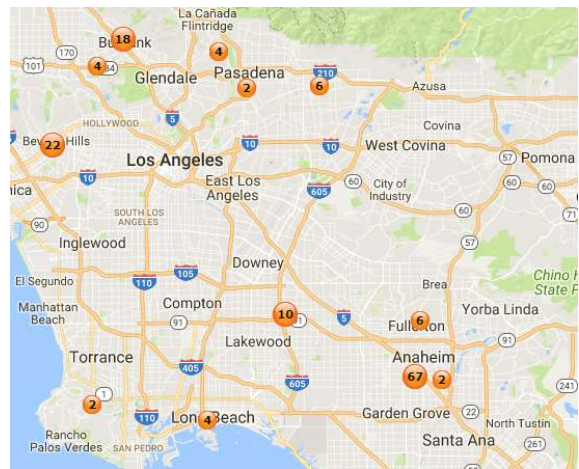
port if no electrical infrastructure upgrades or trenching was required to \$10,000 - \$20,000 per charging port if electrical infrastructure upgrades and/or trenching was required.

Total funding in the amount of \$162,000 was provided by SCAQMD to ChargePoint. Costs under this project were as follows: \$1,000 x 155 publicly accessible charging ports = \$155,000 plus \$7,000 for installation reports.

### Commercialization and Applications

ChargePoint’s CT4000 Level 2 station and networking software are commercially available and best suited for public charging where vehicle dwell time is at least one hour and charging rates can offset the cost of electricity, network and payment processing fees, as well as operation and maintenance costs.

Demand for EV charging stations has significantly increased across the South Coast Air Basin and California as EV adoption increases. EV use is expected to continue to increase and public charging will play a vital supporting role in encouraging EV use.



**Figure 3: 155 ChargePoint Level 2 Charging Locations in Los Angeles and Orange Counties**

# Develop and Demonstrate Solar Forecasting for Larger Solar Arrays with Storage and EV Charging

## Contractor

University of California, San Diego

## Cosponsors

California Energy Commission  
U.S. Environmental Protection Agency  
California Public Utilities Commission  
SCAQMD

## Project Officer

Scott Epstein and Aaron Katzenstein

## Background

Solar photovoltaic (PV) is an increasingly significant energy resource in California providing zero emissions energy to the electric grid. However, solar PV variability and uncertainty limits solar penetration into the electric power system and increases run-time of peaker plants. Solar forecasting and controllable loads help to reduce the uncertainty of solar PV. Business cases for solar PV operation in conjunction with solar forecasting and controllable electric vehicle (EV) charging are considered.

## Project Objective

The objective of the contract was to demonstrate how warehouse rooftops in the Los Angeles Basin can host substantial amounts of zero-emission solar generation and how smart charging of Electric Vehicles (EVs) can mitigate the variability in solar power production.

## Technology Description

Decarbonization and criteria pollutant reductions in the electric power sector cannot be achieved by reducing system demand alone. Electricity consumed at different times of the day and year has different underlying emissions impacts. Energy storage and flexible loads combined with solar forecasting into a Virtual Power Plant (VPP) can play an important role in reducing emissions by

offering operational flexibility in the power system while providing reserve capacity to markets.

Smart EV charging can provide benefits both system-wide to the electric grid as well as to the utility customer. Detailed methodologies to evaluate business cases were developed for wholesale market sales, demand charge management, energy arbitrage, and generation capacity savings/deferral.

To generate solar forecasts, nine hemispheric sky imaging cameras were deployed in the Los Angeles Basin. This globally unique network of cameras provide wide-area coverage with a specific focus on warehouse rooftop areas. Simulations show how more accurate forecasts enable better dispatch of workplace EV loads with long layover periods during which they are connected to the grid. PV forecasts are leveraged to shape an aggregated EV load profile that ‘fills the valley’ in feeder net load resulting from PV generation. Different fleets of EVs that range up to the medium and heavy-duty (school busses) were considered. Control actions are updated in real time given the present and forecast net load as well as the currently connected Plug-in Electric Vehicles (PEVs) and their departure times.

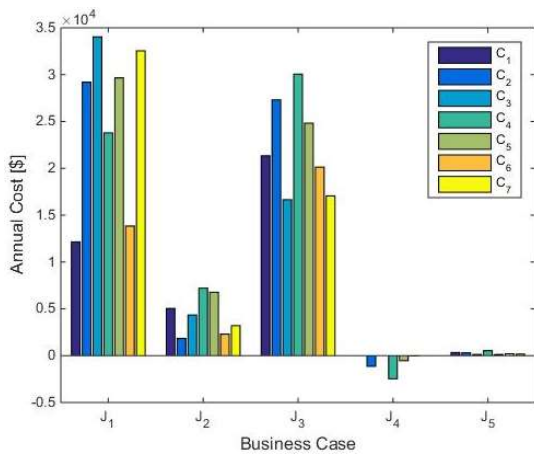
## Status

The project was completed on schedule in January 2018. University of California, San Diego (UCSD) in conjunction with University of California, Los Angeles and Strategen Consulting, Inc. were not successful at finding demonstration sites for the EV charging algorithms. It was too difficult to find all the required hardware (solar, EV, flex charging) in one place and get the owner and occupant to agree to the fairly extensive installation of monitoring and control equipment. Simulations were based on real load data, real PV production data, and real EV data sets and can be considered representative of actual conditions.

## Results

The algorithm was successful in flattening the net load. Economics of the selected use cases are analyzed over a year in Figure 1. Forecasting-aware

scheduling benefits the customer primarily through reduction of demand charges. Conversely, wholesale market sales of PV energy directly to the California Independent System Operator (CAISO) day-ahead market were found to be economically infeasible. The ratepayer benefit of focusing on capacity deferment only was found to be small compared to the microgrid cost savings due to high reliability of the CAISO system. However, ratepayer benefits accrue also indirectly when optimizing around the retail energy costs. Appropriately designed time-of-use tariffs drive scheduling decisions that benefit both the customer and all ratepayers.



**Figure 1: Distribution of annual costs when optimizing for different business cases: C1: Non coincidental demand charge only; C2: Peak demand charge only; C3: Energy arbitrage only; C4: Wholesale market sales only; C5: Capacity deferment only; C6: All objectives; C7: non-optimized charging. The costs for each business case are split by category: J1: Non coincidental demand charge; J2: Peak demand charge; J3: Energy arbitrage; J4: Wholesale market sales; J5: Capacity deferment**

**Benefits**

The project showed that utility customers who implement solar forecasting and smart EV charging could achieve a 67% reduction in energy costs over the year. Monthly peak demand is reduced by 63% on average.

Flexible EV charging at the workplace also reduces criteria pollutant emission through two pathways:

- 1) EV consumption of excess solar electricity during midday reduces curtailment of solar power. Thus carbon-free energy that would otherwise be

wasted is utilized and displaces carbon-intensive electricity that would otherwise be consumed at night when commuters plug in at home.

- 2) EV Charging is scheduled to lower peak load on the grid which reduces the runtime or even allows mothballing of inefficient peaker plants.

**Project Costs**

The total project costs consisted of \$98,908 from SCAQMD; \$396,700 from U.S. Environmental Protection Agency (EPA); \$156,386 from the California Public Utilities Commission (CPUC) and \$999,984 from California Energy Commission.

Funding Source	Amount
CEC	\$999,984
EPA	\$396,700
CPUC	\$156,386
SCAQMD	\$98,908
<b>Total Project Cost</b>	<b>\$1,651,978</b>

**Commercialization and Applications**

Recommendations are provided in the final report to increase the availability of daytime EV charging that support the concepts developed in this contract. UCSD is currently working with Nuvve Corporation to implement solar forecasting and smart EV charging algorithms into EV fleets. These demonstrations commenced in the spring of 2018 and may pave the way for widespread commercialization of smart EV charging. The project parties expect substantial emissions and economic benefits from the technology developed under the SCAQMD award.

# ZECT I: Develop and Demonstrate Three Class 8 LNG Plug-In Hybrid Electric Drayage Trucks

**Contractor**

US Hybrid Corporation

**Cosponsors**

US Hybrid Corporation  
 U.S. Department of Energy  
 SCAQMD  
 University of California, Riverside  
 National Renewable Energy Laboratory

**Project Officer**

Phil Barroca

- 1) Reducing emissions by utilizing zero and near-zero powertrain technologies and alternative, low-carbon fuels;
- 2) Validating the technical and market feasibility of the pre-commercial technologies in preparation for a full-scale, commercial vehicle production launch;
- 3) Generating operational and performance data for the new, PHET vehicle to facilitate commercialization and broad deployment, thereby increasing the environmental and fuel efficiency benefits; and
- 4) Creating a positive economic impact for California through job creation and cost reduction of drayage truck operations.

**Background**

Thousands of older model year diesel-powered heavy-duty vehicles are used in Goods Movement activities in Southern California and, as a result, significantly contribute to NOx emissions and to this region’s non-attainment with NAAQS for ozone pollution. This project was developed and supported through DOE’s Zero Emission Cargo Transportation Program to demonstrate zero emissions heavy-duty vehicle technology useable in freight transportation. This project developed and demonstrated three Class 8 plug-in hybrid electric trucks (PHETs), two of which were demonstrated in drayage operations by fleet operator TTSI which serves the San Pedro Bay Ports area, railyard and regional freight transportation operations. The third PHET was used as a demonstration vehicle for interested parties and events, for continued product development, and conducting emissions testing at the University of California Riverside (UCR) in order to quantify emissions reduction benefits of the hybrid electric system.

**Project Objective**

The objective of the project was to develop and demonstrate heavy-duty hybrid electric technology that is useable in drayage operations. Operational data collected from the two demonstration vehicles helped quantify fuel economy and other metrics including total cost of ownership. Project goals included:

**Technology Description**

The primary technology utilized in this project included the Cummins ISL-G 8.9-liter LNG-powered spark-ignited engine and a 222 kW interior permanent magnet motor in a parallel electric hybrid configuration, 80 kWh of lithium-ion battery storage, and 72 DGE of LNG fuel storage.



**Figure 1: PHETs**

PHET integration includes electric motor/generator in-line between the engine and transmission with auto clutch and, all electric air, hydraulic and HVAC system with 12V and 24V

batteries, DC-DC converter powering the auxiliary systems, and a high voltage lithium-ion batteries. The electronically controlled pneumatic driven clutch allows the electric motor to be decoupled from the engine and permits electric only operation seamlessly and fully transparent to the driver. The electric auxiliary systems (i.e., power steering, air compressor and air conditioning) are installed in parallel with the engine driven systems to give full functionality in EV-only mode. Transitioning between all-electric mode and hybrid-electric mode is an automated transparent

function that is controlled by the vehicle control unit and requires no input from the driver. The vehicle is equipped with an onboard charger that allows it to be plugged in when not in service, providing a full battery state-of-charge at the beginning of every shift.

The PHET’s parallel hybrid configuration results in greater horsepower and torque than larger displacement diesel engines while providing zero emissions operation in near-dock operations, near-zero emissions operation in most other regional applications and a 250-mile total operating range utilizing existing LNG fueling infrastructure with no evaporative emissions. By optimizing the overall control architecture, the Class-8 PHET has significantly higher fuel economy than a comparably powered conventional engine powertrain while providing the power and torque necessary for drayage operations including accelerating over port bridges and steep highway passes.

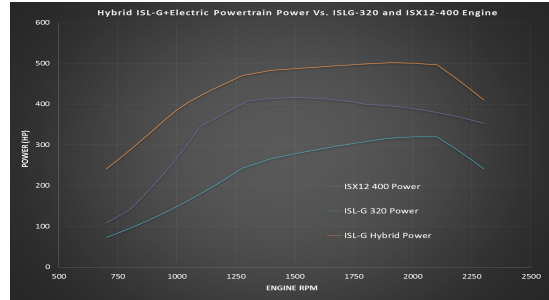
**Status**

The PHET project was completed in September 2018. PHET #1 and #2 were completed and delivered to TTSI on February 27, 2017, and March 29, 2017, respectively. Truck #3 was completed and delivered to UCR for dyno testing in Q3-2017. A no-cost time extension was executed to allow additional time to optimize the hybrid systems to improve fuel efficiency and performance and complete the project.

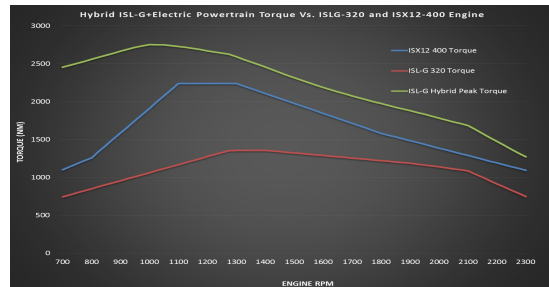
**Results**

TTSI demonstrated the PHET vehicles from March 2017 through October 2018. Data from each vehicle was collected, compiled and analyzed by NREL. NREL’s analysis of these vehicles showed an average efficiency of 3.82 kWh/mi or a 62.5 percent improvement relative to the baseline diesel vehicle tested under this project. The PHETs developed under this project produced higher power (Figure 2) and torque (Figure 3) than the baseline 8.9-liter ISL-G and the 12-liter diesel powered Cummins ISX12 rated at 400 h.p. and 1650 lb-ft. (2237 N-m) torque, significantly improved energy efficiency, and 80 percent less NOx. The trucks performance with both LNG and battery had a range of 250 miles, with exclusive “all-electric” battery range of about 30 miles.

The PHETs demonstrated in this project exceeded operator’s expectations for handling all cargo loads and duty cycles expected of drayage vehicles



**Figure 2: Power Curves**



**Figure 3: Torque Curves**

while meeting zero emissions and near-zero-emissions operations for NOx and lowering GHG emissions using: (1) plug-in battery electric operation for the first 30 miles, (2) hybrid-electric operation during on-road operation, and (3) renewable low carbon intensity LNG alternative fuel. The hybrid configuration provided better fuel and energy economy and hence lower operating costs than a comparably powered non-hybrid heavy-duty vehicles. Additionally, the all-electric operation applied in queuing operations at the port significantly reduced NOx emissions attributable to idling and lower exhaust temperature events.

**Project Costs**

Total project costs were \$1,996,675 with \$925,000 from DOE, \$22,896 from SCAQMD and \$1,048,779 from US Hybrid.

**Commercialization and Applications**

US Hybrid believes drayage truck operators can benefit the most from this technology and can realize immediate return on investments from outstanding engine performance, improved energy efficiency, and reduced emissions from near dock and other operations associated with drayage operations.

# Develop Ultra Low-Emission Natural Gas Engine for On-Road Medium-Duty Vehicles

## Contractor

Gas Technology Institute

## Cosponsors

SCAQMD  
Ricardo  
Southern California Gas Company  
Power Solutions International

## Project Officer

Joseph Lopat

## Background

Medium- and heavy-duty on-road diesel vehicles are currently amongst the top ten sources of NO<sub>x</sub> emissions in the South Coast Air Basin. These source categories are still projected to be one of the largest contributors to the NO<sub>x</sub> emissions inventory, even as the legacy fleet of older and higher polluting vehicles are retired from operation and replaced with vehicles meeting the most stringent 2010 emission standards. The development of ultra-low emission natural gas engines would significantly reduce emissions from this on-road source category and assist the region in meeting federal ambient air quality standards in the coming years. Additionally, the ability to develop an internal combustion engine that emits 90% lower NO<sub>x</sub> emissions, relative to current standards for heavy-duty vehicles would begin to address the issues associated with the NO<sub>x</sub> emissions produced in the operation of heavy-duty vehicles when also factoring in emissions associated with electricity production.

## Project Objective

The objective of this project is to develop an ultra-low NO<sub>x</sub> natural gas engine suitable for on-road applications in the Class 4 to Class 7 vehicle weight rating range. This vehicle segment includes delivery, emergency, transit and other small heavy-duty applications.

In addition the engine system must be commercially viable and capable of:

- Achieving emissions targets of 0.02 g/bhp-hr NO<sub>x</sub>, 0.01 g/bhp-hr PM, 0.14 g/bhp-hr NMHC, and 15.5 g/bhp-hr CO, as determined by the heavy duty engine FTP
- Keeping exhaust NH<sub>3</sub> emissions as low as achievable while targeting 10 ppm,
- Achieving minimal fuel economy penalties relative to 2010 U.S. EPA and CARB certified diesel engines on similar duty cycles, and
- Being certified by the U.S. EPA and CARB.

## Technology Description

Utilizing Ricardo's vast experience in research and development, a naturally aspirated 8.8 liter engine was chosen. The existing stoichiometric cooled exhaust gas recirculation (EGR) spark ignited combustion was selected as the platform. Ricardo began modeling and developing the required exhaust gas recirculation and turbo charger configurations that would best suit the 0.02g/bhp-hr requirement. Power Solutions International (PSI) is an engine builder of natural gas powered engines. The collaboration between PSI and Ricardo was determined to be a positive pathway for development.

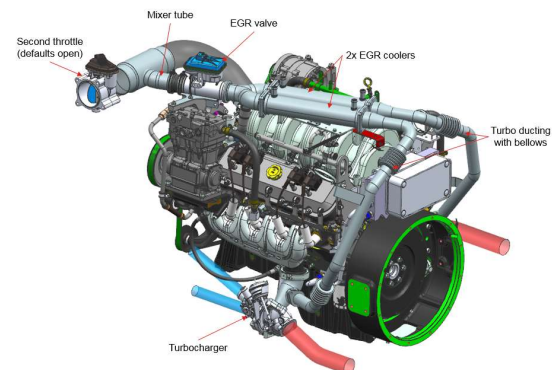


Figure 1: Engine Concept

## Status

Many design ideas such as the configuration of EGR and Turbo charger were developed. The control software also had begun to be developed.

## Results

The project was mutually terminated among all parties and the funds repurposed for other projects.

## Benefits

The 8.8 –liter engine would have been a favorable alternative for class 4-7 vehicles. The availability of an engine with ultra-low emission, specifically one that reduces NOx by over 90% from the current federal standard would enable air quality districts in California as well as other areas of North America to carry out their emissions reduction plans and move closer to meeting their ambient air quality goals. Specifically targeting the NOx emissions attributed to commercial on-road vehicles would be an additional benefit.

## Project Costs

This project was originally funded by SCAQMD, Ricardo, SCG and PSI in an amount totaling \$1.8 million. The chart below reflects actual expenditures before the project was ended.

<b>Project Partners</b>	<b>Funding Amount</b>
SCG	\$55,000
SCAQMD	\$250,000
Total	\$305,000

## Commercialization and Applications

This project was ended before completion. The original design had packaging concerns with integration into the vehicle. After several months of design technical readiness level two discussions, PSI decided to pursue different alternatives in other markets. PSI determined there would not be a significant market to ensure payback on development of the technology.

SCAQMD Contract #16205

June 2018

## Develop, Integrate and Demonstrate Near-Zero Emissions 12-Liter Natural Gas Engine for On-Road Heavy-Duty Vehicles

### Contractor

Cummins Westport Inc.

### Cosponsors

California Energy Commission  
Clean Energy Fuels  
SCAQMD  
Southern California Gas Company

### Project Officer

Joseph Lopat

### Background

Heavy-duty on-road diesel vehicles are currently among the top ten sources of NO<sub>x</sub> in the South Coast Air Basin (Basin). This source category is still projected to be one of the largest contributors to NO<sub>x</sub>, even as the legacy fleet of older and higher polluting vehicles are retired from operation and replaced by the cleanest vehicles meeting the most stringent emissions levels. Development of near-zero emissions natural gas engines would significantly reduce emissions from this source category and assist the region in meeting federal ambient air quality standards.

### Project Objective

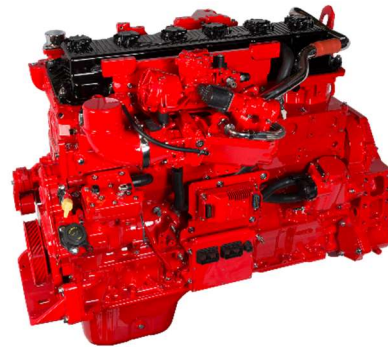
The objectives of this project were for Cummins Westport Inc. (CWI) to develop and demonstrate a 12-liter natural gas engine and associated aftertreatment technologies suitable for on-road heavy-heavy-duty vehicle applications, such as Class 8 trucks and buses. In addition, the engine system had to be commercially viable and capable of:

- Achieving emissions targets of 0.02 g/bhp-hr NO<sub>x</sub>, 0.01 g/bhp-hr PM, 0.14 g/bhp-hr NMHC and 15.5 g/bhp-hr CO, as determined by heavy-duty engine Federal Test Procedures (FTP);
- Keeping exhaust NH<sub>3</sub> emissions as low as achievable while targeting 10 ppm;
- Achieving minimal fuel economy penalties relative to 2010 U.S. EPA and CARB-certified diesel engines on similar duty cycles, and
- Being certified by U.S. EPA and CARB.

### Technology Description

An extensive process was undertaken to design and develop a 12-liter engine and aftertreatment to meet the 0.02 gram NO<sub>x</sub> level. Utilizing learnings from previous technology development, the existing stoichiometric-cooled exhaust gas recirculation (EGR) spark-ignited combustion was selected as the platform to complement with the following additions/changes:

- Implementation of a closed crankcase ventilation (CCV) system with additional pressure sensor;
- Aftertreatment size increased, improved formulation, and O<sub>2</sub> sensor location changed;
- Redesigned fuel system for improved fuel delivery accuracy and responsiveness; and
- Improved software with various emissions optimizing control strategies and addition of an HD-OBD.



**Figure 1: 12-Liter NG Engine**

The closed crankcase ventilation system consists of an electrically driven coalescence filter and hose assembly. Crankcase emissions are routed to the filter where oil is separated through high speed rotation of the filter. The vapor is introduced into air intake at the turbo compressor inlet so that it can enter the combustion process. Separated oil is returned to the engine sump. An additional CCV pressure sensor allows the control system to monitor pressure in the CCV system and alert the operator to issues as part of system diagnostic.

The combination of increased aftertreatment size and improved formulation increases the overall conversion efficiency of the catalyst and thereby



reduces emissions. A key part in the optimized control of the aftertreatment is the relocation of the O2 sensor from the outlet to the mid-bed location.

A redesigned fuel system achieved the goal of increasing the accuracy and responsiveness of the fuel delivered to the combustion chamber, enabling the control software improvements.

The optimized control software targets high NOx forming portions of the duty cycle and utilizes the above-mentioned hardware changes to reduce tailpipe emissions.

### Status

The project was successfully completed with the ISX12N receiving U.S. EPA and CARB certification (to the optional low NOx 0.02 g/bhp-hr level) in December 2017. The engine went into commercial production at the Cummins Jamestown, NY, engine plant February 2018. The final report is on file with technical details of the project.

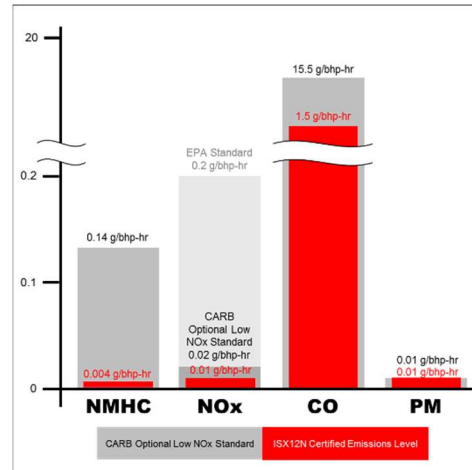
The standard Cummins engine development process was followed, which included analysis and testing at a component level thru to the system level. Multiple prototype engine builds were completed prior to production and tested in test cell dynamometers and in test vehicles.

Fifteen pre-production engines were installed in 14 tractor style trucks and in one refuse truck. Thirteen of these vehicles were owned by fleets and placed back into commercial service. Two of the vehicles were “rapid” test vehicles operated by Cummins and intended to accumulate mileage quickly. The field test vehicles successfully accumulated 1.25 million miles.

The University of California, Riverside (UCR) conducted a third-party chassis dynamometer testing of one field test vehicle, which showed that the ISX12N 400 natural gas engine met and exceeded the target NOx emissions of 0.02 g/bhp-hr and maintained those emissions during in-use duty cycles found in the Basin. Other gaseous and particulate matter emissions were below the standards and/or similar to previous levels. Particle number, ammonia emissions and methane emissions were higher than current 2010 certified diesel engines on similar drive cycles.

### Results

The objectives of this project were achieved. U.S. EPA and CARB certification were received, with results shown in the following graphic.



While the stretch NH3 target of 10 ppm was not achieved, NH3 emissions were reduced by over 50 percent with a value of 40 ppm demonstrated.

Fuel economy analysis based on CO2 emissions from the FTP cycle suggest the ISX12N is approximately 15 percent more fuel efficient than a similar 2010 ISX12 diesel engine. Also based on CO2 emissions, UCR testing found the fuel economy also appeared to be similar to previous versions where the urban dynamometer driving schedule showed the lowest CO2 emissions and were below the current FTP standard of 555 g/bhp-hr for both the cold start and hot start tests during in-use chassis testing.

### Benefits

The availability of a 12-liter near-zero emissions engine, specifically one that reduces NOx by over 90 percent from the current federal standard enables air quality districts in California (and other states who wish to adopt more stringent standards) to carry out their emissions reduction plans in order to meet ambient air quality goals, specifically targeting NOx attributed to heavy-duty on-road vehicles.

### Project Costs

Total project costs were \$5.25 million with cost-share funding as follows: Clean Energy-\$500,000 (10%); CEC-\$1,000,000 (19%); SCG-\$1,000,000 (19%); CWI-\$1,000,000 (19%); and SCAQMD-\$1,750,000 (33%).

### Commercialization and Applications

This engine is now available to a wide range of original equipment manufacturers of heavy-heavy-duty vehicles for duty cycles used in regional haul and refuse trucks and coach buses. It is also available for incentive funding programs.

## Install, Operate and Maintain Three Natural Gas Fueling Stations

### Contractor

Clean Energy

### Cosponsor

California Energy Commission  
SCAQMD

### Project Officer

Phil Barroca/Drue Hargis

### Background

The South Coast Air Basin (Basin), which encompasses all of Orange County and the non-desert portions of Los Angeles, Riverside and San Bernardino counties, is in non-attainment with state and federal standards for ozone and PM emissions. Ozone and PM emissions affect human health contributing to respiratory disease, lung damage, cancer, birth defects and premature death. Air pollution also negatively impacts the environment and sensitive ecosystems. Alternative fueled vehicles help to reduce NOx and PM emissions and meet federally mandated air quality standards. The SCAQMD has a long history of supporting development and commercialization of alternative fueled vehicles and the infrastructure to support them.

### Project Objective

Clean Energy has been operating natural gas fueling facilities in the Basin for many years. The SCAQMD, through a CEC grant (#PON-09-006), provided Clean Energy funding to offset the cost to install, operate and maintain three public access, liquefied natural gas (LNG) fueling stations. The three stations would be located at the following sites: 14226 Valley Blvd., Fontana (92335) at an existing truck stop located less than one-half mile from Interstate 10; 45-601 Dillon Road, Coachella (92336), at an existing travel stop less than one-tenth mile from Interstate 10; and 23261 Cajalco Expressway, Perris (92571) at an existing travel zone center less than one-half mile from Interstate 215. Clean Energy was responsible

for designing, constructing, installing and commissioning the three LNG fueling stations.

### Technology Description

These stations were designed to support heavy duty trucks and included the following equipment: LNG storage tank, LNG pump skid, offload skid, two LNG dispensers, vaporizer skid, switchgear, and card reader as well as site improvements including, but not limited to, utility service lines, block wall, asphalt, concrete and landscaping.

Furthermore, Clean Energy's LNG is significantly derived from renewable low carbon intensity sources to help reduce greenhouse gas emissions.

### Status

All three public access station projects were successfully implemented and are currently open and operating.

The Coachella station opened to the public in May 2013 and the Fontana station in November 2013.



Figure 1: Coachella LNG Station



Figure 2: Fontana LNG Station

The Perris station opened in July 2015, following difficulties establishing permanent power for the station. It was a catch-22 situation. The county would not provide a meter release because the station lacked power on final inspection but Clean Energy couldn't get one without the other. Their lead engineer had to work closely with the county and SCE to get the count inspector to finally grant a meter release. A lessons learned here is to allow more time for this process and the need to continue educating county inspectors.



**Figure 3: Perris LNG Station**

In addition, the Perris station closed temporarily in December 2017 because it was dispensing very low volume due to a number of factors from anticipated customers deciding to install private, mobile fuelers to the variable seasonable demand from local hay farmers coupled with lower diesel costs slowing natural gas truck procurements. Clean Energy made the decision to temporarily close the LNG station to save operational costs while working to identify new fleet customers. The station was re-opened in May 2018. A longer final report is on file.

**Results**

Natural gas for transportation typically costs less than gasoline or diesel, saving money daily for vehicle and fleet owners who use these stations. Specifically, these three LNG fueling stations helped promote transition to cleaner burning fuels, encouraging current natural gas fleets to expand use of natural gas and new fleets to switch to natural gas. Furthermore, these three LNG stations are reducing significant amounts of air pollutants through the displacement of heavy-duty diesel trucks.

Although the original estimated throughput for each station was higher than the first full calendar year of actual fuel dispensed, the stations brought real, quantifiable emissions reductions based on the volume of diesel displaced. California is accelerating fleet turnover to transition to cleaner burning fuels, and since these stations are at convenience fueling sites near major interstates, throughput should increase steadily.

ANNUAL THROUGHPUT IN DGE		
	2016	2017
COACHELLA	110,100	181,529
FONTANA	439,461	608,370

**Benefits**

Based on the stations' volume over the past three years, the stations have directly reduced 1,378,883 pounds of criteria pollutants and greenhouse gas emissions.

Emission Reductions (Pounds)					
Emissions Reduced:	Carbon Monoxide (CO)	Volatile Organic Compound (VOC)	Nitrogen Oxide (NOx)	Fine Particulate Matter (PM2.5)	Greenhouse Gas (GHG)

This project has displaced 825,145 gallons of diesel, a large contributor of air pollution linked to lung disease, asthma, cancers and other respiratory and critical illnesses.

**Project Costs**

SCAQMD using CEC funding provided Clean Energy \$1.4 million to offset the costs to construct all three LNG stations. Clean Energy provided the remaining cost-share. Projected costs varied from actual costs due to the cost of construction and delay in permitting. The engineering timelines were longer than the development timeline which caused costs to be higher than anticipated. Projected vs actual costs are illustrated below.

	Coachella	Fontana	Perris
<b>Projected Costs</b>	\$1,319,356	\$1,394,317	\$1,287,323
<b>Total Cost</b>	\$1,526,496	\$1,361,684	\$1,425,921
<b>Grant</b>	\$500,000	\$500,000	\$400,000
<b>Cost-Share</b>	\$1,026,496	\$861,685	\$1,025,921

**Commercialization and Applications**

Clean Energy successfully established three new public access LNG stations in the Basin. These stations are operating on 24-hour per day, 7-days per week basis.

## Upgrade Existing CNG Fueling Station at City Corporate Yard

**Contractor**

City of Corona

**Cosponsors**

City of Corona  
MSRC/AB 2766 Discretionary Fund  
SCAQMD

**Project Officer**

Phil Barroca/Drue Hargis

**Technology Description**

The City installed three storage vessels, a dual-hose fast-fill dispenser, card reader and priority valve panel. By doubling the existing storage capacity from 36,000 CF to 72,000 CF of CNG, it allowed for the installation of the additional dual-hose fast-fill dispenser, which is an ANGI Series II dispenser with an advanced LCD display and electronics, integrated micro-processor mass flow, sequential and display electronics eliminating remote components, weights and measures certified, three-bank sequencing, temperature compensation, and OPW P36 fill nozzles.

**Background**

In 2003, the City of Corona constructed a CNG station at 430 N. Cota Street, Corona, near the I-15 and SR-91. The station was originally constructed with two Greenfield C3U gas compressors delivering a maximum throughput of 764 cubic feet (CF) per minute, with a storage capacity of 36,000 CF, with a single dual-hose, fast-fill dispenser. Since it was the only CNG fueling station within a 12-mile radius, the station storage capacity and single dispenser became insufficient to serve the residents, commuter traffic and several corporate fleets in the area. When the SCAQMD through a CEC grant (#ARV-10-054) offered funding for new and upgraded natural gas stations, the City of Corona applied for and was awarded funding to upgrade its station.

**Status**

The project was completed and the upgraded station opened to the public in September 2014. During the design phase of the project, there were some delays due to sub-consultants not performing per schedule and to the amount of time the different parties required for the plan review. During the construction everything ran smoothly; the concrete pad was built for the storage vessels; vessels were installed; lights were relocated; the fast-fill dispenser and card reader were installed; and other required civil improvements were constructed. A more detailed Final Report is on file.

**Project Objective**

The objective of this project was to increase the CNG fueling capacity and provide the public with faster fueling service. The City’s goal was to add an additional 36,000 CF of CNG storage and an additional dual-hose fast-fill dispenser. This would double the throughput capacity, reduce the dispensing time and greatly enhance the local CNG infrastructure for the public’s utilization. Under direction by the City of Corona, Fuel Solution Inc. developed design plans for the station upgrades, and the City contracted with Go Natural Gas Inc. to construct the station.



**Figure 1: New Dual-Hose Fast-Fill Dispenser**



**Figure 2: CNG Storage Vessels**

CNG is also less expensive than gasoline or diesel, resulting in cost savings for the City and the users of its CNG fueling station.



**Figure 3: Station after Upgrade**

## Results

Expansion of the existing Cota St. public access CNG fueling station was essential to accommodate increasing users and the subsequent demand for CNG utilization. According to EIA's Alternative Fuel Vehicle Data, CNG demand has increased steadily since 1995. This is beneficial to the environment since natural gas emits approximately 6-11 percent lower levels of GHGs compared to gasoline throughout fuel life cycle, according to the Argonne National Laboratory. Another study shows that there is more than a 90 percent reduction in petroleum use for CNG compared to gasoline. The U.S. DOE mentions that another positive thing is that U.S. natural gas reserve is abundant compared to petroleum, of which 33 percent is imported from politically volatile countries.

**Table 1: Throughput in Gasoline Gallon Equivalents (GGE) Consumed**

<u>Period</u>	<u>GGE</u>	<u>Fueling Transactions</u>
9/1/14 to 8/30/15	490,795	54,835
9/1/15 to 8/30/16	454,913	49,720
9/1/16 to 8/30/17	425,952	45,813
9/1/17 to 8/30/18	373,523	44,349

## Benefits

The construction of the project increased the CNG fueling services provided by the City of Corona. The storage capacity was increased by approximately 36,000 CF and the fueling wait time was decreased by the installation of the additional dual-hose dispenser. CNG burns cleaner than gasoline or diesel and produces fewer emissions of hydrocarbons, NOx, CO and CO2.

## Project Costs

The costs for the project included design, equipment procurement, geotechnical construction services and construction. The original estimate was \$450,000, and while there were no major change orders during the design or construction of the project, some costs were underestimated. Funding for the project was as follows:

**Table 2: Funding Partners**

<u>Cosponsor</u>	<u>Cost-Share</u>
MSRC/AB 2766 Discretionary Funds	\$225,000
SCAQMD (through CEC AB 118 grant)	\$200,000
City of Corona General Fund	\$57,812
Total	\$482,812

## Commercialization and Applications

The use of CNG vehicles benefits the environment and public health. The City will install additional storage capacity in the future if needed.

# Upgrade CNG Fueling Station

**Contractor**

Rainbow Disposal Company, Inc.

**Cosponsors**

California Energy Commission  
SCAQMD

**Project Officer**

Phil Barroca/Drue Hargis

**Background**

In 2010, the SCAQMD amended Rule 1193. The revised rule required solid waste collection vehicles providing waste collection services to public agencies to be powered by alternative fuels by January 1, 2020.

Rainbow Disposal Company, Inc. (RDC), has operated a CNG fuel station in the northwest quadrant of Orange County since 2007. The access to alternative fuels for communities is limited by geographic convenience, fueling capacity, physical barriers to quantity, and the amount of compatible vehicles. The existing public fuel station at RDC has 24-hour accessibility with ingress and egress access for buses, heavy equipment, and multi-passenger vehicles to fuel simultaneously. Additionally, RDC originally installed 50 CNG “time-fill” dispensers which served three quarters of its collection vehicle fleet.

**Project Objective**

The objectives of this project were three-fold: 1) Comply with Rule 1193 by increasing the quantity of CNG powered vehicles from 50 to 72; 2) Increase CNG fueling capacity by increasing the quantity of time-fill CNG dispensers to accommodate 22 additional CNG-powered collection vehicles and increase the volume of reserve CNG capacity at the public “fast fill” station; and 3) Reduce CNG electrical costs by increasing the volume of CNG storage reserves. This last objective would be achieved by increasing the amount of CNG that can be compressed overnight during lower electric rate periods, reducing the number of CNG compressor start-ups and shut-downs, and cost effectively

utilize stored CNG during higher electric rate periods. These efforts would results in lower operating costs through reduced compressor usage during higher electric rate periods. Data collected by RDC shows these station improvements reduced the amount of kilowatts (kW) consumed by nearly eight percent.



Figure 1: CNG “Cascading” Storage Tanks



Figure 2: Public CNG Station



Figure 3: CNG Time-Fill Dispenser

### Technology Description

The technology used in this project includes one ASME three-pak of CNG storage vessels rated at 12,207 scf at 5,000 psig and eight time-fill dual-hose dispensers with three bank sequencing for each hose.

### Status

RDC completed the installation of the additional CNG storage vessels and the 22 vehicle dispensers in January 2015. The existing intercompany and public fueling stations remained operational during the project.

### Results

**Rule 1193 Compliance/Increased CNG Dispenser Capacity** – The addition of the 22 fueling dispensers allowed RDC to replace its remaining fleet of diesel trash collection vehicles with CNG trucks. A total of 20 diesel collection trucks and 3 diesel transfer trucks were replaced with CNG trucks between 2015 and 2018. Using an energy density ratio of 86.55 percent CNG:diesel, **Figure 4** shows the amount of diesel gallons reduced by increasing the facility’s CNG capacity. **Figure 5** depicts the total amount of CNG gallons used in the last five years.

Year	Rainbow CNG Usage	Increased CNG Gallons (Since 2014)	Reduced Diesel Gallons
2014	437,262	-	-
2015	482,201	44,939	38,894
2016	522,998	85,736	74,205
2017	547,751	110,489	95,628
2018	599,141	161,880	140,107
Totals	<b>2,152,091</b>	<b>403,044</b>	<b>348,834</b>

Figure 4: Diesel Usage Reductions

Year	Public	Rainbow	Total
2014	99,446	437,262	533,708
2015	94,867	482,201	577,068
2016	64,067	522,998	587,065
2017	64,052	547,751	611,803
2018	73,269	599,141	672,411

Figure 5: Total CNG Gallons Used

**Increased CNG Fueling Capacity** – In addition to the 22 CNG fuel dispensers, 3 “cascading” CNG storage tanks that were added to reduce kW’s used to start and stop the CNG pumps. As shown in **Figure 6**, the facility achieved a sustained 7.8 percent kW consumption reduction following the installation of the additional CNG storage tanks in 2015.

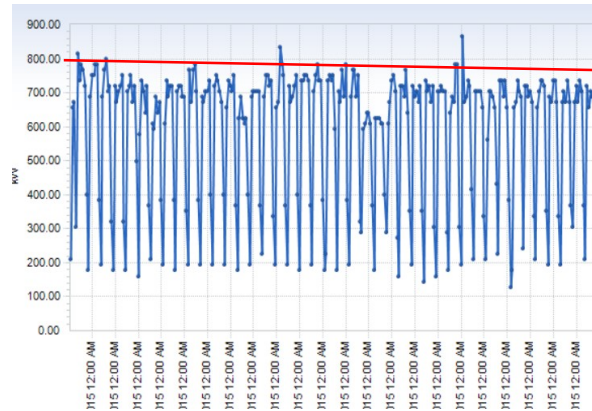


Figure 6: kW Consumption Reductions in 2015

### Benefits

Following the completion of the CNG upgrade project, RDC has displaced approximately 348,834 gallons of diesel. Using the EPA/DOT standard of 22.38 pounds of CO2 emissions per gallon for diesel consumed and 14.22 pounds of CO2 per gallon for CNG consumed, this project has resulted in a reduction of approximately 2,075,619 pounds in CO2 emissions since it was completed in 2015.

### Project Costs

Costs for the station upgrades paid by Rainbow Disposal and SCAQMD with funding from a pass-through grant from the CEC.

Funding Source	Cost-Share
RDC	\$240,891
SCAQMD (through CEC pass-through revenue grant #ARV-10-054)	\$200,000
<b>Total Cost</b>	<b>\$440,891</b>

### Commercialization

The technology employed in this project, cascade sequential CNG storage and dispensing with time-fill, is commercially proven and provides lower costs of operation for anchored fleets that can fuel overnight.

SCAQMD Contract #12854

December 2018

## Upgrade LNG Fueling Station at Baldwin Park Facility

### Contractor

Waste Management

### Cosponsors

SCAQMD  
Waste Management

### Project Officer

Phil Barroca/Drue Hargis

### Background

Waste Management (WM) owns and maintains a fueling facility for refuse collection vehicles at 13940 Live Oak Ave., Baldwin Park. WM has operated a limited public-access liquefied natural gas (LNG) refueling station since 2003. Committed to reducing emissions and implementing cleaner solutions, WM has increased their fleet from 53 heavy-duty natural gas solid waste collection trucks to 75 with the purchase of additional LNG and compressed natural gas (CNG) heavy-duty vehicles to operate at the Baldwin Park facility. To fuel this natural gas fleet, WM planned for the expansion of their fueling station. This included the installation of an additional LNG storage vessel, compressors, pumps, dispensers and a vaporizer to create CNG. WM applied for and received cofunding from the SCAQMD as cost-share for the installation of the storage vessel as well as related work for site improvements.

### Project Objective

The objective of this project was to add approximately 16,000 gallons of additional LNG storage capacity to an existing 16,000 gallons for a total capacity of approximately 32,000 gallons at its existing publicly accessible LNG fueling station in Baldwin Park. In addition, WM would expand the use of their fueling station by adopting advance technologies to vaporize LNG to CNG to support local fleets, both public and private. Other related work would include site improvements and upgrade of controls related to the added storage capacity and technology.

The purpose of this project was to reduce emissions from heavy-duty refuse collection vehicles by installing the necessary infrastructure to fuel extremely low emissions natural gas vehicles. WM will operate the LNG/LCNG fueling station at its facility in Baldwin Park.



Figure 1: LNG Tank Installation

### Technology Description

This project involved the installation of one additional above-ground storage tank with a capacity of approximately 16,000 gallons, four CNG storage spheres, two LCNG pumps, one fan assisted LCNG vaporizer, one odorant injection system, and an upgrade to an existing PLC control system to allow the interface of the new equipment.

All equipment meets AGA, ANSI, API, ASME, ASTM, NEC, NFPA, OSHA, and SAE requirements.

### Status

WM completed installation of the LNG tank, and the station has been operational since May 2012. No significant problems were encountered during the construction of the project. The final report is on file with complete technical details of the project. In accordance with Contract #12854, Waste Management will operate the station for at least five years and continue reporting to the SCAQMD during that period.



## Results

Now that the additional LNG storage installation and related work is complete, the station can adequately provide fuel for their growing natural gas fleet. The expansion of the station will result in fuel cost-savings due to the lower cost of natural gas, increase energy security and lower emissions, all air quality benefits achieved by displacing diesel fuel.

## Annual Fuel Throughput

Throughput data from the upgraded LNG-CNG station since it was completed in May 2012:

Period	LNG Gallons	CNG (DGE)
May2012-Apr2013	282,224	344,728
May2013-Apr2014	246,883	325,706
May2014-Apr2015	333,998	397,241
May2015-Apr2016	251,166	495,065
May2016-Apr2017	154,393	505,121
May2017-Apr2018	136,666	541,758

The first two-year period is data from WM vehicles only, while the throughput listed from subsequent years includes WM vehicles and third-party users accessing the fueling station.

## Benefits

WM is familiar with the many benefits of natural gas, operating one of the largest fleet of heavy-duty natural gas trucks in North America. Benefits identified include fuel cost-savings, energy security, and lower emissions.

Additionally, natural gas fuel contains less carbon than any other fossil fuel and thus produces lower carbon dioxide (CO<sub>2</sub>) and greenhouse gas (GHG) emissions per year. In fact, natural gas vehicles produce 20-30 percent less greenhouse gas emissions than comparable diesel vehicles. Therefore, the successful installation of this additional storage tank will lower the tail-pipe emissions of WM's natural gas fleet and other public and private fleets operating within the South Coast Air Basin.

Based on the average throughput of 310,149 gallons of LNG per year and 292,572 DGE of CNG per year, WM estimates that the Baldwin Park station achieves a reduction of

approximately 36 tons of NO<sub>x</sub> and 0.73 tons of PM per year<sup>1</sup>.

## Project Costs

The total cost of the new LNG storage tank and related site improvements was \$1,719,189. WM paid \$1,419,189 and was awarded \$300,000 cost-share from the SCAQMD as pass-through funding from the CEC AB 118 Program (Agreement #ARV-10-054) for the upgraded natural gas fueling station.

## Commercialization and Applications

This project will provide the additional necessary infrastructure needed in order to make alternative fuels like natural gas a commercially available and preferable fueling option. Commercial fleet drivers and owners of CNG –equipped vehicles can now fuel at WM's newly upgraded Baldwin Park station.

Additionally, the Baldwin Park LNG/LCNG Infrastructure Expansion Project will provide solutions to the development and widespread use of natural gas as a transportation fuel. Public and private fleets will be encouraged to switch to natural gas as additional infrastructure is available due to both the environmental and cost-saving benefits. This project is also beneficial to those vehicles subject to Rule 1193, which requires public and private solid waste collection fleets having exclusive contracts with public entities and greater than 15 trucks to purchase or replace existing vehicles with alternative fuel vehicles.

WM is committed to reducing emissions and implementing cleaner solutions, such as the construction/expansion of alternative fuel infrastructure and natural gas vehicle deployment throughout the South Coast Air Basin.

<sup>1</sup> Estimated using Carl Moyer Program Guidelines (Adopted April 2011) methodology for calculating criteria pollutant emission reductions and using a baseline model year 2006 diesel refuse collection vehicle

## Refurbish Ontario LCNG Fueling Facility

### Contractor

United Parcel Service

### Cosponsors

California Energy Commission  
Department of Energy  
SCAQMD

### Project Officer

Phil Barroca

### Background

An important aspect of natural gas vehicle deployment in California is the supporting infrastructure. The UPS Ontario LNG/CNG (LCNG) station is a public/private access LNG and CNG refueling facility located at 3140 E. Jurupa Ave. Ontario, CA 91761. The facility is adjacent to the Ontario International Airport in a predominantly industrial and commercial zone of the Inland Empire region of Southern California, one of many regions that comprise the South Coast Air Basin (Basin), a region which continues to be non-attainment with state and federal ozone and PM air quality standards.

The United Parcel Service (UPS) LCNG facility has provided natural gas fueling since 1997. The station received funding support from the CEC and DOE to refurbish storage and dispensing equipment and other associated systems to permit the station to operate reliably and continue providing natural gas fueling to UPS and other natural gas vehicle operators in the area. The UPS LCNG refurbishment was a replacement project to the original CEC award under #ARV-10-035; the original CNG infrastructure project, also located in Ontario, was abandoned due to irreconcilable differences between the station owner and its partner.

### Project Objective

The goal of this project was to continue reliable LNG fueling for UPS and other LNG-powered vehicles. UPS' original proposal was based on unreliable LNG fuel supply in combination with expected increases in fleet size, vehicle miles traveled (VMT) and fuel demand. Subsequent to

grant award and contract execution, UPS realized a significant improvement in the reliability of LNG fuel delivery, reducing the immediate need for more onsite LNG storage capacity. In recognition of improved fuel delivery and to reduce project costs, UPS and SCAQMD submitted a request to revise the project scope to a station refurbishment, eliminating the costs associated with the purchase and installation of a new 18,000 gallon LNG tank. The project scope was further revised when it was determined that a proposed new LNG dispenser would not be able to communicate with the rest of the LNG system because UPS was unable to gain legal access to proprietary software access codes.



Figure 1: LNG Fuel Delivery to Station

### Technology Description

UPS performed the following upgrades and refurbishments to the LNG/LCNG refueling station:

- Removal and replacement of LNG submersible pump;
- Rebuilt old LNG pump for back-up;
- Removed and replaced LCNG pump cold ends and rebuilt old cold ends for back-up;
- Removed and replaced CNG dispensers with new dual-hose 3,600 psi dispensers;
- Removed and replaced odorant injection system;
- Performed corrosion control on CNG storage vessels and repainted CNG vessels;
- Identified leaks on LNG storage vessel and repaired as necessary;
- Tested LNG tank and vacuum jacketed piping for proper vacuum and re-pulled vacuum on LNG tank and lines following repairs;

- Serviced the air system and changed air compressor oil and replaced air filters;
- Changed system desiccant dryer material and leak tested all connection points and repaired leaks, as necessary.

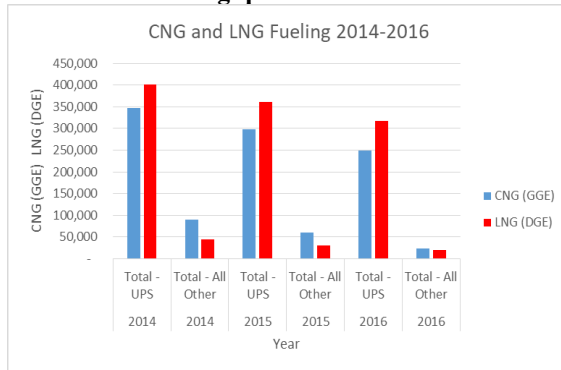
**Status**

UPS met the goals of this reduced-scope project, successfully restoring and upgrading an established public access LNG/LCNG fueling station in the Inland Empire area near the well-travelled 10 and 60 Interstate freeways. The completion of these upgrades restores the reliability and fueling capacity of the original LCNG station and provides increased incentive for goods movement operators, municipal fleets, school districts and water agencies to adopt or expand the use of natural gas vehicles. UPS continues to use this station to fuel heavy-duty vehicles operating between Southern California and Las Vegas as well as heavy-duty goods movement activities within the Basin.

**Results**

The refurbishment of this station restored the station to its original capacity, maintaining its current refueling capabilities and upgrading all private CNG dispensers, hoses and nozzles to 3,600 psig. Below is a graph of the throughputs reported for LNG and CNG from this facility between 2014 and 2016. UPS is the major consumer of the fuel dispensed at this station. UPS has expanded its fleet of heavy-duty LNG powered vehicles from 11 to 44 since 2010.

**Table 1 Throughput for CYs 2014-2016**



Between UPS’s 38 heavy-duty CNG vehicles and its heavy-duty LNG fleet, it is displacing more than 600,000 gallons of petroleum fuel annually, with public fleets displacing another 100,000 gallons annually.

**Benefits**

UPS’ fleet of Class 8 LNG-powered and Class 7 CNG-powered heavy-duty vehicles are the largest and most consistent fuel consumers at this refueling facility. A baseline emissions reduction assessment for this facility can be performed using the Carl Moyer Program Guidelines (July 2014)<sup>1</sup> methodology for calculating criteria pollutant emission reductions. If it is assumed that a comparable fleet of heavy-duty diesel-powered vehicles, subject to the 1.2g NOx per bhp-hr standard, used an equivalent amount of diesel fuel as shown in Table 2 (converting CNG to diesel gallon equivalents), the reduction in NOx from the heavy-duty natural gas-powered vehicles would be approximately 13 tons per year.

**Project Costs**

The UPS Ontario refurbishment project received \$55,792 from the CEC and \$223,168 from the U.S. DOE, which were received as pass-through funds to SCAQMD who administered the project. Total project expenses were \$278,960, with in-kind contributions provided by UPS.

**Commercialization and Applications**

This project will provide the continued and necessary infrastructure needed to make natural gas a commercially available and preferable fueling option. UPS remains committed to reducing emissions and creating cleaner solutions, such as the construction of alternative fuel natural gas refueling stations for its fleet and others within the neighborhoods that UPS employees work and live. This refurbishment project helps to illustrate how the lifespan of a natural gas refueling station can be extended and in turn increase the investment potential and economic attractiveness of natural gas as an alternative fuel.

<sup>1</sup> California Environmental Protection Agency, Air Resources Board, “Carl Moyer Program Guidelines” July 2014 Appendix D – Tables for Emission Reduction and Cost Effectiveness Calculations

## Evaluate SOA Formation Potential from Light-Duty GDI Vehicles

### Contractor

University of California Riverside/CE-CERT

### Cosponsors

California Air Resources Board  
ICM Inc.  
Manufacturers of Emission Controls Association  
SCAQMD

### Project Officer

Wei Li

### Background

Gasoline direct injection (GDI) vehicles are known for higher fuel efficiency and power output but the particulate matter (PM) emissions profile is not well understood, especially on secondary organic aerosol (SOA) formation potential. As manufacturers introduce more GDI models in the market to meet new fuel economy standards, it is important to understand the SOA forming potential from these vehicles as it could lead to further impact on the ambient PM concentration in the South Coast Air Basin (Basin).

### Project Objective

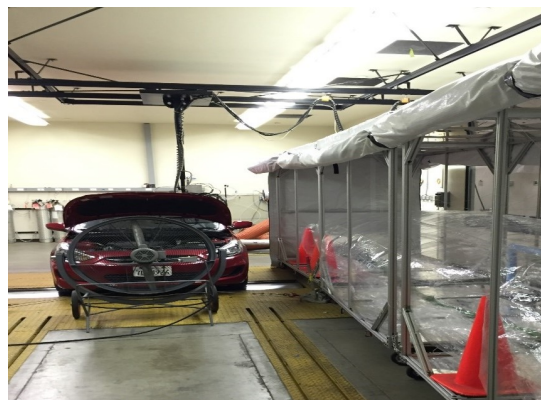
The University of California, Riverside (UCR)/CE-CERT evaluated the primary emissions and SOA production from eight current technology GDI vehicles over the LA92 test cycle. This program had three distinct goals (or separate exercises): 1) evaluate primary emissions and SOA formation from conventional GDI vehicles; 2) evaluate particulate emissions, toxic pollutants and SOA formation from GDI vehicles with and without gasoline particle filters (GPFs); and 3) examine the impact of fuel composition on the tailpipe emissions and SOA formation from GDI flexible fuel vehicles (FFVs).

### Technology Description

A 30m<sup>3</sup> mobile environmental chamber, which is the largest known reactor currently available, was designed and constructed for this program. The large volume (surface area to volume ratio of ~2.2:1) and non-reactive chamber material was selected to help

minimize wall loss of aerosols and semi-volatile precursors.

Emissions tests were conducted in CE-CERT's light-duty chassis dynamometer over the LA92 test cycle. Primary emissions were measured during the tests. Emissions were also collected using the mobile environmental chamber during emissions tests then the chamber was transferred to the atmospheric processes laboratory for aging until air mass was depleted. Secondary emissions measurements were made during the reaction process.



**Figure 1: A vehicle is being tested on the chassis dynamometer with the mobile environmental chamber collecting primary emissions.**

### Status

The scope of this study was expanded with additional funding and in-kind contribution from ICM, MECA and CARB to include hot-start test cycle, additional and more detailed emissions characterization and toxicity analysis. Emissions tests were successfully completed in November 2017. Comprehensive data analysis for the primary and secondary emissions was completed in August 2018. CE-CERT is producing journal papers describing the results of this project with four journal papers having been submitted to date. Two additional journal papers are in preparation for submittal.

### Results

For the first exercise, four 2015 to 2016 model year GDI vehicles were tested. Results showed that PM, black carbon (BC) and particle number (PN) emissions increased markedly during accelerations and the cold-start phase, indicating severe wall

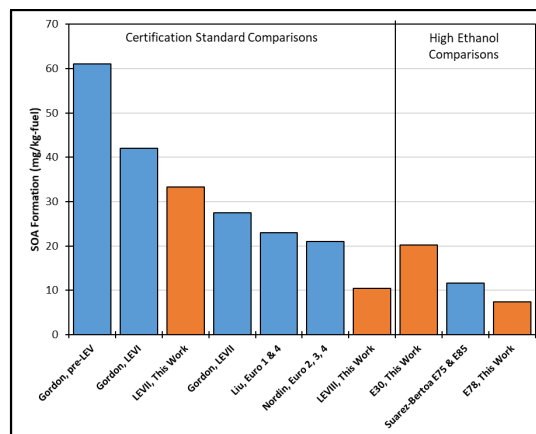
wetting that led to slower fuel evaporation and pool burning. PN and BC emissions showed large reductions during the urban and hot-start phases. Aged exhaust emissions resulted in distinct secondary aerosol emissions that varied significantly in physical and chemical structure. Two of the four vehicles produced considerable amounts of inorganic aerosol, thereby modifying secondary aerosol volatility and hygroscopicity. Primary PM emissions from all vehicles in this study met their certification requirements for their respective model years; however, all vehicles exhibited potential to form a considerable amount of secondary aerosol with different composition.

For the second exercise, two 2016 model year GDI vehicles were evaluated for the effects of catalyzed GPF addition to GDI vehicles. The use of catalyzed GPFs greatly reduced the toxic polycyclic aromatic hydrocarbons (PAHs) and their nitrated derivatives (nitro-PAHs), as well as dramatically reduced PM, PN and BC emissions. Gaseous emissions of NO<sub>x</sub>, total hydrocarbons (THC) and non-methane hydrocarbons (NMHC) were also reduced. Production of SOA was reduced with GPF addition, but was also dependent on engine design which determined the amount of SOA precursors at the tailpipe. This study indicates that SOA production from GDI vehicles will be significantly reduced with the application of catalyzed GPFs through the mitigation of reactive hydrocarbon precursors.

For the third exercise, two GDI FFVs were tested with four fuels of different ethanol blend levels: E10 with high aromatics, E10 with low aromatics, intermediate E30 and high E78 blend. Vehicles fueled with E30 and E78 exhibited reductions in THC, NMHC, CO and NO<sub>x</sub> emissions compared to the high aromatics E10. Particulate emissions from vehicles fueled with E30 and E78 showed large reductions compared to both E10 fuels. Acetaldehyde formation was favored by the higher ethanol content in the fuel, whereas benzene, toluene, ethylbenzene and xylene (BTEX) emissions increased with the high aromatics E10 and reduced with E30 and E78 fuels. As the ethanol content increased, the secondary aerosol formation potential decreased in both FFVs, due to reduction in SOA precursors (i.e., NMHC). In general, this study found that high ethanol content is not only effective in the reduction of tailpipe PM, but also has the potential to greatly decrease SOA formation potential of the emitted exhaust.

As shown in the Figure 2, results from this study were compared to earlier peer-reviewed studies exploring SOA formation from gasoline vehicles. The comparison showed that SOA formation dropped

as the emissions certification standards became more stringent.



**Figure 2: Comparison of SOA formation from GDI vehicles in this study and from gasoline vehicles in earlier peer-reviewed studies**

In summary, this study showed that higher aromatics will increase SOA, while higher ethanol blends will reduce SOA formation. The results also showed that SOA formation increased with increasing NMHC emissions, suggesting that further reductions in NMHC emissions are necessary from current technology GDI vehicles. Catalyzed GPFs may help to reduce SOA productions from GDI vehicles.

### Benefits

This study will enhance our ability to model the formation of SOA from GDI vehicles, helping to close the gap between atmospheric measurements and model predictions of PM concentrations. Models equipped with these SOA formation processes could then be used to help formulate science-based policy for the reduction of ambient PM concentrations.

### Project Costs

SCAQMD	ICM Inc.	MECA	CARB	Total
\$174,972*	\$126,000	\$50,000	In-kind analysis	\$350,972

\*The initial funding from SCAQMD under this contract was \$149,972. An additional \$25,000 was subsequently funded under another SCAQMD contract (#12376) for technical assistance and analysis through a task order issued to UCR/CE-CERT.

### Commercialization and Applications

The mobile environmental chamber developed in this project could be further utilized for examining SOA formation from mobile sources, assessing air quality and the overall environmental impacts of mobile sources.

## Conduct Education Outreach for the Basin DC Fast Charging Network Project

### Contractor

Three Squares Inc.

### Cosponsors

California Energy Commission  
EVgo  
Clean Fuel Connection

### Project Officer

Patricia Kwon

role, they designed a comprehensive outreach strategy to raise awareness about the new DCFC stations throughout their surrounding communities. TSI developed a series of DCFC station launch events, ranging from traditional press events to awareness events held in conjunction with other scheduled events or site host promotional opportunities. TSI also partnered with community organizations and Electric Vehicle (EV) advocacy groups to spread the word about DCFC stations to their networks through social media, online calendars, and e-newsletter promotions.

### Background

Involving local stakeholders in Plug-in Electric Vehicle (PEV) readiness is crucial to the successful deployment of Direct Connection Fast Chargers (DCFC) charging stations. Drivers and charging site hosts need help understanding the benefits of driving PEVs and having public fast charging in their communities. They also need help in understanding the economic value proposition that PEV driving and/or charging holds for them, and the correct procedures for using DCFC charging stations.

### Project Objective

The objective of this project was to develop and conduct a community outreach and education campaign to facilitate PEV readiness in electric vehicle fast charging station communities. This objective was launched by engaging stakeholder groups, including the following:

- Site hosts (owners/employees/students);
- Local businesses (owners/employees);
- Local homeowners and commuters;
- Local governments, associations, and media; and,
- PEV advocacy groups;
- SoCal Fast

### Technology Description

Three Squares Inc. (TSI) served as the Project Community Outreach and Education Lead. In this

### Status

This project was completed in June 2018. Through this project, DCFC station launch events were held for the following locations: Calabasas City Hall, Palm Desert City Hall, Palm Springs Visitors Center, Mel's Drive-In on Sunset, City of Los Angeles Department of Transportation (LADOT), Westwood, LADOT Hollywood and Highland, La Kretz Innovation Center, and LADOT Little Tokyo.



**Figure 1: Outreach Event-Hollywood Farmers Market**

A range of outreach collateral was prepared as part of this campaign, including creation of a website, [www.SoCalFast.com](http://www.SoCalFast.com) to provide a guide for the public to Southern California's electric vehicle fast charge network as well as pull-ups and postcards promoting SoCalFast and their network of stations.

Growing the attendance of launch events presented an unanticipated challenge during this project. After analyzing the problem, the team determined that the following factors limited the events' growth:

- When stations are located in smaller parking lots of commercial businesses, events must be held in off-hours so not to disrupt normal business operations. However, holding events in these hours also decreases the potential audience size for the launches.
- DCFC stations are only able to charge one car every 30 minutes. Therefore, a five-hour event is only able to accommodate a maximum of 10 cars.
- Currently, DCFC stations are only able to charge a select lineup of PEVs. Because of this, the majority of EV drivers are unable to participate in the launches.

To address these challenges, TSI amended the education and outreach strategy to prioritize hosting launch events in conjunction with other community events, such as farmers' markets. Applying this strategy, TSI was able to expand the outreach audience to include attendees of the other community events.

## Results

DCFC station launch events were held to promote the grand opening of eight stations. Additionally, TSI executed digital outreach campaigns to promote the opening of those stations. TSI partnered with community organizations and EV advocacy groups to spread the word about DCFC stations to their networks through social media, online calendars, and e-newsletter promotions. These outreach campaigns were successful in getting information about DCFC stations and the SoCalFast network to millions of people.

The following table illustrates the digital reach of each campaign:

Station/Campaign	Digital Reach
Palm Desert City Hall & Palm Springs Visitors Center	137,500 people
Mel's Drive-In on Sunset	489,900 people
LADOT Westwood	803,700 people
LADOT Hollywood & Highland	704,600 people
La Kretz Innovation Center & LADOT Little Tokyo	821,900 people
<b>Total</b>	<b>2,957,600 people</b>

Given that the stated purpose of this project was to disseminate information about SoCalFast DCFC stations, this project can be considered successful. Information about these stations was distributed to nearly 3 million people who live in and around the communities in which the stations are located.

## Benefits

Through the outreach and education campaign, PEV educational information was distributed to members of the communities where SoCalFast DCFC stations are located. Educational materials included information about the benefits of driving PEVs and having public fast charging, the economic value proposition that PEV driving and/or charging holds, and the correct procedures for using DCFC charging stations.

## Project Costs

This project was completed for a total of \$63,411.28, funded by SCAQMD. The project was executed for less than the original anticipated cost of \$89,183.

## Commercialization and Applications

N/A

# **Appendix D**

## **Technology Status**



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## Technology Status

For each of the core technologies discussed earlier in this report, staff considers numerous factors that influence the proposed allocation of funds, ranging from overall Environment & Health Benefits, Technology Maturity and Compatibility, and Cost, summarized in this technology status evaluation system.

Within the broad factors included above, staff has included sub-factors for each specific type of project that may be considered, as summarized below:

### Environment and Health

Criteria Pollutant Emission Reduction potential continues to receive the highest priority for projects that facilitate the NO<sub>x</sub> reduction goals outlined in the 2016 AQMP. Technologies that provide co-benefits of Greenhouse Gas and Petroleum Reduction are also weighted favorably, considering the Clean Fuels Program is able to leverage funds available through several state and federal programs, as well as overall health benefits in reducing exposure to Ozone and PM<sub>2.5</sub>, especially along disadvantaged communities.

### Technology Maturity & Compatibility

Numerous approaches have been used to evaluate technology maturity and risk that include an evaluation of potential uncertainty in real world operations. This approach can include numerous weighting factors based on assessed importance of a particular technology. Some key metrics that can be considered include Infrastructure Constructability that would evaluate the potential of fuel or energy for the technology and readiness of associated infrastructure, Technology Readiness that includes not only the research and development of the technology, but potential larger scale deployments that consider near-term implementation duty and operational compatibility for the end users. These combined factors can provide an assessment for market readiness of the technology.

### Cost/Incentives

The long-term costs and performance of advanced technologies are highly uncertain, considering continued development of these technologies is likely to involve unforeseen changes in basic design and materials. Additionally, economic sustainability – or market driven – implementation of these technologies is another key factor for the technology research, development, demonstration and deployment projects. Therefore, in an effort to accelerate the demonstration and deployment, especially some pre-commercialization technologies, incentive programs such as those available from local, state and federal programs are key, but may be underfunded for larger scale deployments.

Staff has developed a simplified approach to evaluating the core technologies, especially some of the specific platforms and technologies discussed in the draft plan and annual report. The technology status below take into account experience with implementing the Clean Fuels Program for numerous years, as well as understanding the current development and deployment state of the technologies and associated infrastructure, and are based on the following “Consumer Reports” type approach:

● Excellent    ● Good    ○ Satisfactory    ● Poor    ● Unacceptable

The table below summarizes staff evaluation of the potential projects anticipated in the Plan Update, and it is noted that technology developers, suppliers and other experts may differ in their approach to ranking these projects. For example, staff ranks Electric/Hybrid Technologies and Infrastructure as Excellent or Good for Criteria Pollutant and GHG/Petroleum Reduction, but Poor to Good for Technology Maturity & Compatibility, and Satisfactory to Unacceptable for Costs and Incentives to

affect large scale deployment. It is further noted that the Clean Fuels Fund’s primary focus remains on-road vehicles and fuels, and funds for off-road and stationary sources are limited.

This approach has been reviewed with the Clean Fuels and Technology Advancement Advisory Groups, as well as the Governing Board.

Technologies & Proposed Solutions	Environment & Health			Technology Maturity & Compatibility				Cost	
	Emissions Reduction	GHG/Petroleum Reduction	Health Benefits	Infrastructure Constructability	Technology Readiness	Near-Term Implementation/ Duty Cycle Fulfillment Capability	Operations Compatibility	Relative Cost & Economic Sustainability	Incentives Available
<b>Electric/Hybrid Technologies &amp; Infrastructure</b>									
Plug-In Hybrid Heavy-Duty Trucks with Zero-Emission Range	●	○	●	●	○	●	●	●	●
Heavy-Duty Zero-Emission Trucks	●	●	●	●	○	●	○	●	●
Medium-Duty Trucks	●	●	●	●	○	○	●	●	●
Medium- and Heavy-Duty Buses	●	●	●	●	○	●	○	●	●
Light-Duty Vehicles	●	●	●	●	●	●	●	○	●
Infrastructure	-	-	-	●	●	●	●	○	●
<b>Hydrogen &amp; Fuel Cell Technologies &amp; Infrastructure</b>									
Heavy-Duty Trucks	●	●	●	○	●	●	●	●	●
Heavy-Duty Buses	●	●	●	○	●	●	●	●	●
Off-road – Locomotive/Marine	●	●	●	○	●	●	●	●	●
Light-Duty Vehicles	●	●	●	○	●	○	○	○	●
Infrastructure – Production, Dispensing, Certification	-	-	-	○	○	●	●	●	●
<b>Engine Systems</b>									
Ultra-Low emissions Heavy-Duty Engines	●	●	●	●	○	○	●	●	○
Alternative Fuel Medium- and Heavy-Duty Vehicles	●	●	●	●	●	●	●	●	○
Off-Road Applications	●	●	●	●	●	●	●	●	○
<b>Fueling Infrastructure &amp; Deployment</b>									
Production of Renewable Natural Gas – Biowaste/Feedstock	●	●	●	●	●	●	●	○	○
Synthesis Gas to Renewable Natural Gas	●	●	●	●	●	●	●	○	○
Expansion of Infrastructure/Stations/Equipment/RNG Transition	●	●	●	●	●	●	●	●	○
<b>Stationary Clean Fuel Technologies</b>									
Low-Emission Stationary & Control Technologies	●	●	●	●	○	○	●	○	○
Renewable Fuels for Stationary Technologies	○	●	●	●	○	○	○	○	○
Vehicle-to-Grid or Vehicle-to-Building/Storage	●	●	●	○	○	●	○	○	●
<b>Emission Control Technologies</b>									
Alternative/Renewable Liquid Fuels	●	●	●	●	○	○	●	●	○
Advanced Aftertreatment Technologies	●	○	●	○	○	●	●	●	○
Lower-Emitting Lubricant Technologies	○	○	●	-	●	●	●	●	○
● Excellent    ● Good    ○ Satisfactory    ● Poor    ● Unacceptable									

## **Appendix E**

### **List of Acronyms**

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**LIST OF ACRONYMS**

AB—Assembly Bill	CVAG—Coachella Valley Association of Governments
AC—absorption chiller	CWI—Cummins Westport, Inc.
ADA—American with Disabilities Act	CY—calendar year
AER—all-electric range	DC—direct connection
AFRC—air/fuel ratio control	DCFC—direct connection fast charger
AFVs—Alternative Fuel Vehicles	DCM—dichloromethane
APCD—Air Pollution Control District	DEG—diesel equivalent gallons
AQMD—Air Quality Management District	DGE—diesel gallon equivalents
AQMP—Air Quality Management Plan	DF—deterioration factor
ARB—Air Resources Board	DME—dimethyl ether
ARRA—American Recovery & Reinvestment Act	DMS—Division of Measurement Standards
AWMA—Air & Waste Management Association	DMV—Department of Motor Vehicles
BACT—Best Available Control Technology	DOC—diesel oxidation catalysts
BET—battery electric truck	DOE—Department of Energy
BEV—battery electric vehicle	DOT—Department of Transportation
BSNO <sub>x</sub> —brake specific NO <sub>x</sub>	DPF—diesel particulate filters
BMS—battery management system	DPT3—Local Drayage Port Truck (cycle) - where 3=local (whereas 2=near-dock, etc.)
CAAP—Clean Air Action Plan	DRC—Desert Resource Center
CAFR—Comprehensive Annual Financial Report	DRI—Desert Research Institute
CaFCP—California Fuel Cell Partnership	ECM—emission control monitoring
CARB—California Air Resources Board	EDD—electric drayage demonstration
CATI—Clean Air Technology Initiative	EDTA—Electric Drive Transportation Association
CBD—Central Business District (cycle) - a Dyno test cycle for buses	EGR—exhaust gas recirculation
CCF—California Clean Fuels	EIA—Energy Information Administration
CCHP—combined cooling, heat and power	EIN—Energy Independence Now
CCV—closed crankcase ventilation	EMFAC—Emission FACTors
CDA—cylinder deactivation	EPRI—Electric Power Research Institute
CDFA/DMS—California Department of Food & Agriculture/Division of Measurement Standards	E-rEV—extended-range electric vehicles
CEC—California Energy Commission	ESD—emergency shut down
CE-CERT—College of Engineering – Center for Environmental Research and Technology	ESS—energy storage system
CEMS—continuous emission monitoring system	EV—electric vehicle
CEQA—The California Environmental Quality Act	EVSE—electric vehicle supply equipment
CFCI—Clean Fuel Connection, Inc.	FCV—fuel cell vehicle
CFD—computational fluid dynamic	FTA—Federal Transit Administration
CHBC—California Hydrogen Business Council	FTP—federal test procedures
CHE—cargo handling equipment	g/bhp-hr—grams per brake horsepower per hour
CNG—compressed natural gas	GC/MS—gas chromatography/mass spectrometry
CNGVP—California Natural Gas Vehicle Partnership	GCW—gross combination weight
CO <sub>2</sub> —carbon dioxide	GCVW—gross container vehicle weight
CO—carbon monoxide	GDI—gasoline direct injection
ComZEV—Commercial Zero-Emission Vehicle	GGE—gasoline gallon equivalents
CPA—Certified Public Accountant	GGRF—Greenhouse Gas Reduction Relief Fund
CPUC—California Public Utilities Commission	GHG—Greenhouse Gas
CRDS—cavity ring-down spectroscopy	GNA—Gladstein, Neandross & Associates, LLC
CRT—continuously regenerating technology	GTL—gas to liquid
	GVWR—gross vehicle weight rating
	H&SC—California Health and Safety Code

## LIST OF ACRONYMS (cont'd)

HCCI—Homogeneous Charge Combustion Ignition	NAFA—National Association of Fleet Administrators
HCNG—hydrogen-compressed natural gas (blend)	NFPA—National Fire Protection Association
HDDT—highway dynamometer driving schedule	NCP—nonconformance penalty
HD-FTP—Heavy-Duty Federal Test Procedure	NEV—neighborhood electric vehicles
HD-OBD—heavy-duty on-board diagnostics	NextSTEPS—Next Sustainable Transportation Energy Pathways
HPLC—high-performance liquid chromatography	NG/NGV—natural gas/natural gas vehicle
HT—high throughput	NH <sub>3</sub> —ammonia
HTFCs—high-temperature fuel cells	NHTSA—National Highway Traffic Safety Administration
H2NIP—Hydrogen Network Investment Plan	NMHC—non-methane hydrocarbon
HTPH—high throughput pretreatment and enzymatic hydrolysis	NO—nitrogen monoxide
HyPPO—Hydrogen Progress, Priorities and Opportunities report	NO <sub>2</sub> —nitrogen dioxide
Hz—Hertz	NO + NO <sub>2</sub> —nitrous oxide
ICE—internal combustion engine	NOPA—Notice of Proposed Award
ICEV—internal combustion engine vehicle	NO <sub>x</sub> —oxides of nitrogen
ICU—inverter-charger unit	NRC—National Research Council
ICTC—Interstate Clean Transportation Corridor	NREL—National Renewables Energy Laboratory
IVOC—intermediate volatility organic compound	NSPS—New Source Performance Standard
kg—kilogram	NSR—New Source Review
LACMTA—Los Angeles County Metropolitan Transit Authority	NZ—near zero
LADOT—City of Los Angeles Dept. of Transportation	OBD—On-Board Diagnostics
LADWP—Los Angeles Department of Water and Power	OCS—overhead catenary system
LCFS—Low Carbon Fuel Standard	OCTA—Orange County Transit Authority
Li—lithium ion	OEHHA—Office of Environmental Health Hazard Assessment
LIMS—Laboratory Information Management System	OEM—original equipment manufacturer
LLNL—Lawrence Livermore National Laboratory	One-off—industry term for prototype or concept vehicle
LNG—liquefied natural gas	PAH—polyaromatic hydrocarbons
LPG—liquefied petroleum gas or propane	PbA—lead acid
LSM—linear synchronous motor	PCM—powertrain control module
LSV—low-speed vehicle	PEMFC—proton exchange membrane fuel cell
LUV—local-use vehicle	PEMS—portable emissions measurement system
LVP—low vapor pressure	PEV—plug-in electric vehicle
MATES—Multiple Air Toxics Exposure Study	PHET—plug-in hybrid electric truck
MECA—Manufacturers of Emission Controls Association	PHEV—plug-in hybrid vehicle
MOA—Memorandum of Agreement	PM—particulate matter
MPa—MegaPascal	PM <sub>2.5</sub> —particulate matter ≤ 2.5 microns
MPFI—Multi-Port Fuel Injection	PM <sub>10</sub> —particulate matter ≤ 10 microns
MPG—miles per gallon	POS—point of sale
MPGde—miles per gallon diesel equivalent	ppm—parts per million
MSRC—Mobile Source Air Pollution Reduction Review Committee	ppb—parts per billion
MSW—municipal solid wastes	PSI—Power Solutions International
MY—model year	PTR-MS—proton transfer reaction-mass spectrometry
MTA—Metropolitan Transportation Authority (Los Angeles County “Metro”)	RD&D—research, development and demonstration
NAAQS—National Ambient Air Quality Standards	RDD&D (or RD3)—research, development, demonstration and deployment
	RFP—Request for Proposal
	RFS—renewable fuel standards

**LIST OF ACRONYMS (cont'd)**

RI—reactive intermediates	V2B—vehicle-to-building
RNG—renewable natural gas	V2G—vehicle-to-grid
RTP/SCS—Regional Transportation Plan/Sustainable Communities Strategy	V2G/B—vehicle-to-building functionality
SAE—Society of Automotive Engineers	VMT—vehicle miles traveled
SB—Senate Bill	VOC—volatile organic compounds
SCAB—South Coast Air Basin or “Basin”	VPP—virtual power plant
SCAQMD—South Coast Air Quality Management District	WVU—West Virginia University
SCFM—standard cubic feet per minute	ZECT—Zero Emission Cargo Transport
SCE—Southern California Edison	ZEV—zero emissions vehicle
SCR—selective catalytic reduction	
SHR—Steam Hydrogasification Reaction	
SI—spark ignited	
SI-EGR—spark-ignited, stoichiometric, cooled exhaust gas recirculation	
SIP—State Implementation Plan	
SJVAPCD—San Joaquin Valley Air Pollution Control District	
SOAs—secondary organic aerosols	
SoCalGas—Southern California Gas Company (A Sempra Energy Utility)	
SULEV—super ultra-low emission vehicle	
SUV—Sports Utility Vehicle	
TAO—Technology Advancement Office	
TAP—(Ports’) Technology Advancement Program	
TC—total carbon	
TEMS—transportable emissions measurement system	
THC—total hydrocarbons	
TO—task order	
tpd—tons per day	
TRB—Transportation Research Board	
TRL—technology readiness level	
TSI—Three Squares, Inc.	
TTSI—Total Transportation Services, Inc.	
TWC—three-way catalyst	
UCR—University of California Riverside	
UCR/CE-CERT—UCR/College of Engineering/Center for Environmental Research & Technology	
UCLA—University of California Los Angeles	
UDDS—urban dynamometer driving schedule	
µg/m <sup>3</sup> —microgram per cubic meter	
ULEV—ultra low emission vehicle	
UPS—United Postal Service	
U.S.—United States	
U.S.EPA—United States Environmental Protection Agency	





# South Coast Air Quality Management District

21865 Copley Drive, Diamond Bar, CA 91765-4178  
(909) 396-2000 • www.aqmd.gov

BOARD MEETING DATE: March 1, 2019

AGENDA NO. 33

PROPOSAL: Approve Annual RECLAIM Audit Report for 2017 Compliance Year

SYNOPSIS: The annual report on the NO<sub>x</sub> and SO<sub>x</sub> RECLAIM program is prepared in accordance with Rule 2015 - Backstop Provisions. The report assesses emission reductions, availability of RECLAIM Trading Credits (RTCs) and their average annual prices, job impacts, compliance issues, and other measures of performance for the twenty-fourth year of this program. In addition, recent trends in trading future year RTCs are analyzed and presented in this report. Further, a list of facilities that did not reconcile their emissions for the 2017 Compliance Year is included with the report. This action is to approve the Annual RECLAIM Audit Report for 2017.

COMMITTEE: Stationary Source, February 15, 2019, Reviewed

RECOMMENDED ACTION:

Approve the Annual RECLAIM Audit Report for 2017 Compliance Year.

Wayne Natri  
Executive Officer

LT:DL

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## Background

The Board adopted the RECLAIM program on October 15, 1993 to provide a more flexible compliance program than command-and-control for specific facilities which represent SCAQMD's largest emitters of NO<sub>x</sub> and SO<sub>x</sub>. Although RECLAIM was developed as an alternative to command-and-control, it was designed to meet all state and federal Clean Air Act and other air quality regulations and program requirements, as well as a variety of performance criteria in order to ensure public health protection, air quality improvement, effective enforcement, and the same or lower implementation costs and job impacts. RECLAIM is what is commonly referred to as a "cap and trade" program. Facilities subject to the program were initially allocated declining annual balances of RECLAIM Trading Credits (RTCs, denominated in pounds of emissions in a specified year) based upon their historical production levels and upon emissions factors established in the RECLAIM regulation. RECLAIM facilities are required to

reconcile their emissions with their RTC holdings on a quarterly and annual basis (*i.e.*, hold RTCs equal to or greater than their emissions). These facilities have the flexibility to manage how they meet their emission goals by installing emission controls, making process changes or trading RTCs amongst themselves. RECLAIM achieves its overall emission reduction goals provided aggregate RECLAIM emissions are no more than aggregate allocations.

RECLAIM Rule 2015 - Backstop Provisions requires, staff conduct annual program audits to assess various aspects of the program and to verify that program objectives are met. Staff has completed audits of facility records and completed the annual audit of the RECLAIM program for Compliance Year 2017 (which encompasses the time period for Cycle 1 from January 1, 2017 to December 31, 2017 and for Cycle 2 from July 1, 2017 to June 30, 2018). Based on audited emissions in this report and previous annual reports, staff has determined that RECLAIM met its emissions goals for Compliance Year 2017, as well as for all previous compliance years with the only exception of NOx emissions in Compliance Year 2000. For that year, NOx emissions exceeded programmatic allocations (by 11%) primarily due to emissions from electric generating facilities during the California energy crisis. For Compliance Year 2017, audited NOx emissions were 19% less than programmatic NOx allocations and audited SOx emissions were 17% less than programmatic SOx allocations.

### **Audit Findings**

The audit of the RECLAIM Program's Compliance Year 2017 and trades of RTCs that occurred during calendar year 2018 show:

- **Overall Compliance** – Audited NOx and SOx emissions from RECLAIM facilities were significantly below programmatic allocations.
- **Universe** – The RECLAIM universe consisted of 262 facilities as of June 30, 2017. No new facilities were included, no facilities were excluded, and four facilities in the RECLAIM universe shut down during Compliance Year 2017. Thus, 258 facilities were in the RECLAIM universe on June 30, 2018, the end of Compliance Year 2017.

Of the four facilities that shut down, one facility ceased operations, consolidating its operations with a plant outside of the region. The second facility ceased operations citing that their power purchase contract was not renewed, and as a result, it was closed and decommissioned. The third facility shut down, claiming changing market conditions with decreased demand for its product. The fourth facility attributed RECLAIM as part of the causes for its shutdown and claimed that its small size could not guarantee compliance with the recordkeeping, reporting, and audit requirements of the RECLAIM program, which they characterized as extreme. All four facilities permanently ceasing operations were in NOx RECLAIM.

- Facility Compliance** – The vast majority of RECLAIM facilities complied with their allocations during the 2017 compliance year (95% of NO<sub>x</sub> facilities and 90% of SO<sub>x</sub> facilities). Fifteen facilities (slightly over five percent of total facilities) exceeded their allocations (12 facilities exceeded their NO<sub>x</sub> allocations, and three facilities exceeded their NO<sub>x</sub> and SO<sub>x</sub> allocations) during Compliance Year 2017. The 15 facilities that exceeded their NO<sub>x</sub> allocations had total NO<sub>x</sub> emissions of 565.3 tons and did not have adequate allocations to offset 164.0 of those tons. The exceedances represent 1.83% of total RECLAIM NO<sub>x</sub> universe allocations and 29.0% of total NO<sub>x</sub> emissions from the 15 facilities. The three SO<sub>x</sub> facilities that exceeded their SO<sub>x</sub> allocation had total SO<sub>x</sub> emissions of 450.7 tons and did not have adequate allocations to offset 133.5 tons. This exceedance represents 5.40% of total RECLAIM SO<sub>x</sub> universe allocations and 29.6% of total SO<sub>x</sub> emissions from these facilities. Pursuant to Rule 2010(b)(1)(A), all 15 facilities had their respective exceedances deducted from their annual allocations for the compliance year subsequent to SCAQMD’s determination that the facilities exceeded their Compliance Year 2017 allocations.
- Job Impacts** – Based on a survey of the RECLAIM facilities, the RECLAIM program had minimal impact on employment during the 2017 compliance year, which is consistent with previous years. RECLAIM facilities reported an overall net loss of 276 jobs, representing 0.26% of their total employment. One of the four RECLAIM facilities that shut down during Compliance Year 2017 cited RECLAIM as a contributing factor to the decision to shut down. This shutdown facility reported a loss of 52 jobs. The job loss and job gain data are compiled strictly from reports submitted by RECLAIM facilities, and staff is not able to verify the accuracy of the reported job impacts data.
- Trading Activity** – The RTC trading market activity during calendar year 2018 was lower in terms of number of trades (by 8.5%), lower in volume for discrete-year (32%) and IYB (6.9%) RTCs excluding swaps, and significantly lower with respect to total value (by 43%) when compared to calendar year 2017. A total of over \$1.48 billion in RTCs has been traded since the adoption of RECLAIM, of which \$3.94 million occurred in calendar year 2018 (compared to \$6.86 million in calendar year 2017), excluding swaps.

The annual average prices of discrete-year NO<sub>x</sub> and SO<sub>x</sub> RTCs for Compliance Years 2017, 2018, and 2019 and infinite-year block (IYB) NO<sub>x</sub> and SO<sub>x</sub> RTCs traded in calendar year 2018 were below the applicable review thresholds for average RTC prices. The annual average prices of RTCs traded during calendar years 2017 and 2018 are summarized and compared to the applicable thresholds in Tables 1 and 2:

**Table 1 – Average Prices for Discrete-Year RTCs Traded during Calendar Years 2017 and 2018**

Year Traded	Average Price (\$/ton)				Review Thresholds (\$/ton)	
	2016 NOx RTC	2017 NOx RTC	2018 NOx RTC	2019 NOx RTC	Rule 2015 (b)(6)	Health and Safety Code §39616(f)
2017	\$2,203	\$4,182	\$10,639	None traded	\$15,000	\$45,734
2018		\$1,872	\$3,788	\$5,646		
Year Traded	2016 SOx RTC	2017 SOx RTC	2018 SOx RTC	2019 SOx RTC	Rule 2015 (b)(6)	Health and Safety Code §39616(f)
2017	\$636	\$1,386	None traded	\$4,800	\$15,000	\$32,929
2018		\$786	\$955	None traded		

**Table 2 – Average Prices for IYB RTCs Traded during Calendar Years 2017 and 2018**

RTCs	Average Price (\$/ton)		Review Threshold (\$/ton) [Health and Safety Code §39616(f)]
	Traded in 2017	Traded in 2018	
NOx	\$39,673	\$13,223	\$686,014
SOx	\$22,820	\$30,000	\$493,930

- Role of Investors** – Investors were active in the RTC market. Based on both overall trading values and volume of NOx trades with price, investors’ involvement in 2018 was comparable to calendar year 2017. However, with respect to value and volume of SOx trades with price, investors’ involvement decreased. Investors were involved in 114 of the 186 discrete NOx trades with price, and 11 of the 17 discrete SOx trades with price. With respect to IYB trades, investors’ participation was notable with investors involved with three of the five IYB NOx trades with price, and one of two IYB SOx trades with price. Compared to calendar year 2017, investor holdings of total IYB NOx RTCs increased from 3.3% to 3.8%, and decreased from 6.0% to 4.7% for IYB SOx RTCs at the end of calendar year 2018. Investors purchase RTCs, but are not RECLAIM facilities or brokers. (Brokers typically do not purchase RTCs, but facilitate trades.)
- Other Findings** – RECLAIM also met other applicable requirements including meeting the applicable federal offset ratio under New Source Review and having no significant seasonal fluctuation in emissions. Additionally, there is no evidence that RECLAIM resulted in any increase in health impacts due to emissions of air toxics. RECLAIM facilities and non-RECLAIM facilities are subject to the same requirements for controlling air toxic emissions.

**Attachments**

1. Annual RECLAIM Audit Report for 2017 Compliance Year
2. Board Meeting Presentation

## ATTACHMENT 1

# SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

## Annual RECLAIM Audit Report for 2017 Compliance Year

**March 1, 2019**

**Executive Officer**

Wayne Nastri

**Deputy Executive Officer**

**Engineering & Permitting**

Laki Tisopulos, Ph.D., P.E.

**Assistant Deputy Executive Officer**

**Engineering & Permitting**

Amir Dejbakhsh

**Senior Air Quality Engineering Manager**

**RECLAIM Administration, Refinery Permitting**

Danny Luong, P.E.

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William Wong, Principal Deputy District Counsel

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**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT**

**GOVERNING BOARD**

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Speaker of the Assembly  
Appointee

Vice Chairman: Dr. Clark E. Parker Sr.  
Senate Rules Committee  
Appointee

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Supervisor, Fifth District  
County of Orange

Ben Benoit  
Council Member, Wildomar  
Cities of Riverside County

Joe Buscaino  
Council Member, Fifteenth District  
City of Los Angeles Representative

Michael A. Cacciotti  
Council Member, South Pasadena  
Cities of Los Angeles County/Eastern Region

Janice Hahn  
Supervisor, Fourth District  
County of Los Angeles

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Governor's Appointee

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Mayor Pro Tem, Highland  
Cities of San Bernardino County

Judith Mitchell  
Mayor, Rolling Hills Estates  
Cities of Los Angeles County/Western Region

V. Manuel Perez  
Supervisor, Fourth District  
County of Riverside

Dwight Robinson  
Council Member, Lake Forest  
Cities of Orange County

Janice Rutherford  
Supervisor, Second District  
County of San Bernardino

**EXECUTIVE OFFICER**

Wayne Nastri

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## LIST OF ABBREVIATIONS

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AAQS	Ambient Air Quality Standards
ACEMS	Alternative Continuous Emissions Monitoring System(s)
AER	Annual Emission Report
APEP	Annual Permit Emissions Program
AQMP	Air Quality Management Plan
BACT	Best Available Control Technology
BARCT	Best Available Retrofit Control Technology
CAA	Clean Air Act
CARB	California Air Resources Board
CCAA	California Clean Air Act
CEMS	Continuous Emissions Monitoring System(s)
CEQA	California Environmental Quality Act
CGA	Cylinder Gas Audit
CPMS	Continuous Process Monitoring System(s)
EDR	Electronic Data Reporting
ERC	Emission Reduction Credit
GHG	Greenhouse Gas
IYB RTC	Infinite-Year Block RECLAIM Trading Credit
LAER	Lowest Achievable Emission Rate
LAP	Laboratory Approval Program
MDP	Missing Data Procedures
MRR	Monitoring, Reporting and Recordkeeping
MSERC	Mobile Source Emission Reduction Credit
NAAQS	National Ambient Air Quality Standards
NNI	No Net Increase
NOx	Oxides of Nitrogen
NSR	New Source Review
ODC	Ozone Depleting Compound
OEHHA	Office of Environmental Health Hazard Assessment
QCER	Quarterly Certification of Emissions Report
RACT	Reasonably Available Control Technology
RATA	Relative Accuracy Test Audit
RECLAIM	REgional CLean Air Incentives Market
RTC	RECLAIM Trading Credit
RTU	Remote Terminal Unit
SCAQMD	South Coast Air Quality Management District
SIP	State Implementation Plan
SOx	Oxides of Sulfur
TAC	Toxic Air Contaminant
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound
WATERS	Web Access To Electronic Reporting System

## EXECUTIVE SUMMARY

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### Introduction

The South Coast Air Quality Management District (SCAQMD) Governing Board adopted the REgional CLean Air Incentives Market (RECLAIM) program on October 15, 1993. The RECLAIM program represented a significant departure from traditional command-and-control regulations. RECLAIM's objective is to provide facilities with added flexibility in meeting emissions reduction requirements while lowering the cost of compliance. This is accomplished by establishing facility-specific emissions reduction targets without being prescriptive regarding the method of attaining compliance with the targets. Each facility may determine for itself the most cost-effective approach to reducing emissions, including reducing emissions at their facility, and/or purchasing RECLAIM Trading Credits (RTCs) from other RECLAIM facilities, or from other RTC holders.

Rule 2015 - Backstop Provisions includes provisions for annual program audits focusing on specific topics, as well as a one-time comprehensive audit of the program's first three years, to ensure that RECLAIM is meeting all state and federal requirements and other performance criteria. Rule 2015 also provides backstop measures if the specific criteria are not met. This report constitutes the Rule 2015 annual program audit report for Compliance Year 2017 (January 1 through December 31, 2017 for Cycle 1 and July 1, 2017 through June 30, 2018 for Cycle 2 facilities). This annual audit report covers activities for the twenty-fourth year of the program.

### Chapter 1: RECLAIM Universe

When RECLAIM was adopted in October 1993, a total of 394 facilities were identified as the initial "universe" of sources subject to the requirements of RECLAIM. From program adoption through June 30, 2017, the overall changes in RECLAIM participants were 134 facilities included into the program, 71 facilities excluded from the program, and 195 facilities ceased operation. Thus, the RECLAIM universe consisted of 262 active facilities at the end of Compliance Year 2016 (December 31, 2016 for Cycle 1 facilities and June 30, 2017 for Cycle 2 facilities). During Compliance Year 2017 (January 1, 2017 through December 31, 2017 for Cycle 1 facilities and July 1, 2017 through June 30, 2018 for Cycle 2 facilities), no facilities were included into the RECLAIM universe, no facilities were excluded, and four facilities (all in the NOx universe) shut down and are no longer in the active RECLAIM universe. These changes resulted in a net decrease of four facilities in the universe, bringing the total number of active RECLAIM facilities to 258 as of the end of Compliance Year 2017.

### Chapter 2: RTC Allocations and Trading

On November 5, 2010, the Governing Board adopted amendments to SOx RECLAIM to phase in SOx reductions beginning in Compliance Year 2013 and full implementation in Compliance Year 2019 and beyond. The amendments will result in an overall reduction of 48.4% (or 5.7 tons/day) in SOx allocations when fully implemented (Compliance Year 2019 and beyond). For Compliance Year

2017, the fifth year of implementation, the SOx allocation supply was reduced by 43% (or 5.0 tons/day) to 2,474 tons. On December 4, 2015, the Governing Board adopted amendments to NOx RECLAIM to phase in additional NOx reductions which began in Compliance Year 2016 and continue through Compliance Year 2022. The amendment will result in an overall NOx reduction of 45% (or 12 tons/day) when fully implemented for Compliance Year 2022 and beyond. For Compliance Year 2017, the second year of implementation, the NOx allocation supply was reduced by 7.4 % (or 2 tons/day).

The overall NOx RTC supply increased by 11.0 tons and the SOx RTC supply increased by 0.1 tons during Compliance Year 2017. These changes were due to allocation adjustments for clean fuel production pursuant to Rule 2002(c)(12).

Since the inception of the RECLAIM program in 1994, a total value of over \$1.48 billion dollars has been traded in the RTC trading market, excluding swap trades. During calendar year 2018, there were 280 RTC trade registrations with a total value of \$3.94 million traded, excluding the values reported for swap trades. RTC trades are reported to SCAQMD as either discrete-year RTC trades or infinite-year block (IYB) trades (trades that involve blocks of RTCs with a specified start year and continuing into perpetuity). In terms of volume traded in calendar year 2018, a total of 1,982 tons of discrete-year NOx RTCs, 517 tons of discrete-year SOx RTCs, 208 tons of IYB NOx RTCs and 26 tons of IYB SOx RTCs were traded excluding swap trades. The RTC trading market activity decreased during calendar year 2018 compared to calendar year 2017, in terms of number of trades (by 8.5%), in volume for discrete-year (by 32%) and for IYB RTCs excluding swaps (by 7%), and in total value excluding swaps (by 43%).

Discrete-year RTC trades with price (i.e. price >\$0.00) registered during calendar year 2018 include trades for Compliance Years 2017, 2018, 2019, and 2020 NOx RTCs, and Compliance Years 2017 and 2018 SOx RTCs, excluding swap trades. The annual average prices of discrete-year NOx RTCs traded during calendar year 2018 were \$1,872, \$3,788, \$5,646, and \$5,674 per ton for Compliance Years 2017, 2018, 2019, and 2020 RTCs, respectively. The annual average prices for discrete-year SOx RTCs traded during the same period were \$786, and \$955 per ton for Compliance Years 2017 and 2018 RTCs, respectively.

Prices for discrete-year NOx and SOx RTCs for all compliance years are still well below the \$45,734 per ton of NOx and \$32,929 per ton of SOx discrete-year RTCs pre-determined overall program review thresholds established by the Governing Board pursuant to Health and Safety Code §39616(f), as well as the \$15,000 per ton threshold pursuant to Rule 2015(b)(6).

The annual average price during calendar year 2018 for IYB NOx RTCs was \$13,223 per ton and the annual average price for IYB SOx RTCs was \$30,000 per ton. Therefore, annual average IYB RTC prices did not exceed the \$686,014 per ton of IYB NOx RTCs or the \$493,930 per ton of IYB SOx RTCs pre-determined overall program review thresholds established by the Governing Board pursuant to Health and Safety Code §39616(f).

Investors were again active in the RTC market during calendar year 2018. They were involved in 114 of the 186 discrete-year NOx trade registrations and 11 of the 17 discrete-year SOx trade registrations with price. Investors were also involved in three of the five IYB NOx and one of the two IYB SOx trades with price. Investors were involved in 64% of total value and 55% of total volume for

discrete-year NOx trades, and 61% of the total value and 60% of the total volume for discrete-year SOx trades. At the end of calendar year 2018, investors' holdings of IYB NOx RTCs were slightly higher at 3.8% of total NOx RECLAIM RTCs, while investors' holdings of IYB SOx RTCs were lower at 4.7% of the total SOx RECLAIM RTCs, compared to that of calendar year 2017.

### **Chapter 3: Emission Reductions Achieved**

For Compliance Year 2017, aggregate NOx emissions were below total allocations by 19% and aggregate SOx emissions were below total allocations by 17%. No emissions associated with breakdowns were excluded from reconciliation with facility allocations in Compliance Year 2017. Accordingly, no mitigation is necessary to offset excluded emissions due to approved Breakdown Emission Reports. Therefore, based on audited emissions, RECLAIM achieved its targeted emission reductions for Compliance Year 2017. With respect to the Rule 2015 backstop provisions, Compliance Year 2017 aggregate NOx and SOx emissions were both well below aggregate allocations and, as such, did not trigger the requirement to review the RECLAIM program.

### **Chapter 4: New Source Review Activity**

The annual program audit assesses New Source Review (NSR) activity from RECLAIM facilities in order to ensure that RECLAIM is complying with federal NSR requirements and state no net increase (NNI) in emissions requirements while providing flexibility to facilities in managing their operations and allowing new sources into the program. In Compliance Year 2017, a total of five NOx RECLAIM facilities had NSR NOx emission increases, and no SOx RECLAIM facilities had an NSR SOx emission increase due to expansion or modification. Consistent with all prior compliance years, there were sufficient NOx and SOx RTCs available to allow for expansion, modification, and modernization by RECLAIM facilities.

RECLAIM is required to comply with federal NSR emissions offset requirements at a 1.2-to-1 offset ratio programmatically for NOx emission increases and a 1-to-1 offset ratio for SOx emission increases on a programmatic basis. In Compliance Year 2017, RECLAIM demonstrated federal equivalency with a programmatic NOx offset ratio of 864-to-1 based on the compliance year's total unused allocations and total NSR emission increases for NOx. There were no SOx emission increases during the compliance year. RECLAIM inherently complies with the federally-required 1-to-1 SOx offset ratio for any compliance year, provided aggregate SOx emissions under RECLAIM are lower than or equal to aggregate SOx allocations for that compliance year. As shown in Chapter 3, there was no programmatic SOx exceedance during Compliance Year 2017. In fact, there was a surplus of SOx RTCs. Therefore, RECLAIM more than complied with the federally-required SOx offset ratio and further quantification of the SOx offset ratio is unnecessary. Also, the NNI is satisfied by the program's 1-to-1 offset ratio. In addition, RECLAIM requires application of, at a minimum, California Best Available Control Technology (BACT), which is at least as stringent as federal Lowest Achievable Emission Rate (LAER) for major sources. The same BACT guidelines are used to determine applicable BACT to RECLAIM and non-RECLAIM facilities.

## Chapter 5: Compliance

Based on SCAQMD Compliance Year 2017 audit results, 266 of the 281 (95%) NO<sub>x</sub> RECLAIM facilities complied with their NO<sub>x</sub> allocations, and 28 of the 31 SO<sub>x</sub> facilities (90%) complied with their SO<sub>x</sub> allocations based on SCAQMD audit results. All three SO<sub>x</sub> facilities that exceeded their SO<sub>x</sub> allocations also exceeded their NO<sub>x</sub> allocations. So, fifteen facilities exceeded their allocations (12 facilities exceeded their NO<sub>x</sub> allocations, and three facilities exceeded their NO<sub>x</sub> and SO<sub>x</sub> allocations). The 15 facilities that exceeded their NO<sub>x</sub> allocations had aggregate NO<sub>x</sub> emissions of 565.3 tons and did not have adequate allocations to offset 164.0 tons (or 29.0%) of their combined emissions. The three facilities that exceeded their SO<sub>x</sub> allocations had total SO<sub>x</sub> emissions of 450.7 tons and did not have adequate allocations to offset 133.5 tons (or 29.6%). The NO<sub>x</sub> and SO<sub>x</sub> exceedance amounts are relatively small compared to the overall NO<sub>x</sub> and SO<sub>x</sub> allocations for Compliance Year 2017 (1.83% of total NO<sub>x</sub> allocations and 5.40% of total SO<sub>x</sub> allocations). The exceedances from these facilities did not impact the overall RECLAIM emission reduction goals. The overall RECLAIM NO<sub>x</sub> and SO<sub>x</sub> emission reduction targets and goals were met for Compliance Year 2017 (*i.e.*, aggregate emissions for all RECLAIM facilities were well below aggregate allocations). Pursuant to Rule 2010(b)(1)(A), these facilities had their respective exceedances deducted from their annual allocations for the compliance year subsequent to the date of SCAQMD's determination that the facilities exceeded their Compliance Year 2017 allocations.

## Chapter 6: Reported Job Impacts

This chapter compiles data as reported by RECLAIM facilities in their Annual Permit Emissions Program (APEP) reports. The analysis focuses exclusively on job impacts at RECLAIM facilities and determination if those job impacts were directly attributable to RECLAIM as reported by those facilities. Additional benefits to the local economy (*e.g.*, generating jobs for consulting firms, source testing firms and CEMS vendors) attributable to the RECLAIM program, as well as factors outside of RECLAIM (*e.g.*, the prevailing economic climate), impact the job market. However, these factors are not evaluated in this report. Also, job losses and job gains are strictly based on RECLAIM facilities' reported information. SCAQMD staff is not able to independently verify the accuracy of the reported job impact information.

According to the Compliance Year 2017 employment survey data gathered from APEP reports, RECLAIM facilities reported a net loss of 276 jobs, representing 0.26% of their total employment. One of the four RECLAIM facilities that shut down or ceased operations during Compliance Year 2017 cited RECLAIM as a factor contributing to the decision to shut down. No other facility reported job losses due to RECLAIM, during Compliance Year 2017.

## Chapter 7: Air Quality and Public Health Impacts

Audited RECLAIM emissions have been in an overall downward trend since the program's inception. Compliance Year 2017 NO<sub>x</sub> emissions decreased slightly (1.1%) relative to Compliance Year 2016, and Compliance Year 2017 SO<sub>x</sub> emissions were 0.9% greater than the previous year. Quarterly calendar year 2017 NO<sub>x</sub> emissions fluctuated within seven percent of the mean NO<sub>x</sub> emissions for the year. Quarterly calendar year 2017 SO<sub>x</sub> emissions fluctuated within nine

percent of the year's mean SOx emissions. There was no significant shift in seasonal emissions from the winter season to the summer season for either pollutant.

The California Clean Air Act (CCAA) required a 50% reduction in population exposure to ozone, relative to a baseline averaged over three years (1986 through 1988), by December 31, 2000. The Basin achieved the December 2000 target for ozone well before the deadline. In calendar year 2018, the per capita exposure to ozone (the average length of time each person is exposed) continued to be well below the target set for December 2000.

Air toxic health risk is primarily caused by emissions of certain volatile organic compounds (VOCs) and fine particulates, such as metals. RECLAIM facilities are subject to the same air toxic, VOC, and particulate matter regulations as other sources in the Basin. All sources are subject, where applicable, to the NSR rule for toxics (Rule 1401 and/or Rule 1401.1). In addition, new or modified sources with NOx or SOx emission increases are required to be equipped with BACT, which minimizes to the extent feasible the increase of NOx and SOx emissions. RECLAIM and non-RECLAIM facilities that emit toxic air contaminants are required to report those emissions to SCAQMD. Those emissions reports are used to identify candidates for the Toxics Hot Spots program (AB2588). This program requires emission inventories and, depending on the type and amount of emissions, facilities may be required to do public notice and/or prepare and implement a plan to reduce emissions. There is no evidence that RECLAIM has caused or allowed higher toxic risk in areas adjacent to RECLAIM facilities, than would occur under command-and-control, because RECLAIM facilities must comply with the same toxics rules as non-RECLAIM facilities.

## INTRODUCTION

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The South Coast Air Quality Management District (SCAQMD) REgional CLean Air Incentives Market (RECLAIM) program was adopted in October 1993 and replaced certain command-and-control rules regarding oxides of nitrogen (NO<sub>x</sub>) and oxides of sulfur (SO<sub>x</sub>) with a new market incentives program for facilities that meet the inclusion criteria. The goals of RECLAIM are to provide facilities with added flexibility in meeting emissions reduction requirements while lowering the cost of compliance. The RECLAIM program was designed to meet all state and federal Clean Air Act (CAA) and other air quality regulations and program requirements, as well as various other performance criteria, such as equivalent or better air quality improvement, enforcement, implementation costs, job impacts, and no adverse public health impacts.

Since RECLAIM represents a significant change from traditional command-and-control regulations, RECLAIM rules include provisions for program audits in order to verify that the RECLAIM objectives are being met. The rules provide for a comprehensive audit of the first three years of program implementation and for annual program audits. The audit results are used to help determine whether any program modifications are appropriate. SCAQMD staff has completed the initial tri-annual program audit and each individual annual program audit report through the 2017 Compliance Year Audit.

This report presents the annual program audit and progress report of RECLAIM's twenty-third compliance year (January 1 through December 31, 2017 for Cycle 1 and July 1, 2017 through June 30, 2018 for Cycle 2 RECLAIM facilities), also known as Compliance Year 2017. As required by Rule 2015(b)(1) – Annual Audits, this audit assesses:

- Emission reductions;
- Per capita exposure to air pollution;
- Facilities permanently ceasing operation of all sources;
- Job impacts;
- Annual average price of each type of RECLAIM Trading Credit (RTC);
- Availability of RTCs;
- Toxic risk reductions;
- New Source Review permitting activity;
- Compliance issues, including a list of facilities that were unable to reconcile emissions for that compliance year;
- Emission trends/seasonal fluctuations;
- Emission control requirement impacts on stationary sources in the program compared to other stationary sources identified in the Air Quality Management Plan (AQMP); and
- Emissions associated with equipment breakdowns.

The annual program audit report is organized into the following chapters:



1. ***RECLAIM Universe***  
This chapter discusses summarizes changes to the universe of RECLAIM sources that occurred up until July 1, 2017 (covered under the Annual RECLAIM Audit Report for 2016 Compliance Year), then discusses changes to the RECLAIM universe of sources in detail through the end of Compliance Year 2017.
2. ***RTC Allocations and Trading***  
This chapter summarizes changes in emissions allocations in the RECLAIM universe, RTC supply and RTC trading activity, annual average prices, availability of RTCs, and market participants.
3. ***Emission Reductions Achieved***  
This chapter assesses emissions trends and progress towards emission reduction goals for RECLAIM sources, emissions associated with equipment breakdowns, and emissions control requirement impacts on RECLAIM sources compared to other stationary sources. It also discusses the latest amendments to the RECLAIM program.
4. ***New Source Review Activity***  
This chapter summarizes New Source Review (NSR) activities at RECLAIM facilities.
5. ***Compliance***  
This chapter discusses compliance activities and the compliance status of RECLAIM facilities. It also evaluates the effectiveness of SCAQMD's compliance program, as well as the monitoring, reporting, and recordkeeping (MRR) protocols for NO<sub>x</sub> and SO<sub>x</sub>.
6. ***Reported Job Impacts***  
This chapter addresses job impacts and facilities permanently ceasing operation of all emission sources.
7. ***Air Quality and Public Health Impacts***  
This chapter discusses air quality trends in the South Coast Air Basin, seasonal emission trends for RECLAIM sources, per capita exposure to air pollution, and the toxic impacts of RECLAIM sources.

## CHAPTER 1

### RECLAIM UNIVERSE

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#### Summary

*When RECLAIM was adopted in October 1993, a total of 394 facilities were identified as the initial “universe” of sources subject to the requirements of RECLAIM. From program adoption through June 30, 2017, the overall changes in RECLAIM participants were 134 facilities included into the program, 71 facilities excluded from the program, and 195 facilities ceased operation. Thus, the RECLAIM universe consisted of 262 active facilities at the end of Compliance Year 2016 (December 31, 2016 for Cycle 1 facilities and June 30, 2017 for Cycle 2 facilities). During Compliance Year 2017 (January 1, 2017 through December 31, 2017 for Cycle 1 facilities and July 1, 2017 through June 30, 2018 for Cycle 2 facilities), no facilities were included into the RECLAIM universe, no facilities were excluded, and four facilities (all in the NOx universe) shut down and are no longer in the active RECLAIM universe. These changes resulted in a net decrease of four facilities in the universe, bringing the total number of active RECLAIM facilities to 258 as of the end of Compliance Year 2017.*

#### Background

The RECLAIM program replaced the traditional “command-and-control” rules for a defined list of facilities participating in the program (the RECLAIM “universe”). The criteria for inclusion in the RECLAIM program are specified in Rule 2001 – Applicability. Facilities are generally subject to RECLAIM if they have NOx or SOx reported emissions greater than or equal to four tons per year in 1990 or any subsequent year. However, certain facilities are categorically excluded from RECLAIM. The categorically excluded facilities include dry cleaners; restaurants; police and fire fighting facilities; construction and operation of landfill gas control, landfill gas processing or landfill gas energy facilities; public transit facilities, potable water delivery operations; facilities that converted all sources to operate on electric power prior to October 1993; and facilities, other than electric generating facilities established on or after January 1, 2001, located in the Riverside County portions of the Mojave Desert Air Basin or the Salton Sea Air Basin.

Other categories of facilities are not automatically included but do have the option to enter the program. These categories include electric utilities (exemption only for the SOx program); equipment rental facilities; facilities possessing solely “various locations” permits; schools or universities; portions of facilities conducting research operations; ski resorts; prisons; hospitals; publicly-owned municipal waste-to-energy facilities; publically-owned sewage treatment facilities operating consistent with an approved regional growth plan; electrical power generating systems owned and operated by the Cities of Burbank, Glendale, or Pasadena or their successors; facilities on San Clemente Island; agricultural facilities; and electric generating facilities that are new on or after January 1, 2001 and located in the Riverside County portions of the Mojave Desert Air Basin or the Salton Sea Air Basin. An initial universe of 394 RECLAIM facilities was developed using the inclusion criteria initially adopted in the

RECLAIM program based on 1990, 1991 and 1992 facility reported emissions data.

A facility that is not in a category that is specifically excluded from the program may voluntarily join RECLAIM regardless of its emission level. Additionally, a facility may be required to enter the RECLAIM universe if:

- It increases its NO<sub>x</sub> and/or SO<sub>x</sub> emissions from permitted sources above the four ton per year threshold; or
- It ceases to be categorically excluded and its reported NO<sub>x</sub> and/or SO<sub>x</sub> emissions are greater than or equal to four tons per year; or
- It is determined by SCAQMD staff to meet the applicability requirements of RECLAIM, but was initially misclassified as not subject to RECLAIM.

At the time of joining RECLAIM, each RECLAIM facility is issued an annually declining allocation of emission credits (“RECLAIM Trading Credits” or “RTCs”) based on its historic production level (if the facility existed prior to January 1, 1993), external offsets it previously provided, and any Emission Reduction Credits (ERCs) generated at and held by the facility. Each RECLAIM facility’s RTC holdings constitute an annual emissions budget. RTCs may be bought or sold as the facility deems appropriate (see Chapter 2 – RTC Allocations and Trading).

Up until March 2017, staff has conducted a process of identifying facilities that are to be included in RECLAIM pursuant to Rule 2001(b) – Criteria for Inclusion in RECLAIM. As part of the adoption Resolution of the Final 2016 AQMP in March of 2017, staff was directed to modify Control Measure CMB-05 – Further NO<sub>x</sub> Reductions from RECLAIM Assessment to achieve an additional five tons per day NO<sub>x</sub> emission reductions as soon as feasible but no later than 2025, and to transition the RECLAIM program to a command-and-control regulatory structure requiring Best Available Retrofit Control Technology (BARCT) level controls as soon as practicable. Additionally, California State Assembly Bill (AB) 617, approved in July 2017, required an expedited schedule for implementing BARCT at cap-and-trade facilities, under which many RECLAIM facilities are also subject, and required that the implementation of BARCT be no later than December 31, 2023. On January 5, 2018, the Governing Board amended two rules, Rule 2001 – Applicability, and Rule 2002 – Allocations for Oxides of Nitrogen (NO<sub>x</sub>) and Oxides of Sulfur (SO<sub>x</sub>), to initiate the transition of the NO<sub>x</sub> and SO<sub>x</sub> RECLAIM program to a command-and-control regulatory structure as soon as practicable.

## Universe Changes

In the early years of the RECLAIM program, some facilities initially identified for inclusion were excluded upon determination that they did not meet the criteria for inclusion (*e.g.*, some facilities that had reported emissions from permitted sources above four tons in a year were determined to have over-reported their emissions and subsequently submitted corrected emissions reports reflecting emissions from permitted sources below four tons per year). Additionally, some facilities that were not part of the original universe were subsequently added to the program based on the original inclusion criteria mentioned above. On the

other hand, RECLAIM facilities that permanently go out of business are removed from the active emitting RECLAIM universe.

The overall changes to the RECLAIM universe from the date of adoption (October 15, 1993) through June 30, 2017 (the last day of Compliance Year 2016 for Cycle 2 facilities) were: the inclusion of 134 facilities (including 34 facilities created by partial change of operator of existing RECLAIM facilities), the exclusion of 71 facilities, and the shutdown of 195 facilities. Thus, the net change in the RECLAIM universe from October 15, 1993 through June 30, 2016 was a decrease of 132 facilities from 394 to 262 facilities. In Compliance Year 2017 (January 1, 2017 through December 31, 2017 for Cycle 1 facilities and July 1, 2017 through June 30, 2018 for Cycle 2 facilities), no facilities were included, no facilities were excluded, and four facilities shut down. These changes brought the total number of facilities in the RECLAIM universe to 258 facilities. The Compliance Year 2017 RECLAIM universe includes 228 NO<sub>x</sub>-only, no SO<sub>x</sub>-only, and 30 both NO<sub>x</sub> and SO<sub>x</sub> RECLAIM facilities. The list of active facilities in the RECLAIM universe as of the end of Compliance Year 2017 is provided in Appendix A.

### **Facility Inclusions and Exclusions**

As further discussed in Chapter 3 of this report, amended Rule 2001 commenced the initial steps of this transition by ceasing any future inclusions of facilities as of January 5, 2018 into NO<sub>x</sub> and SO<sub>x</sub> RECLAIM, whereas amended Rule 2002 established notification procedures for RECLAIM facilities for their transition out of the program and addressed the RTC holdings for facilities that will be transitioned from RECLAIM. Staff identified an initial group of 38 facilities that were potentially qualified to exit the NO<sub>x</sub> RECLAIM program. However, they were not issued final determinations pending resolution of New Source Review provisions for facilities that have been transitioned out of RECLAIM (see further discussion in Chapter 3). During Compliance Year 2017 there were no facility inclusions or exclusions.

### **Facilities Permanently Ceasing Operations**

Four RECLAIM facilities permanently ceased operations in Compliance Year 2017. One facility consolidated its operations with a plant in Georgia. One facility ceased operations citing that their power purchase contract had not been renewed, and as a result, was closed and decommissioned. Another facility shut down due to changing market conditions with decreased demand for its product. The last facility shut down and attributed RECLAIM as part of the causes for its shutdown and claimed that its small size could not guarantee compliance with the recordkeeping, reporting, and audit requirements of the RECLAIM program, which they characterized as “extreme”. All of the facilities permanently ceasing operations were in NO<sub>x</sub> RECLAIM. Appendix C lists these facilities and provides brief descriptions of the reported reasons for their closures.

The above mentioned changes to the RECLAIM universe resulted in a net decrease of four facilities in the RECLAIM universe during Compliance Year 2017. Table 1-1 summarizes overall changes in the RECLAIM universe between the start of the program and end of Compliance Year 2017 (December 31, 2017 for Cycle 1 facilities and June 30, 2018 for Cycle 2 facilities). Changes to the

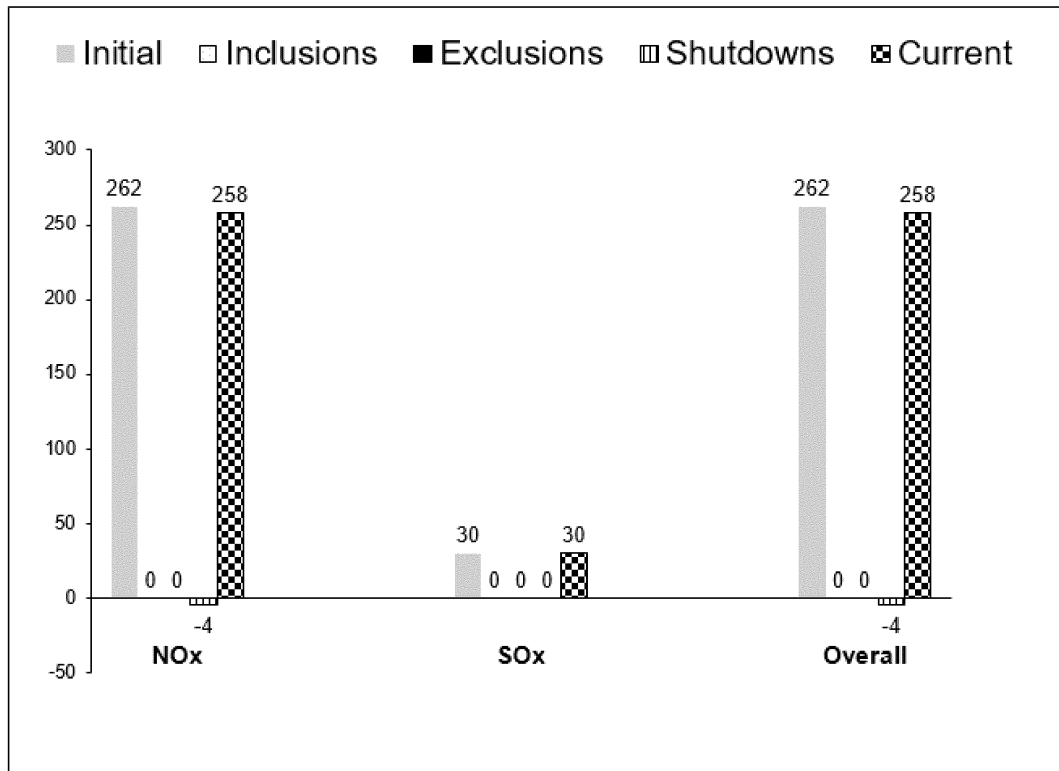
RECLAIM universe that occurred in Compliance Year 2017 are illustrated in Figure 1-1.

**Table 1-1  
RECLAIM Universe Changes**

	<b>NOx Facilities</b>	<b>SOx Facilities</b>	<b>Total* Facilities</b>
<b>Universe – October 15, 1993 (Start of Program)</b>	392	41	394
Inclusions – October 15, 1993 through Compliance Year 2016	134	13	134
Exclusions – October 15, 1993 through Compliance Year 2016	-70	-4	-71
Shutdowns – October 15, 1993 through Compliance Year 2016	-194	-20	-195
<b>Universe – June 30, 2017</b>	262	30	262
Inclusions – Compliance Year 2017	0	0	0
Exclusions – Compliance Year 2017	0	0	0
Shutdowns – Compliance Year 2017	-4	0	-4
<b>Universe – End of Compliance Year 2017</b>	258	30	258

\* "Total Facilities" is not the sum of NOx and SOx facilities due to the overlap of some facilities being in both the NOx and SOx universes.

**Figure 1-1  
Universe Changes in Compliance Year 2017**



## CHAPTER 2

### RTC ALLOCATIONS AND TRADING

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#### Summary

*On November 5, 2010, the Governing Board adopted amendments to SOx RECLAIM to phase in SOx reductions beginning in Compliance Year 2013 and full implementation in Compliance Year 2019 and beyond. The amendments will result in an overall reduction of 48.4% (or 5.7 tons/day) in SOx allocations when fully implemented (Compliance Year 2019 and beyond). For Compliance Year 2017, the fifth year of implementation, the SOx allocation supply was reduced by 43% (or 5.0 tons/day) to 2,474 tons. On December 4, 2015, the Governing Board adopted amendments to NOx RECLAIM to phase in additional NOx reductions which began in Compliance Year 2016 and continue through Compliance Year 2022. The amendment will result in an overall NOx reduction of 45% (or 12 tons/day) when fully implemented for Compliance Year 2022 and beyond. For Compliance Year 2017, the second year of implementation, the NOx allocation supply was reduced by 7.4 % (or 2 tons/day).*

*The overall NOx RTC supply increased by 11.0 tons and the SOx RTC supply increased by 0.1 tons during Compliance Year 2017. These changes were due to allocation adjustments for clean fuel production pursuant to Rule 2002(c)(12).*

*Since the inception of the RECLAIM program in 1994, a total value of over \$1.48 billion dollars has been traded in the RTC trading market, excluding swap trades. During calendar year 2018, there were 280 RTC trade registrations with a total value of \$3.94 million traded, excluding the values reported for swap trades. RTC trades are reported to SCAQMD as either discrete-year RTC trades or infinite-year block (IYB) trades (trades that involve blocks of RTCs with a specified start year and continuing into perpetuity). In terms of volume traded in calendar year 2018, a total of 1,982 tons of discrete-year NOx RTCs, 517 tons of discrete-year SOx RTCs, 208 tons of IYB NOx RTCs and 26 tons of IYB SOx RTCs were traded excluding swap trades. The RTC trading market activity decreased during calendar year 2018 compared to calendar year 2017, in terms of number of trades (by 8.5%), in volume for discrete-year (by 32%) and for IYB RTCs excluding swaps (by 7%), and in total value excluding swaps (by 43%).*

*Discrete-year RTC trades with price (i.e. price >\$0.00) registered during calendar year 2018 include trades for Compliance Years 2017, 2018, 2019, and 2020 NOx RTCs, and Compliance Years 2017 and 2018 SOx RTCs, excluding swap trades. The annual average prices of discrete-year NOx RTCs traded during calendar year 2018 were \$1,872, \$3,788, \$5,646, and \$5,674 per ton for Compliance Years 2017, 2018, 2019, and 2020 RTCs, respectively. The annual average prices for discrete-year SOx RTCs traded during the same period were \$786, and \$955 per ton for Compliance Years 2017 and 2018 RTCs, respectively.*

*Prices for discrete-year NOx and SOx RTCs for all compliance years are still well below the \$45,734 per ton of NOx and \$32,929 per ton of SOx discrete-year RTCs pre-determined overall program review thresholds established by the Governing Board pursuant to Health and Safety Code §39616(f), as well as the \$15,000 per ton threshold pursuant to Rule 2015(b)(6).*

*The annual average price during calendar year 2018 for IYB NOx RTCs was \$13,223 per ton and the annual average price for IYB SOx RTCs was \$30,000 per ton. Therefore, annual average IYB RTC prices did not exceed the \$686,014 per ton of IYB NOx RTCs or the \$493,930 per ton of IYB SOx RTCs pre-determined overall program review thresholds established by the Governing Board pursuant to Health and Safety Code §39616(f).*

*Investors were again active in the RTC market during calendar year 2018. They were involved in 114 of the 186 discrete-year NOx trade registrations and 11 of the 17 discrete-year SOx trade registrations with price. Investors were also involved in three of the five IYB NOx and one of the two IYB SOx trades with price. Investors were involved in 64% of total value and 55% of total volume for discrete-year NOx trades, and 61% of the total value and 60% of the total volume for discrete-year SOx trades. At the end of calendar year 2018, investors' holdings of IYB NOx RTCs were slightly higher at 3.8% of total NOx RECLAIM RTCs, while investors' holdings of IYB SOx RTCs were lower at 4.7% of the total SOx RECLAIM RTCs, compared to that of calendar year 2017.*

## **Background**

SCAQMD issues each RECLAIM facility at the time of inclusion into RECLAIM emissions allocations for each compliance year, according to the methodology specified in Rule 2002 – Allocations for Oxides of Nitrogen (NOx) and Oxides of Sulfur (SOx). For facilities that existed prior to January 1, 1993, the allocation is calculated based on each facility's historic production levels as reported to SCAQMD in its annual emission reports (AERs), NOx emission factors listed in Tables 1, 3, and 6 of Rule 2002 or SOx emission factors in Tables 2 and 4 of Rule 2002 for the appropriate equipment category, any qualified<sup>1</sup> external offsets previously provided by the facility, and any unused ERCs generated at and held by the facility. Facilities entering RECLAIM after 1994 are issued allocations, if eligible, for the compliance year of entry and all years after, and Compliance Year 1994 allocations (also known as the facility's "Starting Allocation") for the sole purpose of establishing New Source Review trigger level.

These allocations are issued as RTCs, denominated in pounds of NOx or SOx with a specified 12-month term. Each RTC may only be used for emissions occurring within the term of that RTC. The RECLAIM program has two staggered compliance cycles—Cycle 1 with a compliance period of January 1 through December 31 of each year, and Cycle 2 with a compliance period of July 1 of each year through June 30 of the following year. Each RECLAIM facility is assigned to either Cycle 1 or Cycle 2 and the RTCs it is issued (if any) have corresponding periods of validity.

The issuance of allocations for future years provides RECLAIM facilities guidance regarding their future emission reduction requirements. Facilities can plan their compliance strategies by reducing actual emissions or securing needed RTCs through trade registrations (or a combination of the two), based on their operational needs.

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<sup>1</sup> Only external offsets provided at a one-to-one offset ratio after the base year used for allocation quantification purposes.

RECLAIM facilities may acquire RTCs issued for either cycle through trading and apply them to emissions, provided that the RTCs are used for emissions occurring within the RTCs' period of validity and the trades are made during the appropriate time period. RECLAIM facilities have until 30 days after the end of each of the first three quarters of each compliance year to reconcile their quarterly and year-to-date emissions, and until 60 days after the end of each compliance year to reconcile their last quarter and total annual emissions by securing adequate RTCs. Please note that, although other chapters in this report present and discuss Compliance Year 2017 data, RTC trading and price data discussed in this chapter are for calendar year 2018.

## **RTC Allocations and Supply**

The methodology for determining RTC allocations is established by Rule 2002. According to this rule, allocations may change when the universe of RECLAIM facilities changes, emissions associated with the production of re-formulated gasoline increase or decrease, reported historical activity levels are updated, or emission factors used to determine allocations are changed. In addition to these SCAQMD-allocated RTCs, RTCs may have been generated by conversion of emissions reduction credits from mobile and area sources pursuant to approved protocols. The total RTC supply in RECLAIM is made up of all RECLAIM facilities' allocations, conversions of ERCs owned by RECLAIM and non-RECLAIM facilities<sup>2</sup>, emissions associated with the production of re-formulated gasoline, and conversion of emission reduction credits from mobile sources and area sources pursuant to approved protocols. Prior to an October 7, 2016 amendment of Rule 2002, facilities that shutdown were allowed to retain all of their RTC holdings and participate in the trading market. For NO<sub>x</sub> RECLAIM facilities listed in Tables 7 and 8 that shutdown on or after October 7, 2016, the Rule 2002 amendment established a BARCT-based RTC discounting methodology that is more closely aligned to ERC discounting methodology under command and control rules. A shutdown facility may trade future year RTCs that remain after the RTC adjustment is completed, if any. If the calculated reduction amount exceeds a facility's holdings for any future compliance year, the facility must purchase and surrender sufficient RTCs to fulfill the entire reduction requirement. This situation may result if the facility previously sold its future year allocations. The SCAQMD Governing Board may adopt additional rules that affect RTC supply. Changes in the RTC supply during Compliance Year 2017 are discussed below.

### **Allocations Adjustments Due to Inclusion and Exclusion of Facilities**

Facilities existing prior to October 1993 and entering RECLAIM after 1994 may receive allocations just like facilities that were included at the beginning of the program. However, allocations issued for these facilities are only applicable for the compliance year of entry and forward. In addition, these facilities are issued allocations and Non-tradable/Non-usable Credits for Compliance Year 1994 for the sole purpose of establishing their starting allocation to ensure compliance with offset requirements under Rule 2005 - New Source Review for RECLAIM and the trading zone restriction to ensure net ambient air quality improvement

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<sup>2</sup> The window of opportunity to convert ERCs to RTCs other than during the process of a non-RECLAIM facility entering the program closed June 30, 1994.



within the sensitive zone established by Health and Safety Code §40410.5. These Compliance Year 1994 credits are not allowed to be used to offset current emissions because they have expired. Similarly, if an existing facility that was previously included in RECLAIM is subsequently excluded because it is determined to be categorically excluded or exempt pursuant to Rule 2001(i) or to not have emitted four tons or more of NO<sub>x</sub> or SO<sub>x</sub> in a year, any RTCs it was issued upon entering RECLAIM are removed from the market upon its exclusion.

On January 5, 2018, the SCAQMD Governing Board amended Rule 2001 – Applicability to discontinue facility inclusions into RECLAIM. The Executive Officer could only include a facility into RECLAIM up until January 5, 2018, and no facility can elect to enter RECLAIM after January 5, 2018. No facilities were included in or excluded from the RECLAIM program in Compliance Year 2017. Therefore, there are no changes to the NO<sub>x</sub> or SO<sub>x</sub> RTC supplies in Compliance Year 2017 due to facility inclusions into RECLAIM or exclusions from RECLAIM.

### **Allocations Adjustments Due to Clean Fuel Production**

Rule 2002(c)(12) – Clean Fuel Adjustment to Starting Allocation, provides refineries with RTCs to compensate for their actual emissions increases caused by the production of California Air Resources Board (CARB) Phase II reformulated gasoline. The amount of these RTCs is based on actual emissions for the subject compliance year and historical production data. The quantities of such clean fuels RTCs needed were projected based on the historical production data submitted, and qualifying refineries were issued in 2000 an aggregate baseline of 86.5 tons of NO<sub>x</sub> and 42.3 tons of SO<sub>x</sub> for Compliance Year 1999, 101.8 tons of NO<sub>x</sub> and 41.4 tons of SO<sub>x</sub> for Compliance Year 2000, and 98.4 tons of NO<sub>x</sub> and 40.2 tons of SO<sub>x</sub> for each subsequent Compliance Year on the basis of those projections. These refineries are required to submit, at the end of each compliance year in their Annual Permit Emissions Program (APEP) report, records to substantiate actual emission increases due solely to the production of reformulated gasoline. If actual emission increases for a subject year are different than the projected amount, the RTCs issued are adjusted accordingly (*i.e.*, excess RTCs issued are deducted if emissions were less than projected; conversely, additional RTCs are issued if emissions were higher than projected).

As a result of the amendment to Rule 2002 in January 2005 to further reduce RECLAIM NO<sub>x</sub> allocations, the NO<sub>x</sub> historical baseline Clean Fuel Adjustments for Compliance Year 2007 and subsequent years held by the facility were also reduced by the appropriate factors as stated in Rule 2002(f)(1)(A). On the other hand, Rule 2002(c)(12) provides refineries a Clean Fuels adjustment based on actual emissions. Therefore, each refinery is subject to an adjustment at the end of each compliance year equal to the difference between the amount of actual emission increases due solely to production of reformulated gasoline at each refinery and the amount of credits it was issued in 2000 after discounting by the factors for the corresponding compliance year. For Compliance Year 2017, 11.0 tons of NO<sub>x</sub> RTCs (0.12% of total NO<sub>x</sub> allocation for Compliance Year 2017 and 0.1 tons of SO<sub>x</sub> RTCs (0.005% of total SO<sub>x</sub> allocation for Compliance Year 2017) were added to refineries' Compliance Year 2017 RTC holdings at the end of the compliance year.

**Changes in RTC Allocations Due to Activity Corrections**

RECLAIM facilities’ allocations are determined by their reported historical activity levels (e.g., fuel usage, material usage, or production) in their AERs. In the case where a facility’s AER reported activity levels are updated within five years of the AER due date, its allocation is adjusted accordingly<sup>3</sup>. There were no changes in RTC allocations due to activity corrections in Compliance Year 2017.

**Conversions of Other Types of Emission Reduction Credits**

Conversions of Mobile Source Emission Reduction Credits (MSERCs) and other types of emission reduction credits, other than regular stationary source ERCs issued under Regulation XIII – New Source Review, to RTCs are allowed under Rule 2008 – Mobile Source Credits, and several programs under Regulation XVI – Mobile Source Offset Programs and Regulation XXV – Intercredit Trading. Conversion of these credits to RTCs is allowed based on the respective approved protocol specified in each rule. Currently, Rules 1610 – Old-Vehicle Scrapping and 1612 – Credits for Clean On-Road Vehicles allow the creation of MSERCs. However, there are no State Implementation Plan (SIP) approved protocols for conversion of MSERCs to RTCs. No new RTCs were issued by conversion of other types of emission reduction credits in Compliance Year 2017.

**Net Changes in RTC Supplies**

The changes to RTC supplies described in the above sections resulted in a net increase of 11.0 tons of NOx RTCs (0.12% of the total) and an increase of 0.1 tons of SOx RTCs (0.005% of the total) for Compliance Year 2017. Table 2-1 summarizes the changes in NOx and SOx RTC supplies that occurred in Compliance Year 2017 pursuant to Rule 2002.

**Table 2-1  
Changes in NOx and SOx RTC Supplies during Compliance Year 2017 (tons/year)**

Source	NOx	SOx
Universe changes	0	0
Clean Fuel/Reformulated Gasoline	11.0	0.1
Activity corrections	0	0
MSERCs	0	0
<b>Net change</b>	<b>11.0</b>	<b>0.1</b>

Note: The data in this table represents the changes that occurred over the course of Compliance Year 2017 to the Compliance Year 2017 aggregate NOx and SOx RTC supplies originally issued pursuant to Rule 2002, not the difference between 2017 aggregate RTC supply and that for any other compliance year.

**Allocation Reduction Resulting from BARCT Review**

Pursuant to California Health and Safety Code §40440, SCAQMD is required to monitor the advancement in BARCT and periodically re-assess the RECLAIM program to ensure that RECLAIM achieves equivalent emission reductions to the

<sup>3</sup> Pursuant to Rule 2002(b)(5) as amended on December 4, 2015, any AERs (including corrections) submitted more than five years after the original due date are not considered in the RTC quantification process.

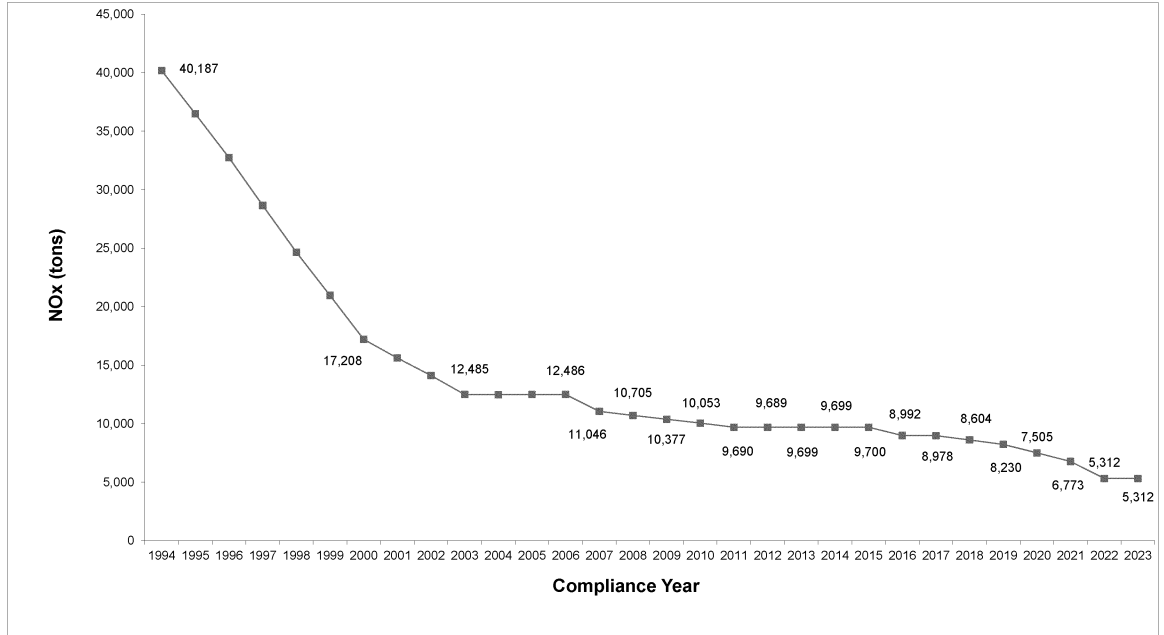
command-and-control BARCT rules it subsumes. This assessment is done periodically as part of AQMP development. This process resulted in 2003 AQMP Control Measure #2003 CMB-10 – Additional NO<sub>x</sub> Reductions for RECLAIM (NO<sub>x</sub>) calling for additional NO<sub>x</sub> reductions from RECLAIM sources. SCAQMD staff started the rule amendment process in 2003, including a detailed analysis of control technologies that qualified as BARCT for NO<sub>x</sub>, and held lengthy discussions with stakeholders—including regulated industry, environmental groups, the California Air Resources Board (CARB), and the United States Environmental Protection Agency (USEPA). On January 7, 2005, the Governing Board implemented CMB-10 by adopting changes to the RECLAIM program that resulted in a 22.5% reduction of NO<sub>x</sub> allocations from all RECLAIM facilities. The reductions were phased in commencing in Compliance Year 2007 and have been fully implemented since Compliance Year 2011.

On November 5, 2010, the Governing Board adopted changes to the RECLAIM program implementing the 2007 AQMP Control Measure CMB-02 – Further SO<sub>x</sub> Reductions for RECLAIM (SO<sub>x</sub>). These amendments resulted in a BARCT-based overall reduction of 5.7 tons SO<sub>x</sub> per day when fully implemented in Compliance Year 2019 (the reductions are being phased in from Compliance Year 2013 through Compliance Year 2019: 3.0 tons per day in 2013; 4.0 tons per day in years 2014, 2015, and 2016; 5.0 tons per day in 2017 and 2018; and 5.7 tons per day starting in 2019 and continuing thereafter). This reduction in SO<sub>x</sub> is an essential part of the South Coast Air Basin's effort in attaining the federal 24-hour average PM<sub>2.5</sub> standard by the year 2020.

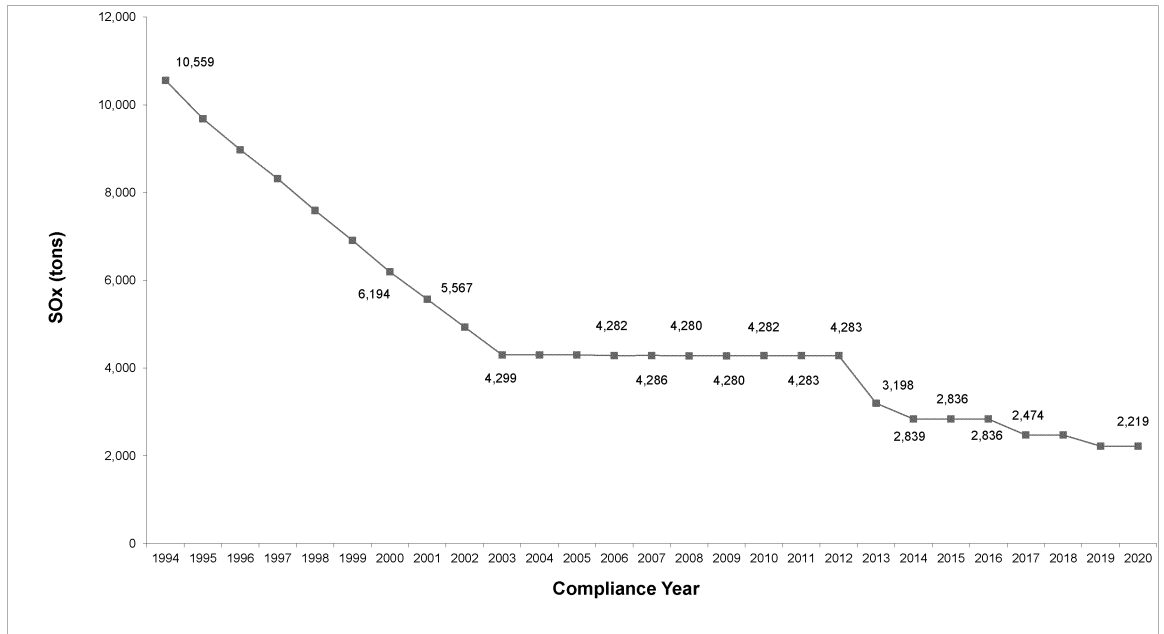
Similarly, the 2012 AQMP adopted by the Governing Board in 2012, included Control Measure CMB-01- Further NO<sub>x</sub> Reductions for RECLAIM that identified a new group of RECLAIM NO<sub>x</sub> emitting equipment that should be reviewed for new BARCT. The rulemaking process for the amendment to the NO<sub>x</sub> RECLAIM program implementing CMB-01 started in 2012. On December 4, 2015, the Governing Board adopted amendments to the RECLAIM rules that resulted in an additional reduction of 12 tons of NO<sub>x</sub> per day (45% reduction) when fully implemented in Compliance Year 2022. The reductions are being phased-in with 2 tons per day in Compliance Year 2016 and 2017, 3 tons per day in Compliance Year 2018, 4 tons per day in Compliance Year 2019, 6 tons per day in Compliance Year 2020, 8 tons per day in Compliance Year 2021 and 12 tons per day in Compliance Year 2022 and thereafter.

Figure 2-1 illustrates the total NO<sub>x</sub> RTC supply through the end of Compliance Year 2023 incorporating all the changes discussed above. Figure 2-2 illustrates the total SO<sub>x</sub> RTC supply through the end of Compliance Year 2020 incorporating the changes discussed.

**Figure 2-1  
NOx RTC Supply**



**Figure 2-2  
SOx RTC Supply**



## RTC Trades

### RTC Price Reporting Methodology

RTC trades are reported to SCAQMD as one of two types: discrete-year RTC transactions or infinite-year block (IYB) transactions (trades that involve blocks of RTCs with a specified start year and continuing into perpetuity). Prices for discrete-year trades are reported in terms of dollars per pound and prices for IYB trades are reported as total dollar value for total amount of IYB RTCs traded. In addition, the trading partners are required to identify any swap trades. Swap trades occur when trading partners exchange different types of RTCs. These trades maybe of equal value or different values, in which case some amount of money or credits are also included in swap trades (additional details on swap trades are discussed later in this chapter). Prices reported for swap trades are based on the agreed upon value of the trade by the participants, and do not involve exchange of funds for the total value agreed upon. As such, the reported prices for swap trades can be somewhat arbitrary, and are therefore excluded from the calculation of annual average prices. Annual average prices for discrete-year RTCs are determined by averaging prices of RTCs for each compliance year, while the annual average price for IYB RTCs are determined based on the amount of IYB RTCs (*i.e.*, the amount of RTCs in the infinite stream) regardless of the start year.

### RTC Price Thresholds for Program Review

Rule 2015(b)(6) specifies that, if the annual average price of discrete-year NO<sub>x</sub> or SO<sub>x</sub> RTCs exceeds \$15,000 per ton, the Executive Officer will conduct an evaluation and review of the compliance and enforcement aspects of RECLAIM. The Governing Board has also established average RTC price overall program review thresholds pursuant to Health and Safety Code §39616(f). Unlike the \$15,000 per ton threshold for review of the compliance and enforcement aspects of RECLAIM, these overall program review thresholds are adjusted by CPI each year. In addition, according to Rule 2002(f)(1)(S), if the annual average price of discrete-year SO<sub>x</sub> RTCs for any compliance year from 2017 through 2019 exceeds \$50,000 per ton, the Governing Board has the discretion to convert facilities' Nontradable/Nonusable RTCs to Tradable/Usable RTCs. Similarly, Rule 2002(f)(1)(H) specifies that in the event that the NO<sub>x</sub> RTC prices exceed \$22,500 per ton (current compliance year credits) based on the 12-month rolling average, or exceed \$35,000 per ton (current compliance year credits) based on the 3-month rolling average calculated pursuant to subparagraph (f)(1)(E), the Executive Officer will report the determination to the Governing Board. If the Governing Board finds that the 12-month rolling average RTC price exceeds \$22,500 per ton or the 3-month rolling average RTC price exceeds \$35,000 per ton, then the Non-tradable/Non-usable NO<sub>x</sub> RTCs, as specified in subparagraphs (f)(1)(B) and (f)(1)(C) valid for the period in which the RTC price is found to have exceeded the applicable threshold, shall be converted to Tradable/Usable NO<sub>x</sub> RTCs upon Governing Board concurrence. For RTC trades occurring in calendar year 2018, the overall program review thresholds<sup>4</sup> in 2018 dollars, pursuant to Health and Safety Code §39616(f), are \$45,734 per ton of discrete-year NO<sub>x</sub>

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<sup>4</sup> These program review thresholds were adjusted using the October 2018 Consumer Price Index (CPI) due to the unavailability of the December 2018 CPI at issuance of this report.

RTCs, \$32,929 per ton of discrete-year SOx RTCs, \$686,014 per ton of IYB NOx RTCs, and \$493,930 per ton of IYB SOx RTCs.

**RTC Trading Activity Excluding Swaps**

***Overall Trading Activity***

RTC trades include discrete-year and IYB RTCs traded with prices, discrete-year and IYB RTC transfers with zero price, and discrete-year and IYB RTC swap trades. The RTC market activity in calendar year 2018 was slightly lower compared to the market activity in calendar year 2017 in terms of the number of trades. Table 2-2 compares NOx and SOx trade registrations for calendar years 2018 and 2017.

**Table 2-2  
Trade Registrations in Calendar Years 2018 and 2017<sup>5</sup>**

<b>Emittent</b>	<b>2018</b>	<b>2017<sup>5</sup></b>
NOx	254	279
SOx	26	27
Total	280	306

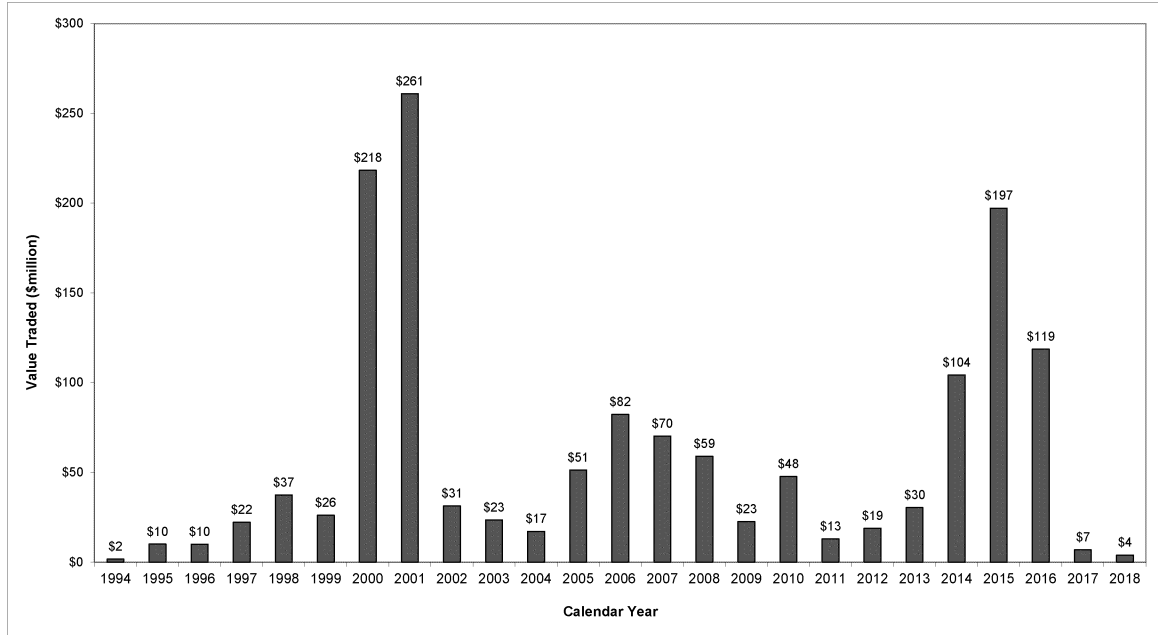
The \$3.94 million traded in calendar year 2018 was much lower compared to calendar year 2017, excluding swap trades. Table 2-3 compares the value of NOx and SOx RTCs traded in calendar years 2018 and 2017. Figure 2-3 illustrates the annual value of RTCs traded in RECLAIM since the inception of the program.

**Table 2-3  
Value Traded in Calendar Years 2018 and 2017, Excluding Swaps (millions of dollars)**

<b>Emittent</b>	<b>2018</b>	<b>2017</b>
NOx	\$3.59	\$6.01
SOx	\$0.35	\$0.85
Total	\$3.94	\$6.86

<sup>5</sup> There were three trades registrations postmarked late December 2017. All three trade registrations were 0 price trades and were between facilities under common ownership. Additional issues were encountered while processing these trades and delayed approvals of these trades until after the compilation of trade data for the previous RECLAIM Annual Report was completed. These RTC registrations were therefore not included in the Compliance Year 2016 RECLAIM Annual Report. These trades were collectively for 130 tons discrete NOx RTCs traded without price, and 191 tons discrete SOx RTCs traded without price. As a result, comparisons of calendar year's 2018 data (with respect to value, volume, and NOx and SOx RTCs trade registrations) with that of calendar year's 2017 data in this year's annual report are based on the updated data inclusive of these three subject trades and do not match the trade data presented in the Compliance Year 2016 RECLAIM Annual Audit Report. However, the trading prices reported in that report were unaffected.

**Figure 2-3  
Annual Trading Values for NOx and SOx (Excluding Swaps)**



With respect to total volume traded (excluding swap trades), trades of discrete and IYB RTCs were both lower in calendar year 2018 than in calendar year 2017. Tables 2-4 and 2-5 compare 2018 and 2017 for NOx and SOx trade volume for discrete and IYB trades, respectively. Figure 2-4 summarizes overall trading activity (excluding swaps) in calendar year 2018 by pollutant. Additional information on the discrete-year and IYB trading activities, value, and volume are discussed later in this chapter.

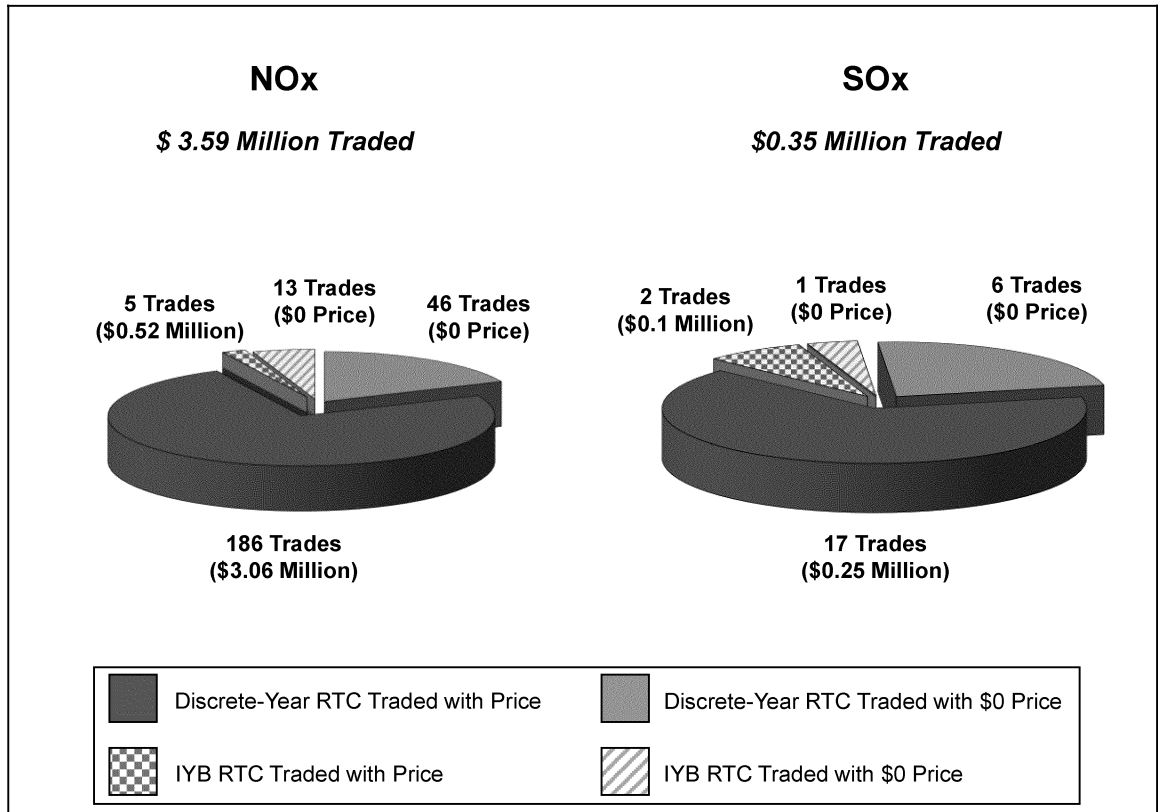
**Table 2-4  
Volume of Discrete RTCs Traded in Calendar Years 2018 and 2017<sup>5</sup>, Excluding Swaps (tons)**

Emittent	2018	2017 <sup>5</sup>
NOx	1,982	2,687
SOx	517	987
Total	2,499	3,671

**Table 2-5  
Volume of IYB RTCs Traded in Calendar Years 2018 and 2017, Excluding Swaps (tons)**

Emittent	2018	2017
NOx	208	218
SOx	26	34
Total	234	252

**Figure 2-4**  
**Calendar Year 2018 Overall Trading Activity (Excluding Swaps)**



There were 66 trades with zero price in calendar year 2018. RTC transfers with zero price generally occur when a seller transfers or escrows RTCs to a broker pending transfer to the purchaser with price, when there is a transfer between facilities under common operator, when a facility is retiring RTCs for a settlement agreement or pursuant to variance conditions, or when there is a transfer between facilities that have gone through a change of operator. Trades with zero price also occur when the trading parties have mutual agreements where one party provides a specific service (e.g., providing steam or other process components) for the second party. In return, the second party will transfer the RTCs necessary to offset emissions generated from the service. In calendar year 2018, the majority of trades with zero price were transfers between facilities under common ownership and facilities that underwent a change of operator.

**Discrete-Year RTC Trading Activity**

In calendar year 2018, there were a total of 232 discrete-year NOx RTC trades and 23 discrete-year SOx RTC trades, excluding swap trades. The trading of discrete-year NOx RTCs included RTCs for Compliance Years 2017 through 2020. The trading of discrete-year SOx RTCs included RTCs for Compliance Years 2017 through 2019. Table 2-6 compares the number of trade registrations in 2018 and 2017, both with price and with zero price.



**Table 2-6**  
**Discrete Trade Registrations in Calendar Years 2018 and 2017<sup>5</sup> by Price**

Year	Emittent	With Price	With 0 Price	Total
2018	NOx	186	46	232
	SOx	17	6	23
	Total	203	52	255
2017 <sup>5</sup>	NOx	193	47	240
	SOx	7	12	19
	Total	200	59	259

Total discrete-year RTC trading values decreased in calendar year 2018 compared to calendar year 2017. Table 2-7 compares the total value of the discrete-year RTC trades in 2018 and 2017.

**Table 2-7**  
**Discrete RTC Value Traded in 2018 and 2017, Excluding Swaps (millions of dollars)**

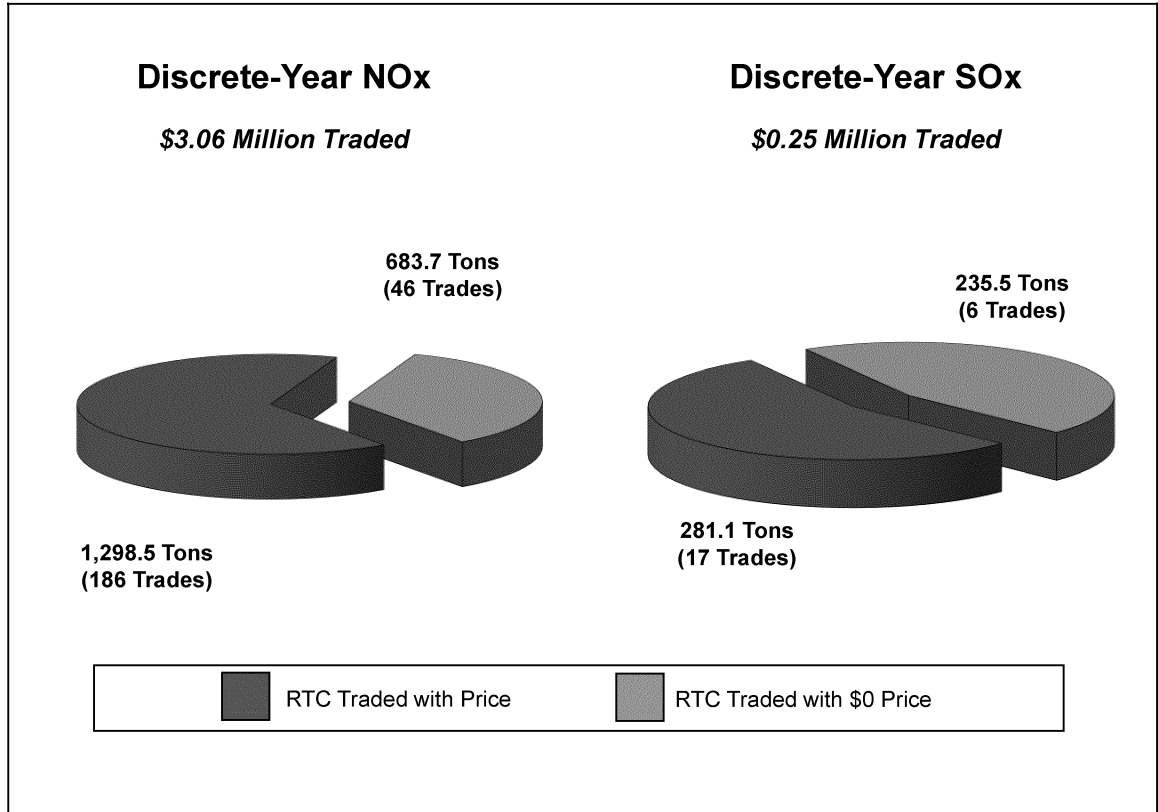
Emittent	2018	2017
NOx	\$3.06	\$4.75
SOx	\$0.25	\$0.07
Total	\$3.31	\$4.83

In calendar year 2018, the overall quantities of discrete-year NOx RTCs traded decreased compared to calendar year 2017. Table 2-8 compares the volume of NOx and SOx RTCs traded in calendar years 2018 and 2017, excluding swap trades. Figure 2-5 illustrates the trading activity of discrete-year RTCs (excluding swaps) for calendar year 2018.

**Table 2-8**  
**Discrete RTC Volume Traded in Calendar Years 2018 and 2017<sup>5</sup> by Price, Excluding Swaps (tons)**

Year	Emittent	With Price	With 0 Price	Total
2018	NOx	1,299	684	1,982
	SOx	281	236	517
	Total	1,580	919	2,499
2017 <sup>5</sup>	NOx	1,533	1,154	2,687
	SOx	65	919	984
	Total	1,598	2,073	3,671

**Figure 2-5**  
**Calendar Year 2018 Trading Activity for Discrete-Year RTCs (Excluding Swaps)**



***IYB RTC Trading Activity***

In calendar year 2018, there were 18 IYB NOx trades and three IYB SOx trades, excluding swaps. The IYB NOx trades included RTCs with Compliance Years 2017 through 2022 as start years, while the IYB SOx trades had RTCs with Compliance Years 2018 and 2019 as start years. Table 2-9 compares the number of RTC trade registrations from 2018 to 2017.

**Table 2-9**  
**IYB Trade Registrations in Calendar Years 2018 and 2017 by Price**

Year	Emittent	With Price	With 0 Price	Total
2018	NOx	5	13	18
	SOx	2	1	3
	Total	7	14	21
2017	NOx	6	24	30
	SOx	4	0	4
	Total	10	24	34

Total IYB RTC trade values decreased in calendar year 2018 compared to calendar year 2017. Table 2-10 compares the NOx and SOx IYB RTC trade values in calendar years 2018 and 2017.

**Table 2-10**  
**IYB RTC Value Traded in 2018 and 2017, Excluding Swaps (millions of dollars)**

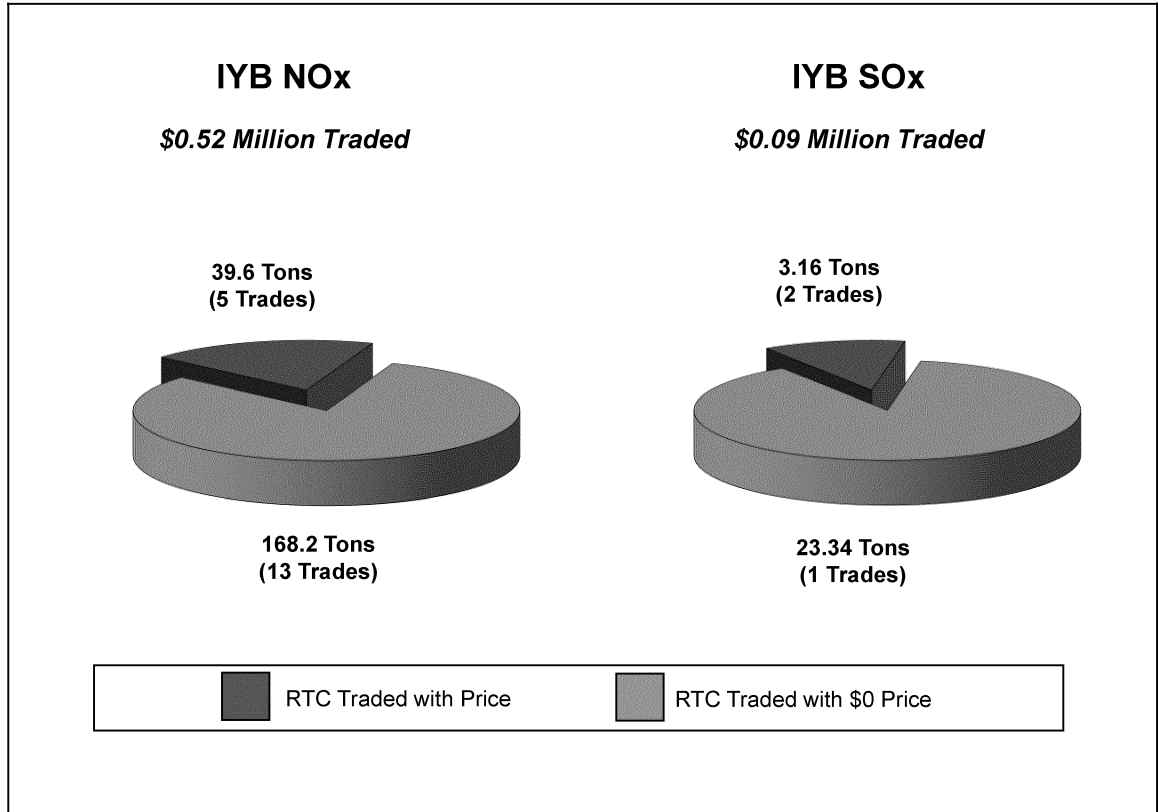
Emittent	2018	2017
NOx	\$0.52	\$1.26
SOx	\$0.09	\$0.77
Total	\$0.62	\$2.07

In calendar year 2018, the total volume of RTCs traded (excluding swap trades) decreased significantly compared to calendar year 2017. Table 2-11 compares the NOx and SOx IYB trade volumes in calendar years 2018 and 2017. As described earlier, the majority of transfers with zero price were between facilities under common ownership and facilities that had a change of operator. Figure 2-6 illustrates the calendar year 2018 IYB RTC trading activity excluding swap trades.

**Table 2-11**  
**IYB RTC Volume Traded in Calendar Years 2018 and 2017 by Price, Excluding Swaps (tons)**

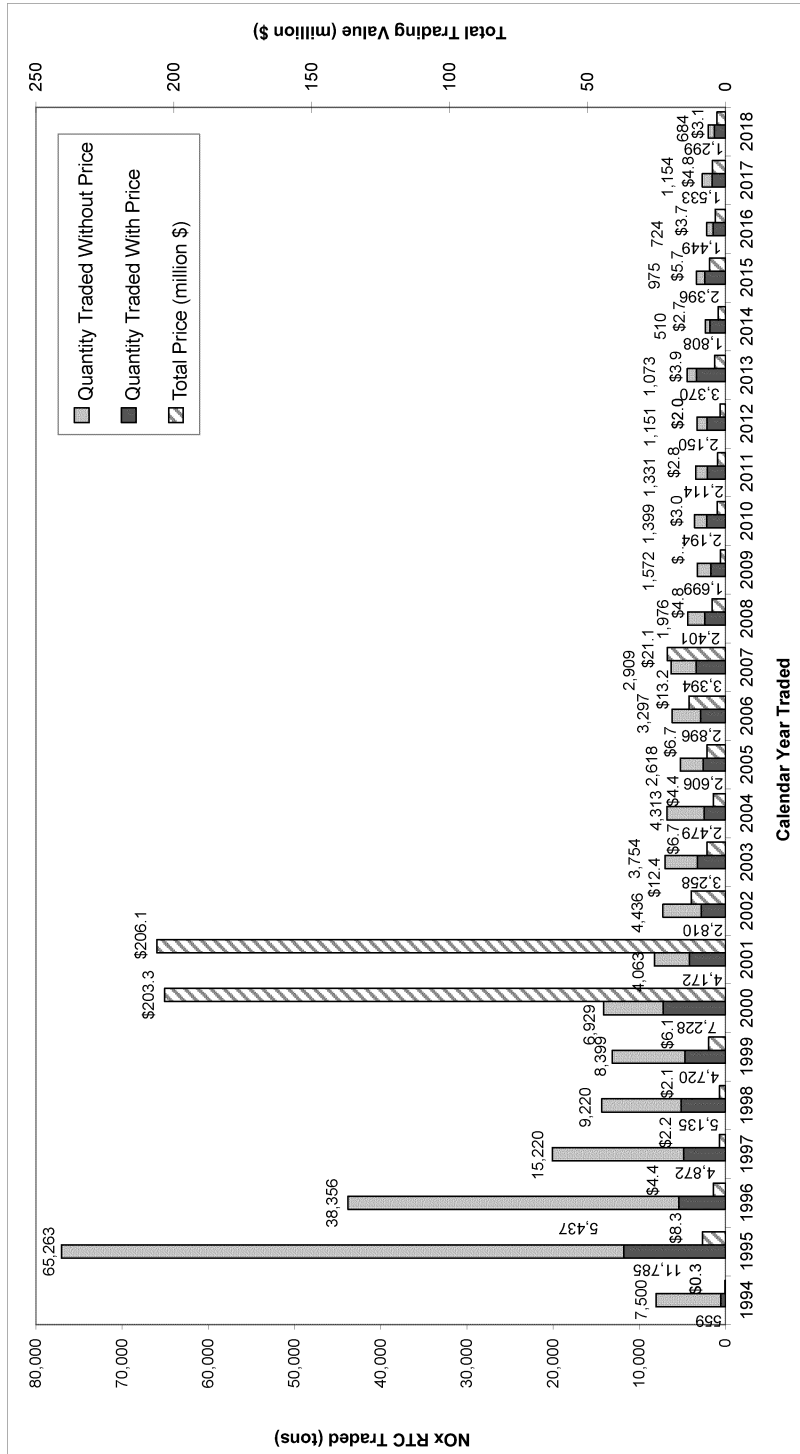
Year	Emittent	With Price	With 0 Price	Total
2018	NOx	40	168	208
	SOx	3	23	26
	Total	43	192	234
2017	NOx	32	186	218
	SOx	34	0	34
	Total	66	186	252

**Figure 2-6**  
**Calendar Year 2018 Trading Activity for IYB RTCs (Excluding Swaps)**

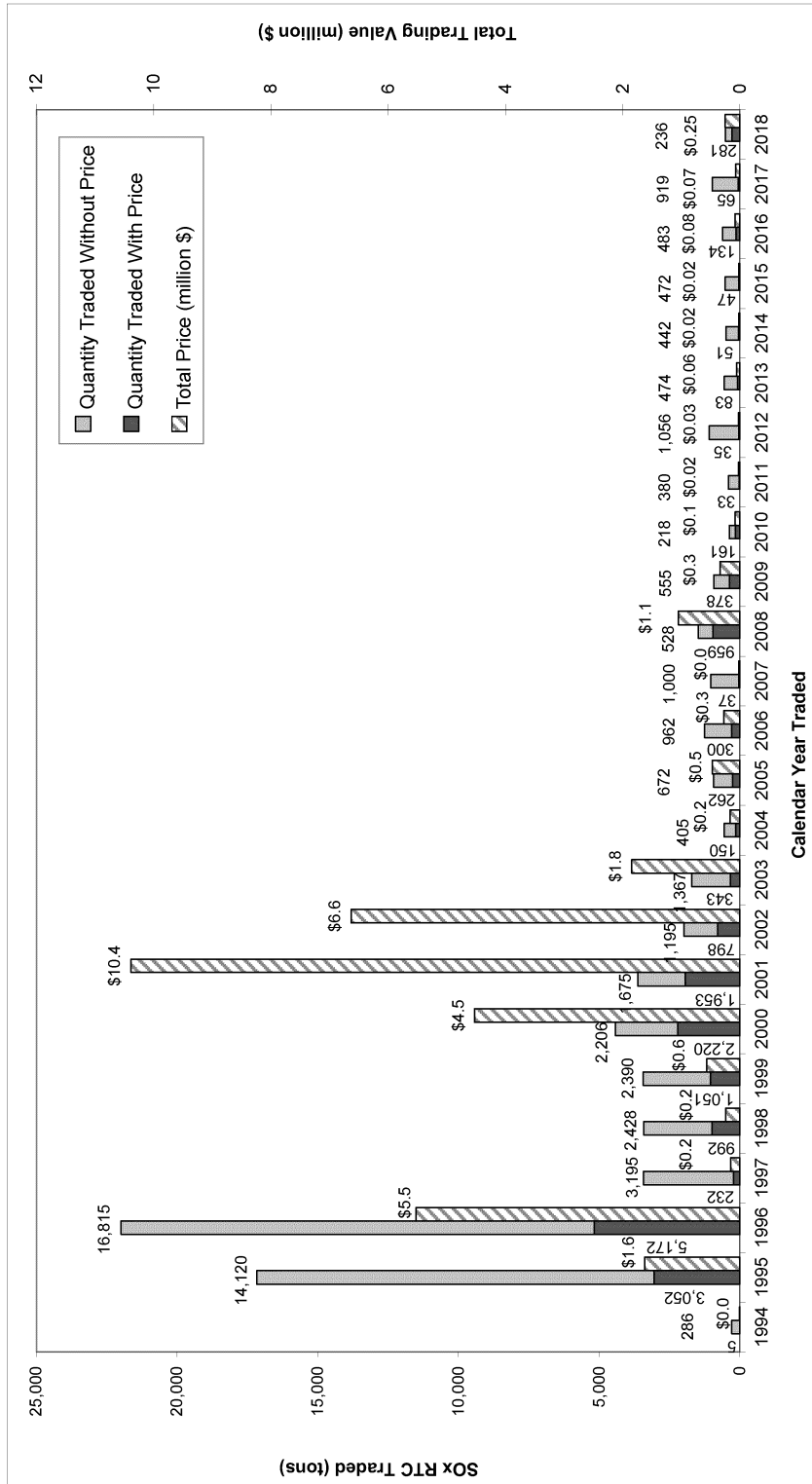


Prior to the amendment of Rule 2007 – Trading Requirements in May 2001, swap information and details of discrete-year and IYB trades were not required to be provided by trade participants. In compiling data for calendar years 1994 through part of 2001, any trade registration involving IYB RTCs was considered as a single IYB trade and swap trades were assumed to be nonexistent. Trading activity since inception of the RECLAIM program is illustrated in Figures 2-7 through 2-10 (discrete-year NOx trades, discrete-year SOx trades, IYB NOx trades, and IYB SOx trades, respectively) based on the trade reporting methodology described earlier in this report.

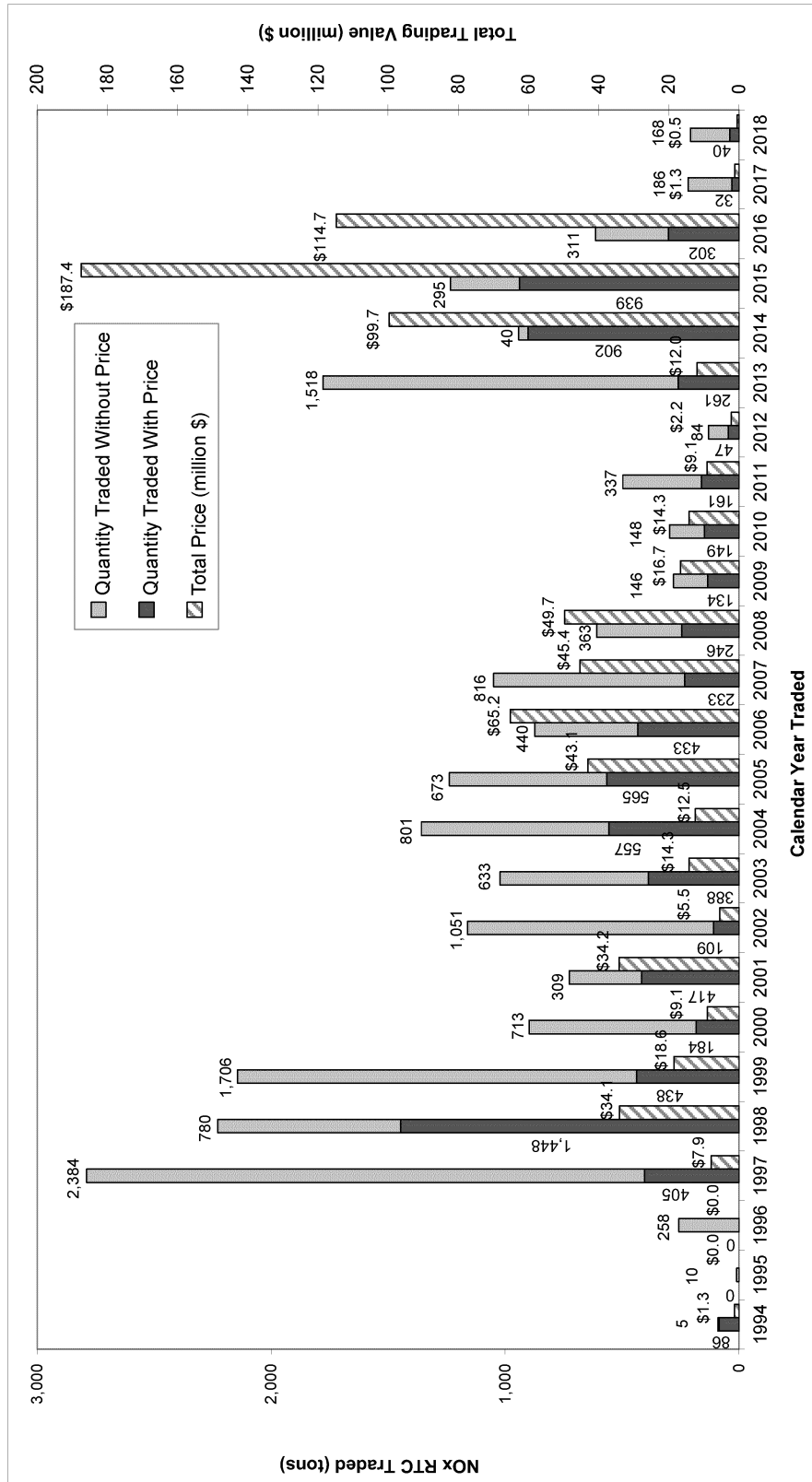
**Figure 2-7  
Discrete-Year NOx RTC Trades (Excluding Swaps)**



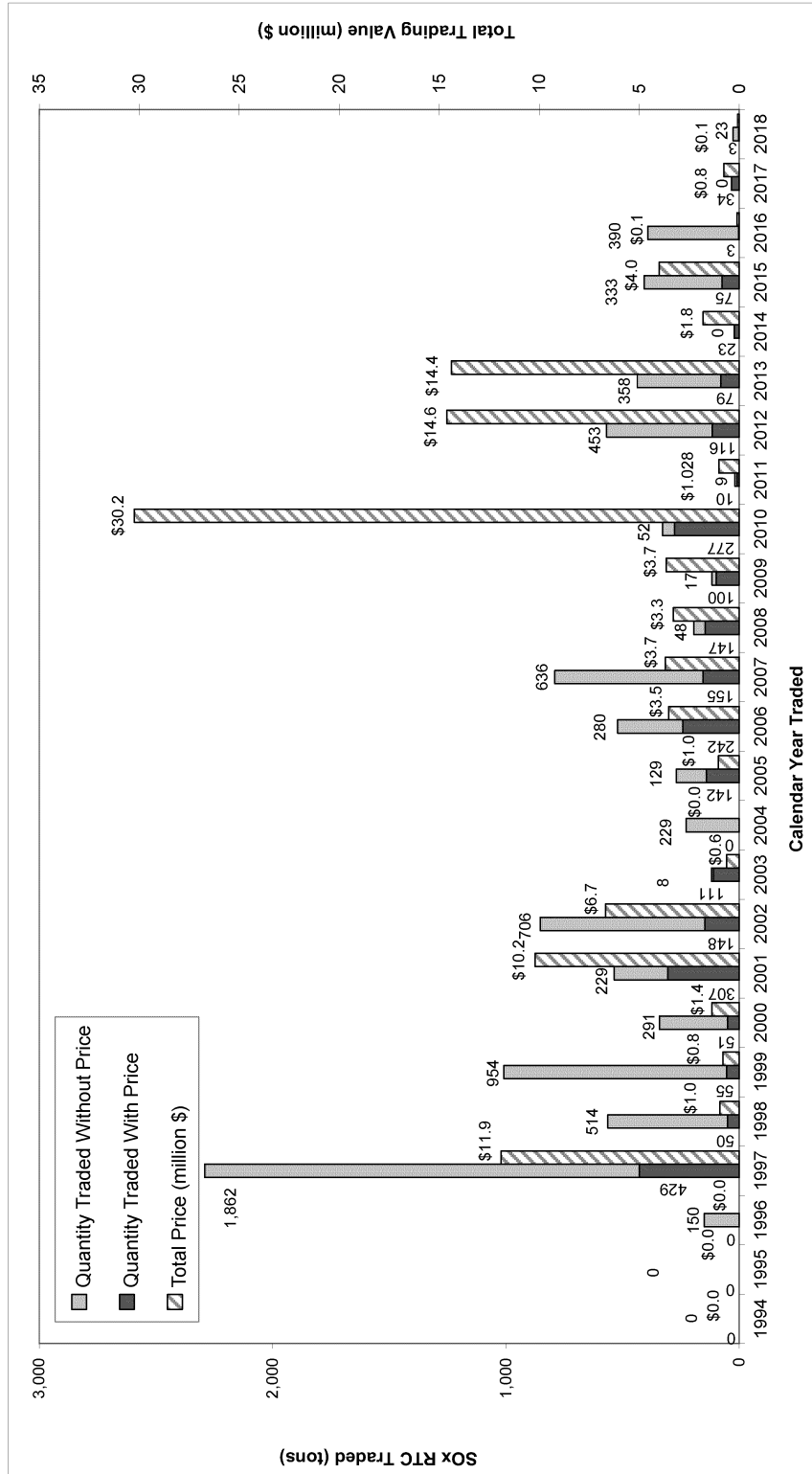
**Figure 2-8  
Discrete-Year SOx RTC Trades (Excluding Swaps)**



**Figure 2-9  
IYB NOx RTC Trades (Excluding Swaps)**



**Figure 2-10**  
**IYB SOx RTC Trades (Excluding Swaps)**





**Swap Trades**

In addition to traditional trades of RTCs for a price, RTC swaps also occurred between trading partners. Most of the swap trades were exchanges of RTCs with different zones, cycles, expiration years, and/or pollutants. Some swaps involved a combination of RTCs and cash payment as a premium. There were also swaps of RTCs for ERCs. Trading parties swapping RTCs were required to report the agreed upon price of RTCs for each trade even though, with the exception of the above-described premiums, no money was actually exchanged. Slightly over \$0.5 million in total value was reported from RTCs that were swapped under four trade registrations in calendar year 2018. Two of the four trades involved swapping discrete coastal NOx RTCs for discrete inland NOx RTCs of a different cycle, and were collectively valued at a total of \$0.50 million. The total value of the other two trades was less than \$15,000. One of these two remaining trades was between a RECLAIM facility and its wholly-owned subsidiary and the other was between two facilities under common ownership. Upon further investigation, staff concluded that the transactions were not at arms-length, and that the prices reported for the transfer of RTCs for these two trades should not be regarded as market prices but “swap trades.” The swap values are based on the prices reported on the RTC trade registrations. Since RTC swap trades occur when two trading partners exchange RTCs, values reported on both trades involved in the exchange are included in the calculation of the total value reported. However, in cases where commodities other than RTCs are involved in the swap, these commodity values are not included in the above reported total value (*e.g.*, in the case of a swap of NOx RTCs valued at \$10,000 for another set of RTCs valued at \$8,000 together with a premium of \$2,000, the value of such a swap would have been reported at \$18,000 in Table 2-2).

For calendar years that have swap trades with large values (*e.g.*, 2009) the inclusion of swap trades in the average trade price calculations would have resulted in calculated annual average prices dominated by swap trades, and therefore, potentially not representative of market prices actually paid for RTCs. Prices of swap trades are excluded from analysis of average trade prices because the values of the swap trades are solely based upon prices agreed upon between trading partners and do not reflect actual funds transferred. Tables 2-12 and 2-13 present the calendar years’ 2001 through 2018 RTC swaps for NOx and SOx, respectively.

**Table 2-12**  
**NOx Registrations Involving Swaps\***

Year	Total Value (\$ millions)	IYB RTC Swapped with Price (tons)	Discrete-Year RTC Swapped with Price (tons)	Number of Swap Registrations with Price	Total Number of Swap Registrations
2001	\$24.29	6.0	612.2	71	78
2002	\$14.31	64.3	1,701.7	94	94
2003	\$7.70	69.9	1,198.1	64	64
2004	\$3.74	0	1,730.5	90	90
2005	\$3.89	18.7	885.3	53	53
2006	\$7.29	14.8	1,105.9	49	49
2007	\$4.14	0	820.0	43	49
2008	\$8.41	4.5	1,945.8	48	50
2009	\$55.76	394.2	1,188.4	37	42
2010	\$3.73	18.2	928.5	25	31
2011	\$2.00	0	775.5	25	32
2012	\$1.29	0	928.1	36	36
2013	\$2.41	11.6	1,273.5	44	44
2014	\$3.24	28.5	489.6	25	25
2015	\$6.77	31.0	317.0	15	15
2016	\$2.18	1.8	622.8	22	22
2017	\$0.87	3.6	31.0	9	9
2018	\$0.51	0	178.5	4	4

\* Swaps without price are strictly transfers of RTCs between trading partners and their respective brokers. Information regarding swap trades was not required prior to May 9, 2001.

**Table 2-13**  
**SOx Registrations Involving Swaps\***

Year	Total Value (\$ millions)	IYB RTC Swapped with Price (tons)	Discrete-Year RTC Swapped with Price (tons)	Number of Swap Registrations with Price	Total Number of Swap Registrations
2001	\$1.53	18.0	240.0	3	4
2002	\$6.11	26.6	408.4	30	30
2003	\$5.88	20.9	656.0	32	32
2004	\$0.39	0	161.8	13	13
2005	\$2.16	43.5	227.8	13	14
2006	\$0.02	0	24.4	2	2
2007	\$0.00	0	0	0	0
2008	\$0.40	0	197.0	5	8
2009	\$3.63	55.3	401.3	9	10
2010	\$6.89	79.4	417.0	16	18
2011	\$0.25	0	228.5	3	4
2012	\$27.01	100.0	7.5	4	4
2013	\$0.33	3.1	5.5	2	2
2014	\$0.01	0.0	14.8	1	1
2015	\$0	0.0	0	0	0
2016	\$3.68	39.6	44.2	3	3
2017	\$0.73	5.0	5.9	4	4
2018	\$0	0	0	0	0

\* Swaps without price are strictly transfers of RTCs between trading partners and their respective brokers. Information regarding swap trades was not required prior to May 9, 2001.

### RTC Trade Prices (Excluding Swaps)

#### *Discrete-Year RTC Prices*

Tables 2-14 and 2-15 list the annual average prices for discrete-year NOx and SOx RTCs traded from calendar years 2013 through 2018. The table shows that all annual average prices for discrete-year NOx and SOx RTCs were well below the \$45,734 per ton of NOx and \$32,929 per ton of SOx discrete-year RTCs pre-determined overall program review thresholds established by the Governing Board pursuant to Health and Safety Code §39616(f), and as well as, the \$15,000 threshold specified under Rule 2015(b)(6) for reviews of the compliance aspects of the program.

**Table 2-14**  
**Annual Average Prices for Discrete-Year NOX RTCs during Calendar Years 2013 through 2018 (price per ton)**

RTC Compliance Year	Calendar Year during which RTCs Traded					
	2013	2014	2015	2016	2017	2018
2011						
2012	548.92					
2013	1,080.49	1,064.97				
2014	1,880.92	1,909.69	1,038.82			
2015	1,000.00	3,779.00	1,642.05	1,625.75		
2016	1,500.00		2,833.39	2,926.90	2,202.90	
2017	3,000.00		4,019.76	6,606.21	4,181.75	1,871.76
2018	3,800.00		6,006.11		10,639.19	3,788.31
2019			8,066.67			5,645.67
2020						5,673.91

**Table 2-15**  
**Annual Average Prices for Discrete-Year SOX RTCs during Calendar Years 2013 through 2018 (price per ton)**

RTC Compliance Year	Calendar Year during which RTCs Traded					
	2013	2014	2015	2016	2017	2018
2011						
2012	291.40					
2013	485.05	377.75				
2014		400.00	483.40			
2015	900.00		380.00	540.29		
2016	900.00			1,254.55	635.83	
2017					1,385.71	785.56
2018						954.61
2019					4,800.00	
2020					4,800.00	

### ***Rolling Average NOx and SOx RTCs Price Report***

On December 4, 2015, the Governing Board amended Rule 2002 to change the 12-month rolling average price of NOx RTCs for all trades for the current compliance year, excluding RTC trades reported at no price and swap transactions to a \$22,500 per ton threshold. It also established a new \$35,000 per ton threshold for the three-month rolling average price of current compliance year NOx RTCs and a \$200,000 per ton “price-floor” threshold for the twelve-month rolling average price of IYB NOx RTCs that would have become effective in 2019. The price floor in 2002(f)(1)(l) was subsequently removed by the Governing Board on October 5, 2018. The reporting of the three-month rolling average prices for current compliance year’s NOx RTCs and the twelve-month rolling average prices of IYB NOx RTCs started on May 1, 2016.

The December 2015 amendments directed the Executive Officer to report to the Governing Board if (a) the cost of current compliance year NOx RTCs exceeds \$22,500 per ton based on the twelve-month rolling average price, or (b) \$35,000

per ton based on the three-month rolling average price. If either (a) or (b) above occurs, the Governing Board may convert the Non-tradable/Non-usable NOx RTCs valid for the period in which the RTC price(s) exceeded an applicable threshold to Tradable/Usable NOx RTCs pursuant to Rule 2002(f)(1)(H). Additionally, the Executive Officer's report to the Governing Board will include a "commitment and schedule to conduct a more rigorous control technology implementation, emission reduction, cost-effectiveness, market analysis, and socioeconomic impact assessment of the RECLAIM program."

Starting January 2017, the Executive Officer is calculating and reporting the twelve-month rolling average prices for current compliance year SOx RTCs as required by the November 5, 2010 amendment to Rule 2002. The amendment established the \$50,000 per ton of SOx RTC threshold. In the event that the SOx RTC price threshold is exceeded, the Governing Board will decide whether or not to convert any portion of the Non-tradable/Non-usable SOx RTCs to Tradable/Usable SOx RTCs. Tables 2-16 through 2-19 list the various rolling average prices described above. The average NOx and SOx discrete-year RTC prices have all remained well below the applicable reporting thresholds.

**Table 2-16  
Twelve-Month Rolling Average Prices of Compliance Year 2018 Discrete-Year NOx RTCs**

Reporting Month	12-Month Period	Average Price (\$/ton)
January 2018	January 2017 through December 2017	\$10,639
February 2018	February 2017 through January 2018	\$10,639
March 2018	March 2017 through February 2018	\$10,337
April 2018	April 2017 through March 2018	\$9,643
May 2018	May 2017 through April 2018	\$9,320
June 2018	June 2017 through May 2018	\$9,473
July 2018	July 2017 through June 2018	\$8,618
August 2018	August 2017 through July 2018	\$8,251
September 2018	September 2017 through August 2018	\$8,050
October 2018	October 2017 through September 2018	\$7,287
November 2018	November 2017 through October 2018	\$5,447
December 2018	December 2017 through November 2018	\$4,219
January 2019	January 2018 through December 2018	\$3,786

**Table 2-17**  
**Three-Month Rolling Average Prices of Compliance Year 2018 Discrete-Year NOx RTCs**

Reporting Month	12-Month Period	Average Price (\$/ton)
January 2018	October 2017 through December 2017	\$10,500
February 2018	November 2017 through January 2018	\$10,500
March 2018	December 2017 through February 2018	\$7,300
April 2018	January 2018 through March 2018	\$7,295
May 2018	February 2018 through April 2018	\$6,855
June 2018	March 2018 through May 2018	\$6,160
July 2018	April 2018 through June 2018	\$6,235
August 2018	May 2018 through July 2018	\$5,848
September 2018	June 2018 through August 2018	\$5,813
October 2018	July 2018 through September 2018	\$4,233
November 2018	August 2018 through October 2018	\$3,517
December 2018	September 2018 through November 2018	\$3,435
January 2019	October 2018 through December 2018	\$3,251

**Table 2-18**  
**Twelve-Month Rolling Average Prices of IYB NOx RTCs\***

Reporting Month	12-Month Period	Average Price (\$/ton)
January 2018	January 2017 through December 2017	\$39,673
February 2018	February 2017 through January 2018	\$26,853
March 2018	March 2017 through February 2018	\$26,853
April 2018	April 2017 through March 2018	\$26,853
May 2018	May 2017 through April 2018	\$21,374
June 2018	June 2017 through May 2018	\$21,339
July 2018	July 2017 through June 2018	\$20,103
August 2018	August 2017 through July 2018	\$20,103
September 2018	September 2017 through August 2018	\$20,103
October 2018	October 2017 through September 2018	\$20,103

\* The October 5, 2018 amendment to Rule 2002 eliminated the requirement to calculate infinite-year block NOx RTC prices. The October 2018 report to the SCAQMD Stationary Source Committee was the last time the twelve-month rolling average prices of IYB NOx RTCs was calculated.

**Table 2-19**  
**Twelve-Month Rolling Average Prices of Compliance Year 2018 Discrete-Year SOx RTCs**

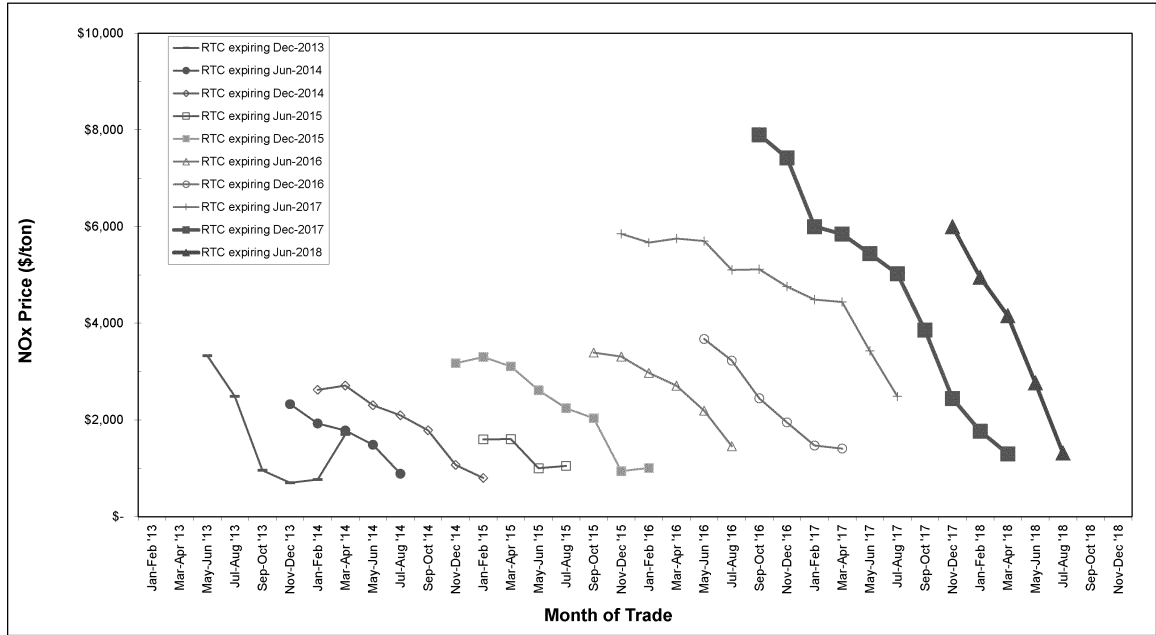
Reporting Month	12-Month Period	Average Price (\$/ton)
January 2018	January 2017 through December 2017	-
February 2018	February 2017 through January 2018	-
March 2018	March 2017 through February 2018	-
April 2018	April 2017 through March 2018	-
May 2018	May 2017 through April 2018	-
June 2018	June 2017 through May 2018	\$700
July 2018	July 2017 through June 2018	\$700
August 2018	August 2017 through July 2018	\$715
September 2018	September 2017 through August 2018	\$713
October 2018	October 2017 through September 2018	\$829
November 2018	November 2017 through October 2018	\$955
December 2018	December 2017 through November 2018	\$955
January 2019	January 2018 through December 2018	\$955

***Average Price for NOx RTCs Nearing Expiration***

Generally, RTC prices decrease as their expiration dates approach and during the sixty days after their expiration dates during which they can be traded. RTC prices are usually lowest during the 60 day-period following their expiration date during which facilities are allowed to trade and obtain RTCs to cover their emissions. This general trend has been repeated every year since 1994 except for Compliance Years 2000 and 2001 (during the California energy crisis), when NOx RTC prices increased as the expiration dates approached because the power plants' NOx emissions increased significantly, causing a shortage of NOx RTCs. Prices for NOx RTCs that expired in calendar year 2018 followed the general trend of RTC prices declining over the course of the compliance year and the sixty-day trading period thereafter.

The bi-monthly average price for these near-expiration NOx RTCs is shown in Figure 2-11 to illustrate the general price trend for these RTCs. The general declining trend of RTC prices nearing and just past expiration indicates that there was an adequate supply to meet RTC demand during the final reconciliation period following the end of the compliance years. A similar analysis is not performed for the price of SOx RTCs nearing expiration because there are not enough SOx trades over the course of the year to yield meaningful data. For calendar year 2018, there were only 17 discrete-year SOx trades with price for Compliance Years' 2017 and 2018 RTCs. These prices ranged from \$786 per ton to \$955 per ton throughout the year.

**Figure 2-11**  
**Bi-Monthly Average Price for NOx RTCs near Expiration**



Note: Data is presented for a limited number of RTC expiration dates for graphical clarity.

**IYB RTC Prices**

The annual average price for IYB NOx RTCs traded in calendar year 2018 was \$13,223 per ton, which is much lower than the annual average price of \$39,673 per ton traded in calendar year 2017. This is expected due to the uncertainty over the future of the NOx RECLAIM program and the program's eventual sunset. The annual average price for IYB SOx RTCs traded in calendar year 2018 was \$30,000 per ton, which is higher than the \$22,820 per ton traded in calendar year 2017. There were two IYB SOx trades with price totaling 3.2 tons in 2018, compared to the four IYB SOx trades and 33.9 tons traded in 2017. Data regarding IYB RTCs traded with price (excluding swap trades) for NOx and SOx RTCs and their annual average prices since 1994 are summarized in Tables 2-20 and 2-21, respectively. In calendar year 2018, the annual average IYB RTC prices did not exceed the \$686,014 per ton of NOx RTCs or the \$493,930 per ton of SOx RTCs program review thresholds established by the Governing Board for IYB RTCs pursuant to California Health and Safety Code §39616(f).



**Table 2-20**  
**IYB NOx Pricing (Excluding Swaps)**

Calendar Year	Total Reported Value (\$ millions)	IYB RTC Traded with Price (tons)	Number of IYB Registrations With Price	Average Price (\$/ton)
1994*	\$1.3	85.7	1	\$15,623
1995*	\$0.0	0	0	N/A
1996*	\$0.0	0	0	N/A
1997*	\$7.9	404.6	9	\$19,602
1998*	\$34.1	1,447.6	23	\$23,534
1999*	\$18.6	438.3	19	\$42,437
2000*	\$9.1	184.2	15	\$49,340
2001*	\$34.2	416.9	25	\$82,013
2002	\$5.5	109.5	31	\$50,686
2003	\$14.3	388.3	28	\$36,797
2004	\$12.5	557.0	52	\$22,481
2005	\$43.1	565.3	71	\$76,197
2006	\$65.2	432.9	50	\$150,665
2007	\$45.4	233.5	25	\$194,369
2008	\$49.7	245.6	27	\$202,402
2009	\$16.7	134.2	14	\$124,576
2010	\$14.3	149.0	13	\$95,761
2011	\$9.1	160.7	29	\$56,708
2012	\$2.2	46.6	13	\$48,146
2013	\$12.0	260.9	17	\$45,914
2014	\$99.7	902.2	49	\$110,509
2015	\$187.4	938.5	47	\$199,685
2016	\$114.7	301.9	20	\$380,057
2017	\$1.26	31.8	6	\$39,673
2018	\$0.52	39.6	5	\$13,223

\* No information regarding swap trades was reported until May 9, 2001.

**Table 2-21**  
**IYB SOx Pricing (Excluding Swaps)**

Calendar Year	Total Reported Value (\$ millions)	IYB RTC Traded with Price (tons)	Number of IYB Registrations With Price	Average Price (\$/ton)
1994*	\$0.0	0	0	N/A
1995*	\$0.0	0	0	N/A
1996*	\$0.0	0	0	N/A
1997*	\$11.9	429.2	7	\$27,738
1998*	\$1.0	50.0	1	\$19,360
1999*	\$0.8	55.0	3	\$14,946
2000*	\$1.4	50.6	5	\$27,028
2001*	\$10.2	306.8	8	\$33,288
2002	\$6.7	147.5	5	\$45,343
2003	\$0.6	110.9	1	\$5,680
2004	\$0.0	0.0	0	N/A
2005	\$1.0	141.5	3	\$7,409
2006	\$3.5	241.7	12	\$14,585
2007	\$3.7	155.2	5	\$23,848
2008	\$3.3	146.8	5	\$22,479
2009	\$3.7	100.0	4	\$36,550
2010	\$30.2	277.0	10	\$109,219
2011	\$1.03	10.0	2	\$102,366
2012	\$14.6	116.2	4	\$125,860
2013	\$14.4	79.2	4	\$181,653
2014	\$1.8	22.5	4	\$80,444
2015	\$4.0	74.8	4	\$53,665
2016	\$0.13	2.5	1	\$50,000
2017	\$0.77	33.92	4	\$22,820
2018	\$0.09	3.16	2	\$30,000

\* No information regarding swap trades was reported until May 9, 2001.

### Recent Program Amendments' Effect on Trading Trend

The SCAQMD Governing Board directed staff in March 2017 to transition the RECLAIM program to a command-and-control regulatory structure (see discussion in Chapter 3 under Program Amendments). Staff then initiated this effort and initial determinations have been sent to a group of facilities. This rulemaking effort may have had a significant impact on RTC trading activity and prices in 2018. Both the total value and the volume of discrete NOx RTCs traded decreased in 2018 compared to 2017. Similar to the discrete NOx trading activity, both the total value and the volume of IYB NOx RTCs decreased (the total value decreased from \$1.3 million in 2017 to only \$0.52 million in 2018). With the planned transition to a Command-and-Control regulatory structure, the longevity and utility of IYB RTCs will most likely diminish. The time horizon to possibly recoup investments in future years is shortened. Therefore, it is reasonable to expect values of IYB RTCs to decrease.

Like discrete NO<sub>x</sub> RTCs, discrete SO<sub>x</sub> RTCs also decreased in price during calendar year 2018 despite further reduction in SO<sub>x</sub> RTC supply in Compliance Year 2017. The SO<sub>x</sub> RTC supply was shaved starting with Compliance Year 2013, and continued to full implementation in Compliance Years 2019 and after. This reduced RTC supply should theoretically lead to higher prices.

The price of IYB SO<sub>x</sub> RTCs increased slightly, whereas the price of IYB NO<sub>x</sub> RTCs decreased significantly. The differing RTC price trend could be due to the further NO<sub>x</sub> emission reductions destined under CMB-05 of the Final 2016 Air Quality Management Plan and to the current transition of NO<sub>x</sub> RECLAIM, whereas the RECLAIM SO<sub>x</sub> program is intended to continue to exist at least until after all NO<sub>x</sub> sources have been transitioned out of the Program.

### **Other Types of RTC Transactions and Uses**

Another type of RTC trade, besides traditional trading and swapping activities, is a trade involving the contingent right (option) to purchase RTCs. In those trades, one party pays a premium for the contingent right (option) to purchase RTCs owned by the other party at a pre-determined price within a certain time period. Until RTCs are transferred from seller to buyer, prices for options are not reported, because the seller is not paid for the actual RTCs, but only for the right to purchase the RTCs at a future date. These rights may or may not actually be exercised. RTC traders are obligated to report options to SCAQMD within five business days of reaching an agreement. These reports are posted on SCAQMD's website. There were no reported trades involving the contingent right to buy or sell RTCs in calendar year 2018.

In addition to mitigating emissions at RECLAIM facilities, RTCs were also used by facilities to satisfy variance conditions. During calendar year 2018, one RECLAIM facility and one non-RECLAIM facility retired a total of 7.6 tons of NO<sub>x</sub> RTCs for this purpose. These consisted of discrete-year NO<sub>x</sub> RTCs for Compliance Years 2017 and 2018.

## **Market Participants**

RECLAIM market participants have traditionally included RECLAIM facilities, brokers, commodity traders, and private investors. Starting in calendar year 2004, mutual funds joined the traditional participants in RTC trades. Market participation expanded further in 2006, when foreign investors started participating in RTC trades. However, foreign investors have not participated in any RTC trades since calendar year 2008 and foreign investors do not hold any current or future RTCs at this time.

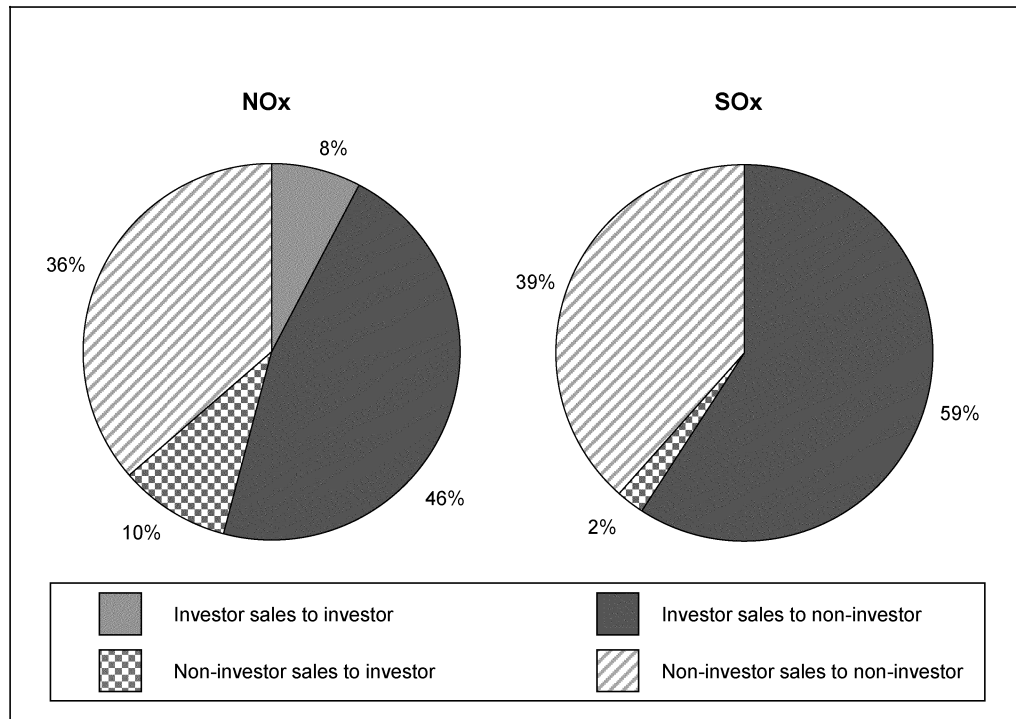
RECLAIM facilities are the primary users of RTCs and they hold the majority of RTCs as allocations. They usually sell their surplus RTCs by the end of the compliance year or when they have a long-term decrease in emissions. Brokers match buyers and sellers, and usually do not purchase or own RTCs. Commodity traders and private investors actually invest in and own RTCs in order to seek profits by trading them. They do not need RTCs to offset or reconcile any emissions. For purposes of discussion in this report, "investors" include all parties who hold RTCs other than RECLAIM facility permit holders and brokers. Brokers typically do not actually purchase RTCs, but only facilitate trades.

**Investor Participation**

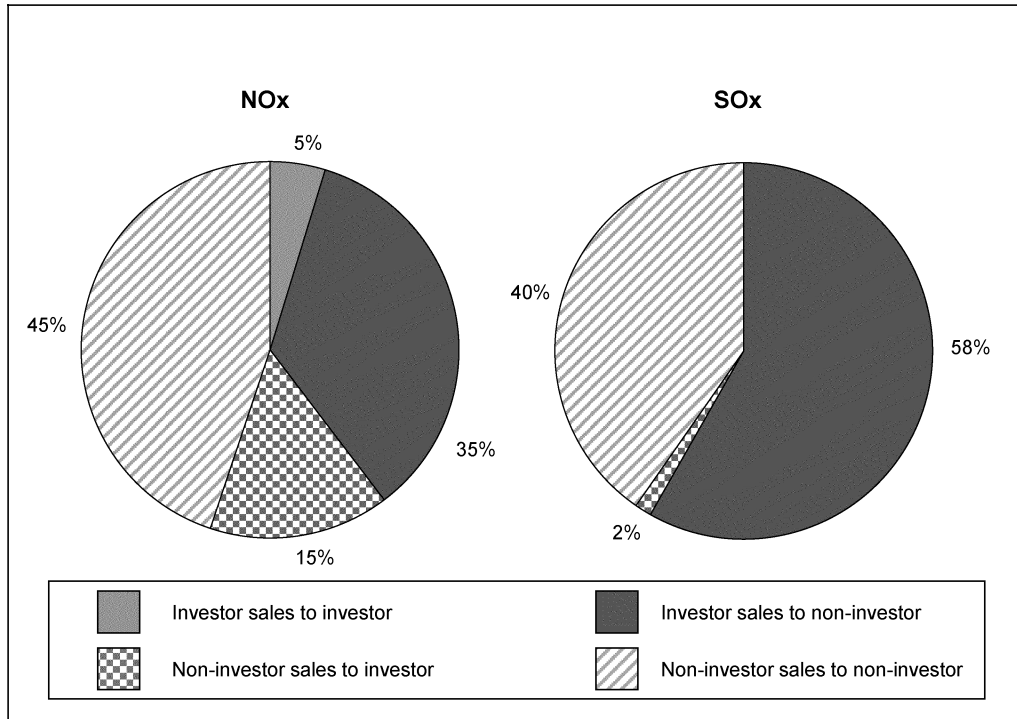
In 2018, investors were actively involved in 114 of the 186 discrete-year NOx RTC trades with price and 11 of the 17 discrete-year SOx RTC trades with price. Investors were involved in three of the five IYB NOx trades with price, and one of the two IYB SOx trades with price.

Investors' involvement in discrete-year NOx and SOx trades registered with price in calendar year 2018 is illustrated in Figures 2-12 and 2-13. Figure 2-12 is based on total value of discrete-year NOx and SOx RTCs traded, and shows that investors were involved in 64% and 61%, respectively, of the discrete-year NOx and SOx trades reported by value. Figure 2-13 is based on volume of discrete-year RTCs traded with price and shows that investors were involved in 55% and 60% of the discrete-year NOx and SOx trades by volume, respectively. Figures 2-14 and 2-15 provide similar data for IYB NOx and SOx trades. Investors were involved 64% and 45% of IYB NOx and SOx trades by value, and 50% and 45% of IYB NOx and SOx trades by volume, respectively.

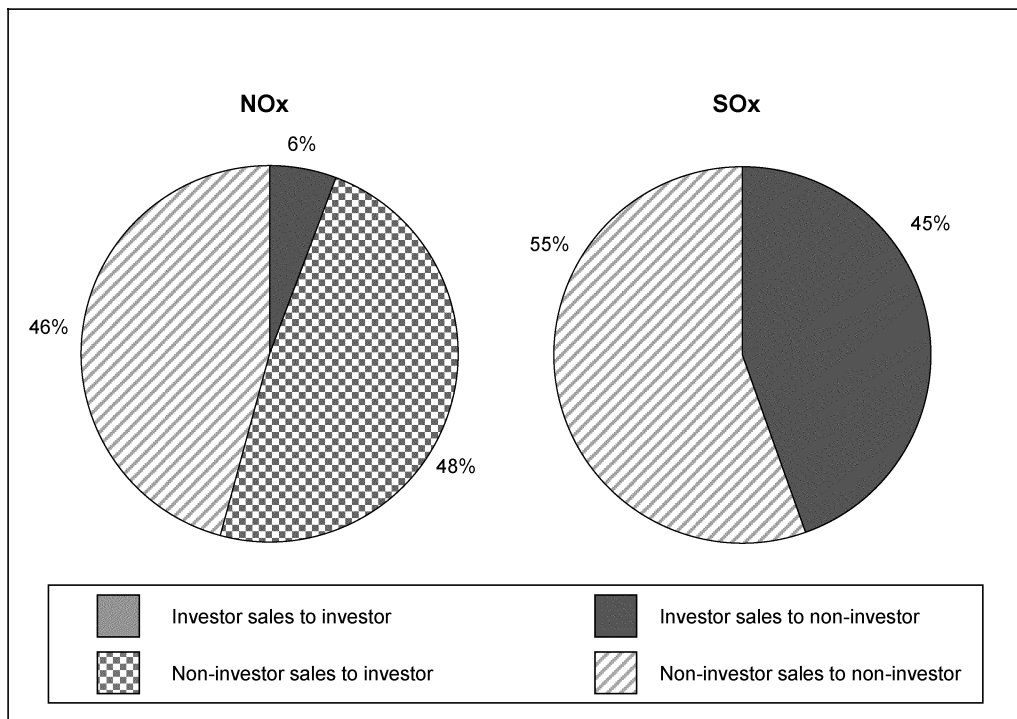
**Figure 2-12  
Calendar Year 2018 Investor-Involved Discrete-Year NOx and SOx Trades Based on Value Traded**



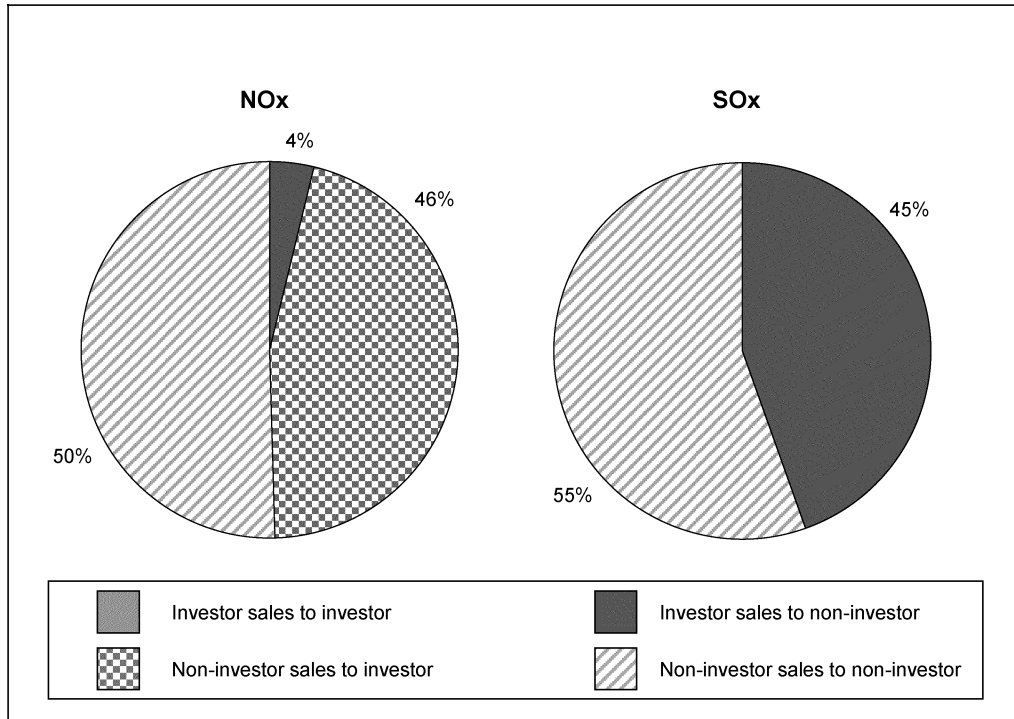
**Figure 2-13**  
**Calendar Year 2018 Investor-Involved Discrete-Year NOx and SOx Trades Based on Volume Traded with Price**



**Figure 2-14**  
**Calendar Year 2018 Investor-Involved IYB NOx and SOx Trades Based on Value Traded**



**Figure 2-15**  
**Calendar Year 2018 Investor-Involved IYB NOx and SOx Trades Based on Volume Traded with Price**



As of the end of calendar year 2018, investors' holding of IYB NOx RTCs had slightly increased to 3.8% compared to 3.3% at the end of calendar year 2017. Mutual fund investors are no longer holders of IYB NOx RTCs, down from a high of 3.3% at the end of calendar year 2011 and 1.4% at the end of calendar year 2014. Investors' holding of IYB SOx RTCs decreased to 4.7% at the end of calendar year 2018 from 6.0% at the end of calendar year 2017. No IYB SOx RTCs are currently held by mutual fund investors.

The available supply of IYB RTCs are generally from facilities that have permanently reduced emissions through the installation of control equipment, the modification or replacement of old equipment, or equipment and/or facility shutdowns. There were four RECLAIM facilities that shut down during Compliance Year 2017. These four facilities all participated in the NOx RECLAIM program only and held a total of 15.9 tons of IYB NOx RTCs. None of the IYB RTCs were sold prior to or after the facilities shutdown.

**Investor Impacts on RTC Market**

Theoretically, the role of investors in this market is to provide capital for installing air pollution control equipment that costs less than the market value of credits. In addition, investors can also improve price competitiveness. This market theory may not fully apply to RECLAIM due to the uniqueness of the program because RECLAIM facility operators have no substitute for RTCs, and short of curtailing operations, pollution controls cannot be implemented within a short time period. That is, there is no alternative source of credits available to RECLAIM facilities

when RTC prices increase (they do not have the option to switch to another source of credits when RTCs become expensive). Therefore, RECLAIM facility operators may be at the mercy of owners of surplus or investor-owned RTCs in the short term, particularly during times of rapid price increases, as evidenced in 2000 and 2001 during the California energy crisis.

Generally, RECLAIM facilities hold back additional RTC's for each year as a compliance margin to ensure that they do not inadvertently find themselves exceeding their allocations (failing to reconcile by securing sufficient RTCs to cover their emissions) if their reported emissions increase as the result of any problems or errors discovered by SCAQMD staff during annual facility audits. Facilities have indicated to staff in the past that this compliance margin is approximately 10% of their emissions. For Compliance Year 2017, the total RECLAIM NOx emissions were 7,246 tons, while the total NOx RTC allocation was 8,978 tons. This NOx RTC surplus of 1,732 tons (19% of allocation) is well above the 10% compliance margin reportedly held by RECLAIM facilities. If the future total NOx emissions stay constant, the difference between the NOx RTC allocation and NOx emissions would not decrease below 10% until Compliance Year 2020.

In past annual audit reports, staff made comparisons between emissions and future available RTC supplies to highlight the potential of a seller's market for NOx RTCs if adequate emissions controls were not implemented in a timely manner. The probability of this scenario has diminished because of current efforts to transition to a command and control framework. Barring a sudden and significant surge in NOx emissions during 2018 Compliance Year, it is expected that there will be adequate RTCs available to reconcile with RECLAIM NOx emissions despite investor IYB holdings of 3.8 percent.

## CHAPTER 3

### EMISSION REDUCTIONS ACHIEVED

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#### Summary

*For Compliance Year 2017, aggregate NOx emissions were below total allocations by 19% and aggregate SOx emissions were below total allocations by 17%. No emissions associated with breakdowns were excluded from reconciliation with facility allocations in Compliance Year 2017. Accordingly, no mitigation is necessary to offset excluded emissions due to approved Breakdown Emission Reports. Therefore, based on audited emissions, RECLAIM achieved its targeted emission reductions for Compliance Year 2017. With respect to the Rule 2015 backstop provisions, Compliance Year 2017 aggregate NOx and SOx emissions were both well below aggregate allocations and, as such, did not trigger the requirement to review the RECLAIM program.*

#### Background

One of the primary objectives of the annual RECLAIM program audits is to assess whether RECLAIM is achieving its targeted emission reductions. Those targeted emission reductions are embodied in the annual allocations issued to RECLAIM facilities. In particular, the annual allocations reflect required emission reductions initially from the subsumed command-and-control rules and control measures, as well as from subsequent reductions in allocations as a result of BARCT implementation.

In January 2005 and December 2015, the Board adopted amendments to Rule 2002 to further reduce aggregate RECLAIM NOx allocations through implementation of the latest BARCT. The 2005 amendments resulted in cumulative NOx allocation reductions of 22.5% (2,811 tons/year, or 7.7 tons/day) from all RECLAIM facilities by Compliance Year 2011, with the biggest single-year reduction of 11.7% in Compliance Year 2007. The 2015 amendments will reduce NOx allocations by 45.2% (4,380 tons/year, or 12.0 tons/day) by Compliance Year 2022. The reductions are phased-in from Compliance Year 2016 through Compliance Year 2022 with 2 tons/day of the NOx Allocation reduction occurring through Compliance Year 2017.

The Board also amended Rule 2002 in November 2010 to implement BARCT for SOx. Specifically, the November 2010 amendments called for certain facilities' RECLAIM SOx allocations to be adjusted to achieve a 48.4% (2,081 tons/year, or 5.7 tons/day) overall reduction, with the reductions phased-in from Compliance Year 2013 through Compliance Year 2019. For Compliance Year 2017, 1,825 tons/year, or 5.0 tons/day (approximately 88% of the scheduled reduction), of SOx allocations were reduced. The final 255.5 ton/year (0.7 ton/day) reduction will occur in Compliance Year 2019.

#### Emissions Audit Process

Since the inception of the RECLAIM program, SCAQMD staff has conducted annual program audits of the emissions data submitted by RECLAIM facilities to ensure the integrity and reliability of RECLAIM emission data. The process



includes reviews of APEP reports submitted by RECLAIM facilities and audits of field records and emission calculations. The audit process is described in further detail in Chapter 5 – Compliance.

SCAQMD staff adjusts the APEP-reported emissions based on audit results, as necessary. Whenever SCAQMD staff finds discrepancies, they discuss the findings with the facility operators and provide the operators an opportunity to review changes resulting from facility audits and to present additional data or information in support of the data stated in their APEP reports.

This rigorous audit process, although resource intensive, reinforces RECLAIM's emissions monitoring and reporting requirements and enhances the validity and reliability of the final emissions data. The audited emissions are used to determine if a facility complied with its allocations. The most recent five compliance years' audited NOx emissions for each facility are posted on SCAQMD's web page after the audits are completed. All emissions data presented in this annual RECLAIM audit report are compiled from audited facility emissions.

## **Emission Trends and Analysis**

RECLAIM achieves its emission reduction goals on an aggregate basis by ensuring that annual emissions are below total RTCs. It is important to understand that the RECLAIM program is successful at achieving these emission reduction goals even when some individual RECLAIM facilities exceed their RTC account balances, provided aggregate RECLAIM emissions do not exceed aggregate RTCs issued. Therefore, aggregate audited NOx or SOx emissions from all RECLAIM sources are the basis for determining whether the programmatic emission reduction goals for that emittent are met each year.

Table 3-1 and Figure 3-1 show aggregate audited NOx emissions and the aggregate annual NOx RTC supply for Compliance Years 1994 through 2017. No facility audits for Compliance Years 1994 through 2016 were reopened during the past year so the aggregate audited NOx and SOx emissions for these years are unchanged from the previous annual report. Programmatically, there were excess NOx RTCs remaining after accounting for audited NOx emissions for every compliance year since 1994, except for Compliance Year 2000 when NOx emissions exceeded the total allocations due to the California energy crisis. Aggregate NOx allocations for Compliance Year 2017 were reduced by 722 tons from Compliance Year 2015 levels due to the 2015 BARCT related amendment of Rule 2002. Annual NOx emissions have remained within a narrow range (between 7,246 tons and 7,691 tons annually) since Compliance Year 2011. Specifically, Compliance Year 2017 NOx emissions were below total allocations by 19% and returned to the same level (7,246 tons) as Compliance Year 2015.

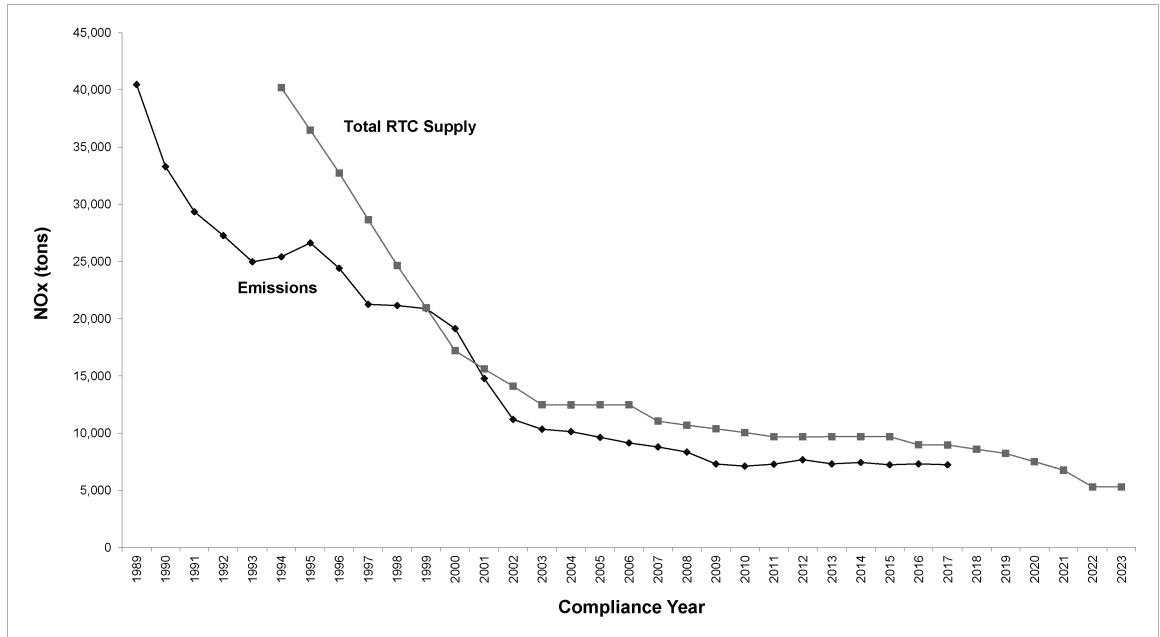
**Table 3-1**  
**Annual NOx Emissions for Compliance Years 1994 through 2017**

Compliance Year	Audited Annual NOx Emissions <sup>1</sup> (tons)	Audited Annual NOx Emissions Change from 1994 (%)	Total NOx RTCs <sup>2</sup> (tons)	Unused NOx RTCs (tons)	Unused NOx RTCs (%)
1994	25,420	0%	40,187	14,767	37%
1995	26,632	4.8%	36,484	9,852	27%
1996	24,414	-4.0%	32,742	8,328	25%
1997	21,258	-16%	28,657	7,399	26%
1998	21,158	-17%	24,651	3,493	14%
1999	20,889	-18%	20,968	79	0.38%
2000	19,148	-25%	17,208	-1,940	-11%
2001	14,779	-42%	15,617	838	5.4%
2002	11,201	-56%	14,111	2,910	21%
2003	10,342	-59%	12,485	2,143	17%
2004	10,134	-60%	12,477	2,343	19%
2005	9,642	-62%	12,484	2,842	23%
2006	9,152	-64%	12,486	3,334	27%
2007	8,796	-65%	11,046	2,250	20%
2008	8,349	-67%	10,705	2,356	22%
2009	7,306	-71%	10,377	3,071	30%
2010	7,121	-72%	10,053	2,932	29%
2011	7,302	-71%	9,690	2,388	25%
2012	7,691	-70%	9,689	1,998	21%
2013	7,326	-71%	9,699	2,373	24%
2014	7,447	-71%	9,699	2,252	23%
2015	7,246	-71%	9,700	2,454	25%
2016	7,328	-71%	8,992	1,664	19%
2017	7,246	-71%	8,978	1,732	19%

<sup>1</sup> The RECLAIM universe is divided into two cycles with compliance schedules staggered by six months. Compliance years for Cycle 1 facilities run from January 1 through December 31 and Cycle 2 compliance years are from July 1 through June 30.

<sup>2</sup> Total RTCs = Allocated RTCs + RTCs from ERC conversion.

**Figure 3-1  
NOx Emissions and Available RTCs**



Similar to Table 3-1 and Figure 3-1 for NOx, Table 3-2 presents aggregate annual SOx emissions data for each compliance year based on audited emissions, and Figure 3-2 compares these audited aggregate annual SOx emissions with the aggregate annual SOx RTC supply. As shown in Table 3-2 and Figure 3-2, RECLAIM facilities have not exceeded their SOx allocations on an aggregate basis in any compliance year since program inception. For Compliance Year 2017, SOx emissions had a slight increase compared to those in Compliance Year 2016 (from 2,024 tons to 2,043 tons) and were below total allocations by 17%. Annual SOx emissions have remained within a narrow range (between 2,024 tons and 2,176 tons) since Compliance Year 2013. For Compliance Year 2017, SOx Allocations were reduced by 362 tons pursuant to reductions adopted by the Governing Board in November 2010. The data indicates that RECLAIM met its programmatic SOx emission reduction goals and demonstrated equivalency in SOx emission reductions compared to the subsumed command-and-control rules and control measures.

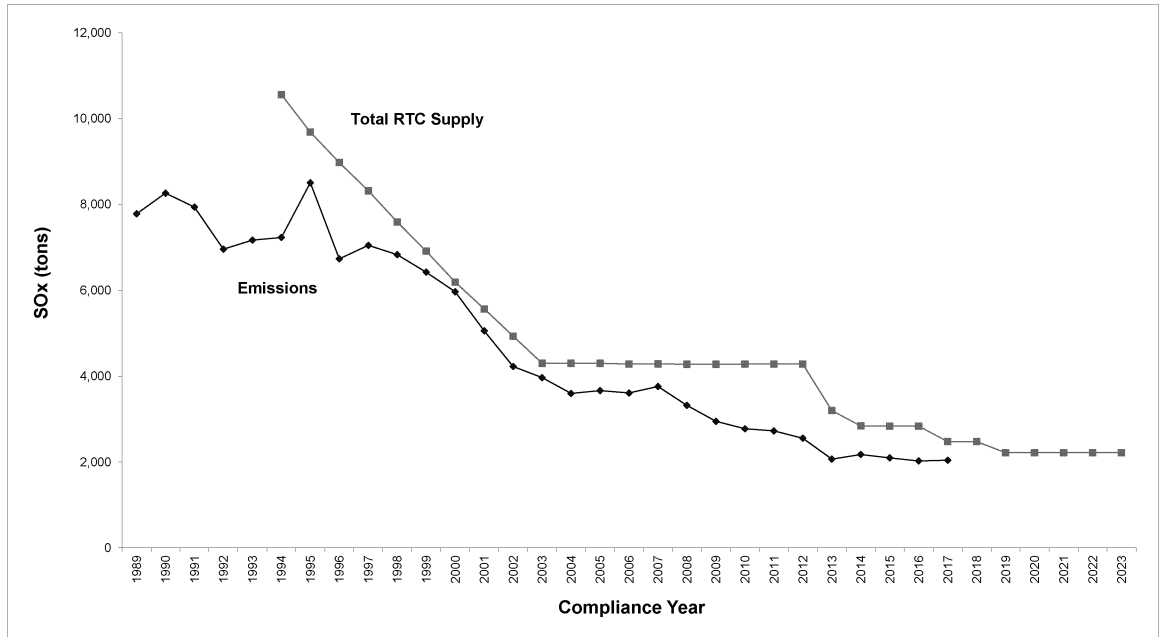
**Table 3-2**  
**Annual SOx Emissions for Compliance Years 1994 through 2017**

Compliance Year	Audited Annual SOx Emissions <sup>1</sup> (tons)	Audited Annual SOx Emissions Change from 1994 (%)	Total SOx RTCs <sup>2</sup> (tons)	Unused SOx RTCs (tons)	Unused SOx RTCs (%)
1994	7,230	0%	10,559	3,329	32%
1995	8,508	18%	9,685	1,177	12%
1996	6,731	-6.9%	8,976	2,245	25%
1997	7,048	-2.5%	8,317	1,269	15%
1998	6,829	-5.5%	7,592	763	10%
1999	6,420	-11%	6,911	491	7.1%
2000	5,966	-17%	6,194	228	3.7%
2001	5,056	-30%	5,567	511	9.2%
2002	4,223	-42%	4,932	709	14%
2003	3,968	-45%	4,299	331	7.7%
2004	3,597	-50%	4,299	702	16%
2005	3,663	-49%	4,300	637	15%
2006	3,610	-50%	4,282	672	16%
2007	3,759	-48%	4,286	527	12%
2008	3,319	-54%	4,280	961	22%
2009	2,946	-59%	4,280	1,334	31%
2010	2,775	-62%	4,282	1,507	35%
2011	2,727	-62%	4,283	1,556	36%
2012	2,552	-65%	4,283	1,731	40%
2013	2,066	-71%	3,198	1,132	35%
2014	2,176	-70%	2,839	663	23%
2015	2,096	-71%	2,836	740	26%
2016	2,024	-72%	2,836	812	29%
2017	2,043	-72%	2,474	431	17%

<sup>1</sup> The RECLAIM universe is divided into two cycles with compliance schedules staggered by six months. Compliance years for Cycle 1 facilities run from January 1 through December 31 and Cycle 2 compliance years are from July 1 through June 30.

<sup>2</sup> Total RTCs = Allocated RTCs + RTCs from ERC conversion.

**Figure 3-2  
SOx Emissions and Available RTCs**



### Comparison to Command-and-Control Rules

RECLAIM subsumed a number of command-and-control rules<sup>1</sup> and sought to achieve reductions equivalent to these subsumed rules that continue to apply to non-RECLAIM facilities. RECLAIM facilities are exempt from the subsumed rules' requirements that apply to SOx or NOx emissions once the facilities comply with the applicable monitoring requirements of Rules 2011 – Requirements for Monitoring, Reporting, and Recordkeeping for Oxides of Sulfur (SOx) Emissions or 2012 – Requirements for Monitoring, Reporting, and Recordkeeping for Oxides of Nitrogen (NOx) Emissions, respectively. No changes were made to these subsumed rules during Compliance Year 2017.

Other rules that were amended or adopted during Compliance Year 2017, but not subsumed by RECLAIM include Rule 1118 – Control of Emissions from Refinery Flares and Rule 1111 – Reduction of NOx Emissions from Natural-Gas-Fired, Fan-Type Central Furnaces. On July 7, 2017, the Governing Board amended Rule 1118 – Control of Emissions from Refinery Flares to minimize flaring from refineries. Refinery flares are specifically excluded from RECLAIM<sup>2</sup>. Amended Rule 1118 incorporated parts of U.S. EPA's recently updated Refinery Sector Rule that focused on reducing significant flaring events, and ensuring that when flaring does occur, combustion is as efficient as possible in order to reduce emissions. Additionally, this amended rule included requirements for facilities to: 1) prepare a Scoping Document to evaluate the feasibility of reducing or avoiding flaring events, 2) update emission factors based on recent U.S. EPA guidance, 3) remove the annual cap on mitigation fees paid for flaring, 4) remove the existing

<sup>1</sup> See Tables 1 and 2 of Rule 2001.

<sup>2</sup> See Rules 2011(i) and Rule 2012(k).

\$4 million annual cap on Mitigation Fees, and 5) enhance current reporting requirements, as well as other administrative updates.

On March 2, 2018, the Governing Board amended Rule 1111 – Reduction of NOx Emissions from Natural-Gas-Fired, Fan-Type Central Furnaces. Prior amendments to this rule had lowered the NOx emission limit for certain natural-gas-fired fan-type residential furnaces to 14 ng/J and provided manufacturers additional time to develop and commercialize compliant units by allowing a mitigation fee alternative compliance option. However, additional time was needed to commercialize a range of compliant units for the various categories of furnaces. The March amendment to Rule 1111 increased and extended this mitigation fee alternative compliance option, and prohibited the installation of propane furnaces in the SCAQMD capable of being fired on natural gas without proper certification. At the Public Hearing to adopt the Rule 1111 amendments, the Board directed staff to propose additional labeling requirements to better inform consumers when they consider a unit which does not meet the emission standard and is subject to mitigation fee. As a result, on July 6, 2018, new requirements for identifying this type of furnace was proposed and Rule 1111 was amended by the Governing Board. The requirements include proper labeling on the equipment, in all brochures, in technical specification sheets, and on the manufacturer’s website for these specific units.

Since both Rule 1118 and Rule 1111 were not subsumed under RECLAIM and contained no exemptions from their applicability to RECLAIM NOx or SOx sources, the requirements of these amended rules apply equally to both RECLAIM and non-RECLAIM facilities. As such, there are no differential impacts in emissions when comparing the applicability of amended rule requirements to NOx and SOx sources under RECLAIM with NOx and SOx sources of non-RECLAIM facilities.

Consequently, during Compliance Year 2017, both rules subsumed by RECLAIM, and rules not subsumed by RECLAIM that were recently amended, did not result in any disparate impacts between NOx and SOx sources at RECLAIM and NOx and SOx sources at non-RECLAIM facilities.

## **Program Amendments**

On March 3, 2017, the Governing Board adopted a resolution during the adoption of the 2016 AQMP that directed staff to modify Control Measure CMB-05 – Further NOx Reductions from RECLAIM Assessment to achieve an additional five tons per day NOx emission reductions as soon as feasible but no later than 2025, and to transition the RECLAIM program to a command and control regulatory structure requiring BARCT level controls as soon as practicable. Additionally, California State Assembly Bill (AB) 617 was approved in July 2017, requiring an expedited schedule for implementing BARCT at RECLAIM facilities that are covered by the Greenhouse Gas (GHG) cap-and-trade program no later than December 31, 2023.

### **Transition Process**

To further this effort, staff organized and held monthly working group meetings (with the first meeting held on June 8, 2017) to discuss the transition of facilities in the RECLAIM program to a command-and-control regulatory structure and to

discuss key policy issues. The objective is to provide an open forum for all stake holders to discuss and guide the transition process. The goal is to develop “Landing Rules” establishing the BARCT emission levels for equipment transitioning out of the NOx RECLAIM program. Rule 2001 – Applicability specifically exempts RECLAIM facilities from a number of existing command-and-control NOx rules (see Table 1 of Rule 2001). As part of the transition process, these command-and-control rules have to be amended and additional new NOx BARCT command-and-control rules have to be adopted (collectively referred to as “Landing Rules”) to ensure that when a facility transitions out of RECLAIM, its NOx equipment has explicit BARCT emission limits and an appropriate time frame to achieve compliance.

The first set of rules to be amended to initiate the transition of NOx sources out of RECLAIM, Rule 2001 – Applicability, and Rule 2002 – Allocations for Oxides of Nitrogen (NOx) and Oxides of Sulfur (SOx), was adopted by the Governing Board on January 5, 2018. Amended Rule 2001 precluded new or existing facilities from entering the NOx and SOx RECLAIM programs as of January 5, 2018. Amended Rule 2002 contained notification procedures for facilities that will be transitioned out of RECLAIM and addressed the RTC holding for these facilities that will be transitioned out or that elect to exit RECLAIM. Under amended Rule 2002, the Executive Officer will provide an initial determination notification to a RECLAIM facility for potential exit to a command-and-control regulatory structure with requirements for the facility to identify all NOx-emitting equipment. This initial determination notification serves as a preliminary notice to a facility for which all NOx sources are covered by Landing Rules, and will be issued when SCAQMD staff determines every permitted NOx source is covered by Landing Rules. When an initial determination notification is issued to a facility, the RECLAIM facility then has 45 days from the date of the notification to identify all NOx-emitting equipment. Failure to provide this information to SCAQMD will result in a freeze on RTC uses, trades, or transfers until the requested information is submitted. If the RECLAIM facility is deemed ready for transition after Executive Officer review, it will receive a final determination notification that will require its exit from RECLAIM and will become subject to command-and-control regulations. If the RECLAIM facility is deemed as not ready for the transition, it will be notified that it will remain in NOx RECLAIM until a later time. Upon exiting RECLAIM, the facility’s future compliance year RTCs cannot be sold or transferred and only RTCs valid for the then current compliance year can be used or sold.

Staff originally identified an initial group of 38 facilities that could potentially exit the NOx RECLAIM program because they had no facility NOx emissions, or had NOx emissions solely from the combination of equipment exempt from obtaining a written permit pursuant to Rule 219 (unless the equipment would be subject to a command-and-control rule that it could not reasonably comply with), various locations permits, or unpermitted equipment and/or RECLAIM equipment that met current command-and-control BARCT rules. However, these facilities have not been issued final determinations to exit RECLAIM pending resolution of New Source Review provisions for facilities that are expected to be transitioned out of RECLAIM.

Both Rules 2001 and 2002 were again amended by the Governing Board on October 5, 2018. Amended Rule 2001 added a provision to allow facilities to opt-

out of RECLAIM if certain criteria were met. Amended Rule 2002 provided an option for facilities that received an initial determination notification to stay in RECLAIM for a limited time, while complying with applicable command-and-control requirements. Additionally, amended Rule 2002 established a requirement that facilities which are issued a final determination to be transitioned out of the NO<sub>x</sub> RECLAIM program to provide emission reduction credits to offset any NO<sub>x</sub> emissions increases, calculated pursuant to Rule 1306 – Emission Calculations, notwithstanding the exemptions contained in Rule 1304 – Exemptions and the requirements contained in Rule 1309.1 – Priority Reserve, until New Source Review provisions governing NO<sub>x</sub> emission calculations and offsets are amended to address former RECLAIM sources. Finally, Rule 2002 removed the requirement to report infinite year block (IYB) NO<sub>x</sub> RTC prices to the Board when the price falls below the minimum threshold.

### **Landing Rules**

As explained earlier, Landing Rules are needed to establish BARCT emission limits, the timing for the implementation of BARCT, and monitoring, reporting, and recordkeeping (MRR) requirements. These Landing Rules also serve to facilitate the transition process for RECLAIM facilities from the requirements of RECLAIM to a command and control regulatory structure. Determination of BARCT limits are made through an analytical process that is comprised of researching control options for facilities' equipment, analyzing the cost-effectiveness of the control options, and calculating the incremental cost-effectiveness of the control options. Emission levels are established based on their current achievability, source test results, and vendor guarantees.

Throughout the BARCT determination process, rule-specific working group meetings are held to present staff's findings regarding the feasibility and cost-effectiveness of implementing BARCT. Working group meetings are open to the public and provide an opportunity for stakeholders to participate in the rule development process. During the public process, cost assumptions are discussed through the Working Group to solicit comments. Cost-effectiveness and incremental cost-effectiveness, if applicable, are discussed and presented during the rule working group meetings, presented at the Public Workshop, included in the Draft Staff Report, and included in the Board Letter for the adoption hearing. The Socioeconomic analysis uses the cost data to estimate regional and industry-specific socioeconomic impacts from the proposed rule and its proposed controls, while the California Environmental Quality Act (CEQA) analysis provides the environmental impacts that result from implementing a rule.

Staff have identified a number of rules that need amendments and new rules that need to be adopted to support the transitioning of NO<sub>x</sub> sources out of RECLAIM. Table 3-3 provides a summary of the identified Landing Rules. Rule 1100 is specifically designed to specify compliance schedules for sources exiting RECLAIM to provide adequate time for the sources to achieve compliance with newly defined BARCT limits. Further information regarding the specifics of each rule can be found at <http://www.agmd.gov/home/rules-compliance/rules/scaqmd-rule-book/proposed-rules>



**Table 3-3  
Summary of Landing Rules**

Rule	Focus Area	Description
113	Monitoring, Reporting, and Recordkeeping	Establishes MRR requirements for facilities exiting RECLAIM.
218 and 218.1	Continuous Emission Monitoring	Revises provisions for continuous emission monitoring systems for facilities exiting RECLAIM.
1100	Implementation Schedule for NOx Facilities	Establishes implementation schedule for equipment that meets applicability provisions of Landing Rules.
1109	Boilers and Process Heaters in Petroleum Refineries	To be rescinded with adoption of Proposed Rule 1109.1.
1109.1	Refinery Equipment	Establishes NOx emission limits to reflect BARCT.
1110.2	Gaseous - and Liquid-Fueled Engines	<ul style="list-style-type: none"> <li>• Updates NOx emission limits to reflect current BARCT.</li> <li>• Establishes ammonia emission limit.</li> </ul>
1117	Glass Melting Furnaces	Establishes NOx emission limits to reflect current BARCT.
1118.1	Non-Refinery Flares	Establishes NOx, VOC and CO emission limits for new or replaced flares and establishes a capacity threshold for existing flares.
1134	Stationary Gas Turbines	<ul style="list-style-type: none"> <li>• Updates NOx emission limits to reflect current BARCT.</li> <li>• Establishes ammonia emission limit.</li> </ul>
1135	Electric Power Generating Systems	<ul style="list-style-type: none"> <li>• Updates NOx emission limits to reflect current BARCT.</li> <li>• Establishes ammonia emission limit.</li> </ul>
1146, 1146.1, and 1146.2	Boilers, Steam Generators, Process Heaters, and Large Water Heaters	<ul style="list-style-type: none"> <li>• Establishes NOx emission limits for specific units.</li> <li>• Requires BARCT technology assessment for specific units.</li> <li>• Establishes ammonia emission limits.</li> </ul>
1147	Miscellaneous Sources	<ul style="list-style-type: none"> <li>• Removes equipment that will be regulated under Proposed Rules 1147.1, 1147.2, and 1147.3.</li> <li>• Evaluates existing NOx emission limits.</li> </ul>
1147.1	Large Miscellaneous Combustion	Establishes NOx emission limits to reflect current BARCT.
1147.2	Metal Melting and Heat Treating Furnaces	Establishes NOx emission limits to reflect current BARCT.
1147.3	Aggregate Facilities	Establishes NOx emission limits to reflect current BARCT.
2001	RECLAIM Applicability	Prevents new NOx RECLAIM facility inclusions as of January 5, 2018.

Rule	Focus Area	Description
2002	RECLAIM Exit Procedures, Requirements and Restrictions	<ul style="list-style-type: none"> <li>• Establishes NOx RECLAIM facility exit notification requirements.</li> <li>• Allows facilities identified as exiting to temporarily remain in NOx RECLAIM.</li> <li>• Requires exited facilities to provide emission reduction credits to offset any NOx emissions increases, until New Source Review provisions governing NOx emission calculations and offsets are amended.</li> <li>• Prohibits exited facilities from selling or transferring future compliance year RECLAIM Trading Credits.</li> </ul>
2005	All Equipment	<ul style="list-style-type: none"> <li>• Allow for New Source Review provisions to address facilities that are transitioning from RECLAIM to command-and-control.</li> <li>• May propose amendments to Regulation XIII to address New Source Review provisions for facilities that transitioned out of RECLAIM.</li> </ul>

Monthly working group meetings are being continued to further discuss steps for transitioning the remaining RECLAIM facilities to a command-and-control structure and to develop necessary rule amendments to implement BARCT for the exiting RECLAIM facilities. Since the RECLAIM universe includes many different industries, separate working groups have been formed to address and develop these different BARCT landing rules. As part of the planning effort, staff originally targeted the first quarter in 2019 to complete the transition. However, completion of the development efforts for the 21 Landing Rules is now targeted for December 2019. Except for those facilities that specifically opted out of the Program pursuant to Rule 2001, transitioning of RECLAIM sources that are eligible to exit is scheduled to begin after the New Source Review provisions are addressed by a rule amendment.

## Breakdowns

Pursuant to Rule 2004(i) – Breakdown Provisions, a facility may request that emission increases due to a breakdown not be counted towards the facility’s allocations. In order to qualify for such exclusion, the facility must demonstrate that the excess emissions were the result of a fire or a mechanical or electrical failure caused by circumstances beyond the facility’s reasonable control. The facility must also take steps to minimize emissions resulting from the breakdown, and mitigate the excess emissions to the maximum extent feasible. Applications for exclusion of unmitigated breakdown emissions from a facility’s total reported annual RECLAIM emissions must be approved or denied by SCAQMD in writing. In addition, facilities are required to quantify unmitigated breakdown emissions for which an exclusion request has been approved in their APEP report.

As part of the annual program audit report, Rule 2015(d)(3) requires SCAQMD staff to determine whether excess emissions approved to be excluded from RTC

reconciliation have been programmatically offset by unused RTCs within the RECLAIM program. If the breakdown emissions exceed the total unused RTCs within the program, any excess breakdown emissions must be offset by either: (1) deducting the amount of emissions not programmatically offset from the RTC holdings for the subsequent compliance year from facilities that had unmitigated breakdown emissions, proportional to each facility’s contribution to the total amount of unmitigated breakdown emissions; and/or (2) RTCs obtained by the Executive Officer for the compliance year following the completion of the annual program audit report in an amount sufficient to offset the unmitigated breakdown emissions.

As shown in Table 3-4, a review of APEP reports for Compliance Year 2017 found that no facilities requested to exclude breakdown emissions from being counted against their allocations. Thus, for Compliance Year 2017, no additional RTCs are required to offset breakdown emissions pursuant to Rule 2015(d)(3).

**Table 3-4  
Breakdown Emission Comparison for Compliance Year 2017**

<b>Emittent</b>	<b>Compliance Year 2017 Unused RTCs (tons)</b>	<b>Unmitigated Breakdown Emissions<sup>1</sup> (tons)</b>	<b>Remaining Compliance Year 2017 RTCs (tons)</b>
NOx	1,732	0	1,732
SOx	431	0	431

<sup>1</sup> Data for unmitigated breakdown emissions (not counted against Allocation) as reported under APEP reports.

### Impact of Changing Universe

As discussed in Chapter 1, no facilities were included or excluded from the NOx universe, no facilities were included or excluded from the SOx universe, and four facilities (four NOx only facilities and no NOx and SOx facility) shut down in Compliance Year 2017. Changes to the universe of RECLAIM facilities have the potential to impact emissions and the supply and demand of RTCs, and therefore, may impact RECLAIM emission reduction goals.

Existing facilities (defined by Rule 2000 as those with valid SCAQMD Permits to Operate issued prior to October 15, 1993 and that continued to be in operation or possess valid SCAQMD permits on October 15, 1993) that are not categorically excluded pursuant to Rule 200(i)(1) may choose to enter the program even though they do not meet the inclusion criteria. Existing facilities that are neither categorically excluded nor exempt pursuant to Rule 2001(i)(2) may also be included by SCAQMD if their facility-wide emissions increase to four tons or more per year of NOx or SOx or both. When one of these existing facilities enters the program, they are issued RTC allocations based on their operational history pursuant to the methodology prescribed in Rule 2002. Inclusions of existing facilities may affect demand more than supply because even though these facilities are issued RTCs based on their operational history, the amount may not be sufficient to offset their current or future operations. Overall, inclusions shift

the accounting of emissions from the universe of non-RECLAIM sources to the universe of RECLAIM sources without actually changing the overall emissions inventory within the South Coast Air Basin. Finally, inclusions change the rules and requirements that apply to the affected facilities. In Compliance Year 2017, no existing facility elected to opt into the RECLAIM universe, no facility was included into the RECLAIM universe based on the Rule 2001 threshold of actual NO<sub>x</sub> and/or SO<sub>x</sub> emissions greater than or equal to four tons per year, and no facility was included through the partial change of operator of an already existing RECLAIM facility.

Facilities that received all SCAQMD Permits to Operate on or after October 15, 1993 are defined by Rule 2000 as new facilities. Except as described above for categorically excluded and exempt facilities, new facilities can choose to enter RECLAIM or can be included due to actual NO<sub>x</sub> or SO<sub>x</sub> emissions in excess of four tons or more per year. New facilities are not issued RTCs based on operational history, but any external offsets provided by the facility are converted to RTCs. For Compliance Year 2017, no new facilities elected to opt into the RECLAIM universe or was included into the RECLAIM universe pursuant to the Rule 2001 threshold. When a new facility joins the RECLAIM universe, it is required to obtain sufficient RTCs to offset its NO<sub>x</sub> or SO<sub>x</sub> emissions. These RTCs must be obtained through the trading market and are not issued by SCAQMD to the facility (any external offsets previously provided by the facility are converted to RTCs). Such facilities increase the overall demand for the fixed supply of RTCs because they increase total RECLAIM emissions without increasing the total supply of RTCs. However, it should be noted that with respect to future facility inclusions, the Governing Board amended Rule 2001 – Applicability on January 5, 2018, which precluded the entry of any new or existing facility into the RECLAIM program.

The shutdown of a RECLAIM facility results in a reduction in actual emissions. Prior to the October 7, 2016 amendment of Rule 2002, shutdown facilities could retain its RTC holdings as an investment, transfer to another facility under common ownership, or trade on the market. Therefore, although the facility was no longer emitting, its RTCs could be used at another facility. Shutdown facilities had the opposite effect on the RTC market as did new facilities: the overall demand for RTCs was reduced while the supply remained constant. It should also be noted that, as discussed previously in Chapter 2, Rule 2002(i) as amended by the Governing Board in October 2016, requires the reduction of the RTC holdings of a facility that is listed in Tables 7 or 8 of Rule 2002 by an amount equivalent to the emissions above the most stringent BARCT level. As reported in Chapter 1, four RECLAIM facilities (four NO<sub>x</sub>-only facilities and no NO<sub>x</sub>/ and SO<sub>x</sub> facility) shut down permanently in Compliance Year 2017.

A facility is excluded from the RECLAIM universe if SCAQMD staff determines that the facility was included in the program in error. In such cases, both the emissions and the RTCs that were issued to the facility for future years are withdrawn, thereby having a neutral impact on the RTC supply. Exclusions have the reverse effect of inclusions, in that the accounting of emissions is shifted from the RECLAIM universe of sources to the non-RECLAIM universe of sources.

Compliance Year 2017 NO<sub>x</sub> and SO<sub>x</sub> audited emissions and initial Compliance Year 2017 allocations for facilities that were shut down, excluded, or included

into the program during Compliance Year 2017 are summarized in Tables 3-5 and 3-6.

**Table 3-5  
NOx Emissions Impact from the Changes in Universe (Tons)**

Category	Compliance Year 2017 NOx Emissions (tons)	Initial Compliance Year 2017 NOx Allocations (tons)
Shutdown Facilities	3.34	18.13
Excluded Facilities	Not applicable	Not applicable
Included Facilities	Not applicable	Not applicable
RECLAIM Universe	7,246	8,978

**Table 3-6  
SOx Emissions Impact from the Changes in Universe (Tons)**

Category	Compliance Year 2017 SOx Emissions (tons)	Initial Compliance Year 2017 SOx Allocations (tons)
Shutdown Facilities	Not applicable	Not applicable
Excluded Facilities	Not applicable	Not applicable
Included Facilities	Not applicable	Not applicable
RECLAIM Universe	2,043	2,474

### Backstop Provisions

Rule 2015 requires that SCAQMD review the RECLAIM program and implement necessary measures to amend it whenever aggregate emissions exceed the aggregate allocations by five percent or more. Compliance Year 2017 aggregate NOx and SOx emissions were both below aggregate allocations as shown in Figures 3-1 and 3-2. Therefore, there is no need to initiate a program review due to emissions exceeding aggregate allocation in Compliance Year 2017.

## CHAPTER 4

### NEW SOURCE REVIEW ACTIVITY

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#### Summary

*The annual program audit assesses New Source Review (NSR) activity from RECLAIM facilities in order to ensure that RECLAIM is complying with federal NSR requirements and state no net increase (NNI) in emissions requirements while providing flexibility to facilities in managing their operations and allowing new sources into the program. In Compliance Year 2017, a total of five NO<sub>x</sub> RECLAIM facilities had NSR NO<sub>x</sub> emission increases, and no SO<sub>x</sub> RECLAIM facilities had an NSR SO<sub>x</sub> emission increase due to expansion or modification. Consistent with all prior compliance years, there were sufficient NO<sub>x</sub> and SO<sub>x</sub> RTCs available to allow for expansion, modification, and modernization by RECLAIM facilities.*

*RECLAIM is required to comply with federal NSR emissions offset requirements at a 1.2-to-1 offset ratio programmatically for NO<sub>x</sub> emission increases and a 1-to-1 offset ratio for SO<sub>x</sub> emission increases on a programmatic basis. In Compliance Year 2017, RECLAIM demonstrated federal equivalency with a programmatic NO<sub>x</sub> offset ratio of 864-to-1 based on the compliance year's total unused allocations and total NSR emission increases for NO<sub>x</sub>. There were no SO<sub>x</sub> emission increases during the compliance year. RECLAIM inherently complies with the federally-required 1-to-1 SO<sub>x</sub> offset ratio for any compliance year, provided aggregate SO<sub>x</sub> emissions under RECLAIM are lower than or equal to aggregate SO<sub>x</sub> allocations for that compliance year. As shown in Chapter 3, there was no programmatic SO<sub>x</sub> exceedance during Compliance Year 2017. In fact, there was a surplus of SO<sub>x</sub> RTCs. Therefore, RECLAIM more than complied with the federally-required SO<sub>x</sub> offset ratio and further quantification of the SO<sub>x</sub> offset ratio is unnecessary. Also, the NNI is satisfied by the program's 1-to-1 offset ratio. In addition, RECLAIM requires application of, at a minimum, California Best Available Control Technology (BACT), which is at least as stringent as federal Lowest Achievable Emission Rate (LAER) for major sources. The same BACT guidelines are used to determine applicable BACT to RECLAIM and non-RECLAIM facilities.*

#### Background

Emissions increases from the construction of new or modified stationary sources in non-attainment areas are regulated by both federal NSR and state NNI requirements to ensure that progress toward attainment of ambient air quality standards is not hampered. RECLAIM is designed to comply with federal NSR

and state NNI requirements without hindering facilities' ability to expand or modify their operations<sup>1</sup>.

Title 42, United States Code §7511a, paragraph (e), requires major sources in extreme non-attainment areas to offset emission increases of extreme non-attainment pollutants and their precursors at a 1.5-to-1 ratio based on potential to emit. However, if all major sources in the extreme non-attainment area are required to implement federal BACT, a 1.2-to-1 offset ratio may be used. Federal BACT is comparable to California's BARCT. SCAQMD requires all major sources to employ federal BACT/California BARCT at a minimum and, therefore, is eligible for a 1.2-to-1 offset ratio for ozone precursors (*i.e.*, NO<sub>x</sub> and VOC). The federal offset requirement for major SO<sub>2</sub> sources is at least a 1-to-1 ratio, which is lower than the aforementioned 1.2-to-1 ratio. Even though the Basin is in attainment with SO<sub>2</sub> standards, SO<sub>x</sub> is a precursor to PM<sub>2.5</sub>. The Basin is in Serious Non-attainment with 2006 Federal 24-hours standard and 2012 Federal annual standard for PM<sub>2.5</sub>. The applicable offset ratio for PM<sub>2.5</sub> is at least 1-to-1, thus, the applicable offset ratio for SO<sub>x</sub> is 1-to-1. Health and Safety Code §40920.5 requires "no net increase in emissions from new or modified stationary sources of non-attainment pollutants or their precursors" (*i.e.*, a 1-to-1 offset ratio on an actual emissions basis). All actual RECLAIM emissions are offset at a 1-to-1 ratio provided there is not a programmatic exceedance of aggregate allocations, thus satisfying the federal offset ratio for SO<sub>x</sub> and state NNI requirements for both SO<sub>x</sub> and NO<sub>x</sub>. Annual RTC allocations follow a programmatic reduction to reflect changes in federal BACT/California BARCT and thereby comply with federal and state offset requirements.

RECLAIM requires, at a minimum, California BACT for all new or modified sources with increases in hourly potential to emit of RECLAIM pollutants. SCAQMD uses the same BACT guidelines in applying BACT to RECLAIM and non-RECLAIM facilities. Furthermore, BACT for major sources is at least as stringent as LAER (LAER is not applicable to minor facilities as defined in Rule 1302(t)). Thus, RECLAIM complies with both state and federal requirements regarding control technologies for new or modified sources. In addition to offset and BACT requirements, RECLAIM subjects RTC trades that are conducted to mitigate emissions increases over the sum of the facility's starting allocation and non-tradable/non-usable credits to trading zone restrictions to ensure net ambient air quality improvement within the sensitive zone established by Health and Safety Code §40410.5. Furthermore, facilities with actual RECLAIM emissions that exceed their initial allocation by 40 tons per year or more are required to analyze the potential impact of their emissions increases through air quality modeling.

Rule 2005 – New Source Review for RECLAIM requires RECLAIM facilities to provide (hold), prior to the start of operation, sufficient RTCs to offset the annual increase in potential emissions for the first year of operation at a 1-to-1 ratio.

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<sup>1</sup> Federal NSR applies to federal major sources (sources with the potential to emit at least 10 tons of NO<sub>x</sub> or 100 tons of SO<sub>x</sub> per year for the South Coast Air Basin) and state NNI requirements apply to all NO<sub>x</sub> sources and to SO<sub>x</sub> sources with the potential to emit at least 15 tons per year in the South Coast Air Basin. RECLAIM's NSR provisions apply to all facilities in the program, including those not subject to federal NSR or state NNI. (Although the threshold for RECLAIM inclusions is four tons per year of NO<sub>x</sub> or SO<sub>x</sub> emissions, some RECLAIM facilities have actual emissions much less than 4 tons per year).

The same rule also requires all new RECLAIM facilities<sup>2</sup> and all other RECLAIM facilities that increase their annual allocations above the level of their starting allocations plus non-tradable/non-usable credits to provide sufficient RTCs to offset the annual potential emissions increase from new or modified source(s) at a 1-to-1 ratio at the commencement of each compliance year after the start of operation of the new or modified source(s). Although RECLAIM allows a 1-to-1 offset ratio for emissions increases, RECLAIM complies with the federal 1.2-to-1 offset requirement for NOx on an aggregate basis as explained. This annual program audit report assesses NSR permitting activities for Compliance Year 2017 to verify that programmatic compliance of RECLAIM with federal and state NSR requirements has been maintained.

## NSR Activity

Evaluation of NSR data for Compliance Year 2017 shows that RECLAIM facilities were able to expand and modify their operations while complying with NSR requirements. During Compliance Year 2017, a total of five NOx RECLAIM facilities (three in Cycle 1 and two in Cycle 2) were issued permits to operate, which resulted in a total of 2.008 tons per year of NOx emission increases from starting operations of new or modified sources. There were no SOx NSR emission increases that resulted from starting operations of new or modified permitted sources. These emission increases were calculated pursuant to Rule 2005(d) – Emission Increase. As in previous years, there were adequate unused RTCs (NOx: 1,732 tons, SOx: 431 tons; see Chapter 3) in the RECLAIM universe available for use to offset emission increases at the appropriate offset ratios.

### NSR Compliance Demonstration

RECLAIM is designed to programmatically comply with the federal NSR offset requirements. Meeting the NSR requirement (offset ratio of 1.2-to-1 for NOx and at least 1-to-1 for SOx) also demonstrates compliance with the state NNI requirements. Section 173 (c) of the federal Clean Air Act (CAA) states that only emissions reductions beyond the requirements of the CAA, such as federal Reasonably Available Control Technology (RACT), shall be considered creditable as emissions reductions for offset purposes. Since the initial allocations (total RTC supply in Compliance Year 1994) already met federal RACT requirements when the program was initially implemented, any emissions reductions beyond the initial allocations are available for NSR offset purposes until RACT becomes more stringent. The programmatic offset ratio calculations presented in the Annual RECLAIM Audit Reports for Compliance Years 1994 through 2004 relied upon aggregate Compliance Year 1994 allocations as representing RACT. However, staff recognizes that RACT may have become more stringent in the intervening years, so it may no longer be appropriate to calculate the programmatic offset ratio based upon aggregate 1994 allocations.

Aggregate allocations for each compliance year represent federal BACT, which is equivalent to local BARCT. Federal BACT is more stringent than federal RACT (*i.e.*, the best available control technology is more stringent than what is reasonably available), so staff started using current allocations (federal BACT) as a surrogate for RACT as the basis for calculating programmatic NOx and SOx

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<sup>2</sup> New facilities are facilities that received all District Permits to Construct on or after October 15, 1993.



offset ratios in the annual program audit report for Compliance Year 2005 and is continuing to do so for NOx in this report. This is a more conservative (*i.e.*, more stringent) approach than using actual RACT and is much more conservative than using aggregate Compliance Year 1994 allocations. The advantage of this approach is that, as long as the calculated NOx offset ratio is at least 1.2-to-1, it provides certainty that RECLAIM has complied with federal and state offset requirements without the need to know exactly what RACT is for RECLAIM facilities. However, if this very conservative approach should ever fail to demonstrate that the aggregate NOx offset ratio for any year is at least 1.2-to-1, that will not necessarily mean RECLAIM has not actually complied with the federally required 1.2-to-1 NOx offset ratio. Rather it will indicate that further analysis is required to accurately identify RACT so that the actual offset ratio can be calculated and a compliance determination made.

Provided aggregate RECLAIM emissions do not exceed aggregate allocations, all RECLAIM emissions are offset at a ratio of 1-to-1. This leaves all unused allocations available to provide offsets beyond the 1-to-1 ratio for NSR emission increases. Unused allocations are based on all Cycle 1 and Cycle 2 RTCs of a given compliance year and the aggregate RECLAIM emissions for the selected time period. The NSR emission increase is the sum of emission increases due to permit activities at all RECLAIM facilities during the same compliance year. The aggregate potential RECLAIM offset ratios are expressed by the following formula:

$$\text{Offset Ratio} = \left( 1 + \frac{\text{compliance year's total unused allocations}}{\text{total NSR emission increases}} \right)\text{-to-1}$$

As stated in the previous section under the title of “NSR Activity”, permits to operate issued to five RECLAIM facilities resulted in 2.008 tons of NOx emission increase pursuant to Rule 2005(d). Additionally, as identified in Table 3-2 (Annual NOx Emissions for Compliance Years 1994 through 2017), 1,732 tons of Compliance Year 2017 NOx RTCs remained unused. Therefore, the Compliance Year 2017 NOx programmatic offset ratio calculated from this methodology is 864-to-1 as shown below:

$$\text{NOx Offset Ratio} = \left( 1 + \frac{1,732 \text{ tons}}{2.008 \text{ tons}} \right)\text{-to-1}$$

864-to-1

RECLAIM continues to generate sufficient excess emission reductions to provide a NOx offset ratio greater than the 1.2-to-1 required by federal law. Since RECLAIM does not dedicate all unused RTCs to NSR uses in any given year, it does not actually provide an 864-to-1 offset ratio; but this analysis does demonstrate that RECLAIM provides more than sufficient unused RTCs to account for the 1.2-to-1 required offset ratio. This compliance with the federal offset requirements is built into the RECLAIM program through annual reductions of the allocations assigned to RECLAIM facilities and the subsequent allocation

adjustments adopted by the Governing Board to implement BARCT. The required offset ratio for SO<sub>x</sub> is 1-to-1. Since RECLAIM facilities are required to secure, at a minimum, adequate RTCs to cover their actual emissions, the SO<sub>x</sub> 1-to-1 offset ratio is met automatically provided there is no programmatic exceedance of aggregate SO<sub>x</sub> allocations for that compliance year. As stated earlier in Chapter 3, there were 431 tons of excess (unused) SO<sub>x</sub> RTCs for Compliance Year 2017. Since there were no SO<sub>x</sub> emission increases during the compliance year, there is certainty that both the federally required SO<sub>x</sub> offset ratio and the California NNI requirement for SO<sub>x</sub> were satisfied.

BACT and modeling are also required for any RECLAIM facility that installs new equipment or modifies sources if the installation or modification results in an increase in emissions of RECLAIM pollutants. Furthermore, the RTC trading zone restrictions in Rule 2005 – New Source Review for RECLAIM, limit trades conducted to offset emission increases over the sum of the facility's starting allocation and non-tradable/non-usable credits to ensure net ambient air quality improvement within the sensitive zone, as required by state law.

The result of the review of NSR activity in Compliance Year 2017 shows that RECLAIM is in compliance with both state NNI and federal NSR requirements. SCAQMD staff will continue to monitor NSR activity under RECLAIM in order to assure continued progress toward attainment of ambient air quality standards without hampering economic growth in the Basin.

## Modeling Requirements

Rule 2004, as amended in May 2001, requires RECLAIM facilities with actual NO<sub>x</sub> or SO<sub>x</sub> emissions exceeding their initial allocation in Compliance Year 1994 by 40 tons per year or more to conduct modeling to analyze the potential impact of the increased emissions. The modeling analysis is required to be submitted within 90 days of the end of the compliance year. For Compliance Year 2017, two RECLAIM facilities were subject to the 40 ton modeling requirement; one facility for NO<sub>x</sub> emissions, and one for SO<sub>x</sub> emissions.

This modeling is performed with an EPA approved air dispersion model to assess the impact of a facilities NO<sub>x</sub> or SO<sub>x</sub> emission increase on compliance with all applicable state and federal ambient air quality standards (AAQS). Air dispersion modeling submitted by each facility is reviewed by staff and revised as necessary to comply with SCAQMD's air dispersion modeling procedures including use of appropriate meteorological data for the facility location. Per Rule 2004 (q)(3), the modeling submitted by a facility must include source parameters and emissions for every major source located at the facility. For comparison against applicable state and federal AAQS, the predicted modeling impacts due to a facility's NO<sub>x</sub> or SO<sub>x</sub> emission increases are added to the highest background NO<sub>x</sub> or SO<sub>x</sub> concentration measured at the nearest ambient air monitoring station during the previous three years. Modeling runs are performed with worst-case emissions data for averaging periods that coincide with the averaging period of each applicable AAQS (e.g., 1-hr, 24-hr, annual).

The SO<sub>x</sub> facility, which had an initial SO<sub>x</sub> allocation in 1994 and exceed this initial allocation by more than 40 tons in Compliance Year 2017, submitted modeling that demonstrated that SO<sub>x</sub> emissions from their major sources during 2017 will not cause an exceedance of any state or federal SO<sub>2</sub> AAQS. The NO<sub>x</sub>

facility had an initial NO<sub>x</sub> allocation in 1994 and exceeded this initial allocation by more than 40 tons in Compliance Year 2017. This facility submitted modeling that demonstrated that NO<sub>x</sub> emissions from their major sources during 2017 will not cause an exceedance of any state or federal NO<sub>2</sub> AAQS.

## CHAPTER 5 COMPLIANCE

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### Summary

*Based on SCAQMD Compliance Year 2017 audit results, 266 of the 281 (95%) NO<sub>x</sub> RECLAIM facilities complied with their NO<sub>x</sub> allocations, and 28 of the 31 SO<sub>x</sub> facilities (90%) complied with their SO<sub>x</sub> allocations based on SCAQMD audit results. All three SO<sub>x</sub> facilities that exceeded their SO<sub>x</sub> allocations also exceeded their NO<sub>x</sub> allocations. So, fifteen facilities exceeded their allocations (12 facilities exceeded their NO<sub>x</sub> allocations, and three facilities exceeded their NO<sub>x</sub> and SO<sub>x</sub> allocations). The 15 facilities that exceeded their NO<sub>x</sub> allocations had aggregate NO<sub>x</sub> emissions of 565.3 tons and did not have adequate allocations to offset 164.0 tons (or 29.0%) of their combined emissions. The three facilities that exceeded their SO<sub>x</sub> allocations had total SO<sub>x</sub> emissions of 450.7 tons and did not have adequate allocations to offset 133.5 tons (or 29.6%). The NO<sub>x</sub> and SO<sub>x</sub> exceedance amounts are relatively small compared to the overall NO<sub>x</sub> and SO<sub>x</sub> allocations for Compliance Year 2017 (1.83% of total NO<sub>x</sub> allocations and 5.40% of total SO<sub>x</sub> allocations). The exceedances from these facilities did not impact the overall RECLAIM emission reduction goals. The overall RECLAIM NO<sub>x</sub> and SO<sub>x</sub> emission reduction targets and goals were met for Compliance Year 2017 (i.e., aggregate emissions for all RECLAIM facilities were well below aggregate allocations). Pursuant to Rule 2010(b)(1)(A), these facilities had their respective exceedances deducted from their annual allocations for the compliance year subsequent to the date of SCAQMD's determination that the facilities exceeded their Compliance Year 2017 allocations.*

### Background

RECLAIM facilities have the flexibility to choose among compliance options to meet their annual allocations by reducing emissions, trading RTCs, or a combination of both. However, this flexibility must be supported by standardized emission MRR requirements to ensure the reported emissions are real, quantifiable, and enforceable. As a result, detailed MRR protocols are specified in the RECLAIM regulation to provide accurate and verifiable emission reports.

The MRR requirements were designed to provide accurate and up-to-date emission reports. Once facilities install and complete certification of the required monitoring and reporting equipment, they are relieved from command-and-control rule limits and requirements subsumed under Rule 2001. Mass emissions from RECLAIM facilities are then determined directly by monitoring and reporting equipment for some sources and from data generated by monitoring equipment for others. If monitoring equipment fails to produce quality-assured data or the facility fails to file timely emissions reports, RECLAIM rules require emissions be determined by a rule-prescribed methodology known as Missing Data Procedures or "MDP." Depending on past performance of the monitoring equipment (i.e., availability of quality-assured data) and the duration of the missing data period, MDP use a tiered approach to calculate emissions. As availability of quality-assured data increases, the MDP-calculated emissions become more representative of the actual emissions, but when the availability of

quality-assured data is low, MDP calculations become more conservative and approach, to some extent, “worst case” assessments.

## **Allocation Compliance**

### **Requirements**

At the beginning of the RECLAIM program in 1994 or at the time a facility is included in the RECLAIM program, each RECLAIM facility is issued an annual allocation for each compliance year pursuant to methodology prescribed in Rule 2002. For a facility in existence prior to October 1993, it is issued allocations by SCAQMD based on its historical production rate. A facility without an operating history prior to 1994 receives no allocation and must purchase enough RTCs to cover the emissions for their operations, except facilities that have provided ERCs to offset emission increases prior to entering RECLAIM are issued RTCs generated by converting the surrendered ERCs to RTCs. Additionally, all facilities entering RECLAIM holding any ERCs generated at and held by the individual facility itself have those ERCs converted to RTCs and added to their allocated RTCs. Knowing their emission goals, RECLAIM facilities have the flexibility to manage their emissions in order to meet their allocations in the most cost-effective manner. Facilities may employ emission control technology or process changes to reduce emissions, buy RTCs, or sell unneeded RTCs.

Facilities may buy RTCs or sell excess RTCs at any time during the year in order to ensure that their emissions are covered. There is a thirty day reconciliation period commencing at the end of each of the first three quarters of each compliance year. In addition, after the end of each compliance year, there is a 60-day reconciliation period (instead of 30 days as at the end of the first three quarters) during which facilities have a final opportunity to buy or sell RTCs for that compliance year. These reconciliation periods are provided for facilities to review and correct their emission reports as well as securing adequate allocations. Each RECLAIM facility must hold sufficient RTCs in its allocation account to cover (or reconcile with) its quarterly as well as year-to-date emissions for the compliance year at the end of each reconciliation period. By the end of each quarterly and annual reconciliation period, each facility is required to certify the emissions for the preceding quarter and/or compliance year by submitting its Quarterly Certification of Emissions Reports (QCERs) and/or APEP report, respectively.

### **Compliance Audit**

Since the beginning of the program, SCAQMD staff has conducted annual audits of each RECLAIM facility’s emission reports to ensure their integrity and reliability. All facilities that submitted emission reports during a compliance year are subject to compliance audits, even for those that are shutdown or have a change of operator. This results in additional facility audits over the number of active facilities in the universe at the end of a compliance year. For Compliance Year 2017, a total of 281 facility audits were completed. The audit process includes conducting field inspections to check process equipment, monitoring devices, and operational records. Additionally, emissions calculations are performed in order to verify emissions reported electronically to SCAQMD or submitted in QCERs and APEP reports. For Compliance Year 2017, these inspections revealed that some facilities did not obtain or record valid monitoring

data, failed to submit emission reports when due, made errors in quantifying their emissions (e.g., arithmetic errors), used incorrect emission and adjustment factors (e.g., bias adjustment factors), failed to correct fuel usage to standard conditions, used emission calculation methodologies not allowed under the rules, or failed to properly apply MDP. Appropriate compliance actions are also taken based on audit findings.

Whenever an audit revealed a facility's emissions to be in excess of its annual allocation, the facility was provided an opportunity to review the audit and to present additional data to further refine audit results. This extensive and rigorous audit process ensures valid and reliable emissions data.

### **Compliance Status**

During this compliance year, a total of 15 RECLAIM facilities failed to reconcile their emissions (12 NOx-only facilities and three NOx-and-SOx facilities that exceeded both their NOx and SOx allocations). Ten of these 15 facilities (seven NOx-only facilities and all three NOx-and-SOx facilities) failed to acquire adequate RTCs to offset their reported emissions. Based on audit findings, eight NOx-only facilities and one NOx-and-SOx facility were found to have under-reported their emissions based on audit findings and didn't hold sufficient RTCs to reconcile their audited emissions. Among the 12 NOx-only facilities, two failed to submit the required QCERs and APEP report.

Among the nine facilities found to have under-reported their emissions, the reasons for the under-reporting include one or more of the following causes:

- mathematical error,
- failure to properly correct measured fuel flow to standard conditions defined as one atmosphere of pressure and a temperature of 60°F or 68°F provided that the same temperature is used throughout the facility, and
- failure to properly apply missing data procedures.

Overall, the Compliance Year 2017 allocation compliance rates for facilities are 95% (266 out of 281 facilities) for NOx RECLAIM and 90% (28 out of 31 facilities) for SOx RECLAIM<sup>1</sup>. For purposes of comparison, the allocation compliance rates for Compliance Year 2016 were 95% and 97% for NOx and SOx RECLAIM facilities, respectively. In Compliance Year 2017, the 15 facilities that had NOx emissions in excess of their individual NOx allocations had 565.3 tons of NOx emissions and didn't have adequate RTCs to cover 164.0 of those tons (or 29.0% of their total emissions). The three SOx facilities that exceeded their SOx allocation had total SOx emissions of 450.7 tons and didn't have adequate allocations to offset 133.5 tons (or 29.6% of their total emissions). The NOx and SOx exceedance amounts are relatively small compared to the overall allocations for Compliance Year 2017 (1.83% of aggregate NOx allocations and 5.40% of aggregate SOx allocations). Pursuant to Rule 2010(b)(1)(A), all 15 facilities had their respective NOx or SOx Allocation exceedances deducted from

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<sup>1</sup> Compliance rates for both NOx and SOx are based on 281 NOx and 31 SOx completed audits, respectively.

their annual emissions allocations for the compliance year subsequent to SCAQMD's determination that the facilities exceeded their Compliance Year 2017 allocations.

### **Impact of Missing Data Procedures**

MDP was designed to provide a method for determining emissions when an emission monitoring system does not yield valid emissions. For major sources, these occurrences may be caused by failure of the monitoring systems, the data acquisition and handling systems, or by lapses in the Continuous Emissions Monitoring System (CEMS) certification period. Major sources are also required to use MDP for determining emissions whenever daily emissions reports are not submitted by the applicable deadline. When comparing actual emissions with a facility's use of substituted MDP emissions, the range of MDP emissions can vary from "more representative" to being overstated to reflect a "worst case"<sup>2</sup> scenario. For instance, an MDP "worst case" scenario may occur for major sources that fail to have their CEMS certified in a timely manner, and therefore, have no valid CEMS data that can be used for substitution. In other cases, where prior CEMS data is available, MDP is applied in tiers depending on the duration of missing data periods and the historical availability of monitoring systems. As the duration of missing data periods gets shorter and the historical availability of monitoring systems gets higher, the substitute data yielded by MDP becomes more representative of actual emissions<sup>3</sup>.

In addition to MDP for major sources, RECLAIM rules also define MDP for large sources and process units. These procedures are applicable when a process monitoring device fails or when a facility operator fails to record fuel usage or other monitored data (*e.g.*, hours of operation). The resulting MDP emissions reports are reasonably representative of the actual emissions because averaged or maximum emissions from previous operating periods may be used. However, for extended missing data periods (more than two months for large sources or four quarters or more for process units) or when emissions data for the preceding year are unavailable, large source and process unit MDP are also based on maximum operation or worst case assumptions.

Based on APEP reports, 92 NO<sub>x</sub> facilities and 15 SO<sub>x</sub> facilities used MDP in reporting portions of their annual emissions during Compliance Year 2017. In terms of mass emissions, 3.8% of the total reported NO<sub>x</sub> emissions and 6.3% of the total reported SO<sub>x</sub> emissions in the APEP reports were calculated using MDP for Compliance Year 2017. Table 5-1 compares the impact of MDP on reported annual emissions for the last few compliance years to the second compliance year, 1995 (MDP was not fully implemented during Compliance Year 1994).

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<sup>2</sup> Based on uncontrolled emission factor at maximum rated capacity of the source and 24 hours per day.

<sup>3</sup> Based on averaged emissions during periods before and after the period for which data is not available.

**Table 5-1**  
**MDP Impact on Annual Emissions**

Year	Percent of Reported Emissions Using Substitute Data*	
	NOx	SOx
1995	23.0% (65 / 6,070)	40.0% (12 / 3,403)
2010	7.0% (93 / 488)	6.1% (23 / 168)
2011	6.2% (94 / 435)	12.4% (19 / 328)
2012	7.5% (95 / 560)	4.5% (13 / 114)
2013	3.9% (107 / 287)	5.6% (15 / 113)
2014	3.3% (97 / 247)	3.0% (13 / 66)
2015	6.9% (98 / 502)	10.9% (14 / 229)
2016	3.9% (91 / 288)	6.2% (14 / 125)
2017	3.8% (92 / 273)	6.3% (15 / 126)

\* Numbers in parenthesis that are separated by a slash represent the number of facilities that reported use of MDP in each compliance year and tons of emissions based on MDP.

Most of the issues associated with CEMS certifications were resolved prior to Compliance Year 1999. Since then, very few facilities have had to submit emissions reports based on the worst case scenario under MDP, which may considerably overstate the actual emissions from major sources. As an example, most facilities that reported emissions using MDP in 1995 did so because they did not have their CEMS certified in time to report actual emissions. Since their CEMS had no prior data, MDP called for an application of the most conservative procedure to calculate substitute data by assuming continuous uncontrolled operation at the maximum rated capacity of the facility's equipment, regardless of the actual operational level during the missing data periods. As a result, the calculations yielded substitute data that may have been much higher than the actual emissions. In comparison to the 65 NOx facilities implementing MDP in Compliance Year 1995, 92 facilities reported NOx emissions using MDP in Compliance Year 2017. Even though the number of facilities is higher than in 1995, the percentage of emissions reported using MDP during Compliance Year 2017 is much lower than it was in 1995 (4% compared to 23%). Additionally, in terms of quantity, NOx emissions determined by the use of MDP in Compliance Year 2017 were about 4% of those in Compliance Year 1995 (273 tons compared to 6,070 tons). Since most CEMS were certified and had been reporting actual emissions by the beginning of Compliance Year 2000, facilities that had to calculate substitute data were able to apply less conservative methods of calculating MDP for systems with high availability and shorter



duration missing data periods. Therefore, the substitute data they calculated for their missing data periods were more likely to be representative of the actual emissions.

It is important to note that portions of annual emissions attributed to MDP include actual emissions from the sources as well as the possibility of overestimated emissions. As shown in Table 5-1, approximately 4% of reported NO<sub>x</sub> annual emissions were calculated using MDP in Compliance Year 2017. MDP may significantly overestimate emissions from some of the sources that operate intermittently and have low monitoring system availability, and/or lengthy missing data periods. Even though a portion of the 4% may be overestimated emissions due to conservative MDP, a significant portion (or possibly all) of it could have also been actual emissions from the sources. Unfortunately, the portion that represents the actual emissions cannot be readily estimated because the extent of this effect varies widely, depending on source categories and operating parameters, as well as the tier of MDP applied. For Compliance Year 2017, a significant portion of NO<sub>x</sub> MDP emissions data (52%) and majority of SO<sub>x</sub> MDP emissions data (86%) were reported by refineries, which tend to operate near maximum capacity for 24 hours per day and seven days per week, except for scheduled shutdowns for maintenance and barring major breakdowns or other unforeseeable circumstances. Missing data emissions calculated using the lower tiers of MDP (*i.e.*, 1N Procedure or 30-day maximum value) for facilities such as refineries that have relatively constant operation near their maximum operation are generally reflective of actual emissions because peak values are close to average values for these operations.

## Emissions Monitoring

### Overview

The reproducibility of reported RECLAIM facility emissions (and the underlying calculations)—and thereby the enforceability of the RECLAIM program—is assured through a tiered hierarchy of MRR requirements. A facility's equipment falls into an MRR category based on the kind of equipment it is and on the level of emissions produced or potentially produced by the equipment. RECLAIM divides all NO<sub>x</sub> sources into major sources, large sources, process units, and equipment exempt from obtaining a written permit pursuant to Rule 219. All SO<sub>x</sub> sources are divided into major sources, process units, and equipment exempt from obtaining a written permit pursuant to Rule 219. Table 5-2 shows the monitoring requirements applicable to each of these categories.

**Table 5-2**  
**Monitoring Requirements for RECLAIM Sources**

Source Category	Major Sources (NOx and SOx)	Large Sources (NOx only)	Process Units and Rule 219 Equipment (NOx and SOx)
Monitoring Method	Continuous Emissions Monitoring System (CEMS) or Alternative CEMS (ACEMS)	Fuel Meter or Continuous Process Monitoring System (CPMS)	Fuel Meter, Timer, or CPMS
Reporting Frequency	Daily	Monthly	Quarterly

### **Continuous Emissions Monitoring System (CEMS)**

#### ***Requirements***

CEMS represent both the most accurate and the most reliable method of calculating emissions because they continuously monitor all of the parameters necessary to directly determine mass emissions of NOx and SOx. They are also the most costly method. These attributes make CEMS the most appropriate method for the largest emission-potential equipment in the RECLAIM universe, major sources.

Alternative Continuous Emissions Monitoring Systems (ACEMS) are alternatives to CEMS that are allowed under the RECLAIM regulation. These are devices that do not directly monitor NOx or SOx mass emissions; instead, they correlate multiple process parameters to arrive at mass emissions. To be approved for RECLAIM MRR purposes, ACEMS must be determined by SCAQMD to be equivalent to CEMS in relative accuracy, reliability, reproducibility, and timeliness.

Even though the number of major sources monitored by either CEMS or ACEMS represent 19% and 64% of all permitted RECLAIM NOx and SOx sources during Compliance Year 2017, respectively, reported emissions for Compliance Year 2017 revealed that 79% of all RECLAIM NOx emissions and 95% of all RECLAIM SOx emissions were determined by CEMS or ACEMS.

#### ***Compliance Status***

By the end of calendar year 1999, almost all facilities that were required to have CEMS had their CEMS certified or provisionally approved. The only remaining uncertified CEMS are for sources that recently became subject to major source reporting requirements and sources that modified their CEMS. Typically, there will be a few new major sources each year. Therefore, there will continue to be a small number of CEMS in the certification process at any time.

#### ***Semiannual and Annual Assessments of CEMS***

RECLAIM facilities conduct their Relative Accuracy Test Audit (RATA) of certified CEMS using private sector testing laboratories approved under SCAQMD's

Laboratory Approval Program (LAP). These tests are conducted either semiannually or annually, depending on the most recent relative accuracy value (the sum of the average differences and the confidence coefficient) for each source. The interval is annual only when all required relative accuracies obtained during an audit are 7.5% or less (*i.e.*, more accurate).

To verify the quality of CEMS, the RATA report compares the CEMS data to data taken simultaneously, according to approved testing methods (also known as reference methods), by a LAP-approved source testing contractor. In order to have a passing RATA, each of the following relative accuracy performance criteria must be met: The relative accuracy of the CEMS results relative to the reference method results must be within  $\pm 20\%$  for pollutant concentration,  $\pm 15\%$  for stack flow rate, and  $\pm 20\%$  for pollutant mass emission rate. The RATAs also determine whether CEMS data must be adjusted for low readings compared to the reference method (bias adjustment factor), and by how much. The RATA presents two pieces of data, the CEMS bias (how much it differs from the reference method on the average) and the CEMS confidence coefficient (how variable that bias or average difference is).

Tables 5-3 and 5-4, respectively, summarize the 2017 and 2018 calendar years' passing rates for submitted RATAs of certified CEMS for NO<sub>x</sub> and SO<sub>x</sub> concentration, total sulfur in fuel gas concentrations, stack flow rate (in-stack monitors and F-factor based calculations), and NO<sub>x</sub> and SO<sub>x</sub> mass emissions. However, the tables do not include SO<sub>x</sub> mass emissions calculated from total sulfur analyzer systems because such systems serve numerous devices, and therefore are not suitable for mass emissions-based RATA testing. As noted in the footnotes for each table, the calendar year 2017 and 2018 passing rates are calculated from RATA data submitted before January 9, 2018 and January 11, 2019, respectively, and may exclude some RATA data from the fourth quarter of each year.

**Table 5-3**  
**Passing Rates Based on RATAs of Certified CEMS in 2017<sup>1</sup>**

Concentration						Stack Flow Rate				Mass Emissions			
NO <sub>x</sub>		SO <sub>2</sub>		Total <sup>2</sup> Sulfur		In-Stack Monitor		F-Factor Based Calc.		NO <sub>x</sub>		SO <sub>x</sub> <sup>3</sup>	
No.	% Pass	No.	% Pass	No.	% Pass	No.	% Pass	No.	% Pass	No.	% Pass	No.	% Pass
346	100	87	100	15	100	43	100	336	100	346	100	78	100

<sup>1</sup> The calculation of passing rates includes all RATAs submitted by January 9, 2018.

<sup>2</sup> Includes Cylinder Gas Audit (CGA) tests.

<sup>3</sup> Does not include SO<sub>x</sub> emissions calculated from total sulfur analyzers.

**Table 5-4  
Passing Rates Based on RATAs of Certified CEMS in 2018**

Concentration						Stack Flow Rate				Mass Emissions			
NOx		SO <sub>2</sub>		Total <sup>2</sup> Sulfur		In-Stack Monitor		F-Factor Based Calc.		NOx		SOx <sup>3</sup>	
No.	% Pass	No.	% Pass	No.	% Pass	No.	% Pass	No.	% Pass	No.	% Pass	No.	% Pass
247	100	67	100	15	100	36	100	247	100	246	100	79	100

<sup>1</sup> The calculation of passing includes all RATAs submitted by January 11, 2019.

<sup>2</sup> Includes Cylinder Gas Audit (CGA) tests.

<sup>3</sup> Does not include SOx emissions calculated from total sulfur analyzers.

As indicated in Tables 5-3 and 5-4, the passing rates for NOx/SO<sub>2</sub> concentration, stack flow rate, and mass emissions were 100%. Since the inception of RECLAIM there have been significant improvements with respect to the availability of reliable calibration gas, the reliability of the reference method, and an understanding of the factors that influence valid total sulfur analyzer data.

***Electronic Data Reporting of RATA Results***

Facilities operating CEMS under RECLAIM are required to submit RATA results to SCAQMD. An electronic reporting system, known as Electronic Data Reporting (EDR), was set up to allow RATA results to be submitted electronically using a standardized format in lieu of the traditional formal source test reports in paper form. This system minimizes the amount of material the facility must submit to SCAQMD and also expedites reviews. In calendar year 2018, 96% of RATA results were submitted via EDR.

**Non-Major Source Monitoring, Reporting, and Recordkeeping**

Emissions quantified for large sources are primarily based on concentration limits or emission rates specified in the Facility Permit. Other variables used in the calculation of large source emissions are dependent on the specific process of the equipment, but generally include fuel usage, applicable dry F-factor, and the higher heating value of the fuel used, which are collectively used to calculate stack flow rate. RECLAIM requires large sources to be source tested within defined three-year windows in order to validate fuel meter accuracy and the equipment’s concentration limit or emission rate. Since emissions quantification is fuel-based, the monitoring equipment required to quantify emissions is a non-resettable fuel meter that must be corrected to standard temperature and pressure. Large source emission data must be submitted electronically on a monthly basis.

Process unit emission calculations are similar to those of large sources in that emissions are quantified using the fuel-based calculations for either a concentration limit or an emission factor specified in the Facility Permit. Similar to large sources, variables used in emission calculations for process units are dependent on the equipment’s specific process, but generally include fuel usage, applicable dry F-factor, and the higher heating value of the fuel used. Process units that are permitted with concentration limits are also required to be source-tested, but within specified five-year windows rather than three-year windows.

Emissions for equipment exempt from obtaining a written permit pursuant to Rule 219 are quantified using emission factors and fuel usage. No source testing is required for such exempt equipment. Since emissions calculations are fuel-based for both process units and exempt equipment, the monitoring equipment required to quantify emissions is a non-resettable fuel meter, corrected to standard temperature and pressure. Alternately, a timer may be used to record operational time. In such cases, fuel usage is determined based on maximum rated capacity of the source. Process units and exempt equipment must submit emission reports electronically on a quarterly basis.

## Emissions Reporting

### Requirements

RECLAIM uses electronic reporting technology to streamline reporting requirements for both facilities and SCAQMD, and to help automate compliance tracking. Under RECLAIM, facilities report their emissions electronically on a per device basis to SCAQMD's Central Station computer as follows:

- Major sources must use a Remote Terminal Unit (RTU) to telecommunicate emission data to SCAQMD's Central Station. The RTU collects data, performs calculations, generates the appropriate data files, and transmits the data to the Central Station. This entire process is required to be performed by the RTU on a daily basis without human intervention.
- Emission data for all equipment other than major sources may be transmitted via RTU or compiled manually and transmitted to the Central Station via modem. Alternatively, operators of non-major sources may use SCAQMD's internet based application, Web Access To Electronic Reporting System (WATERS) to transmit emission data for non-major sources via internet connection. The data may be transmitted directly by the facility or through a third party.

### Compliance Status

The main concern for emission reporting is the timely submittal of accurate daily emissions reports from major sources. If daily reports are not submitted by the specified deadlines, RECLAIM rules may require that emissions from CEMS be ignored and the emissions be calculated using MDP. Daily emission reports are submitted by the RTU of the CEMS to SCAQMD's Central Station via telephone lines. Often communication errors between the two points are not readily detectable by facility operators. Undetected errors can cause facility operators to believe that daily reports were submitted when they were not received by the Central Station. In addition to providing operators a means to confirm the receipt of their reports, the WATERS application can also display electronic reports that were submitted to, and received by, the Central Station. This system helps reduce instances where MDP must be used for late or missing daily reports, because the operators can verify that the Central Station received their daily reports, and can resubmit them if there were communication errors.

## Protocol Review

Even though review of MRR protocols was only required by Rule 2015(b)(1) for the first three compliance years of the RECLAIM program, staff continues to review the effectiveness of enforcement and MRR protocols. Based on such review, occasional revisions to the protocols may be needed to achieve improved measurement and enforcement of RECLAIM emission reductions, while minimizing administrative costs to RECLAIM facilities and SCAQMD.

Since the RECLAIM program was adopted, staff has produced rule interpretations and implementation guidance documents to clarify and resolve specific concerns about the protocols raised by RECLAIM participants or observed by SCAQMD staff. In situations where staff could not interpret existing rule requirements to adequately address the issues at hand, the protocols and/or rules have been amended.

## CHAPTER 6

### REPORTED JOB IMPACTS

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#### Summary

*This chapter compiles data as reported by RECLAIM facilities in their Annual Permit Emissions Program (APEP) reports. The analysis focuses exclusively on job impacts at RECLAIM facilities and determination if those job impacts were directly attributable to RECLAIM as reported by those facilities. Additional benefits to the local economy (e.g., generating jobs for consulting firms, source testing firms and CEMS vendors) attributable to the RECLAIM program, as well as factors outside of RECLAIM (e.g., the prevailing economic climate), impact the job market. However, these factors are not evaluated in this report. Also, job losses and job gains are strictly based on RECLAIM facilities' reported information. SCAQMD staff is not able to independently verify the accuracy of the reported job impact information.*

*According to the Compliance Year 2017 employment survey data gathered from APEP reports, RECLAIM facilities reported a net loss of 276 jobs, representing 0.26% of their total employment. One of the four RECLAIM facilities that shut down or ceased operations during Compliance Year 2017 cited RECLAIM as a factor contributing to the decision to shut down. No other facility reported job losses due to RECLAIM, during Compliance Year 2017.*

#### Background

The APEP reports submitted by RECLAIM facilities include survey forms that are used to evaluate the socioeconomic impacts of the program. Facilities were asked to indicate the number of jobs at the beginning of Compliance Year 2017 and any changes in the number of jobs that took place during the compliance year in each of three categories: manufacturing, sale of products, and non-manufacturing. The numbers of jobs gained and lost reported by facilities in each category during the compliance year were tabulated.

Additionally, APEP reports ask facilities that shut down during Compliance Year 2017 to provide the reasons for their closure. APEP reports also allow facilities to indicate whether the RECLAIM program led to the creation or elimination of jobs during Compliance Year 2017.

Since data regarding job impacts and facility shutdowns are derived from the APEP reports, the submittal of these reports is essential to assessing the influence that the RECLAIM program has on these issues. The following discussion represents data obtained from APEP reports submitted to SCAQMD for Compliance Year 2017 and clarifying information collected by SCAQMD staff. SCAQMD staff is not able to verify the accuracy of the reported job impact information.

#### Job Impacts

Table 6-1 summarizes job impact data gathered from Compliance Year 2017 APEP reports and follow-up contacts with facilities. A total of 115 facilities reported 6,978 job gains, while 129 facilities reported a total of 7,254 job losses.

A net job loss was reported in one of the three categories: manufacturing (419), whereas net job gains were reported in the remaining two categories: sales of products (96), and non-manufacturing (47). Table 6-1 shows a total net loss of 276 jobs, which represents a net decrease of 0.26% at RECLAIM facilities during Compliance Year 2017.

**Table 6-1  
Job Impacts at RECLAIM Facilities for Compliance Year 2017**

Description	Manufacture	Sales of Products	Non-Manufacture	Total <sup>1</sup>
Initial Jobs	39,547	703	66,568	106,818
Overall Job Gain	2,096	166	4,716	6,978
Overall Job Loss	2,515	70	4,669	7,254
Final Jobs	39,128	799	66,615	106,542
Net Job Change	-419	96	47	-276
Percent (%) Job Change	-1.06%	13.66%	0.07%	-0.26%
Facilities Reporting Job Gains	90	19	62	115
Facilities Reporting Job Losses	90	25	77	129

<sup>1</sup> The total number of facilities reporting job gains or losses does not equal the sum of the number of facilities reporting job changes in each category (*i.e.*, the manufacture, sales of products, and non-manufacture categories) due to the fact that some facilities may report changes under more than one of these categories.

Data for four RECLAIM facilities that were reported to have shut down or ceased operations in Compliance Year 2017 as listed in Appendix C are included in Table 6-1. One of these facilities consolidated their operations and moved out of state. Another facility claimed that their power purchase contract was not renewed which caused them to close and dismantle the facility. One facility stated the market conditions had changed and the demand for their services had declined to the point where the facility could not stay in business. The last facility claimed that they could not comply with RECLAIM requirements due to their small facility size. According to their APEP reports, the shutdown of these facilities led to a total loss of 128 jobs (91 manufacturing jobs, 2 sales job, and 35 non-manufacturing jobs).

One RECLAIM facility attributed job gains or losses to RECLAIM for Compliance Year 2017. The facility operator that listed RECLAIM as a reason for shutdown of their facility attributed the loss of 52 jobs to RECLAIM due to cost of meeting air pollution regulations (refer to Appendix E).

The analysis in this report only considers job gains and losses at RECLAIM facilities. It should be noted that this analysis of socioeconomic impacts based on APEP reports and follow-up interviews is focused exclusively on changes in employment that occurred at RECLAIM facilities. The effect of the program on the local economy outside of RECLAIM facilities, including consulting and source testing jobs, is not considered.

It is not possible to compare the impact of the RECLAIM program on the job market *vis-à-vis* a scenario without RECLAIM. This is because factors other than RECLAIM (*e.g.*, the prevailing economic climate), also impact the job market.



Furthermore, there is no way to directly compare job impacts attributed to RECLAIM to job impacts attributed to command-and-control rules that would have been adopted in RECLAIM's absence, because these command-and-control rules do not exist for these facilities. As mentioned previously, the effect of the RECLAIM program on the local economy outside of RECLAIM facilities (*e.g.*, generating jobs for consulting firms, source testing firms and CEMS vendors) is also not considered in this report.

## CHAPTER 7

### AIR QUALITY AND PUBLIC HEALTH IMPACTS

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#### Summary

*Audited RECLAIM emissions have been in an overall downward trend since the program's inception. Compliance Year 2017 NO<sub>x</sub> emissions decreased slightly (1.1%) relative to Compliance Year 2016, and Compliance Year 2017 SO<sub>x</sub> emissions were 0.9% greater than the previous year. Quarterly calendar year 2017 NO<sub>x</sub> emissions fluctuated within seven percent of the mean NO<sub>x</sub> emissions for the year. Quarterly calendar year 2017 SO<sub>x</sub> emissions fluctuated within nine percent of the year's mean SO<sub>x</sub> emissions. There was no significant shift in seasonal emissions from the winter season to the summer season for either pollutant.*

*The California Clean Air Act (CCAA) required a 50% reduction in population exposure to ozone, relative to a baseline averaged over three years (1986 through 1988), by December 31, 2000. The Basin achieved the December 2000 target for ozone well before the deadline. In calendar year 2018, the per capita exposure to ozone (the average length of time each person is exposed) continued to be well below the target set for December 2000.*

*Air toxic health risk is primarily caused by emissions of certain volatile organic compounds (VOCs) and fine particulates, such as metals. RECLAIM facilities are subject to the same air toxic, VOC, and particulate matter regulations as other sources in the Basin. All sources are subject, where applicable, to the NSR rule for toxics (Rule 1401 and/or Rule 1401.1). In addition, new or modified sources with NO<sub>x</sub> or SO<sub>x</sub> emission increases are required to be equipped with BACT, which minimizes to the extent feasible the increase of NO<sub>x</sub> and SO<sub>x</sub> emissions. RECLAIM and non-RECLAIM facilities that emit toxic air contaminants are required to report those emissions to SCAQMD. Those emissions reports are used to identify candidates for the Toxics Hot Spots program (AB2588). This program requires emission inventories and, depending on the type and amount of emissions, facilities may be required to do public notice and/or prepare and implement a plan to reduce emissions. There is no evidence that RECLAIM has caused or allowed higher toxic risk in areas adjacent to RECLAIM facilities, than would occur under command-and-control, because RECLAIM facilities must comply with the same toxics rules as non-RECLAIM facilities.*

#### Background

RECLAIM is designed to achieve the same, or higher level of, air quality and public health benefits as would have been achieved from implementation of the control measures and command-and-control rules that RECLAIM subsumed. Therefore, as a part of each annual program audit, SCAQMD staff evaluates per capita exposure to air pollution, toxic risk reductions, emission trends, and seasonal fluctuations in emissions. SCAQMD staff also generates quarterly emissions maps depicting the geographic distribution of RECLAIM emissions.

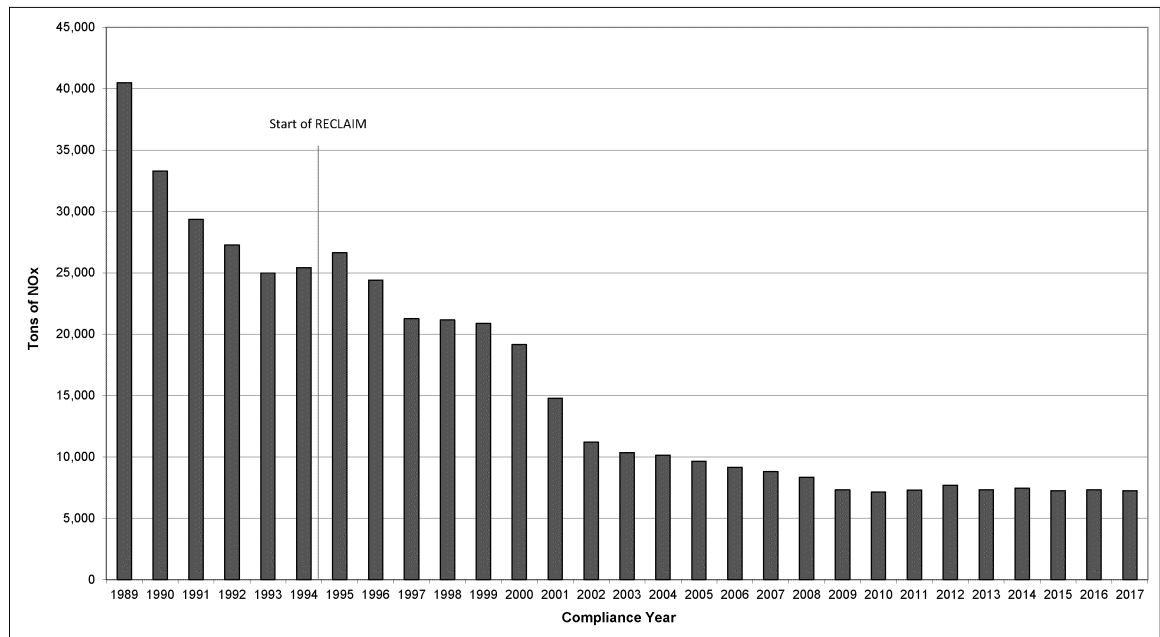
These maps are generated and posted quarterly on SCAQMD’s website<sup>1</sup>, and include all the quarterly emissions maps presented in previous annual program audit reports. This chapter addresses:

- Emission trends for RECLAIM facilities;
- Seasonal fluctuations in emissions;
- Per capita exposure to air pollution; and
- Toxics impacts.

### Emission Trends for RECLAIM Sources

Concerns were expressed during program development that RECLAIM might cause sources to increase their aggregate emissions during the early years of the program due to perceived over-allocation of emissions. As depicted in Figures 7-1 and 7-2, which show NOx and SOx emissions from RECLAIM sources since 1989, the analysis of emissions from RECLAIM sources indicates that overall, RECLAIM emissions have been in a downward trend since program inception, and the emission increases during early years of RECLAIM that were anticipated by some did not materialize.

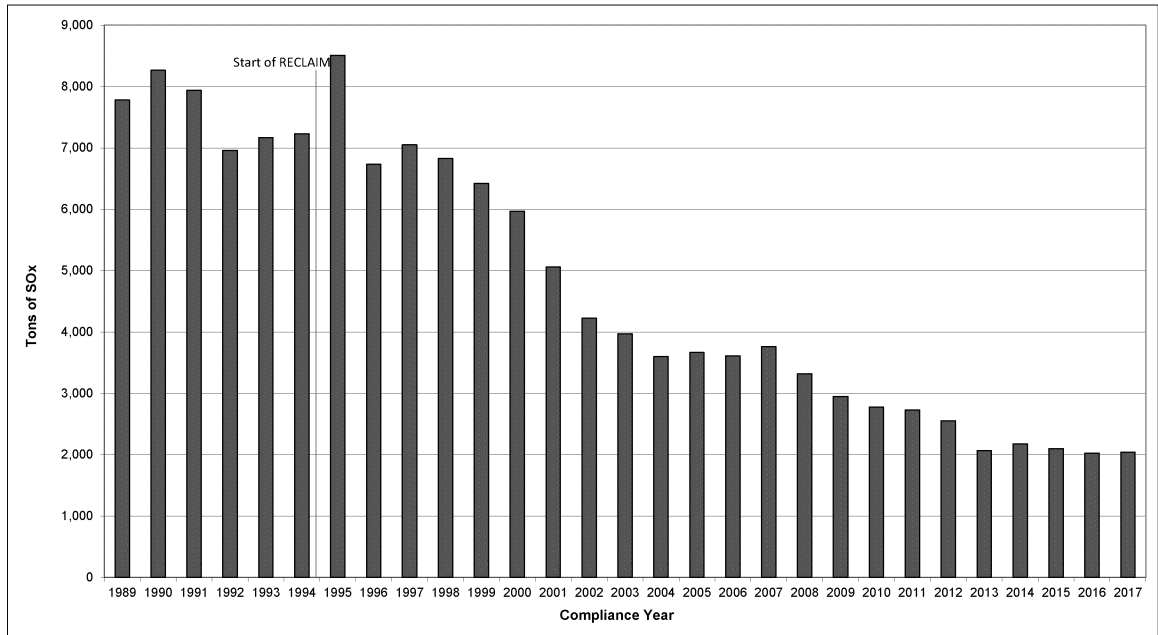
**Figure 7-1**  
**NOx Emission Trend for RECLAIM Sources**



Note: 1989-1993 emissions presented in this figure are the emissions from the facilities in the 1994 NOx universe.

<sup>1</sup> Quarterly emission maps from 1994 to present can be found at:  
<http://www.aqmd.gov/home/programs/business/about-reclaim/quarterly-emission-maps>.

**Figure 7-2**  
**SOx Emission Trend for RECLAIM Sources**



Note: 1989-1993 emissions presented in this figure are the emissions from the facilities in the 1994 SOx universe.

NOx emissions decreased every year from Compliance Year 1995 through Compliance Year 2009, and the emissions from Compliance Year 2009 to Compliance Year 2017 have fluctuated within a narrow range (7,121 – 7,691 tons/year, or  $\pm 4\%$  of the mid-point). Since Compliance Year 1995, annual SOx emissions have also followed a general downward trend, except for slight increases in Compliance Years 1997, 2005, 2007, 2014, and 2017 compared to each respective previous compliance year. SOx emissions, similar to NOx emissions, have been fluctuating within a narrow range (2,024 – 2,176 tons/year or  $\pm 4\%$  of the mid-point) since 2013. As discussed in Chapter 3, NOx and SOx emissions are much lower than the programmatic goals (see Figures 3-1 and 3-2).

The increase in NOx and SOx emissions from Compliance Year 1994 to 1995 can be attributed to the application of MDP at the onset of RECLAIM implementation. RECLAIM provides for emissions from each major source’s first year in the program to be quantified using an emission factor and fuel throughput (interim reporting) while they certify their CEMS. However, at the beginning of the program (Compliance Year 1994), many facilities had difficulties certifying their CEMS within this time frame, and consequently reported their Compliance Year 1995 emissions using MDP. As discussed in Chapter 5, since CEMS for these major sources had no prior data, MDP required the application of the most conservative procedure to calculate substitute data. As a result, the application of MDP during this time period yielded substitute data that may have been much higher than the actual emissions. In addition, emissions after Compliance Year 1995 decreased steadily through 2000. Thus, RECLAIM facilities did not increase their actual aggregate emissions during the early years of the program.

## Seasonal Fluctuation in Emissions for RECLAIM Sources

Another concern during program development was that RECLAIM might cause facilities to shift emissions from the winter season into the summer ozone season and exacerbate poor summer air quality since RECLAIM emission goals are structured on an annual basis. To address this concern, “seasonal fluctuations” were added as part of the analysis required by Rule 2015. Accordingly, SCAQMD staff performed a two-part analysis of the quarterly variation in RECLAIM emissions:

1. In the first part, staff qualitatively compared the quarterly variation in Compliance Year 2017 RECLAIM emissions to the quarterly variation in emissions from the RECLAIM universe prior to the implementation of RECLAIM.
2. In the second part, staff analyzed quarterly audited emissions during calendar year 2017 and compared them with quarterly audited emissions for prior years to assess if there had been such a shift in emissions. This analysis is reflected in Figures 7-3 through 7-6.<sup>2</sup>

Quarterly emissions data from the facilities in RECLAIM before they were in the program is not available. Therefore, a quantitative comparison of the seasonal variation of emissions from these facilities while operating under RECLAIM with their seasonal emissions variation prior to RECLAIM is not feasible. However, a qualitative comparison has been conducted, as follows:

- NOx emissions from RECLAIM facilities are dominated by refineries and power plants.
- SOx emissions from RECLAIM facilities are especially dominated by refineries.
- Prior to RECLAIM, refinery production was generally highest in the summer months because more people travel during summer; thus, increasing demand for gasoline and other transportation fuels.
- Electricity generation prior to RECLAIM was generally highest in the summer months because of increased demand for electricity to drive air conditioning units.

Emissions from refineries (NOx and SOx) and from power plants (NOx) are typically higher in the summer months, which was the trend prior to implementation of RECLAIM for the reasons described above. Therefore, provided a year’s summer quarter RECLAIM emissions do not exceed that year’s quarterly average emissions by a substantial amount, it can be concluded that, for that year, RECLAIM has not resulted in a shift of emissions to the summer months relative to the pre-RECLAIM emission pattern.

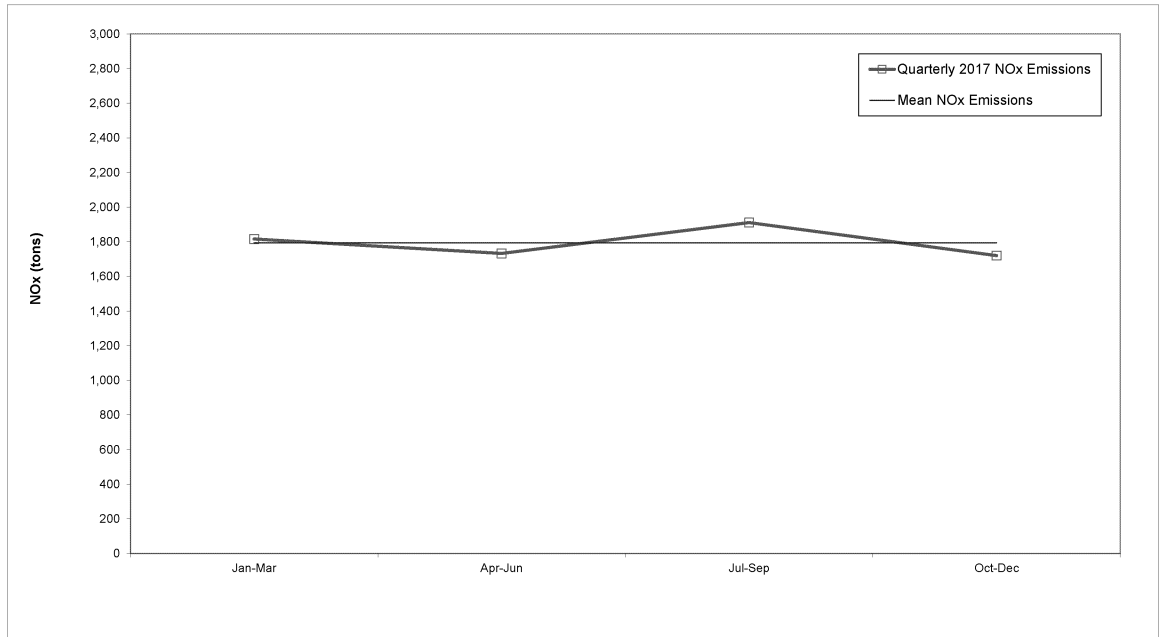
Figure 7-3 shows the 2017 mean quarterly NOx emission level, which is the average of the aggregate audited emissions for each of the four quarters, and the 2017 audited quarterly emissions. Figure 7-4 compares the 2017 quarterly NOx emissions with the quarterly emissions from 2006 through 2016. During calendar year 2017, quarterly NOx emissions varied from four percent below the mean in

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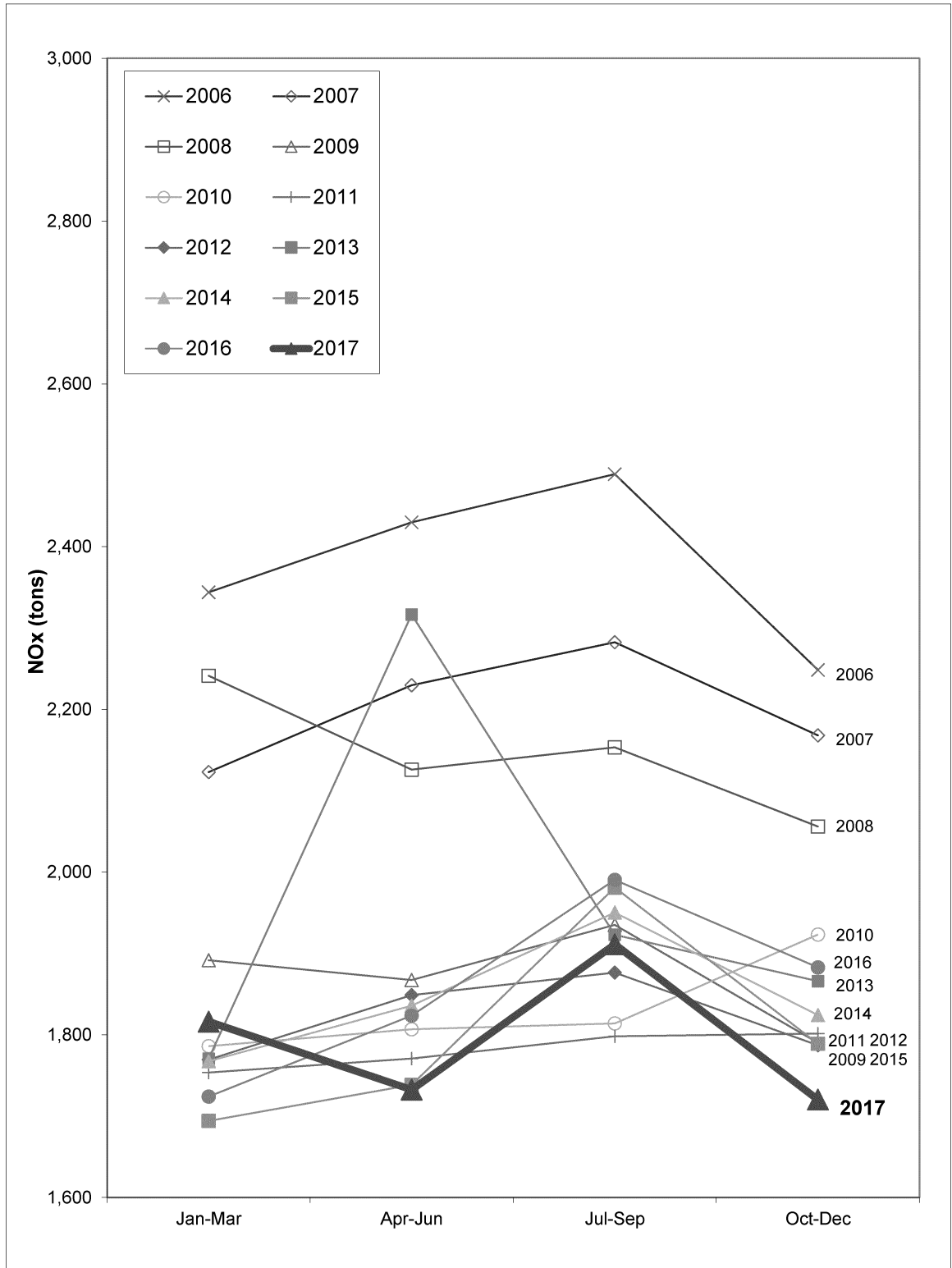
<sup>2</sup> Data used to generate these figures were derived from audited data. Similar figures for calendar years 1994 through 2007 in previous annual reports were generated from a combination of audited and reported data available at the time the reports were written.

the second quarter (April through June) to about seven percent above the mean in the third quarter (July through September). Figure 7-4 shows that the calendar year 2017 quarterly emissions profile is consistent with previous years under RECLAIM, with calendar year 2013 being the only notable exception. Figures 7-3 and 7-4, along with the qualitative analysis performed above, show that in calendar year 2017 there has not been a significant shift in NOx emissions from the winter months to the summer months.

**Figure 7-3**  
**Calendar Year 2017 NOx Quarterly Emissions**

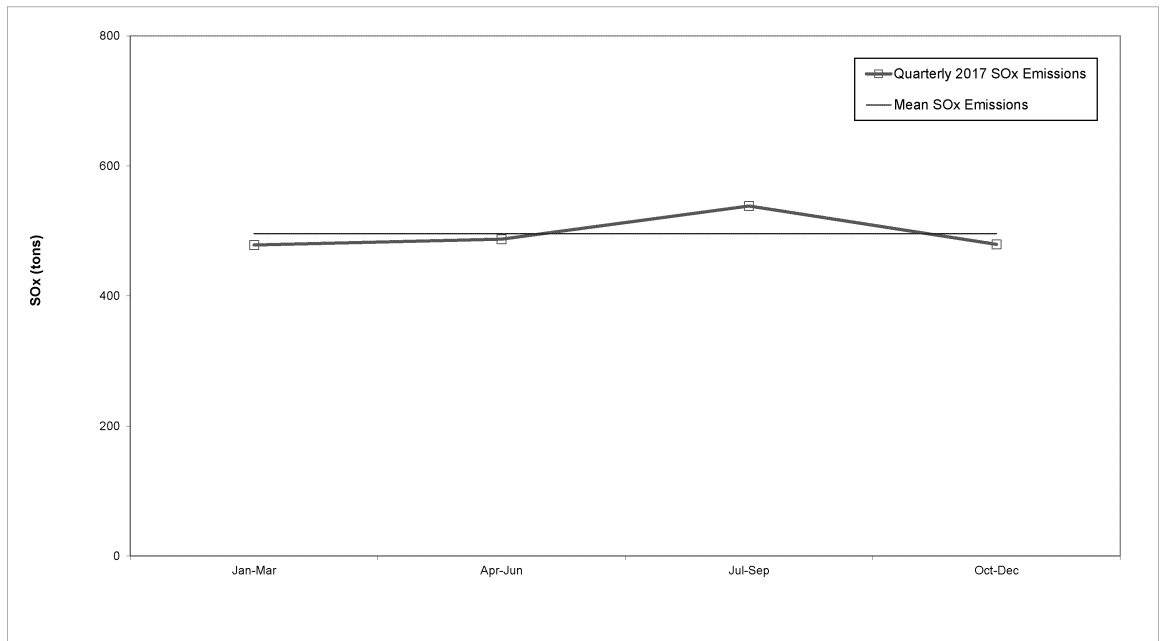


**Figure 7-4**  
**Quarterly NOx Emissions from Calendar Years 2006 through 2017**



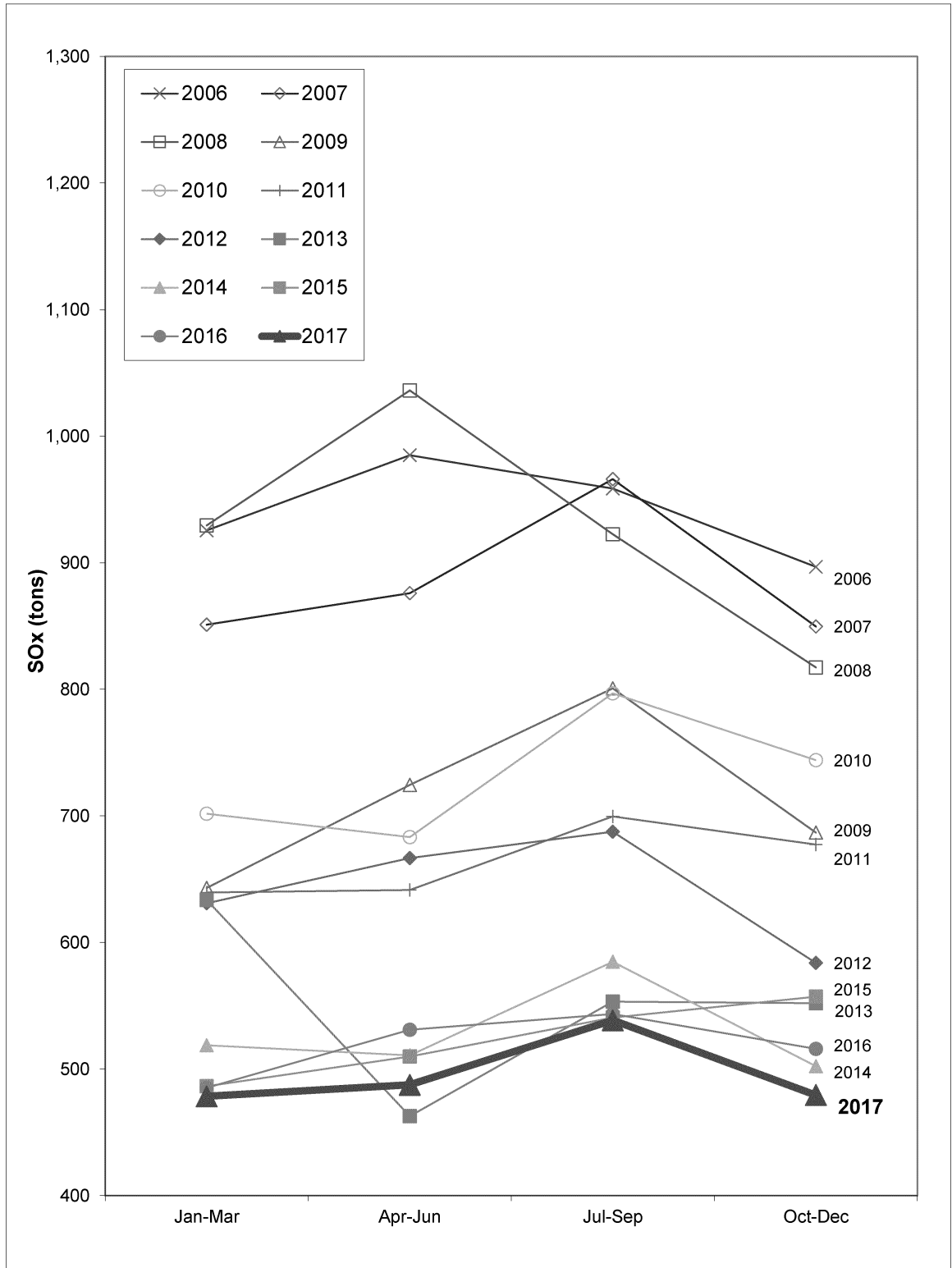
Similar to Figure 7-3 and 7-4 for NOx quarterly emissions, Figure 7-5 presents the 2017 mean quarterly SOx emissions and the 2017 audited quarterly emissions, while Figure 7-6 compares the 2017 quarterly SOx emissions with the quarterly emissions from 2006 through 2016. Figure 7-5 shows that quarterly SOx emissions during calendar year 2017 varied from four percent below the mean in the first quarter (January to March) to about nine percent above the mean in the third quarter (July to September). Figure 7-6 shows that the calendar year 2017 quarterly emissions profile is roughly consistent with previous years under RECLAIM. Both Figures 7-5 and 7-6, along with the qualitative analysis performed above, show that in calendar year 2017 there was not a significant shift in SOx emissions from the winter months to the summer months.

**Figure 7-5**  
**Calendar Year 2017 SOx Quarterly Emissions**





**Figure 7-6**  
**Quarterly SOx Emissions from Calendar Years 2006 through 2017**



## Per Capita Exposure to Pollution

The predicted effects of RECLAIM on air quality and public health were thoroughly analyzed through modeling during program development. The results were compared to the projected impacts from continuing traditional command-and-control regulations and to implementing control measures in the 1991 AQMP. One of the criteria examined in the analysis was per capita population exposure.

Per capita population exposure reflects the length of time each person is exposed to unhealthful air quality. The modeling performed in the program development analysis projected that the reductions in per capita exposure under RECLAIM in calendar year 1994 would be nearly identical to the reductions projected for implementation of the control measures in the 1991 AQMP, and the reductions resulting from RECLAIM would be greater in calendar years 1997 and 2000. As reported in previous annual reports, actual per capita exposures to ozone for 1994 and 1997 were below the projections.

As part of the Children's Environmental Health Protection Act that was passed in 1999, and in consultation with the Office of Environmental Health Hazard Assessment (OEHHA), CARB is to "review all existing health-based ambient air quality standards to determine whether these standards protect public health, including infants and children, with an adequate margin of safety." As a result of that requirement, CARB adopted a new 8-hour ozone standard (0.070 ppm), which became effective May 17, 2006, in addition to the 1-hour ozone standard (0.09 ppm) already in place. Table 7-1 shows the number of days that both the state 8-hour ozone standard of 0.070 ppm and the 1-hour standard of 0.09 ppm were exceeded.

In July 1997, the USEPA established an ozone National Ambient Air Quality Standard (NAAQS) of 0.085 ppm based on an 8-hour average measurement. As part of the Phase I implementation that was finalized in June 2004, the federal 1-hour ozone standard (0.12 ppm) was revoked effective June 2005. Effective May 27, 2008, the 8-hour NAAQS for ozone was reduced to 0.075 ppm. Table 7-1 shows monitoring results based on this 8-hour federal standard. Effective December 28, 2015, the 8-hour NAAQS for ozone was further reduced to 0.070 ppm, the level of the current California Ambient Air Quality Standard. Table 7-1 shows that the Basin exceeded both the newer 8-hour federal 0.07 ppm standard and the state 0.07 ppm standard by 141 days in 2018. The number of days in exceedance of the federal and state standards are the same this year, although they were not last year. A difference could occur again in the future due to the differing language and methods for deriving exceedance days in the federal and state rules.

Table 7-1 summarizes ozone data for calendar years 2001 through 2018 in terms of the number of days that exceeded the state's 1-hour and 8-hour ozone standards, the 2008 and 2015 federal ambient 8-hour ozone standard, and both the Basin's maximum 1-hour and 8-hour ozone concentrations in each calendar year. This table shows that the number of days that exceeded each standard in 2018 decreased when compared to 2017. The data shows the number of days in exceedance of most of these standards has grown from 2015 to 2017 after a drop from 2014. This upward trend has been reversed in 2018. Table 7-1 also shows, however, that while the Basin Maximum 8-hour ozone concentration has

gone up slightly, the Basin Maximum 1-hour ozone concentration dropped sharply relative to last year. The Basin Maximum 1-hour ozone concentration in 2018 was the lowest it has been for at least the last 18 years.

**Table 7-1  
Summary of Ozone Data**

Year	Days exceeding state 1-hour standard (0.09 ppm)	Days exceeding state 8-hour standard (0.07 ppm)	Days exceeding old federal 8-hour standard (0.075 ppm)	Days exceeding new federal 8-hour standard (0.07 ppm)	Basin Maximum 1-hour ozone concentration (ppm)	Basin Maximum 8-hour ozone concentration (ppm)
2001	121	156	132	N/A	0.191	0.146
2002	118	149	135	N/A	0.169	0.148
2003	133	161	141	N/A	0.216	0.200
2004	110	161	126	N/A	0.163	0.148
2005	111	142	116	N/A	0.163	0.145
2006	102	121	114	N/A	0.175	0.142
2007	99	128	108	N/A	0.171	0.137
2008	98	136	121	N/A	0.176	0.131
2009	100	131	113	N/A	0.176	0.128
2010	83	128	109	N/A	0.143	0.123
2011	94	127	107	N/A	0.160	0.136
2012	97	140	111	N/A	0.147	0.112
2013	92	123	106	N/A	0.151	0.122
2014	76	134	93	N/A	0.142	0.114
2015	72	116	83	113	0.144	0.127
2016	85	132	105	132	0.164	0.122
2017	109	150	122	145	0.158	0.136
2018	86	141	109	141	0.125	0.142

The CCAA, which was enacted in 1988, established targets for reducing overall population exposure to severe non-attainment pollutants in the Basin—a 25% reduction by December 31, 1994, a 40% reduction by December 31, 1997, and a 50% reduction by December 31, 2000 relative to a calendar years’ 1986-88 baseline. These targets are based on the average number of hours a person is exposed (“per capita exposure”<sup>3</sup>) to ozone concentrations above the state 1-hour standard of 0.09 ppm. Table 7-2 shows the 1986-88 baseline per capita exposure, the actual per capita exposures each year since 1994 (RECLAIM’s

<sup>3</sup> SCAQMD staff divides the air basin into a grid of square cells and interpolates recorded ozone data from ambient air quality monitors to determine ozone levels experienced in each of these cells. The total person-hours in a county experiencing ozone higher than the state ozone standard is determined by summing over the whole county the products of the number of hours exceeding the state ozone standard per grid cell with the number of residents in the corresponding cell. The per capita ozone exposures are then calculated by dividing the sum of person-hours by the total population within a county. Similar calculations are used to determine the Basin-wide per capita exposure by summing and dividing over the whole Basin.

initial year), and the 1997 and 2000 targets set by the CCAA for each of the four counties in the district and the Basin overall. As shown in Table 7-2, the CCAA reduction targets were achieved as early as 1994 (actual 1994 Basin per capita exposure was 37.6 hours, which is below the 2000 target of 40.2 hours). The per capita exposure continues to remain much lower than the CCAA targets. For calendar year 2018, the actual per capita exposure for the Basin was 1.97 hours, which represents a 97.6% reduction from the 1986-88 baseline level.

**Table 7-2**  
**Per Capita Exposure to Ozone above the State One-Hour Standard of 0.09 ppm (hours)**

Calendar Year	Basin	Los Angeles	Orange	Riverside	San Bernardino
1986-88 baseline <sup>1</sup>	80.5	75.8	27.2	94.1	192.6
1994 actual	37.6	26.5	9	71.1	124.9
1995 actual	27.7	20	5.7	48.8	91.9
1996 actual	20.3	13.2	4	42.8	70
1997 actual	5.9	3	0.6	13.9	24.5
1998 actual	12.1	7.9	3.1	25.2	40.2
2000 actual	3.8	2.6	0.7	8.5	11.4
2001 actual	1.73	0.88	0.15	6	5.68
2002 actual	3.87	2.16	0.13	11.12	12.59
2003 actual	10.92	6.3	0.88	20.98	40.21
2004 actual	3.68	2.26	0.50	6.82	12.34
2005 actual	3.11	1.43	0.03	6.06	12.54
2006 actual	4.56	3.08	0.68	8.02	13.30
2007 actual	2.90	1.50	0.35	4.65	10.53
2008 actual	4.14	2.04	0.26	7.50	14.71
2009 actual	2.87	1.54	0.08	3.88	10.54
2010 actual	1.18	0.38	0.11	2.45	4.48
2011 actual	2.10	0.85	0.02	3.46	8.13
2012 actual	2.37	1.05	0.05	2.59	9.78
2013 actual	1.31	0.52	0.07	1.61	5.50
2014 actual	1.84	1.26	0.29	1.47	6.02
2015 actual	1.96	0.76	0.10	2.14	8.47
2016 actual	2.64	1.14	0.07	2.19	11.56
2017 actual	4.94	2.90	0.14	4.01	18.78
2018 actual	1.97	0.90	0.14	2.37	7.79
1997 target <sup>2</sup>	48.3	45.5	16.3	56.5	115.6
2000 target <sup>3</sup>	40.2	37.9	13.6	47	96.3

<sup>1</sup> Average over three years, 1986 through 1988.

<sup>2</sup> 60% of the 1986-88 baseline exposures.

<sup>3</sup> 50% of the 1986-88 baseline exposures.

Table 7-2 shows that actual per capita exposures during all the years mentioned were well under the 1997 and 2000 target exposures limits. It should also be noted that air quality in the Basin is a complex function of meteorological conditions and an array of different emission sources, including mobile, area, RECLAIM stationary sources, and non-RECLAIM stationary sources. Therefore, the reduction of per capita exposure beyond the projected level is not necessarily wholly attributable to implementation of the RECLAIM program in lieu of the command-and-control regulations.

## Toxic Impacts

Based on a comprehensive toxic impact analysis performed during program development, it was concluded that RECLAIM would not result in any significant impacts on air toxic emissions. Nevertheless, to ensure that the implementation of RECLAIM does not result in adverse toxic impacts, each annual program audit is required to assess any increase in the public health exposure to air toxics potentially caused by RECLAIM.

One of the safeguards to ensure that the implementation of RECLAIM does not result in adverse air toxic health impacts is that RECLAIM sources are subject to the same air toxic statutes and regulations (*e.g.*, SCAQMD Regulation XIV, State AB 2588, State Air Toxics Control Measures, Federal National Emissions Standards for Hazardous Air Pollutants, etc.) as other sources in the Basin. Additionally, air toxic health risk is primarily caused by emissions of VOCs and fine particulates such as certain metals. VOC sources at RECLAIM facilities are subject to source-specific command-and-control rules the same way as are non-RECLAIM facilities, in addition to the toxics requirements described above. Sources of fine particulates and toxic metal emissions are also subject to the above-identified regulations pertaining to toxic emissions. Moreover, new or modified RECLAIM sources with NO<sub>x</sub> or SO<sub>x</sub> emission increases are also required to be equipped with BACT, which minimizes to the extent feasible NO<sub>x</sub> and SO<sub>x</sub> emissions, which are precursors to particulate matter.

There have been concerns raised that trading RTCs could allow for higher production at a RECLAIM facility, which may indirectly cause higher emissions of toxic air contaminants, and thereby make the health risk in the vicinity of the facility worse. Other SCAQMD rules and programs for toxic air contaminants apply to facilities regardless of them being in RECLAIM or under traditional command and control rules. Emission increases at permit units are subject to new source review. RECLAIM facilities must also comply with any applicable Regulation XIV rules for toxics. Permits generally include limiting throughput conditions for new source review or applicable source specific rules. AB2588 and Rule 1402 could also be triggered based on risk, which would require the facility to take appropriate risk reduction measures.

Under the AER program, facilities that emit either: 1) four tons per year or more of VOC, NO<sub>x</sub>, SO<sub>x</sub>, or PM, or 100 tons per year or more of CO; or 2) any one of 24 toxic air contaminants (TACs) and ozone depleting compounds (ODCs) emitted above specific thresholds (Rule 301 Table IV), are required to report their emissions annually to SCAQMD. Beginning with the FY 2000-01 reporting cycle, toxics emission reporting for the AB2588 Program was incorporated into SCAQMD's AER Program. The data collected in the AER program is used to determine which facilities will be required to take further actions under the AB2588 Hot Spots Program.

Facilities in the AB2588 Program are required to submit a comprehensive toxics inventory, which is then prioritized using Board-approved procedures<sup>4</sup> into one of three categories: low, intermediate, or high priority. Facilities ranked with low priority are exempt from future reporting. Facilities ranked with intermediate

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<sup>4</sup> The toxics prioritization procedures can be found at: <http://www.aqmd.gov/home/regulations/compliance/toxic-hot-spots-ab-2588>.

priority are classified as District tracking facilities, which are then required to submit a complete toxics inventory once every four years. In addition to reporting their toxic emissions quadrennially, facilities designated as high priority are required to submit a health risk assessment (HRA) to determine their impacts to the surrounding community.

According to SCAQMD's 2017 Annual Report on the AB2588 Air Toxics "Hot Spots" program<sup>5</sup>, staff has reviewed and approved 339 facility HRAs as of the end calendar of year 2017. About 95% of the facilities have cancer risks below 10 in a million and 96% of the facilities have acute and chronic non-cancer hazard indices less than 1. Facilities with cancer risks above 10 in a million or a non-cancer hazard index above 1 are required to issue public notices informing the community. A public meeting is held during which SCAQMD discusses the health risks from the facility. SCAQMD has conducted such public notification meetings for 55 facilities under the AB2588 Program.

The Board has also established the following action risk levels in Rule 1402 – Control of Toxic Air Contaminants from Existing Sources: a cancer burden of 0.5, a cancer risk of 25 in a million, and a hazard index of 3.0. Facilities above any of the action risk levels must reduce their risks below the action risk levels within three years. To date, 27 facilities have been required to reduce risks and all of these facilities have reduced risks well below the action risk levels mandated by Rule 1402.

The impact of the above rules and measures are analyzed in Multiple Air Toxic Exposure Studies (MATES), which SCAQMD staff conducts periodically to assess cumulative air toxic impacts to the residents and workers of southern California. The fourth version of MATES (*i.e.*, MATES IV) was conducted over a one year period from July 2012 to June 2013, and the final MATES IV report was released on May 1, 2015<sup>6</sup>. Monitoring conducted at that time indicated that the basin-wide population-weighted air toxics exposure was reduced by 57% since MATES III (conducted from April 2004 to March 2006). The results of these recent MATES studies continue to show that the region-wide cumulative air toxic impacts on residents and workers in southern California have been declining. Therefore, staff has not found any evidence that would suggest that the substitution of NO<sub>x</sub> and SO<sub>x</sub> RECLAIM for the command-and-control rules and the measures RECLAIM subsumes caused a significant increase in public exposure to air toxic emissions relative to what would have happened if the RECLAIM program was not implemented.

SCAQMD has initiated a MATES V study and staff began air toxics measurements at 10 fixed stations in early 2018. The advanced monitoring components also began in 2018, and included flight measurements, mobile monitoring and optical remote sensing technologies. SCAQMD staff will work with communities to implement sensor networks for enhanced local-scale data. The advanced monitoring components focus mainly on refinery emissions and potential community impacts, but also include other air pollution sources that are located close to communities. Staff has been gathering supplemental data for the

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<sup>5</sup> The 2017 AB2588 Annual Report can be found at: [http://www.aqmd.gov/docs/default-source/planning/risk-assessment/ab2588annualreport\\_080418.pdf?sfvrsn=6](http://www.aqmd.gov/docs/default-source/planning/risk-assessment/ab2588annualreport_080418.pdf?sfvrsn=6).

<sup>6</sup> The Final MATES IV Report can be found at: <http://www.aqmd.gov/docs/default-source/air-quality/air-toxic-studies/mates-iv/mates-iv-final-draft-report-4-1-15.pdf>.

emissions inventory and has begun developing the modeling platform for the air toxics health risk modeling, which will be performed once data is available. Staff will continue to monitor and assess toxic impacts as part of future annual program audits.

## APPENDIX A

### RECLAIM UNIVERSE OF SOURCES

The RECLAIM universe of active sources as of the end of Compliance Year 2017 is provided below.

Facility ID	Cycle	Facility Name	Program
800088	2	3M COMPANY	NOx
23752	2	AEROCRAFT HEAT TREATING CO INC	NOx
115394	1	AES ALAMITOS, LLC	NOx
115389	2	AES HUNTINGTON BEACH, LLC	NOx/SOx
115536	1	AES REDONDO BEACH, LLC	NOx
148236	2	AIR LIQUIDE LARGE INDUSTRIES U.S., LP	NOx/SOx
3417	1	AIR PROD & CHEM INC	NOx
101656	2	AIR PRODUCTS AND CHEMICALS, INC.	NOx
5998	1	ALL AMERICAN ASPHALT	NOx
114264	1	ALL AMERICAN ASPHALT	NOx
3704	2	ALL AMERICAN ASPHALT, UNIT NO.01	NOx
176708	2	ALTAGAS POMONA ENERGY INC.	NOx
800196	2	AMERICAN AIRLINES, INC.	NOx
184958	1	BRONCS INC. DBA WEST COAST TEXTILES	NOx
185145	2	9W HALO WESTERN OPCP LP DBA ANGELICA	NOx
185146	2	9W HALO WESTERN OPCP L.P. D/B/A ANGELICA	NOx
16642	1	ANHEUSER-BUSCH LLC., (LA BREWERY)	NOx/SOx
117140	2	AOC, LLC	NOx
124619	1	ARDAGH METAL PACKAGING USA INC.	NOx
174406	1	ARLON GRAPHICS LLC	NOx
12155	1	ARMSTRONG FLOORING INC	NOx
122666	2	A'S MATCH DYEING & FINISHING	NOx
183832	2	AST TEXTILE GROUP, INC.	NOx
181510	1	AVCORP COMPOSITE FABRICATION, INC	NOx
117290	2	B BRAUN MEDICAL, INC	NOx
800016	2	BAKER COMMODITIES INC	NOx
800205	2	BANK OF AMERICA NT & SA, BREA CENTER	NOx
40034	1	BENTLEY PRINCE STREET INC	NOx
166073	1	BETA OFFSHORE	NOx
155474	2	BICENT (CALIFORNIA) MALBURG LLC	NOx



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Facility ID	Cycle	Facility Name	Program
132068	1	BIMBO BAKERIES USA INC	NOx
1073	1	BORAL ROOFING LLC	NOx
150201	2	BREITBURN OPERATING LP	NOx
174544	2	BREITBURN OPERATING LP	NOx
25638	2	BURBANK CITY, BURBANK WATER & POWER	NOx
128243	1	BURBANK CITY, BURBANK WATER & POWER, SCPPA	NOx
800344	1	CALIFORNIA AIR NATIONAL GUARD, MARCH AFB	NOx
22607	2	CALIFORNIA DAIRIES, INC	NOx
138568	1	CALIFORNIA DROP FORGE, INC	NOx
800181	2	CALIFORNIA PORTLAND CEMENT CO	NOx/SOx
148896	2	CALIFORNIA RESOURCES PRODUCTION CORP	NOx
148897	2	CALIFORNIA RESOURCES PRODUCTION CORP	NOx
151899	2	CALIFORNIA RESOURCES PRODUCTION CORP	NOx
46268	1	CALIFORNIA STEEL INDUSTRIES INC	NOx
107653	2	CALMAT CO	NOx
107654	2	CALMAT CO	NOx
107655	2	CALMAT CO	NOx
107656	2	CALMAT CO	NOx
153992	1	CANYON POWER PLANT	NOx
94930	1	CARGILL INC	NOx
22911	2	CARLTON FORGE WORKS	NOx
118406	1	CARSON COGENERATION COMPANY	NOx
141555	2	CASTAIC CLAY PRODUCTS, LLC	NOx
14944	1	CENTRAL WIRE, INC.	NOx/SOx
42676	2	CES PLACERITA INC	NOx
148925	1	CHERRY AEROSPACE	NOx
800030	2	CHEVRON PRODUCTS CO.	NOx/SOx
56940	1	CITY OF ANAHEIM/COMB TURBINE GEN STATION	NOx
172077	1	CITY OF COLTON	NOx
129810	1	CITY OF RIVERSIDE PUBLIC UTILITIES DEPT	NOx
139796	1	CITY OF RIVERSIDE PUBLIC UTILITIES DEPT	NOx
164204	2	CITY OF RIVERSIDE, PUBLIC UTILITIES DEPT	NOx
14502	2	VERNON PUBLIC UTILITIES	NOx
184849	2	CLOUGHERTY PACKING, LLC	NOx
182561	1	COLTON POWER, LP	NOx
182563	1	COLTON POWER, LP	NOx

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Facility ID	Cycle	Facility Name	Program
38440	2	COOPER & BRAIN - BREA	NOx
126536	1	CPP – POMONA	NOx
50098	1	D&D DISPOSAL INC, WEST COAST RENDERING CO	NOx
63180	1	DARLING INGREDIENTS INC.	NOx
3721	2	DART CONTAINER CORP OF CALIFORNIA	NOx
7411	2	DAVIS WIRE CORP	NOx
143738	2	DCOR LLC	NOx
143739	2	DCOR LLC	NOx
143740	2	DCOR LLC	NOx
143741	1	DCOR LLC	NOx
47771	1	DELEO CLAY TILE CO INC	NOx
800037	2	DEMENNO-KERDOON DBA WORLD OIL RECYCLING	NOx
125579	1	DIRECTV	NOx
800189	1	DISNEYLAND RESORT	NOx
142536	2	DRS SENSORS & TARGETING SYSTEMS, INC	NOx
180908	1	ECO SERVICES OPERATIONS CORP.	NOx/SOx
800264	2	EDGINGTON OIL COMPANY	NOx/SOx
115663	1	EL SEGUNDO POWER, LLC	NOx
800372	2	EQUILON ENTER. LLC, SHELL OIL PROD. US	NOx/SOx
124838	1	EXIDE TECHNOLOGIES	NOx/SOx
95212	1	FABRICA	NOx
11716	1	FONTANA PAPER MILLS INC	NOx
184288	2	SENTINEL PEAK RESOURCES CALIFORNIA, LLC	NOx
346	1	FRITO-LAY, INC.	NOx
2418	2	FRUIT GROWERS SUPPLY CO	NOx
142267	2	FS PRECISION TECH LLC	NOx
176934	1	GI TC IMPERIAL HIGHWAY, LLC	NOx
124723	1	GREKA OIL & GAS	NOx
137471	2	GRIFOLS BIOLOGICALS INC	NOx
156741	2	HARBOR COGENERATION CO, LLC	NOx
157359	1	HENKEL ELECTRONIC MATERIALS, LLC	NOx
123774	1	HERAEUS PRECIOUS METALS NO. AMERICA, LLC	NOx
113160	2	HILTON COSTA MESA	NOx
800066	1	HITCO CARBON COMPOSITES INC	NOx
2912	2	HOLLIDAY ROCK CO INC	NOx
800003	2	HONEYWELL INTERNATIONAL INC	NOx

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Facility ID	Cycle	Facility Name	Program
124808	2	INEOS POLYPROPYLENE LLC	NOx/SOx
129816	2	INLAND EMPIRE ENERGY CENTER, LLC	NOx
157363	2	INTERNATIONAL PAPER CO	NOx
16338	1	KAISER ALUMINUM FABRICATED PRODUCTS, LLC	NOx
21887	2	KIMBERLY-CLARK WORLDWIDE INC.-FULT. MILL	NOx/SOx
1744	2	KIRKHILL - TA COMPANY	NOx
800335	2	LA CITY, DEPT OF AIRPORTS	NOx
800170	1	LA CITY, DWP HARBOR GENERATING STATION	NOx
800074	1	LA CITY, DWP HAYNES GENERATING STATION	NOx
800075	1	LA CITY, DWP SCATTERGOOD GENERATING STN	NOx
800193	2	LA CITY, DWP VALLEY GENERATING STATION	NOx
61962	1	LA CITY, HARBOR DEPT	NOx
550	1	LA CO., INTERNAL SERVICE DEPT	NOx
173904	2	LAPEYRE INDUSTRIAL SANDS, INC	NOx
141295	2	LEKOS DYE AND FINISHING, INC	NOx
144455	2	LIFOAM INDUSTRIES, LLC	NOx
83102	2	LIGHT METALS INC	NOx
185601	2	BRIDGE ENERGY, LLC	NOx
185600	2	BRIDGE ENERGY, LLC	NOx
185801	1	BERRY PETROLEUM COMPANY, LLC	NOx
185574	1	BRIDGE ENERGY, LLC	NOx
185575	2	BRIDGE ENERGY, LLC	NOx
115314	2	LONG BEACH GENERATION, LLC	NOx
17623	2	LOS ANGELES ATHLETIC CLUB	NOx
58622	2	LOS ANGELES COLD STORAGE CO	NOx
800080	2	LUNDAY-THAGARD CO DBA WORLD OIL REFINING	NOx/SOx
38872	1	MARS PETCARE U.S., INC.	NOx
14049	2	MARUCHAN INC	NOx
3029	2	MATCHMASTER DYEING & FINISHING INC	NOx
182970	1	MATRIX OIL CORP	NOx
2825	1	MCP FOODS INC	NOx
173290	1	MEDICLEAN	NOx
176952	2	MERCEDES-BENZ WEST COAST CAMPUS	NOx
94872	2	METAL CONTAINER CORP	NOx
155877	1	MILLERCOORS USA LLC	NOx
12372	1	MISSION CLAY PRODUCTS	NOx

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Facility ID	Cycle	Facility Name	Program
11887	2	NASA JET PROPULSION LAB	NOx
115563	1	NCI GROUP INC., DBA, METAL COATERS OF CA	NOx
172005	2	NEW- INDY ONTARIO, LLC	NOx
12428	2	NEW NGC, INC.	NOx
131732	2	NEWPORT FAB, LLC	NOx
18294	1	NORTHROP GRUMMAN SYSTEMS CORP	NOx
800408	1	NORTHROP GRUMMAN SYSTEMS	NOx
800409	2	NORTHROP GRUMMAN SYSTEMS CORPORATION	NOx
112853	2	NP COGEN INC	NOx
115315	1	NRG CALIFORNIA SOUTH LP, ETIWANDA GEN ST	NOx
89248	2	OLD COUNTRY MILLWORK INC	NOx
47781	1	OLS ENERGY-CHINO	NOx
183564	2	ONNI TIMES SQUARE LP	NOx
183415	2	ONTARIO INTERNATIONAL AIRPORT AUTHORITY	NOx
35302	2	OWENS CORNING ROOFING AND ASPHALT, LLC	NOx/SOx
7427	1	OWENS-BROCKWAY GLASS CONTAINER INC	NOx/SOx
45746	2	PABCO BLDG PRODUCTS LLC,PABCO PAPER, DBA	NOx/SOx
17953	1	PACIFIC CLAY PRODUCTS INC	NOx
59618	1	PACIFIC CONTINENTAL TEXTILES, INC.	NOx
2946	1	PACIFIC FORGE INC	NOx
130211	2	NOVIPAX, INC	NOx
187165	1	ALTAIR PARAMOUNT, LLC	NOx/SOx
800168	1	PASADENA CITY, DWP	NOx
171107	2	PHILLIPS 66 CO/LA REFINERY WILMINGTON PL	NOx/SOx
171109	1	PHILLIPS 66 COMPANY/LOS ANGELES REFINERY	NOx/SOx
137520	1	PLAINS WEST COAST TERMINALS LLC	NOx
800416	1	PLAINS WEST COAST TERMINALS LLC	NOx
800417	2	PLAINS WEST COAST TERMINALS LLC	NOx
800419	2	PLAINS WEST COAST TERMINALS LLC	NOx
800420	2	PLAINS WEST COAST TERMINALS LLC	NOx
168088	1	POLYNT COMPOSITES USA INC	NOx
11435	2	PQ CORPORATION	NOx/SOx
7416	1	PRAXAIR INC	NOx
42630	1	PRAXAIR INC	NOx
136	2	PRESS FORGE CO	NOx
105903	1	PRIME WHEEL	NOx

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Facility ID	Cycle	Facility Name	Program
179137	1	QG PRINTING II LLC	NOx
8547	1	QUEMETCO INC	NOx/SOx
19167	2	R J. NOBLE COMPANY	NOx
185101	2	LSC COMMUNICATIONS, LA MFG DIV	NOx
20604	2	RALPHS GROCERY CO	NOx
114997	1	RAYTHEON COMPANY	NOx
115172	2	RAYTHEON COMPANY	NOx
800371	2	RAYTHEON SYSTEMS COMPANY - FULLERTON OPS	NOx
20203	2	RECONSERVE OF CALIFORNIA-LOS ANGELES INC	NOx
180410	2	REICHHOLD LLC 2	NOx
52517	1	REXAM BEVERAGE CAN COMPANY	NOx
800113	2	ROHR, INC.	NOx
4242	2	SAN DIEGO GAS & ELECTRIC	NOx
161300	2	SAPA EXTRUDER, INC	NOx
183108	2	URBAN COMMONS LLC EVOLUTION HOSPITALITY	NOx
15504	2	SCHLOSSER FORGE COMPANY	NOx
14926	1	SEMPRA ENERGY (THE GAS CO)	NOx
152707	1	SENTINEL ENERGY CENTER LLC	NOx
184301	1	SENTINEL PEAK RESOURCES CALIFORNIA, LLC	NOx
800129	1	SFPP, L.P.	NOx
37603	1	SGL TECHNIC INC, POLYCARBON DIVISION	NOx
131850	2	SHAW DIVERSIFIED SERVICES INC	NOx
117227	2	SHCI SM BCH HOTEL LLC, LOEWS SM BCH HOTE	NOx
16639	1	SHULTZ STEEL CO	NOx
54402	2	SIERRA ALUMINUM COMPANY	NOx
85943	2	SIERRA ALUMINUM COMPANY	NOx
101977	1	SIGNAL HILL PETROLEUM INC	NOx
119596	2	SNACK KING CORPORATION	NOx
185352	2	SNOW SUMMIT, LLC.	NOx
4477	1	SO CAL EDISON CO	NOx
5973	1	SO CAL GAS CO	NOx
800127	1	SO CAL GAS CO	NOx
800128	1	SO CAL GAS CO	NOx
8582	1	SO CAL GAS CO/PLAYA DEL REY STORAGE FAC	NOx
169754	1	SO CAL HOLDING, LLC	NOx
14871	2	SONOCO PRODUCTS CO	NOx

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Facility ID	Cycle	Facility Name	Program
160437	1	SOUTHERN CALIFORNIA EDISON	NOx
800338	2	SPECIALTY PAPER MILLS INC	NOx
1634	2	STEELCASE INC, WESTERN DIV	NOx
126498	2	STEELSCAPE, INC	NOx
105277	2	SULLY MILLER CONTRACTING CO	NOx
19390	1	SULLY-MILLER CONTRACTING CO.	NOx
3968	1	TABC, INC	NOx
18931	2	TAMCO	NOx/SOx
174591	1	TESORO REF & MKTG CO LLC,CALCINER	NOx/SOx
174655	2	TESORO REFINING & MARKETING CO, LLC	NOx/SOx
151798	1	TESORO REFINING AND MARKETING CO, LLC	NOx/SOx
800436	1	TESORO REFINING AND MARKETING CO, LLC	NOx/SOx
96587	1	TEXOLLINI INC	NOx
16660	2	THE BOEING COMPANY	NOx
115241	1	THE BOEING COMPANY	NOx
800067	1	THE BOEING COMPANY	NOx
800038	2	THE BOEING COMPANY - C17 PROGRAM	NOx
148340	2	THE BOEING COMPANY-BUILDING 800 COMPLEX	NOx
14736	2	THE BOEING CO-SEAL BEACH COMPLEX	NOx
11119	1	THE GAS CO./ SEMPRA ENERGY	NOx
153199	1	THE KROGER CO/RALPHS GROCERY CO	NOx
97081	1	THE TERMO COMPANY	NOx
800330	1	THUMS LONG BEACH	NOx
129497	1	THUMS LONG BEACH CO	NOx
800325	2	TIDELANDS OIL PRODUCTION CO	NOx
68118	2	TIDELANDS OIL PRODUCTION COMPANY ETAL	NOx
171960	2	TIN, INC. DBA INTERNATIONAL PAPER	NOx
137508	2	TONOGA INC, TACONIC DBA	NOx
181667	1	TORRANCE REFINING COMPANY LLC	NOx/SOx
182049	2	TORRANCE VALLEY PIPELINE CO LLC	NOx
182050	1	TORRANCE VALLEY PIPELINE CO LLC	NOx
182051	1	TORRANCE VALLEY PIPELINE CO LLC	NOx
53729	1	TREND OFFSET PRINTING SERVICES, INC	NOx
165192	2	TRIUMPH AEROSTRUCTURES, LLC	NOx
43436	1	TST, INC.	NOx
800026	1	ULTRAMAR INC	NOx/SOx

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Facility ID	Cycle	Facility Name	Program
9755	2	UNITED AIRLINES INC	NOx
800149	2	US BORAX INC	NOx
800150	1	US GOVT, AF DEPT, MARCH AIR RESERVE BASE	NOx
800393	1	VALERO WILMINGTON ASPHALT PLANT	NOx
9053	1	ENWAVE LOS ANGELES INC.	NOx
11034	2	ENWAVE LOS ANGELES INC.	NOx
14495	2	VISTA METALS CORPORATION	NOx
146536	1	WALNUT CREEK ENERGY, LLC	NOx/SOx
42775	1	WEST NEWPORT OIL CO	NOx/SOx
17956	1	WESTERN METAL DECORATING CO	NOx
51620	1	WHEELABRATOR NORWALK ENERGY CO INC	NOx
127299	2	WILDFLOWER ENERGY LP/INDIGO GEN., LLC	NOx

## **APPENDIX B**

### **FACILITY INCLUSIONS**

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As discussed in Chapter 1, no facilities were added to the RECLAIM universe in Compliance Year 2017.



## APPENDIX C RECLAIM FACILITIES CEASING OPERATION OR EXCLUDED

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SCAQMD staff is aware of the following RECLAIM facilities that permanently shut down all operations, inactivated all their RECLAIM permits, or were excluded from the RECLAIM universe during Compliance Year 2017. The reasons for shutdowns and exclusions cited below are based on the information provided by the facilities and other information available to SCAQMD staff.

Facility ID	61722
Facility Name	Ricoh Electronics, Inc.
City and County	Santa Ana, Orange County
SIC	2672
Pollutant(s)	NOx
1994 Allocation	14,443 lbs.
Reason for Shutdown	The facility stated that the reason for shutdown was consolidation with a plant located in Lawrenceville, Georgia. The facility was seeking to expand, and the plant in Georgia was closer to the majority of their customers who are on the east coast.

Facility ID	68042
Facility Name	Corona Energy Partners, Ltd
City and County	Corona, Riverside County
SIC	4923
Pollutant(s)	NOx
1994 Allocation	45,416 lbs.
Reason for Shutdown	The facility stated that their power purchase contract was not renewed. The facility was closed, decommissioned, dismantled, and the property sold. There is no longer an electrical generating station at the location.

Facility ID	109914
Facility Name	Thermal Remediation Solutions, LLC
City and County	Azusa, Los Angeles County
SIC	1794
Pollutant(s)	NOx
1994 Allocation	0 lbs.
Reason for Shutdown	The company stated the reason for shutdown was changing market conditions. The demand for contaminated soil treatment declined to the point where the facility could not stay in business.

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Facility ID	40483
Facility Name	Nelco Prod. Inc
City and County	Fullerton, Orange County
SIC	3612
Pollutant(s)	NOx
1994 Allocation	8,201 lbs.
Reason for Shutdown	The facility claimed that they shut down due to RECLAIM. They cited, among other reasons, that its small size could not guarantee compliance with the recordkeeping, reporting, and audit requirements of the RECLAIM program, which they characterized as "extreme".

## APPENDIX D FACILITIES THAT EXCEEDED THEIR ANNUAL ALLOCATION FOR COMPLIANCE YEAR 2017

The following is a list of facilities that did not have enough RTCs to cover their NOx and/or SOx emissions in Compliance Year 2017 based on the results of audits conducted by SCAQMD staff.

Facility ID	Facility Name	Compliance Year	Emittent
136	Press Forge Co.	2017	NOx
11119	The Gas Co. / Sempra Energy	2017	NOx
18931	Tamco	2017	NOx/SOx
20203	Reconserve of California – Los Angeles Inc.	2017	NOx
50098	D & D Disposal Inc., West Coast Rendering Co.	2017	NOx
63180	Darling Ingredients Inc.	2017	NOx
124723	Greka Oil & Gas	2017	NOx
168088	Polynt Composites USA Inc.	2017	NOx
174591	Tesoro Ref & Mktg Co LLC, Calciner	2017	NOx/SOx
183832	AST Textile Group, Inc.	2017	NOx
184958	Broncs Inc. DBA West Coast Textiles	2017	NOx
185145	9W Halo Western OPCP LP DBA Angelica	2017	NOx
800016	Baker Commodities Inc.	2017	NOx
800181	California Portland Cement Co.	2017	NOx/SOx
800196	American Airlines, Inc.	2017	NOx

## **APPENDIX E**

### **REPORTED JOB IMPACTS ATTRIBUTED TO RECLAIM**

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Each year, RECLAIM facility operators are asked to provide employment data in their APEP reports. The report asks company representatives to quantify job increases and/or decreases, and to report the positive and/or negative impacts of the RECLAIM program on employment at their facilities. This appendix is included in each Annual RECLAIM Audit Report to provide detailed information for facilities reporting that RECLAIM contributed to job gains or losses.

#### **Facilities with reported job gains or losses attributed to RECLAIM:**

Facility ID:	40483
Facility Name:	Nelco Prod. Inc
City and County:	Fullerton, Orange County
SIC:	3612
Pollutant(s):	NOx
Cycle:	2
Job Gain:	0
Job Loss:	52
Comments:	The facility claimed that it shut down and lost up to 52 jobs due to RECLAIM. The facility cited, among other reasons, that its small size could not guarantee compliance with the recordkeeping, reporting, and audit requirements of the RECLAIM program, which they characterized as "extreme".



# Annual RECLAIM Audit Report for 2017 Compliance Year

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South Coast Air Quality Management District  
Governing Board Meeting  
March 1, 2019



## RECLAIM

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REgional Clean Air Incentives Market (RECLAIM) program:

- A cap and trade program adopted in October 1993
- Objective is to meet emission reduction requirements and enhance emission monitoring while providing additional flexibility to lower compliance costs
- Includes largest NO<sub>x</sub> and SO<sub>x</sub> sources
- Specifies facility declining annual emissions caps
- Allows options to reduce emissions or buy RECLAIM Trading Credits (RTCs)

Compliance Year (CompYr) 2017 is the 24<sup>th</sup> year of the program (started in 1994)



## RECLAIM Annual Audit

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- RECLAIM (Rule 2015) requires an annual audit of the program
- Annual RECLAIM Audit Report for Compliance Year 2017
  - Cycle 1: Jan 1, 2017 – Dec 31, 2017
  - Cycle 2: Jul 1, 2017 – Jun 30, 2018
- RECLAIM had 258 facilities at the end of CompYr 2017 (262 at end of CompYr 2016)

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## 2017 Annual RECLAIM Audit Findings Compliance

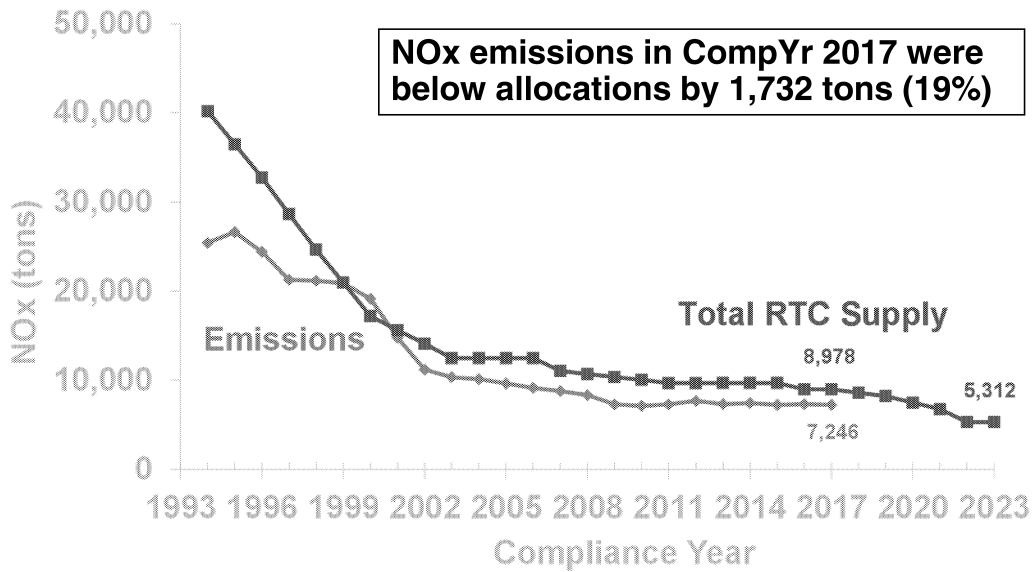
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- RECLAIM met overall NO<sub>x</sub> and SO<sub>x</sub> emissions goals:
  - NO<sub>x</sub> emissions **19%** below allocations
  - SO<sub>x</sub> emissions **17%** below allocations
- Allocation Shave
  - NO<sub>x</sub> Shave of 22.5% adopted January 2005 and implemented in 2007 - 2011
  - SO<sub>x</sub> Shave of 48.4% adopted November 2010 and implemented in 2013 – 2019
  - Additional NO<sub>x</sub> Shave of 45.2% adopted in December 2015 and implemented in 2016 – 2022
  - Reduction of 2 tons/day (7.4%) NO<sub>x</sub> and 5 tons /day (43%) SO<sub>x</sub> allocations in Compliance Year 2017

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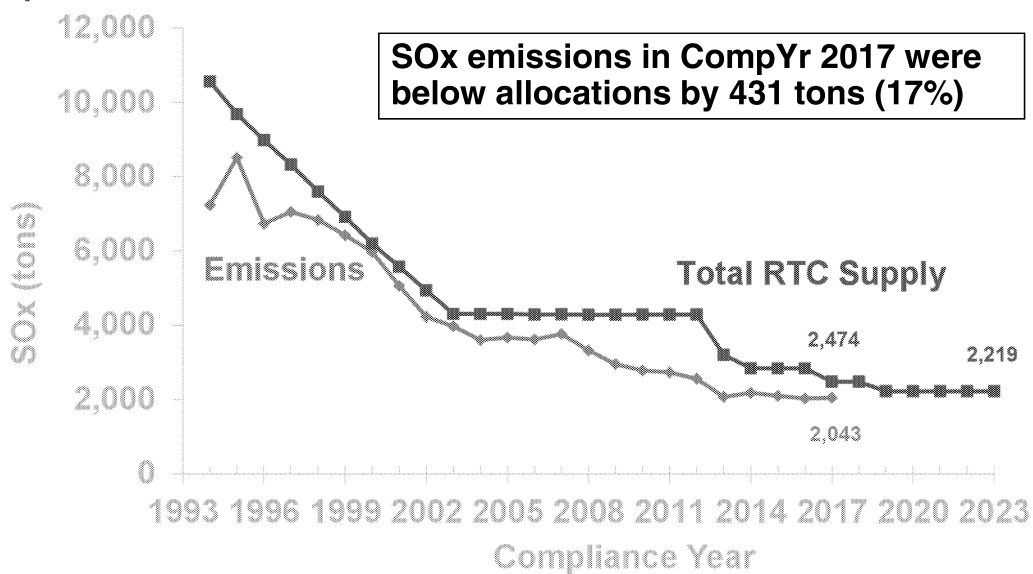
# RECLAIM

## NOx Emissions vs. Allocations Trends



# RECLAIM

## SOx Emissions vs. Allocations Trends



## 2017 Annual RECLAIM Audit Findings Compliance

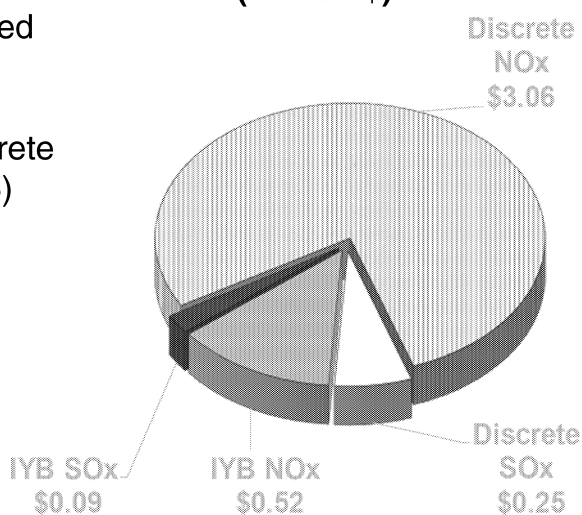
- RECLAIM had a high rate of facility compliance:
  - NOx Facilities – **95%**
  - SOx Facilities – **90%**
- Facilities exceeding their allocations
  - NOx – 15 facilities exceeded by 164.0 tons (1.83% of total allocations)
  - SOx – three facility exceeded by 133.5 tons (5.40% of total allocations)

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## 2017 Annual RECLAIM Audit Findings Credit Trading and Prices

**Value Traded in CalYr 2018  
(Million \$)**

- Over \$1.48 billion of RTCs traded since program inception
- RTCs are traded as either Discrete Year or Infinite-Year Block (IYB)
- \$3.94 million of RTCs traded in Calendar Year (CalYr) 2018 (\$ 6.86 million in CalYr 2017)



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## 2017 Annual RECLAIM Audit Findings Average Discrete Year NOx RTC Prices



- Average prices in CalYr 2018 below program review thresholds:

- \$15,000/ton [Rule 2015]
- \$45,734/ton\* [Health and Safety Code]

\* - Adjusted by October 2018 CPI 9

## 2017 Annual RECLAIM Audit Findings Average Discrete Year SOx RTC Prices

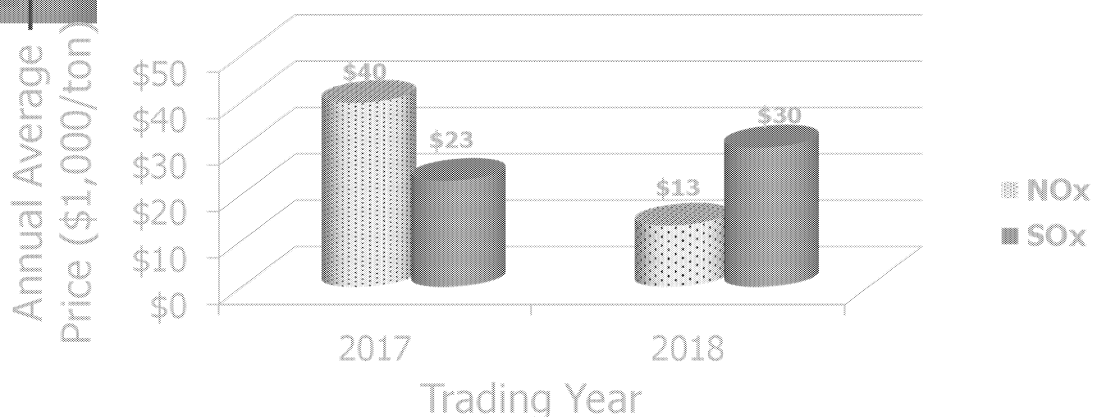


- Average prices in CalYr 2018 below program review thresholds:

- \$15,000/ton [Rule 2015]
- \$32,929\*/ton [Health and Safety Code]

\* - Adjusted by October 2018 CPI 10

## 2017 Annual RECLAIM Audit Findings Average IYB RTC Prices



- 2018 IYB RTC average prices remain below program review thresholds [Health and Safety Code]
  - NOx = \$686,014/ton\*
  - SOx = \$493,930/ton\*

\* - Adjusted by October 2018 CPI 11

## 2017 Annual RECLAIM Audit Findings Investor Participation during CalYr 2018

- Investors are RTC holders who are not RECLAIM facility operators
- Investor participation remains active in CalYr 2018 trades.

RTC Type	Value		Volume	
	NOx	SOx	NOx	SOx
Discrete	64%	61%	55%	61%
IYB	64%	45%	51%	45%

- Investors' holdings at the end of CalYr 2018
  - 3.8% of IYB NOx RTCs (up from 3.3 % in CalYr 2017)
  - 4.7% of IYB SOx RTCs (down from 6.0 % in CalYr 2017)



## 2017 Annual RECLAIM Audit Findings RECLAIM Transition

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- On January 5, 2018, the Board directed staff to initiate the transition of the RECLAIM program to a command-and-control regulatory structure:
  - Monthly working group meetings
  - Rule-specific working groups
  - Identified 21 “Landing Rules” to implement BARCT
  - Completed amendments of two rules as of June 30, 2018 and eight rules as of January 4, 2019.

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## 2017 Annual RECLAIM Audit Findings

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- RECLAIM facilities overall employment loss of 0.26% (net loss of 276 jobs)
- Met federal NSR offset ratios
- No significant shift in seasonal emissions
- No evidence of increased health risk due to RECLAIM

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## 2017 Annual RECLAIM Audit Findings Summary/Recommendations

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### Summary:

- Programmatic compliance achieved (NO<sub>x</sub> and SO<sub>x</sub> emissions were 19% and 17% below allocations, respectively)
- Individual facility compliance rate remained high (95% & 90% for NO<sub>x</sub> and SO<sub>x</sub>, respectively)
- RTC prices stayed far below program review thresholds
- RECLAIM met all other requirements

### Recommendation:

- Approve the Annual RECLAIM Audit Report for 2017 Compliance Year