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)

JULY 2016

Cleaning the Air that We Breathe…

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PURSUANT TO CHAPTER 1702, STATUTES OF 1990 (SB 1928)

JULY 2016

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
GOVERNING BOARD

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Wayne Nastri
Acting Executive Officer

TABLE OF CONTENTS

EXECUTIVE SUMMARY

The South Coast Air Quality Management District (SCAQMD) is subject to internal and external reviews of its air quality programs. These include annual reviews of the District's budget, forecast and proposed operating budget for the upcoming fiscal year, and compliance program audits. In addition, the SCAQMD 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. 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.

Required elements of this report include:

- Summary of each major rule and rule amendment adopted by the District Board in the preceding calendar year, with detailed information about their costs, emission reduction benefits and other alternatives considered;
- Number of permits to operate or construct issued, denied or not renewed, segregated by industry type;
- Emission offset transactions and applications during the previous fiscal year;
- Forecast of budget and staff increases proposed for the following fiscal year;
- Identification of all sources of revenue used or proposed to finance SCAQMD activities; and
- Results of the SCAQMD's Clean Fuels Program.

Chapter I summarizes last year's rulemaking and permitting activity, including offset transactions. Chapter II references the District's draft budget and three-year forecast and existing revenue sources.

Information on the SCAQMD's Clean Fuels Program is also a requirement of this report. Legislation enacted in 1999 now also requires an independent report to the Legislature on the Clean Fuels Program by March 31 of each year [Health and Safety Code 40448.5.1]. The Clean Fuels Program Annual Report and Plan Update is included in this document as Chapter III. Chapter IV is the Annual Regional Clean Air Incentives Market (RECLAIM) Audit Report for the 2014 Compliance Year (inclusion in this report to the Legislature is required by SCAQMD Rule 2015). The report assesses emission reductions, average annual price and availability of RECLAIM Trading Credits, job impacts, compliance issues, and other measures of performance for the fifth year of this program.

In addition to the requirements of this report, various outreach activities are carried out by the SCAQMD Legislative & Public Affairs Office. Information on these activities is included in a monthly report to the SCAQMD's Governing Board and is available by contacting the SCAQMD at 909-396-3242 or visiting the website at www.aqmd.gov.

CHAPTER I
RULE DEVELOPMENT AND PERMIT ACTIVITIES

RULE ADOPTIONS AND AMENDMENTS FOR 2015

Proposed Amended Rule 1420.1 – Emissions Standard for Lead and Other Toxic Air Contaminants from Large Lead-Acid Battery Recycling Facilities

Amendments to Rule 1420.1 were adopted to further protect public health by reducing lead emissions produced by large lead-acid battery recycling facilities by lowering the ambient lead concentration limit, requiring additional housekeeping measures, lowering the point source limit, and requiring daily monitoring. *Estimated Emission Reductions*: Lead (not quantified). *Alternatives*: None. *Cost Effectiveness*: N/A. *Socioeconomic Impact*: See Socioeconomic Impact Analysis section. *Source of Funding*: Permit Fees, Emission Fees, and Annual Operating Fees. *[Amended March 6, 2015]*

Proposed Amended Regulation IX – Standards of Performance for New Stationary Sources, and, Regulation X National Emission Standards for Hazardous Air Pollutants

The purpose of the amendments was to incorporate by reference federal New Source Performance Standards (NSPS) into Regulation IX and National Emission Standards for Hazardous Air Pollutants (NESHAP) requirements into Regulation X. The incorporation by reference of NSPS requirements into Regulation IX and NESHAP requirements into Regulation X recognizes the SCAQMD's authority to implement and enforce these federal regulations at the local level. The SCAQMD Governing Board approved the project as proposed. *Estimated Emission Reductions*: None. *Alternatives*: None. *Cost Effectiveness*: N/A. *Socioeconomic Impact*: N/A. *Source of Funding:* Annual Operating Fees. *[Amended April 3, 2015]*

Rule 2202 Emission Reduction Quantification Protocol for Electric Vehicle Charging Station Projects

The SCAQMD developed a Protocol to establish procedures for evaluating, approving and monitoring future electric vehicle charging station projects submitted under the Rule 2202 Air Quality Investment Program (AQIP) solicitation or pursuant to Rule 2202 (f)(6) as previously amended in June 2014 by the SCAQMD Governing Board. The Protocol was developed to also provide incentives for the deployment of workplace electric vehicle charging stations through the generation of Rule 2202 credits. Electric vehicle charging station projects were expected to generate Rule 2202 credits at any location within the jurisdiction of the SCAQMD where charging stations can be installed for use by the general public or private parking lots and structures accessible only to employees. This includes any worksite where the employer is subject to Rule 2202, provided that the vehicles accessing the charging stations are not used by that employer to comply with Rule 2202's Average Vehicle Ridership (AVR) target. *Estimated Emission Reductions*: None. *Alternatives*: None. *Cost Effectiveness*: N/A. *Socioeconomic Impact*: None. *Source of Funding:* Transportation Fees and Mobile Source Fees. *[Amended May 1, 2015]*

Proposed Amendments to the Rule 2202 Employee Commute Reduction Program (ECRP) Guidelines

Amendments to Rule 2202 ECRP Guidelines were adopted which included administrative language and document restructuring to provide clarity and guidance to the regulated community. Other amendments included the removal of the Employer Clean Fleet Purchase / Lease Program and Mobile Source Diesel Particulate Matter (PM)/Oxides of Nitrogen

(NOx) Emission Minimization Program because these programs were going to be superseded by state regulations that specifically address the original intent of these program elements. The amendments also included additional plan submittal types, High Average Vehicle Ridership (AVR) and AVR Improvement Submittals, to incentivize worksite AVR improvements and streamline submittals of the ECRP as a rule compliance option. *Estimated Emission Reductions*: None. *Alternatives*: None. *Cost Effectiveness*: N/A. *Socioeconomic Impact*: None. *Source of Funding:* Transportation Fees and Mobile Source Fees. *[Amended May 1, 2015]*

Proposed Amended Rules to Implement Office of Environmental Health Hazard Assessment Revisions to the Air Toxics Hot Spots Program Risk Assessment Guidelines

On March 6, 2015, the Office of Environmental Health Hazard Assessment (OEHHA) approved revisions to their Air Toxics Hot Spots Program Guidance Manual for Preparation of Risk Assessments (Revised OEHHA Guidelines). The Revised OEHHA Guidelines incorporated age sensitivity factors which increased cancer risk estimates to residential and sensitive receptors by approximately three times, and more for certain toxic air contaminants with multi-pathway health effects. The following rules were amended to incorporate by reference the Revised OEHHA Guidelines: 1) Rule 1401 – New Source Review of Toxic Air Contaminants; 2) Rule 1401.1 – Requirements for New and Relocated Facilities Near Schools; 3) Rule 1402 – Control of Toxic Air Contaminants from Existing Sources; and, 4) Rule 212 – Standards for Approving Permits and Issuing Public Notice. *Estimated Emission Reductions*: None. *Alternatives*: None. *Cost Effectiveness*: N/A. *Socioeconomic Impact*: See Socioeconomic Impact Analysis section. *Source of Funding*: Permit Fees, Emission Fees, Annual Operating Fees and AB 2588 Air Toxic Fees. *[Amended June 5, 2015]*

Proposed Amended Rule 1148.1 – Oil and Gas Production Wells

Amendments to Rule 1148.1 were adopted to prevent public nuisance and possible detriment to public health caused by exposure to volatile organic compound (VOC), toxic air contaminant (TAC) and total organic compound (TOC) emissions from the operation and maintenance of oil and gas production facilities. Amendments to Rule 1148.1: 1) increased the minimum proximity distance to sensitive receptors (e.g., from 100 meters to 1,500 feet) that would trigger additional emission and odor preventative measures; 2) required the use of odor mitigation best practices for operation and maintenance of oil and gas production facilities; 3) required specific cause analysis and reporting for confirmed odor events and oil deposition events; 4) required Odor Mitigation Plans for facilities with continuing odor issues; and, 5) made administrative changes by removing obsolete rule language and making minor revisions to promote clarity, consistency, and enforceability throughout the rule. *Estimated Emission Reductions*: None. *Alternatives*: None. *Cost Effectiveness*: N/A. *Socioeconomic Impact*: See Socioeconomic Impact Analysis section. *Source of Funding*: Permit Fees, Plan Fees, Emission Fees, and Annual Operating Fees. *[Amended September 4, 2015]*

Proposed Amended Rule 1148.2 – Notification and Reporting Requirements for Oil and Gas Wells and Chemical Suppliers

The California Department of Conservation, through its Division of Oil, Gas, and Geothermal Resources (DOGGR), adopted a well stimulation treatment regulation in response to the passage of Senate Bill (SB) 4 which was finalized in December 2014 and

went into effect on July 1, 2015. Amendments to Rule 1148.2 were adopted to modify the chemical reporting requirements to be more consistent with this state law. Amendments to Rule 1148.2: 1) disaggregated the reporting of the trade name product from the chemical ingredients within the product; 2) eliminated the requirement to report the chemical mass concentration within the trade name product, and instead, required the total mass of each chemical ingredient to be reported; and, 3) no longer allowed specified SB 4-related well stimulation information to be deemed as trade secret and instead, made this information available to the public on the SCAQMD's website. The amendments also increased the public notification period before a well activity begins from 24 hours to 72 hours to provide additional lead time to the public prior to the well event. Changes to the provisions for canceling and revising well event start times were also included along with other minor changes to promote clarity, consistency, and enforceability throughout the rule. *Estimated Emission Reductions*: None. *Alternatives*: None. *Cost Effectiveness*: N/A. *Socioeconomic Impact*: None. *Source of Funding*: Emission Fees and Annual Operating Fees. *[Amended September 4, 2015]*

Proposed Amended Rule 1420.1 – Emissions Standard for Lead and Other Toxic Air Contaminants from Large Lead-Acid Battery Recycling Facilities

Amendments to Rule 1420.1 were adopted to further protect public health by reducing lead emissions produced by large lead-acid battery recycling facilities, in particular, by lowering the point source limit. The amendments also clarified closure applicability and included new provisions to ensure lead and arsenic emissions are appropriately controlled during closure and clean-up activities. *Estimated Emission Reductions*: Lead (not quantified). *Alternatives*: None. *Cost Effectiveness*: N/A. *Socioeconomic Impact*: See Socioeconomic Impact Analysis section. *Source of Funding*: Permit Fees, Emission Fees, and Annual Operating Fees. *[Amended September 4, 2015]*

Proposed Rule 1420.2 – Emissions Standard for Lead from Lead Melting Facilities

Rule 1420.2 was developed to protect public health by reducing lead emissions from lead facilities that melt 100 tons or more of lead annually by limiting the ambient lead concentration, imposing housekeeping, limiting the point source emissions, conducting periodic source testing, and requiring ambient air lead monitoring and sampling. Owners/operators of facilities would be required to meet an ambient lead limit of 0.150 micrograms per cubic meter ($\mu g/m^3$) averaged over any 30 consecutive days for any facility that has approved ambient air monitoring and sampling sites. Facilities that do not conduct ambient air monitoring would be required to meet the ambient limit no later than 90 days after approval of an ambient air monitoring plan. The lead limit would be further reduced to 0.100 $\mu g/m^3$ effective January 1, 2018. Improvements to building enclosures and additional control equipment may be necessary to comply with the proposed ambient standard for some facilities. Also, if a facility exceeds the ambient air lead concentration of 0.150 $\mu g/m^3$ beginning January 1, 2017 and exceeds the 0.100 $\mu g/m^3$ three times within a rolling 24-month period beginning April 1, 2018, a Compliance Plan would be required. *Estimated Emission Reductions*: Lead (not quantified). *Alternatives*: None. *Cost Effectiveness*: N/A. *Socioeconomic Impact*: See Socioeconomic Impact Analysis section. *Source of Funding*: Permit Fees, Emission Fees, and Annual Operating Fees. *[Adopted October 2, 2015]*

Proposed Amended Rule 1156 – Further Reductions of Particulate Emissions from Cement Manufacturing Facilities

Amendments to Rule 1156 were adopted to address potential air quality impacts and exposure to hexavalent chromium (Cr^{+6}) after the closure of cement manufacturing facilities, and to ensure long-term air quality and protection. The amendments reduced permissible Cr^{+6} fence-line levels to reflect the Office of Environmental Health Hazard Assessment's (OEHHA) new risk assessment guidelines; reduced Cr^{+6} monitoring requirements at existing facilities based either on compliance history, or potentially ceasing monitoring upon facility closure; and added provisions for a dust mitigation plan prior to any land disturbance activities occurring on a property after facility closure. *Estimated Emission Reductions*: None. *Alternatives*: None. *Cost Effectiveness*: N/A. *Socioeconomic Impact*: See Socioeconomic Impact Analysis section. *Source of Funding*: Plan Fees, Emission Fees, and Annual Operating Fees. *[Amended November 6, 2015]*

Proposed Amended Rule 1110.2 ─ Emissions from Gaseous- and Liquid-Fueled Engines

Rule 1110.2 applies to all stationary and portable engines with ratings over 50 brake horsepower and limits NOx, VOC, and CO emissions from the combustion of gaseous- and liquid-fueled engines. Amendments to Rule 1110.2 were adopted to provide additional time for biogas-fired engines to comply with the emission limits. Limits were also placed on the number of breakdowns and emissions during breakdown events for all engines. Other minor changes were included for clarity and consistency throughout the rule. *Estimated Emission Reductions*: 0.9 tons per day (tpd) NOx; 0.5 tpd VOC, and 20.0 tpd CO (This amendment was to delay a compliance date, so these values represent emission reductions foregone for a previous compliance date). *Alternatives*: Yes, four alternatives were analyzed. See Alternatives to Rule and Rule Amendments. *Cost Effectiveness*: $1,700 to $5,900 per ton of NOx, VOC and CO/7. *Socioeconomic Impact*: None. *Source of Funding*: Permit Fees, Emission Fees, and Annual Operating Fees. *[Amended December 4, 2015]*

Proposed Amended Regulation XX – Regional Clean Air Incentives Market (RECLAIM)

Several rules and protocols that are part of Regulation XX were amended, including Rule 2002 – Allocations for Oxides of Nitrogen (NOx) and Oxides of Sulfur (SOx); Rule 2005 – New Source Review For RECLAIM; Attachment C from Rule 2011 Appendix A – Protocol for Monitoring, Reporting, and Recordkeeping Oxides of Sulfur (SOx) Emissions; and, Attachment C from Rule 2012 Appendix A – Protocol for Monitoring, Reporting, and Recordkeeping Oxides of Nitrogen (NOx) Emissions. The amendments reduced RECLAIM Trading Credits, established a New Source Review Holding Account, and provided an option for electrical generating facilities meeting certain criteria to opt out of the program. . *Estimated Emission Reductions*: 12 tons per day. *Alternatives*: Yes, five alternatives were analyzed; see Alternatives to Rule and Rule Amendments section. *Cost Effectiveness*: $9,000 to $17,000 per ton. *Socioeconomic Impact*: See Socioeconomic Impact Analysis section. *Source of Funding*: Permit Fees, Emission Fees, and Annual Operating Fees. *[Amended December 4, 2015]*

ALTERNATIVES TO RULES AND RULE AMENDMENTS

Projects undertaken by public agencies are subject to the California Environmental Quality Act (CEQA), so rules and regulations promulgated by the SCAQMD must be reviewed to determine if they are considered to be a "project" as defined by CEQA. If they are not a "project" or they are determined to be exempt from CEQA, no further action is required. If the project has the potential to create significant adverse effects on the environment, then an environmental analysis is necessary.

The SCAQMD operates under a regulatory program certified by the Secretary for Resources pursuant to Public Resources Code (PRC) §21080.5. Certification means that the SCAQMD can incorporate its environmental analyses into documents other than environmental impact reports (EIRs), negative declarations (NDs), or mitigated NDs (MNDs). In addition, certified CEQA programs are not subject to a limited number of specific CEQA requirements identified in PRC §21080.5. All documents prepared by the SCAQMD under its certified regulatory program are called Environmental Assessments (EAs). SCAQMD rules and regulations are subject to the SCAQMD's certified CEQA program, while plans (e.g., AQMP) are not.

New rules or existing rules being amended often require a comprehensive environmental impact analysis. The environmental analyses in EAs include:

- identification of 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.

Supplemental EAs, Addenda, and EAs for projects determined not to have significant environmental impacts often contain a more focused analysis of potential environmental impacts. If it is concluded in these documents that no significant adverse environmental impacts would be generated by the proposed project, neither the identification of feasible mitigation measures nor an analysis of project alternatives is not required. 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.

The following section lists all new and amended rules adopted by the Governing Board in 2015 by month. The type of CEQA document (including projects exempt from CEQA) is described for each new rule or rule amendment project. Alternatives are summarized for those projects requiring an alternatives analysis.

JANUARY 9, 2015
No rules were adopted or amended in January.

FEBRUARY 6, 2015
One State Implementation Plan submittal was amended in February, as follows:

1. **Supplement to 24-Hour PM2.5 State Implementation Plan (SIP) for South Coast Air Basin:** The purpose of the Supplement to the 24-hour PM2.5 SIP for the South Coast Air Basin was to demonstrate attainment of the 2006 24-hour PM2.5 National Ambient Air Quality Standard (NAAQS) by 2015 under Clean Air Act (CAA) Subpart 4, along with a new transportation conformity budget for 2015, analysis of Reasonably Available Control Measures (RACM)/ Reasonably Available Control Technology (RACT), emission reduction commitments submitted in the 2012 AQMP, and other Subpart 4 requirements. In addition, the Supplement included a discussion of the effects of the drought on the 2014 attainment date. The project was determined to exempt from CEQA and a Notice of Exemption was filed with the County Clerks of Los Angeles, Orange, Riverside and San Bernardino counties. Since the project was determined to be exempt from CEQA, no alternatives analysis was required. The SCAQMD Governing Board approved the project as proposed.

MARCH 6, 2015
One rule was amended in March, as follows:

1. **Proposed Amended Rule 1420.1 – Emissions Standard for Lead and Other Toxic Air Contaminants from Large Lead-Acid Battery Recycling Facilities:** Amendments were proposed to Rule 1420.1 to further protect public health by reducing lead emissions produced by large lead-acid battery recycling facilities by lowering the ambient lead concentration limit, requiring additional housekeeping measures, lowering the point source limit, and requiring daily monitoring. A Final Subsequent Environmental Assessment 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, no alternatives analysis was required. The SCAQMD Governing Board approved the project as proposed.

APRIL 3, 2015
Two regulations, combined into one project, were amended in April, as follows:

1. **Proposed Amended Regulation IX – Standards of Performance for New Stationary Sources, and, Regulation X – National Emission Standards for Hazardous Air Pollutants:** The purpose of the amendments was to incorporate by reference federal New Source Performance Standards (NSPS) into Regulation IX and National Emission Standards for Hazardous Air Pollutants (NESHAP) requirements into Regulation X. The incorporation by reference of NSPS requirements into Regulation IX and NESHAP requirements into Regulation X recognizes the SCAQMD's authority to implement and enforce these federal regulations at the local level. The project was determined to exempt from CEQA and a Notice of Exemption was filed with the County Clerks of Los Angeles, Orange, Riverside and San Bernardino counties. Since the project was determined to be

exempt from CEQA, no alternatives analysis was required. The SCAQMD Governing Board approved the project as proposed.

MAY 1, 2015

One protocol and one rule was amended in May, as follows:

1. **Rule 2202 Emission Reduction Quantification Protocol for Electric Vehicle Charging Station Projects:** The SCAQMD developed a Protocol to establish procedures for evaluating, approving and monitoring future electric vehicle charging station projects submitted under the Rule 2202 Air Quality Investment Program (AQIP) solicitation or pursuant to Rule 2202 (f)(6) as amended in June 2014 by the SCAQMD Governing Board. The Protocol was developed to also provide incentives for the deployment of workplace electric vehicle charging stations through the generation of Rule 2202 credits. Electric vehicle charging station projects may generate Rule 2202 credits at any location within the jurisdiction of the SCAQMD where charging stations can be installed for use by the general public or private parking lots and structures accessible only to employees. This includes any worksite where the employer is subject to Rule 2202, provided that the vehicles accessing the charging stations are not used by that employer to comply with Rule 2202's Average Vehicle Ridership (AVR) target. A Final Environmental Assessment 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, no alternatives analysis was required. The SCAQMD Governing Board approved the project as proposed.

2. **Proposed Amendments to the Rule 2202 Employee Commute Reduction Program (ECRP) Guidelines:** Amendments to Rule 2202 ECRP Guidelines were proposed which included administrative language and document restructuring to provide clarity and guidance to the regulated community. Other amendments included the removal of the Employer Clean Fleet Purchase / Lease Program and Mobile Source Diesel Particulate Matter (PM)/Oxides of Nitrogen (NOx) Emission Minimization Program because these programs were going to be superseded by state regulations that specifically address the original intent of these program elements. The amendments also included additional plan submittal types, High Average Vehicle Ridership (AVR) and AVR Improvement Submittals, to incentivize worksite AVR improvements and streamline submittals of the ECRP as a rule compliance option. A Final Environmental Assessment 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, no alternatives analysis was required. The SCAQMD Governing Board approved the project as proposed.

JUNE 5, 2015

Four rules, combined into one project, were amended in June, as follows:

1. **Proposed Amended Rules to Implement Office of Environmental Health Hazard Assessment Revisions to the Air Toxics Hot Spots Program Risk Assessment Guidelines:** On March 6, 2015, the Office of Environmental Health Hazard Assessment

(OEHHA) approved revisions to their Air Toxics Hot Spots Program Guidance Manual for Preparation of Risk Assessments (Revised OEHHA Guidelines). The Revised OEHHA Guidelines incorporated age sensitivity factors which increased cancer risk estimates to residential and sensitive receptors by approximately three times, and more for certain toxic air contaminants with multi-pathway health effects. The following rules were proposed to be amended to incorporate by reference the Revised OEHHA Guidelines: 1) Rule 1401 – New Source Review of Toxic Air Contaminants; 2) Rule 1401.1 – Requirements for New and Relocated Facilities Near Schools; 3) Rule 1402 – Control of Toxic Air Contaminants from Existing Sources; and, 4) Rule 212 – Standards for Approving Permits and Issuing Public Notice. A Final Environmental Assessment 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, no alternatives analysis was required. The SCAQMD Governing Board approved the project as proposed.

JULY 10, 2015
No rules were adopted or amended in July.

AUGUST 2015
There was no Governing Board meeting in August, so no rules were adopted or amended.

SEPTEMBER 4, 2015
Three rules were amended in September, as follows:

1. **Proposed Amended Rule 1148.1 – Oil and Gas Production Wells:** Amendments to Rule 1148.1 were proposed to prevent public nuisance and possible detriment to public health caused by exposure to volatile organic compound (VOC), toxic air contaminant (TAC) and total organic compound (TOC) emissions from the operation and maintenance of oil and gas production facilities. The amendments to Rule 1148.1 would: 1) increase the minimum proximity distance to sensitive receptors (e.g., from 100 meters to 1,500 feet) that would trigger additional emission and odor preventative measures; 2) require the use of odor mitigation best practices for operation and maintenance of oil and gas production facilities; 3) require specific cause analysis and reporting for confirmed odor events and oil deposition events; 4) require Odor Mitigation Plans for facilities with continuing odor issues; and, 5) make administrative changes by removing obsolete rule language and making minor revisions to promote clarity, consistency, and enforceability throughout the rule. A Final Environmental Assessment 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, no alternatives analysis was required. The SCAQMD Governing Board approved the project as proposed.

2. **Proposed Amended Rule 1420.1 ─ Emissions Standard for Lead and Other Toxic Air Contaminants from Large Lead-Acid Battery Recycling Facilities:** Amendments were proposed to Rule 1420.1 to further protect public health by reducing lead emissions produced by large lead-acid battery recycling facilities, in particular, by lowering the point source limit. The amendments also clarified closure applicability and included new

provisions to ensure lead and arsenic emissions are appropriately controlled during closure and clean-up activities. A Final Subsequent Environmental Assessment 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, no alternatives analysis was required. The SCAQMD Governing Board approved the project as proposed.

3. **Proposed Amended Rule 1148.2 – Notification and Reporting Requirements for Oil and Gas Wells and Chemical Suppliers:** The California Department of Conservation, through its Division of Oil, Gas, and Geothermal Resources (DOGGR), adopted a well stimulation treatment regulation in response to the passage of Senate Bill (SB) 4 which was finalized in December 2014 and went into effect on July 1, 2015. Amendments to Rule 1148.2 were proposed to modify the chemical reporting requirements to be more consistent with this state law. The amendments to Rule 1148.2 would: 1) disaggregate the reporting of the trade name product from the chemical ingredients within the product; 2) eliminate the requirement to report the chemical mass concentration within the trade name product, and instead, required the total mass of each chemical ingredient to be reported; and, 3) no longer allow specified SB 4-related well stimulation information to be deemed as trade secret and instead, make this information available to the public on the SCAQMD's website. The amendments would also increase the public notification period before a well activity begins from 24 hours to 72 hours to provide additional lead time to the public prior to the well event. Changes to the provisions for canceling and revising well event start times were also included along with other minor changes to promote clarity, consistency, and enforceability throughout the rule. A Notice of Exemption was prepared for the project. Since the project was exempt from CEQA, no alternatives analysis was required. The SCAQMD Governing Board approved the project as proposed.

OCTOBER 2, 2015

One rule was adopted in October, as follows:

1. **Proposed Rule 1420.2 ─ Emissions Standard for Lead from Lead Melting Facilities:** Proposed Rule 1420.2 was developed to protect public health by reducing lead emissions from lead facilities that melt 100 tons or more of lead annually by limiting the ambient lead concentration, imposing housekeeping, limiting the point source emissions, conducting periodic source testing, and requiring ambient air lead monitoring and sampling. Owner/operators of facilities would be required to meet an ambient lead limit of 0.150 micrograms per cubic meter ($\mu g/m^3$) averaged over any 30 consecutive days for any facility that has approved ambient air monitoring and sampling sites. Facilities that do not conduct ambient air monitoring would be required to meet the ambient limit no later than 90 days after approval of an ambient air monitoring plan. The lead limit would be further reduced to 0.100 $\mu g/m^3$ effective January 1, 2018. Improvements to building enclosures and additional control equipment may be necessary to comply with the proposed ambient standard for some facilities. Also, if a facility exceeds the ambient air lead concentration of 0.150 $\mu g/m^3$ beginning January 1, 2017 and exceeds the 0.100 $\mu g/m^3$ three times within a rolling 24-month period beginning April 1, 2018, a Compliance Plan would be required. A Final Environmental Assessment 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, no alternatives analysis was required. The SCAQMD Governing Board approved the project as proposed.

NOVEMBER 6, 2015
One rule was amended in November, as follows:

1. **Proposed Amended Rule 1156 – Further Reductions of Particulate Emissions from Cement Manufacturing Facilities:** Amendments to Rule 1156 were proposed to address potential air quality impacts and exposure to hexavalent chromium (Cr^{+6}) after the closure of cement manufacturing facilities, and to ensure long-term air quality and protection. The amendments would reduce permissible Cr^{+6} fence-line levels to reflect the Office of Environmental Health Hazard Assessment's (OEHHA) new risk assessment guidelines; reduce Cr^{+6} monitoring requirements at existing facilities based either on compliance history, or potentially ceasing monitoring upon facility closure; and add provisions for a dust mitigation plan prior to any land disturbance activities occurring on a property after facility closure. A Final Environmental Assessment 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, no alternatives analysis was required. The SCAQMD Governing Board approved the project as proposed.

DECEMBER 4, 2015
One rule and one regulation, which is comprised of multiple rules, were amended in December, as follows:

1. **Proposed Amended Rule 1110.2 ─ Emissions from Gaseous- and Liquid-Fueled Engines:** Rule 1110.2 applies to all stationary and portable engines with ratings over 50 brake horsepower and limits NOx, VOC, and CO emissions from the combustion of gaseous- and liquid-fueled engines. Amendments to Rule 1110.2 were proposed to provide additional time for biogas-fired engines to comply with the emission limits. Limits were also placed on the number of breakdowns and emissions during breakdown events for all engines. Other minor changes were included for clarity and consistency throughout the rule. A Final Subsequent Environmental Assessment was prepared for the project and the analysis concluded that the project would create significant adverse air quality impacts. No feasible mitigation measures were identified that would reduce or eliminate the impacts to less than significant, so a mitigation monitoring plan was not adopted for the project. Since significant adverse environmental impacts were identified, an alternatives analysis was required and prepared that included the following alternatives:

   Alternative A - No Project: The proposed project would not be adopted and the current universe of equipment would continue to be subject to the NOx, VOC and CO emission limits according to the current compliance schedule in Rule 1110.2.

Alternative B - Additional Delayed Compliance: Provides additional delay of NOx, CO, and VOC emission limits compliance requirements for affected facilities beyond the proposed project. All other requirements and conditions in the proposed project would be applicable.

Alternative C - Replace Flares: Through additional rule making, the facilities not meeting the current Rule 1110.2 biogas emission limits would be required to process the biogas through new cleaner and efficient flares (ultra-low NOx Bekaert Clean Enclosed Burner®; Bekaert CEB®) under a separate rule. The new flares' emissions would be comparable to the NOx, CO, and VOC emission limits of the proposed project. All other requirements and conditions in the proposed project would be applicable.

Alternative D - New Micro Turbines: Through additional rule making, the facilities not meeting the current Rule 1110.2 biogas emission limits would be required to process the biogas through new micro turbines (Capstone C65) to handle their facilities' biogas. All other requirements and conditions in the proposed project would be applicable.

The SCAQMD Governing Board approved the project as proposed:

2. **Proposed Amended Regulation XX – Regional Clean Air Incentives Market (RECLAIM):** Several rules and protocols that are part of Regulation XX were amended, including Rule 2002 – Allocations for Oxides of Nitrogen (NOx) and Oxides of Sulfur (SOx); Rule 2005 – New Source Review For RECLAIM; Attachment C from Rule 2011 Appendix A – Protocol for Monitoring, Reporting, and Recordkeeping Oxides of Sulfur (SOx) Emissions; and, Attachment C from Rule 2012 Appendix A – Protocol for Monitoring, Reporting, and Recordkeeping Oxides of Nitrogen (NOx) Emissions. The amendments reduced RECLAIM Trading Credits, established a New Source Review Holding Account, and provided an option for electrical generating facilities meeting certain criteria to opt out of the program. A Final Program Environmental Assessment was prepared for the project and the analysis concluded that the project would cause significant adverse environmental impacts for the topics of air quality and GHGs, hydrology (water demand), and, hazards and hazardous materials (due to ammonia transportation). Feasible mitigation measures were identified but none would reduce or eliminate the impacts to less than significant. A mitigation monitoring plan was adopted for the project. Since significant adverse environmental impacts were identified, an alternatives analysis was required and prepared that included the following alternatives:

   Alternative 1 – Across the Board Shave of NOx RTCs: Alternative 1 consists of an across the board NOx RTC reduction (shave) of 14 tons per day (tpd) that would affect all NOx RECLAIM facilities and investors. Under Alternative 1, the NOx RTC holdings would be shaved by 53 percent overall.

   Alternative 2 – Most Stringent Shave of NOx RTCs: Alternative 2 consists of the most stringent approach by applying an across the board NOx RTC shave of 15.87 tpd. Alternative 2 would affect all RECLAIM facilities and investors, but without

including the 10 percent compliance margin or the BARCT adjustment for refinery equipment. Under Alternative 2, the NOx RTC holdings would be shaved by 60 percent overall.

Alternative 3 – Industry Approach: Alternative 3, an approach that was proposed by industry representatives, consists of an across the board NOx RTC shave of 8.77 tpd from total RTC holdings that would affect all RECLAIM facilities and investors. The calculation under Alternative 3 subtracts the base year emissions at the proposed BARCT level from the base year emissions at the previous BARCT level (Year 2000 or 2005). Under Alternative 3, the NOx RTCs held by all RECLAIM facilities and investors would be shaved by 33 percent overall.

Alternative 4 - No Project: Alternative 4 is the "No Project" approach such that no NOx RTC reductions would be applied to any RECLAIM facility or investor.

Alternative 5 – Weighted by BARCT Reduction Contribution: Alternative 5 consists of an across the board NOx RTC reduction (shave) of 14 tpd that would affect all NOx RECLAIM facilities and investors. However, the NOx RTC reductions under this alternative would be weighted by the BARCT reduction contribution for major refineries and all other facilities, with investors grouped with the major refineries.

The SCAQMD Governing Board adopted 12 tons per day total reductions on the following schedule:

2016: 2 tons per day
2017: 0 tons per day
2018: 1 ton per day
2019: 1 ton per day
2020: 2 tons per day
2021: 2 tons per day
2022: 4 tons per day

CEQA LEAD AGENCY PROJECTS

The SCAQMD also acts as the Lead Agency under CEQA for non-SCAQMD projects where the SCAQMD typically has primary approval, i.e., discretionary permitting, authority. Under CEQA, the Lead Agency is responsible for determining whether an Environmental Impact Report (EIR), Negative Declaration 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 the SCAQMD for permit projects are subject to the standard CEQA requirements.

Since January 2015, SCAQMD staff has been responsible for preparing or having prepared CEQA documents for stationary source permit projects. The lead agency projects that were approved by the SCAQMD in 2015 are identified below.

JANUARY 2015
No projects were approved in January.

FEBRUARY 18, 2015

1. **Final Subsequent Mitigated Negative Declaration for the Signal Hill West Unit Facility - Gas Plant Modification Project:** Signal Hill Petroleum, Inc. proposed a modification to a previously-approved project evaluated in a 1998 Mitigated Negative Declaration (MND), adopted by the City of Signal Hill on June 16, 1998. A Final Subsequent MND was prepared which evaluated environmental impacts of upgrading the existing natural gas processing plant at its West Unit Production Facility by: 1) expanding the existing vapor recovery system; 2) modifying the existing natural gas dehydration system; 3) making beneficial use of the natural gas by sale; and, 4) providing operational flexibility by allowing for reduced operations and the ability to sell excess gas to Long Beach. Based on the analysis of potential environmental impacts from the project, it was concluded that the project would not create significant adverse environmental impacts after mitigation. A mitigation monitoring plan was adopted for the project. Since no significant adverse environmental impacts were identified, no alternatives analysis was required. The project was adopted as proposed by the SCAQMD's Executive Officer.

MARCH 2015
No projects were approved in March.

APRIL 2015
No projects were approved in April.

MAY 2015
No projects were approved in May.

JUNE 2015
No projects were approved in June.

JULY 2015
No projects were approved in July.

AUGUST 11, 2015

1. **August 2015 Addendum to the Final Environmental Impact Report for the Chevron Products Company, El Segundo Refinery, Product Reliability and Optimization Project:** Chevron proposed modifications to a previously approved project, to include operational changes to the Tail Gas Unit (TGU) incinerator component of the 2008 PRO Project (e.g., the TGU project component) that were made during the SCAQMD permit modification process. Based on the analysis of potential environmental impacts from the project, it was concluded that the project would not create significant adverse environmental impacts. Since no significant adverse environmental impacts were identified, no alternatives analysis was required. The project was certified by the SCAQMD's Executive Officer.

SEPTEMBER 2015
No projects were approved in September.

OCTOBER 2, 2015

1. **Final Environmental Impact Report (EIR) for the Breitburn Santa Fe Springs Blocks 400/700 Upgrade Project:** The project proposed to upgrade and augment the fluid (e.g., oil, gas, and water) handling systems at the Breitburn Santa Fe Springs Facilities within the Santa Fe Springs Oil Field. The project proposed to provide additional capacity to accommodate existing well production capacity and potential increases in fluid production from future well drilling. The scope of the project was covered by three SCAQMD permit applications for: 1) a new oil/water/gas processing plant in the 400 Block to allow the processing of up to an additional 4,000 barrels of oil per day, 196,000 barrels of produced water per day, and two million standard cubic feet of produced gas per day; 2) an upgrade to the existing truck loading system in the 700 Block to increase the volume of oil that could be transported from the site via trucks; and, 3) the replacement of the existing produced gas flare system in the 400 Block with a low-emission burner and addition of up to three other identical burners. The analysis in the Final EIR concluded that implementation of the project would result in significant adverse air quality impacts. Feasible mitigation measures were identified but none would reduce or eliminate the impacts to less than significant. A mitigation monitoring plan was adopted for the project. Since significant adverse environmental impacts were identified, an alternatives analysis was required and prepared that included the following alternatives:

   Alternative 1 – No Project: Under Alternative 1, the Santa Fe Springs Facility would continue to operate with the existing equipment. The proposed 400 Block Reinjection Facility would not be constructed, produced water would continue to be processed at the existing 700 Block Facility, and the additional truck loading connection would not be installed. As such, oil would continue to be trucked off-site using only the existing connection. Under this alternative, the lower-emission

enclosed burners (Flare Industries' CEBs) would not be installed to process field gas and the existing John Zink Flare would remain in place.

Alternative 2 – Gas Reinjection: Under Alternative 2, field gas would be re-injected into an existing oil producing formation within the Santa Fe Springs Oil Field rather than being flared on-site. All other project components would proceed as described under the proposed action. For this alternative, one CEB would be available in ready-standby mode in case there is a problem with the gas injection process.

Alternative 3 – Additional Microturbines: Under Alternative 3, Breitburn would install up to an additional 175 microturbines to further increase electricity capacity and reduce the amount of gas flared on-site. All other project components would proceed as described under the proposed project. The CEBs would be installed as a safety back-up, but would be off during standard operation of the microturbines.

Alternative 4 – Gas Sales: Under Alternative 4, instead of flaring field gas on-site, the majority of the field gas would be sold to the Southern California Gas Company (SoCalGas) and the gas quality of the process gas and volume of gas throughput levels must meet certain standards before SoCalGas will approve metering and odorizing equipment necessary to sell the gas. Further, because the field gas does not meet standards set by SoCal Gas, construction of a gas processing plant (Gas Plant) would be required in order to meet SoCalGas specifications. All other project components would proceed as described under the proposed action. Although up to four new CEBs would be installed, the CEBs would be in ready/standby mode.

Alternative 5– Electrification of Oil/Injection Well Drilling: Under Alternative 5, electric drill rigs, instead of diesel-fueled units, would be used for drilling one well at a time. To replace these diesel drill rigs with electric drill rigs, Breitburn would need to obtain custom built, pure electric drill rigs, specially made on a by-request basis, because electric drill rigs are not available for rental. All other project components would proceed as described under the proposed action.

The project was certified as proposed by the SCAQMD's Executive Officer.

NOVEMBER 2015
No projects were approved in November.

DECEMBER 11, 2015

1. **Final Mitigated Negative Declaration for the Hixson Metal Finishing Risk Reduction Project:** Hixson Metal Finishing is a facility that conducts anodizing, testing, plating, and coating operations for the aerospace and defense industries and proposed a Risk Reduction Project to reduce the facility's emissions by: 1) relocating an on-site tank, spray booth, and oven; 2) installing additional air pollution control systems; 3) constructing permanent total enclosures; 4) installing covers on wastewater treatment tanks; 5) preparing and implementing an improved housekeeping and dust minimization plan; and, 6) improving the facility's electrical system. Based on the analysis of potential

environmental impacts from the project, it was concluded that the project would not create significant adverse environmental impacts after mitigation. A mitigation monitoring plan was adopted for the project. Since no significant adverse environmental impacts were identified, no alternatives analysis was required. The project was adopted as proposed by the SCAQMD's Executive Officer.

SOCIOECONOMIC IMPACT ANALYSES

In accordance with the California Health and Safety Code (HSC) §40440.8, the SCAQMD is required to conduct socioeconomic impact assessments for its rules and regulations that may have significant air quality or emissions impacts. Prior to the enactment of HSC §40440.8, SCAQMD staff evaluated the socioeconomic impacts of its actions pursuant to a 1989 resolution of its Governing Board. Additionally, SCAQMD staff assesses the socioeconomic impacts of CEQA alternatives for rules or regulations that may have significant air quality or emissions impacts and associated significant costs.

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

In 2015, one new rule and one new protocol was adopted; and, one regulation and nine rules were amended. Out of the ten amended rules/regulations, seven had socioeconomic impacts and one rule and one regulation had CEQA alternatives.

NEWLY-ADOPTED RULE

Rule 1420.2 — Emission Standards for Lead from Metal Melting Facilities

Rule 1420.2 was adopted to protect public health by minimizing public exposure to lead emissions from metal melting facilities and preventing exceedances of the lead National Ambient Air Quality Standards (NAAQS) in the Basin. Rule 1420.2 requires metal melting facilities to comply with an ambient air lead concentration limit of 0.150 μg/m3 and 0.100 μg/m3 (after January 1, 2018) averaged over any consecutive 30 days. Rule 1420.2 is applicable to 13 metal melting facilities. Cumulatively these facilities process more than 50,000 tons of lead annually through a combination of metal melting furnaces.

The main requirements of Rule 1420.2 that have cost impacts for affected facilities include ambient air monitoring and sampling, point source emissions controls, total enclosures, housekeeping measures, maintenance activity requirements, source testing, recordkeeping, and reporting. The total annual compliance costs of Rule 1420.2 were estimated to range from $6.5 to $7.2 million, depending on the real interest rate assumed (1 percent to 4 percent). Gerdau, a steel mini mill, was shown to bear the largest share of compliance costs (71 percent or approximately $5.1 million annually based on 4 percent real interest) due to the projected installation of a complete baghouse replacement that would be necessary to reduce lead emissions. Although Gerdau's meltshop/baghouse project received air permits from the SCAQMD on July 24, 2014, prior to the Rule 1420.2 rulemaking process, the socioeconomic analysis nonetheless analyzed the cost of the meltshop/baghouse given that its implementation will help Gerdau achieve ambient lead levels in compliance with Rule 1420.2 and help implement a Risk Reduction Plan required by Rule 1402.

Implementation of Rule 1420.2 is expected to result in approximately 140 jobs foregone annually between 2016 and 2035 when a 4 percent real interest rate is assumed or approximately 120 jobs with a 1 percent real interest rate. Note that jobs foregone may include either losses of existing jobs or projected additional jobs not created. The projected job impacts represent about 0.001 percent of the total employment in the four-county region.

NEWLY-ADOPTED PROTOCOL

Rule 2202 Emission Reduction Quantification Protocol for Electric Vehicle Charging Station Projects

This newly-adopted Protocol established procedures for evaluating, approving and monitoring future electric vehicle charging station projects submitted under the Rule 2202 Air Quality Investment Program (AQIP) solicitation or pursuant to Rule 2202 (f)(6) as amended in June 2014 by the SCAQMD Governing Board. The Protocol was developed to also provide incentives for the deployment of workplace electric vehicle charging stations through the generation of Rule 2202 credits. Electric vehicle charging station projects may generate Rule 2202 credits at any location within the jurisdiction of the SCAQMD where charging stations can be installed for use by the general public or private parking lots and structures accessible only to employees. This includes any worksite where the employer is subject to Rule 2202, provided that the vehicles accessing the charging stations are not used by that employer to comply with Rule 2202's Average Vehicle Ridership (AVR) target. There were no socioeconomic impacts associated with this Protocol.

AMENDMENTS TO RULES AND REGULATIONS WITH SOCIOECONOMIC IMPACTS

Amendments to rules and regulations that had socioeconomic impacts were: 1) Proposed Amended Rule 1420.1 - Emissions Standard for Lead and Other Toxic Air Contaminants from Large Lead-Acid Battery Recycling Facilities; 2) Proposed Amended Rules to Implement Office of Environmental Health Hazard Assessment (OEHHA) Revisions to the Air Toxics Hot Spots Program Risk Assessment Guidelines; 3) Proposed Amended Rule 1148.1 - Oil and Gas Production Well; 4) Proposed Amended Rule 1156 - Further Reductions of Particulate Emissions from Cement Manufacturing Facilities; and, 5) Proposed Amended Regulation XX - Regional Clean Air Incentives Markets (RECLAIM).

Proposed Amended Rule 1420.1 (March)

On March 6, 2015, amendments to Rule 1420.1 were adopted to improve implementation of housekeeping provisions and enhance maintenance measures, particularly in situations where there is a greater opportunity for fugitive emissions such as construction activities and soil disturbances. The amendments are applicable to two large lead-acid battery recycling facilities (e.g., Exide and Quemetco) that process more than 50,000 tons of lead annually. The total compliance cost from implementing the March amendments to Rule 1420.1 was estimated to be $0.7 million annually, of which $0.6 million would be incurred by Exide. An annual compliance cost of this magnitude, when compared to the relative total value of the local economy (about $1 trillion), was concluded to have no significant regional economic impacts.

Proposed Amended Rules 212, 1401, 1401.1 and 1402

On March 6, 2015, the OEHHA approved revisions to their Air Toxics Hot Spots Program Guidance Manual for Preparation of Risk Assessments (Revised OEHHA Guidelines). The Revised OEHHA Guidelines incorporated age sensitivity factors which increased cancer risk estimates to residential and sensitive receptors by approximately three times, and more for certain toxic air contaminants with multi-pathway health effects. The following rules were amended to incorporate by reference the Revised OEHHA Guidelines: 1) Rule 1401 – New Source Review of Toxic Air Contaminants; 2) Rule 1401.1 – Requirements for New and Relocated Facilities Near Schools; 3) Rule 1402 – Control of Toxic Air Contaminants from Existing Sources; and, 4) Rule 212 – Standards for Approving Permits and Issuing Public Notice.

The compliance costs estimated in the analysis are associated with the installation of additional pollution control equipment and their permitting costs, submitting or updating health risk assessments (HRAs), and the costs of issuing additional public notices. However, they do not take into account other potential costs, such as some permitting and administrative costs, as these cost would have occurred independent of the Revised OEHHA Guidelines. The compliance costs associated with implementing Rule 1401 are estimated to increase annually by an amount ranging from $239,000 to $255,000, depending on the real interest rate assumed (from 1 percent to 4 percent).

The compliance costs associated with implementing Rule 1402 are estimated for existing AB2588 facilities, as follows:

- 22 facilities would need to conduct risk reductions and install additional controls. The estimated associated total annual compliance cost is estimated to range from $1.3 million to $1.4 million, depending on the real interest rate assumed (from 1 percent to 4 percent).
- 87 facilities would need to submit HRAs for the first time or update their existing HRAs which would incur a total one-time cost of $2.2 million. If annualized over a period of ten years, the cost would range from $0.2 million to $0.3 million, using a real interest rate of 1 percent to 4 percent.
- 42 facilities would need to issue public notices in order to comply with the Revised OEHHA Guidelines. The overall costs associated with conducting public notification is estimated to be $71,400. If annualized over a period of ten years, the cost would range from $7,500 to $8,800, using a real interest rate of 1 percent to 4 percent.

Finally, the annual compliance costs due to implementing Rule 212 are estimated to range from $17,000 and $51,000.

Overall, implementation of these amended rules are expected to result in approximately 10 to 100 annual jobs foregone between 2015 and 2024 which is based on the assumption that facilities would finance the capital costs of control equipment at a 4 percent real interest rate and that all equipment and services would be purchased from businesses located within the region. When a 1 percent real interest rate is assumed instead, the job impact would become less negative, with approximately 10 to 90 annual jobs foregone over the same period.

Proposed Amended Rule 1420.1 (September)

On September 4, 2015, additional amendments to Rule 1420.1 were adopted in order to further protect public health by reducing lead emissions produced by large lead-acid battery recycling facilities, in particular, by lowering the point source limit. Rule 1420.1 is applicable to two large lead-acid battery recycling facilities (e.g., Exide and Quemetco) that process more than 50,000 tons of lead annually. The total compliance cost from implementing the September amendments to Rule 1420.1 is estimated to be $0.7 million annually, where 97 percent is attributed to ambient monitoring during facility closure. These amendments were not expected to have significant regional economic impacts.

Proposed Amended Rule 1148.1

Amendments to Rule 1148.1 were adopted to prevent public nuisance and possible detriment to public health caused by exposure to VOC, TAC, and TOC emissions from the operation and maintenance of oil and gas production facilities. Specifically, the amendments to Rule 1148.1: 1) increased the minimum proximity distance to sensitive receptors (e.g., from 100 meters to 1,500 feet) that would trigger additional emission and odor preventative measures; 2) required the use of odor mitigation best practices for operation and maintenance of oil and gas production facilities; 3) required specific cause analysis and reporting for confirmed odor events and oil deposition events; 4) required Odor Mitigation Plans for facilities with continuing odor issues; and, 5) made administrative changes by removing obsolete rule language and making minor revisions to promote clarity, consistency, and enforceability throughout the rule. These amendments reflect best practices that have been widely implemented in the oil and gas production industry. Any additional control measure would only be triggered for those facilities that are either not adhering to the industry standards or have historically demonstrated limited operational or management oversight. After considering the individual cost of each Odor Mitigation Plan improvement for potentially affected facilities, the annual cost would fall within the range of $113,200 to $121,500.

Proposed Amended Rule 1156

Amendments to Rule 1156 were adopted which included requirements for owners/operators of an affected property, before and after facility closure, to reduce permissible Cr^{+6} fence-line levels to reflect the Office of Environmental Health Hazard Assessment's (OEHHA) new risk assessment guidelines. The amendments also would allow for reduced Cr^{+6} monitoring requirements at existing facilities based on compliance history, or, in the event of facility closure, ceasing monitoring altogether. The amendments also included requirements for a dust mitigation plan to be prepared prior to any land disturbance activities occurring on a property after facility closure.

After meeting all of the criteria in Rule 1156, the number of monitoring stations may be reduced which could potentially result in an estimated cost savings of $112,500 per year for one facility and $30,500 per year for the other facility. However, if applicable thresholds are exceeded, some or all of these cost savings would no longer occur since the owner/operator would be required to revert back to a 1-in-3 day sampling frequency. If the exceedances occur three or more times in any consecutive 12 calendar month period, the owner/operator would also be required to submit for approval an amended Compliance Monitoring Plan to operate a minimum of three monitoring stations. The fees would be approximately $1,925,

which includes filing and plan evaluation fees. The Executive Officer's decision can be appealed to the Hearing Board which has a minimum filing fee of $1,740.

Proposed Amended Regulation XX

The socioeconomic analysis of the amendments was conducted based on overall NOx emission reductions of 14 tons per day from 2016 to 2022, and the adopted amendment was 12 tons per day, with a different implementation schedule.

The proposed amendments would affect the current RTC holdings for 56 facilities, including 9 major refineries, 21 electricity generating facilities, and 26 other facilities. Total compliance costs was estimated to range from $728 million to $1.1 billion in present worth values (expressed in 2014 dollars). Using the high-end cost estimates, the annualized compliance cost was estimated to be approximately $70 million when evaluated at a four percent discount rate, or $60 million when evaluated at a one percent discount rate from year 2022 onwards when all controls are assumed to have been installed. More than 73 percent of the annualized compliance cost is expected to occur in the refinery sector, and more than 43 percent of the sector's annualized compliance cost would be associated with installation of control equipment on FCCU technology. Among the non-refinery sectors, gas turbines would account for more than 60 percent of the sector's annualized compliance cost. It should be noted that these cost estimates do not consider the possibility that these 20 facilities could potentially sell surplus NOx RTCs, if any, gained after control installation. This would then offset control installation costs.

The proposed shave was shown to potentially affect facilities with no identified cost-effective controls in two ways. First, 36 of these facilities would be subject to the proposed shave, and some of them would need to buy additional NOx RTCs to reconcile actual emissions. Second, all facilities could potentially pay a higher price for NOx RTCs that they purchase each year for compliance. Additionally, higher NOx RTC prices could be potentially induced by the opt-out of any electricity generating facilities that regularly sell their surplus credits. Furthermore, under the proposed amendments, the 12-month rolling average price trigger would be raised to $22,500 per ton (discrete credits), thus potentially allowing NOx RTC prices to increase further before non-tradable/non-usable NOx RTCs are converted to tradable/usable NOx RTCs. However, the proposed addition of a 3-month rolling average price trigger of $35,000 per ton (discrete credits) would ensure short-term price stability during the period of proposed phase-in shave. Total incremental compliance cost (expressed in 2014 dollars) associated with RTC purchases over the course of 25 years is estimated to range from $19 million—if discrete NOx RTC prices remain the same—to $500 million—if the average annual discrete NOx RTC prices increase to $24,999 per ton for a total of 25 years and none of the affected facilities pursue any other more cost-effective compliance options.

Assuming that the proposed amendments would induce full BARCT installation by 2023 and the 9 refineries and 11 non-refinery facilities would incur the high-end estimated costs, the analysis projected that 20 net jobs would be created on an annual average basis between 2018 and 2035, and about 140 net jobs would be foregone when the analysis horizon is extended to 2043. This difference is attributed to the creation of the majority of jobs, mostly in the construction sector, occurring at the beginning of the analysis period (2018-2022) when

installation of control equipment is assumed to occur. Despite having a large share of the total compliance cost, the refinery industry is projected to have fewer jobs foregone relative to other industries with a similar magnitude of cost impact due to the fact that the industry is the most capital-intensive. As such, less labor would be required to produce the same amount of products or services. Note that the projected job impact would be more positive (i.e., fewer jobs foregone) if facilities sell any surplus NOx RTCs that result from installing control equipment, to offset control installation costs. Regarding the incremental compliance cost that could be potentially incurred by the rest of NOx RECLAIM facilities, the associated job impacts have been estimated under various scenarios of discrete NOx RTC prices. If prices remain the same, little job impact would be expected if the amendments as proposed were implemented. If the average annual discrete NOx RTC prices increase to $22,499 per ton and none of the affected facilities pursue any other more cost-effective compliance options, then about 40 net jobs would be foregone annually between 2023 and 2035. However, this latter price scenario is unlikely to occur, particularly if the 9 refineries and 11 non-refinery facilities install the identified cost-effective controls, which would then either decrease the market demand or increase the market supply of NOx RTCs by these facilities.

Five CEQA alternatives to the proposed amendments to NOx RECLAIM were also analyzed: Alternative 1 (Across the Board), Alternative 2 (Most Stringent), Alternative 3 (Industry Approach), Alternative 4 (No Project), and Alternative 5 (Weighted by BARCT Reduction Contribution for all Facilities and Investors). Regarding cost-effective control installation, the proposed amendments were shown to have the highest cost with the second to highest positive job impact, due to increased labor demand for the full, instead of partial, installation of control equipment.

If either Alternative 1 or Alternative 2 is implemented, each would cost less than the proposed amendments but more negative job impacts would be expected to occur (approximately 80 jobs foregone on an annual average basis) because less control equipment would be installed and less spending in the refinery sector relative to the 11 non-refinery facilities would occur. For the incremental costs associated with NOx RTC purchases that could potentially be incurred by some of the facilities without identified cost-effective controls, Alternative 2 has the highest estimated costs (up to $31 million in total), as it would result in the largest amount of NOx RTC shave.

Alternative 3 was shown to have the lowest annualized cost ($9.40 million) if implemented because the lowest number of control equipment would be installed. Alternative 3 would not create as many jobs and would result in an average of 30 jobs foregone on an annual average. However, SCAQMD staff concluded that Alternative 3, if implemented, would not comply with state law.

Alternative 4, the No Project alternative, would maintain the status quo and serves as a benchmark against which other alternatives were evaluated; however, SCAQMD staff concluded that Alternative 4, if implemented, would not comply with state law.

Alternative 5 would cost about the same as the proposed amendments and would result in about 60 jobs foregone on an annual average basis.

When compared to the proposed amendments, all of the CEQA alternatives except Alternative 4 would result in a more negative job impact—up to about 60 jobs foregone on an average annual basis if the average annual discrete NOx RTC prices increase to $22,499 per ton and none of the affected facilities pursue any other more cost-effective compliance options This negative job impact is mainly because, unlike the proposed amendments, Alternatives 1, 2, 3 and 5 would not exempt the 219 facilities from the RTC shave and these facilities tend to be smaller and use more labor intensive production technologies than, for example, those used by refinery sector.

ONGOING SOCIOECONOMIC IMPACTS FROM ANNUAL AUTOMATIC FEE ADJUSTMENTS

Regulation III - Fees

Previous amendments to Regulation III - Fees included inflationary cost recovery of various programs and clarification of existing rule language. Specifically, pursuant to Rule 320 – Automatic Adjustment Based on Consumer Price Index for Regulation III Fees, an across-the-board 1.4-percent increase in fee rates occurred on July 1, 2015, which is equivalent to the change in the California Consumer Price Index (CPI) from December 2013 to December 2014. In addition to the CPI adjustment, Regulation III was amended on June 6, 2014 to evenly phase in a six percent increase in permit processing and annual permit renewal fees over Fiscal Years 2014-2015 and 2015-2016.

The across-the-board CPI-based fee rate increase, combined with the second year phase-in of fee rate increase for permit processing and annual permit renewal, would bring additional revenue totaling $2.88 million to the SCAQMD. Nearly all the facilities regulated by the SCAQMD would be affected by the CPI increase. These facilities belong to every sector of the economy.

RULE AMENDMENTS WITHOUT SOCIOECONOMIC IMPACTS

The following rule amendments had no significant socioeconomic impacts: Regulation IX – Standards of Performance for New Stationary Sources and Regulation X – National Emission Standards for Hazardous Air Pollutants; Rule 2202 – Emission Reduction Quantification Protocol for Electric Vehicle Charging Station Projects; Proposed Amendments to the Rule 2202 – Employee Commute Reduction Program (ECRP) Guidelines; Proposed Amended Rule 1148.2 - Notification and Reporting Requirements for Oil and Gas Wells and Chemical Suppliers; and, Proposed Amended Rule 1110.2 - Emissions from Gaseous- and Liquid-Fueled Engines.

Proposed Amended Regulation IX and Regulation X

The purpose of the amendments was to incorporate by reference federal New Source Performance Standards (NSPS) into Regulation IX and National Emission Standards for Hazardous Air Pollutants (NESHAP) requirements into Regulation X. The incorporation by reference of NSPS requirements into Regulation IX and NESHAP requirements into Regulation X recognizes the SCAQMD's authority to implement and enforce these federal

regulations at the local level. The analysis concluded that there will be no additional costs or other socioeconomic impacts.

Proposed Amendments to Rule 2202 Employee Commute Reduction Program (ERPC) Guidelines

The amendments are applicable to 494 worksites that have implemented an ECRP within the SCAQMD's jurisdiction. These worksites belong to most major sectors in the local economy. Implementation of the amendments were projected to result in a reduction of filing fees for qualifying program submittals associated with the High AVR or AVR Improvement Program options. Removal of the Clean Fleet and Diesel Minimization requirements was shown to reduce the paperwork needed, thus resulting in a cost savings. It should be noted that employers will continue to be able to choose from different compliance options. In conclusion, implementation of the amendments was not expected to cause additional costs or other adverse socioeconomic impacts.

Proposed Amended Rule 1148.2

Amendments to Rule 1148.2 were adopted that revised the reporting requirements for drilling, well rework, and well completion chemicals and trade name products in order to increase the notification submission timeframes, streamline the reporting process, and be more consistent with SB-4 (Oil and gas: well stimulation) and Division of Oil, Gas & Geothermal Resources **(**DOGGR's) reporting structure. Thus, the implementation of Rule 1148.2 would not result in emission reductions as it is administrative in nature and cost impacts were expected to be minimal, and as such, no significant adverse socioeconomic impacts were anticipated to occur. The SCAQMD staff worked with the Working Group members to streamline chemical reporting requirements to minimize impacts and also took steps to structure the reporting process to be nearly identical to the current system to ensure a smooth transition for operators and suppliers. Increasing the minimal timeframe for notifications from 24 to 48 hours with five 24-hour extensions may require additional re-notifications. However, staff has streamlined the notification portal to populate most information for extensions to minimize any significant costs. Costs associated with the proposed amendments were projected to be minimal. Therefore, no cost estimates are provided.

Proposed Amended Rule 1110.2

Amendments were adopted to Rule 1110.2 that delayed implementation of new concentration limits for biogas-fired engines at affected facilities from 2016 to between 2017 and 2019. In addition, the amendments to Rule 1110.2 would affect fewer biogas-fired engines. The additional time for compliance and fewer affected engines would result in potential savings for affected facilities. As such, no adverse socioeconomic impact is anticipated for Rule 1110.2.

SPECIAL PROJECTS

"A Business Case for Clean Air Strategies" - 2016 AQMP White Paper

In 2015, the SCAQMD staff prepared a white paper "A Business Case for Clean Air Strategies" in support of the 2016 AQMP. The primary purpose of the white paper was to develop planning concepts that can be used to evaluate potential AQMP control strategies

that support a business case for deployment of needed technologies and efficiency measures to achieve upcoming air quality standards. The AQMP is the planning document that sets forth policies and measures to achieve the federal air quality standards in the region.

Implementation of Abt Recommendations

During 2015, SCAQMD staff continued to refine its socioeconomic analysis as recommended by Abt Associates in August 2014. After SCAQMD staff held multiple study sessions with SCAG and consultants, a consensus was reached about the most suitable approach for defining the baseline for socioeconomic analyses. Three Requests for Proposals were issued related to the following topics: 1) analysis of health benefits; 2) environmental justice; and, 3) small scale economic impacts. Contracts were issued for a third-party evaluation of macroeconomic modeling of public health and other non-market benefits. Based on a stakeholder request that was documented in the Abt report but not as a recommendation, a contract was issued for analysis of the health impacts of unemployment in the SCAQMD region.

In 2015, a total of four meetings of the Scientific, Technical & Modeling Peer Review (STMPR) Advisory Group were convened to provide guidance in implementing the Abt recommendations as well as reviewing technical issues associated with the development of the 2016 AQMP Socioeconomic Assessments.

In 2016, SCAQMD staff is planning, to the extent possible, to implement the remaining Abt recommendations such as improving uncertainty analysis, increase transparency of the analyses, increase public outreach, make the peer review process more transparent, and enhance documentation clarity by redesigning the reporting system to consider different types of audiences.

For the future enhancements, SCAQMD staff is planning to:

- update literature review for visibility, material, and agriculture benefits;
- conduct partial equilibrium modeling to supplement the REMI model;
- update best practices for estimating small business impacts; and,
- closely monitor the U.S. EPA Economy-Wide Modeling (Science Advisory Board) Panel's discussions and recommendations (which will also potentially provide recommendations on the best practice to incorporate non-market benefits, e.g., public health benefits, into economy-wide modeling).

PERMITTING & COMPLIANCE

SB 1928 REPORT	
Permit Applications Processed During CY 2015	
Application Type	Count
Permits to Construct Issued	724
Permits to Operate Issued	2,415*
Plans	323
Denied	22
Cancelled	567
Change of ownership	1,362
Area Sources & Certification/Registration	2,992
Others (TV/RECLAIM Modification, ERCs)	478
Total	8,883
Permits Not Renewed	894

*This includes 1,392 applications for Permit to Construct that were issued Permit to Construct/Permit to operate.

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/RECLAIM Modification	Not Renewed	Area Source	Grand Total
111219	Other Vegetable (except Potato) and Melon Farming	0	0	0	0	0	0	0	0	0	6	6
111310	Orange Groves	0	0	1	0	0	0	0	0	0	0	1
111320	Citrus (except Orange) Groves	0	0	0	0	0	0	0	0	0	2	2
111332	Grape Vineyards	0	0	0	0	0	0	0	0	0	6	6
111998	All Other Miscellaneous Crop Farming	0	2	2	0	0	0	0	0	0	4	8
112111	Beef Cattle Ranching and Farming	0	0	0	0	0	0	0	0	0	1	1
112120	Dairy Cattle and Milk Production	0	1	0	0	0	0	0	0	2	0	3
112511	Finfish Farming and Fish Hatcheries	0	0	0	0	0	0	0	0	0	1	1
112990	All Other Animal Production	1	2	0	0	1	0	0	0	0	1	5
115112	Soil Preparation, Planting, and Cultivating	0	3	0	0	0	0	0	0	0	0	3
115114	Postharvest Crop Activities (except Cotton Ginning)	0	1	0	0	0	0	0	0	0	0	1
115115	Farm Labor Contractors and Crew Leaders	0	0	0	0	0	0	0	0	0	2	2
115116	Farm Management Services	0	0	0	0	0	0	0	0	0	1	1
115210	Support Activities for Animal Production	0	0	0	0	0	0	1	0	0	1	2
115310	Support Activities for Forestry	0	0	0	0	0	0	0	0	0	1	1
211111	Crude Petroleum and Natural Gas Extraction	14	35	11	0	16	0	23	9	1	4	113
211112	Natural Gas Liquid Extraction	0	0	1	0	0	0	0	0	0	0	1
212312	Crushed and Broken Limestone Mining and Quarrying	0	3	0	0	0	0	0	0	0	0	3
212321	Construction Sand and Gravel Mining	2	0	0	0	0	0	0	0	0	0	2

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/RECLAIM Modification	Not Renewed	Area Source	Grand Total
212325	Clay and Ceramic and Refractory Minerals Mining	0	2	0	0	0	0	0	0	0	0	2
213112	Support Activities for Oil and Gas Operations	2	18	0	0	1	1	3	5	0	1	31
221118	Other Electric Power Generation	8	7	0	0	20	33	2	7	0	1	78
221122	Electric Power Distribution	0	14	0	0	0	0	0	0	0	0	14
221210	Natural Gas Distribution	0	8	0	0	0	0	0	1	2	0	11
221310	Water Supply and Irrigation Systems	13	56	5	0	9	0	17	6	0	23	129
221320	Sewage Treatment Facilities	0	0	0	0	0	1	0	0	0	0	1
236115	New Single-Family Housing Construction (except For-Sale Builders)	0	11	0	0	1	0	3	1	3	29	48
236116	New Multifamily Housing Construction (except For-Sale Builders)	0	2	0	0	1	0	2	0	0	18	23
236210	Industrial Building Construction	2	0	0	0	0	0	2	0	0	0	4
236220	Commercial and Institutional Building Construction	0	8	4	0	3	1	16	0	1	2	35
237110	Water and Sewer Line and Related Structures Construction	8	3	1	0	0	0	8	1	0	1	22
237120	Oil and Gas Pipeline and Related Structures Construction	0	9	0	0	0	0	1	0	0	0	10
237210	Land Subdivision	0	2	0	0	0	0	1	0	6	11	20
237310	Highway, Street, and Bridge Construction	5	10	0	0	2	0	1	0	11	18	47
237990	Other Heavy and Civil Engineering Construction	1	6	0	0	0	0	6	1	6	0	20
238110	Poured Concrete Foundation and Structure Contractors	0	2	1	0	0	0	4	0	3	0	10

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/RECLAIM Modification	Not Renewed	Area Source	Grand Total
238120	Structural Steel and Precast Concrete Contractors	0	2	0	0	0	0	0	0	0	0	2
238130	Framing Contractors	0	3	1	0	0	0	0	0	0	1	5
238140	Masonry Contractors	0	1	0	0	0	0	0	0	0	0	1
238160	Roofing Contractors	0	0	0	0	0	0	0	0	6	3	9
238190	Other Foundation, Structure, and Building Exterior Contractors	0	0	0	0	0	0	0	0	1	0	1
238210	Electrical Contractors and Other Wiring Installation Contractors	9	2	0	0	0	0	2	1	27	8	49
238220	Plumbing, Heating, and Air-Conditioning Contractors	0	4	0	0	0	1	1	0	0	4	10
238310	Drywall and Insulation Contractors	0	0	0	0	0	0	1	0	3	41	45
238320	Painting and Wall Covering Contractors	0	1	0	0	3	0	0	0	2	2	8
238350	Finish Carpentry Contractors	0	0	0	0	0	0	0	0	1	0	1
238390	Other Building Finishing Contractors	1	0	0	0	0	0	0	0	0	0	1
238910	Site Preparation Contractors	0	0	1	0	0	0	12	0	10	170	193
238990	All Other Specialty Trade Contractors	7	7	0	0	0	1	9	0	20	29	73
311111	Dog and Cat Food Manufacturing	2	0	0	0	0	0	0	1	0	0	3
311211	Flour Milling	0	2	25	0	0	0	0	0	0	0	27
311212	Rice Milling	0	0	0	0	0	0	0	0	0	1	1
311340	Nonchocolate Confectionery Manufacturing	0	0	0	0	0	0	0	0	0	1	1
311411	Frozen Fruit, Juice, and Vegetable Manufacturing	0	0	0	0	0	0	0	0	0	1	1
311412	Frozen Specialty Food Manufacturing	0	1	0	0	0	0	0	0	0	0	1

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/RECLAIM Modification	Not Renewed	Area Source	Grand Total
311422	Specialty Canning	0	0	0	0	0	0	0	0	0	1	1
311423	Dried and Dehydrated Food Manufacturing	0	0	0	0	0	0	0	0	0	3	3
311511	Fluid Milk Manufacturing	4	2	0	0	0	0	0	0	0	1	7
311513	Cheese Manufacturing	0	0	0	0	0	0	0	0	0	1	1
311514	Dry, Condensed, and Evaporated Dairy Product Manufacturing	0	1	0	0	0	0	0	0	0	0	1
311520	Ice Cream and Frozen Dessert Manufacturing	0	0	0	0	0	0	0	0	0	1	1
311611	Animal (except Poultry) Slaughtering	3	0	0	0	0	0	0	1	0	4	8
311612	Meat Processed from Carcasses	0	0	0	0	0	0	0	0	0	2	2
311613	Rendering and Meat Byproduct Processing	13	0	0	0	1	0	0	1	0	1	16
311710	Seafood Product Preparation and Packaging	2	0	0	0	0	0	0	0	0	0	2
311811	Retail Bakeries	0	2	0	0	0	0	0	0	0	1	3
311812	Commercial Bakeries	3	4	0	0	4	0	0	0	0	16	27
311824	Dry Pasta, Dough, and Flour Mixes Manufacturing from Purchased Flour	2	7	0	0	0	0	0	1	0	3	13
311830	Tortilla Manufacturing	0	0	0	0	0	0	0	0	2	2	4
311919	Other Snack Food Manufacturing	0	4	0	0	0	0	0	2	7	1	14
311920	Coffee and Tea Manufacturing	6	1	0	0	0	0	0	0	0	0	7
311930	Flavoring Syrup and Concentrate Manufacturing	1	0	0	0	0	0	0	0	0	0	1
311942	Spice and Extract Manufacturing	2	0	0	0	2	1	0	1	0	1	7
311999	All Other Miscellaneous Food	1	0	0	0	0	0	0	0	0	5	6

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/RECLAIM Modification	Not Renewed	Area Source	Grand Total
	Manufacturing											
312111	Soft Drink Manufacturing	1	0	0	0	0	0	0	0	0	3	4
312112	Bottled Water Manufacturing	2	1	0	0	0	0	0	0	0	2	5
312120	Breweries	1	0	0	0	0	0	0	1	0	1	3
312130	Wineries	0	0	0	0	0	0	0	0	0	2	2
312140	Distilleries	0	4	0	0	0	0	0	0	0	0	4
313210	Broadwoven Fabric Mills	0	0	0	0	2	0	0	0	0	0	2
313310	Textile and Fabric Finishing Mills	0	0	0	0	0	0	0	0	6	1	7
313320	Fabric Coating Mills	0	0	0	0	10	0	0	0	0	0	10
314110	Carpet and Rug Mills	3	3	0	0	1	0	0	4	0	0	11
314999	All Other Miscellaneous Textile Product Mills	1	0	0	0	0	0	0	0	0	0	1
315220	Men's and Boys' Cut and Sew Apparel Manufacturing	2	0	0	0	0	0	0	0	0	0	2
315240	Women's, Girls', and Infants' Cut and Sew Apparel Manufacturing	1	1	0	0	0	0	0	0	1	0	3
315990	Apparel Accessories and Other Apparel Manufacturing	0	1	0	0	0	0	0	0	0	1	2
321219	Reconstituted Wood Product Manufacturing	0	1	0	0	0	0	0	1	0	1	3
321918	Other Millwork (including Flooring)	1	1	0	0	0	0	0	0	0	0	2
321920	Wood Container and Pallet Manufacturing	0	0	1	0	0	0	0	0	1	0	2
321991	Manufactured Home (Mobile Home) Manufacturing	0	0	0	0	0	0	0	0	0	1	1
321992	Prefabricated Wood Building Manufacturing	0	1	0	0	0	0	0	0	0	0	1
321999	All Other Miscellaneous Wood Product Manufacturing	0	0	0	0	1	0	0	0	1	0	2

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/RECLAIM Modification	Not Renewed	Area Source	Grand Total
322121	Paper (except Newsprint) Mills	7	1	0	0	1	0	0	2	0	1	12
322130	Paperboard Mills	3	0	1	0	0	0	0	1	0	0	5
322211	Corrugated and Solid Fiber Box Manufacturing	7	3	11	0	0	0	0	3	0	4	28
322212	Folding Paperboard Box Manufacturing	0	0	0	0	0	0	0	1	0	0	1
322219	Other Paperboard Container Manufacturing	0	2	0	0	0	0	0	0	0	0	2
322220	Paper Bag and Coated and Treated Paper Manufacturing	1	2	0	0	1	0	0	0	1	0	5
322299	All Other Converted Paper Product Manufacturing	0	1	0	0	0	0	0	0	3	0	4
323111	Commercial Printing (except Screen and Books)	13	22	11	0	2	1	0	5	4	5	63
323113	Commercial Screen Printing	0	3	0	0	0	0	0	1	1	0	5
324110	Petroleum Refineries	20	53	0	0	5	0	4	14	0	1	97
324121	Asphalt Paving Mixture and Block Manufacturing	18	1	0	0	1	0	0	2	0	1	23
324122	Asphalt Shingle and Coating Materials Manufacturing	0	6	0	0	7	0	1	3	0	0	17
324191	Petroleum Lubricating Oil and Grease Manufacturing	6	0	0	0	0	1	0	0	0	0	7
325110	Petrochemical Manufacturing	0	3	0	0	0	0	0	0	4	1	8
325120	Industrial Gas Manufacturing	0	0	0	0	0	0	1	2	0	1	4
325130	Synthetic Dye and Pigment Manufacturing	0	4	48	0	2	0	0	0	0	0	54
325180	Other Basic Inorganic Chemical Manufacturing	4	3	12	0	0	46	0	2	0	5	72
325199	All Other Basic Organic Chemical Manufacturing	0	5	0	0	0	0	0	0	0	0	5
325211	Plastics Material and Resin Manufacturing	6	9	59	0	0	2	0	1	0	3	80

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/RECLAIM Modification	Not Renewed	Area Source	Grand Total
325212	Synthetic Rubber Manufacturing	0	0	18	0	1	0	0	1	0	0	20
325220	Artificial and Synthetic Fibers and Filaments Manufacturing	0	1	0	0	0	0	0	0	5	0	6
325320	Pesticide and Other Agricultural Chemical Manufacturing	7	2	0	0	0	0	0	0	0	0	9
325411	Medicinal and Botanical Manufacturing	1	1	0	0	0	0	0	0	0	0	2
325412	Pharmaceutical Preparation Manufacturing	0	9	54	0	1	0	0	0	0	5	69
325414	Biological Product (except Diagnostic) Manufacturing	0	4	0	0	0	0	0	1	0	0	5
325510	Paint and Coating Manufacturing	0	3	0	0	0	0	0	1	5	1	10
325520	Adhesive Manufacturing	1	3	0	0	0	0	0	1	0	1	6
325611	Soap and Other Detergent Manufacturing	0	2	0	0	0	0	0	0	0	0	2
325612	Polish and Other Sanitation Good Manufacturing	0	0	0	0	6	0	0	0	0	1	7
325613	Surface Active Agent Manufacturing	0	0	0	0	0	0	0	0	0	1	1
325620	Toilet Preparation Manufacturing	0	11	0	0	8	0	0	0	0	1	20
325910	Printing Ink Manufacturing	0	0	0	0	0	0	0	0	10	0	10
325998	All Other Miscellaneous Chemical Product and Preparation Manufacturing	0	4	0	0	0	0	0	0	0	1	5
326111	Plastics Bag and Pouch Manufacturing	2	0	0	0	0	0	0	0	0	0	2
326113	Unlaminated Plastics Film and Sheet (except Packaging) Manufacturing	1	0	0	0	0	0	0	0	0	0	1
326121	Unlaminated Plastics Profile	0	3	0	0	7	0	0	0	0	1	11

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/RECLAIM Modification	Not Renewed	Area Source	Grand Total
	Shape Manufacturing											
326130	Laminated Plastics Plate, Sheet (except Packaging), and Shape Manufacturing	1	0	0	0	0	0	0	0	0	1	2
326140	Polystyrene Foam Product Manufacturing	0	0	0	0	0	0	0	0	0	1	1
326150	Urethane and Other Foam Product (except Polystyrene) Manufacturing	2	3	0	0	0	0	0	0	0	1	6
326160	Plastics Bottle Manufacturing	0	1	0	0	0	0	0	0	0	0	1
326199	All Other Plastics Product Manufacturing	13	1	15	0	27	0	0	1	6	2	65
326211	Tire Manufacturing (except Retreading)	0	0	0	0	0	0	0	0	0	1	1
326299	All Other Rubber Product Manufacturing	2	11	0	0	0	0	0	0	0	0	13
327120	Clay Building Material and Refractories Manufacturing	2	11	0	0	7	0	0	3	0	0	23
327211	Flat Glass Manufacturing	1	0	0	0	0	0	0	0	0	0	1
327213	Glass Container Manufacturing	0	1	0	0	0	0	0	0	0	2	3
327215	Glass Product Manufacturing Made of Purchased Glass	0	4	0	0	0	0	0	0	0	0	4
327310	Cement Manufacturing	0	5	5	0	36	0	0	2	0	1	49
327320	Ready-Mix Concrete Manufacturing	3	21	0	0	2	0	0	0	0	0	26
327331	Concrete Block and Brick Manufacturing	0	9	5	0	0	0	0	0	0	0	14
327390	Other Concrete Product Manufacturing	0	5	0	0	0	0	0	0	0	0	5
327420	Gypsum Product Manufacturing	0	0	0	0	0	0	0	0	0	1	1
327992	Ground or Treated Mineral and Earth Manufacturing	0	2	0	0	0	0	0	0	0	0	2

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/RECLAIM Modification	Not Renewed	Area Source	Grand Total
327999	All Other Miscellaneous Nonmetallic Mineral Product Manufacturing	0	2	0	0	0	0	0	0	0	0	2
331110	Iron and Steel Mills and Ferroalloy Manufacturing	5	2	6	0	0	0	0	3	0	0	16
331221	Rolled Steel Shape Manufacturing	1	1	0	0	0	0	0	0	2	0	4
331318	Other Aluminum Rolling, Drawing, and Extruding	7	2	0	0	7	0	0	4	0	1	21
331410	Nonferrous Metal (except Aluminum) Smelting and Refining	0	0	0	0	0	0	1	0	0	0	1
331492	Secondary Smelting, Refining, and Alloying of Nonferrous Metal (except Copper and Aluminum)	5	10	0	0	0	0	0	4	0	1	20
331511	Iron Foundries	0	3	0	0	0	0	0	0	0	0	3
331512	Steel Investment Foundries	0	4	0	0	0	0	0	1	0	2	7
331523	Nonferrous Metal Die-Casting Foundries	0	2	0	0	0	0	0	0	0	0	2
331524	Aluminum Foundries (except Die-Casting)	0	5	0	0	0	0	0	0	0	0	5
331529	Other Nonferrous Metal Foundries (except Die-Casting)	0	1	0	0	0	0	0	0	3	0	4
332111	Iron and Steel Forging	1	0	0	0	0	0	0	0	0	0	1
332112	Nonferrous Forging	11	3	8	0	1	1	0	2	0	0	26
332119	Metal Crown, Closure, and Other Metal Stamping (except Automotive)	2	1	0	0	0	0	0	0	0	0	3
332311	Prefabricated Metal Building and Component Manufacturing	0	0	0	0	0	0	0	1	0	0	1
332312	Fabricated Structural Metal	3	0	0	0	0	0	0	0	1	1	5

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/RECLAIM Modification	Not Renewed	Area Source	Grand Total
	Manufacturing											
332321	Metal Window and Door Manufacturing	0	2	0	0	0	0	0	0	1	0	3
332322	Sheet Metal Work Manufacturing	2	11	0	0	20	0	0	0	2	0	35
332323	Ornamental and Architectural Metal Work Manufacturing	0	2	0	0	0	0	0	0	2	0	4
332431	Metal Can Manufacturing	1	7	0	0	0	0	0	2	0	2	12
332439	Other Metal Container Manufacturing	0	0	0	0	0	0	0	0	1	0	1
332510	Hardware Manufacturing	2	4	1	0	0	0	0	0	1	0	8
332710	Machine Shops	1	4	8	0	0	0	0	0	0	0	13
332721	Precision Turned Product Manufacturing	1	0	0	0	0	0	0	1	0	0	2
332722	Bolt, Nut, Screw, Rivet, and Washer Manufacturing	14	0	0	0	0	0	0	0	0	0	14
332811	Metal Heat Treating	4	3	0	0	2	0	0	1	0	0	10
332812	Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers	8	21	0	0	1	0	1	3	9	0	43
332813	Electroplating, Plating, Polishing, Anodizing, and Coloring	44	15	4	0	8	0	0	0	5	3	79
332912	Fluid Power Valve and Hose Fitting Manufacturing	2	2	6	0	0	0	0	0	0	0	10
332919	Other Metal Valve and Pipe Fitting Manufacturing	0	6	0	0	0	0	0	0	3	2	11
332994	Small Arms, Ordnance, and Ordnance Accessories Manufacturing	2	1	0	0	0	0	0	0	0	0	3
332999	All Other Miscellaneous Fabricated Metal Product	0	1	0	0	0	0	0	0	3	0	4

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/RECLAIM Modification	Not Renewed	Area Source	Grand Total
	Manufacturing											
333111	Farm Machinery and Equipment Manufacturing	0	0	0	0	1	0	0	0	0	0	1
333112	Lawn and Garden Tractor and Home Lawn and Garden Equipment Manufacturing	0	0	0	0	0	0	0	0	10	0	10
333120	Construction Machinery Manufacturing	0	1	0	0	0	0	0	0	0	0	1
333132	Oil and Gas Field Machinery and Equipment Manufacturing	1	0	0	0	0	0	0	0	0	0	1
333249	Other Industrial Machinery Manufacturing	0	2	0	0	0	0	0	0	0	0	2
333314	Optical Instrument and Lens Manufacturing	0	0	0	0	0	0	0	0	0	1	1
333316	Photographic and Photocopying Equipment Manufacturing	0	0	0	0	0	0	0	0	0	4	4
333318	Other Commercial and Service Industry Machinery Manufacturing	0	4	6	0	0	0	0	0	0	1	11
333415	Air-Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment Manufacturing	0	2	0	0	0	0	0	0	0	3	5
333611	Turbine and Turbine Generator Set Units Manufacturing	0	1	0	0	1	0	0	0	0	0	2
333618	Other Engine Equipment Manufacturing	0	0	0	0	0	0	0	0	0	6	6
333921	Elevator and Moving Stairway Manufacturing	0	9	0	0	0	0	0	0	0	0	9
333922	Conveyor and Conveying	0	0	1	0	0	0	0	0	0	0	1

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/RECLAIM Modification	Not Renewed	Area Source	Grand Total
	Equipment Manufacturing											
333923	Overhead Traveling Crane, Hoist, and Monorail System Manufacturing	2	2	0	0	0	0	0	0	0	0	4
333999	All Other Miscellaneous General Purpose Machinery Manufacturing	0	4	1	0	0	0	0	0	0	0	5
334112	Computer Storage Device Manufacturing	0	0	0	0	1	0	0	0	0	0	1
334118	Computer Terminal and Other Computer Peripheral Equipment Manufacturing	0	0	2	0	0	0	0	0	0	0	2
334220	Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing	3	2	0	0	0	0	0	1	0	2	8
334310	Audio and Video Equipment Manufacturing	0	0	0	0	0	0	0	0	0	1	1
334412	Bare Printed Circuit Board Manufacturing	0	3	0	0	0	0	0	0	0	0	3
334413	Semiconductor and Related Device Manufacturing	0	11	53	0	0	0	0	0	0	11	75
334416	Capacitor, Resistor, Coil, Transformer, and Other Inductor Manufacturing	0	0	0	0	0	0	0	0	0	2	2
334417	Electronic Connector Manufacturing	0	0	1	0	0	0	0	0	0	0	1
334418	Printed Circuit Assembly (Electronic Assembly) Manufacturing	0	13	3	0	3	0	0	0	7	1	27
334419	Other Electronic Component Manufacturing	0	1	1	0	0	0	0	1	0	0	3
334510	Electromedical and Electrotherapeutic Apparatus Manufacturing	0	2	1	0	0	0	0	0	0	5	8

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/RECLAIM Modification	Not Renewed	Area Source	Grand Total
334511	Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System and Instrument Manufacturing	7	6	0	0	3	0	1	4	5	5	31
334513	Instruments and Related Products Manufacturing for Measuring, Displaying, and Controlling Industrial Process Variables	0	2	0	0	0	0	0	0	0	1	3
334514	Totalizing Fluid Meter and Counting Device Manufacturing	0	3	0	0	0	0	0	0	0	0	3
334515	Instrument Manufacturing for Measuring and Testing Electricity and Electrical Signals	0	0	2	0	0	0	0	0	0	2	4
334516	Analytical Laboratory Instrument Manufacturing	0	2	0	0	0	0	0	1	0	9	12
334519	Other Measuring and Controlling Device Manufacturing	0	1	0	0	0	0	0	0	0	0	1
334614	Software and Other Prerecorded Compact Disc, Tape, and Record Reproducing	0	20	0	0	0	0	0	0	0	1	21
335110	Electric Lamp Bulb and Part Manufacturing	1	0	0	0	0	0	0	1	0	0	2
335121	Residential Electric Lighting Fixture Manufacturing	0	1	0	0	0	0	0	0	0	0	1
335122	Commercial, Industrial, and Institutional Electric Lighting Fixture Manufacturing	1	2	0	0	0	0	0	0	3	0	6
335129	Other Lighting Equipment Manufacturing	5	0	0	0	1	0	0	0	2	0	8

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/RECLAIM Modification	Not Renewed	Area Source	Grand Total
335221	Household Cooking Appliance Manufacturing	0	2	0	0	0	0	0	0	0	0	2
335311	Power, Distribution, and Specialty Transformer Manufacturing	2	0	0	0	2	0	0	0	0	1	5
335312	Motor and Generator Manufacturing	0	0	0	0	30	9	0	0	4	0	43
335313	Switchgear and Switchboard Apparatus Manufacturing	1	0	0	0	0	0	0	0	0	0	1
335314	Relay and Industrial Control Manufacturing	0	17	0	0	3	4	1	1	0	0	26
335921	Fiber Optic Cable Manufacturing	0	5	0	0	0	0	0	0	0	0	5
335931	Current-Carrying Wiring Device Manufacturing	2	0	0	0	0	0	0	0	0	0	2
335932	Noncurrent-Carrying Wiring Device Manufacturing	0	1	0	0	0	0	0	0	0	0	1
335999	All Other Miscellaneous Electrical Equipment and Component Manufacturing	1	0	0	0	0	0	0	0	0	0	1
336214	Travel Trailer and Camper Manufacturing	0	2	0	0	1	0	1	0	0	0	4
336390	Other Motor Vehicle Parts Manufacturing	5	7	0	0	0	0	0	2	0	4	18
336411	Aircraft Manufacturing	4	16	17	0	1	0	0	4	0	6	48
336412	Aircraft Engine and Engine Parts Manufacturing	2	1	0	0	0	0	0	0	0	1	4
336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing	11	16	0	7	4	4	1	4	0	6	53
336414	Guided Missile and Space Vehicle Manufacturing	0	3	0	0	0	0	0	0	0	0	3
336612	Boat Building	0	0	0	0	0	0	0	0	2	0	2
336991	Motorcycle, Bicycle, and Parts Manufacturing	0	0	0	0	0	0	0	0	1	0	1

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/RECLAIM Modification	Not Renewed	Area Source	Grand Total
337110	Wood Kitchen Cabinet and Countertop Manufacturing	1	4	0	0	0	0	0	1	7	0	13
337121	Upholstered Household Furniture Manufacturing	0	8	0	0	0	0	0	0	9	0	17
337122	Nonupholstered Wood Household Furniture Manufacturing	4	0	0	0	0	0	0	1	2	1	8
337124	Metal Household Furniture Manufacturing	0	0	0	0	2	0	0	0	0	0	2
337127	Institutional Furniture Manufacturing	4	1	0	0	0	0	0	0	0	1	6
337211	Wood Office Furniture Manufacturing	0	1	2	0	0	0	0	0	5	0	8
337212	Custom Architectural Woodwork and Millwork Manufacturing	0	0	0	0	0	0	0	0	1	0	1
337214	Office Furniture (except Wood) Manufacturing	0	1	0	0	0	0	0	1	0	0	2
337920	Blind and Shade Manufacturing	0	0	0	0	0	0	0	0	2	0	2
339112	Surgical and Medical Instrument Manufacturing	1	5	0	0	3	0	0	1	0	6	16
339113	Surgical Appliance and Supplies Manufacturing	0	0	0	0	0	0	0	0	0	3	3
339114	Dental Equipment and Supplies Manufacturing	0	1	0	0	0	0	0	0	0	1	2
339115	Ophthalmic Goods Manufacturing	2	19	0	0	9	0	0	0	0	2	32
339910	Jewelry and Silverware Manufacturing	1	3	0	0	0	0	0	0	0	0	4
339920	Sporting and Athletic Goods Manufacturing	0	0	0	0	0	0	0	0	3	0	3
339930	Doll, Toy, and Game Manufacturing	0	0	0	0	0	0	0	0	0	1	1
339940	Office Supplies (except	0	0	0	0	0	0	0	0	0	1	1

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	Paper) Manufacturing											
339950	Sign Manufacturing	0	1	1	0	0	0	0	0	0	0	2
339992	Musical Instrument Manufacturing	0	0	0	0	0	0	0	0	1	1	2
339993	Fastener, Button, Needle, and Pin Manufacturing	2	2	0	0	0	0	0	2	0	1	7
339999	All Other Miscellaneous Manufacturing	0	15	1	0	1	0	1	0	5	1	24
423110	Automobile and Other Motor Vehicle Merchant Wholesalers	0	2	0	0	0	0	1	0	3	1	7
423120	Motor Vehicle Supplies and New Parts Merchant Wholesalers	0	0	2	0	1	0	0	0	0	0	3
423130	Tire and Tube Merchant Wholesalers	0	10	0	0	0	0	0	0	0	2	12
423140	Motor Vehicle Parts (Used) Merchant Wholesalers	0	1	0	0	0	0	0	0	0	0	1
423210	Furniture Merchant Wholesalers	4	0	0	0	1	5	0	0	5	0	15
423220	Home Furnishing Merchant Wholesalers	0	2	0	0	0	0	1	0	0	0	3
423310	Lumber, Plywood, Millwork, and Wood Panel Merchant Wholesalers	0	4	0	0	0	0	0	0	1	0	5
423320	Brick, Stone, and Related Construction Material Merchant Wholesalers	0	8	0	0	1	0	0	1	0	0	10
423390	Other Construction Material Merchant Wholesalers	0	1	0	0	0	0	0	0	0	0	1
423420	Office Equipment Merchant Wholesalers	0	0	0	0	0	0	0	0	0	2	2
423430	Computer and Computer Peripheral Equipment and Software Merchant	0	4	1	0	0	0	1	0	0	0	6

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/RECLAIM Modification	Not Renewed	Area Source	Grand Total
	Wholesalers											
423440	Other Commercial Equipment Merchant Wholesalers	0	2	0	0	0	0	0	0	1	0	3
423450	Medical, Dental, and Hospital Equipment and Supplies Merchant Wholesalers	1	4	2	0	15	0	0	0	0	14	36
423490	Other Professional Equipment and Supplies Merchant Wholesalers	0	0	0	0	0	0	1	0	0	0	1
423510	Metal Service Centers and Other Metal Merchant Wholesalers	1	7	6	0	0	0	0	1	0	0	15
423520	Coal and Other Mineral and Ore Merchant Wholesalers	0	0	0	0	0	0	0	0	1	0	1
423610	Electrical Apparatus and Equipment, Wiring Supplies, and Related Equipment Merchant Wholesalers	0	2	0	0	0	0	0	0	0	0	2
423690	Other Electronic Parts and Equipment Merchant Wholesalers	0	0	5	0	0	0	0	0	1	2	8
423710	Hardware Merchant Wholesalers	0	0	1	0	0	0	0	0	1	0	2
423720	Plumbing and Heating Equipment and Supplies (Hydronics) Merchant Wholesalers	0	1	0	0	0	0	0	0	2	1	4
423730	Warm Air Heating and Air-Conditioning Equipment and Supplies Merchant Wholesalers	0	0	0	0	0	0	0	0	2	0	2
423810	Construction and Mining (except Oil Well) Machinery and Equipment Merchant	0	1	0	0	0	0	0	0	0	13	14

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/RECLAIM Modification	Not Renewed	Area Source	Grand Total
	Wholesalers											
423820	Farm and Garden Machinery and Equipment Merchant Wholesalers	0	1	0	3	1	0	0	0	1	0	6
423830	Industrial Machinery and Equipment Merchant Wholesalers	0	8	2	0	1	0	3	1	1	1	17
423840	Industrial Supplies Merchant Wholesalers	3	12	5	0	0	0	0	0	0	0	20
423850	Service Establishment Equipment and Supplies Merchant Wholesalers	0	2	8	0	0	0	0	0	1	3	14
423860	Transportation Equipment and Supplies (except Motor Vehicle) Merchant Wholesalers	9	0	0	0	0	0	0	0	0	0	9
423910	Sporting and Recreational Goods and Supplies Merchant Wholesalers	0	0	0	0	0	0	0	0	1	0	1
423920	Toy and Hobby Goods and Supplies Merchant Wholesalers	0	0	0	0	0	0	0	0	0	16	16
423930	Recyclable Material Merchant Wholesalers	1	3	1	0	1	0	0	0	1	2	9
423940	Jewelry, Watch, Precious Stone, and Precious Metal Merchant Wholesalers	0	0	0	0	0	0	0	0	1	0	1
423990	Other Miscellaneous Durable Goods Merchant Wholesalers	2	3	0	0	1	0	0	0	1	1	8
424120	Stationery and Office Supplies Merchant Wholesalers	0	0	1	0	0	0	0	0	0	0	1
424130	Industrial and Personal Service Paper Merchant	1	0	1	0	0	0	1	0	0	0	3

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	Wholesalers											
424210	Drugs and Druggists' Sundries Merchant Wholesalers	2	4	4	0	0	0	0	0	1	6	17
424410	General Line Grocery Merchant Wholesalers	0	4	0	0	0	1	1	0	0	12	18
424420	Packaged Frozen Food Merchant Wholesalers	0	1	0	0	0	0	0	0	0	1	2
424440	Poultry and Poultry Product Merchant Wholesalers	0	0	0	0	0	0	0	0	1	0	1
424450	Confectionery Merchant Wholesalers	0	1	0	0	0	0	0	0	0	1	2
424460	Fish and Seafood Merchant Wholesalers	0	0	0	0	0	0	0	0	0	1	1
424470	Meat and Meat Product Merchant Wholesalers	0	0	2	0	0	0	0	0	0	3	5
424480	Fresh Fruit and Vegetable Merchant Wholesalers	0	2	0	0	0	0	0	0	0	7	9
424490	Other Grocery and Related Products Merchant Wholesalers	0	3	0	0	0	0	0	0	0	2	5
424590	Other Farm Product Raw Material Merchant Wholesalers	1	1	0	0	0	0	0	0	0	0	2
424690	Other Chemical and Allied Products Merchant Wholesalers	4	44	0	0	27	0	1	1	0	0	77
424710	Petroleum Bulk Stations and Terminals	0	0	10	0	0	0	0	0	0	0	10
424720	Petroleum and Petroleum Products Merchant Wholesalers (except Bulk Stations and Terminals)	1	18	24	0	5	1	3	5	3	3	63
424810	Beer and Ale Merchant	0	0	0	0	0	0	0	0	0	1	1

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	Wholesalers											
424820	Wine and Distilled Alcoholic Beverage Merchant Wholesalers	3	1	0	0	0	0	0	0	0	0	4
424910	Farm Supplies Merchant Wholesalers	6	8	0	0	2	0	0	0	0	1	17
424930	Flower, Nursery Stock, and Florists' Supplies Merchant Wholesalers	0	0	0	0	0	0	0	0	0	1	1
424950	Paint, Varnish, and Supplies Merchant Wholesalers	0	1	2	0	6	0	0	0	0	0	9
424990	Other Miscellaneous Nondurable Goods Merchant Wholesalers	1	1	4	0	0	0	0	0	0	1	7
441110	New Car Dealers	2	13	4	0	1	0	0	0	3	4	27
441120	Used Car Dealers	2	3	0	0	0	0	0	0	1	1	7
441210	Recreational Vehicle Dealers	0	0	0	0	0	0	0	0	0	1	1
441228	Motorcycle, ATV, and All Other Motor Vehicle Dealers	0	2	4	0	0	0	0	0	0	0	6
441310	Automotive Parts and Accessories Stores	1	7	1	0	0	0	0	0	0	6	15
441320	Tire Dealers	0	2	0	0	0	0	0	0	0	0	2
442110	Furniture Stores	0	5	0	0	0	0	0	1	4	4	14
442210	Floor Covering Stores	0	0	0	0	0	0	0	0	0	1	1
443142	Electronics Stores	0	1	1	0	1	0	0	0	0	3	6
444110	Home Centers	0	10	1	0	0	0	1	1	7	3	23
444120	Paint and Wallpaper Stores	0	2	3	0	0	0	0	0	0	0	5
444130	Hardware Stores	0	1	1	0	0	0	0	0	0	6	8
444190	Other Building Material Dealers	0	1	3	0	0	0	0	0	0	0	4
444220	Nursery, Garden Center, and Farm Supply Stores	0	0	0	0	0	0	0	0	2	0	2

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/RECLAIM Modification	Not Renewed	Area Source	Grand Total
445110	Supermarkets and Other Grocery (except Convenience) Stores	0	30	24	2	1	0	1	0	2	262	322
445120	Convenience Stores	1	21	34	0	0	0	0	0	2	11	69
445210	Meat Markets	0	0	4	0	0	0	0	0	0	2	6
445230	Fruit and Vegetable Markets	0	1	0	0	0	0	0	0	0	1	2
445291	Baked Goods Stores	0	1	1	0	0	0	0	0	0	3	5
445299	All Other Specialty Food Stores	4	0	1	0	1	0	0	0	0	4	10
445310	Beer, Wine, and Liquor Stores	0	0	0	0	0	0	0	0	0	2	2
446110	Pharmacies and Drug Stores	0	2	2	0	0	0	0	0	0	6	10
446120	Cosmetics, Beauty Supplies, and Perfume Stores	1	2	0	0	3	0	0	0	0	0	6
446130	Optical Goods Stores	0	0	0	0	0	0	0	0	0	1	1
446191	Food (Health) Supplement Stores	0	0	0	0	0	0	0	0	1	1	2
447110	Gasoline Stations with Convenience Stores	1	0	0	0	0	0	0	0	0	0	1
447190	Other Gasoline Stations	15	111	63	0	5	1	5	10	28	3	241
448110	Men's Clothing Stores	0	0	0	0	0	0	0	0	0	3	3
448120	Women's Clothing Stores	0	2	0	0	0	0	0	0	0	2	4
448140	Family Clothing Stores	0	2	0	0	0	0	0	0	0	8	10
448190	Other Clothing Stores	0	0	0	0	0	0	0	0	1	0	1
448210	Shoe Stores	0	1	0	0	0	0	0	0	0	0	1
448310	Jewelry Stores	0	1	0	0	0	0	1	0	0	0	2
448320	Luggage and Leather Goods Stores	0	0	0	0	0	0	0	0	0	1	1
451110	Sporting Goods Stores	0	2	0	0	0	0	0	0	0	3	5
451120	Hobby, Toy, and Game Stores	0	1	2	0	0	0	0	0	0	1	4

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/RECLAIM Modification	Not Renewed	Area Source	Grand Total
451211	Book Stores	0	4	0	0	0	0	1	0	1	5	11
452111	Department Stores (except Discount Department Stores)	0	7	0	0	1	0	0	0	1	37	46
452112	Discount Department Stores	0	1	0	0	0	0	0	0	0	57	58
452910	Warehouse Clubs and Supercenters	3	18	0	0	0	34	0	0	0	13	68
452990	All Other General Merchandise Stores	0	0	1	0	0	0	0	0	0	14	15
453110	Florists	0	0	0	0	0	0	0	0	0	1	1
453220	Gift, Novelty, and Souvenir Stores	1	1	0	0	0	0	0	0	0	3	5
453310	Used Merchandise Stores	0	0	0	0	0	0	0	0	3	2	5
453910	Pet and Pet Supplies Stores	1	0	5	0	0	0	0	0	0	0	6
453991	Tobacco Stores	0	0	0	0	0	0	0	0	1	0	1
453998	All Other Miscellaneous Store Retailers (except Tobacco Stores)	0	3	7	0	0	0	0	0	7	10	27
454113	Mail-Order Houses	0	0	6	0	0	0	0	0	0	0	6
454210	Vending Machine Operators	0	1	0	0	0	0	0	2	1	0	4
454310	Fuel Dealers	1	0	1	0	0	0	0	0	0	0	2
454390	Other Direct Selling Establishments	0	8	0	0	0	0	1	0	0	22	31
481111	Scheduled Passenger Air Transportation	0	1	0	0	0	0	0	0	1	3	5
481112	Scheduled Freight Air Transportation	0	0	0	0	0	0	0	0	0	1	1
482111	Line-Haul Railroads	0	3	1	0	0	0	0	0	0	1	5
483212	Inland Water Passenger Transportation	0	0	0	0	0	0	0	0	0	1	1
484110	General Freight Trucking, Local	0	6	2	0	0	0	4	0	0	1	13
484121	General Freight Trucking,	0	2	0	0	0	0	0	0	0	4	6

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/RECLAIM Modification	Not Renewed	Area Source	Grand Total
	Long-Distance, Truckload											
484122	General Freight Trucking, Long-Distance, Less Than Truckload	0	0	0	0	0	0	0	0	0	1	1
484220	Specialized Freight (except Used Goods) Trucking, Local	0	1	0	0	0	0	0	0	0	0	1
485111	Mixed Mode Transit Systems	0	4	0	0	1	0	1	0	0	3	9
485113	Bus and Other Motor Vehicle Transit Systems	0	1	0	0	3	0	0	0	0	4	8
485999	All Other Transit and Ground Passenger Transportation	0	4	3	0	0	0	0	0	0	0	7
486110	Pipeline Transportation of Crude Oil	0	4	0	0	3	0	1	2	0	0	10
486210	Pipeline Transportation of Natural Gas	0	0	0	0	3	0	2	3	0	0	8
488111	Air Traffic Control	0	1	0	0	0	0	0	0	2	0	3
488119	Other Airport Operations	0	18	5	1	0	1	0	2	0	4	31
488190	Other Support Activities for Air Transportation	0	8	6	0	1	0	0	1	0	2	18
488210	Support Activities for Rail Transportation	1	0	0	0	0	0	0	1	1	0	3
488310	Port and Harbor Operations	0	0	1	0	0	0	0	0	0	0	1
488320	Marine Cargo Handling	0	6	0	0	0	0	1	3	0	2	12
488390	Other Support Activities for Water Transportation	0	2	0	0	0	0	0	0	0	0	2
488410	Motor Vehicle Towing	0	0	0	0	0	0	1	0	1	0	2
488490	Other Support Activities for Road Transportation	0	0	0	0	1	0	0	0	0	5	6
488510	Freight Transportation Arrangement	0	0	2	0	5	0	0	0	0	2	9
488999	All Other Support Activities for Transportation	2	6	2	0	0	1	0	1	1	3	16

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/RECLAIM Modification	Not Renewed	Area Source	Grand Total
491110	Postal Service	0	0	0	0	0	0	0	0	1	8	9
492110	Couriers and Express Delivery Services	0	0	0	0	0	0	0	0	1	1	2
493110	General Warehousing and Storage	0	4	2	0	0	0	1	0	4	3	14
493190	Other Warehousing and Storage	2	3	37	0	0	0	4	3	1	0	50
511110	Newspaper Publishers	0	0	1	0	0	0	0	0	1	4	6
511120	Periodical Publishers	0	0	1	0	0	0	0	0	0	0	1
511199	All Other Publishers	0	1	0	0	0	0	1	0	0	0	2
511210	Software Publishers	0	0	1	0	0	0	0	0	0	1	2
512110	Motion Picture and Video Production	1	9	2	0	0	0	0	3	0	28	43
512120	Motion Picture and Video Distribution	0	4	0	0	0	0	0	0	0	3	7
512131	Motion Picture Theaters (except Drive-Ins)	0	0	0	0	0	0	0	0	1	1	2
512191	Teleproduction and Other Postproduction Services	8	0	0	0	2	0	0	0	0	1	11
512199	Other Motion Picture and Video Industries	0	2	6	0	0	0	0	0	0	2	10
512210	Record Production	0	0	1	0	0	0	0	0	0	2	3
512240	Sound Recording Studios	0	1	0	0	0	0	0	0	0	1	2
515111	Radio Networks	0	0	0	0	0	0	0	0	0	1	1
515120	Television Broadcasting	0	7	0	0	0	0	1	0	0	4	12
515210	Cable and Other Subscription Programming	0	5	0	0	0	0	0	0	0	1	6
517110	Wired Telecommunications Carriers	0	4	1	0	0	0	0	0	0	1	6
517210	Wireless Telecommunications Carriers (except Satellite)	0	2	0	0	1	0	0	0	0	2	5
517911	Telecommunications	0	19	1	0	0	0	1	0	0	10	31

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/RECLAIM Modification	Not Renewed	Area Source	Grand Total
	Resellers											
517919	All Other Telecommunications	0	5	2	0	0	0	0	0	0	5	12
518210	Data Processing, Hosting, and Related Services	0	5	0	0	0	0	0	0	1	3	9
519120	Libraries and Archives	0	4	1	0	1	0	1	0	0	20	27
519190	All Other Information Services	0	2	0	0	0	0	1	0	1	0	4
521110	Monetary Authorities-Central Bank	0	0	0	0	0	0	0	0	0	2	2
522110	Commercial Banking	0	0	0	0	1	0	1	0	0	5	7
522120	Savings Institutions	0	0	0	0	0	0	0	0	0	1	1
522130	Credit Unions	0	1	6	0	2	0	0	0	0	4	13
522298	All Other Nondepository Credit Intermediation	0	0	0	0	1	0	0	0	0	2	3
522310	Mortgage and Nonmortgage Loan Brokers	0	0	0	0	0	0	1	0	0	2	3
522320	Financial Transactions Processing, Reserve, and Clearinghouse Activities	0	2	0	0	0	0	0	0	0	0	2
522390	Other Activities Related to Credit Intermediation	0	0	0	0	0	0	0	0	3	1	4
523110	Investment Banking and Securities Dealing	0	0	0	0	0	0	0	0	0	1	1
523120	Securities Brokerage	0	0	0	0	0	0	0	0	0	1	1
523910	Miscellaneous Intermediation	0	9	8	0	4	13	1	0	2	16	53
523920	Portfolio Management	0	5	1	0	0	0	0	0	0	12	18
523930	Investment Advice	0	0	2	0	0	0	0	0	0	2	4
523991	Trust, Fiduciary, and Custody Activities	0	0	1	0	0	0	0	0	0	0	1
524113	Direct Life Insurance Carriers	0	0	0	0	0	0	0	0	1	3	4
524114	Direct Health and Medical Insurance Carriers	0	1	1	0	0	0	0	1	10	2	15

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/RECLAIM Modification	Not Renewed	Area Source	Grand Total
524126	Direct Property and Casualty Insurance Carriers	0	1	0	0	1	0	0	0	0	4	6
524127	Direct Title Insurance Carriers	0	0	0	0	0	0	0	0	0	1	1
524210	Insurance Agencies and Brokerages	0	0	1	1	0	0	1	0	0	11	14
524298	All Other Insurance Related Activities	0	1	0	0	0	0	0	0	0	0	1
525920	Trusts, Estates, and Agency Accounts	0	1	0	0	0	0	0	0	0	2	3
525990	Other Financial Vehicles	0	0	1	0	0	0	0	0	0	0	1
531110	Lessors of Residential Buildings and Dwellings	0	19	9	0	1	0	0	1	0	41	71
531120	Lessors of Nonresidential Buildings (except Miniwarehouses)	1	5	7	0	0	0	3	0	0	31	47
531190	Lessors of Other Real Estate Property	0	0	0	0	0	0	0	0	0	3	3
531210	Offices of Real Estate Agents and Brokers	3	22	28	0	0	0	5	0	3	77	138
531312	Nonresidential Property Managers	0	5	6	0	0	0	2	0	4	14	31
532111	Passenger Car Rental	0	2	4	0	0	0	0	0	0	0	6
532120	Truck, Utility Trailer, and RV (Recreational Vehicle) Rental and Leasing	0	2	0	1	0	0	0	0	0	1	4
532210	Consumer Electronics and Appliances Rental	0	0	2	0	0	0	0	0	0	0	2
532220	Formal Wear and Costume Rental	0	2	0	0	0	0	0	0	0	1	3
532230	Video Tape and Disc Rental	0	1	0	0	0	0	0	0	0	0	1
532299	All Other Consumer Goods Rental	0	1	0	0	0	0	0	0	0	0	1
532412	Construction, Mining, and Forestry Machinery and	0	3	0	0	0	0	0	0	0	0	3

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/RECLAIM Modification	Not Renewed	Area Source	Grand Total
	Equipment Rental and Leasing											
532490	Other Commercial and Industrial Machinery and Equipment Rental and Leasing	0	2	2	0	0	0	0	0	4	2	10
533110	Lessors of Nonfinancial Intangible Assets (except Copyrighted Works)	0	0	0	0	0	0	0	0	8	1	9
541110	Offices of Lawyers	0	3	2	0	0	0	0	0	2	5	12
541211	Offices of Certified Public Accountants	0	0	0	0	0	0	0	0	0	1	1
541213	Tax Preparation Services	0	0	0	0	0	0	0	0	0	17	17
541219	Other Accounting Services	0	1	0	0	0	0	0	0	0	1	2
541310	Architectural Services	0	8	0	0	1	0	0	0	0	0	9
541320	Landscape Architectural Services	0	1	0	0	0	0	0	0	2	5	8
541330	Engineering Services	5	17	4	0	0	0	19	0	3	60	108
541350	Building Inspection Services	0	1	0	0	0	0	0	0	0	1	2
541380	Testing Laboratories	3	8	0	0	0	0	0	0	0	5	16
541410	Interior Design Services	0	2	0	0	0	0	0	3	3	0	8
541430	Graphic Design Services	0	1	2	0	0	0	0	0	0	0	3
541511	Custom Computer Programming Services	0	2	0	0	0	0	0	0	1	3	6
541512	Computer Systems Design Services	0	0	1	0	0	0	0	0	2	4	7
541519	Other Computer Related Services	0	0	0	0	0	0	1	0	0	1	2
541611	Administrative Management and General Management Consulting Services	0	3	3	0	0	0	1	0	2	10	19
541612	Human Resources Consulting	0	1	0	0	0	0	0	0	0	0	1

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/RECLAIM Modification	Not Renewed	Area Source	Grand Total
	Services											
541613	Marketing Consulting Services	0	1	3	0	0	0	0	0	0	2	6
541618	Other Management Consulting Services	4	1	1	0	1	0	5	0	0	18	30
541620	Environmental Consulting Services	1	23	3	0	3	3	32	0	30	10	105
541690	Other Scientific and Technical Consulting Services	0	1	0	0	0	1	0	1	1	1	5
541711	Research and Development in Biotechnology	0	0	0	0	0	0	0	0	0	1	1
541712	Research and Development in the Physical, Engineering, and Life Sciences (except Biotechnology)	10	6	2	0	0	0	1	0	3	3	25
541720	Research and Development in the Social Sciences and Humanities	0	0	1	0	0	0	0	0	0	2	3
541810	Advertising Agencies	2	0	0	0	0	0	0	0	0	1	3
541860	Direct Mail Advertising	0	0	0	0	0	7	0	0	0	3	10
541870	Advertising Material Distribution Services	0	1	0	0	0	0	0	0	0	0	1
541910	Marketing Research and Public Opinion Polling	0	1	0	0	0	1	0	1	0	0	3
541921	Photography Studios, Portrait	0	0	0	0	0	0	0	0	0	1	1
541922	Commercial Photography	0	0	1	0	0	0	0	0	0	0	1
541940	Veterinary Services	1	2	0	0	0	0	0	0	0	1	4
541990	All Other Professional, Scientific, and Technical Services	0	5	2	0	0	1	1	0	6	5	20
551112	Offices of Other Holding Companies	1	2	0	0	19	0	3	1	6	12	44
561110	Office Administrative Services	0	12	5	0	2	0	3	1	2	16	41

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/RECLAIM Modification	Not Renewed	Area Source	Grand Total
561210	Facilities Support Services	0	0	0	0	0	0	7	0	3	0	10
561311	Employment Placement Agencies	0	0	0	0	0	0	1	0	0	2	3
561312	Executive Search Services	0	0	0	0	0	0	0	0	1	0	1
561421	Telephone Answering Services	0	0	0	0	1	0	0	0	0	0	1
561422	Telemarketing Bureaus and Other Contact Centers	0	0	2	0	0	0	0	0	0	0	2
561431	Private Mail Centers	0	0	0	0	0	0	0	0	0	1	1
561440	Collection Agencies	0	0	1	0	0	0	0	0	0	0	1
561491	Repossession Services	0	0	0	0	0	0	0	0	0	3	3
561499	All Other Business Support Services	1	20	5	0	0	0	1	0	1	16	44
561510	Travel Agencies	1	0	0	0	0	0	0	0	0	1	2
561520	Tour Operators	0	0	0	0	0	0	0	0	0	1	1
561611	Investigation Services	0	1	0	0	0	0	0	0	0	0	1
561612	Security Guards and Patrol Services	0	2	0	0	0	0	0	0	0	0	2
561621	Security Systems Services (except Locksmiths)	0	3	1	0	0	0	0	0	0	0	4
561622	Locksmiths	1	1	1	0	0	0	0	0	0	0	3
561710	Exterminating and Pest Control Services	0	0	0	0	0	0	0	3	0	0	3
561720	Janitorial Services	0	9	2	0	0	0	0	0	5	25	41
561730	Landscaping Services	0	3	0	0	0	0	0	0	1	0	4
561790	Other Services to Buildings and Dwellings	0	4	5	0	0	0	0	0	4	11	24
561910	Packaging and Labeling Services	2	0	0	0	0	0	0	0	0	0	2
561920	Convention and Trade Show Organizers	0	1	0	0	0	0	0	0	0	4	5

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/RECLAIM Modification	Not Renewed	Area Source	Grand Total
561990	All Other Support Services	18	17	4	0	8	5	1	3	4	15	75
562112	Hazardous Waste Collection	2	0	0	0	0	0	6	0	0	0	8
562211	Hazardous Waste Treatment and Disposal	0	4	0	0	1	0	1	0	0	1	7
562212	Solid Waste Landfill	1	13	18	0	1	0	1	2	2	2	40
562219	Other Nonhazardous Waste Treatment and Disposal	0	13	0	0	15	0	0	2	0	1	31
562910	Remediation Services	0	3	1	0	2	0	2	0	37	85	130
562920	Materials Recovery Facilities	0	2	0	0	0	1	2	2	0	1	8
562998	All Other Miscellaneous Waste Management Services	0	6	0	0	0	0	1	0	20	0	27
611110	Elementary and Secondary Schools	1	27	1	0	0	0	2	0	11	65	107
611210	Junior Colleges	0	2	0	0	0	0	2	1	0	8	13
611310	Colleges, Universities, and Professional Schools	0	15	0	0	1	0	1	3	0	70	90
611620	Sports and Recreation Instruction	0	2	0	0	0	0	0	0	0	0	2
611699	All Other Miscellaneous Schools and Instruction	0	3	0	0	1	0	0	0	0	1	5
621111	Offices of Physicians (except Mental Health Specialists)	1	5	1	0	0	0	0	0	8	15	30
621112	Offices of Physicians, Mental Health Specialists	0	5	0	0	0	0	0	0	0	1	6
621210	Offices of Dentists	0	1	1	0	0	0	0	0	0	5	7
621310	Offices of Chiropractors	0	0	0	0	0	0	0	0	0	1	1
621340	Offices of Physical, Occupational and Speech Therapists, and Audiologists	0	1	1	0	0	0	0	0	0	1	3
621391	Offices of Podiatrists	0	0	0	0	0	0	0	0	0	1	1
621399	Offices of All Other Miscellaneous Health	0	0	0	0	0	0	0	0	1	0	1

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/RECLAIM Modification	Not Renewed	Area Source	Grand Total
	Practitioners											
621410	Family Planning Centers	0	1	0	0	0	0	0	0	0	1	2
621498	All Other Outpatient Care Centers	0	0	0	0	0	0	0	0	0	5	5
621610	Home Health Care Services	0	0	2	0	0	0	0	0	0	0	2
621991	Blood and Organ Banks	0	1	0	0	0	0	0	0	0	1	2
621999	All Other Miscellaneous Ambulatory Health Care Services	3	0	1	0	2	0	0	0	1	5	12
622110	General Medical and Surgical Hospitals	0	28	5	0	3	0	3	3	0	41	83
622210	Psychiatric and Substance Abuse Hospitals	0	9	0	0	1	0	0	2	0	2	14
622310	Specialty (except Psychiatric and Substance Abuse) Hospitals	0	2	0	0	0	0	0	0	0	0	2
623110	Nursing Care Facilities (Skilled Nursing Facilities)	0	6	0	0	0	0	0	0	4	8	18
623220	Residential Mental Health and Substance Abuse Facilities	0	2	0	0	0	0	0	0	0	1	3
623311	Continuing Care Retirement Communities	0	2	0	0	0	0	0	0	3	1	6
623312	Assisted Living Facilities for the Elderly	0	2	0	0	0	0	1	0	0	0	3
623990	Other Residential Care Facilities	0	1	0	0	0	0	1	0	0	1	3
624120	Services for the Elderly and Persons with Disabilities	0	1	0	0	0	0	0	0	0	1	2
624190	Other Individual and Family Services	0	6	0	0	0	0	1	3	1	3	14
624230	Emergency and Other Relief Services	0	0	0	0	0	0	0	0	0	1	1
624410	Child Day Care Services	0	1	3	0	0	0	0	1	0	2	7

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/RECLAIM Modification	Not Renewed	Area Source	Grand Total
711190	Other Performing Arts Companies	0	2	2	0	0	0	0	0	0	3	7
711211	Sports Teams and Clubs	0	0	3	0	0	0	0	0	0	0	3
711212	Racetracks	0	1	0	0	0	0	0	0	0	0	1
711219	Other Spectator Sports	0	0	0	0	0	0	0	0	0	1	1
711310	Promoters of Performing Arts, Sports, and Similar Events with Facilities	0	0	0	0	0	0	0	0	0	1	1
711410	Agents and Managers for Artists, Athletes, Entertainers, and Other Public Figures	0	1	0	0	0	0	1	0	0	0	2
711510	Independent Artists, Writers, and Performers	4	1	0	0	0	0	1	0	1	3	10
712110	Museums	0	0	0	0	0	0	0	0	0	8	8
712130	Zoos and Botanical Gardens	0	0	0	0	0	0	0	0	4	0	4
713110	Amusement and Theme Parks	4	7	0	0	1	1	0	2	0	3	18
713120	Amusement Arcades	0	0	1	0	0	0	0	0	0	0	1
713910	Golf Courses and Country Clubs	3	6	4	0	0	0	0	0	1	3	17
713920	Skiing Facilities	0	3	0	0	0	0	0	0	0	0	3
713940	Fitness and Recreational Sports Centers	0	7	0	0	1	0	0	0	0	3	11
713990	All Other Amusement and Recreation Industries	0	0	1	0	1	0	1	0	1	4	8
721110	Hotels (except Casino Hotels) and Motels	1	13	11	0	3	0	1	0	3	51	83
721120	Casino Hotels	0	0	0	0	0	0	0	0	0	3	3
721191	Bed-and-Breakfast Inns	0	0	0	0	0	0	0	0	0	1	1
721310	Rooming and Boarding Houses	0	2	0	0	0	0	0	0	0	0	2
722310	Food Service Contractors	0	0	0	0	0	0	0	0	0	1	1

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/RECLAIM Modification	Not Renewed	Area Source	Grand Total
722320	Caterers	0	0	0	0	0	0	0	0	4	1	5
722410	Drinking Places (Alcoholic Beverages)	0	1	0	0	0	0	0	0	1	1	3
722511	Full-Service Restaurants	12	5	3	0	0	1	0	0	52	128	201
722513	Limited-Service Restaurants	0	5	4	0	0	0	1	0	45	115	170
722514	Cafeterias, Grill Buffets, and Buffets	0	1	0	0	0	0	0	0	1	1	3
811111	General Automotive Repair	1	18	33	1	1	0	0	1	18	3	76
811112	Automotive Exhaust System Repair	0	2	0	0	0	0	0	0	0	0	2
811118	Other Automotive Mechanical and Electrical Repair and Maintenance	6	6	1	0	0	0	0	1	2	1	17
811121	Automotive Body, Paint, and Interior Repair and Maintenance	18	47	108	0	6	0	0	0	40	0	219
811192	Car Washes	0	7	5	1	0	0	0	0	0	0	13
811198	All Other Automotive Repair and Maintenance	1	4	5	0	1	0	0	0	0	0	11
811213	Communication Equipment Repair and Maintenance	0	0	0	0	0	0	0	0	1	0	1
811219	Other Electronic and Precision Equipment Repair and Maintenance	0	1	0	0	8	0	3	0	0	0	12
811310	Commercial and Industrial Machinery and Equipment (except Automotive and Electronic) Repair and Maintenance	1	3	0	0	0	0	1	0	2	1	8
811412	Appliance Repair and Maintenance	0	3	1	0	0	0	0	0	3	17	24
811420	Reupholstery and Furniture Repair	2	2	3	0	0	0	0	0	7	0	14

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/RECLAIM Modification	Not Renewed	Area Source	Grand Total
811490	Other Personal and Household Goods Repair and Maintenance	1	1	0	0	0	0	0	0	0	2	4
812112	Beauty Salons	1	10	0	0	0	0	0	2	0	2	15
812199	Other Personal Care Services	0	1	0	0	0	0	0	0	0	0	1
812210	Funeral Homes and Funeral Services	2	2	2	0	0	0	0	0	1	0	7
812220	Cemeteries and Crematories	3	4	5	0	0	0	0	0	0	1	13
812310	Coin-Operated Laundries and Drycleaners	0	0	0	0	0	0	0	0	1	0	1
812320	Drycleaning and Laundry Services (except Coin-Operated)	0	56	30	0	0	0	0	0	40	4	130
812331	Linen Supply	0	0	0	0	0	0	0	0	0	4	4
812332	Industrial Launderers	0	0	0	0	0	0	0	0	0	1	1
812910	Pet Care (except Veterinary) Services	0	0	0	0	0	0	0	0	1	0	1
812921	Photofinishing Laboratories (except One-Hour)	0	0	0	0	0	0	0	0	1	1	2
812930	Parking Lots and Garages	0	0	0	0	0	0	0	0	0	1	1
812990	All Other Personal Services	0	2	2	0	0	0	0	0	1	3	8
813110	Religious Organizations	0	11	3	0	1	0	0	0	1	7	23
813319	Other Social Advocacy Organizations	0	6	0	0	0	0	0	0	0	0	6
813410	Civic and Social Organizations	0	6	2	0	1	0	0	0	0	5	14
813910	Business Associations	6	4	0	0	0	0	0	1	0	2	13
813920	Professional Organizations	0	0	0	0	0	0	1	0	0	0	1
813930	Labor Unions and Similar Labor Organizations	0	0	0	0	0	0	0	0	0	1	1
813990	Other Similar Organizations (except Business,	0	3	3	0	0	0	1	0	1	26	34

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/RECLAIM Modification	Not Renewed	Area Source	Grand Total
	Professional, Labor, and Political Organizations)											
921110	Executive Offices	0	14	3	5	0	0	2	2	4	37	67
921120	Legislative Bodies	0	2	0	0	0	0	0	0	0	3	5
921190	Other General Government Support	2	9	1	0	0	0	0	1	0	4	17
922110	Courts	0	3	0	0	0	0	0	0	0	11	14
922120	Police Protection	0	14	0	0	0	0	1	2	0	18	35
922130	Legal Counsel and Prosecution	0	0	0	0	0	0	0	0	0	1	1
922140	Correctional Institutions	0	11	0	0	0	0	2	0	0	8	21
922150	Parole Offices and Probation Offices	0	1	0	0	0	0	0	0	0	1	2
922160	Fire Protection	0	33	0	0	1	0	0	0	0	3	37
923110	Administration of Education Programs	0	1	0	0	0	0	0	0	0	2	3
923120	Administration of Public Health Programs	0	0	0	0	0	0	0	0	0	3	3
923130	Administration of Human Resource Programs (except Education, Public Health, and Veterans' Affairs Programs)	0	0	0	0	0	0	0	0	0	4	4
923140	Administration of Veterans' Affairs	0	10	0	0	0	0	1	4	0	0	15
924110	Administration of Air and Water Resource and Solid Waste Management Programs	13	10	1	0	4	0	3	4	3	4	42
924120	Administration of Conservation Programs	0	1	0	0	2	0	1	0	0	3	7
925120	Administration of Urban Planning and Community and Rural Development	0	0	0	0	0	0	0	0	2	2	4

NAICS Code	NAICS Code Description	Permit to Construct	Permit to Operate	Change of Operator	Denied	Cancelled	ERC	Plans	TV/RECLAIM Modification	Not Renewed	Area Source	Grand Total
926110	Administration of General Economic Programs	0	0	0	0	0	0	0	0	0	1	1
926120	Regulation and Administration of Transportation Programs	0	1	0	0	0	0	0	0	3	5	9
926130	Regulation and Administration of Communications, Electric, Gas, and Other Utilities	0	0	0	0	1	0	0	0	0	4	5
926150	Regulation, Licensing, and Inspection of Miscellaneous Commercial Sectors	0	0	0	0	0	0	0	0	0	1	1
927110	Space Research and Technology	0	1	0	0	0	0	0	1	0	0	2
928110	National Security	7	1	0	0	0	0	0	2	0	0	10
999990	Unclassified	63	221	215	0	70	35	17	20	69	280	990
Grand Total		**724**	**2415**	**1362**	**22**	**567**	**220**	**323**	**258**	**894**	**2992**	**9777**

Publication of Emission Reduction Credit (ERC)
And Short Term Emission Reduction Credit (STERC)
Transactions for Fiscal Year 2014-15[1]
(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 2014-15, 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 2014-15, 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 2014-15, 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 2014-15

Criteria Pollutant	Number of Emission Offset Transfer Transactions[2]				Quantity of Emission Offsets Transferred[3] (lb/day)				Annualized Quantity of Emission Offsets Transferred[3] (ton/year)			
	ERC	STERC[4]	STERC[5]	TOTAL	ERC	STERC[4]	STERC[5]	TOTAL	ERC	STERC[4]	STERC[5]	TOTAL
ROG	59	8	1	68	1,174	75	1	1,250	214.2	13.7	0.2	228.1
NOX	0	0	0	0	0	0	0	0	0	0	0	0
SOX	0	0	0	0	0	0	0	0	0	0	0	0
CO	1	0	0	1	81	0	0	81	14.8	0	0	14.8
PM10	1	0	0	1	19	0	0	19	3.5	0	0	3.5

Table 2: Emission Offset Applications – Fiscal Year 2014-15

Criteria Pollutant	Number of Banking Applications Resulting in the Issuance of New STERCs[6]	Quantity of Emission Reductions Achieved (STERCs)[7] (lb/day)	Annualized Quantity of Emission Reductions Achieved[7] (ton/year)
ROG	0	0	0
NOX	0	0	0
SOX	0	0	0
CO	0	0	0
PM10	1	4	0.7

Table 3: Emission Offset Transaction Summary – Fiscal Year 2014-15
Sorted by Pollutant and Amount

[1] This report does not include RECLAIM Trading Credit (RTC) transactions.
[2] Includes all emission offset certificates that transferred ownership.
[3] Includes the total amount of emission offsets transferred.
[4] STERC transfer transactions including the long term emission offset, those that have an ending year of 9999.
[5] 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.
[6] Includes all emission offset applications resulting in the generation of new certificates.
[7] Includes the total amount of emission offsets generated.

SCAQMD NO.	POLLUTANT	AMOUNT (LB/DAY)	AMOUNT (TON/YR)	TYPE	START YEAR	END YEAR
SC1415-001	ROG	1	0.2	STERC	2014	9999
SC1415-002	ROG	1	0.2	ERC	N/A	N/A
SC1415-003	ROG	1	0.2	STERC	2014	9999
SC1415-004	ROG	1	0.2	ERC	N/A	N/A
SC1415-005	ROG	1	0.2	STERC	2014	9999
SC1415-006	ROG	1	0.2	ERC	N/A	N/A
SC1415-007	ROG	1	0.2	ERC	N/A	N/A
SC1415-008	ROG	1	0.2	STERC	2014	9999
SC1415-009	ROG	1	0.2	ERC	N/A	N/A
SC1415-010	ROG	1	0.2	ERC	N/A	N/A
SC1415-011	ROG	1	0.2	ERC	N/A	N/A
SC1415-012	ROG	0	0	STERC	2015	2015
SC1415-013	ROG	0	0	STERC	2016	2016
SC1415-014	ROG	0	0	STERC	2017	2017
SC1415-015	ROG	1	0.2	STERC	2018	9999
SC1415-016	ROG	1	0.2	ERC	N/A	N/A
SC1415-017	ROG	1	0.2	ERC	N/A	N/A
SC1415-018	ROG	1	0.2	ERC	N/A	N/A
SC1415-019	ROG	2	0.4	ERC	N/A	N/A
SC1415-020	ROG	2	0.4	ERC	N/A	N/A
SC1415-021	ROG	2	0.4	ERC	N/A	N/A
SC1415-022	ROG	2	0.4	ERC	N/A	N/A
SC1415-023	ROG	2	0.4	ERC	N/A	N/A
SC1415-024	ROG	2	0.4	ERC	N/A	N/A
SC1415-025	ROG	2	0.4	ERC	N/A	N/A
SC1415-026	ROG	2	0.4	ERC	N/A	N/A
SC1415-027	ROG	2	0.4	ERC	N/A	N/A
SC1415-028	ROG	2	0.4	ERC	N/A	N/A
SC1415-029	ROG	2	0.4	ERC	N/A	N/A
SC1415-030	ROG	3	0.5	ERC	N/A	N/A
SC1415-031	ROG	3	0.5	ERC	N/A	N/A
SC1415-032	ROG	3	0.5	ERC	N/A	N/A
SC1415-033	ROG	3	0.5	ERC	N/A	N/A
SC1415-034	ROG	3	0.5	ERC	N/A	N/A
SC1415-035	ROG	3	0.5	ERC	N/A	N/A
SC1415-036	ROG	3	0.5	ERC	N/A	N/A
SC1415-037	ROG	4	0.7	ERC	N/A	N/A
SC1415-038	ROG	4	0.7	ERC	N/A	N/A
SC1415-039	ROG	4	0.7	ERC	N/A	N/A
SC1415-040	ROG	4	0.7	STERC	2014	9999
SC1415-041	ROG	4	0.7	ERC	N/A	N/A
SC1415-042	ROG	4	0.7	ERC	N/A	N/A
SC1415-043	ROG	5	0.9	ERC	N/A	N/A
SC1415-044	ROG	5	0.9	STERC	2014	9999

SCAQMD NO.	POLLUTANT	AMOUNT (LB/DAY)	AMOUNT (TON/YR)	TYPE	START YEAR	END YEAR
SC1415-045	ROG	5	0.9	STERC	2011	9999
SC1415-046	ROG	6	1.1	ERC	N/A	N/A
SC1415-047	ROG	7	1.3	ERC	N/A	N/A
SC1415-048	ROG	8	1.5	ERC	N/A	N/A
SC1415-049	ROG	9	1.6	ERC	N/A	N/A
SC1415-050	ROG	10	1.8	ERC	N/A	N/A
SC1415-051	ROG	11	2.0	ERC	N/A	N/A
SC1415-052	ROG	17	3.1	ERC	N/A	N/A
SC1415-053	ROG	17	3.1	ERC	N/A	N/A
SC1415-054	ROG	19	3.5	ERC	N/A	N/A
SC1415-055	ROG	20	3.7	ERC	N/A	N/A
SC1415-056	ROG	22	4.0	ERC	N/A	N/A
SC1415-057	ROG	26	4.7	ERC	N/A	N/A
SC1415-058	ROG	32	5.8	ERC	N/A	N/A
SC1415-059	ROG	35	6.4	ERC	N/A	N/A
SC1415-060	ROG	35	6.4	ERC	N/A	N/A
SC1415-061	ROG	35	6.4	ERC	N/A	N/A
SC1415-062	ROG	38	6.9	ERC	N/A	N/A
SC1415-063	ROG	50	9.1	ERC	N/A	N/A
SC1415-064	ROG	55	10.0	ERC	N/A	N/A
SC1415-065	ROG	0	0	STERC	2015	2015
SC1415-066	ROG	0	0	STERC	2016	2016
SC1415-067	ROG	0	0	STERC	2017	2017
SC1415-068	ROG	0	0	STERC	2018	2018
SC1415-069	ROG	0	0	STERC	2019	2019
SC1415-070	ROG	0	0	STERC	2020	2020
SC1415-071	ROG	57	10.4	STERC	2021	9999
SC1415-072	ROG	80	14.6	ERC	N/A	N/A
SC1415-073	ROG	83	15.1	ERC	N/A	N/A
SC1415-074	ROG	86	15.7	ERC	N/A	N/A
SC1415-075	ROG	95	17.3	ERC	N/A	N/A
SC1415-076	ROG	150	27.4	ERC	N/A	N/A
SC1415-077	ROG	150	27.4	ERC	N/A	N/A
Total		**1,250**	**228.1**	**N/A**		

SCAQMD NO.	POLLUTANT	AMOUNT (LB/DAY)	AMOUNT (TON/YR)	TYPE	START YEAR	END YEAR
SC1415-078	CO	81	14.8	ERC	N/A	N/A
Total		**81**	**14.8**	**N/A**		

SCAQMD NO.	POLLUTANT	AMOUNT (LB/DAY)	AMOUNT (TON/YR)	TYPE	START YEAR	END YEAR
SC1415-079	PM10	19	3.5	ERC	N/A	N/A
Total		**19**	**3.5**	**N/A**		

Table 4: Emission Offset Application Summary – Fiscal Year 2014-15
Sorted by Pollutant and Amount

SCAQMD NO.	POLLUTANT	AMOUNT (LB/DAY)	AMOUNT (TON/YR)	TYPE	START YEAR	END YEAR
SC1415-080	PM10	0	0	STERC	2014	2014
SC1415-081	PM10	0	0	STERC	2015	2015
SC1415-082	PM10	0	0	STERC	2016	2016
SC1415-083	PM10	0	0	STERC	2017	2017
SC1415-084	PM10	0	0	STERC	2018	2018
SC1415-085	PM10	0	0	STERC	2019	2019
SC1415-086	PM10	0	0	STERC	2020	2020
SC1415-087	PM10	4	0.7	STERC	2021	9999
Total		**4**	**0.7**	**N/A**		

CHAPTER II
BUDGET AND FORECAST

[For information on this chapter, please see the SCAQMD's FY 2016-17 Draft Budget and Work Program]

Draft Budget & Work Program

Fiscal Year 2016 - 2017

South Coast Air Quality Management District

South Coast AQMD

SOUTH COAST

AIR QUALITY MANAGEMENT DISTRICT

DRAFT BUDGET & WORK PROGRAM

FISCAL YEAR 2016-2017

Prepared by Finance
Michael B. O'Kelly, Chief Financial Officer

SOUTH COAST
AIR QUALITY MANAGEMENT DISTRICT

SOUTH COAST

AIR QUALITY MANAGEMENT DISTRICT

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

SOUTH COAST

AIR QUALITY MANAGEMENT DISTRICT

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

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Speaker of the Assembly Appointee

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JOE BUSCAINO
City of Los Angeles Representative

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Governor's Appointee

JUDY MITCHELL
County of Los Angeles
Cities Representative
Western Region

DR. CLARK E. PARKER, SR.
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Cities Representative
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Cities Representative

SHAWN NELSON
County of Orange Representative

DWIGHT ROBINSON
County of Orange
Cities Representative

WAYNE NASTRI
Acting 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

May 6, 2016

South Coast Air Quality Management District Board and Stakeholders

Transmittal of the Executive Officer's
Fiscal Year 2016-17 Budget and Work Program

This document represents South Coast Air Quality Management District's (SCAQMD) proposed General Fund Budget and Work Program for FY 2016-17. The budget was developed based on SCAQMD's commitment to protect public health from air pollution with effective and efficient air quality improvement programs that develop solutions for the future in collaboration with stakeholders and partners. The following goals directed the prioritization of projects and resources for the FY 2016-17 Budget: Continue progress toward meeting clean air standards and protecting public health; Enhance public education and ensure equitable treatment for all communities; and Operate efficiently and in a manner sensitive to public agencies, businesses, the public and SCAQMD staff.

The proposed budget for FY 2016-17, with expenditures of $141.5 million and revenues of $136.4 million, is in line with the long-term projection approved as part of the FY 2015-16 adopted budget and uses prior year revenues to supplement FY 2016-17 estimated revenues. The proposed level of expenditures, up 3.1% from the FY 2015-16 adopted budget, includes increased costs for retirement, salaries, and contractual needs as well as a net increase of 10 positions to bring the staffing level to 813. This increase in positions is primarily fully funded by mobile source-related incentive programs such as Clean Fuels, Carl Moyer, and Prop 1B.

Over the last decade, SCAQMD has taken several measures to enhance the District's financial stability, including reducing the District's pickup of the employees' share of retirement costs, deleting or unfunding select vacant positions, increasing the vacancy rate, creating a Debt Service fund to offset pension obligation bond payments, creating an Infrastructure Improvement fund for major building projects, and early pay-off of the Diamond Bar Headquarters. Comparing the proposed FY 2016-17 budget to the FY 1991-92 adopted budget, when legislation went into effect limiting the agency's fee

authority, SCAQMD has successfully reduced staffing by 30%. Adjusting for inflation, the FY 2016-17 expenditure proposal is 28% less than the 1991-92 adopted budget.

The FY 2016-17 proposed revenue budget of $136.4 million, up 1.1% from the FY 2015-16 adopted budget, includes a CPI fee adjustment of 2.4%. At $85.2 million or 62% of the estimated revenue budget, stationary source revenues account for the largest source of revenue; when adjusted for inflation, however, even with CPI fee adjustments, stationary source revenues have decreased by 26% since FY 1991-92.

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 workshop to discuss the proposed budget and work program, and two meetings of the Governing Board. The public workshop and Governing Board meetings are noticed to the public through direct mail to permitted facilities, print media, and through the SCAQMD website.

In summary, I am proposing a budget for FY 2016-17 that is consistent with the long term projection approved by the Governing Board last year. The proposed budget allows our programs to operate efficiently and in a manner sensitive to businesses and the public, yet addresses the need for streamlining our operations while providing a continuum of emissions reductions and health benefit improvements. The proposed Fiscal Year 2016-17 Budget and Work Program serves to ensure the strength and stability of the District as we make progress toward attaining the federal and state clean air mandates.

Respectfully,

Wayne Nastri
Acting Executive Officer

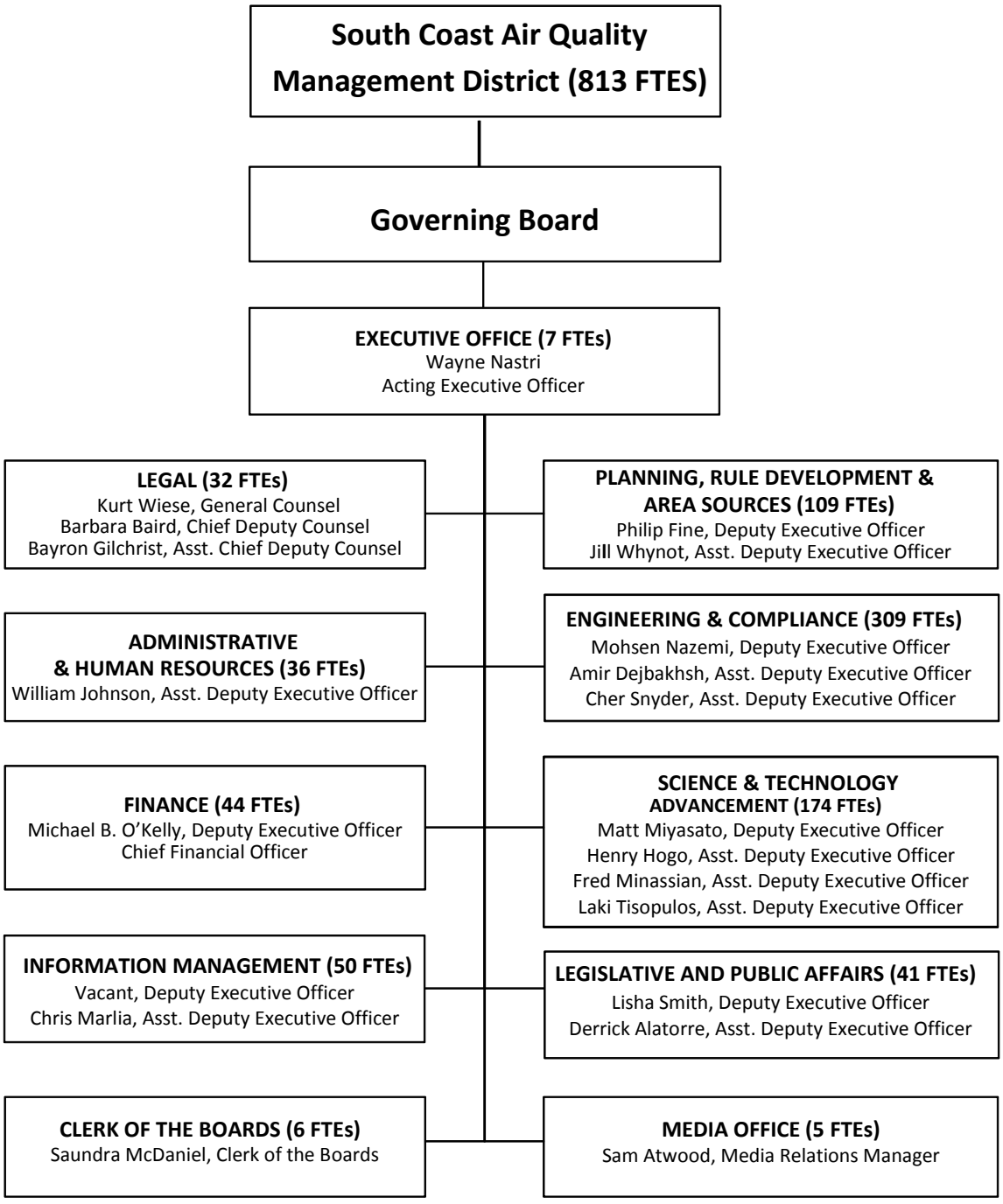
MBO:DRP

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, 2015**. In order to receive this award, a governmental unit must publish a budget document that meets program criteria as a policy document, as an operations guide, as a financial plan, 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


South Coast Air Quality Management District (813 FTES)
Governing Board
EXECUTIVE OFFICE (7 FTEs)
Wayne Nastri
Acting Executive Officer
LEGAL (32 FTEs)
Kurt Wiese, General Counsel
Barbara Baird, Chief Deputy Counsel
Bayron Gilchrist, Asst. Chief Deputy Counsel
PLANNING, RULE DEVELOPMENT & AREA SOURCES (109 FTEs)
Philip Fine, Deputy Executive Officer
Jill Whynot, Asst. Deputy Executive Officer
ADMINISTRATIVE & HUMAN RESOURCES (36 FTEs)
William Johnson, Asst. Deputy Executive Officer
ENGINEERING & COMPLIANCE (309 FTEs)
Mohsen Nazemi, Deputy Executive Officer
Amir Dejbakhsh, Asst. Deputy Executive Officer
Cher Snyder, Asst. Deputy Executive Officer
FINANCE (44 FTEs)
Michael B. O'Kelly, Deputy Executive Officer
Chief Financial Officer
SCIENCE & TECHNOLOGY ADVANCEMENT (174 FTEs)
Matt Miyasato, Deputy Executive Officer
Henry Hogo, Asst. Deputy Executive Officer
Fred Minassian, Asst. Deputy Executive Officer
Laki Tisopulos, Asst. Deputy Executive Officer
INFORMATION MANAGEMENT (50 FTEs)
Vacant, Deputy Executive Officer
Chris Marlia, Asst. Deputy Executive Officer
LEGISLATIVE AND PUBLIC AFFAIRS (41 FTEs)
Lisha Smith, Deputy Executive Officer
Derrick Alatorre, Asst. Deputy Executive Officer
CLERK OF THE BOARDS (6 FTEs)
Saundra McDaniel, Clerk of the Boards
MEDIA OFFICE (5 FTEs)
Sam Atwood, Media Relations Manager

SOUTH COAST

AIR QUALITY MANAGEMENT DISTRICT

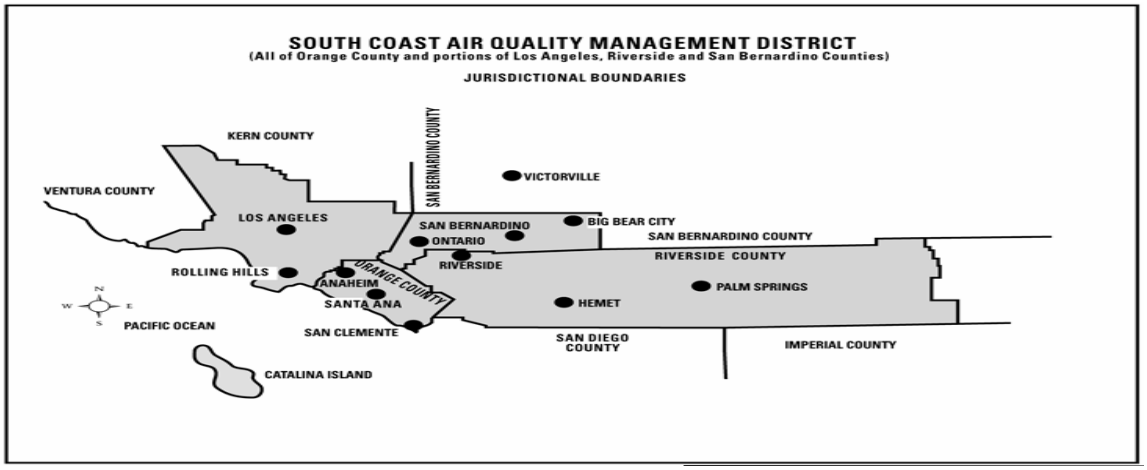
SUMMARY

Preface

This document represents the proposed FY 2016-17 Budget and Work Program of the South Coast Air Quality Management District (SCAQMD). The proposed budget is available for public review and comment during the month of April. Two workshops are scheduled to discuss the budget, one for the public on April 6, 2016 and one for the Governing Board on April 8, 2016. A final Budget and Work Program, which may include changes based on input from the public and Board, will be presented for adoption at a public hearing on May 6, 2016.

Introduction

The South Coast Air Quality Management District (SCAQMD) 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 SCAQMD 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 SCAQMD Governing Board is composed of 13 members, including four members appointed by the Boards of Supervisors of the four counties in SCAQMD's jurisdiction, six members appointed by cities in the SCAQMD'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.

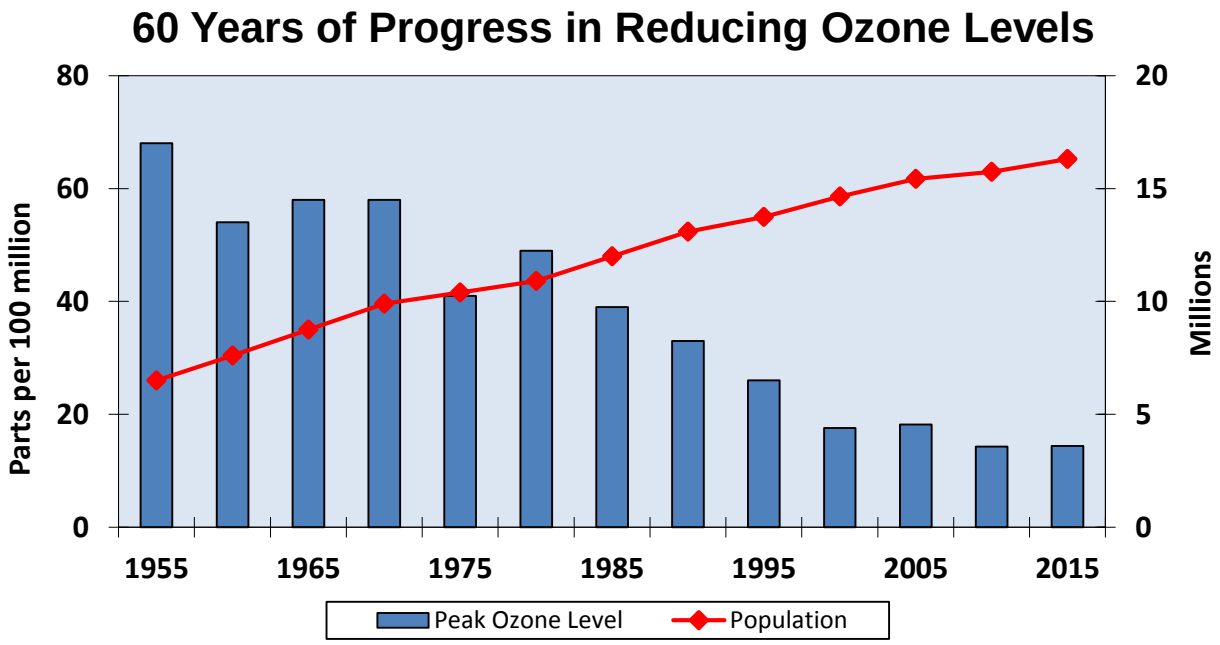


Air Quality History

The South Coast Air Basin has suffered unhealthful 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 67-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 2015, the region's population has more than tripled from 4.8 million to 16.9 million; the number of motor vehicles has increased over five-fold from 2.3 million to 13 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

The SCAQMD believes all residents have a right to live and work in an environment of clean air and is committed to undertaking all necessary steps to protect public health from air pollution, with sensitivity to the impacts of its actions on the community and businesses. 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 SCAQMD 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 for air that is more healthful to breathe.

To carry out its mission the SCAQMD develops a set of Goals and Priority Objectives which are evaluated and revised annually and presented at a public hearing. The following Goals have been established for FY 2016-17:

I. Continue progress toward meeting clean air standards and protecting public health.

II. Enhance public education and ensure equitable treatment for all communities.

III. Operate efficiently and in a manner sensitive to public agencies, businesses, the public and SCAQMD staff.

These goals are the foundation for the SCAQMD's Work Program. Each goal is supported by multiple activities, which target specific areas of program performance. A public hearing to receive input on the Goals and Priority Objectives for FY 2016-17 will be held on May 6, 2016.

Air Quality

Overview

The four-county Southern California region, designated for air quality purposes as the South Coast Air 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 national health standards. Called "criteria pollutants," these are: ozone (O_3); nitrogen dioxide (NO_2); particulates (PM10); fine particulates (PM2.5); carbon monoxide (CO); lead (Pb); and sulfur dioxide (SO_2).

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 South Coast Basin than in any other region in California. The Basin's large number

of vehicles and small sources, including small businesses and households using ozone-forming consumer products and paints, compounds the problem.

Air Quality Trends

While our air quality continues to improve, the South Coast Air 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 standard, effective December 28, 2015, from concentrations exceeding 75 parts-per-billion (ppb) to concentrations exceeding 70 ppb. In 2015, the new federal 8-hour ozone standard was exceeded in the Basin on 113 days and the former standard was exceeded on 83 days, the lowest number of exceedance days ever recorded, based on preliminary 2015 data. The new federal ozone standard was exceeded in the Basin on 123 days in 2014 and 116 days in 2013. The maximum observed ozone levels show some year-to-year variability, but have generally been decreasing over the years. The highest 8-hour ozone level in the 2015 preliminary data was 127 ppb, compared to 110 ppb and 122 ppb in 2014 and 2013 respectively.

PM2.5 levels have decreased dramatically in the Basin since 1999; however, design value concentrations are still above the current federal annual and 24-hour standards. Effective March 18, 2014, U.S. EPA strengthened the annual average PM2.5 standard from 15 $\mu g/m^3$ to 12 $\mu g/m^3$, while retaining the 24-hour PM2.5 standard of 35 $\mu g/m^3$. In 2015, 25 days Basin-wide exceeded the 24-hour federal PM2.5 standard, based on preliminary filter data. This was an increase over recent years, due to the long-term effects of the drought in California. The rain and the windy, unsettled storm conditions that normally improve ventilation in the Basin on many days in the winter months did not occur in 2015. This caused multiple days of stagnant conditions and all 25 days over the 24-hour federal PM2.5 standard in the Basin occurred in the first quarter of 2015. During the final three quarters of 2015, no days exceeded the 24-hour federal PM2.5 standard. On a positive note, the peak annual average PM2.5 level in the Basin in 2015, 13.3 $\mu g/m^3$ (preliminary data), was the lowest annual average since monitoring started in 1999.

In 2006, U.S. EPA rescinded the annual federal standard for PM10 but retained the 24-hour standard. U.S. EPA re-designated the Basin as attainment of the health based standard for PM10, effective July 26, 2013. Ambient levels of PM10 in the Basin have continued to meet the federal 24-hour PM10 standard through 2015.

In November 2008, U.S. EPA revised the lead standard from a 1.5 $\mu g/m^3$ quarterly average to a 0.15 $\mu g/m^3$ rolling 3-month average 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, the 3-year 2012-2014 design value, along with the preliminary data from 2015, shows that the Basin now meets 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 federal health standards. In 2007, U.S. EPA formally re-designated the Basin to attainment of the federal health standard for carbon monoxide. Basin-wide maximum levels

of carbon monoxide have been consistently measured at more than 30% below the federal standard since 2004. In 2010, U.S. EPA revised the NO_2 1-hour standard at a level of 100 ppb and the SO_2 1-hour standard at a level of 75 ppb. In 2015, no sites in the Basin exceeded either of these standards.

Mandates

The SCAQMD is governed and directed by several state laws and a comprehensive federal law which provide the regulatory framework for air quality management in this Basin. These laws require the SCAQMD to take prescribed steps to improve air quality.

Generally speaking, SCAQMD is responsible for stationary sources such as factories and businesses. CARB and U.S. EPA are primarily responsible for motor vehicles. The SCAQMD and CARB share responsibilities with respect to area sources. The SCAQMD and Southern California Association of Governments (SCAG) share some responsibilities with CARB regarding some 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 the U.S. EPA, CARB and the SCAQMD. 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.

Under state law, the SCAQMD must periodically develop and submit to the state an Air Quality Management Plan (AQMP) demonstrating how the region will achieve state and federal ambient air quality standards, or at a minimum demonstrate that all feasible measures are being carried out to meet state air quality standards. Each iteration of the plan is an update of the previous plan. To date, the SCAQMD's Governing Board has adopted such plans demonstrating attainment in 1989, 1991, 1994, 1997, 1999 (amendments to the plan adopted in 1997), 2003, 2007 and 2012. Earlier plans in 1979 and 1982 did not show attainment and predicted continued unhealthful air well into this century. Revisions to the federal annual PM2.5 standard, adopted by U.S. EPA to further protect public health, will extend the projected attainment of the new annual PM2.5 standard to the 2020-2025 timeframe. A request to U.S. EPA is pending to change the Basin's non-attainment status of the 24-hour PM2.5 federal standard from Moderate to Serious, which will extend the attainment deadline to 2019. The 2008 federal 8-hour ozone standard has an attainment deadline of 2032. Attainment designations for the new 2015 ozone standard are expected to be finalized by late 2017, with State Implementation Plan (SIP) attainment demonstrations likely due in 2020 or 2021. Attainment deadlines for the new ozone standard are still pending.

State Laws include:

- California Clean Air Act (AB 2595) requires air districts in California to adopt plans to expeditiously meet state ambient air quality standards. It mandates that SCAQMD's attainment plans meet several specific requirements including:
  - ♦ a 5% per year reduction in emissions (the plan can achieve less than 5% annual reduction if it includes every feasible measure and an expeditious adoption schedule);
  - ♦ Best Available Control Technology (BACT) for new and modified sources;

- ♦ Best Available Retrofit Control Technology (BARCT) for existing sources.
- Lewis-Presley Air Quality Management Act (SB 151) specifies additional, more stringent requirements for air quality plans in the South Coast Air Basin. It specifies that SCAQMD has responsibility to prepare the plan in conjunction with SCAG, which must prepare the portions of the plan relating to demographic projections, land use, and transportation programs.
- Air Toxics "Hot Spots" Information & Assessment Act (AB 2588) requires facilities that emit significant quantities of pollutants to prepare health risk assessments describing the impact of toxic contaminants on neighboring areas. If the SCAQMD determines that the toxic emissions create a significant risk, the public must be notified, and facilities must reduce emissions to below significant levels.
- Tanner Air Toxics Process (AB 1807) 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.

State law also includes the following measures:

- authorizes SCAQMD to adopt market incentives such as the emissions trading program known as RECLAIM as long as the emitters achieve reductions equivalent to command-and-control regulations;
- requires SCAQMD to establish a program to encourage voluntary participation in projects to increase the use of clean-burning fuels;
- requires SCAQMD to adopt and enforce rules to ensure no net emission increases from stationary sources.

Under the Federal Clean Air Act, the SCAQMD must develop and submit to CARB for review, followed by submittal to the U.S. EPA, an element of the State Implementation Plan (SIP) demonstrating how the region will achieve federal ambient air quality standards. In the case of ozone, the plan was required to be submitted by November 15, 1994 and for fine particulates, PM_{10}, the plan was required to be submitted by February 8, 1997. Plans for other pollutants were submitted in earlier years. In 1997, U.S. EPA adopted new ambient air quality standards for PM2.5 and replaced the 1-hour ozone standard with the new standard measured over an 8 hour period. Plans to attain these federal standards were submitted to U.S. EPA in November, 2007. The plan to attain the 24-hour PM2.5 standard was submitted in early 2013. The Federal Clean Air Act mandates that sanctions be imposed on an area if a suitable plan 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 SCAQMD'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. Also, air toxics regulations adopted by U.S. U.S. EPA pursuant to Title III must be implemented by SCAQMD.

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. SCAQMD operates 43 monitoring stations throughout its four-county jurisdiction. 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: The SCAQMD, 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, the SCAQMD 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 the AQMP for use in developing the necessary control strategies.

Air Quality Modeling: Using air quality, meteorological and emissions models, SCAQMD 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_2) and react in sunlight to form ozone; similarly, nitrogen oxide gases from tailpipes and smokestacks can be transformed into nitrates or particulates (PM2.5 and PM10). 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 SCAQMD 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 rulemaking, Environmental Impact Report (EIR) development and for other Offices within SCAQMD.

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

Once a plan of emission controls to achieve federal standards is outlined, SCAQMD is required to hold multiple public meetings to present the proposed control strategies and receive public

input. The SCAQMD also conducts a socioeconomic analysis of the strategies. The SCAQMD 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 2007 AQMP called for significant reductions from projected baseline emissions (2015 for annual PM2.5 and 2024 for 8-hour ozone). These combined reductions, while meeting federal standards, will still not result in attainment of all California air quality standards since these are more stringent than federal standards. The 2012 AQMP addressed the 24-hour PM2.5 standard. The SCAQMD is working on improving the emissions inventory and modeling techniques to address the new federal annual PM2.5 and 8-hour ozone air quality standards for the next AQMP revision, the 2016 AQMP.

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 which will regulate their operations. Once the requirements are developed, the proposed rule, along with an environmental impact report and a socioeconomic report, is presented to SCAQMD'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 Committees.

Enforcement and Education: The SCAQMD 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, SCAQMD 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 SCAQMD. 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_x 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 the SCAQMD with $1.20 going to the SCAQMD for mobile source emissions reductions, $1.60 subvened directly to cities and counties to support their air quality programs, and $1.20 to the Mobile Source 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: In the end, SCAQMD'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 our cleanup effort. Thus, the SCAQMD strives to involve and inform the public through the Legislative and Public Affairs office, public meetings, publications, the press, and public service announcements.

Budget Synopsis

The SCAQMD's annual budget is adopted for the General Fund for a fiscal year that runs from July 1 through June 30 of the following year. The period covered by the FY 2016-17 budget is from July 1, 2016 to June 30, 2017. 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 which estimates staff resources and expenditures along program and activity lines. A Work Program Output Justification 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 SCAQMD'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.

SCAQMD 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 SCAQMD budget process begins by establishing Goals and Priority Objectives for the fiscal year. The proposed annual budget and multi-year forecast is then developed by the Offices,

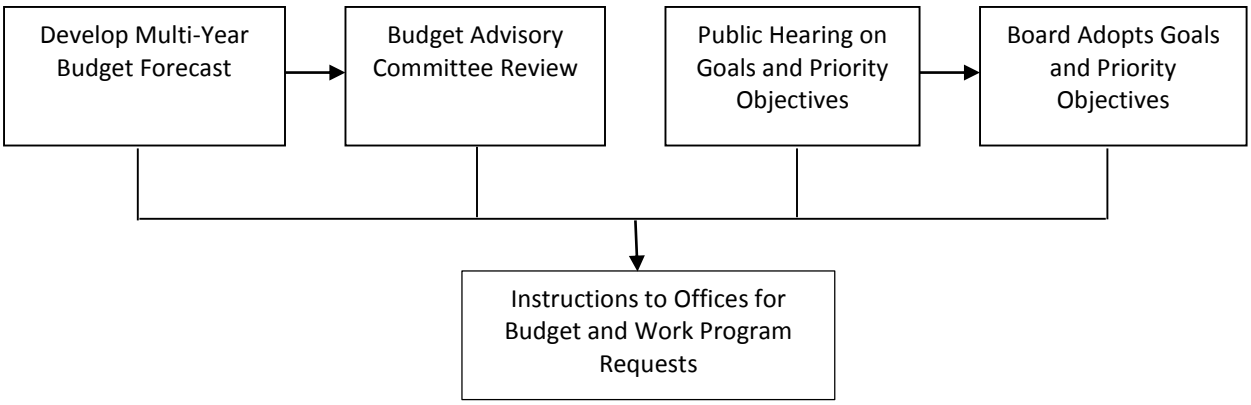
Finance, Executive Council, and the Executive Officer based on the Goals and Priority Objectives as well as guidelines issued by the Executive Officer. Each Office submits requests for staffing, select Salary accounts, Services and Supplies accounts, and the Capital Outlays account. The remaining salary 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 incorporating any proposed changes to the fee schedules. This information is integrated into an initial budget request, including a top-level multi-year forecast, and then fine-tuned under the direction of 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
- a public workshop to discuss proposed changes to the fee schedules and to discuss the proposed budget
- two public hearings, including one on the Goals and Priority Objectives and one on the proposed budget

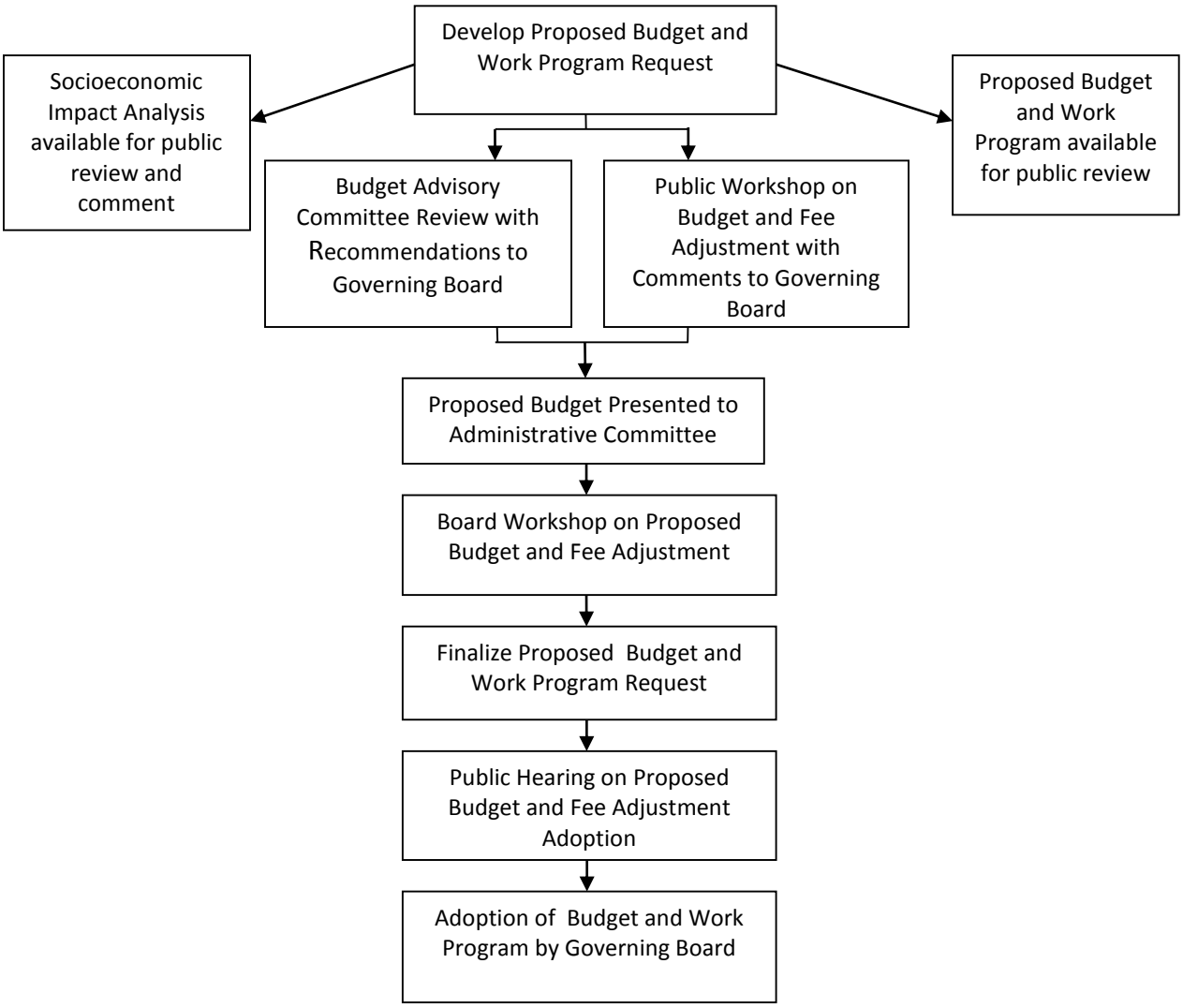
The proposed budget is presented to SCAQMD's Governing Board at a budget workshop and to SCAQMD's Administrative Committee. Any public comment and Budget Advisory Committee recommendations are also submitted to the Governing Board by April 15 of each year. The final proposed budget, including final fee schedules, 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 the development of the SCAQMD budget:

Preliminary Budget Process



Annual Budget Process



Budget Timeline	
Budget packages distributed to Offices	Dec 4, 2015
Budget Advisory Committee meeting	Jan 22, 2016
Budget submissions received from Offices	Jan 15, 2016
Proposed budget available for public review	April 1, 2016
Budget Advisory Committee meeting on proposed budget	April 5, 2016
Public Workshop on proposed budget	April 6, 2016
Budget presented to Administrative Committee	April 8, 2016
Governing Board Budget Workshop	April 8, 2016
Public comments and Budget Advisory Committee recommendations submitted to Governing Board	April 15, 2016
Public Hearing & Governing Board adoption of budget	May 6, 2016

Proposed Budget & Work Program

Budget Overview

The budget for FY 2016-17 proposes expenditures of $141.5 million and revenues of $136.4 million, using prior year revenues to supplement FY 2016-17 projected revenues. To compare against prior years, the following table shows SCAQMD amended budget and actual expenditures for FY 2014-15, adopted and amended budgets for FY 2015-16 and proposed budget for FY 2016-17.

Description	FY 2014-15 Amended	FY 2014-15 Actual	FY 2015-16 Adopted	FY 2015-16 Amended[1]	FY 2016-17 Proposed
Staffing	800	-	803	803	813
Revenue/Transfers In	$141.5	$137.8	$135.0	$141.3	$136.4
Program Costs/Transfers Out	$145.2	$137.3	$137.2	$145.9	$141.5

[1] Includes Board approved changes through March 2016

This budget reflects a decrease of approximately $4.4 million in expenditures from the FY 2015-16 amended budget and a $4.3 million increase in expenditures from the budget adopted for FY 2015-16. The increase in expenditures from the FY 2015-16 adopted budget can be attributed to increases in retirement, salaries, and contractual costs. The FY 2016-17 proposed budget includes 813 positions, an increase of 10 positions over the FY 2015-16 adopted budget. The new positions are primarily fully funded by mobile source-related incentive programs such as Clean Fuels, Carl Moyer, and Prop 1B.

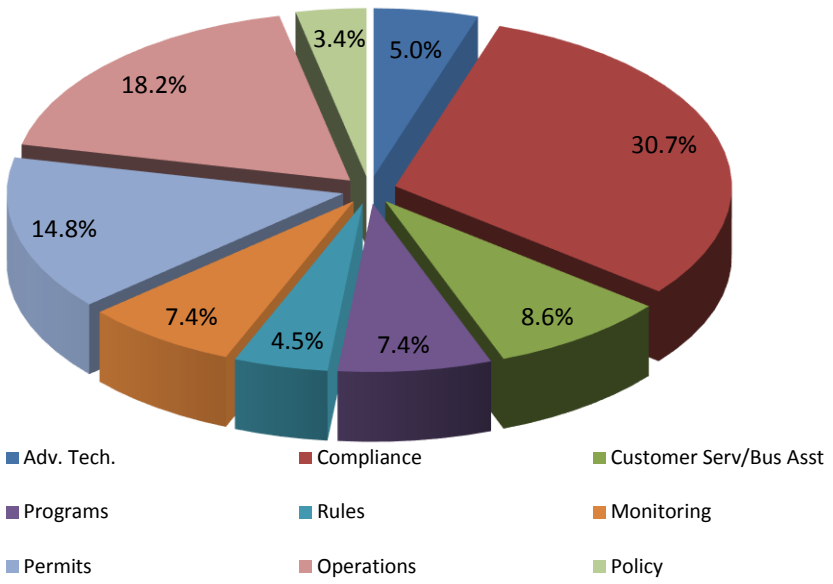
Expenditures

Work Program

SCAQMD 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 Work Program section. The pie chart that follows represents the budgeted expenditures by Program Category for FY 2016-17.

Work Program Category Expenditures



The following table compares SCAQMD Work Program expenditures by category for the FY 2015-16 adopted budget and FY 2016-17 proposed budget.

Work Program Categories	FY 2015-16 Adopted Budget	FY 2016-17 Proposed Budget
Advance Clean Air Technology	$ 6,273,618	$ 7,093,418
Ensure Compliance with Clean Air Rules	42,891,828	43,314,046
Customer Service and Business Assistance	11,644,377	12,217,648
Develop Programs to Achieve Clean Air	9,531,386	10,419,982
Develop Rules to Achieve Clean Air	7,034,486	6,387,801
Monitoring Air Quality	10,346,762	10,458,169
Operational Support	24,743,686	25,899,412
Timely Review of Permits	20,800,011	20,952,521
Policy Support	3,951,646	4,784,698
Total	$ 137,217,800	$ 141,527,695

Account Categories

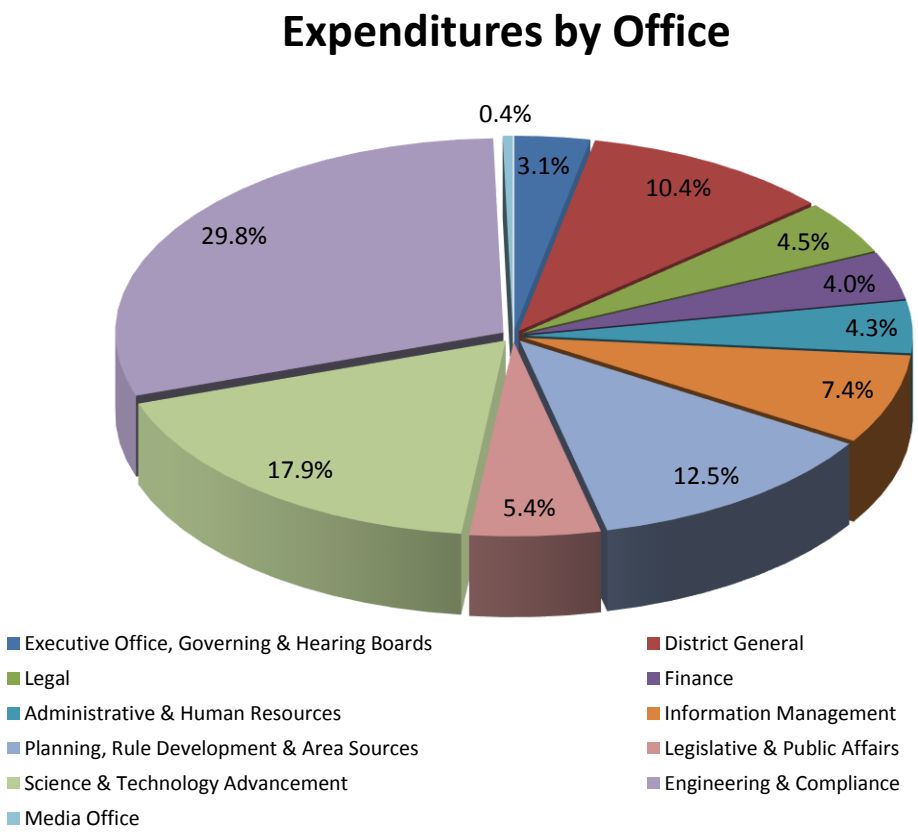
The following table compares the FY 2015-16 adopted budget and the FY 2015-16 amended budget to the proposed budget for FY 2016-17 by account category. The FY 2015-16 amended budget includes the Board-approved mid-year adjustments through March 2016.

Account Description	FY 2015-16 Adopted Budget	FY 2015-16 Amended Budget	FY 2016-17 Proposed Budget
Salaries/Benefits	$ 110,766,918	$ 110,873,055	$ 114,841,998
Insurance	1,317,400	1,342,400	1,317,400
Rents	457,388	555,195	462,973
Supplies	2,605,501	3,050,765	2,630,504
Contracts and Services	8,672,281	13,105,293	8,989,091
Maintenance	1,949,741	2,157,328	1,420,861
Travel/Auto Expense	854,972	998,251	852,960
Utilities	1,943,689	1,953,501	2,213,288
Communications	706,590	748,610	701,000
Capital Outlays	722,500	3,632,700	850,000
Other	1,030,668	1,207,389	1,053,128
Debt Service	6,190,152	6,190,153	6,194,492
Transfers Out	-	45,000	-
Total	$ 137,217,800	$ 145,859,640	$ 141,527,695

As mentioned previously, the proposed budget for FY 2016-17 represents an approximately $4.4 million decrease in expenditures from the FY 2015-16 amended budget. The FY 2015-16 amended budget includes mid-year increases associated with the purchase of air toxics monitoring lab and field equipment, contracts for the enhancement of the socioeconomic assessments, purchase of hand-held XRF analyzers for rule compliance verification and potential toxic release evaluations, purchase of an Enterprise Content Management System for the General Counsel's Office, the upgrade and expansion of EV charging infrastructure at SCAQMD headquarters, development and implementation of a PM monitoring sensor, as well as grant related expenditures offset by revenue.

Office Categories

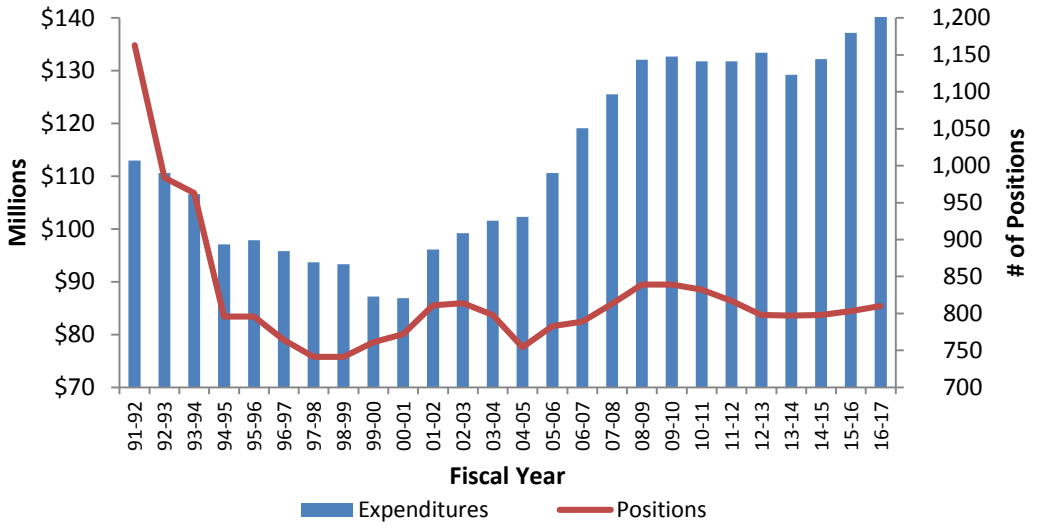
The following pie chart represents budgeted expenditures by Office for FY 2016-17.



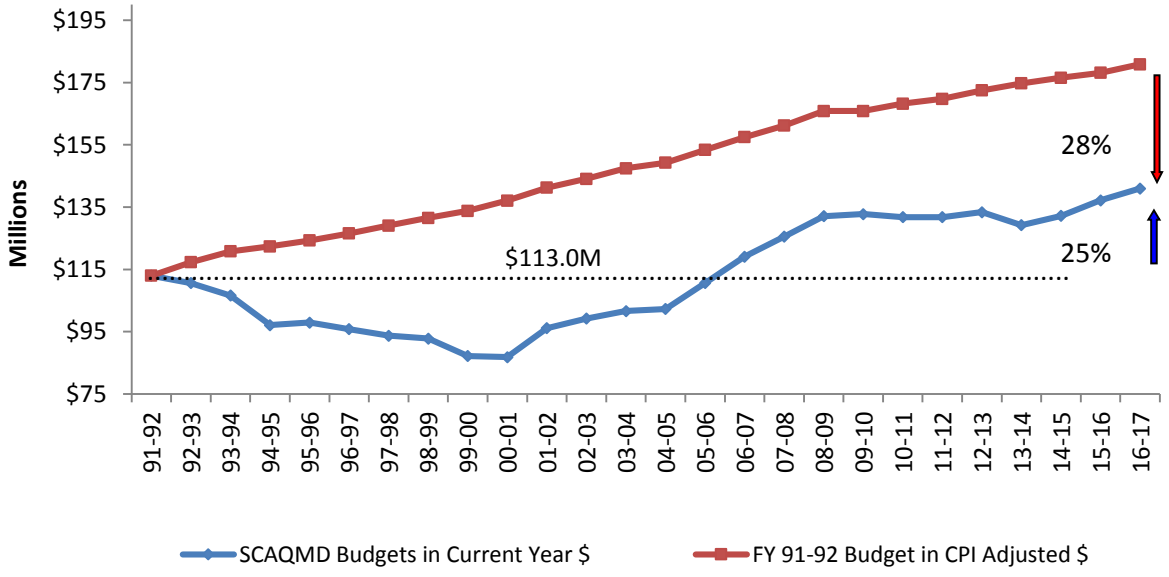
Budget Changes

Over the years, SCAQMD 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 on reducing expenditures 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. This effort has resulted in reduced program costs and is reflected in the following charts showing SCAQMD's staffing and budget levels starting in FY 1991-92 when staffing was at 1,163 FTEs. The proposed budget for FY 2016-17 reflects a staffing level of 813 FTEs. This level is 30% (350 FTEs) below the FY 1991-92 level. The FY 2016-17 proposed budget is only 25% higher when compared to the FY 1991-92 adopted budget of $113 million. After adjusting the FY 1991-92 adopted budget for CPI over the last 25 years, the FY 16- 17 proposal is 28% lower.

Changes in Expenditure Budget



Inflation Impact on SCAQMD Budgets
FY 1991-92 through FY 2016-17

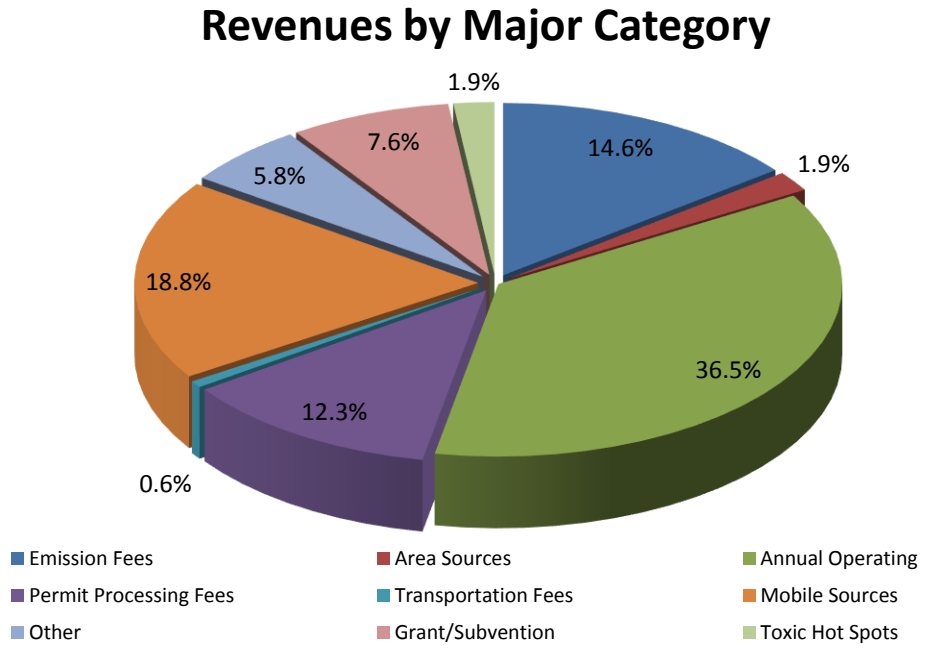


CPI adjustment based on California Consumer Price Index for the preceding Calendar Year

Revenues

Revenue Categories

Each year, in order to meet its financial needs, the SCAQMD 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, and transportation plan fees which are estimated to generate approximately $91 million or about 67% of SCAQMD revenues. Other sources, which include penalties/settlements, interest, and miscellaneous income, generate approximately 7% of total revenues. The remaining 26% of revenue are projected to be received in the form of federal grants, California Air Resource Board (CARB) subvention, and California Clean Air Act motor vehicle fees. Beginning with its Fiscal Year 1978-79 Budget, the SCAQMD became a fee supported agency no longer receiving financial support from property taxes. The revenue budget includes a proposed CPI fee adjustment of 2.4%.



The following table compares the FY 2015-16 adopted revenue budget and the FY 2015-16 amended revenue budget to the proposed revenue budget for FY 2016-17. The FY 2015-16 amended revenue budget include Board-approved mid-year changes through March 2016.

Revenue Description	FY 2015-16 Adopted Budget	FY 2015-16 Amended Budget	FY 2016-17 Proposed Budget
Annual Operating Emission Fees	$ 20,597,280	$ 20,597,280	$ 19,859,100
Annual Operating Permit Renewal Fees	47,471,770	47,471,770	48,565,400
Permit Processing Fees	17,319,690	17,319,690	16,771,480
Portable Equipment Registration Program	1,151,630	1,151,630	1,277,420
Area Sources	2,535,000	2,535,000	2,549,180
Grant/Subvention	10,487,980	12,955,838	10,362,130
Mobile Sources	23,585,360	25,548,785	25,724,780
Transportation Programs	812,720	812,720	860,520
Toxic Hot Spots	2,802,310	2,802,310	2,619,510
Other[1]	7,871,070	8,621,070	7,350,970
Transfers In	345,500	1,466,062	505,790
Total	$ 134,980,310	$ 141,282,155	$ 136,446,280

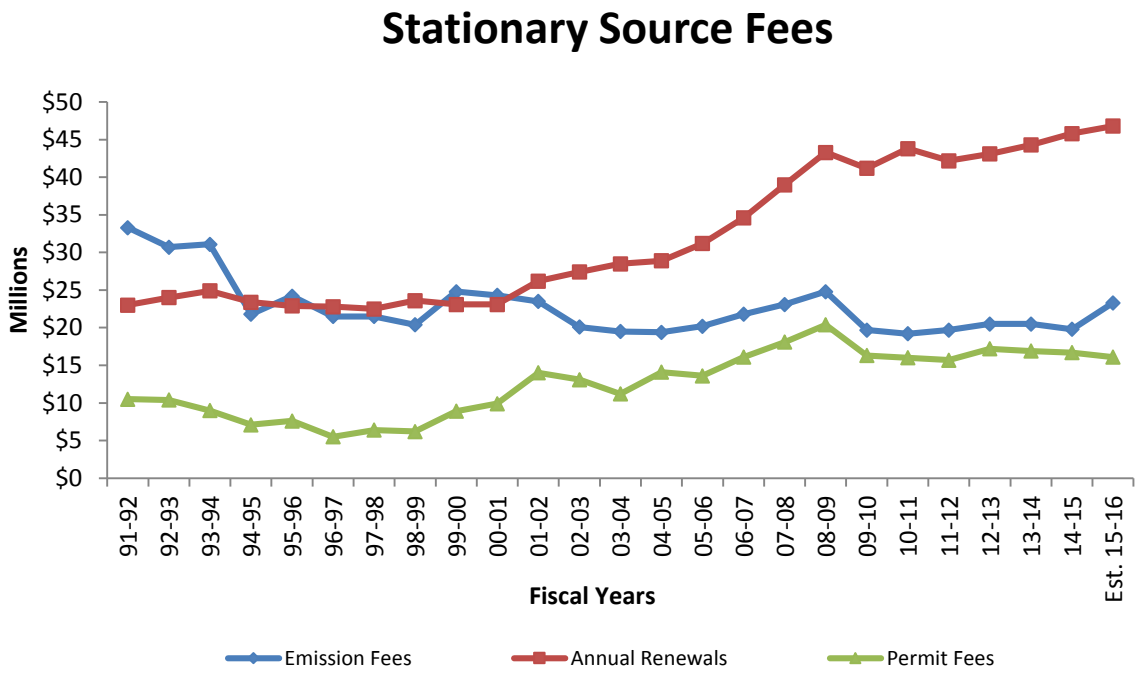
[1]Includes revenues from Interest, Lease Income, Source Testing, Hearing Board, Penalties/Settlements, Interest, Subscriptions, and Other.

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 29% from $66.8 million in FY 1991-92 to $86.1 million (estimated) in FY 2015-16. When adjusted for inflation however, stationary source revenues have decreased by 23% over this same period.

Mobile source revenues that are subvened to the SCAQMD by the Department of Motor Vehicles (DMV) are projected to stay flat from the FY 2015-16 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, and Prop 1B) 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 stay flat in FY 2016-17 from FY 2015-16 budgeted levels reflecting little change in the anticipated amount of federal dollars from one-time and on-going grants in support of air quality efforts. State Subvention funding is expected to remain at the current level (reduced approximately 35% from FY 2001-02) for FY 2016-17.

The following graph tracks actual stationary source revenues by type of fee from FY 1991-92 (when CPI limits were placed on SCAQMD fee authority) to estimated revenues for FY 2015-16.



Debt Structure

Pension Obligation Bonds

These bonds were issued jointly by the County of San Bernardino and the SCAQMD in December 1995. In June 2004 the SCAQMD went out separately and issued pension obligation bonds to refinance its respective obligation to the San Bernardino County Employee's Retirement Association 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
2017	$ 3,331,010	$ 3,863,482	$ 7,194,492
2018	3,432,798	3,756,716	7,189,514
2019	3,553,110	3,637,290	7,190,400
2020	3,686,640	3,503,982	7,190,622
2021-2024	15,637,324	7,007,100	22,644,424
Total	$ 29,640,882	$ 21,768,570	$ 51,409,452

Fund Balance

The SCAQMD is projecting an Unreserved Unassigned Fund Balance for June 30, 2017 of $28,116,551 in addition to the following Reserved and Unreserved Designated Fund Balances for FY 2016-17.

Classification	Reserves/Unreserved Designations	Amount
Committed	Reserve for Encumbrances	$ 8,229,000
Nonspendable	Reserve for Inventory of Supplies	80,000
	Unreserved Designations:	
Assigned	For Enhanced Compliance Activities	883,018
Assigned	For Litigation/Enforcement	100,000
Assigned	For Other Post Employment Benefit (OPEB) Obligations	2,952,496
Assigned	For Permit Streamlining	288,385
Assigned	For Self-Insurance	2,000,000
Assigned	For Unemployment Claims	80,000
	Total Reserved & Unreserved Designations	$ 14,612,899

Reserves represent 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' unperformed 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 Litigation/Enforcement provides funding for outside legal support. 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. The SCAQMD is self-insured for general liability, workers' compensation, automobile liability, premises liability, and unemployment.

Long-Term Projection

The SCAQMD continues to face a number of challenges in the upcoming years, including higher operating costs due to increased retirement costs and the need for major infrastructure improvement projects for an aging headquarters building and continued streamlining of operations while meeting air quality targets and growing program commitments. A primary uncertainty continues to be the degree of fluctuations the financial markets will take over the next few years which will determine the performance of our retirement investments and other investments. Another uncertainty is any legislative action that may impact the level of federal and state funding from grant awards and subvention funds. Cost recovery within the constraints of Prop 26 is a third uncertainty as SCAQMD strives to balance program operating expenses with revenues collected from fees. In order to face these challenges, SCAQMD 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, and strives to keep the percentage of unreserved fund balance to revenue within the Governing Board mandate of 20%. The following chart, outlining SCAQMD'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 SCAQMD boundaries and remaining sensitive to business.

Fiscal 2015-16 Estimate and Five Year Projection ($ in Millions)						
	FY 15-16 Estimate	**FY 16-17 Proposed**	**FY 17-18 Projected**	**FY 18-19 Projected**	**FY 19-20 Projected**	**FY 20-21 Projected**
STAFFING		813	813	813	813	813
REVENUES/TRANSFERS IN*	$137.4	$136.4	$139.5	$141.4	$141.4	$142.7
EXPENDITURES/TRANSFERS OUT	$139.0	$141.5	$142.2	$142.0	$141.6	$141.4
Change in Fund Balance	-$1.6	-$5.1	-$2.7	-$0.6	-$0.2	$1.3
UNRESERVED FUND BALANCE (at year-end)	$39.5	$34.4	$31.7	$31.1	$30.9	$32.2
% of REVENUE	29%	25%	23%	22%	22%	23%
*Includes projected CPI fee increase of 2.4% for FY 2016-17, 2.3% for FY 2017-18, 2.6% for FY 2018-19, 2.4% for FY 2019-20, and 2.3% for FY 2020-21.						

As part of the Five Year Projection, SCAQMD details out 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 Fund has been created with unanticipated one-time revenues from the General Fund for many of the capital outlay building improvement projects. The projects proposed from the Infrastructure Improvement Fund

include upgrading the Energy Management System, replacing the centrifugal chillers and cooling towers, and replacing the Liebert air conditioning units in the Computer Room.

GENERAL FUND **POTENTIAL BUILDING MAINTENANCE and CAPITAL OUTLAY PROJECTS** **FY 2016-17 through 2020-21**
Renovate Childcare Center Playground
Repair Sidewalks/Curbs
Repair/Reseal Parking Lot
Recoat Cooling Tower Piping
Repaint Building Interior
Repaint Building Exterior (Trim and Doors)
Replace Restroom and Copy/Coffee Room Sinks and Counter Tops
Rebuild/Re-compact Patio Area
Retrofit Can Lighting (LED)
Renovate Irrigation and Upgrade Controllers
Refurbish/Replace Restroom Panels
Replace Cooling Towers and Chillers
Addition to Auditorium Dais
Replace Liebert AC Units, including Computer Room
Replace Air Handler Fan Walls
Replace Gaylord Air Scrubbers
Replace Air Volume Controllers (CVDD) Lab
Upgrade Pneumatic Controls to DDC (Direct Digital Control.)
Replace Lighting Control System
Replace Aging Kitchen Equipment
Upgrade Energy Management System
Upgrade Parking Lot and Building Lights to LED
Recoat Roofing Surface District Headquarters
Repaint Parking Stalls and Curbs
Repair and Re-coat Parking Structure Deck
Replace Vinyl Composite Tiles (Various Areas)
Paint and Wallpaper Conference Center
Replace Ceiling Tiles (Various Floors)
Electrical Vehicle Charger and Support System Upgrades
Upgrade Fluorescent Office Lighting to LED

SUMMARY OF FISCAL YEAR 2016-17 DRAFT BUDGET				
	FY 2015-16 Adopted Budget	FY 2015-16 Amended Budget [1]	FY 2015-16 Estimate [2]	FY 2016-17 Proposed
Funding Sources				
Revenue	$ 134,634,810	$ 139,816,093	$ 136,302,208	$ 135,940,490
Transfers-In	345,500	1,466,062	1,053,600	505,790
Total Financing Sources	$ 134,980,310	$ 141,282,155	$ 137,355,808	$ 136,446,280
Funding Uses				
Salaries & Employee Benefits	$ 110,766,918	$ 110,873,055	$ 106,269,201	$ 114,841,998
Services & Supplies	25,728,382	31,308,885	29,204,162	25,835,697
Capital Outlays	722,500	3,632,700	3,494,095	850,000
Transfers-Out	-	45,000	-	-
Total Funding Uses	$ 137,217,800	$ 145,859,640	$ 138,967,457	$ 141,527,695

Fund Balances -Reserves & Unreserved Designations	Classification	Projected June 30, 2016	Projected June 30, 2017
Reserve for Encumbrances	Committed	$ 7,794,000	$ 8,229,000
Reserve for Inventory of Supplies	Nonspendable	80,000	80,000
Designated for Enhanced Compliance Activities	Assigned	883,018	883,018
Designated for Litigation/Enforcement	Assigned	100,000	100,000
Designated for Other Post Employment Benefit (OPEB) Obligations	Assigned	2,952,496	2,952,496
Designated for Permit Streamlining	Assigned	288,385	288,385
Designated for Self-Insurance	Assigned	2,000,000	2,000,000
Designated for Unemployment Claims	Assigned	80,000	80,000
Total Reserves & Unreserved Designations		$ 14,177,899	$ 14,612,899
Unassigned Fund Balance	Unassigned	$ 33,197,966	$ 28,116,551
Total Fund Balances		$ 47,375,865	$ 42,729,450

[1] The FY 15-16 Amended Budget includes mid-year changes through March 2016.

[2] Includes estimated encumbrances of $5,500,000 which will be applicable to the fiscal year ending June 30, 2016.

ANALYSIS OF PROJECTED JUNE 30, 2016 FUND BALANCE			
Fund Balances as of June 30, 2015			
Reserves	$ 6,606,968		
Designated	6,803,899		
Unassigned	34,353,647		
Total Fund Balances, June 30, 2015:		$	47,764,514
Add Excess Fiscal Year 2015-16 Revenues over Expenditures:			
Revenues	$ 137,355,808		
Expenditures[1]	133,467,457		
Sub-Total:		$	3,888,351
Deduct Decrease in Encumbrances Open on June 30, 2015:			(4,277,000)
Deduct Projected FY 2015-16 Transfers Out to Other Funds			-
Total Projected Fund Balances, June 30, 2016:		$	47,375,865
Fund Balances (Projected) at June 30, 2016			
Reserve for Encumbrances		$	7,794,000
Reserve for Inventory of Supplies			80,000
Designated for Enhanced Compliance Activities			883,018
Designated for Litigation/Enforcement			100,000
Designated for Other Post Employment Benefit (OPEB) Obligations			2,952,496
Designated for Permit Streamlining			288,385
Designated for Self-Insurance			2,000,000
Designated for Unemployment Claims			80,000
Unassigned			33,197,966
Total Projected Fund Balances, June 30, 2016		$	47,375,865
Note: This analysis summarizes the estimated amount of funds that will be carried into FY 2016-17.			
[1] Expenditures do not include estimated $5,500,000 encumbrances for the Fiscal Year ended June 30, 2016.			

SCHEDULE OF AVAILABLE FINANCING AND PROPOSED FISCAL YEAR 2016-17 RESERVES AND DESIGNATIONS		
Fund Balances	$ 47,375,865	
Emission Fees	19,859,100	
Annual Renewal Fees	48,565,400	
Permit Processing Fees	16,771,480	
Portable Equipment Registration Program	1,277,420	
State Subvention	3,947,390	
Federal Grant	6,414,740	
Interest Revenue	332,060	
Lease Revenue	136,540	
Source Test/Analysis Fees	774,140	
Hearing Board Fees	307,200	
Penalties and Settlements	5,000,000	
Area Sources	2,549,180	
Transportation Programs	860,520	
Mobile Sources/Clean Fuels	25,724,780	
Air Toxics "Hot Spots"	2,619,510	
Other Revenues/Transfers In	1,306,820	
Total Funds		$ 183,822,145
Less Proposed Fiscal Year 2016-17 Reserves and Designations:		
Reserve for Encumbrances	$ 8,229,000	
Reserve for Inventory of Supplies	80,000	
Designated for Enhanced Compliance Activities	883,018	
Designated for Litigation/Enforcement	100,000	
Designated for Other Post Employment Benefit (OPEB) Obligations	2,952,496	
Designated for Permit Streamlining	288,385	
Designated for Self-Insurance	2,000,000	
Designated for Unemployment Claims	80,000	
Total Proposed Reserves and Designations:		$ 14,612,899
Available Financing:		$ 169,209,246

ANALYSIS OF PROJECTED JUNE 30, 2017 FUND BALANCE		
Fund Balances as of June 30, 2016		
Reserves	$ 7,874,000	
Designated	6,303,899	
Unassigned	33,197,966	
Total Fund Balances, June 30, 2016:		$ 47,375,865
Add Excess Fiscal Year 2016-17 Revenues over Expenditures:		
Revenues	$ 136,446,280	
Expenditures[1]	135,990,695	
Sub-Total:		$ 455,585
Deduct Decrease in Encumbrances Open on July 1, 2016:		(5,102,000)
Total Projected Fund Balances, June 30, 2017:		$ 42,729,450
Fund Balances (Projected) Fiscal Year 2016-17:		
Reserve for Encumbrances		$ 8,229,000
Reserve for Inventory of Supplies		80,000
Designated for Enhanced Compliance Activities		883,018
Designated for Litigation/Enforcement		100,000
Designated for Other Post Employment Benefit (OPEB) Obligations		2,952,496
Designated for Permit Streamlining		288,385
Designated for Self-Insurance		2,000,000
Designated for Unemployment Claims		80,000
Unassigned		28,116,551
Total Projected Fund Balances, June 30, 2017		$ 42,729,450

[1] Expenditures do not include estimated $5,537,000 encumbrances for the Fiscal Year ended June 30, 2017.

Revenue Comparison				
Revenue Account	FY 2014-15 Actual	FY 2015-16 Budget	FY 15-16 Estimate	FY 16-17 Proposed
Emission Fees	$ 19,838,979	$ 20,597,280	$ 23,279,373	$ 19,859,100
Annual renewal Fees	44,699,554	47,471,770	46,759,327	48,565,400
Permit Processing Fees	16,668,485	17,319,690	16,079,098	16,771,480
Portable Equipment Registration Program	1,060,184	1,151,630	1,207,544	1,277,420
State Subvention	3,947,386	3,947,390	3,944,602	3,947,390
Federal Grant	7,759,558	6,540,590	7,264,699	6,414,740
Interest Revenue	339,005	482,110	435,110	332,060
Lease Revenue	141,878	145,410	136,256	136,540
Source Test/Analysis Fees	746,399	766,580	576,227	774,140
Hearing Board Fees	531,879	349,830	144,947	307,200
Penalties and Settlements	8,733,773	5,000,000	5,329,384	5,000,000
Area Sources	2,573,959	2,535,000	2,535,000	2,549,180
Transportation Programs	845,236	812,720	993,588	860,520
Mobile Sources/Clean Fuels	23,680,772	23,585,360	23,972,188	25,724,780
Air Toxics "Hot Spots"	2,001,389	2,802,310	2,802,310	2,619,510
Other Revenues/Transfers In	4,249,368	1,472,640	1,896,155	1,306,820
Total Revenue	$ 137,817,804	$ 134,980,310	$ 137,355,808	$ 136,446,280

Annual Operating Emissions Fees

The Lewis-Presley Air Quality Management Act (Health & Safety Code §40400-40540) authorizes the SCAQMD to collect fees for permitted sources to recover the costs of District programs related to these sources. (Health & Safety Code §40510(b)). This statute provides that such fees may be varied in accordance with the quantity of emissions and the effect of those emissions on ambient air quality in the District. (Health & Safety Code §40510(c)(1)). The SCAQMD initiated an annual operating emissions fees program in January 1978 whereby 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 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 actual emissions. These facilities pay for emissions from permitted equipment as well as emissions from unpermitted equipment and processes that 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 SCAQMD Rule 301.
Emissions fees partially recover the costs of SCAQMD's planning, rulemaking, air monitoring, public outreach, small business assistance, and intergovernmental affairs programs.

FY 2016-17 Proposed Budget: The non-RECLAIM emissions are based on Annual Emission Report (AER) data for Calendar Year 2014. The RECLAIM NO_X and SO_X 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 2.4% CPI increase is included.

Annual Operating Permit Renewal

State law authorizes the SCAQMD to have an annual permit renewal program and authorizes fees to recover the costs of the program. Health & Safety Code §42300; §40510(b). The annual operating permit renewal program, initiated by the SCAQMD 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 SCAQMD 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. Annual operating permit renewal fees are designed to recover the costs of SCAQMD's compliance and enforcement programs.

FY 2016-17 Proposed Budget: The projection is based on an estimated number of permits at the various equipment fee schedules. A 2.4% CPI increase is included.

Permit Processing Fees

Under the Health and Safety Code, SCAQMD may adopt and implement a program requiring that before the construction or operation of any equipment which emits or controls air pollution in SCAQMD's jurisdictional boundaries, a permit to operate must be obtained from SCAQMD. SCAQMD has adopted rules requiring such permits, but exempts certain equipment which is deemed to have de minimis emissions (Rule 219) to ensure that the equipment is in compliance with SCAQMD rules and regulations. Permit processing fees are authorized by state law to recover the costs of the permit processing program. SCAQMD Rule 301 establishes the fee rate schedule for the different equipment categories, which 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, issuance of the permit to construct, and any permit modifications. This revenue category also includes fees charged to partially recover the costs of evaluation of plans, including but not limited to Rule 403 dust control plans, Rule 1118 flare monitoring plans, and Rule 1113 architectural coating plans. Fees for plan review and enforcement are authorized by Health & Safety Code §40522. In addition, permit processing fees include fees to cover the administrative cost to process Change of Operator applications, applications for Emission Reduction Credits, and Administrative Changes to permits.

FY 2016-17 Proposed Budget: The projection is based on the anticipated number and type of applications that will be processed. A 2.4% CPI increase is included.

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 SCAQMD field staff are collected by CARB at the time of registration and passed through to SCAQMD on an annual basis. Fees for inspection of all other PERP-registered equipment are billed at an hourly rate set forth in SCAQMD Rule 301, as determined by CARB and collected by SCAQMD at the time the inspection is conducted.

FY 2016-17 Proposed Budget: The revenue projection is based on the anticipated number of inspections.

Area Sources

Emissions fees from architectural coatings revenue covers architectural coatings fair share of emissions supported programs. Quantity-based fees on architectural coatings are also assessed. SCAQMD Rule 314 covers emission-based fees and quantity-based fees. Fees on area sources are authorized by Health & Safety Code §40522.5. Beginning in FY 2008-09, annual assessments of architectural coatings, based on quantity (gallons) distributed or sold for use in SCAQMD's jurisdiction, are included in revenue projections. This revenue allows SCAQMD to recover the costs of staff working on compliance, laboratory support, architectural coatings emissions data, rule development, and architectural coatings revenue collection.

FY 2016-17 Proposed Budget: Fees are based on the annual quantity and emissions of architectural coatings distributed or sold into or within the District for use in the District for the previous calendar year. Emissions are decreasing while sales volume is increasing. A 2.4% 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. The SCAQMD received subvention funds, at its inception, beginning in 1977.

FY 2016-17 Proposed Budget: In FY 2002-03, the state reduced SCAQMD's subvention to $4 million, a reduction of approximately $2 million from the FY 2001-02 level. The current amount of $3.9 million is included in the FY 2016-17 proposed budget.

EXPLANATION OF REVENUE SOURCES

Federal Grants/Other Federal Revenue

SCAQMD receives funding from EPA Section 103 and 105 grants to help support the SCAQMD in its administration of active air quality control and monitoring programs where the SCAQMD 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 2016-17 Proposed Budget: The revenue projection is based on funding levels from current federal grants.

Interest

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

FY 2016-17 Proposed Budget: A projected rate of return of 0.73% is included in the proposed budget.

Leases

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

FY 2016-17 Proposed Budget: The projection is based on the terms of any negotiated lease payments SCAQMD expects to receive.

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 2016-17 Proposed Budget: A 2.4% 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 the District; therefore, there are no Hearing Board fees/revenue related to these proceedings.

FY 2016-17 Proposed Budget: This estimate is based on the number of hearings held/cases heard. A 2.4% CPI increase is included.

Penalties/Settlements

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

FY 2016-17 Proposed Budget: It is anticipated that revenue in this category will be approximately $5.0 million.

Mobile Sources

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

AB2766:
Section 9250.17 of the Vehicle Code gives the Department of Motor Vehicles (DMV) authority to collect and forward to the SCAQMD $4 for every vehicle registered in SCAQMD's jurisdictional boundaries. Thirty percent of the money ($1.20 per vehicle) collected is recognized in SCAQMD's General Fund as mobile sources revenue and is used 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 Air Quality Management Plan.

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 Sources Air Pollution Reduction Special Revenue Fund (MSRC) to pay for projects recommended by the MSRC and approved by the Governing Board.

Carl Moyer:
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.

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.

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 2016-17 Proposed Budget: Revenue projections are based on vehicle registration data from the DMV, recent revenue received, and anticipated reimbursable staff costs to implement the Carl Moyer 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 SCAQMD

money for clean fuels technology advancement programs and transportation control measures related to stationary sources, according to the plan approved pursuant to Health & Safety Code §40448.5. One dollar is collected by the DMV for every vehicle registered in SCAQMD's jurisdictional boundaries, forwarded to SCAQMD, 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 are collected from sources that emit 250 tons or more per year of Nitrogen Oxides (NO_x), Sulfur Oxides (SO_x), 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.

FY 2016-17 Proposed Budget: Revenue projections are based on anticipated reimbursable staff costs to implement the Clean Fuels Program.

Transportation Programs

In accordance with federal and state Clean Air Act requirements, SCAQMD's Rule 2202 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. 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 2016-17 Proposed Budget: The projection is based on the anticipated number of registrations. A 2.4% CPI increase is included.

Toxic "Hot Spots"

Health and Safety Code Section 44380 requires the SCAQMD to assess and collect fees from facilities that emit toxic compounds. Fees collected are used to recover state and SCAQMD 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.

FY 2016-17 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 the SCAQMD renders to other agencies, reimbursements from special revenue funds (non-mobile source), vanpool revenue, fees from fitness center memberships, and Public Records Act requests.

FY 2016-17 Proposed Budget: The revenue projections are based on historical trend information.

SCAQMD Line Item Expenditure						
Major Object / Account # **/** Account Description		**FY 2014-15 Actuals**	**FY 2015-16 Adopted Budget**	**FY 2015-16 Amended Budget ***	**FY 2015-16 Estimate ****	**FY 2016-17 Proposed Budget**
Salary & Employee Benefits						
51000-52000	Salaries	$ 67,765,207	$ 73,107,948	$ 73,208,600	$ 70,682,719	$ 75,122,297
53000-55000	Employee Benefits	34,362,635	37,658,969	37,664,455	35,586,482	39,719,701
Sub-total Salary & Employee Benefits		$ 102,127,842	$ 110,766,918	$ 110,873,055	$ 106,269,201	$ 114,841,998
Services & Supplies						
67250	Insurance	$ 1,182,393	$ 1,317,400	$ 1,342,400	$ 1,233,369	$ 1,317,400
67300	Rents & Leases Equipment	220,751	176,682	241,989	228,860	176,182
67350	Rents & Leases Structure	274,571	280,706	313,206	285,004	286,791
67400	Household	570,580	722,021	646,921	629,676	722,021
67450	Professional & Special Services	8,315,081	6,598,832	10,879,176	10,143,537	6,888,870
67460	Temporary Agency Services	1,052,284	880,398	1,136,854	1,065,094	911,420
67500	Public Notice & Advertising	345,894	406,100	366,912	309,917	403,850
67550	Demurrage	81,705	64,930	75,430	60,005	62,930
67600	Maintenance of Equipment	496,520	542,262	996,640	882,354	538,382
67650	Building Maintenance	708,589	1,407,479	1,160,688	1,160,688	882,479
67700	Auto Mileage	113,526	68,659	164,272	153,509	66,647
67750	Auto Service	399,365	471,000	432,016	358,580	471,000
67800	Travel	270,829	315,313	401,963	359,879	315,313
67850	Utilities	1,825,536	1,943,689	1,953,501	1,631,092	2,213,288
67900	Communications	638,002	706,590	748,610	675,256	701,000
67950	Interest Expense	4,031,995	3,954,554	3,954,555	3,954,555	3,863,482
68000	Clothing	39,940	28,418	32,668	31,225	35,698
68050	Laboratory Supplies	406,106	300,000	499,300	489,849	302,160
68060	Postage	304,202	450,087	440,575	330,723	450,087
68100	Office Expense	1,281,792	1,066,979	1,132,124	1,043,283	1,075,565
68200	Office Furniture	35,340	61,500	71,648	56,773	61,500
68250	Subscriptions & Books	126,501	166,027	177,027	127,166	173,545
68300	Small Tools, Instruments, Equipment	157,518	160,490	340,058	319,093	159,949
68400	Gas and Oil	236,024	372,000	357,365	324,821	372,000
69500	Training/Conference/Tuition/ Board Exp.	595,880	660,165	707,155	663,785	681,665
69550	Memberships	217,769	69,780	190,225	182,425	70,440
69600	Taxes	34,219	74,000	67,152	65,964	74,000
69650	Awards	77,051	77,023	77,023	74,914	77,023
69700	Miscellaneous Expenses	114,090	149,700	165,834	127,167	150,000
69750	Prior Year Expense	(50,395)	-	-	-	-
69800	Uncollectable Accounts Receivable	3,049	-	-	-	-
89100	Principal Repayment	3,159,384	2,235,598	2,235,598	2,235,598	2,331,010
Sub-total Services & Supplies		$ 27,266,092	$ 25,728,382	$ 31,308,885	$ 29,204,162	$ 25,835,697
77000	**Capital Outlays**	$ 4,031,026	$ 722,500	$ 3,632,700	$ 3,494,095	$ 850,000
79050	**Building Remodeling**	$ -	$ -	$ -	$ -	$ -
Total Expenditures		$ 133,424,960	$ 137,217,800	$ 145,814,640	$ 138,967,457	$ 141,527,695

* Does not include Transfers Out.

** Estimates based on July 2015 through February 2016 actual expenditures and budget amendments.

Acct. #	Account Description	FY 2015-16 Adopted Budget	FY 2015-16 Amended Budget	FY 2015-16 Estimate	FY 2016-17 Proposed Budget	Increase/ (Decrease)[a]
51000-52000	**SALARIES**	**$ 73,107,948**	**$ 73,208,600**	**$ 70,682,719**	**$ 75,122,297**	**$2,014,349**
These accounts include salaries and special pays such as: Call-Back, Hazard, Night Shift, Rideshare, Skilled Based, Stand By and Overtime. The FY 2016-17 Request includes the costs associated with the three year labor agreement that went into effect on January 1, 2015, the addition a net of eight positions (primarily grant funded) and proposes to maintain vacant positions at 8%. The FY 2016-17 Proposed Budget does not include overtime amounts for federal grant work that is not expected to be awarded until mid-year and will not be appropriated until the grants are awarded.						
53000	**EMPLOYEE BENEFITS**	**$ 3,094,129**	**$ 3,094,129**	**$ 2,747,005**	**$ 3,222,026**	**$127,897**
This account includes the costs associated with State Disability Insurance, employer share of unemployment insurance, Social Security and Medicare. In addition, this account includes individual memberships and/or management physicals.						
54000	**RETIREMENT**	**$ 24,466,886**	**$ 24,472,370**	**$ 23,151,380**	**$26,060,373**	**$1,593,487**
This account includes the employer's share of the employee retirement system contributions. The increase from the FY 2015-16 Adopted Budget is based on the contribution rates provided from the San Bernardino County Retirement Association (SBCERA).						
55000	**INSURANCE**	**$ 10,097,955**	**$ 10,097,956**	**$ 9,688,097**	**$10,437,302**	**$339,347**
This account includes employer's share of health, life, dental, vision care and accident insurance.						

[a]FY 2016-17 Proposed Budget vs. FY 2015-16 Adopted Budget.

SCAQMD Personnel Summary – Authorized/Funded Positions						
Positions as of	**Mid-Year Adjustments**		**Positions as of**	**FY 2016-17 Request**		**Positions as of**
June 30, 2015	Add	Delete	June 30, 2016	Add	Delete	July 1, 2016
803	1	1	803	17	7	813

Fiscal Year 2015-16 Mid-Year Changes in Authorized/Funded Positions				
Office	**Position**	**Add**	**Delete**	**Total**
Information Management	Assistant Telecommunication Technician	1		1
Information Management	Computer Operator		(1)	(1)
Total Mid-Year Changes		**1**	**(1)**	**0**

Fiscal Year 2016-17 Requested Personnel Actions				
Office	**Position**	**Add**	**Delete**	**Total**
Engineering & Compliance	Senior Administrative Secretary	1		1
Engineering & Compliance	Senior Office Assistant		(1)	(1)
Information Management	Senior Office Assistant	1		1
Legal	Paralegal	1		1
Legal	Office Assistant		(1)	(1)
Media Office	Staff Assistant	1		1
Media Office	Senior Public Information Specialist	1		1
Planning, Rules Development, & Area Sources	Senior Staff Specialist	1		1
Planning, Rules Development, & Area Sources	Senior Transportation Specialist		(1)	(1)
Science & Technology Advancement	Contracts Assistant	5		5
Science & Technology Advancement	Office Assistant	3		3
Science & Technology Advancement	Technology Implementation Manager	1		1
Science & Technology Advancement	Atmospheric Measurements Manager	1		1
Science & Technology Advancement	Quality Assurance Manager		(1)	(1)
Science & Technology Advancement	Planning and Rules Manager	1		1
Science & Technology Advancement	Community Relations Manager		(1)	(1)
Science & Technology Advancement	Planning and Rules Manager		(1)	(1)
Science & Technology Advancement	Clean Fuels Officer		(1)	(1)
		17	(7)	10

Acct. #	Account Description	FY 2015-16 Adopted Budget	FY 2015-16 Amended Budget	FY 2015-16 Estimate	FY 2016-17 Proposed Budget	Increase/ (Decrease)[a]
67250	**INSURANCE**	**$1,317,400**	**$1,342,400**	**$1,233,369**	**$1,317,400**	**$ -**
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. The SCAQMD 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 SCAQMD's insurance deductibles, and liability claim payments.						
67300	**RENTS & LEASES EQUIPMENT**	**$176,682**	**$241,989**	**$228,860**	**$176,182**	**($500)**
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 2015-16 Adopted Budget reflects anticipated needs.						
67350	**RENTS & LEASES STRUCTURE**	**$280,706**	**$313,206**	**$285,004**	**$286,791**	**$6,085**
This account is for expenditures associated with structures and lot leases, and off-site storage rentals: Long Beach field office - $106,791; Wind Station Leases in the Coachella Valley - $2,000; Conference and meeting rooms - $9,000; and Air monitoring sites/Wind Stations - $169,000 Free and low-cost public facilities are used whenever possible for public workshops and informational meetings. The change from the FY 2015-16 Adopted Budget is due to an increase in the Long Beach field office lease and addition of Wind Station leases in the Coachella Valley. The FY 2016-17 Proposed Budget does not include amounts for federally funded grant programs. An expenditure appropriation will occur mid-year when the grants are awarded.						
67400	**HOUSEHOLD**	**$722,021**	**$646,921**	**$629,676**	**$722,021**	**$ -**
This account is used for trash disposal, landscape maintenance, parking lot maintenance, janitorial supplies, and janitorial contracts. This account is also used for expenses associated with the Diamond Bar facility, such as specialized cleaning supplies and services required in the computer room.						
67450	**PROFESSIONAL & SPECIAL SERVICES**	**$6,598,832**	**$10,879,176**	**$10,143,537**	**$6,888,870**	**$290,038**
This account is for services rendered to the SCAQMD by outside contractors. The FY 2016-17 Professional & Special Services supporting detail is located at the end of this section. The increase from the FY 2015-16 Adopted Budget is attributed to budgeting a full year of legislative advocacy contracts. The FY 2016-17 Proposed Budget does not include amounts for federally funded grant programs. An expenditure appropriation will occur mid-year when the grants are awarded.						

[a]FY 2016-17 Proposed Budget vs. FY 2015-16 Adopted Budget.

Acct. #	Account Description	FY 2015-16 Adopted Budget	FY 2015-16 Amended Budget	FY 2015-16 Estimate	FY 2016-17 Proposed Budget	Increase/ (Decrease)[(a)]
67460	**TEMPORARY AGENCY SERVICES**	**$880,398**	**$1,136,854**	**$1,065,094**	**$911,420**	**$31,022**
Funds budgeted in this account are used for specialized temporary services that supplement staff in support of SCAQMD 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 increase from the FY 2015-16 Adopted Budget is for a temporary employee in the Media Office. The FY 2016-17 Proposed Budget does not include amounts for federally funded grant programs. An expenditure appropriation will occur mid-year when the grants are awarded.						
67500	**PUBLIC NOTICE & ADVERTISING**	**$406,100**	**$366,912**	**$309,917**	**$403,850**	**($2,250)**
This account is used for legally required publications such as Requests for Proposals, Requests for Quotations, personnel recruitment, public outreach, advertisement of SCAQMD Governing Board and Hearing Board meetings, and public notification of SCAQMD rulemaking activities.						
67550	**DEMURRAGE**	**$64,930**	**$75,430**	**$ 60,005**	**$62,930**	**($2,000)**
This account is for various freight and cylinder charges as well as workspace reconfigurations and personnel moves. The FY 2016-17 Proposed Budget does not include amounts for federally funded grant programs. An expenditure appropriation will occur mid-year when the grants are awarded.						
67600	**MAINTENANCE OF EQUIPMENT**	**$542,262**	**$996,640**	**$882,354**	**$538,382**	**($3,880)**
This account is for maintenance costs of SCAQMD equipment such as the following: mainframe computer hardware, phone switch, air monitoring equipment, print shop equipment, copiers, and audio visual equipment. The FY 2016-17 Proposed Budget reflects anticipated maintenance cost increases for printers, server hardware, network hardware as well as equipment maintenance costs for the AQ-SPEC Program but does not include amounts for federally funded grant programs. An expenditure appropriation will occur mid-year when the grants are awarded.						
67650	**BUILDING MAINTENANCE**	**$1,407,479**	**$1,160,688**	**$1,160,688**	**$882,479**	**($525,000)**
This account reflects expenditures for maintaining SCAQMD 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 2015-16 Adopted Budget is due to budgeted one-time projects. The FY 2016-17 Proposed Budget does not include amounts for federally funded grant programs. An expenditure appropriation will occur mid-year when the grants are awarded.						

[(a)]FY 2016-17 Proposed Budget vs. FY 2015-16 Adopted Budget.

Acct. #	Account Description	FY 2015-16 Adopted Budget	FY 2015-16 Amended Budget	FY 2015-16 Estimate	FY 2016-17 Proposed Budget	Increase/ (Decrease)[(a)]
67700	**AUTO MILEAGE**	**$68,659**	**$164,272**	**$153,509**	**$66,647**	**($2,012)**
This account is used to reimburse employees for the cost of using personal vehicles while on SCAQMD business. The requests include the mileage incurred for staff that are required to work on their scheduled days off and for employees who use their personal vehicles on SCAQMD-related business, conferences, and seminars. Mileage reimbursement for the Legislative and Public Affairs staff to attend various community, business and intergovernmental events is also included. The FY 2016-17 Proposed Budget does not include amounts for federally funded grant programs. An expenditure appropriation will occur mid-year when the grants are awarded.						
67750	**AUTO SERVICE**	**$471,000**	**$432,016**	**$358,580**	**$471,000**	**$ -**
This account is used for the maintenance, towing, repair, and expired CNG tank replacement of SCAQMD fleet vehicles. The FY 2016-17 Proposed Request reflects the growing age of the fleet and the costs to maintain vehicles.						
67800	**TRAVEL**	**$315,313**	**$401,963**	**$359,879**	**$315,313**	**$ -**
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 FY 2016-17 Proposed Budget reflects anticipated needs but does not include amounts for federally funded grant programs. An expenditure appropriation will occur mid-year when the grants are awarded.						
67850	**UTILITIES**	**$1,943,689**	**$1,953,501**	**$1,631,092**	**$2,213,288**	**$269,599**
This account is used to pay gas, water, and electricity costs at the SCAQMD's headquarters building, the Long Beach field office, and air monitoring stations. The FY 2016-17 Proposed Budget reflects anticipated rate increases.						
67900	**COMMUNICATIONS**	**$706,590**	**$748,610**	**$675,256**	**$701,000**	**($5,590)**
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 FY 2016-17 Proposed Budget does not include amounts for federally funded grant programs. An expenditure appropriation will occur mid-year when the grants are awarded.						
67950	**INTEREST EXPENSE**	**$3,954,554**	**$3,954,555**	**$3,954,555**	**$3,863,482**	**($91,072)**
This account is for the interest due on the 1995 and 2004 Pension Obligation Bonds. The decrease from the FY 2015-16 Adopted Budget reflects scheduled payments for FY 2016-17.						

[(a)]FY 2016-17 Proposed Budget vs. FY 2015-16 Adopted Budget.

Acct. #	Account Description	FY 2015-16 Adopted Budget	FY 2015-16 Amended Budget	FY 2015-16 Estimate	FY 2016-17 Proposed Budget	Increase/ (Decrease)[(a)]
68000	**CLOTHING**	**$28,418**	**$32,668**	**$31,225**	**$35,698**	**$7,280**
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 2015-16 Adopted Budget reflects the anticipated level of expenditures for FY 2016-17.						
68050	**LABORATORY SUPPLIES**	**$300,000**	**$499,300**	**$489,849**	**$302,160**	**$2,160**
This account is used to purchase various supplies such as chemicals, calibration gases and glassware for laboratory services. The FY 2016-17 Proposed Budget reflects anticipated needs but does not include amounts for federally funded grant programs. An expenditure appropriation will occur mid-year when the grants are awarded.						
68060	**POSTAGE**	**$450,087**	**$440,575**	**$330,723**	**$450,087**	**$ -**
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 2016-17 Proposed Budget reflects mailings based on current activity.						
68100	**OFFICE EXPENSE**	**$1,066,979**	**$1,132,124**	**$1,043,283**	**$1,075,565**	**$8,586**
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 FY 2016-17 Proposed Budget reflects anticipated needs but does not include amounts for federally funded grant programs. An expenditure appropriation will occur mid-year when the grants are awarded.						
68200	**OFFICE FURNITURE**	**$61,500**	**$71,648**	**$56,773**	**$61,500**	**$ -**
This account is for office furniture under $5,000.						
68250	**SUBSCRIPTIONS & BOOKS**	**$166,027**	**$177,027**	**$127,166**	**$173,545**	**$7,518**
This account is used to purchase reference materials, magazine subscriptions, books, and on-line database legal research services. The FY 2016-17 Proposed Budget reflects anticipated cost increases.						
68300	**SMALL TOOLS, INSTRUMENTS, EQUIPMENT**	**$160,490**	**$340,058**	**$319,093**	**$159,949**	**($541)**
This account covers the purchase of small tools and equipment for air monitoring stations, laboratory, and headquarters building maintenance. The FY 2016-17 Proposed Budget does not include amounts for federally funded grant programs. An expenditure appropriation will occur mid-year when the grants are awarded.						

[(a)]FY 2016-17 Proposed Budget vs. FY 2015-16 Adopted Budget.

Acct. #	Account Description	FY 2015-16 Adopted Budget	FY 2015-16 Amended Budget	FY 2015-16 Estimate	FY 2016-17 Proposed Budget	Increase/ (Decrease)[(a)]
68400	**GAS & OIL**	**$372,000**	**$357,365**	**$324,821**	**$372,000**	**$ -**
This account is for the purchase of gasoline, oil, and alternative fuels for the SCAQMD fleet. The cost is anticipated to stay flat from the FY 2015-16 Adopted Budget.						
69500	**TRAINING/CONF/ TUITION/BOARD EXP**	**$660,165**	**$707,155**	**$663,785**	**$681,665**	**$21,500**
This account is used for tuition reimbursement, conference and training registrations, certain costs associated with the SCAQMD's Governing and Hearing Boards and SCAQMD advisory groups, and training-related travel expenditures. The FY 2016-17 Proposed Budget reflects anticipated needs.						
69550	**MEMBERSHIPS**	**$69,780**	**$190,225**	**$182,425**	**$70,440**	**$660**
This account provides for SCAQMD membership in scientific, clean fuels, advanced technology, and related environmental business/policy organizations. The FY 2016-17 Adopted Budget reflects anticipated needs.						
69600	**TAXES**	**$74,000**	**$67,152**	**$65,964**	**$74,000**	**$ -**
This account is for unsecured property and use taxes, fuel taxes, and sales taxes. The FY 2016-17 Adopted Budget reflects anticipated needs.						
69650	**AWARDS**	**$77,023**	**$77,023**	**$74,914**	**$77,023**	**$ -**
This account covers employee service awards for continuous service, employee recognition programs, plaques/awards the SCAQMD may present to individuals/businesses/ community groups for outstanding contributions towards air quality goals, and promotional awards for community events. The cost is anticipated to stay flat from the FY 2015-16 Adopted Budget.						
69700	**MISCELLANEOUS EXPENSES**	**$149,700**	**$165,834**	**$127,167**	**$150,000**	**$300**
This account is to record expenditures that do not fall in any other account such as SCAQMD advisory group per diems, meeting and event expenses, and sponsorships. The FY 2016-17 Adopted Budget reflects the anticipated miscellaneous expenses for FY 2016-17.						
69750	**PRIOR YEAR EXPENSE**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
This account is used to record expenditures attributable to prior year budgets. No amount is budgeted for this account due to the nature of the account.						

[(a)]FY 2016-17 Proposed Budget vs. FY 2015-16 Adopted Budget.

	Account Description	FY 2015-16 Adopted Budget	FY 2015-16 Amended Budget	FY 2015-16 Estimate	FY 2016-17 Proposed Budget	Increase/ (Decrease)[a]
69800	**UNCOLLECTIBLE ACCOUNTS RECEIVABLE**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
No amount is budgeted for this account due to the nature of the account.						
89100	**PRINCIPAL REPAYMENT**	**$2,235,598**	**$2,235,598**	**$2,235,598**	**$2,331,010**	**$95,412**
This account is for the principal due on pension obligation bonds. The increase from the FY 2015-16 Adopted Budget reflects scheduled payments for FY 2016-17.						

[a]FY 2016-17 Proposed Budget vs. FY 2015-16 Adopted Budget.

Proposed Fiscal Year 2016-17 Professional & Special Services Detail by Office			
Office	**Program**	**Contract Description**	**Amount**
District General	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	Commercial Real Estate Broker	95,000
	Dist. General Overhead	COBRA Administration Services	6,000
	Dist. General Overhead	Employee Assistance Program	13,995
	Dist. General Overhead	Employee Relations Litigation	250,000
	Dist. General Overhead	Custodial Fees for 1995 & 2004 POBs	800
	Dist. General Overhead	Health Reimbursement Arrangement Plan Administration	5,000
	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	Security Alarm Monitoring	1,980
	Dist. General Overhead	Security Guard Services	490,000
	Dist. General Overhead	Wellness Program	37,500
	Sub-total District General		**$1,177,975**
Governing Board	Operational Support	Board Member Assistant/Consultants	$713,628
	Sub-total Governing Board		**$713,628**
Executive Office	Develop Programs	Professional & Special Services	$150,000
	Sub-total Executive Office		**$150,000**
Finance	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	43,000
	Operational Support	Financial Audit – AB 2766 DMV Fee Recipients	10,000
	Operational Support	Financial Consultant for Treasury Management	22,000
	Operational Support	LA County Treasurer Office - PGP Maintenance	1,650
	Sub-total Finance		**$151,650**
Legal	Ensure Compliance	Experts/Court Reporters/Attorney Services	$25,000
	Ensure Compliance	Litigation Counsel	159,500
	Ensure Compliance	Software Maintenance & Licensing - Courtview Justice Solutions	30,000
	Ensure Compliance	Software Maintenance & Licensing - Hyland	5,000
	Operational Support	Specialized Legal Services	60,000
	Sub-total Legal		**$279,500**

Proposed Fiscal Year 2016-17 Professional & Special Services Detail by Office (cont.)			
Office	**Program**	**Contract Description**	**Amount**
Administrative & Human Resources	Operational Support	Architectural, Engineering and Surveyor Consultants	$3,250
	Operational Support	Classification Study & Consulting Services	65,000
	Operational Support	In-house Training Classes	500
	Operational Support	Insurance Broker of Record	49,000
	Operational Support	Locksmith	2,000
	Operational Support	Medical Services Provider	20,000
	Operational Support	NEOGOV Subscription License	8,000
	Operational Support	Occupational Health Services	25,000
	Operational Support	Office Ergonomics Evaluations and Training	10,000
	Customer Service & Business Assistance	Outside Binding Services	6,000
	Customer Service & Business Assistance	Outside Printing Services	5,000
	Operational Support	Test Development	15,000
	Operational Support	Third-Party Claims Administrator for Workers Compensation	18,000
	Sub-total Administrative & Human Resources		**$226,750**
Clerk of the Boards	Ensure Compliance	Court Reporting, Audiovisual, and/or Security Services	$4,000
	Ensure Compliance	Outside Legal Contract	15,000
	Ensure Compliance	Professional Interpreter Services	6,400
	Sub-total Clerk of the Boards		**$25,400**
Media Office	Policy Support	Graphics, Printing & Outreach Materials	$4,000
	Policy Support	News Release Services	9,000
	Policy Support	Photographic & Video Services	5,000
	Policy Support	Radio/Television Monitoring	11,000
	Sub-total Media Office		**$29,000**
Information Management	Operational Support	Action Works Metro System Software Support	$20,000
	Operational Support	Adobe Creative Cloud Software Support	600
	Operational Support	AER & R1113/314 Upgrade & Maintenance	15,000
	Operational Support	AIS (Address Information System) Five Digit subscription	1,100
	Operational Support	Anti-Spam Maintenance/Support	11,500

Proposed Fiscal Year 2016-17 Professional & Special Services Detail by Office (cont.)			
Office	**Program**	**Contract Description**	**Amount**
Information Management (cont.)	Operational Support	Backup Software	$32,000
	Operational Support	Backup Utility Maintenance	11,500
	Operational Support	CLASS System Maintenance	88,000
	Operational Support	Component One Software Support	1,100
	Operational Support	Computer-Based Training Software Support	1,800
	Operational Support	CourtView System Maintenance	10,000
	Operational Support	Crystal Reports Software Support	20,000
	Operational Support	Disaster Recovery Software	60,000
	Operational Support	Dundas Chart Software Support	700
	Operational Support	Email Recovery Software (PowerControls) Maint/Support	1,750
	Operational Support	Email Reporting	3,800
	Operational Support	ERwin ERX & BPwin SW Support	24,000
	Operational Support	Faxcom FaxServer Support	12,500
	Operational Support	Imaging Software Support	129,000
	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 Maintenance/Support	35,000
	Operational Support	Kronos Time Keeper	2,000
	Operational Support	Microsoft Developer Network CD - 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	12,500
	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

Proposed Fiscal Year 2016-17 Professional & Special Services Detail by Office (cont.)			
Office	**Program**	**Contract Description**	**Amount**
Information Management (cont.)	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	6,500
	Operational Support	SCAQMD Web Application Modifications	20,000
	Operational Support	Secure Service Digital ID Services	1,000
	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	13,000
	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
	Sub-total Information Management		**$1,302,621**
Planning, Rule Development , & Area Sources	Ensure Compliance	AER Printing	$5,000
	Develop Programs	California Emissions Estimator Model (CalEEMod) Upgrades/Support	10,000
	Develop Programs	CEQA for AQMD Projects	140,000
	Develop Programs	CEQA Special Studies	50,000
	Develop Rules	Coating Application Techniques	50,000
	Timely Review of Permits	Dispersion Modeling Support	50,000
	Develop Programs	Dun & Bradstreet Data	30,000
	Develop Programs	Implementation of Abts Recommendations	229,900
	Monitoring Air Quality	Maintain Wind Stations and Analyze Data	60,000

Proposed Fiscal Year 2016-17 Professional & Special Services Detail by Office (cont.)			
Office	**Program**	**Contract Description**	**Amount**
Planning, Rule Development, & Area Sources (cont.)	Monitoring Air Quality	Meteorological Data Services	$7,500
	Develop Rules	PM and Ozone Model Consulting	90,000
	Develop Rules	Polymer Research and Technology Transfer of Coatings	50,000
	Develop Programs	REMI Renewal	51,000
	Develop Programs	Rule 2202 Computer System Maintenance	15,000
	Customer Service & Business Assistance	Rule 2202 ETC On-Line Training	25,000
	Develop Programs	SIP, AQMP and Rule Printing	8,000
	Develop Rules	Software/Hardware Maintenance in Support of Regional Modeling	43,600
	Develop Programs	STAMPRAG Member Sole Source Contracts	100,000
	Develop Rules	Technical Assessment - Regional Modeling	50,000
	Ensure Compliance	Technology Assessment Studies	50,000
	Monitoring Air Quality	Weather Data Services Communications	7,500
	Sub-total Planning, Rule Development & Area Sources		**$1,122,500**
Legislative & Public Affairs	Policy Support	After-hours Call Center Service	$3,500
	Customer Service & Business Assistance	Clean Air Awards	12,600
	Customer Service & Business Assistance	Community Outreach	410,000
	Policy Support	Graphics & Printing	33,616
	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	Photographic and Video Services	50,000
	Customer Service & Business Assistance	Promotion Marketing of Smart Phone Tools	50,000
	Sub-total Legislative & Public Affairs		**$1,619,846**

Proposed Fiscal Year 2016-17 Professional & Special Services Detail by Office (cont.)			
Office	**Program**	**Contract Description**	**Amount**
Science &Technology Advancement	Ensure Compliance	Laboratory Analytical Services	$15,000
	Ensure Compliance	Source Testing Services	30,000
	Ensure Compliance	Technical Support for Air Monitoring and Community Complaint Resolution	35,000
	Sub-total Science & Technology Advancement		**$80,000**
Engineering & Compliance	Ensure Compliance	Lab Analysis Services for R1176 & Other Air Samples	$5,000
	Operational Support	Workspace Reconfiguration	5,000
	Sub-total Engineering & Compliance		**$10,000**
		Total Professional & Special Services	**$6,888,870**

Acct. #	Account Description	FY 2015-16 Adopted Budget	FY 2015-16 Amended Budget	FY 2015-16 Estimate	FY 2016-17 Proposed Budget	Increase/ (Decrease)[(a)]
77000	**CAPITAL OUTLAYS**	**$ 722,500**	**3,632,700**	**$ 3,494,095**	**$ 850,000**	**$127,500**

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 increase from the FY 2015-16 Adopted Budget reflects anticipated needs. The FY 2016-17 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 2016-17 is provided at the end of this section.

[(a)]FY 2016-17 Proposed Budget vs. FY 2015-16 Adopted Budget.

Acct. #	Account Description	FY 2015-16 Adopted Budget	FY 2015-16 Amended Budget	FY 2015-16 Estimate	FY 2016-17 Proposed Budget	Increase/ (Decrease)[(a)]
79050	**BUILDING REMODELING**	**$-**	**$-**	**$-**	**$-**	**$-**

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 2016-17.

[(a)]FY 2016-17 Proposed Budget vs. FY 2015-16 Adopted Budget.

Fiscal Year 2016-17 Capital Outlays Detail				
Office	**Program**	**Category**	**Description**	**Amount**
District General	Operational Support	N/A	Unbudgeted Capital Outlay - This amount is set aside for unanticipated needs or emergency situations to avoid interruption of operations.	$75,000
	Operational Support	Replacement	System Support and Programming (PeopleSoft/CLASS) - Funding for functional and technical support and special reporting needs for the CLean Air Support System (CLASS)-Finance automated billing and the PeopleSoft Human Capital Management and Financial Accounting systems.	75,000
	Operational Support	Replacement	PeopleSoft HCM Enhancements and Modifications - New rules, regulations and reporting requirements (e.g., Affordable Care Act (ACA)) as well as implementation of self-service and other PeopleSoft modules require changes and in some cases integration into the existing benefits structure and human resources information system.	15,000
	Sub-total District General			**$165,000**
Planning, Rule Development & Area sources	Develop Rules	New	Architectural Coating Reporting & Fee Billing - Funding for modifications and enhancements to the web-based R314/R1113 Architectural Coatings Reporting system to provide functionality for invoicing, auditing and reporting; support for the public product search and modifications needed to support any R314 and R1113 rule changes	$50,000
	Policy Support	New	AER and FIND System Enhancements - Enhancements to allow a facility's summary emissions data to be populated in "FIND" so that the public will have easy access to this information. In addition, query tools will be developed to generate various reports for auditing purposes and CARB's use.	25,000
	Sub-total Planning, Rules & Area Sources			**$75,000**
Information Management	Operational Support	New	Miscellaneous Telecommunication Upgrade/Enhancement – Funding to enable Telecommunications to meet unforeseen network needs/changes required to support SCAQMD staff.	$35,000
	Operational Support	Replacement	Network Server Upgrade – Funding for the planned replacement and upgrade of servers to maintain acceptable performance levels and ensure robust, fault tolerant, reliable, and stable server functions with performance to match user demand.	75,000

Fiscal Year 2016-17 Capital Outlays Detail (cont.)				
Office	**Program**	**Category**	**Description**	**Amount**
Information Management (cont.)	Operational Support	Replacement	SCAQMD Network Core Switch and Router - Funding to replace the existing core switch and router which is no longer fully supported by the manufacturer. The new core switch and router will deliver enhanced functionality with additional bandwidth and speed.	150,000
	Customer Service/Business Assistance	New	Emission Reporting System – Funding to re-design, re-architect, and develop the new Emission Reporting System (ERS) in order to provide the regulated community with the infrastructure, programs, and tools to capture electronic reporting emission information from NOx and SOx RECLAIM Facilities and Rule 1135 Facilities.	242,000
	Operational Support	New	OnBase Agenda Tracking System Software - Funding to replace the outdated Board Agenda Tracking system and enable staff to better track and monitor the processing of the Agenda Items and Governing Board packages.	108,000
	Sub-total Information Management			**$610,000**
			Total Capital Outlays	**$850,000**

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
DRAFT GOALS AND PRIORITY OBJECTIVES FOR FY 2016-2017

MISSION STATEMENT

"All residents have a right to live and work in an environment of clean air and we are committed to undertaking all necessary steps to protect public health from air pollution with sensitivity to the impacts of our actions on the community, public agencies and businesses."

GOALS AND PRIORITY OBJECTIVES

The following Goals and Priority Objectives have been identified as being critical to meeting SCAQMD's Mission in Fiscal Year 2016-17.

GOAL I. Continue progress toward meeting clean air standards and protecting public health.

Priority Objective/Project	Outcome
1. Development of the 2016 AQMP	Finish development of the 2016 AQMP (Plan), bring to the Board for adoption, and submit the Plan into the SIP. Ensure the Plan is a comprehensive attainment strategy to meet the federal 8-hour ozone (75 ppb) and annual PM2.5 (12 ug/m3) air quality standards by the statutory deadlines. Include control measures and modeling to demonstrate attainment of the standards. Early action measures will be identified and implemented, if needed, to further ensure attainment of the federal 24-hour PM2.5 standard. The Plan will also update the 1-hour ozone and the 1997 8-hour ozone SIPs to demonstrate progress toward attainment. Plan, organize and execute basin-wide outreach on the 2016 AQMP that will provide detailed information on the proposed control measures to stakeholders and solicit input through a series of workshops and public meetings to be held in the counties of Los Angeles, San Bernardino, Riverside, and Orange and the Coachella Valley.
2. Update to AQMD's Air Toxics Control Program	Include a chapter in the 2016 AQMP on air toxics that will provide an update on the 2010 Clean Communities Plan, discuss recent findings on fugitive toxic metals, identify priorities for potential toxic risk reduction from stationary sources, and identify AQMP related co-benefits from air toxic control strategies.
3. Next-generation natural gas engine/hybrid vehicles	Develop 12 and 6.7 liter natural gas heavy-duty engines that are 90% cleaner than the current emissions standard for NOx, including the option for integration with hybrid systems and alternative fuels that will provide additional NOx reductions.

GOAL I. **Continue progress toward meeting clean air standards and protecting public health.** ***(Cont.)***

Priority Objective/Project	Outcome
4. Develop and demonstrate zero-emission goods movement technologies	Continue to work with the DOE, CEC, CARB, the Ports and others to develop and demonstrate zero-emission miles in goods movement technologies. On the federal level, continue to work with the US Congress, the Administration, US DOE, US EPA, US DOT and other federal agencies to secure funding and policy support to facilitate the development, demonstration, deployment, and commercialization of zero and near-zero emission goods movement transportation technologies for on-road and off-road vehicles and marine vessels. Coordinate these actions with national outreach efforts to develop a nationwide supportive stakeholder network comprised of partners from various sectors, including industry, environmental, government, and academia. Continue similar work with the California Legislature, the Governor, and other stakeholders to secure such funding and policy support for zero and near-zero emission goods movement transportation technologies.
5. Develop and demonstrate low-emission energy generation technology as well as energy storage options	Continue demonstration projects and continue working with stakeholders to facilitate additional power options.
6. Implementation of OEHHA Revised Health Risk Assessment Guidelines	Implement the OEHHA guidelines and use in SCAQMD programs. Complete analysis related to impacts on spray booths and gas stations and develop recommendations for potential rule changes.
7. Proposition 1B-Goods Movement Program	Implement goods movement modernization projects for heavy-duty trucks, locomotives, and cargo handling equipment in accordance with CARB's program guidelines.
8. Updating and enhancement of the Carl Moyer Program	Following the adoption of SB 513 into law, work closely with CARB and CAPCOA to develop the enhanced Carl Moyer Program guidelines allowing expansion of project categories, leveraging of funds, increasing cost-effectiveness limit to fund advanced technologies, and improving implementation efficiency.
9. Incentive Funding Programs	Identify and pursue additional funding resources (e.g. local, state, national and international to expand incentive programs. Continue the implementation of the Carl Moyer, Proposition 1B-Goods Movement, Lower-Emission School Bus, Lawnmower Exchange, and other incentive funding programs to achieve early and surplus emissions reductions. Continue outreach for the various incentive programs, connecting with elected officials, businesses, and community members as well as the general public to

GOAL I. **Continue progress toward meeting clean air standards and protecting public health.** ***(Cont.)***

Priority Objective/Project	Outcome
9. Incentive Funding Programs *(Cont.)*	increase awareness of the programs. Use all available social media and marketing to broaden the outreach; and continue inter-department coordination to successfully implement each program.
10. Zero-emission lawn and garden equipment	Execute agreements with participating public entities and conduct a loaner program for zero-emission lawn and garden equipment to promote their environmental benefits and efficacy. Continue program outreach and inter-organization coordination to ensure smooth implementation of the program.
11. Cutting-edge Efforts of Air Monitoring and Laboratory Capabilities	Continue investing in and deploying state of the art monitoring and analytical tools and technologies in stationary and mobile platforms. Specifically, continue to develop optical remote sensing technologies to provide continuous and enhanced pollutant assessment and visualization capabilities in real and near-real time for criteria pollutants, toxics, metals and GHGs.
12. Implementation of socioeconomic analysis enhancements	Continue to implement the action plan approved by the Governing Board in 2014 to address recommendations contained in the November 2014 Abt Associates report.
13. Ensure compliance through Small Business outreach programs	Execute the continued expansion of SCAQMD's Small Business Assistance programs to increase small business owners' and operators understanding of the agency and compliance requirements. Programs to include: (1) introduction of revised form and increase effective usage of the Air Quality Permit Checklist (AQPC) that helps to determine businesses' air quality requirements and expedites their receipt of SCAQMD clearance letters; and (2) the ongoing implementation of the Expired Permit Outreach Program (EPOP) that prevents small businesses from incurring costly fees due to failure to properly renew their air quality permit(s).
14. Continue to implement SCAQMD's Environmental Justice (EJ) policies and programs, and other initiatives directed at equitable treatment for all communities and sensitive populations	Work with residents and community leaders in disproportionately impacted communities to remedy their air quality concerns. Increase partnerships with health, educational, and other organizations in impacted communities. Better communicate, coordinate and streamline agency response to EJ-related concerns, in part through the execution of SCAQMD's Environmental Justice Community Partnership, SCAQMD's initiative offering workshops and forums to strengthen the agency's partnership with both EJ thought leaders and community stakeholders, while increasing awareness of SCAQMD's

GOAL I. **Continue progress toward meeting clean air standards and protecting public health. *(Cont.)***

Priority Objective/Project	Outcome
14. Continue to implement SCAQMD's Environmental Justice (EJ) policies and programs, and other initiatives directed at equitable treatment for all communities and sensitive populations *(Cont.)*	targeted efforts to mitigate air pollution specifically in and around adversely impacted EJ communities. To further these objectives in 2016-17, hold community outreach events, one in each county, to recognize local EJ leaders and host a second Environmental Justice conference to broaden all stakeholders' awareness of SCAQMD EJ-related programs as well as SCAQMD's awareness of local EJ community concerns so we can work together towards resolving air quality related EJ issues in the basin. Prioritize representation of SCAQMD on community task forces and other organizations as appropriate, including business organizations, to help mitigate current and prevent future air quality impacts.
15. Enhance community response program	Assess current SCAQMD community response program and identify measurement techniques and protocols with consideration to recurring types of community concerns, and update the program accordingly to be more informative and responsive to impacted communities in a timelier manner. Develop an enhanced communication plan to inform the community regarding complaints. Continue to maintain, build upon, and update our outreach databases and management systems to communicate more effectively with stakeholders, impacted communities and the public. Incorporate rapid response protocols that can be implemented in the SCAQMD's social media presence, website, communication center, and media department in a coordinated fashion to more effectively communicate to the impacted communities and their local, state, and federal elected representatives and the general public.
16. Ensure compliance through a program that includes timely processing of permit applications for stationary sources	Process a total of 7,000 applications, including 1,800 Permits to Construct (new construction, modification or relocations). Process all Title V Permit Renewals in a timely manner and meet all statutory requirements. Through SCAQMD's Small Business Assistance program help more local businesses understand the permit process, prepare and submit permit applications, and expand efforts to educate small business owners about the agency and compliance. Continue the program's expanded outreach to help ensure continued compliance through efforts to more widely distribute the Air Quality Permit Checklist and through the ongoing Expired Permit Outreach Program. Continue to hold meetings with the permit streamlining working group.

GOAL I. **Continue progress toward meeting clean air standards and protecting public health.** ***(Cont.)***

17. Prioritize prosecution of high-impact enforcement cases to maximize deterrence for air pollution violations and protect public health	Enhance prosecution of high-impact enforcement cases, such as prosecutions of major or serial violators, major air toxics releases, significant public nuisance cases, or companies having violations at several locations. Achieve satisfactory resolution of these cases to reduce health impacts and provide for future deterrence.
18. Ensure compliance through a program that includes using community-based and/or industry-specific deployment of field personnel	Inspect all Major or RECLAIM sources at least annually and inspect all chrome plating facilities quarterly. Conduct a total of 20,000 site visits for compliance evaluations and perform inspections of 3,300 portable equipment and 1,800 Asbestos demolition or renovation activities. Continue targeted evaluation program for select industries, including but not limited to, metal processing, and oil production. Conduct 40 Team Inspections at selected facilities. Continue to further develop inventory, implement rules, and inspect area sources of emissions. On a case by case basis SBA Team will continue support of E&C's compliance efforts by handling referrals seeking help with permit applications forms, recordkeeping, understanding of air quality rules and regulations, etc., to their compliance with air quality rules and regulations. Also through coordinated efforts with SCAQMD's EJ Coordinator, develop new and build upon existing relationships with communities and businesses to increase rule compliance.
19. Promote, support and partner with other organizations and groups on strategies and programs to encourage multi-modal forms of transportation.	Promotion of bus, light rail, heavy rail, and bicycle usage through partnerships resulting in reduction of traffic congestion and improved air quality and health.
20. Update Digital Advisor delivery platform.	Develop a universal interactive Digital Advisor that can be simultaneously delivered across all tablet and PC platforms.

GOAL II. **Enhance public education and ensure equitable treatment for all communities.**

Priority Objective/Project	Outcome
1. Continue implementation of the Clean Communities Plan Pilot Studies in Boyle Heights and San Bernardino and complete implementation of the U.S. EPA Targeted Air Shed Grant	Complete the implementation of the Clean Communities Plan Pilot Studies in Boyle Heights and San Bernardino. Seek other opportunities to apply for U.S. EPA Targeted Air Shed Grant funding to support emission reduction projects benefiting impacted communities in the basin.

GOAL II. Enhance public education and ensure equitable treatment for all communities. ***(Cont.)***

	Priority Objective/Project	Outcome
2.	Continue with full-scale implementation of state-of-the-art air monitoring technologies	Continue with the comprehensive efforts to test emerging "low-cost sensors" for accuracy and performance through AQ-SPEC. Deploy several pilot sensor networks, especially in EJ communities, to help validate enhanced low-cost continuous air quality monitoring capabilities for the SCAQMD, the regulated community and the public. Also conduct optical remote sensing to quantify emissions and their dispersion over EJ communities near large refineries and other sources. Communicate findings to the public and explore collaborative opportunities with entities interested in utilizing such sensors and technologies for community-based monitoring. Plan specific outreach opportunities to promote AQ-SPEC, particularly in Southland disadvantaged communities.
3.	Employ the latest communication technologies; engage in community based programs and outreach events; and foster relationships with traditional media outlets	Creatively and actively engage the public, through town hall and community meetings, video and PSA messages relayed through local cable and Public, Education and Government channels, specifically themed or targeted outreach events links to public interest and environmental and health concerns. Further improve agency engagement with the public through more effective use of website, video and social and digital media tools (i.e. smartphone app, the digital Advisor, YouTube, Facebook, Twitter, email blasts, etc.), as well as the integration of other possible communication platforms to deliver information and messages in a timely manner. Expand upon the recent launching of SCAQMD's comprehensive social media campaigns. Develop and share short educational videos and special targeted publications that further the public's knowledge about SCAQMD rules, actions, jurisdiction, and programs.
4.	Implementation of the Enhanced Fleet Modernization Program (EFMP) and EFMP Plus-Up Program	The first year of the Enhanced Fleet Modernization Program (EFMP) and EFMP Plus-Up has been successfully implemented. Staff will be working with CARB to develop a long-term program for sustained funding. Continue program outreach and education, specifically in disadvantaged communities and work with interested legislative members to expand outreach to their constituencies.
5.	Continue timely response to community complaints	Respond to all air quality complaints received by SCAQMD in a timely manner.

GOAL III. Operate efficiently and in a manner sensitive to public agencies, businesses, the public and SCAQMD staff.

Priority Objective/Project	Outcome
1. Maintain a knowledgeable, professional and well-trained staff	Provide training and educational opportunities to ensure up-to-date expertise and competency in core agency functions. Develop leadership development programs and opportunities to ensure a smooth transition of key leadership positions within the agency.
2. Ensure rulemaking is transparent and inclusive	Continue to work with all stakeholders early and continuing through the rule development process. Include all interested stakeholders, including business, local agencies, environmental justice and environmental groups, and the communities that will be affected, in the rulemaking process, and provide ample opportunity for input and collaboration.
3. Build and maintain partnerships with public agencies, stakeholder groups and the business community	Further enhanced outreach programs to public agencies in areas including, but not limited to, rulemaking and rule implementation and enforcement, regional air quality impacts and attainment strategies, and other issues affecting public agencies, especially local government. Develop partnerships with local jurisdictions and regional agencies, and seek cooperative strategies for achieving air quality goals and objectives while supporting local control and sustainable economic growth, and leveraging local efforts to improve the health and well-being of residents. Develop new partnerships with the business and regulated communities, as well as environmental justice, environmental, health-based organizations, and community groups – especially environmentally conscientious youth groups – through outreach to, and participation in, various activities, conferences, and other opportunities to cultivate early and continuing cooperative relationships. Build relationships outside of California to broaden support for SCAQMD's federal priorities.
4. Continue to overhaul SCAQMD's information technology systems, including the use of state-of-the-art software, hardware, and communications systems to improve overall agency effectiveness and efficiency	Continue the phased replacement of server and desktop hardware and software. Expand server virtualization and private cloud capabilities, along with public cloud capabilities. Initiate the upgrade of the agency data network infrastructure. Continue to implement electronic document workflow and storage through implementation of the agency enterprise content management system. Continue work on development and implementation of a web-based portal to provide compliance, financial and permitting information to improve overall agency effectiveness and operational activities. Initiate upgrade of the suite of web-based applications to support the agencies

GOAL III. Operate efficiently and in a manner sensitive to public agencies, businesses, the public and SCAQMD staff. *(Cont.)*

Priority Objective/Project	Outcome
4. Continue to overhaul SCAQMD's information technology systems, including the use of state-of-the-art software, hardware, and communications systems to improve overall agency effectiveness and efficiency *(Cont.)*	new web page "look and feel" and implement responsive design capabilities for application use across all computing devices including desktops, laptops, tablets and mobile phones. Continue expansion of SCAQMD's e-government/e-commerce capabilities by providing for additional permit application filing, plan filing and compliance notification form filing capabilities. Continue upgrade and expansion of the GIS infrastructure to implement core HTML-5 capabilities and provide additional access functionalities across all computing devices including desktops, laptops, tablets and mobile phones. Expand agency use of Business Intelligence (extraction of meaningful and useful business analysis information from raw operational data) capabilities by providing systems, tools and user training to any user groups that require them. Implement the PeopleSoft Benefits Administration modules to allow SCAQMD staff self-service enrollment, maintenance, cost and claims information relative to SCAQMD provided benefits. Continue effort to further enhance and improve website's user-friendliness and ease of use based on the website evaluation.
5. Provide excellent customer service to all stakeholders	Ensure that all stakeholders are treated as partners, and that regulations, requirements and objectives are made clear early in the permitting, rulemaking and planning processes. Work with stakeholders in a cooperative and collaborative manner toward air quality goals and related activities in a timely and cost-effective manner, always seeking to balance priorities of public health protections, business retention, economic growth, and job creation, while meeting Federal and State Clean Air Laws.

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 the SCAQMD'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 SCAQMD rules for existing major and small stationary sources.

(A) Verify compliance with SCAQMD 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 SCAQMD 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 accesses and input into the regulatory and policy processes of the SCAQMD.

(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, 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 SCAQMD plans and regulations.

(D) Conduct outreach activities to solicit public input on proposed control measures.

(E) Implement Rule 2201 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.

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 SCAQMD'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.

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 IV, National Air Toxics Trends (NATTS), Port Air Quality Monitoring, Near Road NO_2 Monitoring, and TraPac Air Filtration Program.

(G) Deploy low-cost sensors to monitor air pollution within communities of the South Coast Air Basin and from specific sources.

OPERATIONAL SUPPORT

Provide operational support to facilitate overall air quality improvement programs.

(A) Provide services that enable SCAQMD offices to function properly. Services include facility administration, human resources and financial services.

(B) Provide information management services in support of all SCAQMD operations, including automation of permitting and compliance records, systems analysis and design, computer programming and operations, records management, and the library.

(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 operations of equipment from 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 and Emission Reductions Credits (RTC).

(D) Continue efforts to streamline and expedite permit issuance through:

(1) Equipment certification/registration programs
(2) Area sources filing program
(3) Streamlined standard permits
(4) Certification of Permit Processing (CPP) professionals
(5) Enhancement of permitting systems
(6) Expedited Permit Processing Program

PROGRAM CATEGORIES

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 SCAQMD.

(B) Respond to Congressional and Senatorial inquiries regarding SCAQMD programs, policies or initiatives.

(C) Assist SCAQMD consultants in identifying potential funding sources and securing funding for SCAQMD 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 SCAQMD revenue offsets operational support costs of the SCAQMD.

1a Allocatable SCAQMD – 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**

XVI. This revenue category is no longer used.

XVII. **Other Revenue**

XVIII. **Area Sources**

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

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.

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 Justifications 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 on the following pages. A glossary of terms and acronyms used in the Work Program 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 FTE. A District General overhead cost has been apportioned to each Work Program line based on the number of Full-Time Equivalent (FTE) staff positions for that 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 number. The last three digits are the Program number.

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	**Continue progress toward meeting clean air standards and protecting public health.**
GOAL II	**Enhance public education and ensure equitable treatment for all communities.**
GOAL III	**Operate efficiently and in a manner sensitive to public agencies, businesses, the public and SCAQMD staff.**

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 (FTE) 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 **Proposed 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 on the preceding page 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			Proposed Expenditures			Revenue Categories
							FY 2015-16	+/-	FY 2016-17	FY 2015-16	+/-	FY 2016-17	
1	08	001	I	LEG	AB2766/Mob Src/Legal Advice	AB2766 Leg Adv: Trans/Mob Source	0.05		0.05	$ 10,029	$ 391	$ 10,420	IX
2	04	003	III	FIN	AB2766/MSRC	MSRC Program Administration	0.35		0.35	48,560	1,120	49,680	IX
3	08	003	I	LEG	AB2766/MSRC	Legal Advice: MSRC Prog Admin	0.15		0.15	30,086	1,174	31,260	IX
4	44	003	I	STA	AB2766/MSRC	Mob Src Review Comm Prog Admin	1.00	(0.50)	0.50	161,658	(80,503)	81,155	IX
5	44	004	I	STA	AB2766/MSRC/Contract Admin	AB2766 Admin Discretionary Prog	3.00		3.00	484,974	1,955	486,929	IX
6	44	039	I	STA	Admin/Office Mgt/Tech Adv	Admin Support/Coordination	0.77		0.77	124,477	502	124,978	VIII
7	44	048	I	STA	Admin/Prog Mgmt/Tech Advance	Overall TA Program Mgmt/Coord	1.55		1.55	250,570	1,010	251,580	VIII
8	44	066	I	STA	AQIP Marine SCR DPF	AQIP Marine SCR DPF/Admin/Impl	0.15		0.15	24,249	98	24,346	IX
9	44	012	I	STA	AQMP/Control Tech Assessment	Tech Supp: Quantify Cost Effec	0.10		0.10	16,166	65	16,231	VIII
10	44	095	I	STA	CA Natural Gas Veh Partnership	CA Natural Gas Veh Partnership	0.05		0.05	8,083	33	8,115	VIII
11	04	130	III	FIN	Clean Fuels/Contract Admin	Clean Fuels Contract Admin/Monitor	0.15		0.15	20,811	480	21,291	VIII
12	44	130	I	STA	Clean Fuels/Contract Admin	Admin/Project Supp for TA Cont	3.40	3.17	6.57	549,637	516,737	1,066,374	VIII
13	08	131	I	LEG	Clean Fuels/Legal Advice	Legal Advice: Clean Fuels	0.05		0.05	10,029	391	10,420	VIII
14	44	132	I	STA	Clean Fuels/Mobile Sources	Dev/Impl Mobile Src Proj/Demo	5.10	(0.75)	4.35	824,456	(118,409)	706,047	VIII
15	44	134	I	STA	Clean Fuels/Stationary Combust	Dev/Demo Clean Combustion Tech	0.70		0.70	113,161	456	113,617	VIII
16	44	135	I	STA	Clean Fuels/Stationary Energy	Dev/Demo Alt Clean Energy	0.70		0.70	113,161	456	113,617	VIII
17	44	136	I	STA	Clean Fuels/Tech Transfer	Disseminate Low Emiss CF Tech	1.45	(0.25)	1.20	234,404	(39,632)	194,772	VIII
18	44	188	I	STA	DERA FY 13 Veh Repl	DERA Vehicle Repl Admin/Impl	0.20		0.20	32,332	130	32,462	XVII
19	44	187	I	STA	DERA Sch Bus Repl	DERA Sch Bus Repl Admin/Impl	0.03		0.03	4,850	20	4,869	V
20	44	190	I	STA	Diesel Projects EPA	Diesel Projects EPA/Admin/Impl	0.11		0.11	17,782	72	17,854	V
21	44	356	I	STA	GGRF ZEDT Demo	GGRF ZEDT Demo Admin	0.00	1.10	1.10	-	178,541	178,541	XVII
22	44	361	I	STA	HD Trucks DOE ARRA	DOE HD Trucks Admin (ARRA)	2.00		2.00	323,316	1,303	324,619	V,XVII
23	44	424	I	STA	LNG Trucks CEC	LNG Trucks Admin CEC	1.00	(1.00)	0.00	161,658	(161,658)	-	V,IX
24	44	457	I	STA	Mob Src/C Moyer Adm/Outreach	Carl Moyer: Impl/Admin Grant	5.65	3.16	8.81	913,368	516,581	1,429,948	IX
25	44	459	I	STA	Mob Src/C Moyer/Impl/Prg Dev	Moyer/Implem/Program Dev	2.80		2.80	452,642	1,825	454,467	IX
26	08	457	I	LEG	Mob Src/C Moyer/Leg Advice	Moyer/Implem/Program Dev	0.20	(0.10)	0.10	40,115	(19,275)	20,840	IX
27	44	453	I	STA	Mob Src: Emiss Inven Method	Rvw CARB/US EPA emissions inven methodology	1.50		1.50	242,487	978	243,464	VIII,IX
28	04	457	III	FIN	Mobile Source/Moyer Adm	Carl Moyer: Contract/Fin Admin	1.02		1.02	141,517	3,264	144,782	IX
29	03	455	I	EO	Mobile Sources	Dev/Impl Mobile Source Strategies	0.10		0.10	24,514	388	24,903	IX
30	16	457	I	AHR	MS/Carl Moyer Admin	C Moyer/Contractor Compliance	0.50		0.50	87,794	3,102	90,896	IX
31	44	497	I	STA	Plug-in Hybrid EV DOE ARRA	DOE Plug-in Hybrid EV Admin (ARRA)	0.75		0.75	121,243	489	121,732	V
32	44	533	I	STA	POLB AMECS Demo	POLB AMECS Demo-Admin/Impl	0.47		0.47	75,979	306	76,286	XVII
33	04	542	I	FIN	Prop 1B:Goods Movement	Contracts/Finance Admin	0.50		0.50	69,371	1,600	70,971	IX
34	16	542	I	AHR	Prop 1B:Goods Movement	Prop 1B: Goods Movement	0.50		0.50	87,794	3,102	90,896	IX
35	04	544	I	FIN	Prop 1B:Low Emiss Sch Bus	Grants/Finance Admin	0.05		0.05	6,937	160	7,097	IX
36	44	677	I	STA	School Bus/Lower Emission Prog	School Bus Program Oversight	0.70		0.70	113,161	456	113,617	IX
37	26	738	I	PRA	Target Air Shed EPA	Targeted Air Shed Admin/Impl	0.25		0.25	41,265	919	42,185	V,XVII
38	44	738	I	STA	Target Air Shed EPA	Targeted Air Shed Admin/Impl	0.15		0.15	24,249	98	24,346	V,XVII
39	44	740	I	STA	Tech Adv/Commercialization	Assess CFs/Adv Tech Potential	0.25		0.25	40,414	163	40,577	VIII
40	44	741	I	STA	Tech Adv/Non-Combustion	Dev/Demo Non-Combustion Tech	0.10		0.10	16,166	65	16,231	VIII
41	44	816	I	STA	Transportation Research	Transport Research/Adv Systems	0.50		0.50	80,829	326	81,155	VIII
42	44	460	I	STA	VIP Admin	VIP Admin/Outreach/Impl	0.80		0.80	129,326	521	129,848	IX
						Total	38.85	4.83	43.68	$ 6,273,618	$ 819,800	$ 7,093,418	

A prorated share of the District General budget has been allocated to each line in the workplan 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 2015-16	+/-	FTEs FY 2016-17	Proposed Expenditures FY 2015-16	+/-	Proposed Expenditures FY 2016-17	Revenue Categories
1	04	002	III	FIN	AB2766/Mobile Source	Prog Admin: Monitor/Dist/Audit	0.10		0.10	$ 13,874	$ 10,320	$ 24,194	IX
2	26	007	I	PRA	AB2766/MSRC	AB2766 Prov Tech Asst to Cities	1.10		1.10	181,568	4,045	185,613	IX
3	50	038	I	EAC	Admin/Office Management	Dev/Coord Goals/Policies/Overs	5.00		5.00	765,248	6,808	772,055	Ib
4	50	047	I	EAC	Admin/Operations Support	Budget/Contracts/Reports/Projects	5.00		5.00	770,248	6,808	777,055	Ib
5	35	046	III	LPA	Admin/Prog Mgmt	Admin Office/Units/SuppCoord Staff	3.02		3.02	480,842	14,388	495,230	Ib
6	26	216	I	PRA	AER Public Assistance	AER Design/Impl/Monitor Emiss	2.00		2.00	330,123	7,355	337,478	II
7	04	170	I	FIN	Billing Services	Answer/Resp/Resolv Prob & Inq	8.00		8.00	1,125,439	25,603	1,151,042	II,III,IV
8	04	631	III	FIN	Cash Mgmt/Refunds	Research/Doc/Prep/Proc Refunds	0.30		0.30	41,623	960	42,583	III,IV,XI
9	35	126	II	LPA	Clean Air Connections	Coord of region-wide community group	1.00		1.00	159,219	4,764	163,984	II,IX
10	50	200	I	EAC	Economic Dev/Bus Retention	Perm Proc/Public Participation	0.10		0.10	15,305	136	15,441	III
11	35	205	II	LPA	Environmental Education	Curriculum Dev/Project Coord	0.25		0.25	39,805	1,191	40,996	II,IX,XV
12	35	240	I	LPA	Environmental Justice	Impl Board's EJ Pgrms/Policies	2.00		2.00	318,439	9,528	327,967	II,IV
13	04	260	III	FIN	Fee Review	Cmte Mtg/Fee-Related Complaint	0.10		0.10	13,874	320	14,194	II,III,IV,XV
14	35	260	III	LPA	Fee Review	Cmte Mtg/Fee-Related Complaint	0.50		0.50	79,610	2,382	81,992	II,III,IV,XV
15	50	260	III	EAC	Fee Review	Fee Review Committee	0.45		0.45	68,872	613	69,485	II,III,IV
16	04	355	III	FIN	Grants Management	Grant Anlyz/Eval/Negot/Acc/Rpt	1.00		1.00	138,742	3,200	141,943	IV,V,XV
17	35	381	III	LPA	Interagency Liaison	Interact Gov Agns/Promote SCAQMD	0.15		0.15	23,883	715	24,598	Ia,XV
18	35	390	I	LPA	Intergov/Geographic Deployment	Dev/Impl Local Govt Outreach	9.50		9.50	1,550,583	45,260	1,595,843	II,IX
19	08	404	I	LEG	Legal Rep/Legislation	Draft Legis/SCAQMD Position/Mtgs	0.05		0.05	10,029	391	10,420	II,IX,XV
20	50	425	I	EAC	Lobby Permit Services	Supp Perm Proc/Customer Svc	1.00		1.00	153,050	1,362	154,411	III
21	03	390	I	EO	Local Govt Policy Development	Policy Development	0.05		0.05	12,257	194	12,451	Ia,IX
22	27	481	III	IM	New System Development	Dev sys in supp of Dist-wide	1.75		1.75	344,816	248,915	593,731	Ia,III
23	03	490	II	EO	Outreach	Publ Awareness Clean Air Prog	1.00		1.00	245,141	3,885	249,026	Ia
24	35	491	II	LPA	Outreach/Business	Chambers/Business Meetings	1.00		1.00	171,819	4,764	176,584	II,IV
25	35	496	II	LPA	Outreach/Visiting Dignitary	Tours/Briefings-Dignitary	0.25		0.25	39,805	1,191	40,996	Ia
26	50	520	I	EAC	Perm Proc/Pre-Appl Mtg Outreac	Pre-App Mtgs/Genl Prescreening	4.00		4.00	612,198	5,446	617,644	III
27	35	514	I	LPA	Permit: Expired Permit Program	Assist w Permit Reinstatement	0.30		0.30	47,766	1,429	49,195	IV
28	16	540	III	AHR	Print Shop	Printing/Collating/Binding	4.00		4.00	713,352	24,813	738,165	Ia
29	35	492	II	LPA	Public Education/Public Events	Pub Events/Conf/Rideshare Fair	1.00		1.00	569,219	4,764	573,984	II,V,IX,XV
30	35	555	II	LPA	Public Information Center	Inform public of unhealthy air	1.00		1.00	249,219	4,764	253,984	II,V,IX
31	03	565	III	EO	Public Records Act	Comply w/ Public Req for Info	0.05		0.05	12,257	194	12,451	Ia
32	04	565	I	FIN	Public Records Act	Comply w/ Public Rec Requests	0.02		0.02	2,775	64	2,839	Ia
33	08	565	III	LEG	Public Records Act	Comply w/ Public Rec Requests	1.00		1.00	200,573	7,826	208,399	Ia
34	16	565	III	AHR	Public Records Act	Comply w/ Public Rec Requests	0.05		0.05	8,779	310	9,090	Ia
35	17	565	III	CB	Public Records Act	Comply w/ Public Rec Requests	0.02		0.02	3,929	90	4,019	Ia
36	26	565	III	PRA	Public Records Act	Comply w/ Public Rec Requests	0.53		0.53	87,483	1,949	89,432	Ia
37	27	565	III	IM	Public Records Act	Comply w/ Public Req for Info	3.75	1.00	4.75	672,891	97,578	770,469	Ia
38	35	565	III	LPA	Public Records Act	Comply w/ Public Req for Info	0.10		0.10	15,922	476	16,398	Ia
39	44	565	III	STA	Public Records Act	Comply w/ Public Req for Info	0.17		0.17	27,482	111	27,593	Ia
40	50	565	III	EAC	Public Records Act	Comply w/ Public Req for Info	0.50		0.50	76,525	681	77,206	Ia
41	26	833	II	PRA	Rule 2202 ETC Training	Rule 2202 ETC Training	1.30		1.30	247,080	(2,719)	244,361	XI
42	35	679	III	LPA	Small Business Assistance	Small Business/Financial Assistance	1.00		1.00	159,219	4,764	163,984	III
43	08	681	III	LEG	Small Business/Legal Advice	Legal Advice: SB/Fee Review	0.05		0.05	10,029	391	10,420	II,III
44	50	690	I	EAC	Source Education	Prov Tech Asst To Industries	2.80		2.80	428,539	3,812	432,351	III,IV,V,XV

A prorated share of the District General budget has been allocated to each line in the workplan 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 2015-16	FTEs +/-	FTEs FY 2016-17	Proposed Expenditures FY 2015-16	Proposed Expenditures +/-	Proposed Expenditures FY 2016-17	Revenue Categories
45	44	701	I	STA	Source Testing/Customer Svc	Conduct ST/Prov Data/Cust Svc	0.05		0.05	$ 8,083	$ 33	$ 8,115	VI
46	35	710	I	LPA	Speakers Bureau	Coordinate/conduct speeches	0.10		0.10	15,922	476	16,398	Ia
47	16	720	I	AHR	Subscription Services	Rule & Gov Board Materials	1.70		1.70	298,500	10,545	309,045	IV,XVII
48	35	791	I	LPA	Toxics/AB2588	Outreach/AB 2588 Air Toxics	0.01		0.01	1,592	48	1,640	X
49	44	709	I	STA	VOC Sample Analysis/SBA/Other	VOC Analysis & Reptg/Cust Svc	0.50		0.50	80,829	326	81,155	VI
						Total	68.67	1.00	69.67	$ 11,644,377	$ 573,271	$ 12,217,648	

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

Ensure Compliance with Clean Air Rules
Work Program by Category

#	Program Code		Goal	Office	Program	Activities	FTEs FY 2015-16	FTEs +/-	FTEs FY 2016-17	Proposed Expenditures FY 2015-16	Proposed Expenditures +/-	Proposed Expenditures FY 2016-17	Revenue Categories
1	44	015	I	STA	Acid Rain Program	Acid Rain CEMS Eval/Cert	0.50		0.50	$ 80,829	$ 326	$ 81,155	II,IV
2	26	042	I	PRA	Admin/Office Mgmt/Compliance	Admin: Compl w SCAQMD Rules	0.25	0.25	0.50	41,265	43,104	84,370	Ib
3	26	046	I	PRA	Admin/Office Mgmt/Compliance	Admin: Compl of Existing Source	0.52	0.23	0.75	85,832	40,722	126,554	Ib
4	44	042	I	STA	Admin/Office Mgmt/Compliance	Compliance: Assign/Manage/Supp	0.37		0.37	59,813	241	60,055	Ib
5	26	215	I	PRA	Annual Emission Reporting	Annl Des/Impl/Emiss Monitor Sys	7.50		7.50	1,392,962	(122,419)	1,270,543	II,V
6	50	071	I	EAC	Arch Ctgs - Admin	Report Review	0.10		0.10	15,305	136	15,441	XVIII
7	08	072	I	LEG	Arch Ctgs - End User	Case Dispo/Rvw, Track, Prep NOVs	0.05		0.05	10,029	391	10,420	XVIII
8	26	072	I	PRA	Arch Ctgs - End User	Compliance/Rpts/Rule Implementation	1.00		1.00	165,062	3,677	168,739	XVIII
9	44	072	I	STA	Arch Ctgs - End User	Sample Analysis/Rpts	5.00		5.00	808,290	3,258	811,548	XVIII
10	50	072	I	EAC	Arch Ctgs - End User	Compliance/Rpts/RuleImpmenta	0.10		0.10	15,305	136	15,441	XVIII
11	08	073	I	LEG	Arch Ctgs - Other	Case Dispo/Rvw, Track, Prep NOVs	0.05		0.05	10,029	391	10,420	XVIII
12	26	073	I	PRA	Arch Ctgs - Other	Compliance/Rpts/Rule Implementation	1.00		1.00	165,062	3,677	168,739	XVIII
13	50	073	I	EAC	Arch Ctgs - Other	Compliance/Rpts/Rule Implementation	4.50		4.50	688,723	6,127	694,850	XVIII
14	26	076	I	PRA	Area Sources/Compliance	Area Source Compliance	4.00	1.00	5.00	710,247	183,449	893,695	III,IV,V,IX,XV
15	16	080	III	AHR	Auto Services	Vehicle/Radio Repair & Maint	3.00		3.00	526,764	18,609	545,374	Ia
16	35	111	II	LPA	Call Center/CUT SMOG	Smoking Vehicle Complaints	8.00		8.00	1,273,754	38,114	1,311,868	IX,XV
17	50	070	I	EAC	CARB PERP Program	CARB Audits/Statewide Equip Reg	7.00		7.00	1,071,347	9,531	1,080,878	XIX
18	08	115	I	LEG	Case Disposition	Trial/Dispo-Civil Case/Injunct	5.00		5.00	1,002,865	39,128	1,041,993	II,IV,V,VII,XV
19	44	105	I	STA	CEMS Certification	CEMS Review/Approval	6.15		6.15	994,197	4,008	998,204	II,III,VI
20	50	155	I	EAC	Compliance Guidelines	Procedures/Memos/Manuals	0.50		0.50	76,525	681	77,206	II
21	50	158	I	EAC	Compliance Testing	R461/Combustion Equip Testing	1.00		1.00	158,050	1,362	159,411	II
22	50	152	III	EAC	Compliance/IM Related Activiti	Assist IM: Design/Review/Test	0.50		0.50	76,525	681	77,206	II
23	08	154	I	LEG	Compliance/NOV Administration	Review/Track/Prep NOVs/MSAs	1.20		1.20	240,688	9,391	250,078	IV
24	50	157	I	EAC	Compliance/Special Projects	Prog Audits/Data Req/Board Supp	5.00		5.00	765,248	6,808	772,055	IV
25	08	185	I	LEG	Database Management	Support IM/Dev Tracking System	0.20	0.05	0.25	70,115	16,985	87,100	IV
26	44	175	I	STA	DB/Computerization	Develop Systems/Database	0.44		0.44	71,130	287	71,416	II,IV,VI
27	08	235	I	LEG	Enforcement Litigation	Maj Prosecutions/Civil Actions	1.00	1.00	2.00	200,573	216,224	416,797	IV
28	50	365	I	EAC	Hearing Bd/Variances	Variances/Orders of Abatement	1.50		1.50	229,574	2,042	231,617	VII
29	17	364	I	CB	Hearing Board/Abatement Orders	Attnd/Recrd/Monitr Mtgs	0.10		0.10	19,645	449	20,094	IV
30	08	366	I	LEG	Hearing Board/Legal	Hear/Disp-Varian/Appeal/Rev	3.00		3.00	601,719	23,477	625,196	IV,V,XV
31	17	365	I	CB	Hearing Board/Variances/Appeal	Attend/Record/Monitor HB Mtgs	3.20		3.20	654,035	14,364	668,399	IV,V,VII
32	50	375	I	EAC	Inspections	Compliance/Inspection/Follow-up	79.20		79.20	12,121,521	107,837	12,229,357	IV,V,XV
33	50	377	I	EAC	Inspections/RECLAIM Audits	Audit/Compliance Assurance	23.80		23.80	3,642,578	32,405	3,674,984	II,IV
34	08	380	I	LEG	Interagency Coordination	Coordinate with Other Agencies	0.25	(0.05)	0.20	50,143	(8,464)	41,680	II,V
35	08	402	III	LEG	Legal Advice/Legislation	Legal Support/Rep on Legal Matter	0.10	(0.10)	0.00	20,057	(20,057)	-	Ia
36	08	403	III	LEG	Legal Rep/Litigation	Prep/Hearing/Disposition	3.50		3.50	891,505	22,389	913,895	Ia,II
37	44	450	I	STA	Microscopic Analysis	Asbestos/PM/Metals Analysis	3.00	(1.00)	2.00	484,974	(160,355)	324,619	VI
38	08	465	I	LEG	Mutual Settlement	Mutual Settlement Program	3.00		3.00	601,719	23,477	625,196	IV,V
39	50	156	I	EAC	Perm Proc/Info to Compliance	Prov Permit Info to Compliance	3.00		3.00	459,149	4,085	463,233	III,IV,XV

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

Ensure Compliance with Clean Air Rules
Work Program by Category

#	Program Code		Goal	Office	Program	Activities	FTEs FY 2015-16	FTEs +/-	FTEs FY 2016-17	Proposed Expenditures FY 2015-16	Proposed Expenditures +/-	Proposed Expenditures FY 2016-17	Revenue Categories
40	44	500	I	STA	PM2.5 Program	Est/Operate/Maint PM2.5 Network	11.30		11.30	$ 1,826,735	$ 7,364	$ 1,834,099	II,V,IX
41	50	538	I	EAC	Port Comm AQ Enforcement	Port Comm AQ Enforcement	0.50		0.50	76,525	681	77,206	IX
42	50	542	I	EAC	Prop 1B:Goods Movement	Prop 1B: Gds Mvmnt/Inspect	0.30		0.30	45,915	408	46,323	IX
43	50	550	II	EAC	Public Complaints/Breakdowns	Compltresp/Invflwup/Resolutn	10.00		10.00	1,530,495	13,616	1,544,111	II,IV,V,XV
44	50	605	I	EAC	RECLAIM/Admin Support	Admin/Policy/Guidelines	10.00		10.00	1,530,495	13,616	1,544,111	II,III,IV,XV
45	26	620	I	PRA	Refinery Pilot Project	Refinery Pilot Project	0.25		0.25	41,265	919	42,185	II
46	26	645	I	PRA	Rule 1610 Plan Verification	Rule 1610 Plan Verification	0.50		0.50	82,531	1,839	84,370	V,IX
47	50	678	I	EAC	School Siting	Identify Haz. Emission Sources near Schools	1.00		1.00	153,050	1,362	154,411	II
48	50	680	I	EAC	Small Business Assistance	Asst sm bus w/ Permit Process	0.50		0.50	76,525	681	77,206	III,IV
49	44	700	I	STA	Source Testing/Compliance	Conduct ST/Prov Data/Compl	2.25		2.25	393,730	1,466	395,197	VI
50	26	716	I	PRA	Spec Monitoring/R403	Rule 403 Compliance Monitoring	1.05		1.05	173,315	3,861	177,176	III,IV,IX,XV
51	44	716	I	STA	Special Monitoring	Rule 403 Compliance Monitoring	2.20		2.20	390,648	1,434	392,081	III,IV,IX,XV
52	44	704	I	STA	ST/Sample Analysis/Compliance	Analyze ST Samples/Compliance	4.00		4.00	646,632	2,607	649,239	VI
53	50	751	I	EAC	Title III Inspections	Title III Comp/Insp/Follow Up	0.50		0.50	76,525	681	77,206	IV
54	08	770	I	LEG	Title V	Leg Advice: Title V Prog/Perm Dev	0.05		0.05	10,029	391	10,420	II,IV
55	50	771	I	EAC	Title V Inspections	Title V Compl/Inspect/Follow Up	11.00		11.00	1,683,545	14,977	1,698,522	II,IV
56	04	791	III	FIN	Toxics/AB2588	AB2588 Toxics HS Fee Collection	0.15		0.15	35,811	480	36,291	X
57	08	791	I	LEG	Toxics/AB2588	AB2588 Legal Advice: Plan & Impl	0.05		0.05	10,029	391	10,420	X
58	26	794	I	PRA	Toxics/AB2588	AB2588 Core, Tracking, IWS	9.45	(0.05)	9.40	1,809,833	(223,685)	1,586,147	X
59	27	791	III	IM	Toxics/AB2588	AB2588 Database Software Supp	0.50		0.50	145,319	1,976	147,295	X
60	44	794	I	STA	Toxics/AB2588	Eval Protocols/Methods/ST	1.25		1.25	202,072	815	202,887	X
61	50	791	I	EAC	Toxics/AB2588	AB2588 Rev Rprts/Risk Redplans	0.25		0.25	38,262	340	38,603	X
62	44	795	I	STA	Toxics/Engineering	R1401 Toxics/HRA Prot/Rpt Eval	0.05		0.05	8,083	33	8,115	VI,X
63	08	805	III	LEG	Training	Continuing Education/Training	0.50		0.50	100,286	3,913	104,199	Ib
64	50	850	I	EAC	VEE Trains	Smoking Trains-Compl/Inspec/FU	0.50		0.50	76,525	681	77,206	IX,XV
65	44	707	I	STA	VOC Sample Analysis/Compliance	VOC Analysis & Rptg/Compliance	7.00		7.00	1,168,606	4,562	1,173,168	IV,XV
66	17	855	II	CB	Web Tasks	Create/edit/review web content	0.03		0.03	5,893	135	6,028	Ia
						Total	262.71	1.33	264.04	$ 42,891,827	$ 422,217	$ 43,314,044	

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

Develop Programs to Achieve Clean Air
Work Program by Category

#	Program Code		Goal	Office	Program	Activities	FTEs FY 2015-16	FTEs +/-	FTEs FY 2016-17	Proposed Expenditures FY 2015-16	Proposed Expenditures +/-	Proposed Expenditures FY 2016-17	Revenue Categories
1	04	009	I	FIN	AB 1318 Mitigation	AB 1318 Projects Admn/Impl	0.13		0.13	$ 18,037	$ 416	$ 18,453	XVII
2	08	009	I	LEG	AB 1318 Mitigation	AB 1318 Projects Admn/Impl	0.05		0.05	10,029	391	10,420	XVII
3	26	009	I	PRA	AB 1318 Mitigation	AB 1318 Projects Admn/Impl	0.25		0.25	41,265	919	42,185	XVII
4	44	009	I	STA	AB 1318 Mitigation	AB 1318 Projects Admn/Impl	0.75		0.75	121,243	489	121,732	XVII
5	26	002	I	PRA	AB2766/Mobile Source	AB2766 Mobile Source Outreach	0.89	0.01	0.90	146,905	4,960	151,865	IX
6	26	038	I	PRA	Admin/Office Management	Coordinate Off/Admin Activities	0.50	0.25	0.75	82,531	44,023	126,554	Ib
7	26	049	I	PRA	Admin/Prog Mgmt/AQMP	Admin: AQMP Development	0.75	0.25	1.00	123,796	44,943	168,739	Ib
8	03	028	I	EO	Admin/SCAQMD Policy	Dev/Coord Goals/Policies/Overs	2.00		2.00	540,282	107,770	648,052	Ia
9	26	057	I	PRA	Admin/Transportation Prog Mgmt	Admin: Transportation Programs	0.86	(0.11)	0.75	141,953	(15,399)	126,554	Ib
10	44	069	I	STA	AQIP Evaluation	AQIP Contract Admin/Evaluation	0.65		0.65	105,078	424	105,501	IX
11	03	010	I	EO	AQMP	Develop/Implement AQMP	0.05		0.05	12,257	194	12,451	II,IX
12	08	010	I	LEG	AQMP	AQMP Revision/CEQA Review	0.60	(0.40)	0.20	120,344	(78,664)	41,680	II,IV,IX
13	26	010	I	PRA	AQMP	AQMP Special Studies	2.00		2.00	338,123	7,355	345,478	IV,V,IX,XV
14	26	218	I	PRA	AQMP/Emissions Inventory	Dev Emiss Inv: Forecasts/RFPs	1.30		1.30	214,580	4,781	219,361	II,IX
15	26	102	II	PRA	CEQA Document Projects	Review/Prepare CEQA Comments	3.75	0.25	4.00	618,981	55,975	674,956	II,IX
16	26	104	I	PRA	CEQA Policy Development	ID/Develop/Impl CEQA Policy	0.50	0.40	0.90	92,531	69,334	161,865	IV,IX
17	26	128	I	PRA	Cln Communities Pln	Cln Communities Plan Admn/Impl	0.50	(0.30)	0.20	82,531	(48,783)	33,748	II,IX
18	26	600	I	PRA	Credit Generation Programs	Dev RFP/AQMP Ctrl Strats/Inter	1.20	(1.20)	0.00	198,074	(198,074)	-	II,V,IX
19	26	219	I	PRA	Emissions Field Audit	Emissions Field Audit	0.50		0.50	82,531	1,839	84,370	II
20	26	217	I	PRA	Emissions Inventory Studies	Dev Emiss DB/Dev/Update Emiss	2.00		2.00	330,123	7,355	337,478	II,V,IX,XV
21	44	396	I	STA	Lawnmower Exchange	Lawn Mower Admin/Impl/Outreach	0.30		0.30	48,497	196	48,693	XVII
22	26	397	II	PRA	Lead Agency Projects	Prep Envrnmt Assmts/Perm Proj	0.75	0.35	1.10	123,796	61,817	185,613	III
23	44	451	I	STA	Mob Src/CARB/EPA Monitoring	CARB/US EPA Mob Src Fuel Policies	1.50		1.50	242,487	978	243,464	IX
24	44	452	I	STA	Mob Src/CEC/US DOE Monitoring	CEC/US DOE Mob Src rulemaking proposals	1.00		1.00	161,658	652	162,310	IX,XVII
25	44	458	I	STA	Mobile Source Strategies	Implement Fleet Rules	1.00	(0.15)	0.85	161,658	(23,695)	137,963	VIII
26	44	448	I	STA	Mobile Src Strategies-Off Road	CARB Off-Road Mob Src ctrl strategy for SIP	1.00	(0.85)	0.15	161,658	(137,312)	24,346	XVII
27	26	834	I	PRA	Rule 2202 Implement	Rule 2202 Proc/Sub Plans/Tech Eval	3.07	0.33	3.40	506,739	66,974	573,713	XI
28	26	503	I	PRA	PM Strategies	PM10 Plan/Analyze/Strategy Dev	3.85	1.10	4.95	635,487	199,771	835,258	II,V,XV
29	26	221	I	PRA	PR2301 ISR Rule Implementation	Mitigate dev growth	1.50	(1.50)	0.00	247,592	(247,592)	-	II,IX
30	44	542	I	STA	Prop 1B:Goods Movement	Prop 1B:Goods Movement	5.70	4.17	9.87	921,450	680,546	1,601,996	IX
31	44	544	II	STA	Prop 1B:Low Emiss Sch Bus	Prop 1B:Low Emiss Sch Bus	0.50	(0.50)	0.00	80,829	(80,829)	-	IX
32	35	560	I	LPA	Public Notification	Public notif of rules/hearings	0.50		0.50	99,610	2,382	101,992	II,IV,IX
33	26	745	I	PRA	Rideshare	Dist Rideshare/Telecommute Prog	0.65	0.40	1.05	107,290	69,886	177,176	IX
34	26	836	I	PRA	Rule 2202 Support	R2202 Supt/CmptrMaint/WebSubmt	2.80	0.20	3.00	627,173	(105,955)	521,217	V,XI
35	26	068	II	PRA	SCAQMD Projects	Prepare Environmental Assessments	4.70	(0.60)	4.10	950,790	(68,959)	881,830	II,IV,IX
36	26	685	I	PRA	Socio-Economic	Apply econ models/Socio-econ	3.25	0.75	4.00	740,450	389,006	1,129,456	II,IV
37	44	702	I	STA	ST Methods Development	Eval ST Methods/Validate	0.95		0.95	153,575	619	154,194	II
38	44	705	I	STA	ST Sample Analysis/Air Program	Analyze ST Samples/Air Prgms	0.25		0.25	40,414	163	40,577	II
39	26	816	I	PRA	Transportation Regional Progs	Dev AQMP Meas/Coord w/Reg Agn	0.60	0.40	1.00	99,037	69,702	168,739	V,IX
						Total	53.10	3.25	56.35	$ 9,531,386	$ 888,596	$ 10,419,982	

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

Develop Rules to Achieve Clean Air
Work Program by Category

#	Program Code		Goal	Office	Program	Activities	FTEs			Proposed Expenditures			Revenue Categories
							FY 2015-16	+/-	FY 2016-17	FY 2015-16	+/-	FY 2016-17	
1	44	043	I	STA	Admin/Office Mgmt/Rules	Rules: Assign/Manage/Supp	0.15		0.15	$ 24,249	$ 98	$ 24,346	Ib
2	26	050	I	PRA	Admin/Rule Dev/PRA	Admin: Rule Development	1.00	0.25	1.25	165,062	45,862	210,924	Ib
3	26	071	I	PRA	Arch Ctgs - Admin	Rdev/Aud/DB/TA/SCAQMD/Rpts/AER	1.00		1.00	165,062	3,677	168,739	XVIII
4	26	077	I	PRA	Area Sources/Rulemaking	Dev/Eval/Impl Area Source Prog	4.00	(2.00)	2.00	660,247	(322,768)	337,478	II,IX
5	26	084	I	PRA	Blk Carbon Stdy EPA	EPA Blck Carbon Climate Study	0.20		0.20	33,012	735	33,748	V,XVII
6	26	165	I	PRA	Conformity	Monitor Transp. Conformity	0.50	(0.10)	0.40	82,531	(15,035)	67,496	V,IX
7	03	385	I	EO	Credit Generation Programs	Dev/Impl Marketable Permit	0.02		0.02	4,903	78	4,981	II
8	26	385	I	PRA	Criteria Pollutants/Mob Srcs	Dev/Impl Intercredit Trading	0.75		0.75	123,796	2,758	126,554	IV,IX
9	26	362	II	PRA	Health Effects	Study Health Effect/Toxicology	1.90		1.90	313,617	6,987	320,604	II,III,IX
10	44	449	I	STA	Mob Src/SCAQMD Rulemaking	Prepare SCAQMD Mob Src rulemaking proposals	2.00		2.00	323,316	1,303	324,619	VIII,IX
11	44	456	I	STA	MS & AQMP Control Strategies	AQMP Control Strategies	0.30		0.30	48,497	196	48,693	VIII
12	26	655	I	PRA	NSR/Adm Rulemaking	Amend/Develop NSR & Admin Rules	3.00	(1.00)	2.00	495,185	(157,707)	337,478	II,IV,V,XV
13	26	460	I	PRA	Regional Modeling	Rule Impact/Analyses/Model Dev	5.30		5.30	1,024,827	9,490	1,034,317	II,V,IX
14	50	650	I	EAC	Rulemaking	Dev/Amend/Impl Rules	0.50		0.50	76,525	681	77,206	II,XV
15	44	653	I	STA	Rulemaking/BACT	Dev/Amend BACT Guidelines	2.00		2.00	323,316	1,303	324,619	II
16	26	654	I	PRA	Rulemaking/NOX	Rulemaking/NOx	2.20	0.50	2.70	363,136	92,460	455,596	II,IV,XV
17	08	661	I	LEG	Rulemaking/RECLAIM	RECLAIM Legal Adv/Related Iss	0.05		0.05	10,029	391	10,420	II
18	26	661	I	PRA	Rulemaking/RECLAIM	RECLAIM Amend Rules/Related Is	1.10	(0.53)	0.57	181,568	(85,387)	96,181	II
19	44	657	I	STA	Rulemaking/Support PRA	Assist PRA w/ Rulemaking	0.05		0.05	8,083	33	8,115	II
20	50	657	I	EAC	Rulemaking/Support PRA	Provide Rule Development Supp	0.50		0.50	76,525	681	77,206	II,XV
21	26	659	I	PRA	Rulemaking/Toxics	Develop/Amend Air Toxic Rules	5.00	2.50	7.50	825,308	440,235	1,265,543	II,XV
22	26	656	I	PRA	Rulemaking/VOC	Dev/Amend VOC Rules	7.50	(4.50)	3.00	1,337,962	(681,745)	656,217	II,IV,XV
23	03	650	I	EO	Rules	Develop & Implement Rules	0.04		0.04	9,806	155	9,961	II,IV,IX
24	08	651	I	LEG	Rules/Legal Advice	Legal Advice: Rules/Draft Regs	1.00		1.00	200,573	7,826	208,399	II
25	44	706	I	STA	ST Sample Analysis/Air Program	Analyze ST Samples/Rules	0.25		0.25	40,414	163	40,577	II
26	50	752	I	EAC	Title III Rulemaking	Title III Dev/Implement Rules	0.25		0.25	38,262	340	38,603	II,V,XV
27	50	773	I	EAC	Title V & NSR Rulemaking-Supp	Title V Rules Dev/Amend/Impl	0.25		0.25	38,262	340	38,603	II
28	44	708	I	STA	VOC Sample Analysis/Rules	VOC Analysis & Rptg/Rules	0.25		0.25	40,414	163	40,577	II,XV
						Total	41.06	(4.88)	36.18	$ 7,034,486	$ (646,686)	$ 6,387,801	

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

Monitoring Air Quality
Work Program by Category

#	Program Code		Goal	Office	Program	Activities	FTEs FY 2015-16	FTEs +/-	FTEs FY 2016-17	Proposed Expenditures FY 2015-16	Proposed Expenditures +/-	Proposed Expenditures FY 2016-17	Revenue Categories
1	44	038	I	STA	Admin/Office Mgmt/Monitoring	Overall Program Mgmt/Coord	0.90	0.50	1.40	$ 145,492	$ 81,741	$ 227,234	Ib
2	44	046	I	STA	Admin/Program Management	STA Program Administration	2.00		2.00	335,316	1,303	336,619	Ib
3	44	082	I	STA	Air Fltration Other	Air Filtration Other/Admn/Impl	0.50	(0.25)	0.25	80,829	(40,252)	40,577	XVII
4	44	065	I	STA	Air Quality Data Management	AM Audit/Validation/Reporting	1.00		1.00	161,658	652	162,310	II,V,IX
5	26	061	I	PRA	Air Quality Evaluation	Air Quality Evaluation	1.05		1.05	173,315	3,861	177,176	IX
6	44	063	I	STA	Ambient Air Analysis	Analyze Criteria/Tox/Pollutants	7.91		7.91	1,278,715	5,155	1,283,869	II,V,IX
7	44	067	II	STA	Ambient Lead Monitoring	Lead Monitoring/Analysis/Reporting	0.50		0.50	80,829	326	81,155	IV
8	44	064	I	STA	Ambient Network	Air Monitoring/Toxics Network	18.85	0.20	19.05	3,154,853	44,746	3,199,599	II,IV,V,IX
9	44	073	I	STA	Arch Ctgs - Other	Sample Analysis/Rpts	2.00		2.00	323,316	1,303	324,619	XVIII
10	44	084	I	STA	Blk Carbon Stdy EPA	EPA Blck Carbon Climate Study	0.20	(0.20)	0.00	32,332	(32,332)	-	XVII
11	50	210	II	EAC	Emergency Response	Emerg Tech Asst to Public Saf	0.25		0.25	38,262	340	38,603	II,XV
12	44	248	I	STA	EPA Community Scale AQ-SPEC	EPA Community Scale AQ-SPEC	0.00	1.00	1.00	-	162,310	162,310	V,XVII
13	44	240	I	STA	Environmental Justice	Implement Environmental Justice	0.45		0.45	72,746	293	73,039	II,IX
14	26	445	I	PRA	Meteorology	ModelDev/Data Analysis/Forecast	2.15		2.15	434,883	2,906	437,789	II,V,IX
15	44	468	I	STA	NATTS(Natl Air Tox Trends Sta)	NATTS (Natl Air Tox Trends)	1.50		1.50	242,487	978	243,464	II,V,IX
16	44	469	I	STA	Near Roadway Mon	Near Roadway Monitoring	1.50		1.50	242,487	978	243,464	IV,V,IX
17	26	530	I	PRA	Photochemical Assessment	Photochemical Assessment	0.25		0.25	41,265	919	42,185	II,V
18	44	530	I	STA	Photochemical Assessment	Photochemical Assess & Monitor	3.00		3.00	484,974	1,955	486,929	V,IX
19	44	505	I	STA	PM Sampling Program (EPA)	PM Sampling Program - Addition	10.60		10.60	1,713,575	6,908	1,720,482	V
20	44	507	I	STA	PM Sampling Spec	PM Sampling Special Events	0.10		0.10	16,166	65	16,231	V
21	44	585	I	STA	Quality Assurance	Quality Assurance Branch	3.00		3.00	484973.92	1,955	486,929	II,V,IX
22	44	663	I	STA	Salton Sea Monit	Mon/Analyze Hydrogen Sulfide	0.25		0.25	40,414	163	40,577	XVII
23	44	715	II	STA	Spec Monitoring/Emerg Response	Emergency Response	0.50		0.50	80,829	326	81,155	II
24	44	821	II	STA	TraPac Air Filt Prg	Admin/Tech Suppt/Reptg/Monitor	1.00	(0.85)	0.15	161,658	(137,312)	24,346	XVII
						Total	62.71	0.40	63.11	$ 10,346,762	$ 111,407	$ 10,458,169	

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Operational Support
Work Program by Category

#	Program Code		Goal	Office	Program	Activities	FTEs FY 2015-16	FTEs +/-	FTEs FY 2016-17	Proposed Expenditures FY 2015-16	Proposed Expenditures +/-	Proposed Expenditures FY 2016-17	Revenue Categories
1	04	045	III	FIN	Admin/Office Budget	Office Budget/Prep/Impl/Track	0.05		0.05	$ 6,937	$ 160	$ 7,097	Ib
2	03	038	III	EO	Admin/Office Management	Budget/Program Management	1.00		1.00	245,141	3,885	249,026	Ib
3	04	038	III	FIN	Admin/Office Management	Fin Mgmt/Oversee Activities	3.00		3.00	416,227	9,601	425,828	Ib
4	08	038	III	LEG	Admin/Office Management	Attorney Timekeeping/Perf Eval	3.50		3.50	714,505	22,389	736,895	Ib
5	16	038	III	AHR	Admin/Office Management	Reports/Proj/Budget/Contracts	4.45		4.45	786,367	27,604	813,971	Ib
6	27	038	III	IM	Admin/Office Management	Overall Direction/Coord of IM	3.00		3.00	538,313	11,855	550,168	Ib
7	44	052	I	STA	Admin/Prog Mgmt/Mob Src	Admin: Mobile Source	1.80		1.80	290,984	1,173	292,157	Ib
8	04	020	III	FIN	Admin/SCAQMD Budget	Analyze/Prepare/Impl/Track WP	2.50		2.50	346,856	8,001	354,857	Ia
9	04	023	III	FIN	Admin/SCAQMD Capital Assets	FA Rep/Reconcile/Inv/Acct	0.70		0.70	97,120	2,240	99,360	Ia
10	04	021	III	FIN	Admin/SCAQMD Contracts	Contract Admin/Monitor/Process	3.20		3.20	443,976	10,241	454,217	Ia
11	17	024	III	CB	Admin/SCAQMD/GB/HB Mgmt	Admin Governing/Hearing Brds	1.25		1.25	245,561	5,611	251,171	Ia,VII,XV
12	08	025	III	LEG	Admin/SCAQMD-Legal Research	Legal Research/Staff/Exec Mgmt	1.20		1.20	240,688	9,391	250,078	Ia
13	27	215	I	IM	Annual Emission Reporting	System Enhancements for GHG	0.50		0.50	89,719	1,976	91,695	II,XVII
14	04	071	I	FIN	Arch Ctgs - Admin	Cost Analysis/Payments	0.04		0.04	5,550	128	5,678	XVIII
15	08	071	I	LEG	Arch Ctgs - Admin	Rule Dev/TA/Reinterpretations	0.50	(0.45)	0.05	100,286	(89,867)	10,420	XVIII
16	27	071	I	IM	Arch Ctgs - Admin	Database Dev/Maintenance	0.25		0.25	44,859	988	45,847	XVIII
17	04	085	III	FIN	Building Corporation	Building Corp Acct/Fin Reports	0.02		0.02	2,775	64	2,839	Ia
18	16	090	III	AHR	Building Maintenance	Repairs & Preventative Maint	7.00		7.00	1,232,367	43,422	1,275,789	Ia
19	16	092	III	AHR	Business Services	Building Services Admin/Contracts	2.40		2.40	421,412	14,888	436,299	Ia
20	04	630	III	FIN	Cash Mgmt/Revenue Receiving	Receive/Post Pymts/Reconcile	5.25		5.25	728,397	16,802	745,200	II,III,IV,XI
21	08	102	II	LEG	CEQA Document Projects	CEQA Review	1.00		1.00	200,573	7,826	208,399	II,III,IX
22	16	226	III	AHR	Classification & Pay	Class & Salary Studies	0.30		0.30	117,676	1,861	119,537	Ia
23	27	160	III	IM	Computer Operations	Oper/Manage Host Computer Sys	5.25		5.25	1,286,898	83,246	1,370,144	Ia
24	27	184	III	IM	Database Information Support	Ad Hoc Reports/Bulk Data Update	1.00		1.00	199,438	3,952	203,389	Ia
25	27	185	III	IM	Database Management	Dev/Maintain Central Database	2.25		2.25	403,735	8,891	412,626	Ia
26	16	225	III	AHR	Employee Benefits	Benefits Analysis/Orient/Records	1.50		1.50	263,382	9,305	272,687	Ia
27	04	233	III	FIN	Employee Relations	Assist HR/Interpret Salary Res	0.10		0.10	13,874	320	14,194	Ia
28	16	233	III	AHR	Employee Relations	Meet/Confer/Labor-Mgmt/Grievance	2.20		2.20	386,294	13,647	399,941	Ia
29	08	227	III	LEG	Employee/Employment Law	Legal Advice: Employment Law	1.00		1.00	200,573	7,826	208,399	Ia
30	16	060	III	AHR	Equal Employment Opportunity	Program Dev/Monitor/Reporting	0.10		0.10	17,559	620	18,179	Ia
31	16	255	III	AHR	Facilities Services	Phones/Space/Keys/Audio-Visual	1.00		1.00	177,588	6,203	183,791	Ia
32	04	265	III	FIN	Financial Mgmt/Accounting	Record Accts Rec & Pay/Rpts	6.20		6.20	903,203	19,843	923,045	Ia
33	04	266	III	FIN	Financial Mgmt/Fin Analysis	Fin/SCAQMD Stat Analysis & Audit	0.80		0.80	110,994	2,560	113,554	Ia
34	04	267	III	FIN	Financial Mgmt/Treasury Mgmt	Treas Mgt Anlyz/Trk/Proj/Invst	0.90		0.90	208,518	2,880	211,398	Ia
35	04	268	III	FIN	Financial Systems	CLASS/Rev/Acct/PR/Sys Analyze	0.10		0.10	13,874	320	14,194	Ia
36	02	275	II	GB	Governing Board	Rep of Dist Meet/Conf/Testimony	0.00		0.00	1,399,707	158,175	1,557,882	Ia
37	08	275	III	LEG	Governing Board	Legal Advice:Attend Board/Cmte Mtgs	1.00		1.00	200,573	7,826	208,399	Ia
38	17	275	III	CB	Governing Board	Attend/Record/Monitor Meetings	1.40		1.40	275,028	6,284	281,312	Ia
39	35	350	III	LPA	Graphic Arts	Graphic Arts	2.00		2.00	318,439	9,528	327,967	Ia
40	27	370	III	IM	Information Technology Svcs	Enhance Oper Effic/Productivity	2.75		2.75	516,204	10,867	527,071	Ia
41	08	401	III	LEG	Legal Advice/SCAQMD Programs	General Advice: Contracts	2.00		2.00	461,146	15,651	476,797	Ia

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

Operational Support
Work Program by Category

#	Program Code		Goal	Office	Program	Activities	FTEs FY 2015-16	FTEs +/-	FTEs FY 2016-17	Proposed Expenditures FY 2015-16	Proposed Expenditures +/-	Proposed Expenditures FY 2016-17	Revenue Categories
42	27	420	III	IM	Library	General Library Svcs/Archives	0.25		0.25	$ 53,209	$ 988	$ 54,197	Ia
43	04	447	I	FIN	Mobile Sources/Accounting	Record Acct Rec & Pay/Special Funds	0.65		0.65	90,183	2,080	92,263	IX
44	27	470	III	IM	Network Operations/Telecomm	Operate/Maintain/Implem SCAQMD	9.25		9.25	1,979,194	191,052	2,170,246	Ia
45	27	480	III	IM	New System Development	Dev sys for special oper needs	3.00		3.00	605,509	11,855	617,364	II,IV
46	04	493	II	FIN	Outreach/SB/MB/DVBE	Outreach/Incr SB/DVBE Partic	0.05		0.05	6,937	160	7,097	Ia
47	04	510	III	FIN	Payroll	Ded/Ret Rpts/PR/St & Fed Rpts	3.60		3.60	546,950	11,543	558,494	Ia
48	16	232	III	AHR	Position Control	Track Positions/Workforce Analys	0.55		0.55	96,573	3,412	99,985	Ia
49	04	570	III	FIN	Purchasing	Purch/Track Svcs & Supplies	2.50		2.50	346,856	8,001	354,857	Ia
50	04	571	III	FIN	Purchasing/Receiving	Receive/Record SCAQMD Purchases	1.20		1.20	166,491	3,840	170,331	Ia
51	04	572	III	FIN	Purchasing-Receiving/Stockroom	Track/Monitor SCAQMD Supplies	1.00		1.00	138,742	3,200	141,943	Ia
52	27	615	III	IM	Records Information Mgmt Plan	Plan/Impl/Dir/Records Mgmt plan	1.25		1.25	276,297	4,940	281,237	Ia
53	27	616	III	IM	Records Services	Records/Documents processing	3.75		3.75	798,891	125,819	924,710	Ia,III,IV
54	16	228	III	AHR	Recruitment & Selection	Recruit Candidates for SCAQMD	3.25		3.25	594,161	20,160	614,322	Ia
55	16	640	III	AHR	Risk Management	Liabl/Property/Wk Comp/Selflns	1.00		1.00	297,588	6,203	303,791	Ia
56	16	026	III	AHR	SCAQMD Mail	Posting/Mailing/Delivery	2.30		2.30	403,853	14,267	418,120	Ia
57	27	736	III	IM	Systems Implementation/PeopleS	Fin/HR PeopleSoft Systems Impl	1.50		1.50	269,157	5,927	275,084	Ia
58	27	735	III	IM	Systems Maintenance	Maintain Existing Software Prog	4.50		4.50	1,312,170	23,282	1,335,452	II,III,IV
59	04	805	III	FIN	Training	Continuing Education/Training	0.20		0.20	27,748	640	28,389	Ib
60	26	805	III	PRA	Training	Training	0.05		0.05	8,253	184	8,437	Ib
61	50	805	III	EAC	Training	Dist/Org Unit Training	6.00		6.00	931,797	(5,331)	926,467	Ib
62	04	825	III	FIN	Union Negotiations	Official Labor/Mgmt Negotiate	0.02		0.02	2,775	64	2,839	Ia
63	08	825	III	LEG	Union Negotiations	Legal Adv: Union Negotiations	0.05		0.05	10,029	391	10,420	Ia
64	26	825	III	PRA	Union Negotiations	Official Labor/Mgmt Negotiate	0.01		0.01	1,651	37	1,687	Ia
65	35	825	III	LPA	Union Negotiations	Official Labor/Mgmt Negotiate	0.01		0.01	1,592	48	1,640	Ia
66	44	825	III	STA	Union Negotiations	Labor/Mgmt Negotiations	0.05		0.05	8,083	33	8,115	Ia
67	50	825	III	EAC	Union Negotiations	Official Labor/Mgmt Negotiate	0.10		0.10	15,305	136	15,441	Ia
68	04	826	III	FIN	Union Steward Activities	Rep Employees in Grievance Act	0.01		0.01	1,387	32	1,419	Ia
69	08	826	III	LEG	Union Steward Activities	Rep Employees in Grievance Act	0.05		0.05	10,029	391	10,420	Ia
70	26	826	III	PRA	Union Steward Activities	Rep Employees in Grievance Act	0.01		0.01	1,651	37	1,687	Ia
71	35	826	III	LPA	Union Steward Activities	Union Steward Activities	0.01		0.01	1,592	48	1,640	Ia
72	44	826	III	STA	Union Steward Activities	Rep Employees in Grievance Act	0.05		0.05	8,083	33	8,115	Ia
73	50	826	III	EAC	Union Steward Activities	Rep Employees in Grievance Act	0.10		0.10	15,305	136	15,441	Ia
74	03	855	II	EO	Web Tasks	Create/edit/review web content	0.03		0.03	7,354	117	7,471	Ia
75	04	855	II	FIN	Web Tasks	Create/edit/review web content	0.02		0.02	2,775	64	2,839	Ia
76	20	855	II	MO	Web Tasks	Create/edit/review web content	0.04	1.00	1.04	6,510	227,956	234,466	Ia
77	26	855	II	PRA	Web Tasks	Create/edit/review web content	0.10		0.10	16,506	368	16,874	Ia
78	27	855	II	IM	Web Tasks	Create/edit/review web content	3.25		3.25	868,973	12,843	881,815	Ia
79	35	855	II	LPA	Web Tasks	Create/edit/review web content	0.40		0.40	63,688	1,906	65,593	Ia
80	50	855	II	EAC	Web Tasks	Creation/Update of Web Content	0.50		0.50	76,525	681	77,206	Ia
						Total	125.12	0.55	125.67	$ 24,743,686	$ 1,155,726	$ 25,899,412	

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

Timely Review of Permits
Work Program by Category

#	Program Code		Goal	Office	Program	Activities	FTEs			Proposed Expenditures			Revenue Categories
							FY 2015-16	+/-	FY 2016-17	FY 2015-16	+/-	FY 2016-17	
1	26	040	I	PRA	Admin/Office Mgmt/AQ Impl	Admin/Modeling/New Legis/Sm Sr	0.42	0.05	0.47	$ 69,326	$ 9,981	$ 79,307	Ib
2	26	044	I	PRA	Admin/Office Mgmt/Permit & Fee	Admin: Resolve Perm/Fee Issues	0.10		0.10	16,506	368	16,874	Ib
3	26	120	I	PRA	Certification/Registration Pro	Certification/Registration Prog	1.80	(1.80)		297,111	(297,111)	-	III
4	50	253	I	EAC	ERC Appl Processing	Process ERC Applications	3.50		3.50	535,673	4,766	540,439	III
5	50	367	I	EAC	Hearing Board/Appeals	Appeals: Permits & Denials	0.50		0.50	76,525	681	77,206	III
6	50	476	I	EAC	NSR Data Clean Up	Edit/Update NSR Data	0.50		0.50	76,525	681	77,206	II
7	50	475	I	EAC	NSR Implementation	Implement NSR/Allocate ERCs	2.50		2.50	382,624	3,404	386,028	II,III,V,XV
8	50	521	I	EAC	Perm Proc/Expedited Permit	Proc Expedited Permits (301OT)	0.50		0.50	76,525	681	77,206	III
9	50	728	I	EAC	Perm Proc/IM Programming	Assist IM: Design/Review/Test	2.00		2.00	306,099	2,723	308,822	II,III,IV
10	50	515	I	EAC	Perm Proc/Non TV/Non RECLAIM	PP: Non TitlV/TitlIII/RECLAIM	55.30	2.00	57.30	8,536,138	341,617	8,877,755	III,XV
11	50	519	I	EAC	Perm Proc/Title III (Non TV)	Process Title III Permits	1.00		1.00	153,050	1,362	154,411	III
12	26	461	I	PRA	Permit & CEQA Modeling Review	Review Model Permit/Risk Assmt	1.50		1.50	297,592	5,516	303,109	III
13	08	516	I	LEG	Permit Processing/Legal	Legal Advice: Permit Processing	0.15	0.05	0.20	30,086	11,594	41,680	III
14	44	725	I	STA	Permit Processing/Support E&C	Assist EAC w/ Permit Process	0.05		0.05	8,083	33	8,115	III
15	50	517	I	EAC	Permit Services	Facility Data-Create/Edit	12.50		12.50	1,913,119	17,020	1,930,139	III,XV
16	27	523	III	IM	Permit Streamlining	Permit Streamlining	0.25		0.25	44,859	988	45,847	III
17	50	523	I	EAC	Permit Streamlining	Permit Streamlining	3.75		3.75	573,936	5,106	579,042	III
18	44	545	I	STA	Protocols/Reports/Plans	Eval Test Protocols/Cust Svc	0.10		0.10	16,166	65	16,231	III,IV
19	44	546	I	STA	Protocols/Reports/Plans	Eval Test Protocols/Compliance	6.15		6.15	994,197	4,008	998,204	IV,VI
20	50	607	I	EAC	RECLAIM & Title V	Process RECLAIM & TV Permits	12.40		12.40	1,897,814	16,884	1,914,697	III
21	50	518	I	EAC	RECLAIM Non-Title V	Process RECLAIM Only Permits	4.50		4.50	688,723	6,127	694,850	III,IV,XV
22	26	643	I	PRA	Rule 222 Filing Program	Rule 222 Filing Program	0.20	(0.20)	0.00	83,012	(33,012)	50,000	IV
23	35	680	I	LPA	Small Business/Permit Streamln	Asst sm bus to comply/SCAQMD req	3.95		3.95	628,916	18,819	647,735	II,III,IV,V,XV
24	27	770	I	IM	Title V	Dev/Maintain Title V Program	1.00		1.00	179,438	3,952	183,389	III
25	50	775	I	EAC	Title V – Admin	Title V Administration	1.00		1.00	153,050	1,362	154,411	III
26	08	772	I	LEG	Title V Permits	Leg Advice: New Source Title V Permit	0.05		0.05	10,029	391	10,420	III
27	50	774	I	EAC	TV/Non-RECLAIM	Process Title V Only Permits	18.00		18.00	2,754,891	24,508	2,779,400	III
						Total	133.67	0.10	133.77	$ 20,800,011	$ 152,511	$ 20,952,521	

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

Policy Support
Work Program by Category

#	Program Code		Goal	Office	Program	Activities	FTEs FY 2015-16	FTEs +/-	FTEs FY 2016-17	Proposed Expenditures FY 2015-16	Proposed Expenditures +/-	Proposed Expenditures FY 2016-17	Revenue Categories
1	44	041	I	STA	Admin/Office Mgmt/Policy Supp	Overall Policy Supp/Mgmt/Coord	0.49		0.49	$ 79,212	$ 319	$ 79,532	Ib
2	26	048	I	PRA	Admin/Prog Mgmt/Policy	Admin: GB/Committee Support	1.00	0.25	1.25	165,062	45,862	210,924	Ib
3	26	277	I	PRA	Advisory Group/AQMP	Governing Board AQMP Advisory Group	0.05		0.05	8,253	184	8,437	II,IX
4	35	280	I	LPA	Advisory Group/Ethnic Comm	GB Ethnic Comm Advisory Group	0.40		0.40	63,688	1,906	65,593	II,IX
5	03	276	III	EO	Advisory Group/Governing Board	Governing Board Advisory Group	0.05		0.05	12,257	194	12,451	Ia
6	26	276	I	PRA	Advisory Group/Home Rule	Governing Board Advisory Group	0.30		0.30	49,518	1,103	50,622	Ia
7	26	278	I	PRA	Advisory Group/Sci,Tech,Model	Scientific/Tech/Model Peer Rev	0.15	1.00	1.15	24,759	169,291	194,050	II,IX
8	35	281	I	LPA	Advisory Group/Small Business	SBA Advisory Group Staff Support	0.50		0.50	79,610	2,382	81,992	IV,IX
9	44	276	I	STA	Advisory Group/Technology Adva	Tech Adv Advisory Group Supp	0.10		0.10	16,166	65	16,231	VIII
10	03	078	II	EO	Asthma & Outdoor AQ Consortium	Asthma & Outdoor AQ Consortium	0.01		0.01	2,451	39	2,490	Ia
11	50	276	I	EAC	Board Committees	Admin/Stationary Source Committees	0.25		0.25	38,262	340	38,603	Ia
12	26	083	II	PRA	Brain Tumor & Air Poll Fdn	Brain Tumor & Air Poll Foundation Support	0.10		0.10	16,506	368	16,874	Ia,II,IV
13	03	083	II	EO	Brain Tumor & Air Poll Foundat	Brain Tumor & Air Poll Foundation Support	0.03		0.03	7,354	117	7,471	Ia
14	04	083	II	FIN	Brain Tumor & Air Poll Foundat	Brain Tumor & Air Poll Foundation Support	0.02		0.02	2,775	64	2,839	Ia
15	26	148	I	PRA	Climate Change	GHG/Climate Change Policy Development	1.10	1.00	2.10	206,568	172,784	379,352	IV,XVII
16	50	148	I	EAC	Climate Change	GHG/Climate Change Support	0.50		0.50	76,525	681	77,206	II,IX
17	26	240	I	PRA	EJ-AQ Guidance Document	AQ Guidance Document	0.23	0.17	0.40	37,964	29,531	67,496	II,IX
18	35	345	II	LPA	Goods Mvmt&Financial Incentive	Goods Movement & Financial Incentives Progr	1.00		1.00	159,219	4,764	163,984	IX
19	03	275	I	EO	Governing Board	Board/Committee Support	1.60		1.60	392,226	6,216	398,441	Ia
20	35	283	I	LPA	Governing Board Policy	Brd sup/Respond to GB req	0.55		0.55	87,571	2,620	90,191	Ia
21	03	381	I	EO	Interagency Liaison	Local/State/Fed Coord/Interact	0.40		0.40	98,056	1,554	99,610	Ia,IX
22	03	410	I	EO	Legislation	Testimony/Mtgs:New/Current Leg	0.50		0.50	122,571	1,942	124,513	Ia,IX
23	44	410	I	STA	Legislation	Support Pollution Reduction thru Legislatio	0.50		0.50	80,829	326	81,155	IX
24	35	413	I	LPA	Legislation/Exec Office Suppor	Coord Legis w/ EO, EC, Mgmt	0.25		0.25	39,805	1,191	40,996	Ia
25	35	412	I	LPA	Legislation/Federal	Lobbying/Analyses/Tracking/Out	0.25		0.25	480,405	225,721	706,126	Ia
26	35	414	I	LPA	Legislation-Effects	Lobbying/Analyses/Tracking/Out	0.80		0.80	137,375	3,811	141,187	Ia,IX
27	03	416	I	EO	Legislative Activities	Supp/Promote/Influence Legis/Adm	0.05		0.05	12,257	194	12,451	Ia
28	08	416	I	LEG	Legislative Activities	Lobbying: Supp/Promote/Influence legis/Adm	0.10		0.10	20,057	783	20,840	Ia
29	26	416	I	PRA	Legislative Activities	Supp/Promote/Influence Legis/Adm	0.10		0.10	16,506	368	16,874	Ia
30	35	416	I	LPA	Legislative Activities	Supp/Promote/Influence Legis/Adm	0.50		0.50	444,610	2,382	446,992	Ia
31	50	416	I	EAC	Legislative Activities	Legislative Activities	0.25		0.25	38,262	340	38,603	Ia
32	44	454	I	STA	Mob Src:Greenhs Gas Reduc Meas	Provide comments on mob src portion of AB32	0.89		0.89	143,876	580	144,456	XVII
33	35	494	I	LPA	Outreach/Collateral Developmen	Edits,Brds,Talk shows,Commercl	0.60		0.60	182,648	2,859	185,506	Ia
34	20	494	II	MO	Outreach/Media	Edits,Brds,Talk shows,Commercl	2.96	1.00	3.96	510,735	148,774	659,509	Ia,IX
35	03	717	III	EO	Student Interns	Gov Board/Student Intern Program	0.02		0.02	4,903	78	4,981	Ia
36	08	717	II	LEG	Student Interns	Gov Board/Student Intern Program	0.20		0.20	40,115	1,565	41,680	Ia
37	16	717	II	AHR	Student Interns	Gov Board/Student Intern Program	0.20		0.20	35,118	1,241	36,358	Ia
38	26	717	II	PRA	Student Interns	Gov Bd/Student Intern Program	0.01		0.01	1,651	37	1,687	Ia
39	35	717	II	LPA	Student Interns	Student Interns	0.10		0.10	15,922	476	16,398	Ia
						Total	17.11	3.42	20.53	$ 3,951,646	$ 833,052	$ 4,784,698	
						Total SCAQMD	803.00	10.00	813.00	$ 137,217,800	$ 4,309,895	$ 141,527,695	

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

WORK PROGRAM GLOSSARY

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

AB 1318 Mitigation - an eligible electrical generating facility shall pay mitigation fees for the transfer of emission credits from SCAQMD'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 subvened to local governments; and performing SCAQMD 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/SCAQMD - supporting the administration of the SCAQMD. Examples are tracking fixed assets, operating the mailroom, preparing and reviewing contracts, conducting oversight of SCAQMD activities, developing District-wide policies and procedures, preparing the SCAQMD budget, providing legal advice on SCAQMD programs and other activities, and performing activities in support of the SCAQMD as a whole.

Admin/SCAQMD 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 such items as preparing Office budgets, tracking programs, providing overall direction and coordination of the office, 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.

AER (Air Emission Reporting) Program Public Assistance – providing public assistance in implementing SCAQMD's AER program by conducting workshops, resolving fee-related issues, and responding to questions.

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.

WORK PROGRAM GLOSSARY

Air Monitoring (Ambient Air Analysis, Ambient Network, Audit, Data Reporting, Special Monitoring) - monitoring the ambient air in the SCAQMD's jurisdiction. This includes operating the SCAQMD's air monitoring network and localized monitoring at landfill sites as well as conducting specialized monitoring in response to public nuisance situations. Also see Special Monitoring.

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 the SCAQMD's air monitoring network and localized monitoring at landfill sites as well as conducting specialized monitoring in response to public nuisance situations. SCAQMD monitoring stations also collect samples which are analyzed by SCAQMD's laboratory. Also see Special Monitoring.

Ambient Lead Monitoring – maintain 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.

AQIP Evaluation – provides incentive funding for projects to meet VOC, NOx, 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 (Admin, End User, Other) – Rule 314 requires architectural coatings manufacturers which distribute or sell their manufactured architectural coatings into or within the SCAQMD for use in the SCAQMD 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 as well as the cumulative emissions from the quantity of coatings distributed or sold for use in the SCAQMD.

Area Sources/Compliance – developing rules and compliance programs, as well as alternatives to traditional permitting for smaller sources of emissions of VOC and NOx.

WORK PROGRAM GLOSSARY

Asthma and Outdoor Air Quality Consortium – a group composed of researchers from local universities with air pollution and respiratory disease expertise that conducts research projects relating to asthma and air quality.

Auto Services - maintaining the SCAQMD's fleet of automobiles, trucks, and vans as well as providing messenger services as needed.

Billing Services - administering the SCAQMD's permit billing system, responding to inquiries, and resolving issues related to fees billed.

Black Carbon Study – analyzing black carbon emissions in the Basin to determine climate implications that may be used within the AB 32 climate programs and in other air districts.

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

Brain & Lung Tumor & Air Pollution Foundation – foundation established to support research on the relationship between air pollution and brain tumors. The demographic, behavioral, and genetic factors in patients with brain tumors in the Los Angeles area are being studied to determine any potential impact that air pollution may have on brain tumor incidence.

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 the SCAQMD's Diamond Bar headquarters facility.

Building Maintenance - maintaining and repairing the Diamond Bar Headquarters facility and SCAQMD air monitoring sites.

Business Services – overseeing operation of Facilities Services, Automotive Services, Print Shop and Mail/Subscriptions Services; negotiating and administering Diamond Bar facility, Long Beach Office, and air monitoring station lease agreements.

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 (Central Operator, CUT-SMOG, Field Support) - operating the 24-hour radio communication system via telephone between SCAQMD headquarters and the public.

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 SCAQMD inspectors. This includes preparing both civil and criminal cases and administering SCAQMD's Mutual Settlement Letter Program.

Cash Management (Revenue Receiving, Refunds) – receiving revenue, posting of payments, processing of refunds associated with SCAQMD programs, and bank and 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 SCAQMD 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 SCAQMD to ensure that it meets all applicable requirements.

Classification and Pay – maintaining the classification plan and conducting job analyses to ensure SCAQMD 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 SCAQMD'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 the district, with emphasis on cumulative impacts.

Clean Fuels Program (Contract Admin, Legal Advice, Mobile Sources, Stationary Combust/Energy, Tech Transfer) **–** 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 (Guidelines, Testing, IM Related Activities, NOV Admin, Special Projects) **–** 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 general public.

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 the SCAQMD's computer resources. These resources support the SCAQMD'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 the SCAQMD'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 - See Call Center.

Database Information Support – day-to-day supporting of ad hoc reports and bulk data updates required from SCAQMD's enterprise databases.

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

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

DERA (Diesel Emission Reduction Act) School Bus Replacement – an EPA funded project to replace diesel school buses with Compressed Natural Gas (CNG) and electric buses.

DERA (Diesel Emission Reduction Act) FY 13 Vehicle Replacement – an EPA funded project to replace on-road medium-duty diesel trucks with battery electric trucks.

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

EJ-AQ Guidance Document – providing outreach to local governments as they update their general plans and make land use 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 SCAQMD'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 COBRA program.

Employee Relations – managing the collective bargaining process, administering MOU's, preparing disciplinary documents, and administering SCAQMD'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.

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 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, building access control, and key/lock systems, and workspace planning.

Fee Review – activities relating to conducting Fee Review Committee hearings for businesses that contest SCAQMD fees (Rule 313).

Financial Management (Accounting, Financial Analyses, Treasury Management, Systems) - managing the financial aspects of the SCAQMD. This includes SCAQMD's cash management, investment, and accounting programs, and program and financial audits. It also includes maintaining SCAQMD's permit-related financial and accounting records as well as maintaining and enhancing SCAQMD'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 SCAQMD. 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 the SCAQMD's air pollution program and financial activities relating to grants, including EPA, DOE, CEC, DHS grants, and CARB Subvention.

Graphics Arts - designing and producing presentation materials and SCAQMD publications.

Green House Gas Reporting - many of the businesses and facilities within SCAQMD'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 a project to demonstrate zero emission drayage 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 EPA and providing information to concerned citizens.

Hearing Board (Variances, Abatement Orders, Appeals, Legal) – supporting operation of the SCAQMD'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 – SCAQMD permitting and rule development projects where a CEQA document is prepared and the SCAQMD is the lead agency.

Legal (Advice, District Prosecutor Support, Representation, Legislation, Liability Defense) - providing legal support to SCAQMD 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 (Annual Reports, State, Federal, Legislative Activity) - 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 SCAQMD'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 the SCAQMD's Diamond Bar headquarters.

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

Microscopical Analysis - analyzing, identifying, and quantifying asbestos for compliance with SCAQMD, state, and federal regulations.

Mobile Sources (SCAQMD Rulemaking, Carl Moyer, CARB/EPA and CEC/US DOE monitoring, Emission Incentive Method, Greenhouse Gas Reduction Measures, Strategies (Off Road, Control, Accounting,) - 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 EPA funding, two sites in the monitoring network are utilized to collect ambient VOC and particulate samples. Samples are analyzed by the SCAQMD lab and reported to EPA where the data is used to determine toxic trends.

Near Roadway (NO_2) Monitoring – federal monitoring requirement that calls for state and local air monitoring agencies to install near-road NO_2 monitoring stations at locations where peak hourly NO_2 concentrations are expected to occur within the near-road environment in larger urban areas.

Network Operations/Telecommunications – installing, maintaining, and providing operational support of the SCAQMD's PC, voice, data, image, and radio networks; planning, designing, and implementing new network systems or services in response to the SCAQMD'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 major computer systems development efforts.

New Source Review (NSR) (Data Clean-up, Implementation, Modeling Permit Review, Rulemaking) - developing and implementing New Source Review rules; designing, implementing, and maintaining the Emission Reduction Credits and the New Source Review programs. These programs streamline the evaluation of permit renewal and emissions reporting.

Outreach (Business, Media, Visiting Dignitary) - increasing public awareness of the SCAQMD's programs, goals, permit requirements, and employment opportunities; interacting, providing technical assistance, and acting as liaison between SCAQMD staff and various sectors of the private industry, local governments, and small businesses.

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

Payroll - paying salaries and benefits to SCAQMD employees, withholding and remitting applicable taxes, and issuing W2s.

Permit Processing NSR, (RECLAIM, Non RECLAIM, Title V, Title III, Pre-Application, Services, Expedited, IM Processing, CEQA Modeling Review, Legal, Support EAC, Expired) - 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 EPA funding, ozone precursors are measured at seven stations and samples are collected.

PM Sampling Program (EPA) – daily collection of particulate samples

PM Monitoring/Strategies Programs ($PM_{2.5}$, PM_{10}, $PM_{10\text{-}2.5}$) – planning and developing rules related to $PM_{2.5}$, PM_{10}, and $PM_{10\text{-}2.5}$. Obtaining measurements of particulates at air monitoring stations throughout the South Coast Air Basin (Basin). Measurements are made for Total Suspended Particulate lead, PM_{10}, and $PM_{2.5}$ using federal reference methods (FRM) to determine compliance with state and federal air quality standards.

Port Community Air Quality Enforcement/I-710 Monitoring - inspecting and auditing marine vessels in the Rule 1631 pilot credit generation program. These oversight activities will help ensure the credit generation program produces real, quantified, and enforceable emissions reductions. Measurements including air toxics and criteria pollutants collected to determine impact of port activities on air quality near the ports and surrounding communities.

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 hotelling emissions form 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 SCAQMD workforce utilization, processing personnel transactions for use by Payroll, and preparing reports regarding employee status, personnel transactions, and vacant positions.

PR 2301 Indirect Source Rule (ISR) Implementation– developing and implementing rules to mitigate emissions growth from new and redevelopment projects; the scope of the rule will include the reduction of emissions related to residential, commercial and industrial projects.

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 SCAQMD 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 SCAQMD information materials.

Public Notification – providing timely and adequate notification to the public of SCAQMD rulemaking workshops and public hearing, 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 SCAQMD programs.

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 SCAQMD 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.

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 SCAQMD.

Records Services – maintaining SCAQMD'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 the SCAQMD's Records Retention Policy.

Recruitment and Selection – assisting SCAQMD management in meeting staffing needs by conducting fair and non-discriminatory recruitment and selection processes that result in qualified, diverse applicants for SCAQMD 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 the SCAQMD's Rule 2202 Trip Reduction Plan.

Risk Management - developing and administering SCAQMD's liability, property, and workers' compensation and safety programs.

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 the SCAQMD.

Rulemaking/Rules (NOx, BACT, SOx, VOC, Toxics, RECLAIM, Support PRA, Legal Advice) – developing new rules and evaluating existing SCAQMD 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.

SCAQMD Mail – processing and delivering all incoming and outgoing mail.

SCAQMD Projects – SCAQMD permitting and rule development projects where a California Environmental Quality Act (CEQA) document is prepared and the SCAQMD 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 (Financial, Legal, Permit Streamlining) **-** 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.

Source Education - providing classes to facility owners and operators to ensure compliance with applicable SCAQMD'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 SCAQMD Rules. Additionally, data submitted by facilities is reviewed for protocol approval, CEMS certification, or test data acceptance.

Speaker's Bureau - training SCAQMD staff for advising local government and private industry on air quality issues.

Special Monitoring (Emergency, Rule 403) – 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 SCAQMD 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 SCAQMD.

Subscription Services - maintaining SCAQMD's rule subscription mailing list and coordinating the mailing of SCAQMD 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 SCAQMD's business fluctuations, including minor modifications, special requests, fixes, and general maintenance.

Targeted Air Shed – funding from EPA to reduce air pollution in the nation's areas with the highest levels of ozone or particulate matter 2.5 ($PM_{2.5}$) exposure.

Technology Advancement (Commercialization, non-Combustion) - supporting the development of innovative controls for mobile and stationary sources, reviewing promising control technologies, and identifying those most deserving of SCAQMD developmental support.

Title III (Inspections, Rulemaking) - permitting equipment that emits hazardous air pollutants in compliance with the federal Clean Air Act.

Title V (Compliance,Legal Advice, Inspections, NSR Permits, Rulemaking) - developing and implementing a permit program in compliance with the federal Clean Air Act.

Toxic Inventory Development – non-facility specific tasks performed by the AB 2588 team to include toxic inventory development, support for rule development, and responding to public records and other data requests.

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 the District'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.

TraPac Air Filtration Program – implementing/administering the installation and maintenance of air filtration systems at Wilmington area schools.

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

VEE Trains – conducting periodic visible emission evaluations (VEE) of trains to verify compliance with visible emission requirements.

VOC Sample Analysis (Compliance/Rules/SBA/Other) - providing data and technical input for VOC rule development, performing analytical testing for compliance with SCAQMD 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.

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 SCAQMD's internet and/or intranet website.

WORK PROGRAM ACRONYMS

ORGANIZATIONAL UNITS

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

PROGRAMS

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
ERC	Emission Reduction Credit
GGRF	Greenhouse Gas Reduction Fund
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

POLLUTANTS

CO	Carbon Monoxide
NO_x	Oxides of Nitrogen
O_3	Ozone
$PM_{2.5}$	Particulate Matter <2.5 microns
PM_{10}	Particulate Matter $\leq$ 10 microns
ROG	Reactive Organic Gases
SO_x	Oxides of Sulfur
VOC	Volatile Organic Compound

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
CE-CERT	College of Engineering-Center for Environmental Research and Technology
CLASS	Clean Air Support System
CNG	Compressed Natural Gas
CTC	County Transportation Commission
CTG	Control Techniques Guideline
DB	Database
DPF	Diesel Particulate Filter
EIR	Environmental Impact Report
EJ	Environmental Justice
ETC	Employee Transportation Coordinator
EV	Electric Vehicle
FIP	Federal Implementation Plan
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
MPO	Metropolitan Planning Organization
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
ODC	Ozone Depleter Compounds
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
SCR	Selective Catalytic Reduction
STE	Source Testing Evaluations
SULEV	Super Ultra Low-Emission Vehicle
TCM	Transportation Control Measure
ULEV	Ultra- Low-Emissions Vehicle
VEE	Visible Emissions Evaluations
VMT	Vehicle Miles Traveled
ZECT	Zero Emission Cargo Transport
ZEV	Zero-Emission Vehicle

Governing Board

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 SCAQMD Executive Officer and General Counsel, and members of the Hearing Board.

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 2014-15 Actuals**	**FY 2015-16 Adopted Budget**	**FY 2015-16 Amended Budget**	**FY 2015-16 Estimate ***	**FY 2016-17 Proposed Budget**
Salary & Employee Benefits						
51000-52000	Salaries	$ 251,577	$ 403,710	$ 412,572	$ 237,027	$ 311,670
53000-55000	Employee Benefits	21,636	252,431	253,215	20,266	244,285
Sub-total Salary & Employee Benefits		$ 273,213	$ 656,140	$ 665,787	$ 257,293	$ 555,955
Services & Supplies						
67250	Insurance	$ -	$ -	$ -	$ -	$ -
67300	Rents & Leases Equipment	-	-	-	-	-
67350	Rents & Leases Structure	-	-	-	-	-
67400	Household	-	-	-	-	-
67450	Professional & Special Services	439,784	436,777	591,102	580,425	713,628
67460	Temporary Agency Services	-	-	-	-	-
67500	Public Notice & Advertising	46,703	52,000	52,560	52,000	52,000
67550	Demurrage	-	-	-	-	-
67600	Maintenance of Equipment	-	-	-	-	-
67650	Building Maintenance	-	-	-	-	-
67700	Auto Mileage	8,922	10,000	10,000	10,000	10,000
67750	Auto Service	-	-	-	-	-
67800	Travel	45,008	64,800	64,800	59,505	64,800
67850	Utilities	-	-	-	-	-
67900	Communications	36,064	20,000	23,329	36,988	20,000
67950	Interest Expense	-	-	-	-	-
68000	Clothing	-	-	-	-	-
68050	Laboratory Supplies	-	-	-	-	-
68060	Postage	1,688	10,000	10,000	2,603	10,000
68100	Office Expense	4,660	4,000	3,440	3,024	4,000
68200	Office Furniture	-	-	-	-	-
68250	Subscriptions & Books	-	-	-	-	-
68300	Small Tools, Instruments, Equipment	-	-	-	-	-
68400	Gas and Oil	-	-	-	-	-
69500	Training/Conference/Tuition/ Board Exp.	118,940	112,500	112,000	112,000	112,500
69550	Memberships	-	-	-	-	-
69600	Taxes	-	-	-	-	-
69650	Awards	-	-	-	-	-
69700	Miscellaneous Expenses	33,760	15,000	15,500	15,500	15,000
69750	Prior Year Expense	-	-	-	-	-
69800	Uncollectable Accounts Receivable	-	-	-	-	-
89100	Principal Repayment	-	-	-	-	-
Sub-total Services & Supplies		$ 735,529	$ 725,077	$ 882,731	$ 872,045	$ 1,001,928
77000	**Capital Outlays**	$ -	$ -	$ -	$ -	$ -
79050	**Building Remodeling**	$ -	$ -	$ -	$ -	$ -
Total Expenditures		$ 1,008,742	$ 1,381,217	$ 1,548,518	$ 1,129,339	$ 1,557,883
* Estimates based on July 2015 through February 2016 actual expenditures and budget amendments.						

DISTRICT GENERAL

Accounts associated with general operations of the SCAQMD are budgeted and tracked in District General. Included are such items as 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 2014-15 Actuals**	**FY 2015-16 Adopted Budget**	**FY 2015-16 Amended Budget**	**FY 2015-16 Estimate ***	**FY 2016-17 Proposed Budget**
Salary & Employee Benefits						
51000-52000	Salaries	$ -	$ 990,000	$ 583,638	$ 580,875	$ 990,000
53000-55000	Employee Benefits	11,814	240,000	240,000	8,331	380,000
Sub-total Salary & Employee Benefits		$ 11,814	$ 1,230,000	$ 823,638	$ 589,206	$ 1,370,000
Services & Supplies						
67250	Insurance	$ 1,143,957	$ 1,317,400	$ 1,297,400	$ 1,188,369	$ 1,317,400
67300	Rents & Leases Equipment	18,637	18,600	18,700	18,700	18,600
67350	Rents & Leases Structure	-	-	-	-	-
67400	Household	570,365	717,066	641,966	629,426	717,066
67450	Professional & Special Services	1,000,087	1,560,475	1,665,474	1,349,086	1,177,975
67460	Temporary Agency Services	-	-	-	-	-
67500	Public Notice & Advertising	24,364	25,000	25,000	24,364	25,000
67550	Demurrage	-	-	-	-	-
67600	Maintenance of Equipment	22,661	141,900	293,843	293,843	141,900
67650	Building Maintenance	683,224	1,356,479	1,005,940	986,444	831,479
67700	Auto Mileage	-	-	-	-	-
67750	Auto Service	-	-	-	-	-
67800	Travel	-	-	-	-	-
67850	Utilities	1,824,686	1,943,689	1,943,689	1,621,092	2,213,288
67900	Communications	110,224	120,900	117,571	112,167	120,900
67950	Interest Expense	4,031,995	3,954,554	3,954,555	3,954,555	3,863,482
68000	Clothing	-	-	-	-	-
68050	Laboratory Supplies	-	-	-	-	-
68060	Postage	26,053	30,000	30,000	23,914	30,000
68100	Office Expense	241,184	278,800	270,857	237,513	275,150
68200	Office Furniture	1,530	4,000	4,000	1,716	4,000
68250	Subscriptions & Books	-	-	-	-	-
68300	Small Tools, Instruments, Equipment	-	-	-	-	-
68350	Film	-	-			-
68400	Gas and Oil	(2,482)	-	-	-	-
69500	Training/Conference/Tuition/ Board Exp.	-	-	-	-	-
69550	Memberships	-	-	-	-	-
69600	Taxes	32,353	71,000	40,323	40,323	71,000
69650	Awards	21,734	27,342	27,342	25,233	27,342
69700	Miscellaneous Expenses	8,683	11,375	11,375	11,375	11,675
69750	Prior Year Expense	(31,301)	-	-	-	-
69800	Uncollectable Accounts Receivable	3,049	-	-	-	-
89100	Principal Repayment	3,159,384	2,235,598	2,235,598	2,235,598	2,331,010
Sub-total Services & Supplies		$ 12,890,387	$ 13,814,178	$ 13,583,633	$ 12,753,717	$ 13,177,267
77000	**Capital Outlays**	$ 765,119	$ 230,000	$ -	$ -	$ 165,000
79050	**Building Remodeling**	$ -	$ -	$ -	$ -	$ -
Total Expenditures		$ 13,667,320	$ 15,274,178	$ 14,407,271	$ 13,342,923	$ 14,712,267
* Estimates based on July 2015 through February 2016 actual expenditures and budget amendments.						

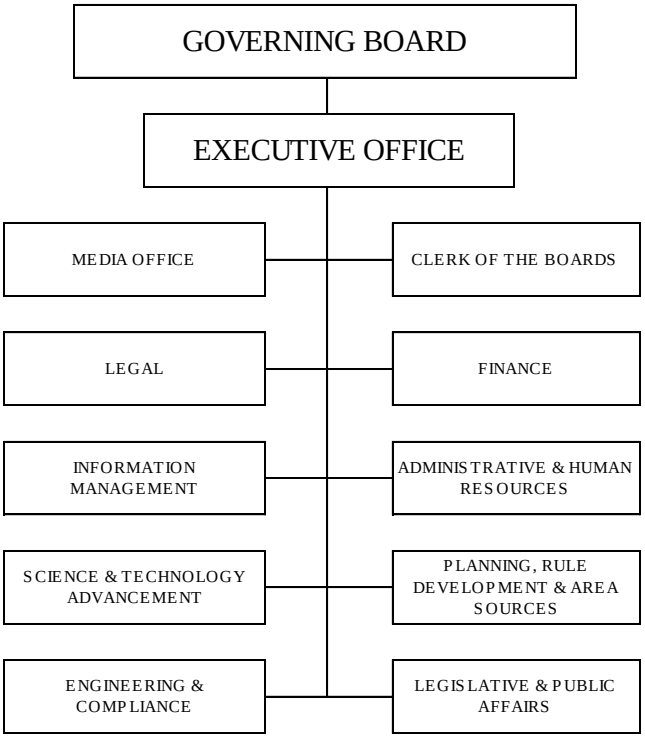
EXECUTIVE OFFICE

WAYNE NASTRI
ACTING EXECUTIVE OFFICER

DESCRIPTION OF MAJOR SERVICES:

The Executive Office is responsible for the comprehensive management of the SCAQMD 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, a Senior Policy Advisor, and five 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.



POSITION SUMMARY: 7 FTEs

Executive Office Unit	FY 15-16	Change	Proposed FY 16-17
Administration	7	-	7

STAFFING DETAIL:

2016-17 Requested Staffing

Position	Title
1	Executive Officer
3	Executive Secretary
1	Senior Administrative Secretary
1	Senior Policy Advisor
1	Staff Specialist
7	Total Requested Positions

Executive Office
Work Program by Office

#	Program Code		Program Category	Goal	Program	Activities	FTEs FY 2015-16	FTEs +/-	FTEs FY 2016-17	Revenue Category
1	03	010	Develop Programs	I	AQMP	Develop/Implement AQMP	0.05		0.05	II,IX
2	03	028	Develop Programs	I	Admin/SCAQMD Policy	Dev/Coord Goals/Policies/Overs	2.00		2.00	Ia
3	03	038	Operational Support	III	Admin/Office Management	Budget/Program Management	1.00		1.00	Ib
4	03	078	Policy Support	II	Asthma & Outdoor AQ Consortium	Asthma & Outdoor AQ Consortium	0.01		0.01	Ia
5	03	083	Policy Support	II	Brain Tumor & Air Poll Foundat	Brain Tumor & Air Poll Foundation Support	0.03		0.03	Ia
6	03	275	Policy Support	I	Governing Board	Board/Committee Support	1.60		1.60	Ia
7	03	276	Policy Support	III	Advisory Group/Governing Board	Governing Board Advisory Group	0.05		0.05	Ia
8	03	381	Policy Support	I	Interagency Liaison	Local/State/Fed Coord/Interact	0.40		0.40	Ia,IX
9	03	385	Develop Rules	I	Credit Generation Programs	Dev/Impl Marketable Permit	0.02		0.02	II
10	03	390	Customer Service and Business Assistance	I	Local Govt Policy Development	Policy Development	0.05		0.05	Ia,IX
11	03	410	Policy Support	I	Legislation	Testimony/Mtgs:New/Current Leg	0.50		0.50	Ia,IX
12	03	416	Policy Support	I	Legislative Activities	Supp/Promote/Influence Legis/Adm	0.05		0.05	Ia
13	03	455	Advance Clean Air Technology	I	Mobile Sources	Dev/Impl Mobile Source Strategies	0.10		0.10	IX
14	03	490	Customer Service and Business Assistance	II	Outreach	Publ Awareness Clean Air Prog	1.00		1.00	Ia
15	03	565	Customer Service and Business Assistance	III	Public Records Act	Comply w/ Public Req for Info	0.05		0.05	Ia
16	03	650	Develop Rules	I	Rules	Develop & Implement Rules	0.04		0.04	II,IV,IX
17	03	717	Policy Support	III	Student Interns	Gov Board/Student Intern Program	0.02		0.02	Ia
18	03	855	Operational Support	II	Web Tasks	Create/edit/review web content	0.03		0.03	Ia
						Total	7.00	0.00	7.00	

Executive Office Line Item Expenditure						
Major Object / Account # **/** Account Description		**FY 2014-15 Actuals**	**FY 2015-16 Adopted Budget**	**FY 2015-16 Amended Budget**	**FY 2015-16 Estimate ***	**FY 2016-17 Proposed Budget**
Salary & Employee Benefits						
51000-52000	Salaries	$ 980,841	$ 932,281	$ 1,310,532	$ 1,178,227	$ 954,942
53000-55000	Employee Benefits	552,312	513,358	518,843	444,842	523,495
Sub-total Salary & Employee Benefits		$ 1,533,153	$ 1,445,638	$ 1,829,375	$ 1,623,069	$ 1,478,436
Services & Supplies						
67250	Insurance	$ -	$ -	$ -	$ -	$ -
67300	Rents & Leases Equipment	-	-	-	-	-
67350	Rents & Leases Structure	-	-	-	-	-
67400	Household	-	-	-	-	-
67450	Professional & Special Services	-	50,000	50,000	50,000	150,000
67460	Temporary Agency Services	-	-	-	-	-
67500	Public Notice & Advertising	-	7,500	7,500	-	7,500
67550	Demurrage	-	-	-	-	-
67600	Maintenance of Equipment	-	400	400	-	400
67650	Building Maintenance	-	-	-	-	-
67700	Auto Mileage	381	800	800	452	800
67750	Auto Service	-	-	-	-	-
67800	Travel	30,645	52,000	52,000	31,795	52,000
67850	Utilities	-	-	-	-	-
67900	Communications	3,847	6,500	6,500	5,046	6,500
67950	Interest Expense	-	-	-	-	-
68000	Clothing	-	-	-	-	-
68050	Laboratory Supplies	-	-	-	-	-
68060	Postage	15	7,000	7,000	581	7,000
68100	Office Expense	2,601	6,000	6,000	3,152	6,300
68200	Office Furniture	-	-	-	-	-
68250	Subscriptions & Bools	-	5,000	5,000	-	5,000
68300	Small Tools, Instruments, Equipment	-	-	-	-	-
68400	Gas and Oil	-	-	-	-	-
69500	Training/Conference/Tuition/ Board Exp.	2,070	1,000	1,800	1,800	1,000
69550	Memberships	25,000	26,000	26,000	25,000	26,000
69600	Taxes	-	-	-	-	-
69650	Awards	-	-	-	-	-
69700	Miscellaneous Expenses	1,747	25,000	24,200	16,520	25,000
69750	Prior Year Expense	-	-	-	-	-
69800	Uncollectable Accounts Receivable	-	-	-	-	-
89100	Principal Repayment	-	-	-	-	-
Sub-total Services & Supplies		$ 66,306	$ 187,200	$ 187,200	$ 134,346	$ 287,500
77000	**Capital Outlays**	$ -	$ -	$ -	$ -	$ -
79050	**Building Remodeling**	$ -	$ -	$ -	$ -	$ -
Total Expenditures		$ 1,599,459	$ 1,632,838	$ 2,016,575	$ 1,757,415	$ 1,765,936
* Estimates based on July 2015 through February 2016 actual expenditures and budget amendments.						

CLERK OF THE BOARDS

SAUNDRA MCDANIEL
CLERK OF THE BOARDS

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 assists petitioners and attorneys in the filing of petitions before the Hearing Board and explains 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 SCAQMD staff and state and federal agencies.

ACCOMPLISHMENTS:

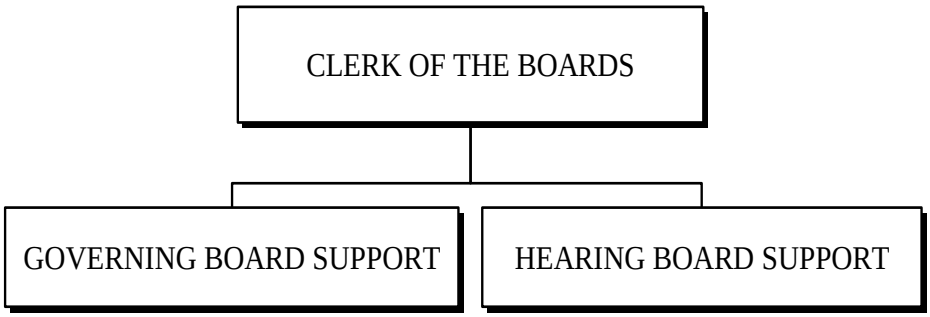
RECENT:

- Received and processed 31 subpoenas, public/administrative records requests, and claims against the District.
- Provided support for 14 Governing Board meetings, including: preparing an agenda and minutes for each meeting; preparation, distribution, and publication of 25 meeting and public hearing notices; preparation of 23 Board Resolutions.
- Provided support for 89 hearings, pre-hearing conferences, and general meetings held by the Hearing Board, including: processing 118 petitions; preparation, distribution, and publication of 128 meeting and public hearing notices; preparation of 156 Minute Orders, Findings & Decisions, Pre-hearing Memoranda, and General Meeting Reports of Actions; and preparation and distribution of 150 daily agendas and monthly case calendars.
- Planned/coordinated efforts and provided clerical support for special offsite meetings.

ANTICIPATED:

- Provide support for approximately 140 hearings, pre-hearing conferences, and general meetings held by the Hearing Board, including: processing approximately 160 petitions; preparation, distribution, and publication of 130-140 meeting and public hearing notices; preparation of over 200 Minute Orders, Findings and Decisions, Pre-hearing Memoranda, and General Meeting Reports of Actions; and preparation and distribution of more than 200 daily agendas and monthly case calendars.

ORGANIZATIONAL CHART:



POSITION SUMMAEY: 6 FTEs

Clerk of the Boards Unit	FY 2015-16	Change	Proposed FY 2016-17
Governing/Hearing Board Support	6	-	6

STAFFING DETAIL:

2016-17 Requested Staffing

Position	Title
1	Clerk of the Board
3	Deputy Clerk/Transcriber
1	Office Assistant
1	Senior Deputy Clerk
6	Total Requested Positions

Clerk of the Boards Work Program by Office										
#	Program Code		Program Category	Goal	Program	Activities	FTEs FY 2015-16	+/-	FTEs FY 2016-17	Revenue Category
1	17	024	Operational Support	III	Admin/SCAQMD/GB/HB Mgmt	Admin Governing/Hearing Brds	1.25		1.25	Ia,VII,XV
2	17	275	Operational Support	III	Governing Board	Attend/Record/Monitor Meetings	1.40		1.40	Ia
3	17	364	Ensure Compliance	I	Hearing Board/Abatement Orders	Attnd/Recrd/Monitr Mtgs	0.10		0.10	IV
4	17	365	Ensure Compliance	I	Hearing Board/Variances/Appeal	Attend/Record/Monitor HB Mtgs	3.20		3.20	IV,V,VII
5	17	565	Customer Service and Business Assistance	III	Public Records Act	Comply w/ Public Rec Requests	0.02		0.02	Ia
6	17	855	Ensure Compliance	II	Web Tasks	Create/edit/review web content	0.03		0.03	Ia
						Total	6.00	0.00	6.00	

Clerk of the Boards Line Item Expenditure						
Major Object / Account # **/** Account Description		**FY 2014-15 Actuals**	**FY 2015-16 Adopted Budget**	**FY 2015-16 Amended Budget**	**FY 2015-16 Estimate ***	**FY 2016-17 Proposed Budget**
Salary & Employee Benefits						
51000-52000	Salaries	$ 410,391	$ 390,836	$ 390,837	$ 448,473	$ 407,113
53000-55000	Employee Benefits	236,688	232,553	232,553	252,834	248,286
Sub-total Salary & Employee Benefits		$ 647,080	$ 623,390	$ 623,390	$ 701,307	$ 655,399
Services & Supplies						
67250	Insurance	$ -	$ -	$ -	$ -	$ -
67300	Rents & Leases Equipment	-	-	-	-	-
67350	Rents & Leases Structure	-	-	-	-	-
67400	Household	-	-	-	-	-
67450	Professional & Special Services	-	25,400	30,400	30,400	25,400
67460	Temporary Agency Services	-	-	-	-	-
67500	Public Notice & Advertising	26,524	40,000	35,000	22,580	40,000
67550	Demurrage	-	-	-	-	-
67600	Maintenance of Equipment	-	200	200	-	200
67650	Building Maintenance	-	-	-	-	-
67700	Auto Mileage	-	100	200	200	100
67750	Auto Service	-	-	-	-	-
67800	Travel	-	200	200	-	200
67850	Utilities	-	-	-	-	-
67900	Communications	20	500	500	-	500
67950	Interest Expense	-	-	-	-	-
68000	Clothing	-	-	-	-	-
68050	Laboratory Supplies	-	-	-	-	-
68060	Postage	641	1,200	1,200	940	1,200
68100	Office Expense	1,497	6,600	6,600	5,456	6,600
68200	Office Furniture	-	-	-	-	-
68250	Subscriptions & Books	-	-	-	-	-
68300	Small Tools, Instruments, Equipment	-	-	-	-	-
68400	Gas and Oil	-	-	-	-	-
69500	Training/Conference/Tuition/ Board Exp.	358,340	391,873	391,873	386,227	391,873
69550	Memberships	-	-	-	-	-
69600	Taxes	-	-	-	-	-
69650	Awards	-	-	-	-	-
69700	Miscellaneous Expenses	50	500	400	118	500
69750	Prior Year Expense	-	-	-	-	-
69800	Uncollectable Accounts Receivable	-	-	-	-	-
89100	Principal Repayment	-	-	-	-	-
Sub-total Services & Supplies		$ 387,072	$ 466,573	$ 466,573	$ 445,921	$ 466,573
77000	**Capital Outlays**	$ -	$ -	$ -	$ -	$ -
79050	**Building Remodeling**	$ -	$ -	$ -	$ -	$ -
Total Expenditures		$ 1,034,152	$ 1,089,963	$ 1,089,963	$ 1,147,229	$ 1,121,972
* Estimates based on July 2015 through February 2016 actual expenditures and budget amendments.						

MEDIA OFFICE

SAM ATWOOD
MEDIA RELATIONS MANAGER

DESCRIPTION OF MAJOR SERVICES:

SCAQMD's 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 SCAQMD 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.

Services provided by the Media Relations Office include telephone, in-person and on-camera interviews with news media; planning and execution of media events; and the creation, production and distribution of news releases, media advisories, web content, letters to the editor, op-eds, flyers, brochures and videos. The Media Relations Office also plans and executes major advertising and marketing initiatives in partnership with outside contractors.

ACCOMPLISHMENTS:

RECENT:

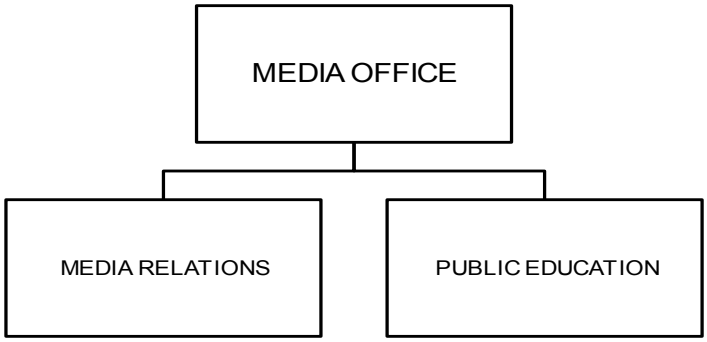
- Launched a new advertising campaign with Google to promote the SCAQMD brand and specific SCAQMD programs through videos on YouTube and banner ads on websites.
- Implemented the third year of an enhanced winter Check Before You Burn advertising and outreach campaign, including radio, online and billboard ads to continue educating and informing residents about the program and mandatory no-burn days.
- Supported the 2015 Lawn Mower Exchange Program with enhanced advertising and outreach.
- Supported SCAQMD's commercial lawn mower program with a press event to deliver 17 commercial mowers to seven agencies in San Bernardino County.
- Supported SCAQMD's school air filtration program with a press event at one school in Boyle Heights that received a new air filtration system.
- Distributed new educational video "Do One Thing" to encourage Southland residents to do one thing to help clean our air.
- Supported SCAQMD programs and projects through ongoing outreach to media through press releases, media advisories, press events, opinion pieces and letters to the editor.

- Provided media relations services and strategic counsel for high-profile media issues through press releases, media advisories, in-person and on-camera interviews, and opinion pieces and letters to the editor.

ANTICIPATED:

- Oversee implementation of Google advertising program to promote the SCAQMD brand and specific SCAQMD programs.
- Support the 2016 Lawn Mower Exchange program with outreach.
- Implement outreach for the 2016-2017 Check Before You Burn season to educate media and public about the program and mandatory no-burn days.
- Support SCAQMD programs and projects through ongoing outreach to media through press releases, media advisories, press events, opinion pieces and letters to the editor. d
- Provide media relations services and strategic counsel for high-profile media issues through press releases, media advisories, in-person and on-camera interviews, and opinion pieces and letters to the editor.

ORGIZATIONAL CHART:



POSITION SUMMARY: 5 FTEs

Media Office Unit	FY 2015-16	Change	Proposed FY 2016-17
Media Relations/Public Education	3	2	5

STAFFING DETAIL:

2016-17 Requested Staffing

Position	Title
1	Community Relations Manager
1	Secretary
2	Senior Public Information Specialist
1	Staff Assistant
5	Total Requested Positions

Media Office Work Program by Office										
#	Program Code		Program Category	Goal	Program	Activities	FTEs FY 2015-16	FTEs +/-	FTEs FY 2016-17	Revenue Category
1	20	494	Policy Support	II	Outreach/Media	Edits,Brds,Talk shows,Commercl	2.96	1.00	3.96	Ia,IX
2	20	855	Operational Support	II	Web Tasks	Create/edit/review web content	0.04	1.00	1.04	Ia
						Total	3.00	2.00	5.00	

Media Office Line Item Expenditure						
Major Object / Account # **/** Account Description		**FY 2014-15 Actuals**	**FY 2015-16 Adopted Budget**	**FY 2015-16 Amended Budget**	**FY 2015-16 Estimate ***	**FY 2016-17 Proposed Budget**
Salary & Employee Benefits						
51000-52000	Salaries	$ 283,210	$ 264,690	$ 264,690	$ 285,313	$ 467,189
53000-55000	Employee Benefits	156,708	151,641	151,641	165,269	274,224
Sub-total Salary & Employee Benefits		$ 439,918	$ 416,331	$ 416,331	$ 450,582	$ 741,413
Services & Supplies						
67250	Insurance	$ -	$ -	$ -	$ -	$ -
67300	Rents & Leases Equipment	-	500	500	-	500
67350	Rents & Leases Structure	-	-	-	-	-
67400	Household	-	-	-	-	-
67450	Professional & Special Services	60,527	29,000	43,740	44,240	29,000
67460	Temporary Agency Services	-	-	-	-	36,000
67500	Public Notice & Advertising	-	-	-	-	-
67550	Demurrage	-	-	-	-	-
67600	Maintenance of Equipment	-	-	-	-	-
67650	Building Maintenance	-	-	-	-	-
67700	Auto Mileage	604	1,000	1,000	582	1,000
67750	Auto Service	-	-	-	-	-
67800	Travel	384	2,000	2,000	1,188	2,000
67850	Utilities	-	-	-	-	-
67900	Communications	1,872	2,000	2,000	2,000	2,000
67950	Interest Expense	-	-	-	-	-
68000	Clothing	-	-	-	-	-
68050	Laboratory Supplies	-	-	-	-	-
68060	Postage	91	1,000	1,000	92	1,000
68100	Office Expense	1,401	2,500	7,960	7,960	3,500
68200	Office Furniture	-	-	-	-	-
68250	Subscriptions & Books	1,387	2,000	2,500	2,000	2,000
68300	Small Tools, Instruments, Equipment	-	-	-	-	-
68400	Gas and Oil	-	-	-	-	-
69500	Training/Conference/Tuition/ Board Exp.	-	1,500	325	-	500
69550	Memberships	575	750	925	575	750
69600	Taxes	-	-	-	-	-
69650	Awards	-	-	-	-	-
69700	Miscellaneous Expenses	347	1,600	600	600	1,600
69750	Prior Year Expense	-	-	-	-	-
69800	Uncollectable Accounts Receivable	-	-	-	-	-
89100	Principal Repayment	-	-	-	-	-
Sub-total Services & Supplies		$ 67,186	$ 43,850	$ 62,550	$ 59,237	$ 79,850
77000	**Capital Outlays**	$ -	$ -	$ -	$ -	$ -
79050	**Building Remodeling**	$ -	$ -	$ -	$ -	$ -
Total Expenditures		$ 507,104	$ 460,181	$ 478,881	$ 509,819	$ 821,263

* Estimates based on July 2015 through February 2016 actual expenditures and budget amendments.

SOUTH COAST

AIR QUALITY MANAGEMENT DISTRICT

LEGAL

KURT WIESE
GENERAL COUNSEL

DESCRIPTION OF MAJOR SERVICES:

The General Counsel's Office is responsible for advising the SCAQMD Board and staff on all legal matters and enforcing SCAQMD rules and state laws related to air pollution controls. Attorneys review and assist in the drafting of SCAQMD rules and regulations to ensure they are within the District'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 are satisfied.

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

The Office is responsible for the enforcement of all SCAQMD rules and regulations and applicable state law. In addition, staff attorneys represent the Executive Officer in all matters before the SCAQMD 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:

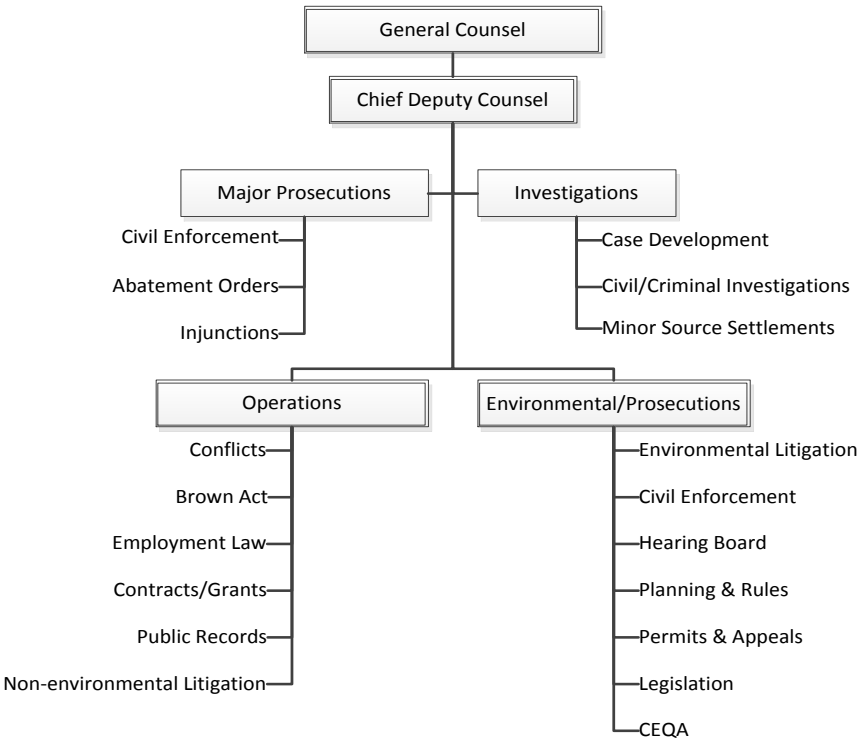
- Successfully defended challenges by Exide to SCAQMD Rule 1420.1 limiting lead emissions
- Obtained order for abatement from SCAQMD Hearing Board requiring implementation of risk reduction measures at the Exide facility in Vernon, a lead-acid battery recycler
- Successfully defended challenge by environmentalists to EPA's approval of SCAQMD's 2007 PM2.5 plan, confirming ability to rely on enforceable commitments for rulemaking
- Successfully defended environmentalist challenge to EPA's approval of SCAQMD Rule 1315, which establishes SCAQMD "internal bank" of offsets used by essential public services and other high-priority projects
- Successfully defended environmentalist challenge to EPA's approval of SCAQMD Rule 317, substituting motor vehicle fees for fees otherwise required to be imposed on stationary sources under Clean Air Act §185
- Obtained abatement order and preliminary injunction against Ridgeline Energy Services, a wastewater treatment company in Santa Fe Springs for creating a public nuisance and releasing H_2S, a toxic air pollutant

- Obtained abatement order against Rainbow Environmental Services, a trash collection and recycling facility for creating a public nuisance affecting a school in Huntington Beach
- Obtained abatement order against Hixson Metal Finishing, a chrome and other metals finishing facility in Newport Beach, for releasing hexavalent chromium causing unacceptably high cancer risk and requiring implementation of risk reduction measures
- Provided legal advice for all issues related to adoption of amendments to RECLAIM rule, providing a cap and trade program for large NOx emitters
- Successfully defended environmentalist challenges to the CEQA document for a storage tank project at local Phillips 66 refinery
- Provided legal advice and testimony in legislature to rebut claims that Carl Moyer Program violates Proposition 13 because it allows motor vehicle fees to be used to reduce emissions from other mobile sources and stationary sources

ANTICIPATED:

- Develop high impact enforcement cases to maximize deterrence for air pollution violations.
- Implement training programs to broaden staff knowledge of and ability to handle all types of work handled by the office.
- Provide legal advice concerning the SCAQMD's priority projects such as the 2016 AQMP, SoCal Gas leak, and rules to implement the 2012 AQMP and reduce toxic exposure.

ORGANIZATIONAL CHART:



POSITION SUMMARY: 32 FTEs

Legal Units	FY 2015-16	Change	Proposed FY 2016-17
Office Administration	4	-	4
General Counsel	22	-	22
Investigations	6	-	6
Total	32	-	32

STAFFING DETAIL:

2016-17 Requested Staffing

Position	Title
4	Administrative Secretary/Legal
1	Assistant Chief Deputy – Major Prosecutions
1	Chief Deputy Counsel
1	General Counsel
1	Investigations Manager
4	Investigator
3	Legal Secretary
2	Paralegal
4	Principal Deputy District Counsel
8	Senior Deputy District Counsel
1	Senior Office Assistant
1	Senior Paralegal
1	Supervising Investigator
32	Total Requested Positions

Legal Work Program by Office										
#	Program Code		Program Category	Goal	Program	Activities	FTEs FY 2015-16	FTEs +/-	FTEs FY 2016-17	Revenue Category
1	08	001	Advance Clean Air Technology	I	AB2766/Mob Src/Legal Advice	AB2766 Leg Adv: Trans/Mob Source	0.05		0.05	IX
2	08	003	Advance Clean Air Technology	I	AB2766/MSRC	Legal Advice: MSRC Prog Admin	0.15		0.15	IX
3	08	009	Develop Programs	I	AB 1318 Mitigation	AB 1318 Projects Admn/Impl	0.05		0.05	XVII
4	08	010	Develop Programs	I	AQMP	AQMP Revision/CEQA Review	0.60	(0.40)	0.20	II,IV,IX
5	08	025	Operational Support	III	Admin/SCAQMD-Legal Research	Legal Research/Staff/Exec Mgmt	1.20		1.20	Ia
6	08	038	Operational Support	III	Admin/Office Management	Attorney Timekeeping/Perf Eval	3.50		3.50	Ib
7	08	071	Operational Support	I	Arch Ctgs - Admin	Rule Dev/TA/Reinterpretations	0.50	(0.45)	0.05	XVIII
8	08	072	Ensure Compliance	I	Arch Ctgs - End User	Case Dispo/Rvw, Track, Prep NOVs	0.05		0.05	XVIII
9	08	073	Ensure Compliance	I	Arch Ctgs - Other	Case Dispo/Rvw, Track, Prep NOVs	0.05		0.05	XVIII
10	08	102	Operational Support	II	CEQA Document Projects	CEQA Review	1.00		1.00	II,III,IX
11	08	115	Ensure Compliance	I	Case Disposition	Trial/Dispo-Civil Case/Injunct	5.00		5.00	II,IV,V,VII,XV
12	08	131	Advance Clean Air Technology	I	Clean Fuels/Legal Advice	Legal Advice: Clean Fuels	0.05		0.05	VIII
13	08	154	Ensure Compliance	I	Compliance/NOV Administration	Review/Track/Prep NOVs/MSAs	1.20		1.20	IV
14	08	185	Ensure Compliance	I	Database Management	Support IM/Dev Tracking System	0.20	0.05	0.25	IV
15	08	227	Operational Support	III	Employee/Employment Law	Legal Advice: Employment Law	1.00		1.00	Ia
16	08	235	Ensure Compliance	I	Enforcement Litigation	Maj Prosecutions/Civil Actions	1.00	1.00	2.00	IV
17	08	275	Operational Support	III	Governing Board	Legal Advice:Attend Board/Cmte Mtgs	1.00		1.00	Ia
18	08	366	Ensure Compliance	I	Hearing Board/Legal	Hear/Disp-Varian/Appeal/Rev	3.00		3.00	IV,V,XV
19	08	380	Ensure Compliance	I	Interagency Coordination	Coordinate with Other Agencies	0.25	(0.05)	0.20	II,V
20	08	401	Operational Support	III	Legal Advice/SCAQMD Programs	General Advice: Contracts	2.00		2.00	Ia
21	08	402	Ensure Compliance	III	Legal Advice/Legislation	Legal Support/Rep on Legal Matter	0.10	(0.10)		Ia
22	08	403	Ensure Compliance	III	Legal Rep/Litigation	Prep/Hearing/Disposition	3.50		3.50	Ia,II
23	08	404	Customer Service and Business Assistance	I	Legal Rep/Legislation	Draft Legis/SCAQMD Position/Mtgs	0.05		0.05	II,IX,XV
24	08	416	Policy Support	I	Legislative Activities	Lobbying: Supp/Promote/Influence legis/Adm	0.10		0.10	Ia
25	08	457	Advance Clean Air Technology	I	Mob Src/C Moyer/Leg Advice	Moyer/Implem/Program Dev	0.20	(0.10)	0.10	IX
26	08	465	Ensure Compliance	I	Mutual Settlement	Mutual Settlement Program	3.00		3.00	IV,V
27	08	516	Timely Review of Permits	I	Permit Processing/Legal	Legal Advice: Permit Processing	0.15	0.05	0.20	III
28	08	565	Customer Service and Business Assistance	III	Public Records Act	Comply w/ Public Rec Requests	1.00		1.00	Ia
29	08	651	Develop Rules	I	Rules/Legal Advice	Legal Advice: Rules/Draft Regs	1.00		1.00	II
30	08	661	Develop Rules	I	Rulemaking/RECLAIM	RECLAIM Legal Adv/Related Iss	0.05		0.05	II
31	08	681	Customer Service and Business Assistance	III	Small Business/Legal Advice	Legal Advice: SB/Fee Review	0.05		0.05	II,III
32	08	717	Policy Support	II	Student Interns	Gov Board/Student Intern Program	0.20		0.20	Ia
33	08	770	Ensure Compliance	I	Title V	Leg Advice: Title V Prog/Perm Dev	0.05		0.05	II,IV
34	08	772	Timely Review of Permits	I	Title V Permits	Leg Advice: New Source Title V Permit	0.05		0.05	III
35	08	791	Ensure Compliance	I	Toxics/AB2588	AB2588 Legal Advice: Plan & Impl	0.05		0.05	X
36	08	805	Ensure Compliance	III	Training	Continuing Education/Training	0.50		0.50	Ib
37	08	825	Operational Support	III	Union Negotiations	Legal Adv: Union Negotiations	0.05		0.05	Ia
38	08	826	Operational Support	III	Union Steward Activities	Rep Employees in Grievance Act	0.05		0.05	Ia
						Total	32.00	0.00	32.00	

Legal Line Item Expenditure						
Major Object / Account # **/** Account Description		**FY 2014-15 Actuals**	**FY 2015-16 Adopted Budget**	**FY 2015-16 Amended Budget**	**FY 2015-16 Estimate ***	**FY 2016-17 Proposed Budget**
Salary & Employee Benefits						
51000-52000	Salaries	$ 3,752,096	$ 3,630,871	$ 3,630,871	$ 4,142,198	$ 3,809,944
53000-55000	Employee Benefits	2,006,882	1,989,809	1,989,809	2,144,103	2,083,166
Sub-total Salary & Employee Benefits		$ 5,758,978	$ 5,620,680	$ 5,620,680	$ 6,286,301	$ 5,893,111
Services & Supplies						
67250	Insurance	$ -	$ -	$ -	$ -	$ -
67300	Rents & Leases Equipment	-	-	-	-	-
67350	Rents & Leases Structure	-	-	-	-	-
67400	Household	-	-	-	-	-
67450	Professional & Special Services	1,761,414	279,500	1,878,554	1,878,554	279,500
67460	Temporary Agency Services	585	12,500	7,500	-	7,500
67500	Public Notice & Advertising	-	5,000	3,500	612	2,500
67550	Demurrage	4,078	7,500	4,000	5,791	5,000
67600	Maintenance of Equipment	-	300	300	-	300
67650	Building Maintenance	-	-	-	-	-
67700	Auto Mileage	594	1,600	1,600	898	1,600
67750	Auto Service	-	-	-	-	-
67800	Travel	14,022	15,000	15,000	15,000	15,000
67850	Utilities	-	-	-	-	-
67900	Communications	4,200	10,300	10,300	5,307	10,300
67950	Interest Expense	-	-	-	-	-
68000	Clothing	104	250	250	-	250
68050	Laboratory Supplies	-	-	-	-	-
68060	Postage	3,879	4,750	4,750	3,338	4,750
68100	Office Expense	25,851	12,520	12,520	12,520	15,000
68200	Office Furniture	4,098	5,000	5,000	5,000	5,000
68250	Subscriptions & Books	105,962	102,500	111,725	102,500	110,000
68300	Small Tools, Instruments, Equipment	-	-	-	-	-
68400	Gas and Oil	-	-	-	-	-
69500	Training/Conference/Tuition/ Board Exp.	16,462	22,500	22,500	19,010	22,500
69550	Memberships	300	750	750	300	750
69600	Taxes	-	-	-	-	-
69650	Awards	-	-	-	-	-
69700	Miscellaneous Expenses	801	1,000	1,000	813	1,000
69750	Prior Year Expense	-	-	-	-	-
69800	Uncollectable Accounts Receivable	-	-	-	-	-
89100	Principal Repayment	-	-	-	-	-
Sub-total Services & Supplies		$ 1,942,348	$ 480,970	$ 2,079,249	$ 2,049,644	$ 480,950
77000	**Capital Outlays**	$ -	$ -	$ -	$ -	$ -
79050	**Building Remodeling**	$ -	$ -	$ -	$ -	$ -
Total Expenditures		$ 7,701,326	$ 6,101,650	$ 7,699,929	$ 8,335,945	$ 6,374,061

* Estimates based on July 2015 through February 2016 actual expenditures and budget amendments.

SOUTH COAST

AIR QUALITY MANAGEMENT DISTRICT

FINANCE

MICHAEL B. O'KELLY
CHIEF FINANCIAL OFFICER

DESCRIPTION OF MAJOR SERVICES:

The Finance Office provides services to internal and external customers and stakeholders, including fee payers, other divisions, employees, the Mobile Source Air Pollution Reduction Review Committee, the Building Corporation, and the Brain and Lung Tumor and 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. 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.
- Processed 1,273 contracts and modifications, issued 68 Request for Proposals/Quotes, and processed 1,634 proposals/quotations. Processed 1,392 purchase orders and 338 CalCard orders.
- Implemented new Internal Revenue Service tax reporting requirements under the Affordable Care Act (ACA).
- 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.

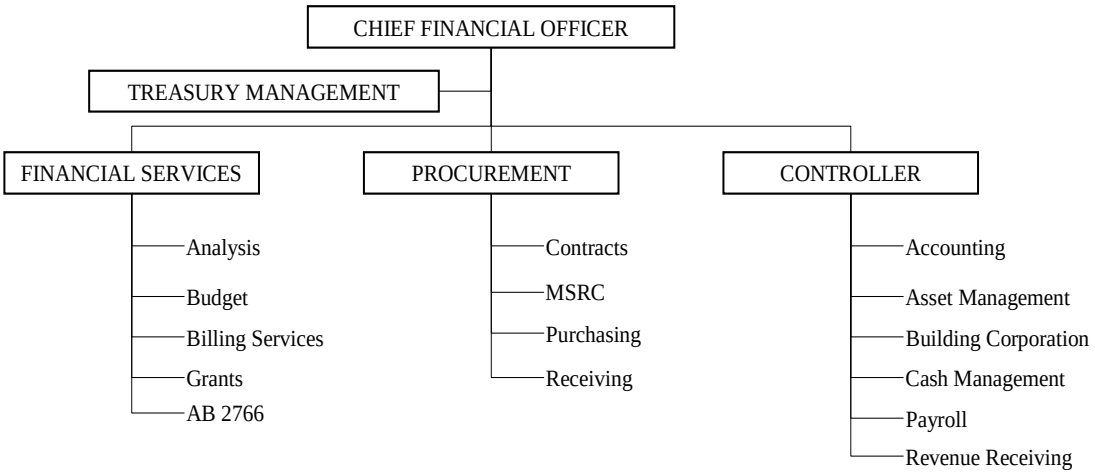
ANTICIPATED:

- Continue to identify and implement additional opportunities for electronic payments.
- Implement 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.

- Continue to receive GFOA Awards for the Annual Budget, CAFR, and PAFR to ensure SCAQMD's financial reports meet the highest professional standards.

ORGANIZATIONAL CHART:



POSITION SUMMARY: 44 FTEs

Finance Units	FY 2015-16	Change	Proposed FY 2015-16
Office Administration	3	-	3
Financial Services	13	-	13
Procurement	9	-	9
Controller	19	-	19
Total	44	-	44

STAFFING DETAIL:

2016-17 Requested Staffing

Position	Title
2	Accounting Technician
1	Chief Financial Officer
2	Contracts Assistant
1	Controller
1	District Storekeeper
3	Financial Analyst
1	Financial Services Manager
6	Fiscal Assistant
2	Payroll Technician
1	Procurement Manager
1	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
1	Supervising Payroll Technician
44	Total Requested Positions

Finance Work Program by Office										
#	Program Code		Program Category	Goal	Program	Activities	FTEs FY 2015-16	+/-	FTEs FY 2016-17	Revenue Category
1	04	002	Customer Service and Business Assistance	III	AB2766/Mobile Source	Prog Admin: Monitor/Dist/Audit	0.10		0.10	IX
2	04	003	Advance Clean Air Technology	III	AB2766/MSRC	MSRC Program Administration	0.35		0.35	IX
3	04	009	Develop Programs	I	AB 1318 Mitigation	AB 1318 Projects Admn/Impl	0.13		0.13	XVII
4	04	020	Operational Support	III	Admin/SCAQMD Budget	Analyze/Prepare/Impl/Track WP	2.50		2.50	Ia
5	04	021	Operational Support	III	Admin/SCAQMD Contracts	Contract Admin/Monitor/Process	3.20		3.20	Ia
6	04	023	Operational Support	III	Admin/SCAQMD Capital Assets	FA Rep/Reconcile/Inv/Acct	0.70		0.70	Ia
7	04	038	Operational Support	III	Admin/Office Management	Fin Mgmt/Oversee Activities	3.00		3.00	Ib
8	04	045	Operational Support	III	Admin/Office Budget	Office Budget/Prep/Impl/Track	0.05		0.05	Ib
9	04	071	Operational Support	I	Arch Ctgs - Admin	Cost Analysis/Payments	0.04		0.04	XVIII
10	04	083	Policy Support	II	Brain Tumor & Air Poll Foundat	Brain Tumor & Air Poll Foundation Support	0.02		0.02	Ia
11	04	085	Operational Support	III	Building Corporation	Building Corp Acct/Fin Reports	0.02		0.02	Ia
12	04	130	Advance Clean Air Technology	III	Clean Fuels/Contract Admin	Clean Fuels Contract Admin/Monitor	0.15		0.15	VIII
13	04	170	Customer Service and Business Assistance	I	Billing Services	Answer/Resp/Resolv Prob & Inq	8.00		8.00	II,III,IV
14	04	233	Operational Support	III	Employee Relations	Assist HR/Interpret Salary Res	0.10		0.10	Ia
15	04	260	Customer Service and Business Assistance	III	Fee Review	Cmte Mtg/Fee-Related Complaint	0.10		0.10	II,III,IV,XV
16	04	265	Operational Support	III	Financial Mgmt/Accounting	Record Accts Rec & Pay/Rpts	6.20		6.20	Ia
17	04	266	Operational Support	III	Financial Mgmt/Fin Analysis	Fin/SCAQMD Stat Analysis & Audit	0.80		0.80	Ia
18	04	267	Operational Support	III	Financial Mgmt/Treasury Mgmt	Treas Mgt Anlyz/Trk/Proj/Invst	0.90		0.90	Ia
19	04	268	Operational Support	III	Financial Systems	CLASS/Rev/Acct/PR/Sys Analyze	0.10		0.10	Ia
20	04	355	Customer Service and Business Assistance	III	Grants Management	Grant Anlyz/Eval/Negot/Acc/Rpt	1.00		1.00	IV,V,XV
21	04	447	Operational Support	I	Mobile Sources/Accounting	Record Acct Rec & Pay/Special Funds	0.65		0.65	IX
22	04	457	Advance Clean Air Technology	III	Mobile Source/Moyer Adm	Carl Moyer: Contract/Fin Admin	1.02		1.02	IX
23	04	493	Operational Support	II	Outreach/SB/MB/DVBE	Outreach/Incr SB/DVBE Partic	0.05		0.05	Ia
24	04	510	Operational Support	III	Payroll	Ded/Ret Rpts/PR/St & Fed Rpts	3.60		3.60	Ia
25	04	542	Advance Clean Air Technology	I	Prop 1B:Goods Movement	Contracts/Finance Admin	0.50		0.50	IX
26	04	544	Advance Clean Air Technology	I	Prop 1B:Low Emiss Sch Bus	Grants/Finance Admin	0.05		0.05	IX
27	04	565	Customer Service and Business Assistance	I	Public Records Act	Comply w/ Public Rec Requests	0.02		0.02	Ia
28	04	570	Operational Support	III	Purchasing	Purch/Track Svcs & Supplies	2.50		2.50	Ia
29	04	571	Operational Support	III	Purchasing/Receiving	Receive/Record SCAQMD Purchases	1.20		1.20	Ia
30	04	572	Operational Support	III	Purchasing-Receiving/Stockroom	Track/Monitor SCAQMD Supplies	1.00		1.00	Ia
31	04	630	Operational Support	III	Cash Mgmt/Revenue Receiving	Receive/Post Pymts/Reconcile	5.25		5.25	II,III,IV,XI
32	04	631	Customer Service and Business Assistance	III	Cash Mgmt/Refunds	Research/Doc/Prep/Proc Refunds	0.30		0.30	III,IV,XI
33	04	791	Ensure Compliance	III	Toxics/AB2588	AB2588 Toxics HS Fee Collection	0.15		0.15	X
34	04	805	Operational Support	III	Training	Continuing Education/Training	0.20		0.20	Ib
35	04	825	Operational Support	III	Union Negotiations	Official Labor/Mgmt Negotiate	0.02		0.02	Ia
36	04	826	Operational Support	III	Union Steward Activities	Rep Employees in Grievance Act	0.01		0.01	Ia
37	04	855	Operational Support	II	Web Tasks	Create/edit/review web content	0.02		0.02	Ia
						Total	44.00	0.00	44.00	

Finance Line Item Expenditure						
Major Object / Account # **/** Account Description		**FY 2014-15 Actuals**	**FY 2015-16 Adopted Budget**	**FY 2015-16 Amended Budget**	**FY 2015-16 Estimate ***	**FY 2016-17 Proposed Budget**
Salary & Employee Benefits						
51000-52000	Salaries	$ 3,327,414	$ 3,158,294	$ 3,158,293	$ 3,350,555	$ 3,230,528
53000-55000	Employee Benefits	1,967,360	1,878,129	1,878,129	1,960,639	1,983,941
Sub-total Salary & Employee Benefits		$ 5,294,774	$ 5,036,422	$ 5,036,422	$ 5,311,193	$ 5,214,469
Services & Supplies						
67250	Insurance	$ -	$ -	$ -	$ -	$ -
67300	Rents & Leases Equipment	-	-	-	-	-
67350	Rents & Leases Structure	-	-	-	-	-
67400	Household	-	900	900	-	900
67450	Professional & Special Services	119,622	141,650	141,650	133,396	151,650
67460	Temporary Agency Services	48,532	62,978	62,978	58,913	63,000
67500	Public Notice & Advertising	2,463	6,500	6,500	5,275	6,750
67550	Demurrage	50	780	780	411	780
67600	Maintenance of Equipment	420	1,200	1,200	298	1,320
67650	Building Maintenance	-	-	-	-	-
67700	Auto Mileage	3,278	3,000	3,000	3,000	1,488
67750	Auto Service	-	-	-	-	-
67800	Travel	2,180	6,000	6,000	4,390	6,000
67850	Utilities	-	-	-	-	-
67900	Communications	1,300	9,000	9,000	1,230	9,000
67950	Interest Expense	-	-	-	-	-
68000	Clothing	1,027	1,200	1,200	1,027	1,200
68050	Laboratory Supplies	-	-	-	-	-
68060	Postage	97,386	130,050	98,388	99,673	130,050
68100	Office Expense	11,606	36,120	36,120	36,120	36,120
68200	Office Furniture	-	-	-	-	-
68250	Subscriptions & Books	2,270	3,480	3,480	2,891	3,498
68300	Small Tools, Instruments, Equipment	-	-	-	-	-
68400	Gas and Oil	-	-	-	-	-
69500	Training/Conference/Tuition/ Board Exp.	13,335	26,500	26,500	17,024	26,850
69550	Memberships	1,613	2,445	2,445	1,613	3,105
69600	Taxes	-	-	-	-	-
69650	Awards	-	-	-	-	-
69700	Miscellaneous Expenses	3,750	4,125	4,125	4,127	4,125
69750	Prior Year Expense	(25)	-	-	-	-
69800	Uncollectable Accounts Receivable	-	-	-	-	-
89100	Principal Repayment	-	-	-	-	-
Sub-total Services & Supplies		$ 308,807	$ 435,928	$ 404,266	$ 369,389	$ 445,836
77000	**Capital Outlays**	$ -	$ -	$ -	$ -	$ -
79050	**Building Remodeling**	$ -	$ -	$ -	$ -	$ -
Total Expenditures		$ 5,603,581	$ 5,472,350	$ 5,440,688	$ 5,680,582	$ 5,660,305
* Estimates based on July 2015 through February 2016 actual expenditures and budget amendments.						

SOUTH COAST

AIR QUALITY MANAGEMENT DISTRICT

ADMINISTRATIVE & HUMAN RESOURCES

WILLIAM JOHNSON
ASSISTANT DEPUTY EXECUTIVE OFFICER

DESCRIPTION OF MAJOR SERVICES:

Administrative and Human Resources consists of three units: Human Resources, Business Services and Building Services. Human Resources is responsible for administering the personnel and employee relations programs to maximize hiring, retention, and development of highly-qualified employees necessary to meet SCAQMD's air quality goals. Business Services oversees the management of the SCAQMD headquarters facility, the maintenance of vehicles, and the management of Print Shop services, including maintenance of walk-up copiers. Business Services also coordinates and handles SCAQMD's subscription services and incoming and outgoing mail. Building Services is responsible for the maintenance and repair of the SCAQMD headquarters building and its equipment/fixtures, childcare center, field offices, air monitoring stations, and meteorological stations. Building Services is also responsible for landscape maintenance, construction/renovation projects, temperature control, and performing preventative maintenance on all SCAQMD equipment.

ACCOMPLISHMENTS:

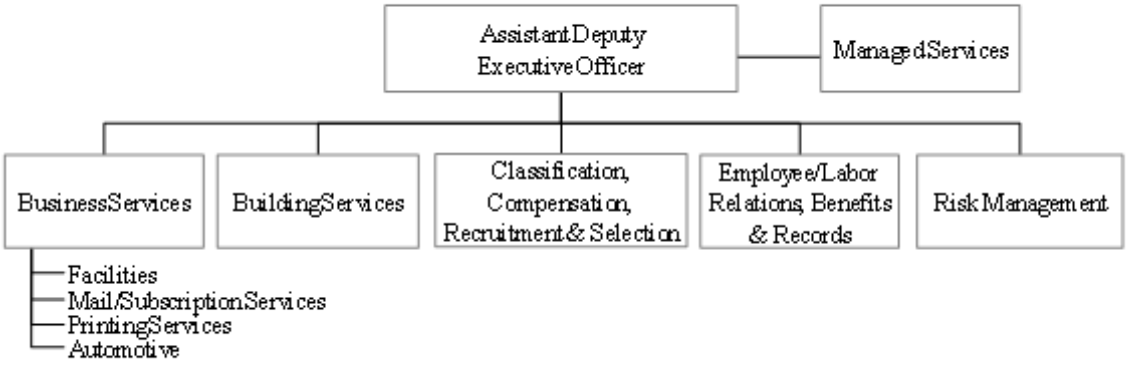
RECENT:

- Implemented and administered effective human resources and administrative support programs that further SCAQMD goals and objectives and conform to best business and management practices.
- Provided support and direction to management and staff with respect to adherence to relevant state and federal laws and SCAQMD policies, procedures and memoranda of understanding.
- Negotiated new 3–year MOUs with three labor bargaining units, and amended Salary Resolution and Administrative Code for unrepresented employees.
- Implemented and supported an Employee Assistance Program for SCAQMD's workforce.
- Continued to ensure personalized workspace evaluations to reduce/eliminate ergonomic risks.
- Completed office construction and remodels on various floors.
- Re-carpeted various areas.
- Replaced urinals with waterless urinals.
- Installed specialized laboratory testing equipment.
- Refurbished elevator cabs.
- Replaced tile on third floor elevator lobby.

ANTICIPATED

- Continue to provide support and direction to management and staff with respect to adherence to relevant state and federal laws and SCAQMD policies, procedures and memoranda of understanding.
- Formalize Succession Planning model utilizing internal and/or external resources.
- Evaluate and plan for significant turnover of vehicle fleet due to CNG tank expiration.
- Assist the Science and Technology Advancement Office with establishing an electrical vehicle charging plaza, including design and implementation of the necessary charging station locations.
- Install two 770-ton chillers at Diamond Bar Headquarters.
- Install two 880-ton cooling towers at Diamond Bar Headquarters.
- Six air conditioning units for Information Management's computer room, the print shop, and the stock room at Diamond Bar Headquarters.
- Upgrade four Pace air-handlers.

ORGANIZATIONAL CHART:



POSITION SUMMARY: 36 FTEs

Administrative & Human Resources Units	FY 2015-16	Change	Proposed FY 16-17
Office Administration	4	-	4
Business Services	15	-	15
Building Services	7	-	7
Classification, Compensation, Recruitment & Selection	5	-	5
Employee/Labor Relations, Benefits & Records	3	-	3
Risk Management	2	-	2
Total	36	-	36

STAFFING DETAIL:

2016-17 Requested Staffing

Position	Title
1	Assistant Deputy Executive Officer/Administrative & Human Resources
1	Building Maintenance Manager
1	Building Supervisor
1	Business Services Manager
2	Career Development Intern
1	Facilities Services Technician
1	Fleet Services Supervisor
2	Fleet Services Worker II
4	General Maintenance Worker
4	Human Resources Analyst
2	Human Resources Manager
1	Human Resources Technician
3	Mail Subscription Services Clerk
1	Mail Subscription Services Supervisor
2	Office Assistant
1	Offset Press Operator
2	Print Shop Duplicator
1	Print Shop Supervisor
1	Risk Manager
2	Secretary
1	Senior Administrative Secretary
1	Staff Specialist
36	Total Requested Positions

Administrative & Human Resources Work Program by Office										
#	Program Code		Program Category	Goal	Program	Activities	FTEs FY 2015-16	FTEs +/-	FTEs FY 2016-17	Revenue Category
1	16	026	Operational Support	III	SCAQMD Mail	Posting/Mailing/Delivery	2.30		2.30	Ia
2	16	038	Operational Support	III	Admin/Office Management	Reports/Proj/Budget/Contracts	4.45		4.45	Ib
3	16	060	Operational Support	III	Equal Employment Opportunity	Program Dev/Monitor/Reporting	0.10		0.10	Ia
4	16	080	Ensure Compliance	III	Auto Services	Vehicle/Radio Repair & Maint	3.00		3.00	Ia
5	16	090	Operational Support	III	Building Maintenance	Repairs & Preventative Maint	7.00		7.00	Ia
6	16	092	Operational Support	III	Business Services	Building Services Admin/Contracts	2.40		2.40	Ia
7	16	225	Operational Support	III	Employee Benefits	Benefits Analysis/Orient/Records	1.50		1.50	Ia
8	16	226	Operational Support	III	Classification & Pay	Class & Salary Studies	0.30		0.30	Ia
9	16	228	Operational Support	III	Recruitment & Selection	Recruit Candidates for SCAQMD	3.25		3.25	Ia
10	16	232	Operational Support	III	Position Control	Track Positions/Workforce Analys	0.55		0.55	Ia
11	16	233	Operational Support	III	Employee Relations	Meet/Confer/Labor-Mgmt/Grievance	2.20		2.20	Ia
12	16	255	Operational Support	III	Facilities Services	Phones/Space/Keys/Audio-Visual	1.00		1.00	Ia
13	16	457	Advance Clean Air Technology	I	MS/Carl Moyer Admin	C Moyer/Contractor Compliance	0.50		0.50	IX
14	16	540	Customer Service and Business Assistance	III	Print Shop	Printing/Collating/Binding	4.00		4.00	Ia
15	16	542	Advance Clean Air Technology	I	Prop 1B:Goods Movement	Prop 1B: Goods Movement	0.50		0.50	IX
16	16	565	Customer Service and Business Assistance	III	Public Records Act	Comply w/ Public Rec Requests	0.05		0.05	Ia
17	16	640	Operational Support	III	Risk Management	Liabl/Property/Wk Comp/Selflns	1.00		1.00	Ia
18	16	717	Policy Support	II	Student Interns	Gov Board/Student Intern Program	0.20		0.20	Ia
19	16	720	Customer Service and Business Assistance	I	Subscription Services	Rule & Gov Board Materials	1.70		1.70	IV,XVII
						Total	36.00	0.00	36.00	

Administrative & Human Resources Line Item Expenditure						
Major Object / Account # **/** Account Description		**FY 2014-15 Actuals**	**FY 2015-16 Adopted Budget**	**FY 2015-16 Amended Budget**	**FY 2015-16 Estimate ***	**FY 2016-17 Proposed Budget**
Salary & Employee Benefits						
51000-52000	Salaries	$ 2,504,216	$ 2,772,925	$ 2,774,478	$ 2,570,820	$ 2,937,419
53000-55000	Employee Benefits	1,537,903	1,585,779	1,585,780	1,497,312	1,674,965
Sub-total Salary & Employee Benefits		$ 4,042,119	$ 4,358,704	$ 4,360,258	$ 4,068,131	$ 4,612,384
Services & Supplies						
67250	Insurance	$ -	$ -	$ -	$ -	$ -
67300	Rents & Leases Equipment	88,320	111,902	111,902	111,902	111,902
67350	Rents & Leases Structure	-	-	-	-	-
67400	Household	-	2,305	2,305	-	2,305
67450	Professional & Special Services	151,754	226,750	246,750	198,082	226,750
67460	Temporary Agency Services	40,945	5,000	25,000	23,000	5,000
67500	Public Notice & Advertising	18,593	26,500	9,500	9,500	26,500
67550	Demurrage	-	-	-	-	-
67600	Maintenance of Equipment	43,670	71,762	71,762	66,224	71,762
67650	Building Maintenance	-	-	-	-	-
67700	Auto Mileage	3,558	4,200	4,200	4,200	4,200
67750	Auto Service	396,678	470,000	430,000	357,564	470,000
67800	Travel	1,126	1,440	3,440	3,270	1,440
67850	Utilities	-	-	-	-	-
67900	Communications	5,665	20,900	20,900	7,783	20,900
67950	Interest Expense	-	-	-	-	-
68000	Clothing	6,055	8,848	8,848	8,848	8,848
68050	Laboratory Supplies	-	-	-	-	-
68060	Postage	3,083	11,469	11,469	2,969	11,469
68100	Office Expense	71,633	90,740	87,740	87,740	90,740
68200	Office Furniture	29,052	50,000	48,000	28,619	50,000
68250	Subscriptions & Books	2,101	2,520	2,520	1,192	2,520
68300	Small Tools, Instruments, Equipment	2,682	5,030	5,030	4,989	5,030
68400	Gas and Oil	238,497	372,000	357,000	324,821	372,000
69500	Training/Conference/Tuition/ Board Exp.	13,652	12,817	12,817	6,422	12,817
69550	Memberships	3,065	3,265	3,265	2,808	3,265
69600	Taxes	-	-	-	-	-
69650	Awards	-	-	-	-	-
69700	Miscellaneous Expenses	1,804	12,000	12,000	5,006	12,000
69750	Prior Year Expense	(3,099)	-	-	-	-
69800	Uncollectable Accounts Receivable	-	-	-	-	-
89100	Principal Repayment	-	-	-	-	-
Sub-total Services & Supplies		$ 1,118,833	$ 1,509,448	$ 1,474,448	$ 1,254,937	$ 1,509,448
77000	**Capital Outlays**	$ -	$ -	$ -	$ -	$ -
79050	**Building Remodeling**	$ -	$ -	$ -	$ -	$ -
Total Expenditures		$ 5,160,952	$ 5,868,152	$ 5,834,706	$ 5,323,069	$ 6,121,832
* Estimates based on July 2015 through February 2016 actual expenditures and budget amendments.						

SOUTH COAST

AIR QUALITY MANAGEMENT DISTRICT

INFORMATION MANAGEMENT

CHRIS MARLIA
ASSISTANT DEPUTY EXECUTIVE OFFICER

DESCRIPTION OF MAJOR SERVICES:

Information Management (IM) provides a wide range of information management systems and services in support of all SCAQMD 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, and automatic system messaging (e.g., through email). The Special Projects unit processes all of the public records requests and handles day-to-day updates and additions to the SCAQMD website along with other projects as they arise.

ACCOMPLISHMENTS:

RECENT:

- Audio-Visual Upgrades – Upgraded the audio-visual capabilities in the Hearing Board and Conference Room GB to include the ability to record and webcast meetings. Further upgraded Conference Room GB with a video wall for presentations and enhanced audio recording functionality.
- Desktop Computer Upgrades – Upgraded all agency desktop computers to Windows 8.1 and Office 2013. Replaced approximately 30% of desktop computer hardware.
- Permit Processing Fees Portal – Provided fully functional web-based application that allows permit filers to calculate and pay permit processing fees online via credit card or e-check.
- Finance Voucher System – Provided online voucher generation and payment service(s) that can integrate with any web application. Current systems using these services include the Permit Processing Fees Portal and the Clean Air Awards system.
- SCAQMD Security and Reporting Portals – Implemented the web-based backbone system to support all core SCAQMD e-commerce application needs by providing login and registration, user management, application management, and reporting copy of record functionality for all web applications.
- Oil and Gas Well Electronic Notification and Reporting (Rule 1148.2) – Made major enhancements to the R1148 reporting system to accommodate changes made by SB-4.

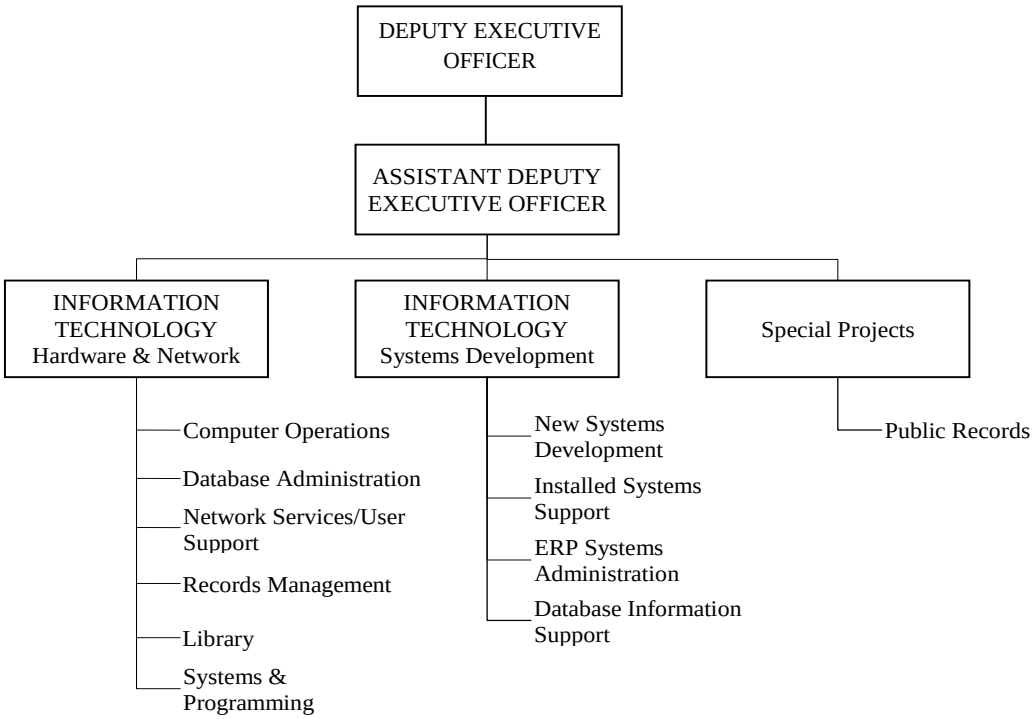
This enhancement also included several performance and interface improvements to provide a better user experience.

- PeopleSoft HCM/Payroll 9.2 Upgrade – Upgraded the PeopleSoft Human Capital Management and Payroll systems to enable implementation of the Affordable Care Act (ACA) and to ensure adherence to government regulatory requirements and continuation of manufacturer support.

ANTICIPATED:

- Network Upgrade – Upgrade the agency core network switching equipment
- Server Upgrades – Upgrade the agency Storage Area Network (SAN) to increase the available storage commensurate with increasing data storage needs.
- DPO/Enforcement Tracking System replacement – CourtView system implementation
- R1415 Stationary Air Conditioning Systems Online Registration system development
- R1403 Demolition and Asbestos Removal Notification system development
- CLASS Compliance Enforcement Portal – Compliance system replacement Phase 1
- Finance Customer Service Portal – Finance system replacement Phase 1
- Online Filing Infrastructure Expansion to support filing of Permit Applications and Transportation Plans
- PeopleSoft Benefits Administration and Self Service Module implementation

ORGANIZATIONAL CHART:



POSITION SUMMARY: 50 FTEs

Information Management Units	FY 2015-16	Change	Proposed FY 2016-17
Office Administration	3	-	3
Hardware & Network	27	-	27
Systems Development	14	-	14
Special Projects	5	1	6
Total	49	1	50

STAFFING DETAIL:

2016-17 Requested Staffing

Position	Title
1	Assistant Database Administrator
1	Assistant Deputy Executive Officer/Information Management
1	Assistant Telecommunications Technician
1	Audio Visual Specialist
1	Computer Operations Supervisor
3	Computer Operator
1	Database Administrator
1	Deputy Executive Officer/Information Management
4	Office Assistant
1	Principal Office Assistant
1	Public Affairs Specialist
2	Secretary
1	Senior Administrative Secretary
4	Senior Office Assistant
1	Supervising Office Assistant
9	Systems Analyst
8	Systems and Programming Supervisor
2	Technology Implementation Manager
2	Telecommunications Supervisor
5	Telecommunications Technician II
50	Total Requested Positions

Information Management Work Program by Office										
#	Program Code		Program Category	Goal	Program	Activities	FTEs FY 2015-16	FTEs +/-	FTEs FY 2016-17	Revenue Category
1	27	038	Operational Support	III	Admin/Office Management	Overall Direction/Coord of IM	3.00		3.00	Ib
2	27	071	Operational Support	I	Arch Ctgs - Admin	Database Dev/Maintenance	0.25		0.25	XVIII
3	27	160	Operational Support	III	Computer Operations	Oper/Manage Host Computer Sys	5.25		5.25	Ia
4	27	184	Operational Support	III	Database Information Support	Ad Hoc Reports/Bulk Data Update	1.00		1.00	Ia
5	27	185	Operational Support	III	Database Management	Dev/Maintain Central Database	2.25		2.25	Ia
6	27	215	Operational Support	I	Annual Emission Reporting	System Enhancements for GHG	0.50		0.50	II,XVII
7	27	370	Operational Support	III	Information Technology Svcs	Enhance Oper Effic/Productivity	2.75		2.75	Ia
8	27	420	Operational Support	III	Library	General Library Svcs/Archives	0.25		0.25	Ia
9	27	470	Operational Support	III	Network Operations/Telecomm	Operate/Maintain/Implem SCAQMD	9.25		9.25	Ia
10	27	480	Operational Support	III	New System Development	Dev sys for special oper needs	3.00		3.00	II,IV
11	27	481	Customer Service and Business Assistance	III	New System Development	Dev sys in supp of Dist-wide	1.75		1.75	Ia,III
12	27	523	Timely Review of Permits	III	Permit Streamlining	Permit Streamlining	0.25		0.25	III
13	27	565	Customer Service and Business Assistance	III	Public Records Act	Comply w/ Public Req for Info	3.75	1.00	4.75	Ia
14	27	615	Operational Support	III	Records Information Mgmt Plan	Plan/Impl/Dir/Records Mgmt plan	1.25		1.25	Ia
15	27	616	Operational Support	III	Records Services	Records/Documents processing	3.75		3.75	Ia,III,IV
16	27	735	Operational Support	III	Systems Maintenance	Maintain Existing Software Prog	4.50		4.50	II,III,IV
17	27	736	Operational Support	III	Systems Implementation/PeopleS	Fin/HR PeopleSoft Systems Impl	1.50		1.50	Ia
18	27	770	Timely Review of Permits	I	Title V	Dev/Maintain Title V Program	1.00		1.00	III
19	27	791	Ensure Compliance	III	Toxics/AB2588	AB2588 Database Software Supp	0.50		0.50	X
20	27	855	Operational Support	II	Web Tasks	Create/edit/review web content	3.25		3.25	Ia
						Total	49.00	1.00	50.00	

Information Management Line Item Expenditure						
Major Object / Account # **/** Account Description		**FY 2014-15 Actuals**	**FY 2015-16 Adopted Budget**	**FY 2015-16 Amended Budget**	**FY 2015-16 Estimate ***	**FY 2016-17 Proposed Budget**
Salary & Employee Benefits						
51000-52000	Salaries	$ 4,758,735	$ 4,669,627	$ 4,682,658	$ 4,917,070	$ 4,812,069
53000-55000	Employee Benefits	2,708,867	2,648,376	2,648,376	2,779,808	2,823,654
Sub-total Salary & Employee Benefits		$ 7,467,602	$ 7,318,003	$ 7,331,034	$ 7,696,877	$ 7,635,722
Services & Supplies						
67250	Insurance	$ -	$ -	$ -	$ -	$ -
67300	Rents & Leases Equipment	-	1,880	1,880	-	1,880
67350	Rents & Leases Structure	-	-	-	-	-
67400	Household	-	1,250	1,250	-	1,250
67450	Professional & Special Services	775,496	1,227,121	1,090,844	919,970	1,302,621
67460	Temporary Agency Services	328,002	500,320	156,376	144,376	500,320
67500	Public Notice & Advertising	-	-	-	-	-
67550	Demurrage	-	650	650	-	650
67600	Maintenance of Equipment	48,544	88,000	73,909	16,000	88,000
67650	Building Maintenance	-	-	-	-	-
67700	Auto Mileage	4,424	1,250	1,250	1,250	1,250
67750	Auto Service	-	-	-	-	-
67800	Travel	15,581	2,160	12,387	34,198	2,160
67850	Utilities	-	-	-	-	-
67900	Communications	24,981	36,900	36,900	1,113	36,900
67950	Interest Expense	-	-	-	-	-
68000	Clothing	-	-	-	-	-
68050	Laboratory Supplies	-	-	-	-	-
68060	Postage	963	5,500	5,500	5,500	5,500
68100	Office Expense	482,605	323,912	323,878	323,878	323,912
68200	Office Furniture	-	-	-	-	-
68250	Subscriptions & Books	9,595	30,000	30,000	-	30,000
68300	Small Tools, Instruments, Equipment	-	2,000	2,000	3,005	2,000
68350	Film	-	-			-
68400	Gas and Oil	-	-	-	-	-
69500	Training/Conference/Tuition/ Board Exp.	23,057	46,575	61,940	61,940	46,575
69550	Memberships	449	1,320	1,320	449	1,320
69600	Taxes	-	1,000	1,000	-	1,000
69650	Awards	-	-	-	-	-
69700	Miscellaneous Expenses	16	-	34	34	-
69750	Prior Year Expense	(921)	-	-	-	-
69800	Uncollectable Accounts Receivable	-	-	-	-	-
89100	Principal Repayment	-	-	-	-	-
Sub-total Services & Supplies		$ 1,712,793	$ 2,269,838	$ 1,801,118	$ 1,511,713	$ 2,345,338
77000	**Capital Outlays**	$ 1,121,888	$ 110,000	$ 849,813	$ 849,813	$ 610,000
79050	**Building Remodeling**	$ -	$ -	$ -	$ -	$ -
Total Expenditures		$ 10,302,283	$ 9,697,841	$ 9,981,965	$ 10,058,404	$ 10,591,060
* Estimates based on July 2015 through February 2016 actual expenditures and budget amendments.						

SOUTH COAST

AIR QUALITY MANAGEMENT DISTRICT

PLANNING, RULE DEVELOPMENT & AREA SOURCES

PHILIP FINE
DEPUTY EXECUTIVE OFFICER

DESCRIPTION OF MAJOR SERVICES:

The Office of Planning, Rule Development and Area Sources (PRDAS) is responsible for the majority of SCAQMD's air quality planning functions, including State Implementation Plan (SIP)-related activities, air quality management and maintenance plans, reporting requirements and other federal Clean Air Act requirements. PRDAS is also responsible for developing proposals for new rules and amendments to existing rules to implement the SIP obligations, to reduce air toxic emissions/exposures, and for conducting socioeconomic assessments of Air Quality Management Plans (AQMPs) and rulemaking actions. All CEQA functions are part of this office including lead agency, responsible agency, and commenting agency under CEQA. In addition, this office is responsible for developing and implementing the SCAQMD's Clean Communities Plan which is an overall plan for air toxics and includes communities that support the agency's overall goals for environmental justice. PRDAS implements AB2588, the state Toxic Hot Spots Program, and is responsible for climate change and energy policy. The office also conducts air quality evaluations and forecasting, inventories of area sources, and compliance activities related to area sources. The Transportation Program provides Rule 2202 and AB2766 Subvention fund program assistance and training to the regulated community and local governments.

ACCOMPLISHMENTS:

RECENT:

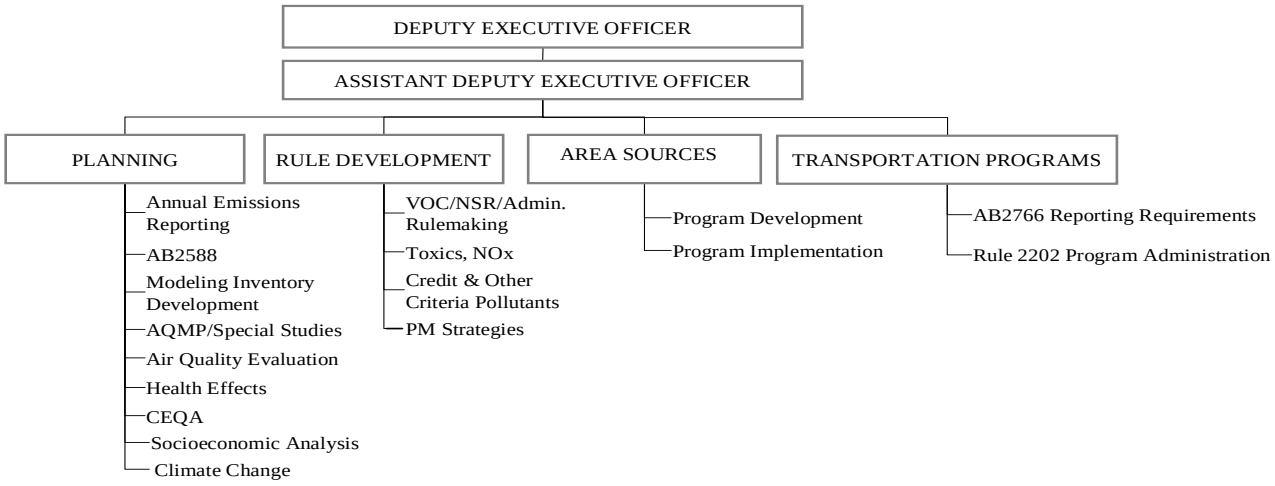
- Completed the Supplemental Amendment to the 2012 AQMP for the 24-hour PM2.5 attainment demonstration, and requested re-designation of the region as Serious nonattainment for the 24-hour PM2.5 standard.
- Amended Regulation XX, RECLAIM to implement control measure CMB-01 (Further Reductions from RECLAIM) from the 2012 AQMP. The amendments will reduce 12 tons per day (tpd) of NOx by 2023.
- Performed substantial work for development of the 2016 AQMP, including inventory, modeling, carrying capacity, and control strategies. Conducted a Control Strategy Symposium to solicit input on potential emission reduction strategies. Finalized 10 White Papers, with stakeholder input, that provide a policy framework for the 2016 AQMP. Held numerous meetings with the Advisory Committee and STMPR to solicit input on the Plan, and worked with federal, state, and local government and other stakeholders. Completed and submitted the RACT analysis for the 2016 AQMP to U.S. EPA.
- Amended 12 rules or guidelines. Two rules affected NOx emissions, two rules reduced VOC emissions, two amendments focused on improving transportation program implementation guidelines and protocols, and six amendments strengthened public health with more stringent toxic emission requirements.

- Amended Rule 1420.1 to lower the point source emission rate and ambient lead concentration limits, and add other housekeeping and maintenance measures. Rule 1420.1 was amended again in September 2015 to address lead emissions during closure and clean-up activities of a large lead-acid battery recycling facility.
- Amended Rule 1148.2 to change reporting timeframes and revised the chemical reporting requirements to be more consistent with the state requirements for reporting of well stimulation fluid chemicals.
- Amended Rules 1401, 1401.1, 1402, and 212 to reference and harmonize specific rule provisions with the Revised OEHHA Guidelines and to use the Revised OEHHA Guidelines to estimate health risks from air toxics during permitting and AB 2588.
- Adopted Rule 1420.2 – Emission Standards for Lead from Metal Melting Facilities to further protect public health from exposure to lead and to help ensure and maintain attainment of the 2008 lead NAAQS.
- Amended Rule 1156 to reflect updated OEHHA Guidance as it pertains to fence-line monitoring of hexavalent chromium for cement manufacturing facilities and address facility closure requirements.
- Reviewed and commented on over 1,000 CEQA documents prepared by other lead agencies, and provided technical support for two CEQA lawsuits including the Southern California Intermodal Gateway rail yard project and the World Logistics Center warehouse project.
- Continued ongoing implementation of the Clean Communities Plan, including administering programs funded by EPA's Targeted Air Shed Grant. Approximately $1 million was spent on the following programs: residential lawn mower exchanges, collaboration with Southern California Gas Company on a weatherization program, aqueous brake cleaning systems for auto repair shops, air filtration for several schools, Super Compliant coatings for several beautification projects, and kicked off a pilot program to test and demonstrate commercial mowers at municipal agencies
- The air quality forecasting program was upgraded to address implementation of Rule 445, the residential burn rule.
- Collaborated with the Institute of Transportation Engineers and industry representatives to develop a protocol for a national study of warehouse truck trip rates.
- Completed MATES IV Sample Collection and analyses, received comments on the draft report and finalized the document.
- Implemented recommendations from Abt socioeconomic report, including, working with stakeholders to come to consensus regarding defining baseline for socioeconomic analyses, issuing 3 Requests for Proposals for analysis of health benefits, environmental justice, and small scale economic impacts, and issued contracts for a third-party evaluation of macroeconomic modeling of public health and other non-market benefits; and for analysis of the health impacts of unemployment in the SCAQMD region.
- Fully implemented the new Annual Emissions Reporting (AER) web tool.
- Continued inventory and implementation of rules relative to area sources of emissions.
- Assisted local governments with the implementation of AB 2766 funds to reduce mobile source emissions. The annual report submitted in 2015 covered FY 13-14 and reflected 162 eligible cities, funded 353 projects of which 222 had quantified mobile emission reductions.
- Assisted regulated employers in the development of their Rule 2202 plans. Evaluated and processed over 1,300 Rule 2202 plan submittals.

ANTICIPATED:

- Continue implementation of 2012 AQMP SIP obligations through development of new and amended VOC, NOx, and PM2.5 rules.
- Finalize the 2016 AQMP and submit for inclusion into the SIP. Begin rule development to implement control measures.
- Develop toxic rule for grinding operations at metal forging operations; amend rule for metal finishing operations regarding use of fume suppressants that meet federal requirements; strengthen emission standards consistent with the lead National Ambient Air Quality Standard for lead emitting facilities; develop additional requirements for marine tank vessel operations transferring bulk organic liquids, develop a new rule for oil well rework and stimulation activities to address best management practices, develop a new rule to reduce methylene chloride emissions from furniture stripping operations; and develop provisions to allow early voluntary risk reductions for AB2588 facilities.
- Implement OEHHA's revised risk reduction guidelines, and establish streamlining procedures for the AB2588 program.
- Continue ongoing rulemaking efforts to meet commitments in the 2012 AQMP, such as further volatile organic compounds (VOC) reductions from architectural coatings, adhesive and sealant applications (Rule 1168), mold release products (Rule 1161) and vacuum trucks (Rule 1188). Further evaluate potential adverse impacts from lowering VOC limits.
- Complete analysis on use of the Revised OEHHA Guidelines for spray booths and gas stations use of the Revised OEHHA Guidelines for CEQA.
- Complete implementation of the US EPA Targeted Air Shed Grant, and pilot studies for Clean Communities Plan for San Bernardino and Boyle Heights.
- Support development of backstop regulations to limit emissions from port facilities.
- Finalize guidelines and adopt rules to implement emission reduction funding programs via fees paid for use of offsets by electrical generating facilities (EGFs).
- Continue inventory and implementation of rules in support of rulemaking efforts and compliance verification activities.
- Complete development of an on-line Rule 2202 plan submittal process.
- Complete development of an on-line Rule 2202 Employee Transportation Coordinator training platform.

ORGANIZATIONAL CHART:



POSITION SUMMARY: 109 FTEs

Planning, Rule Development and Area Sources Units	FY 2015-16*	Changes	Proposed FY 2016-17
Office Administration	6	-	6
Planning	66	-	66
Rule Development	12	-	12
Area Sources	10	-	10
Transportation Programs	13	-	13
Health Effects	2	-	2
Total	109	-	109

*FY 2015-16 includes the transfer of one Senior Air Quality Engineer position and one Air Quality Engineer II position from Planning Rule Development and Area Sources to Engineering and Compliance.

STAFFING DETAIL:

2016-17 Requested Staffing

Position	Title
2	Administrative Secretary
8	Air Quality Engineer II
4	Air Quality Inspector II
1	Air Quality Inspector III
39	Air Quality Specialist
1	Assistant Deputy Executive Officer
1	Deputy Executive Officer - Planning, Rule Development & Area Sources
1	Director of Strategic Initiatives
1	Health Effects Officer
6	Office Assistant
5	Planning and Rules Manager
19	Program Supervisor
7	Secretary
2	Senior Administrative Secretary
3	Senior Air Quality Engineer
1	Senior Meteorologist
3	Senior Office Assistant
3	Senior Staff Specialist
2	Transportation Plan Reviewer
109	Total Requested Positions

Planning, Rule Development, and Area Sources Work Program by Office										
#	Program Code		Program Category	Goal	Program	Activities	FTEs FY 2015-16	FTEs +/-	FTEs FY 2016-17	Revenue Category
1	26	002	Develop Programs	I	AB2766/Mobile Source	AB2766 Mobile Source Outreach	0.89	0.01	0.90	IX
2	26	007	Customer Service and Business Assistance	I	AB2766/MSRC	AB2766 Prov Tech Asst to Cities	1.10		1.10	IX
3	26	009	Develop Programs	I	AB 1318 Mitigation	AB 1318 Projects Admn/Impl	0.25		0.25	XVII
4	26	010	Develop Programs	I	AQMP	AQMP Special Studies	2.00		2.00	IV,V,IX,XV
5	26	038	Develop Programs	I	Admin/Office Management	Coordinate Off/Admin Activities	0.50	0.25	0.75	Ib
6	26	040	Timely Review of Permits	I	Admin/Office Mgmt/AQ Impl	Admin/Modeling/New Legis/Sm Sr	0.42	0.05	0.47	Ib
7	26	042	Ensure Compliance	I	Admin/Office Mgmt/Compliance	Admin: Compl w SCAQMD Rules	0.25	0.25	0.50	Ib
8	26	044	Timely Review of Permits	I	Admin/Office Mgmt/Permit & Fee	Admin: Resolve Perm/Fee Issues	0.10		0.10	Ib
9	26	046	Ensure Compliance	I	Admin/Office Mgmt/Compliance	Admin: Compl of Existing Source	0.52	0.23	0.75	Ib
10	26	048	Policy Support	I	Admin/Prog Mgmt/Policy	Admin: GB/Committee Support	1.00	0.25	1.25	Ib
11	26	049	Develop Programs	I	Admin/Prog Mgmt/AQMP	Admin: AQMP Development	0.75	0.25	1.00	Ib
12	26	050	Develop Rules	I	Admin/Rule Dev/PRA	Admin: Rule Development	1.00	0.25	1.25	Ib
13	26	057	Develop Programs	I	Admin/Transportation Prog Mgmt	Admin: Transportation Programs	0.86	(0.11)	0.75	Ib
14	26	061	Monitoring Air Quality	I	Air Quality Evaluation	Air Quality Evaluation	1.05		1.05	IX
15	26	068	Develop Programs	II	SCAQMD Projects	Prepare Environmental Assessments	4.70	(0.60)	4.10	II,IV,IX
16	26	071	Develop Rules	I	Arch Ctgs - Admin	Rdev/Aud/DB/TA/SCAQMD/Rpts/AER	1.00		1.00	XVIII
17	26	072	Ensure Compliance	I	Arch Ctgs - End User	Compliance/Rpts/Rule Implementation	1.00		1.00	XVIII
18	26	073	Ensure Compliance	I	Arch Ctgs - Other	Compliance/Rpts/Rule Implementation	1.00		1.00	XVIII
19	26	076	Ensure Compliance	I	Area Sources/Compliance	Area Source Compliance	4.00	1.00	5.00	III,IV,V,IX,XV
20	26	077	Develop Rules	I	Area Sources/Rulemaking	Dev/Eval/Impl Area Source Prog	4.00	(2.00)	2.00	II,IX
21	26	083	Policy Support	II	Brain Tumor & Air Poll Fdn	Brain Tumor & Air Poll Foundation Support	0.10		0.10	Ia,II,IV
22	26	084	Develop Rules	I	Blk Carbon Stdy EPA	EPA Blck Carbon Climate Study	0.20		0.20	V,XVII
23	26	102	Develop Programs	II	CEQA Document Projects	Review/Prepare CEQA Comments	3.75	0.25	4.00	II,IX
24	26	104	Develop Programs	I	CEQA Policy Development	ID/Develop/Impl CEQA Policy	0.50	0.40	0.90	IV,IX
25	26	120	Timely Review of Permits	I	Certification/Registration Pro	Certification/Registration Prog	0.00	0.00	0.00	III
26	26	128	Develop Programs	I	Cln Communities Pln	Cln Communities Plan Admn/Impl	0.50	(0.30)	0.20	II,IX
27	26	148	Policy Support	I	Climate Change	GHG/Climate Change Policy Development	1.10	1.00	2.10	IV,XVII
28	26	165	Develop Rules	I	Conformity	Monitor Transp. Conformity	0.50	(0.10)	0.40	V,IX
29	26	215	Ensure Compliance	I	Annual Emission Reporting	Annl Des/Impl/Emiss Monitor Sys	7.50		7.50	II,V
30	26	216	Customer Service and Business Assistance	I	AER Public Assistance	AER Design/Impl/Monitor Emiss	2.00		2.00	II
31	26	217	Develop Programs	I	Emissions Inventory Studies	Dev Emiss DB/Dev/Update Emiss	2.00		2.00	II,V,IX,XV
32	26	218	Develop Programs	I	AQMP/Emissions Inventory	Dev Emiss Inv: Forecasts/RFPs	1.30		1.30	II,IX
33	26	219	Develop Programs	I	Emissions Field Audit	Emissions Field Audit	0.50		0.50	II
34	26	221	Develop Programs	I	PR2301 ISR Rule Implementation	Mitigate dev growth	1.50	(1.50)	0.00	II,IX
35	26	240	Policy Support	I	EJ-AQ Guidance Document	AQ Guidance Document	0.23	0.17	0.40	II,IX
36	26	276	Policy Support	I	Advisory Group/Home Rule	Governing Board Advisory Group	0.30		0.30	Ia
37	26	277	Policy Support	I	Advisory Group/AQMP	Governing Board AQMP Advisory Group	0.05		0.05	II,IX
38	26	278	Policy Support	I	Advisory Group/Sci,Tech,Model	Scientific/Tech/Model Peer Rev	0.15	1.00	1.15	II,IX
39	26	362	Develop Rules	II	Health Effects	Study Health Effect/Toxicology	1.90		1.90	II,III,IX
40	26	385	Develop Rules	I	Criteria Pollutants/Mob Srcs	Dev/Impl Intercredit Trading	0.75		0.75	IV,IX

Planning, Rule Development, and Area Sources Work Program by Office										
#	Program Code		Program Category	Goal	Program	Activities	FTEs FY 2015-16	FTEs +/-	FTEs FY 2016-17	Revenue Category
41	26	397	Develop Programs	II	Lead Agency Projects	Prep Envrnmt Assmts/Perm Proj	0.75	0.35	1.10	III
42	26	416	Policy Support	I	Legislative Activities	Supp/Promote/Influence Legis/Adm	0.10		0.10	Ia
43	26	439	Monitoring Air Quality	I	MATES IV	MATES IV	0.00		0.00	II,IX
44	26	445	Monitoring Air Quality	I	Meteorology	ModelDev/Data Analysis/Forecast	2.15		2.15	II,V,IX
45	26	460	Develop Rules	I	Regional Modeling	Rule Impact/Analyses/Model Dev	5.30		5.30	II,V,IX
46	26	461	Timely Review of Permits	I	Permit & CEQA Modeling Review	Review Model Permit/Risk Assmt	1.50		1.50	III
47	26	503	Develop Programs	I	PM Strategies	PM10 Plan/Analyze/Strategy Dev	3.85	1.10	4.95	II,V,XV
48	26	530	Monitoring Air Quality	I	Photochemical Assessment	Photochemical Assessment	0.25		0.25	II,V
49	26	565	Customer Service and Business Assistance	III	Public Records Act	Comply w/ Public Rec Requests	0.53		0.53	Ia
50	26	600	Develop Programs	I	Credit Generation Programs	Dev RFP/AQMP Ctrl Strats/Inter	1.20	(1.20)	0.00	II,V,IX
51	26	620	Ensure Compliance	I	Refinery Pilot Project	Refinery Pilot Project	0.25		0.25	II
52	26	643	Timely Review of Permits	I	Rule 222 Filing Program	Rule 222 Filing Program	0.00		0.00	IV
53	26	645	Ensure Compliance	I	Rule 1610 Plan Verification	Rule 1610 Plan Verification	0.50		0.50	V,IX
54	26	654	Develop Rules	I	Rulemaking/NOX	Rulemaking/NOx	2.20	0.50	2.70	II,IV,XV
55	26	655	Develop Rules	I	NSR/Adm Rulemaking	Amend/Develop NSR & Admin Rules	3.00	(1.00)	2.00	II,IV,V,XV
56	26	656	Develop Rules	I	Rulemaking/VOC	Dev/Amend VOC Rules	7.50	(4.50)	3.00	II,IV,XV
57	26	659	Develop Rules	I	Rulemaking/Toxics	Develop/Amend Air Toxic Rules	5.00	2.50	7.50	II,XV
58	26	661	Develop Rules	I	Rulemaking/RECLAIM	RECLAIM Amend Rules/Related Is	1.10	(0.53)	0.57	II
59	26	685	Develop Programs	I	Socio-Economic	Apply econ models/Socio-econ	3.25	0.75	4.00	II,IV
60	26	716	Ensure Compliance	I	Spec Monitoring/R403	Rule 403 Compliance Monitoring	1.05		1.05	III,IV,IX,XV
61	26	717	Policy Support	II	Student Interns	Gov Bd/Student Intern Program	0.01		0.01	Ia
62	26	738	Advance Clean Air Technology	I	Target Air Shed EPA	Targeted Air Shed Admin/Impl	0.25		0.25	V,XVII
63	26	745	Develop Programs	I	Rideshare	Dist Rideshare/Telecommute Prog	0.65	0.40	1.05	IX
64	26	794	Ensure Compliance	I	Toxics/AB2588	AB2588 Core, Tracking, IWS	9.45	(0.05)	9.40	X
65	26	805	Operational Support	III	Training	Training	0.05		0.05	Ib
66	26	816	Develop Programs	I	Transportation Regional Progs	Dev AQMP Meas/Coord w/Reg Agn	0.60	0.40	1.00	V,IX
67	26	825	Operational Support	III	Union Negotiations	Official Labor/Mgmt Negotiate	0.01		0.01	Ia
68	26	826	Operational Support	III	Union Steward Activities	Rep Employees in Grievance Act	0.01		0.01	Ia
69	26	833	Customer Service and Business Assistance	II	Rule 2202 ETC Training	Rule 2202 ETC Training	1.30		1.30	XI
70	26	834	Develop Programs	I	Rule 2202 Implement	Rule 2202 Proc/Sub Plans/Tech Eval	3.07	0.33	3.40	XI
71	26	836	Develop Programs	I	Rule 2202 Support	R2202 Supt/CmptrMaint/WebSubmt	2.80	0.20	3.00	V,XI
72	26	855	Operational Support	II	Web Tasks	Create/edit/review web content	0.10		0.10	Ia
						Total	109.00	(0.00)	109.00	

Planning, Rule Development & Area Sources Line Item Expenditure						
Major Object / Account # **/** Account Description		**FY 2014-15 Actuals**	**FY 2015-16 Adopted Budget**	**FY 2015-16 Amended Budget**	**FY 2015-16 Estimate ***	**FY 2016-17 Proposed Budget**
Salary & Employee Benefits						
51000-52000	Salaries	$ 9,400,446	$ 10,524,261	$ 10,523,125	$ 9,446,420	$ 10,605,729
53000-55000	Employee Benefits	4,537,294	5,234,407	5,234,407	4,688,847	5,354,141
Sub-total Salary & Employee Benefits		$ 13,937,740	$ 15,758,668	$ 15,757,532	$ 14,135,267	$ 15,959,870
Services & Supplies						
67250	Insurance	$ -	$ -	$ -	$ -	$ -
67300	Rents & Leases Equipment	-	500	700	-	-
67350	Rents & Leases Structure	22,939	1,000	27,000	18,486	2,000
67400	Household	-	-	-	-	-
67450	Professional & Special Services	729,847	1,122,000	1,348,460	1,290,587	1,122,500
67460	Temporary Agency Services	29,108	50,000	80,000	77,214	50,000
67500	Public Notice & Advertising	68,515	100,000	80,000	73,698	100,000
67550	Demurrage	200	500	3,000	2,726	1,000
67600	Maintenance of Equipment	3,188	8,000	57,000	14,009	5,000
67650	Building Maintenance	6,470	1,000	7,000	1,760	1,000
67700	Auto Mileage	4,033	4,000	4,000	4,000	3,500
67750	Auto Service	-	-	-	-	-
67800	Travel	23,070	45,000	43,800	34,237	45,000
67850	Utilities	-	-	-	-	-
67900	Communications	42,836	40,000	58,000	48,086	40,000
67950	Interest Expense	-	-	-	-	-
68000	Clothing	1,645	800	800	780	800
68050	Laboratory Supplies	-	-	-	-	-
68060	Postage	23,404	50,000	50,150	40,436	50,000
68100	Office Expense	115,758	150,000	163,000	111,911	150,000
68200	Office Furniture	-	-	10,900	17,948	-
68250	Subscriptions & Books	1,148	2,000	2,000	1,014	2,000
68300	Small Tools, Instruments, Equipment	-	-	1,100	-	-
68400	Gas and Oil	-	-	-	-	-
69500	Training/Conference/Tuition/ Board Exp.	9,645	18,000	16,000	15,962	20,000
69550	Memberships	6,012	6,000	6,300	5,960	6,000
69600	Taxes	-	-	-	-	-
69650	Awards	-	-	-	-	-
69700	Miscellaneous Expenses	21,721	25,000	34,500	32,175	25,000
69750	Prior Year Expense	(20)	-	-	-	-
69800	Uncollectable Accounts Receivable	-	-	-	-	-
89100	Principal Repayment	-	-	-	-	-
Sub-total Services & Supplies		$ 1,109,520	$ 1,623,800	$ 1,993,710	$ 1,790,990	$ 1,623,800
77000	**Capital Outlays**	$ 137,863	$ 332,500	$ 338,730	$ 288,730	$ 75,000
79050	**Building Remodeling**	$ -	$ -	$ -	$ -	$ -
Total Expenditures		$ 15,185,123	$ 17,714,968	$ 18,089,972	$ 16,214,987	$ 17,658,670
* Estimates based on July 2015 through February 2016 actual expenditures and budget amendments.						

LEGISLATIVE & PUBLIC AFFAIRS

LISHA B. SMITH
DEPUTY EXECUTIVE OFFICER

DESCRIPTION OF MAJOR SERVICES:

Legislative & Public Affairs' (LPA) primary responsibilities include all legislative matters at the federal and state levels, community and local government relations, creation of collateral materials to support all SCAQMD departments and programs, as well as staffing the 1-800-CUT-SMOG phone line. The Public Advisor, within the LPA office, is responsible for keeping open lines of communication and coordination with the public, elected officials at all levels, the business community, as well as local residents. LPA is also the primary point of contact for SCAQMD's Speakers Bureau and Visiting Dignitary program, oversees execution of SCAQMD's Environmental Justice Community Partnership initiative and annual Clean Air Awards ceremony, and provides assistance to small businesses throughout SCAQMD's jurisdiction.

ACCOMPLISHMENTS:

RECENT:

- During the last legislative session, LPA's legislative team effectively advocated on behalf of SCAQMD's legislative goals.
    - At the state level, the Governor signed SCAQMD's priority bill for 2015, SB 513 by Senator Beall, which updates and refines the Carl Moyer program to improve program efficiencies and outcomes. While the Legislature has not settled the policy disputes regarding the disposition of the Greenhouse Gas Reduction Fund (GGRF), SCAQMD's legislative team consistently advocated on the need to maximize the benefit to the state from its GGRF investments by prioritizing co-benefits. Those co-benefits include but are not limited to criteria and toxic emission reductions, public health impacts, and support for clean technologies, jobs and the economy. The legislative discussion has continued in 2016 and much of the new legislation reflects SCAQMD's principles.
    - At the federal level, Congress passed a federal surface transportation reauthorization law, the FAST Act, which contains several provisions supported by SCAQMD, including establishing national electric vehicle charging and hydrogen, and natural gas fueling corridors. Other provisions in the new law include developing a plan which identifies "best practices to mitigate the impacts of freight movement on communities." In addition, through one of our federal consultant's work with Congressman Ken Calvert's staff, Rep. Calvert successfully secured funding for several important programs: (1) the Diesel Emission

Reduction Act (DERA) was funded at $50 million, a huge increase from the previous year, and (2) the Targeted Airshed Grants program, which provides diesel retrofit funds to the most polluted regions, was doubled to $20 million. Language was also added to the DERA grants that 70% of those funds must be targeted to the most polluted areas. Our federal consultant's work with Senator Feinstein and her staff successfully secured in Congress another $10 million for the Zero Emission Cargo Transport program.

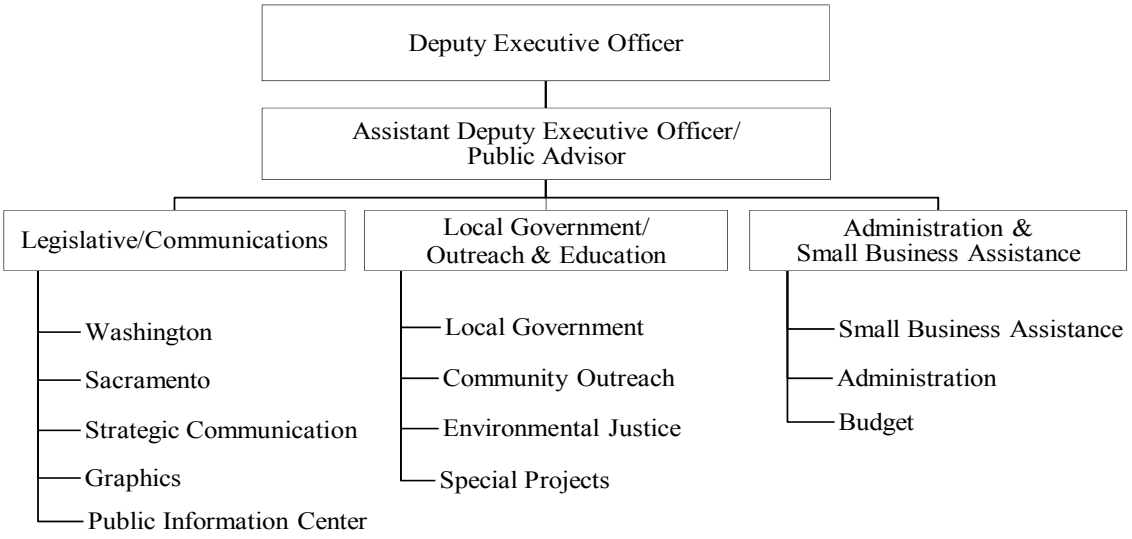
- In 2015, SCAQMD's social media presence has become much more focused, consistent, and responsive to our online community. This effort has resulted in a consistent level of public engagement that surpasses that of equivalent regional and national agencies with a much more established social media presence.
- In February 2015, SCAQMD held an environmental conference that drew over 300 participants and attendees, representing the region and the state of California. During the event, SCAQMD's Governing Board Chair announced the launching of SCAQMD's Environmental Justice Community Partnership (the Partnership) initiative. The Partnership's objective is to both strengthen and build upon SCAQMD's relationships and alliances with community members and organizations to work towards achieving clean air and healthy sustainable communities for everyone.

  To date, the Partnership has held two successful community meetings: one in June 2015, in the Mira Loma area, in collaboration with the non-profit organization the Center for Community Action and Environmental Justice (CCAEJ); and another in November 2015 in partnership with the Long Beach Alliance for Children with Asthma (LBACA). LPA is overseeing SCAQMD's contract with an experienced public affairs firms to continue the Partnership's programming to include community meetings, local recognition programs and a second Environmental Justice conference.
- Staff coordinated 118 air quality related community meetings, including workshops and events; and participated in 217 community/public meetings throughout SCAQMD's jurisdiction.
- The Small Business Assistance Team responded to 1,354 requests for Permit Application Assistance, conducted 56 on-site consultations, processed 74 Fee Review requests and issued 301 Clearance Letters. The Team also launched its Expired Permit Outreach Program pilot that in 2015, reinstated 286 expired SCAQMD permits and helped SCAQMD to recover about $211,807 in fees.
- Staff improved SCAQMD's educational outreach through the design and production of collateral materials, including brochures, flyers, web pages, PowerPoint presentations, videos, and signage, for meetings, conferences and the annual Clean Air Awards program.
- Outreach also included successful community programs, such as the Dr. Martin Luther King Jr. Day of Service Forum and the Cesar Chavez Day of Remembrance events that inspired attendees to learn more about SCAQMD, air quality issues that impact their lives, and ways we can work together to create healthier, more sustainable communities.

ANTICIPATED:

- Continue to move SCAQMD's legislative agenda at the state and federal levels.
- Enhance communications with local, state, and federal elected officials and their staff by generating electronic publications highlighting the most current information on SCAQMD activities, programs and incentives.
- Improve communication with the business community in the area of small business outreach to increase awareness of available programs and services, and provide information that enables business owners and operators to understand and comply with SCAQMD's rules and regulations.
- Continue to expand our current connections with the public, as we develop ways to increase our outreach through the use and enhancement of increasingly more engaging, accessible, and user-friendly social media, apps, and other online capabilities, as well as broader opportunities face-to-face interactions with the public we serve.

ORGANIZATIONAL CHART:



POSITION SUMMARY: 41 FTEs

Legislative & Public Affairs Units	FY 2015-16	Change	Proposed FY 2016-17
Office Administration	5	-	5
Legislative/Communications	20	-	20
Local Government/Outreach & Education	7	-	7
Administration & Small Business Assistance	9	-	9
Total	41	-	41

STAFFING DETAIL:

2015-16 Requested Staffing

Position	Title
2	Air Quality Engineer II
2	Air Quality Inspector II
1	Assistant Deputy Executive Officer/Public Affairs
2	Community Relations Manager
1	Deputy Executive Officer/Public Affairs
4	Graphic Arts Illustrator II
1	Office Assistant
1	Program Supervisor (Federal Legislation)
1	Public Affairs Specialist
7	Radio/Telephone Operator
2	Secretary
2	Senior Administrative Secretary
1	Senior Office Assistant
1	Senior Public Affairs Manager
10	Senior Public Information Specialist
1	Senior Staff Specialist
1	Staff Assistant (Social Media Coordinator)
1	Supervising Radio/Telephone Operator
41	Total Requested Positions

Legislative & Public Affairs
Work Program by Office

#	Program Code		Program Category	Goal	Program	Activities	FTEs FY 2015-16	FTEs +/-	FTEs FY 2016-17	Revenue Category
1	35	046	Customer Service and Business Assistance	III	Admin/Prog Mgmt	Admin Office/Units/SuppCoord Staff	3.02		3.02	Ib
2	35	111	Ensure Compliance	II	Call Center/CUT SMOG	Smoking Vehicle Complaints	8.00		8.00	IX,XV
3	35	126	Customer Service and Business Assistance	II	Clean Air Connections	Coord of region-wide community group	1.00		1.00	II,IX
4	35	205	Customer Service and Business Assistance	II	Environmental Education	Curriculum Dev/Project Coord	0.25		0.25	II,IX,XV
5	35	240	Customer Service and Business Assistance	I	Environmental Justice	Impl Board's EJ Pgrms/Policies	2.00		2.00	II,IV
6	35	260	Customer Service and Business Assistance	III	Fee Review	Cmte Mtg/Fee-Related Complaint	0.50		0.50	II,III,IV,XV
7	35	280	Policy Support	I	Advisory Group/Ethnic Comm	GB Ethnic Comm Advisory Group	0.40		0.40	II,IX
8	35	281	Policy Support	I	Advisory Group/Small Business	SBA Advisory Group Staff Support	0.50		0.50	IV,IX
9	35	283	Policy Support	I	Governing Board Policy	Brd sup/Respond to GB req	0.55		0.55	Ia
10	35	345	Policy Support	II	Goods Mvmt&Financial Incentive	Goods Movement & Financial Incentives Progr	1.00		1.00	IX
11	35	350	Operational Support	III	Graphic Arts	Graphic Arts	2.00		2.00	Ia
12	35	381	Customer Service and Business Assistance	III	Interagency Liaison	Interact Gov Agns/Promote SCAQMD	0.15		0.15	Ia,XV
13	35	390	Customer Service and Business Assistance	I	Intergov/Geographic Deployment	Dev/Impl Local Govt Outreach	9.50		9.50	II,IX
14	35	412	Policy Support	I	Legislation/Federal	Lobbying/Analyses/Tracking/Out	0.25		0.25	Ia
15	35	413	Policy Support	I	Legislation/Exec Office Suppor	Coord Legis w/ EO, EC, Mgmt	0.25		0.25	Ia
16	35	414	Policy Support	I	Legislation-Effects	Lobbying/Analyses/Tracking/Out	0.80		0.80	Ia,IX
17	35	416	Policy Support	I	Legislative Activities	Supp/Promote/Influence Legis/Adm	0.50		0.50	Ia
18	35	491	Customer Service and Business Assistance	II	Outreach/Business	Chambers/Business Meetings	1.00		1.00	II,IV
19	35	492	Customer Service and Business Assistance	II	Public Education/Public Events	Pub Events/Conf/Rideshare Fair	1.00		1.00	II,V,IX,XV
20	35	494	Policy Support	I	Outreach/Collateral Developmen	Edits,Brds,Talk shows,Commercl	0.60		0.60	Ia
21	35	496	Customer Service and Business Assistance	II	Outreach/Visiting Dignitary	Tours/Briefings-Dignitary	0.25		0.25	Ia
22	35	514	Customer Service and Business Assistance	I	Permit: Expired Permit Program	Assist w Permit Reinstatement	0.30		0.30	IV
23	35	555	Customer Service and Business Assistance	II	Public Information Center	Inform public of unhealthy air	1.00		1.00	II,V,IX
24	35	560	Develop Programs	I	Public Notification	Public notif of rules/hearings	0.50		0.50	II,IV,IX
25	35	565	Customer Service and Business Assistance	III	Public Records Act	Comply w/ Public Req for Info	0.10		0.10	Ia
26	35	679	Customer Service and Business Assistance	III	Small Business Assistance	Small Business/Financial Assistance	1.00		1.00	III
27	35	680	Timely Review of Permits	I	Small Business/Permit Streamln	Asst sm bus to comply/SCAQMD req	3.95		3.95	II,III,IV,V,XV
28	35	710	Customer Service and Business Assistance	I	Speakers Bureau	Coordinate/conduct speeches	0.10		0.10	Ia
29	35	717	Policy Support	II	Student Interns	Student Interns	0.10		0.10	Ia
30	35	791	Customer Service and Business Assistance	I	Toxics/AB2588	Outreach/AB 2588 Air Toxics	0.01		0.01	X
31	35	825	Operational Support	III	Union Negotiations	Official Labor/Mgmt Negotiate	0.01		0.01	Ia
32	35	826	Operational Support	III	Union Steward Activities	Union Steward Activities	0.01		0.01	Ia
33	35	855	Operational Support	II	Web Tasks	Create/edit/review web content	0.40		0.40	Ia
						Total	41.00	0.00	41.00	

Legislative & Public Affairs Line Item Expenditure						
Major Object / Account # **/** Account Description		**FY 2014-15 Actuals**	**FY 2015-16 Adopted Budget**	**FY 2015-16 Amended Budget**	**FY 2015-16 Estimate ***	**FY 2016-17 Proposed Budget**
Salary & Employee Benefits						
51000-52000	Salaries	$ 3,324,533	$ 3,384,658	$ 3,384,659	$ 3,655,384	$ 3,516,949
53000-55000	Employee Benefits	1,802,039	1,880,875	1,880,875	1,946,588	1,978,501
Sub-total Salary & Employee Benefits		$ 5,126,572	$ 5,265,534	$ 5,265,534	$ 5,601,971	$ 5,495,450
Services & Supplies						
67250	Insurance	$ -	$ -	$ -	$ -	$ -
67300	Rents & Leases Equipment	6,794	6,500	6,500	6,500	6,500
67350	Rents & Leases Structure	8,414	9,000	9,000	9,000	9,000
67400	Household	-	-	-	-	-
67450	Professional & Special Services	1,503,976	1,395,316	1,601,146	1,601,146	1,619,846
67460	Temporary Agency Services	30,009	78,000	78,000	57,484	78,000
67500	Public Notice & Advertising	41,960	26,600	26,600	10,462	26,600
67550	Demurrage	7,619	-	500	500	-
67600	Maintenance of Equipment	-	9,000	9,000	6,115	9,000
67650	Building Maintenance	-	-	-	-	-
67700	Auto Mileage	10,449	23,800	23,784	19,489	23,800
67750	Auto Service	-	-	16	16	-
67800	Travel	33,582	43,200	43,200	35,010	43,200
67850	Utilities	-	-	-	-	-
67900	Communications	54,512	45,000	45,000	45,000	45,000
67950	Interest Expense	-	-	-	-	-
68000	Clothing	-	-	-	-	-
68050	Laboratory Supplies	-	-	-	-	-
68060	Postage	82,277	136,800	136,300	73,640	136,800
68100	Office Expense	68,474	41,800	41,800	41,800	41,800
68200	Office Furniture	-	-	-	-	-
68250	Subscriptions & Books	3,657	16,200	16,975	16,200	16,200
68300	Small Tools, Instruments, Equipment	-	-	-	-	-
68400	Gas and Oil	-	-	-	-	-
69500	Training/Conference/Tuition/ Board Exp.	8,905	8,000	10,500	10,500	8,000
69550	Memberships	82,180	25,500	25,500	25,500	25,500
69600	Taxes	-	-	-	-	-
69650	Awards	55,317	49,681	49,681	49,681	49,681
69700	Miscellaneous Expenses	29,164	41,500	39,000	30,287	41,500
69750	Prior Year Expense	(381)	-	-	-	-
69800	Uncollectable Accounts Receivable	-	-	-	-	-
89100	Principal Repayment	-	-	-	-	-
Sub-total Services & Supplies		$ 2,026,907	$ 1,955,897	$ 2,162,502	$ 2,038,331	$ 2,180,427
77000	**Capital Outlays**	$ -	$ -	$ -	$ -	$ -
79050	**Building Remodeling**	$ -	$ -	$ -	$ -	$ -
Total Expenditures		$ 7,153,479	$ 7,221,431	$ 7,428,036	$ 7,640,302	$ 7,675,877

* Estimates based on July 2015 through February 2016 actual expenditures and budget amendments.

SCIENCE & TECHNOLOGY ADVANCEMENT

MATT MIYASATO
DEPUTY EXECUTIVE OFFICER

DESCRIPTION OF MAJOR SERVICES:

The Office of Science & Technology Advancement (STA) is responsible for three key areas of operation: monitoring and analysis; technology research, development and implementation; and mobile source policy and regulatory analysis. The Monitoring & Analysis Division) maintains the SCAQMD's air monitoring network, operates the analytical laboratory and conducts source tests and evaluation, responds to local community monitoring requests, including meteorological and sampling services as part of the SCAQMD's emergency response program; and performs quality assurance functions for the agency. The Technology Advancement Office implements the Clean Fuels Program to commercialize advanced emission control technologies and fund incentive programs such as the Carl Moyer, Lower-emission School Bus, and Proposition 1B-Goods Movement programs. Lastly, the Mobile Source Division oversees the implementation of the SCAQMD Clean Fleet Vehicle Rules, provides support in the development of the mobile source control strategy for the Air Quality Management Plan (AQMP), and provides input and comments on state and federal regulatory activities.

ACCOMPLISHMENTS:

RECENT:

- Continued the implementation of the Carl Moyer, Surplus Off-Road Opt-In for NOx (SOON), Lower-emission School Bus, and the Proposition 1B-Goods Movement programs with total funding exceeding $150 million annually. Implemented the Voucher Incentive Program (VIP) for replacement of on-road trucks on a first-come-first-served basis. Awarded $23 million to Southern California Regional Rail Authority with an additional $36 million to be considered with the progress of the project, to replace ten Tier 0 locomotives with Tier 4 locomotives. Completed the replacement of about 1,800 older diesel trucks with a funding of $75 million under the Proposition 1B-Goods Movement program.
- Continued the Clean Fuels program, which is the research, development, demonstration and early deployment program for the SCAQMD. Executed over $14.3 million in contracts with $64.7 million in total project costs (1:5 leveraging). Projects in key technical areas include heavy-duty electric drive technologies, in-use emissions testing of heavy-duty trucks, and refueling infrastructure for alternative fuels (natural gas, electricity and hydrogen).
- Continued the implementation of the SCAQMD Fleet Vehicle Rules, and implementation of incentive programs for old vehicle scrapping, off-road equipment repowers and replacement of Tier 0 locomotives with Tier 4 locomotives.
- 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

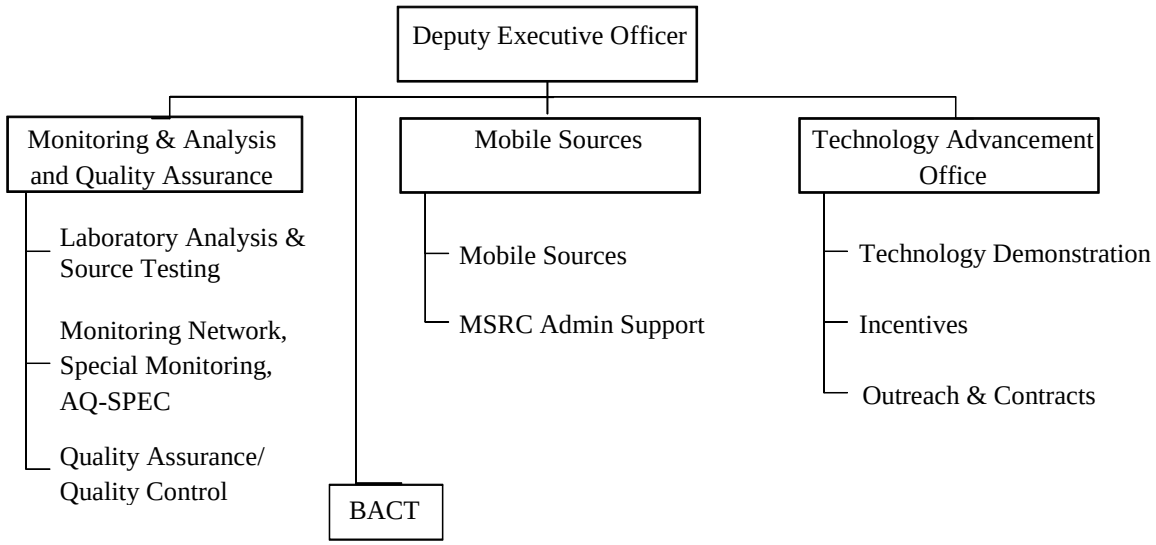
month, collection and analysis of 3,800 canisters for ambient Volatile Organic Compounds (VOCs) and toxics and over 15,000 filters for components including mass, ions, carbon and metals in support of federal programs including those for National Air Toxics Trends Stations (NATTS), Photochemical Assessment Monitoring Stations (PAMS), National Core (NCORE) PM2.5 Speciation, and Near-Road Monitoring.

- 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, hydraulic fracturing operations, emissions leaking from a gas storage facility, and odors from rendering plants. Deployed additional near road monitors. Continued air monitoring in support of Rule 444. Continued PM2.5 monitoring to assess potential impacts from CPV Sentinel power plant in Coachella Valley and continued the hydrogen sulfide and additional PM10 monitoring efforts near the Salton Sea. To support and verify 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 audit of monitoring stations in support of federal programs including those for NCORE, NATTS, PAMS, Criteria Pollutants, and PM2.5 Speciation; Performed 2014 data certification and review; and approved Criteria and PM2.5 Quality Assurance Project Plans (QAPPs).
- Expanded SCAQMD'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 SCAQMD staff.
- Initiated the implementation of Board-approved enhancements comprised of instrument/vehicle upgrades and additions to significantly improve SCAQMD's deployment and monitoring and analysis capabilities for air toxics.
- AQ-SPEC was initiated with 20 low-cost sensors tested in the field alongside federal reference monitors. The environmental chamber was delivered and inaugurated in 2015 with three different sensors evaluated.
- Two separate EPA grants were awarded to conduct community monitoring, and the website was deployed to provide public access to the AQ-SPEC analyses of the different sensors.
- Three different field studies using optical remote sensing technologies to measure air pollution emissions from refineries small point sources and marine vessels.
- In an effort to help SCAQMD acquire fence-line/remote sensing monitoring capabilities, initiated an in-depth monitoring study to experiment with and assess capabilities of several next generation optical remote sensing technologies.
- Developed hydrogen fuel testing protocols to assure that hydrogen fuel quality meets the requirements of fuel cell powered vehicles.

ANTICIPATED:

- Continue the development and demonstration of heavy-duty zero emission cargo transport trucks, and initiate the development and demonstration of a zero emission goods movement corridor utilizing overhead catenary to power heavy-duty hybrid electric trucks near the Ports.
- Continue the implementation of the VIP on a first-come-first-served basis; and solicit for heavy-duty on- and off-road projects under the "Year 18" Carl Moyer and Proposition 1B-Goods Movement Programs. Also, issue a new solicitation for the school bus replacement and retrofit program.
- Increase deployment of cleaner construction equipment, locomotives, and on-road heavy-duty vehicles through the continued implementation of funding incentive programs, compliance with SCAQMD Clean Fleet Vehicle Rules, and identification of future mobile source strategies for the development of the 2016 AQMP.
- Continue with the implementation of routine and special monitoring and analysis efforts critical to the SCAQMD operations, including compliance verification efforts and rule development.
- Continue to enhance and modernize the District's telemetry system and data management system that receives and validates the incoming data from the air monitoring stations and special monitoring locations.
- Continue source test protocol and report evaluations, CEMS certifications, LAP application reviews and ST observations.
- Improve operational integrity, efficiency and quality assurance through monthly internal audits of laboratory and field monitoring stations.
- Continue with the implementation of the remote sensing technology projects and experimentation with other next generation monitoring technologies and formulate appropriate recommendations for the Board on how to best integrate such monitoring tools into the SCAQMD's current arsenal.
- Continue operational efficiency improvement by investing in latest software, automated instruments and equipment and other workflow streamlining efforts.
- Continue with full-scale testing of air quality sensors in AQ-SPEC and share testing results with the public.
- Deploy and pilot several air quality sensor networks for the purposes of developing new low-cost monitoring capabilities for SCAQMD, regulated entities, and the public.
- Utilize recent grants received to conduct emission studies in EJ communities around refineries utilizing optical remote sensing technologies in conjunction with air quality sensors.

ORGANIZATIONAL CHART:



POSITION SUMMARY: 174 FTEs

Science & Technology Advancement Units	FY 2015-16	Changes	Proposed FY 2016-17
Office Administration	8	3	11
Monitoring & Analysis	111	-	111
Mobile Source Division	14	(2)	12
Technology Advancement	34	6	40
Total	167	7	174

STAFFING DETAIL:

2016-17 Requested Staffing

Position	Title
25	Air Quality Chemist
10	Air Quality Engineer II
2	Air Quality Inspector II
20	Air Quality Instrument Specialist I
15	Air Quality Instrument Specialist II
14	Air Quality Specialist
3	Assistant Deputy Executive Officer/Science & Technology Advancement
2	Atmospheric Measurement Manager
10	Contracts Assistant
1	Deputy Executive Officer/Science & Technology Advancement
4	Laboratory Technician
1	Meteorologist Technician
8	Office Assistant
3	Planning and Rules Manager
3	Principal Air Quality Chemist
3	Principal Air Quality Instrument Specialist
13	Program Supervisor
5	Secretary
4	Senior Administrative Secretary
6	Senior Air Quality Chemist
3	Senior Air Quality Engineer
8	Senior Air Quality Instrument Specialist
1	Senior Enforcement Manager
1	Senior Public Information Specialist
1	Senior Office Assistant
1	Senior Staff Specialist
2	Staff Assistant
3	Staff Specialist
1	Supervising Air Quality Engineer
1	Technology Implementation Manager
174	Total Requested Positions

Science & Technology Advancement Work Program by Office										
#	Program Code		Program Category	Goal	Program	Activities	FTEs FY 2015-16	 +/-	 FY 2016-17	Revenue Category
1	44	003	Advance Clean Air Technology	I	AB2766/MSRC	Mob Src Review Comm Prog Admin	1.00	(0.50)	0.50	IX
2	44	004	Advance Clean Air Technology	I	AB2766/MSRC/Contract Admin	AB2766 Admin Discretionary Prog	3.00		3.00	IX
3	44	009	Develop Programs	I	AB 1318 Mitigation	AB 1318 Projects Admn/Impl	0.75		0.75	XVII
4	44	012	Advance Clean Air Technology	I	AQMP/Control Tech Assessment	Tech Supp: Quantify Cost Effec	0.10		0.10	VIII
5	44	015	Ensure Compliance	I	Acid Rain Program	Acid Rain CEMS Eval/Cert	0.50		0.50	II,IV
6	44	038	Monitoring Air Quality	I	Admin/Office Mgmt/Monitoring	Overall Program Mgmt/Coord	0.90	0.50	1.40	Ib
7	44	039	Advance Clean Air Technology	I	Admin/Office Mgt/Tech Adv	Admin Support/Coordination	0.77		0.77	VIII
8	44	041	Policy Support	I	Admin/Office Mgmt/Policy Supp	Overall Policy Supp/Mgmt/Coord	0.49		0.49	Ib
9	44	042	Ensure Compliance	I	Admin/Office Mgmt/Compliance	Compliance: Assign/Manage/Supp	0.37		0.37	Ib
10	44	043	Develop Rules	I	Admin/Office Mgmt/Rules	Rules: Assign/Manage/Supp	0.15		0.15	Ib
11	44	046	Monitoring Air Quality	I	Admin/Program Management	STA Program Administration	2.00		2.00	Ib
12	44	048	Advance Clean Air Technology	I	Admin/Prog Mgmt/Tech Advance	Overall TA Program Mgmt/Coord	1.55		1.55	VIII
13	44	052	Operational Support	I	Admin/Prog Mgmt/Mob Src	Admin: Mobile Source	1.80		1.80	Ib
14	44	063	Monitoring Air Quality	I	Ambient Air Analysis	Analyze Criteria/Tox/Pollutants	7.91		7.91	II,V,IX
15	44	064	Monitoring Air Quality	I	Ambient Network	Air Monitoring/Toxics Network	18.85	0.20	19.05	II,IV,V,IX
16	44	065	Monitoring Air Quality	I	Air Quality Data Management	AM Audit/Validation/Reporting	1.00		1.00	II,V,IX
17	44	066	Advance Clean Air Technology	I	AQIP Marine SCR DPF	AQIP Marine SCR DPF/Admin/Impl	0.15		0.15	IX
18	44	067	Monitoring Air Quality	II	Ambient Lead Monitoring	Lead Monitoring/Analysis/Reporting	0.50		0.50	IV
19	44	069	Develop Programs	I	AQIP Evaluation	AQIP Contract Admin/Evaluation	0.65		0.65	IX
20	44	072	Ensure Compliance	I	Arch Ctgs - End User	Sample Analysis/Rpts	5.00		5.00	XVIII
21	44	073	Monitoring Air Quality	I	Arch Ctgs - Other	Sample Analysis/Rpts	2.00		2.00	XVIII
22	44	079	Monitoring Air Quality	II	AQ SPEC	AQ SPEC	3.00		3.00	XVII
23	44	081	Monitoring Air Quality	I	Air Filtration EPA	Air Filtration EPA/Admn/Impl	0.25		0.25	V
24	44	082	Monitoring Air Quality	I	Air FItration Other	Air Filtration Other/Admn/Impl	0.50	(0.25)	0.25	XVII
25	44	084	Monitoring Air Quality	I	Blk Carbon Stdy EPA	EPA Blck Carbon Climate Study	0.20	(0.20)	0.00	XVII
26	44	095	Advance Clean Air Technology	I	CA Natural Gas Veh Partnership	CA Natural Gas Veh Partnership	0.05		0.05	VIII
27	44	105	Ensure Compliance	I	CEMS Certification	CEMS Review/Approval	6.15		6.15	II,III,VI
28	44	130	Advance Clean Air Technology	I	Clean Fuels/Contract Admin	Admin/Project Supp for TA Cont	3.40	3.17	6.57	VIII
29	44	132	Advance Clean Air Technology	I	Clean Fuels/Mobile Sources	Dev/Impl Mobile Src Proj/Demo	5.10	(0.75)	4.35	VIII
30	44	134	Advance Clean Air Technology	I	Clean Fuels/Stationary Combust	Dev/Demo Clean Combustion Tech	0.70		0.70	VIII
31	44	135	Advance Clean Air Technology	I	Clean Fuels/Stationary Energy	Dev/Demo Alt Clean Energy	0.70		0.70	VIII
32	44	136	Advance Clean Air Technology	I	Clean Fuels/Tech Transfer	Disseminate Low Emiss CF Tech	1.45	(0.25)	1.20	VIII
33	44	175	Ensure Compliance	I	DB/Computerization	Develop Systems/Database	0.44		0.44	II,IV,VI
34	44	187	Advance Clean Air Technology	I	DERA Sch Bus Repl	DERA Sch Bus Repl Admin/Impl	0.03		0.03	V
35	44	188	Advance Clean Air Technology	I	DERA FY 13 Veh Repl	DERA Vehicle Repl Admin/Impl	0.20		0.20	XVII
36	44	190	Advance Clean Air Technology	I	Diesel Projects EPA	Diesel Projects EPA/Admin/Impl	0.11		0.11	V
37	44	240	Monitoring Air Quality	I	Environmental Justice	Implement Environmental Justice	0.45		0.45	II,IX
38	44	248	Monitoring Air Quality	I	EPA Community Scale AQ-SPEC	EPA Community Scale AQ-SPEC	0.00	1.00	1.00	V,XVII
39	44	276	Policy Support	I	Advisory Group/Technology Adva	Tech Adv Advisory Group Supp	0.10		0.10	VIII
40	44	356	Advance Clean Air Technology	I	GGRF ZEDT Demo	GGRF ZEDT Demo Admin	0.00	1.10	1.10	XVII

Science & Technology Advancement Work Program by Office										
#	Program Code		Program Category	Goal	Program	Activities	FTEs FY 2015-16	+/-	FY 2016-17	Revenue Category
41	44	361	Advance Clean Air Technology	I	HD Trucks DOE ARRA	DOE HD Trucks Admin (ARRA)	2.00		2.00	V,XVII
42	44	396	Develop Programs	I	Lawnmower Exchange	Lawn Mower Admin/Impl/Outreach	0.30		0.30	XVII
43	44	424	Advance Clean Air Technology	I	LNG Trucks CEC	LNG Trucks Admin CEC	1.00	(1.00)	0.00	V,IX
44	44	439	Monitoring Air Quality	I	MATES IV	MATES IV	0.00		0.00	II,VIII
45	44	448	Develop Programs	I	Mobile Src Strategies-Off Road	CARB Off-Road Mob Src ctrl strategy for SIP	1.00	(0.85)	0.15	XVII
46	44	449	Develop Rules	I	Mob Src/SCAQMD Rulemaking	Prepare SCAQMD Mob Src rulemaking proposals	2.00		2.00	VIII,IX
47	44	450	Ensure Compliance	I	Microscopic Analysis	Asbestos/PM/Metals Analysis	3.00	(1.00)	2.00	VI
48	44	451	Develop Programs	I	Mob Src/CARB/EPA Monitoring	CARB/US EPA Mob Src Fuel Policies	1.50		1.50	IX
49	44	452	Develop Programs	I	Mob Src/CEC/US DOE Monitoring	CEC/US DOE Mob Src rulemaking proposals	1.00		1.00	IX,XVII
50	44	453	Advance Clean Air Technology	I	Mob Src: Emiss Inven Method	Rvw CARB/US EPA emissions inven methodology	1.50		1.50	VIII,IX
51	44	454	Policy Support	I	Mob Src:Greenhs Gas Reduc Meas	Provide comments on mob src portion of AB32	0.89		0.89	XVII
52	44	456	Develop Rules	I	MS & AQMP Control Strategies	AQMP Control Strategies	0.30		0.30	VIII
53	44	457	Advance Clean Air Technology	I	Mob Src/C Moyer Adm/Outreach	Carl Moyer: Impl/Admin Grant	5.65	3.16	8.81	IX
54	44	458	Develop Programs	I	Mobile Source Strategies	Implement Fleet Rules	1.00	(0.15)	0.85	VIII
55	44	459	Advance Clean Air Technology	I	Mob Src/C Moyer/Impl/Prg Dev	Moyer/Implem/Program Dev	2.80		2.80	IX
56	44	460	Advance Clean Air Technology	I	VIP Admin	VIP Admin/Outreach/Impl	0.80		0.80	IX
57	44	468	Monitoring Air Quality	I	NATTS(Natl Air Tox Trends Sta)	NATTS (Natl Air Tox Trends)	1.50		1.50	II,V,IX
58	44	469	Monitoring Air Quality	I	Near Roadway Mon	Near Roadway Monitoring	1.50		1.50	IV,V,IX
59	44	497	Advance Clean Air Technology	I	Plug-in Hybrid EV DOE ARRA	DOE Plug-in Hybrid EV Admin (ARRA)	0.75		0.75	V
60	44	500	Ensure Compliance	I	PM2.5 Program	Est/Operate/Maint PM2.5 Network	11.30		11.30	II,V,IX
61	44	505	Monitoring Air Quality	I	PM Sampling Program (EPA)	PM Sampling Program - Addition	10.60		10.60	V
62	44	507	Monitoring Air Quality	I	PM Sampling Spec	PM Sampling Special Events	0.10		0.10	V
63	44	530	Monitoring Air Quality	I	Photochemical Assessment	Photochemical Assess & Monitor	3.00		3.00	V,IX
64	44	533	Advance Clean Air Technology	I	POLB AMECS Demo	POLB AMECS Demo-Admin/Impl	0.47		0.47	XVII
65	44	542	Develop Programs	I	Prop 1B:Goods Movement	Prop 1B:Goods Movement	5.70	4.17	9.87	IX
66	44	544	Develop Programs	II	Prop 1B:Low Emiss Sch Bus	Prop 1B:Low Emiss Sch Bus	0.50	(0.50)	0.00	IX
67	44	545	Timely Review of Permits	I	Protocols/Reports/Plans	Eval Test Protocols/Cust Svc	0.10		0.10	III,IV
68	44	546	Timely Review of Permits	I	Protocols/Reports/Plans	Eval Test Protocols/Compliance	6.15		6.15	IV,VI
69	44	565	Customer Service and Business Assistance	III	Public Records Act	Comply w/ Public Req for Info	0.17		0.17	Ia
70	44	585	Monitoring Air Quality	I	Quality Assurance	Quality Assurance Branch	3.00		3.00	II,V,IX
71	44	653	Develop Rules	I	Rulemaking/BACT	Dev/Amend BACT Guidelines	2.00		2.00	II
72	44	657	Develop Rules	I	Rulemaking/Support PRA	Assist PRA w/ Rulemaking	0.05		0.05	II
73	44	663	Monitoring Air Quality	I	Salton Sea Monit	Mon/Analyze Hydrogen Sulfide	0.25		0.25	XVII
74	44	677	Advance Clean Air Technology	I	School Bus/Lower Emission Prog	School Bus Program Oversight	0.70		0.70	IX
75	44	700	Ensure Compliance	I	Source Testing/Compliance	Conduct ST/Prov Data/Compl	2.25		2.25	VI
76	44	701	Customer Service and Business Assistance	I	Source Testing/Customer Svc	Conduct ST/Prov Data/Cust Svc	0.05		0.05	VI
77	44	702	Develop Programs	I	ST Methods Development	Eval ST Methods/Validate	0.95		0.95	II
78	44	704	Ensure Compliance	I	ST/Sample Analysis/Compliance	Analyze ST Samples/Compliance	4.00		4.00	VI
79	44	705	Develop Programs	I	ST Sample Analysis/Air Program	Analyze ST Samples/Air Prgms	0.25		0.25	II
80	44	706	Develop Rules	I	ST Sample Analysis/Air Program	Analyze ST Samples/Rules	0.25		0.25	II

Science & Technology Advancement Work Program by Office										
#	Program Code		Program Category	Goal	Program	Activities	FTEs FY 2015-16	+/-	FY 2016-17	Revenue Category
81	44	707	Ensure Compliance	I	VOC Sample Analysis/Compliance	VOC Analysis & Rptg/Compliance	7.00		7.00	IV,XV
82	44	708	Develop Rules	I	VOC Sample Analysis/Rules	VOC Analysis & Rptg/Rules	0.25		0.25	II,XV
83	44	709	Customer Service and Business Assistance	I	VOC Sample Analysis/SBA/Other	VOC Analysis & Reptg/Cust Svc	0.50		0.50	VI
84	44	715	Monitoring Air Quality	II	Spec Monitoring/Emerg Response	Emergency Response	0.50		0.50	II
85	44	716	Ensure Compliance	I	Special Monitoring	Rule 403 Compliance Monitoring	2.20		2.20	III,IV,IX,XV
86	44	725	Timely Review of Permits	I	Permit Processing/Support E&C	Assist EAC w/ Permit Process	0.05		0.05	III
87	44	738	Advance Clean Air Technology	I	Target Air Shed EPA	Targeted Air Shed Admin/Impl	0.15		0.15	V,XVII
88	44	740	Advance Clean Air Technology	I	Tech Adv/Commercialization	Assess CFs/Adv Tech Potential	0.25		0.25	VIII
89	44	741	Advance Clean Air Technology	I	Tech Adv/Non-Combustion	Dev/Demo Non-Combustion Tech	0.10		0.10	VIII
90	44	794	Ensure Compliance	I	Toxics/AB2588	Eval Protocols/Methods/ST	1.25		1.25	X
91	44	795	Ensure Compliance	I	Toxics/Engineering	R1401 Toxics/HRA Prot/Rpt Eval	0.05		0.05	VI,X
92	44	816	Advance Clean Air Technology	I	Transportation Research	Transport Research/Adv Systems	0.50		0.50	VIII
93	44	821	Monitoring Air Quality	II	TraPac Air Filt Prg	Admin/Tech Suppt/Reptg/Monitor	1.00	(0.85)	0.15	XVII
94	44	825	Operational Support	III	Union Negotiations	Labor/Mgmt Negotiations	0.05		0.05	Ia
95	44	826	Operational Support	III	Union Steward Activities	Rep Employees in Grievance Act	0.05		0.05	Ia
						Total	167.00	7.00	174.00	

Science & Technology Advancement Line Item Expenditure						
Major Object / Account # **/** Account Description		**FY 2014-15 Actuals**	**FY 2015-16 Adopted Budget**	**FY 2015-16 Amended Budget**	**FY 2015-16 Estimate ***	**FY 2016-17 Proposed Budget**
Salary & Employee Benefits						
51000-52000	Salaries	$ 14,386,613	$ 14,841,049	$ 14,956,362	$ 14,930,633	$ 15,489,191
53000-55000	Employee Benefits	7,195,974	7,637,560	7,637,560	7,612,255	8,248,036
Sub-total Salary & Employee Benefits		$ 21,582,586	$ 22,478,609	$ 22,593,922	$ 22,542,888	$ 23,737,227
Services & Supplies						
67250	Insurance	$ 38,436	$ -	$ 45,000	$ 45,000	$ -
67300	Rents & Leases Equipment	107,001	36,800	101,807	91,758	36,800
67350	Rents & Leases Structure	153,871	169,000	175,500	159,101	169,000
67400	Household	215	500	500	250	500
67450	Professional & Special Services	709,482	80,000	1,350,056	1,301,652	80,000
67460	Temporary Agency Services	553,550	141,600	697,000	679,667	141,600
67500	Public Notice & Advertising	38,706	37,000	40,752	33,359	37,000
67550	Demurrage	69,758	55,000	66,000	50,370	55,000
67600	Maintenance of Equipment	364,436	200,000	467,526	467,526	200,000
67650	Building Maintenance	18,895	50,000	147,748	172,483	50,000
67700	Auto Mileage	59,072	3,909	99,438	94,438	3,909
67750	Auto Service	2,687	-	1,000	1,000	-
67800	Travel	78,917	48,403	124,026	118,943	48,403
67850	Utilities	850	-	9,812	10,000	-
67900	Communications	231,495	231,000	255,020	265,110	231,000
67950	Interest Expense	-	-	-	-	-
68000	Clothing	8,612	4,000	8,250	7,250	4,000
68050	Laboratory Supplies	402,456	295,000	494,300	485,222	295,000
68060	Postage	36,736	22,318	44,818	44,818	22,318
68100	Office Expense	140,429	41,393	99,615	99,615	41,393
68200	Office Furniture	660	-	1,248	1,248	-
68250	Subscriptions & Books	382	1,527	2,027	1,369	1,527
68300	Small Tools, Instruments, Equipment	143,597	130,000	308,468	308,295	130,000
68400	Gas and Oil	10	-	365	-	-
69500	Training/Conference/Tuition/ Board Exp.	17,900	9,000	20,000	17,000	9,000
69550	Memberships	98,575	2,250	122,220	120,220	2,250
69600	Taxes	1,866	2,000	25,829	25,641	2,000
69650	Awards	-	-	-	-	-
69700	Miscellaneous Expenses	8,917	2,600	19,100	6,612	2,600
69750	Prior Year Expense	(14,621)	-	-	-	-
69800	Uncollectable Accounts Receivable	-	-	-	-	-
89100	Principal Repayment	-	-	-	-	-
Sub-total Services & Supplies		$ 3,272,890	$ 1,563,300	$ 4,727,425	$ 4,607,947	$ 1,563,300
77000	**Capital Outlays**	$ 2,006,156	$ -	$ 2,307,241	$ 2,343,552	$ -
79050	**Building Remodeling**	$ -	$ -	$ -	$ -	$ -
Total Expenditures		$ 26,861,632	$ 24,041,909	$ 29,628,588	$ 29,494,387	$ 25,300,527
* Estimates based on July 2015 through February 2016 actual expenditures and budget amendments.						

SOUTH COAST

AIR QUALITY MANAGEMENT DISTRICT

ENGINEERING & COMPLIANCE

MOHSEN NAZEMI
DEPUTY EXECUTIVE OFFICER

DESCRIPTION OF MAJOR SERVICES:

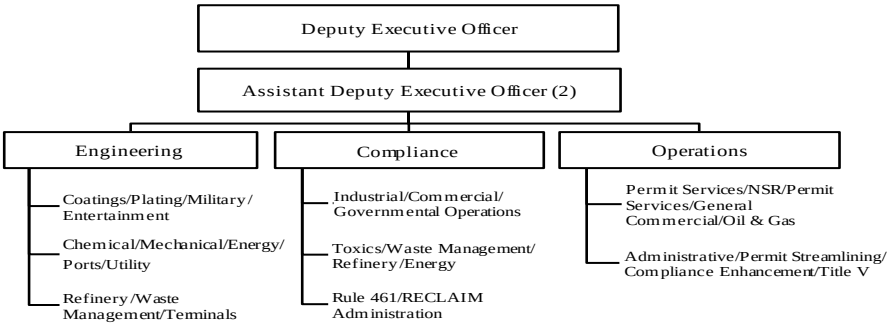
The Office of Engineering & Compliance (E&C) is primarily responsible for processing applications for Permits to Construct & Operate, compliance inspections and special services. The permit processing activities involve 390 major facilities that have been issued Title V Federal Operating permits, 272 facilities in the RECLAIM program, and over 27,000 large and small business operations. The compliance staff conducts routine unannounced field inspections to verify compliance with SCAQMD, State and Federal rules and regulations and responds to air quality complaints. In addition, staff participate in Emergency Response activities with other agencies, conduct training classes, assist with Economic Development and Business Retention programs, and evaluate and implement Permit Streamlining activities.

ACCOMPLISHMENTS

ANTICIPATED:

- Process 7,000 applications for Permits, Plans, ERCs, and timely renewal of TV permits.
- Conduct 22,000 site inspections for compliance determination.
- Conduct 3,500 equipment registered pursuant to Portable Equipment Registration Program (PERP) and 2,200 asbestos inspections.
- Conduct 40 training classes for businesses, public, and SCAQMD's staff.
- Timely response to all air quality complaints.

ORGANIZATIONAL CHART:



POSITION SUMMARY: 309 FTEs

Engineering & Compliance Units	FY 2015-16*	Changes	Proposed FY 2016-17
Administration	5	1	6
Engineering	153	(1)	152
Compliance	151	-	151
Total	309	-	309

*FY 2015-16 includes the transfer of one Senior Air Quality Engineer position and one Air Quality Engineer II position from Planning Rule Development and Area Sources to Engineering and Compliance.

STAFFING DETAIL:

2016-17 Requested Staffing

Position	Title
15	Air Quality Analysis and Compliance Supervisor
92	Air Quality Engineer II
89	Air Quality Inspector II
14	Air Quality Inspector III
2	Air Quality Specialist
2	Assistant Deputy Executive Officer/Engineering & Compliance
2	Data Technician
1	Deputy Executive Officer/Engineering & Compliance
12	Office Assistant
1	Principal Office Assistant
7	Secretary
3	Senior Administrative Secretary
20	Senior Air Quality Engineer
3	Senior Air Quality Engineering Manager
4	Senior Enforcement Manager
19	Senior Office Assistant
5	Staff Specialist
17	Supervising Air Quality Inspector
1	Supervising Office Assistant
309	Total Requested Positions

Engineering & Compliance Work Program by Office										
#	Program Code		Program Category	Goal	Program	Activities	FTEs FY 2015-16	+/-	FTEs FY 2016-17	Revenue Category
1	50	038	Customer Service and Business Assistance	I	Admin/Office Management	Dev/Coord Goals/Policies/Overs	5.00		5.00	Ib
2	50	047	Customer Service and Business Assistance	I	Admin/Operations Support	Budget/Contracts/Reports/Projects	5.00		5.00	Ib
3	50	070	Ensure Compliance	I	CARB PERP Program	CARB Audits/Statewide Equip Reg	7.00		7.00	XIX
4	50	071	Ensure Compliance	I	Arch Ctgs - Admin	Report Review	0.10		0.10	XVIII
5	50	072	Ensure Compliance	I	Arch Ctgs - End User	Compliance/Rpts/RuleImpmenta	0.10		0.10	XVIII
6	50	073	Ensure Compliance	I	Arch Ctgs - Other	Compliance/Rpts/Rule Implementation	4.50		4.50	XVIII
7	50	148	Policy Support	I	Climate Change	GHG/Climate Change Support	0.50		0.50	II,IX
8	50	152	Ensure Compliance	III	Compliance/IM Related Activiti	Assist IM: Design/Review/Test	0.50		0.50	II
9	50	155	Ensure Compliance	I	Compliance Guidelines	Procedures/Memos/Manuals	0.50		0.50	II
10	50	156	Ensure Compliance	I	Perm Proc/Info to Compliance	Prov Permit Info to Compliance	3.00		3.00	III,IV,XV
11	50	157	Ensure Compliance	I	Compliance/Special Projects	Prog Audits/Data Req/Board Supp	5.00		5.00	IV
12	50	158	Ensure Compliance	I	Compliance Testing	R461/Combustion Equip Testing	1.00		1.00	II
13	50	200	Customer Service and Business Assistance	I	Economic Dev/Bus Retention	Perm Proc/Public Participation	0.10		0.10	III
14	50	210	Monitoring Air Quality	II	Emergency Response	Emerg Tech Asst to Public Saf	0.25		0.25	II,XV
15	50	253	Timely Review of Permits	I	ERC Appl Processing	Process ERC Applications	3.50		3.50	III
16	50	260	Customer Service and Business Assistance	III	Fee Review	Fee Review Committee	0.45		0.45	II,III,IV
17	50	276	Policy Support	I	Board Committees	Admin/Stationary Source Committees	0.25		0.25	Ia
18	50	365	Ensure Compliance	I	Hearing Bd/Variances	Variances/Orders of Abatement	1.50		1.50	VII
19	50	367	Timely Review of Permits	I	Hearing Board/Appeals	Appeals: Permits & Denials	0.50		0.50	III
20	50	375	Ensure Compliance	I	Inspections	Compliance/Inspection/Follow-up	79.20		79.20	IV,V,XV
21	50	377	Ensure Compliance	I	Inspections/RECLAIM Audits	Audit/Compliance Assurance	23.80		23.80	II,IV
22	50	416	Policy Support	I	Legislative Activities	Legislative Activities	0.25		0.25	Ia
23	50	425	Customer Service and Business Assistance	I	Lobby Permit Services	Supp Perm Proc/Customer Svc	1.00		1.00	III
24	50	475	Timely Review of Permits	I	NSR Implementation	Implement NSR/Allocate ERCs	2.50		2.50	II,III,V,XV
25	50	476	Timely Review of Permits	I	NSR Data Clean Up	Edit/Update NSR Data	0.50		0.50	II
26	50	515	Timely Review of Permits	I	Perm Proc/Non TV/Non RECLAIM	PP: Non TitlV/TitlII/RECLAIM	57.30		57.30	III,XV
27	50	517	Timely Review of Permits	I	Permit Services	Facility Data-Create/Edit	12.50		12.50	III,XV
28	50	518	Timely Review of Permits	I	RECLAIM Non-Title V	Process RECLAIM Only Permits	4.50		4.50	III,IV,XV
29	50	519	Timely Review of Permits	I	Perm Proc/Title III (Non TV)	Process Title III Permits	1.00		1.00	III
30	50	520	Customer Service and Business Assistance	I	Perm Proc/Pre-Appl Mtg Outreac	Pre-App Mtgs/Genl Prescreening	4.00		4.00	III
31	50	521	Timely Review of Permits	I	Perm Proc/Expedited Permit	Proc Expedited Permits (301OT)	0.50		0.50	III
32	50	523	Timely Review of Permits	I	Permit Streamlining	Permit Streamlining	3.75		3.75	III
33	50	538	Ensure Compliance	I	Port Comm AQ Enforcement	Port Comm AQ Enforcement	0.50		0.50	IX
34	50	542	Ensure Compliance	I	Prop 1B:Goods Movement	Prop 1B: Gds Mvmnt/Inspect	0.30		0.30	IX
35	50	550	Ensure Compliance	II	Public Complaints/Breakdowns	Compltresp/Invflwup/Resolutn	10.00		10.00	II,IV,V,XV
36	50	565	Customer Service and Business Assistance	III	Public Records Act	Comply w/ Public Req for Info	0.50		0.50	Ia
37	50	605	Ensure Compliance	I	RECLAIM/Admin Support	Admin/Policy/Guidelines	10.00		10.00	II,III,IV,XV
38	50	607	Timely Review of Permits	I	RECLAIM & Title V	Process RECLAIM & TV Permits	12.40		12.40	III
39	50	650	Develop Rules	I	Rulemaking	Dev/Amend/Impl Rules	0.50		0.50	II,XV
40	50	657	Develop Rules	I	Rulemaking/Support PRA	Provide Rule Development Supp	0.50		0.50	II,XV
41	50	678	Ensure Compliance	I	School Siting	Identify Haz. Emission Sources near Schools	1.00		1.00	II

Engineering & Compliance Work Program by Office										
#	Program Code		Program Category	Goal	Program	Activities	FTEs FY 2015-16	+/-	FTEs FY 2016-17	Revenue Category
42	50	680	Ensure Compliance	I	Small Business Assistance	Asst sm bus w/ Permit Process	0.50		0.50	III,IV
43	50	690	Customer Service and Business Assistance	I	Source Education	Prov Tech Asst To Industries	2.80		2.80	III,IV,V,XV
44	50	728	Timely Review of Permits	I	Perm Proc/IM Programming	Assist IM: Design/Review/Test	2.00		2.00	II,III,IV
45	50	751	Ensure Compliance	I	Title III Inspections	Title III Comp/Insp/Follow Up	0.50		0.50	IV
46	50	752	Develop Rules	I	Title III Rulemaking	Title III Dev/Implement Rules	0.25		0.25	II,V,XV
47	50	771	Ensure Compliance	I	Title V Inspections	Title V Compl/Inspect/Follow Up	11.00		11.00	II,IV
48	50	773	Develop Rules	I	Title V & NSR Rulemaking-Supp	Title V Rules Dev/Amend/Impl	0.25		0.25	II
49	50	774	Timely Review of Permits	I	TV/Non-RECLAIM	Process Title V Only Permits	18.00		18.00	III
50	50	775	Timely Review of Permits	I	Title V – Admin	Title V Administration	1.00		1.00	III
51	50	791	Ensure Compliance	I	Toxics/AB2588	AB2588 Rev Rprts/Risk Redplans	0.25		0.25	X
52	50	805	Operational Support	III	Training	Dist/Org Unit Training	6.00		6.00	Ib
53	50	825	Operational Support	III	Union Negotiations	Official Labor/Mgmt Negotiate	0.10		0.10	Ia
54	50	826	Operational Support	III	Union Steward Activities	Rep Employees in Grievance Act	0.10		0.10	Ia
55	50	850	Ensure Compliance	I	VEE Trains	Smoking Trains-Compl/Inspec/FU	0.50		0.50	IX,XV
56	50	855	Operational Support	II	Web Tasks	Creation/Update of Web Content	0.50		0.50	Ia
						Total	309.00		309.00	

Engineering & Compliance Line Item Expenditure						
Major Object / Account # **/** Account Description		**FY 2014-15 Actuals**	**FY 2015-16 Adopted Budget**	**FY 2015-16 Amended Budget**	**FY 2015-16 Estimate ***	**FY 2016-17 Proposed Budget**
Salary & Employee Benefits						
51000-52000	Salaries	$ 24,385,134	$ 27,135,885	$ 27,135,885	$ 24,939,723	$ 27,589,566
53000-55000	Employee Benefits	11,627,158	13,413,267	13,413,267	12,065,390	13,903,011
Sub-total Salary & Employee Benefits		$ 36,012,293	$ 40,549,152	$ 40,549,152	$ 37,005,113	$ 41,492,577
Services & Supplies						
67250	Insurance	$ -	$ -	$ -	$ -	$ -
67300	Rents & Leases Equipment	-	-	-	-	-
67350	Rents & Leases Structure	89,347	101,706	101,706	98,418	106,791
67400	Household	-	-	-	-	-
67450	Professional & Special Services	1,063,091	16,000	841,000	766,000	10,000
67460	Temporary Agency Services	21,553	30,000	30,000	24,439	30,000
67500	Public Notice & Advertising	78,068	80,000	80,000	78,068	80,000
67550	Demurrage	-	500	500	206	500
67600	Maintenance of Equipment	13,602	21,500	21,500	18,339	20,500
67650	Building Maintenance	-	-	-	-	-
67700	Auto Mileage	18,211	15,000	15,000	15,000	15,000
67750	Auto Service	-	1,000	1,000	-	1,000
67800	Travel	26,314	35,110	35,110	22,342	35,110
67850	Utilities	-	-	-	-	-
67900	Communications	120,987	163,590	163,590	145,426	128,000
67950	Interest Expense	-	-	-	-	-
68000	Clothing	22,497	13,320	13,320	13,320	20,600
68050	Laboratory Supplies	3,650	5,000	5,000	4,627	7,160
68060	Postage	27,984	40,000	40,000	32,219	40,000
68100	Office Expense	114,094	72,594	72,594	72,594	81,050
68200	Office Furniture	-	2,500	2,500	2,242	2,500
68250	Subscriptions & Books	-	800	800	-	800
68300	Small Tools, Instruments, Equipment	11,239	23,460	23,460	2,804	22,919
68400	Gas and Oil	-	-	-	-	-
69500	Training/Conference/Tuition/ Board Exp.	13,575	9,900	30,900	15,900	30,050
69550	Memberships	-	1,500	1,500	-	1,500
69600	Taxes	-	-	-	-	-
69650	Awards	-	-	-	-	-
69700	Miscellaneous Expenses	3,330	10,000	4,000	4,000	10,000
69750	Prior Year Expense	(27)	-	-	-	-
69800	Uncollectable Accounts Receivable	-	-	-	-	-
89100	Principal Repayment	-	-	-	-	-
Sub-total Services & Supplies		$ 1,627,514	$ 643,480	$ 1,483,480	$ 1,315,943	$ 643,480
77000	**Capital Outlays**	$ -	$ 50,000	$ 136,916	$ 12,000	$ -
79050	**Building Remodeling**	$ -	$ -	$ -	$ -	$ -
Total Expenditures		$ 37,639,807	$ 41,242,632	$ 42,169,548	$ 38,333,057	$ 42,136,057
* Estimates based on July 2015 through February 2016 actual expenditures and budget amendments.						

SCAQMD 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
    - 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
    - Population – 16,894,297 (2015)
    - Vehicle Registrations - 12,956,095 (2015)
- 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 (27,303 operating locations with 74,357 permits)
- Decision-making body is a 13 member Governing Board
    - Total of 10 elected officials with four appointed by the Board of Supervisors from each of the four counties and six appointed by cities within the District
    - Three officials 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 Nine Fiscal Years

Program Category	2007	2008	2009	2010	2011	2012	2013	2014	2015
Advance Clean Air Technology									
Contracts awarded	304	295	292	530	526	556	938	523	1,047
Total Funding awarded ($M)	$133.6	$91.3	$19.4	$190.7	$131.4	$82.5	$207.2	$216.1	$123.2
Ensure Compliance with Clean Air Rules									
Inspections	35,039	33,742	40,558	33,735	33,560	34,191	32,535	29,501	22,871
Notices of Violations	1,407	1,321	1,908	1,530	1,254	1,211	965	956	811
Hearing Board Orders for Abatement	49	30	36	35	47	93	51	46	411
Hearing Board Appeals	12	22	19	20	2	7	3	7	-
Customer Service									
Public Information Requests	4,651	3,528	4,962	3,821	3,410	3,543	3,460	4,505	4,012
Community/Public Meetings attended	182	145	198	202	190	274	294	264	217
Small Business Assistance Contacts	2,289	2,680	2,662	2,578	2,497	2,574	2,266	1,850	1,711
Develop Programs to Achieve Clean Air									
Transportation Plans processed	1,502	1,534	1,412	1,372	1,385	1,392	1,371	1,333	1,329
Emission Inventory Updates	284	439	586	703	521	530	408	460	336
Develop Rules to Achieve Clean Air									
Rules Developed	24	29	32	15	40	8	20	24	24
Monitoring Air Quality									
Samples Analyzed by the Laboratory	14,683	31,530	25,400	29,685	28,915	29,520	32,520	29,340	30,824
Source Testing Analyses/Evaluations/Review	830	794	718	740	1,030	952	1,035	968	996
Timely Review of Permits									
Applications Processed	9,481	9,599	11,564	9,627	13,044	12,225	14,153	13,217	9,495
Applications Received-Small Business	-	-	627	694	798	732	615	514	629
Applications Received-All Others	8,261	9,297	10,954	10,941	10,769	11,682	11,709	11,156	9,961
Policy Support									
News releases	44	51	76	69	64	57	61	62	76
Media Calls	643	684	334	313	252	520	1,131	774	532
Media Inquiries Completed	604	684	334	313	252	520	1,131	774	532

FINANCIAL POLICIES

SCAQMD is required to follow specific sections of the California Health & Safety Code, which guide SCAQMD's overall financial parameters. The Governing Board also provides financial direction to SCAQMD staff through the adoption of various financial-related policies. In addition, the Executive Officer's 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 District 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 district to fund its programs. The district shall notify each person who was subject to fees imposed by the district in the preceding year of the availability of information. The district 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 district 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 SCAQMD 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.

SCAQMD Governing Board Policy

- 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.

- 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 percent 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 SCAQMD's reliance on state subvention ($4M), U.S. EPA Section 103/105 grants ($5M), and one-time penalties and settlements ($5M).

- Fund Balance Use

  When both restricted and unrestricted resources are available for use, it is SCAQMD's policy to use restricted resources first and then unrestricted resources as they are needed. When using unrestricted fund balance amounts, SCAQMD's Governing Board approved policy is to use committed amounts first, followed by assigned and then assigned.

- 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 Air Quality Management District (SCAQMD). The purpose of this policy is to ensure all of SCAQMD's funds are prudently invested to preserve principal and provide necessary liquidity, while earning a market average rate of return. The SCAQMD 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 SCAQMD.

The policy provides the Governing Board, the Treasurer, the Chief Financial Officer, and the Investment Oversight Committee with set duties and responsibilities to execute the policy.

- Treasury Operations Contingency Plan and Procedures

  The Treasury Operations Contingency Plan and Procedures states the course of action that may be implemented by the SCAQMD to protect the safety and liquidity of the SCAQMD funds and to protects SCAQMD from disruptions to ongoing operations if: 1) the financial stability of Los Angeles County may jeopardize SCAQMD funds invested through the Los Angeles County Treasurer; and/or 2) the Los Angeles County Treasurer, as Treasurer of SCAQMD, can no longer provide the treasury services currently provided in a satisfactory manner.

  Under authority granted by Resolution 97-32, the Executive Officer, upon recommendation of the Chief Financial Officer and concurrence of the Administrative Committee, can appoint either the Chief Financial Officer or Controller as Acting Treasurer to immediately begin implementing the defined procedures to safeguard SCAQMD funds.

- Budget Advisory Committee

  Established by the SCAQMD Governing Board, the Budget Advisory Committee serves in an advisory capacity to the SCAQMD 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 15th of each year pursuant to SCAQMD Rule 320.

- Administrative Code

  The Administrative Code of Rules and Procedures prescribes the responsibilities, conduct and specified reimbursements of SCAQMD employees and SCAQMD Board members. Sections include, but are not limited to, mileage reimbursement, travel expenses, tuition reimbursement, professional licenses and memberships, and bilingual pay.

- 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 SCAQMD 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 SCAQMD contracts and that SCAQMD utilizes, when necessary, the most highly qualified outside consultants/contractors to carry out the organization's responsibilities. SCAQMD Executive Officer, Deputy/Assistant Deputy Executive Officers, Legal Counsel, the Procurement Section, and staff all have responsibilities to execute the Procurement Policy and Procedure.

<u>Executive Officer Administrative Policies and Procedures</u>

- Travel

  The Travel Policy provides guidance on allowable travel expenses, travel advances, and documentation requirements.

- 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 SCAQMD Procurement Policy and Procedure document.

BUDGET GLOSSARY

Adopted Budget	The annual budget for the General Fund that has been approved by SCAQMD's Governing Board.
Amended Budget	The adopted budget plus any modifications approved by SCAQMD's Governing Board during the fiscal year.
Appropriation	A specific amount of money authorized by SCAQMD's Governing Board which permits the SCAQMD to incur obligations and to make expenditures of resources.
Assigned Fund Balance	The portion of the fund balance that has been allocated by SCAQMD's Governing Board for a specific purpose but does not meet the criteria to be classified as committed or nonspendable.
Budget Advisory Committee	A committee made up of representatives from the business and environmental communities who review and provide feedback on SCAQMD's financial performance and proposed budget.
Budgetary Basis of Accounting	A form of accounting used in the budget where encumbered amounts are recognized as cash expenditures.
Balanced Budget	A budget in which planned expenditures do not exceed planned revenues.
Capital Asset	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.
Capital Outlays	Expenditures for capital assets; A Major Object, or classification of expenditures, within SCAQMD's budget.
Committed Fund Balance	The portion of the fund balance that includes amounts that can be used only for specific purposes as determined by the SCAQMD Governing Board. Contract encumbrances at year-end make up the committed fund balance.
CPI-Based Fee Increase	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

Debt Service The cost to cover the repayment of interest and principal on a debt for a particular period of time.

Debt Structure The make-up of long-term debt. SCAQMD's long-term debt has been taken on to fund building and pension obligations.

Designation A portion of the Fund Balance that has been assigned for specific purposes by actions of SCAQMD's Governing Board.

Encumbrance An amount of money committed for the payment of goods and services that have not yet been received or paid for.

Expenditures Charges incurred for goods and services.

Fee Schedule 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 SCAQMD is approved by SCAQMD's Governing Board as part of the annual budget process. (Also see Regulation III.)

Fiscal Year A period of 12 consecutive months selected to be the budget year. SCAQMD's fiscal year runs from July 1 to June 30.

FTE 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.

Fund Balance The accumulation of revenues less expenditures within a fund for a specific year. SCAQMD'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.

GASB 54 New standards issued by the Government Accounting Standards Board (GASB) to guide fund balance reporting.

General Fund The primary operating fund for SCAQMD where expenditures and revenues associated with the daily operations of SCAQMD are accounted for.

Grant A sum of money given by an organization for a particular purpose. The grants which provide funding to SCAQMD's General Fund are primarily received from the Environmental Protection Agency (EPA), the Department of Homeland Security (DHS), and the Department of Energy (DOE).

Inventory	Value at cost of office, computer, cleaning and laboratory supplies at year-end.
Major Object	A term representing the classification of SCAQMD's annual budget into three categories: Salaries and Employee Benefits, Services and Supplies, and Capital Outlays.
Mobile Source Revenues	Revenues received from motor vehicle registrations and from the administration of motor vehicle programs aimed at reducing air pollution from motor vehicles.
Nonspendable Fund Balance	Amounts in the fund balance that are not in a spendable form. In SCAQMD's General Fund, inventory makes up the nonspendable fund balance.
Pension Obligation Bonds (POBs)	A method of financing used by SCAQMD to refinance its obligations to its employees' pension fund.
Proposed Budget	The annual budget that has been developed by SCAQMD and made available to the public for review but not yet presented to its Governing Board for approval.
Regulation III	The rule that establishes the fee rates and schedules associated with permitting, annual renewals, emissions and other activities that help fund most of SCAQMD's regulatory programs and services. (Also see Fee Schedule.)
Reserves	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).
Revenue	Monies the SCAQMD receives as income. SCAQMD's revenue is mainly from fees charged to control or regulate emissions.
SBCERA	San Bernardino County Employment Retirement System manages the retirement plan for SCAQMD employees.
Salaries and Employee Benefits	Expenditures for Salary expenses and employee, retirement and insurance benefits. It is a Major Object, or classification of expenditures, within SCAQMD's budget.
Services and Supplies	Expenditures for items and services needed for the daily operations of the SCAQMD including professional services, utilities, office expenses, maintenance, and debt service. It is a Major Object, or classification of expenditures, within SCAQMD's budget.

Special Revenue Fund — A fund used to account for revenues and expenditures from specific sources earmarked for specific purposes. SCAQMD's main operating fund is its General Fund. All other funds are designated as Special Revenue Funds. The SCAQMD does not adopt a budget for Special Revenue Funds.

State Subvention — Assistance provided by the state for a specific purpose. The state of California provides assistance to air districts in recognition that they perform mandated functions such as compliance assistance, planning, and rule development that should be covered by state funding sources.

Stationary Source Fees — Revenues collected from emission fees, permit fees, and annual operating fees to support activities for improving air quality.

Transfer In/Out — A transfer of funds between different funds within SCAQMD. 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.

Unassigned Fund Balance — The residual fund balance of the General Fund. It is not designated for a specific purpose and can only be used upon approval of SCAQMD's Governing Board.

Unreserved Designations — The portion of the Fund Balance that has not been committed by SCAQMD's Governing Board or is nonspendable due to specific Board constraints. It is further broken down into either amounts assigned by SCAQMD's Governing Board for specific purposes or an unassigned amount that can only be used upon approval of SCAQMD's Governing Board.

Work Programs — Activities carried out by SCAQMD staff. Work Programs are classified into nine Work Program Categories according to the nature of the activity being performed.

Air Quality Historical Timeline

Photo courtesy of Los Angeles Times Collection, Department of Special Collections, UCLA Library

First recognized episodes of smog occur in Los Angeles in the summer of 1943.

1943

1947

Los Angeles County Air Pollution Control District (APCD) established–the first of its kind in the nation.

1950

Orange County APCD established.

1957

San Bernardino and Riverside County APCDs formed.

1966

California adopts first automobile tailpipe emission standards in the nation.

1968

California Air Resources Board (CARB) holds its first meeting with Dr. Arie J. Haagen-Smit as its first chairman.

1970

Federal Clean Air Act is enacted, establishing the basic U.S. program for controlling air pollution.

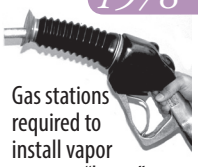
1971

U.S. EPA, created in 1970,adopts first national air quality standards.

1977

SCAQMD formed through merger of Los Angeles, Orange, Riverside and San Bernardino APCDs.

1978



Gas stations required to install vapor recovery "boots" on gas nozzles.

1984

California's Smog Check program takes effect.

1987

SCAQMD establishes ridesharing requirements for region's employers.

1989

SCAQMD adopts first Air Quality Management Plan to show attainment of clean air standards.

1990

Federal Clean Air Act Amendments of 1990 enacted. Established new programs aimed at curbing urban ozone, toxic emissions, and vehicle emissions.

1993

RECLAIM (REgional CLean Air Incentives Market) emissions trading program adopted.

1998

The Carl Moyer Program established to reduce mobile source emissions.

2002

SCAQMD adopts the nation's first phase-out of the toxic chemical perchloroethylene (or "perc") used at dry cleaners.

2003

SCAQMD Mow Down Air Pollution Electric Lawnmower Exchange Program begins.

2006

California Global Warming Solutions Act of 2006 (AB 32) enacted to establish first ever comprehensive program to reduce greenhouse gases.

2008

SCAQMD adopts Climate Change Policy.

2011

Federal agencies and the State of California establish single timeframe for corporate average fuel economy (CAFE) and greenhouse gas standards for the next generation of cars and light-duty trucks.

2014-2027

Projected achievement of current air quality health standards in South Coast air basin.

South Coast
Air Quality Management District

21865 Copley Drive
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www.aqmd.gov

CHAPTER III
CLEAN FUELS ANNUAL REPORT FOR 2015/2016

[An independent report to the Legislature on the Clean Fuels Program is required by March 31 of each year pursuant to Health and Safety Code 40448.5.1. The Clean Fuels Annual Report is included here as Chapter III.]

Technology Advancement Office

Leading the way to zero and near-zero emission technologies

Clean Fuels Program 2015 Annual Report and 2016 Plan Update

March 2016

South Coast AQMD
South Coast Air Quality Management District
aqmd.gov

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South Coast Air Quality Management District

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Vice Chairman

Ben Benoit
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Riverside County Cities

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San Bernardino County Cities

Judith Mitchell*
Councilmember, City of Rolling Hills Estates
Los Angeles County, Western Region

Dwight Robinson*
Councilmember, City of Lake Forest
Orange County Cities

Acting Executive Officer
Michael B. O'Kelly

*Technology Committee Members **Technology Committee Chairman

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South Coast Air Quality Management District
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Brian Choe, Program Supervisor
Connie Day, Program Supervisor
Ranji George, Program Supervisor
Joseph Impullitti, Program Supervisor
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Von Loveland, Air Quality Specialist
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Greg Ushijima, Air Quality Specialist

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Andrew Yoon, Air Quality Specialist
Greta Grier, Air Quality Inspector II
Arun Kumar, Air Quality Inspector II

Drue Hargis, Sr. Public Information Specialist

Penny Shaw Cedillo, Sr. Administrative Secretary
Pat Krayser, Senior Administrative Secretary
Ana Ponce, Sr. Administrative Secretary
Marjorie Eaton, Secretary
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Table of Contents

Figures

Tables

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. Recognizing this challenge, in 1988 the state established the SCAQMD's Clean Fuels Program (Program), along with the SCAQMD's Technology Advancement Office (TAO). The Clean Fuels Program affords the SCAQMD the ability to fund the development, demonstration and accelerated deployment of clean fuels and transportation technologies.

For over 20 years, using funding received through a $1 motor vehicle registration fee, the Clean Fuels Program has encouraged, fostered and supported 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. A key strategy of the Program, which allows significant leveraging of the Clean Fuels funding (typically $3-$4 to every $1), is its implementation as a public-private partnership in conjunction with private industry, technology developers, academic institutions, research institutions and government agencies. Further, while the SCAQMD aggressively seeks leverage funds to accomplish more with every dollar, it also strives to act as a leader in technology development and commercialization in an effort to accelerate the reduction of criteria pollutants. As a result, the SCAQMD Clean Fuels Program has traditionally supported a portfolio of technologies, in different stages of maturity, to provide a continuum of emission reductions and health benefits over time. This approach provides the greatest flexibility and optimizes the region's ability to achieve National Ambient Air Quality Standards (NAAQS).

Health & Safety Code (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 expenditures for the next CY, essentially re-calibrating the technical direction 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 2016 Plan Update, along with the 2015 Clean Fuels Annual Report, which are due to the Legislative Analyst by March 31, 2016.

The overall strategy of the SCAQMD's Clean Fuels Program is based in large part on technology needs identified through the Air Quality Management Plan (AQMP) process and the SCAQMD Board's directives to protect the health of residents in Southern California, which encompasses approximately 16.8 million people (nearly half the population of California). The AQMP is the long-term "blueprint" that defines:

- basin-wide emission reductions needed to achieve federal ambient air quality standards;
- regulatory measures to achieve those reductions;
- timeframes to implement these proposed measures; and
- technologies required to meet these future proposed regulations.

The preliminary 2016 AQMP control measures 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 air quality standards. The preliminary 2016 AQMP

projects that an approximate 50 percent reduction in NOx is required by 2023 and a 65 percent reduction by 2031, the majority of which must come from mobile sources both on- and off-road. These emission reduction needs were further identified in the California Air Resources Board's (CARB's) recent draft discussion document "Mobile Source Strategy" (October 2015)[1]. Moreover, the SCAQMD is currently only one of two regions in the nation recognized as an extreme ozone nonattainment area (the other is San Joaquin Valley). Ozone (a key component of smog) is created by a chemical reaction between NOx and volatile organic compound (VOC) emissions at ground level. This is especially noteworthy because the largest contributor to ozone is NOx emissions, and mobile sources contribute approximately 80 percent of the NOx emissions in this region. Furthermore, NOx emissions, along with VOC emissions, also lead to the formation of PM2.5 (particulate matter measuring 2.5 microns in size as contained in a cubic meter of air, expressed as micrograms per cubic meter ($\mu g/m^3$).

The preliminary 2016 AQMP includes integrated strategies and measures to demonstrate attainment of the following NAAQS:

- 8-hour Ozone (75 parts per billion or ppb) by 2031
- Annual PM2.5 (12 $\mu g/m^3$) by 2021-2025
- 8-hour Ozone (80 ppb) by 2023 (updated from the 2012 AQMP)
- 1-hour Ozone (120 ppb) by 2022 (updated from the 2012 AQMP)
- 24-hour PM2.5 (35 $\mu g/m^3$) by 2019 (updated from the 2012 AQMP)

The 2016 AQMP will also take an initial look at the emission reductions needed to meet the new federal 8-hour ozone air quality standard of 70 ppb anticipated to be attained by 2037.

The daunting challenge to reduce NOx and PM2.5 requires the Clean Fuels Program to encourage and accelerate advancement of transformative fuel and transportation technologies, leading the way for commercialization of progressively lower-emitting fuels and vehicles. Given the relationship between NOx, ozone and PM2.5, the 2016 Plan Update must emphasize emission reductions in all these areas. However, the confluence of federal, state and local planning efforts on climate change, greenhouse gases (GHGs), petroleum reduction, air quality and other environmental areas should provide co-benefits that may help the region.

Since the last AQMP, it has become clear that the effect of moving containers through the Ports of Los Angeles and Long Beach and the subsequent movement of goods throughout the region not only have a dramatic impact on air quality but also the quality of life in the communities along the major goods movement corridors. 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 movement technologies, such as electric trucks, plug-in hybrid trucks with all-electric range, zero emission container transport technologies, trucks operating from wayside power including catenary technology and other heavy-duty technologies. The SCAQMD goods movement projects that have been initiated or anticipated incorporate a variety of fuels, including electricity, natural gas, biofuels, hydrogen and diesel. The prioritization of these types of projects is emphasized in this 2016 Plan Update.

The proposed funding allocations and prioritization are commensurate with the emissions inventory for the various categories, as illuminated by Table 1 (page 3) which reflects NOx summary planning inventory in tons per day (tpd) from base year 2012 to NOx inventory for 2023, as projected in the preliminary 2016 AQMP.

[1] http://www.arb.ca.gov/planning/sip/2016sip/2016mobsrc_dd.pdf

2015 Annual Report

During CY 2015 the SCAQMD executed 69 new contracts, projects or studies and modified 9 continuing projects adding additional dollars toward research, development, demonstration and deployment (RDD&D) of alternative fuel and clean fuel technologies. Table 3 (page 30) lists these 78 projects or studies, which are further described in this report. The SCAQMD Clean Fuels Program contributed nearly $10.7 million in partnership with other governmental organizations, private industry, academia and research institutes, and interested parties, with total project costs of nearly $47.3 million. Table 4 (page 33) provides information on outside funding received into the Clean Fuels Fund ($2.75 million in 2015) as cost-share passed through the SCAQMD for the contracts executed in CY 2015. Table 5 (page 33) provides a comprehensive summary of federal, state and other revenue awarded to the SCAQMD during CY 2015 (approximately $8.56 million) for projects to be included within the Clean Fuels Program or which align well with and are complementary to the Clean Fuels Program.

The projects or studies executed in 2015 addressed a wide range of issues and opportunities with a diverse mix of advanced technologies. The following core areas of technology advancement for 2015 executed contracts (in order of funding percentage) include:

- Engine Systems (emphasizing alternative and renewable fuels for truck and rail applications)
- Electric and Hybrid Vehicle Technologies and Related Infrastructure (emphasizing electric and hybrid electric trucks and container transport technologies with zero emission operations)
- Hydrogen and Mobile Fuel Cell Technologies and Infrastructure
- Outreach and Technology Transfer
- Fuels and Emission Studies
- Emission Control Technologies
- Fueling Infrastructure and Deployment (predominantly natural gas and renewable fuels)

During CY 2015, the SCAQMD supported a variety of projects and technologies, ranging from near-term to long-term research, development, demonstration and deployment 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 South Coast Air Basin (Basin). Projects executed in CY 2015 included but are not limited to continued development and demonstration of electric and hybrid technologies with an emphasis on zero emission goods movement technologies, development and demonstration of hydrogen technologies and infrastructure, development and demonstration of heavy-duty natural gas engines and vehicles, and fuels and emissions studies.

As of January 1, 2016, there were 112 open contracts (Appendix B) in the Clean Fuels Program.

Forty RDD&D projects or studies and seven technology assessment and transfer contracts were completed in 2015, as listed in Table 6 (page 63). Appendix C comprises two-page summaries of the technical projects completed in 2015. In accordance with California Health and Safety Code Section 40448.5.1(d), this report must be submitted to the state legislature by March 31, 2016, after approval by the SCAQMD Governing Board.

2016 Plan Update

Every year TAO staff re-evaluates the Clean Fuels Program to develop a Plan Update which essentially serves to re-assess the technology progress and direction for the agency. The Program continually seeks to support the development and deployment of lower-emitting technologies. 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 opportunity. As the state and federal governments have turned a great deal of their attention to climate change and

petroleum reduction goals, the SCAQMD has remained committed to developing, demonstrating and commercializing zero and near-zero emission technologies. Fortunately many, if not the majority, of technology sectors that address our need for NOx reductions also garner greenhouse gas (GHG) and petroleum reductions. Due to these "co-benefits," the SCAQMD has been successful in partnering with the state and federal government, which allows the Clean Fuels Program to extensively leverage its funding.

The overall strategy is based in large part on technology needs identified in the SCAQMD's AQMP and the SCAQMD Governing Board's directives to protect the health of residents in the Basin. As summarized in Figure 1 (page 3), the NOx, VOC and PM emission sources of greatest concern are heavy-duty on-road vehicles, medium- and light-duty on-road vehicles, and off-road equipment.

To identify project or technology opportunities in which its available 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 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 issuance of Requests for Information to determine the state of various technologies and the challenges faced by those technologies for commercialization.

The Plan Update includes projects to develop, demonstrate and commercialize a variety of technologies, from near-term to long-term, that are intended to provide solutions to the emission control needs identified in the preliminary 2016 AQMP. As noted, the preliminary 2016 AQMP analysis indicates that an approximate 50 percent reduction in NOx is required by 2023 with an additional 15 percent NOx reduction beyond 2023 levels by 2031. Given the need for these significant reductions over the next 7-15 year timeframe, mid- and longer-term alternative fuels, hybrid, electric and fuel cell based technologies are emphasized. Several of the technology areas of focus include:

- reducing emissions from port-related activities, such as cargo handling equipment and container movement technologies, including demonstration and deployment of cargo container movement systems with zero emission range;
- mitigating criteria pollutant increases from renewable fuels, such as renewable diesel and dimethyl ether (DME);
- developing electric, hybrid, battery and plug-in hybrid technologies across light-, medium- and heavy-duty platforms; and
- producing transportation fuels and energy from renewable sources.

Table 7 (page 81) lists the potential projects across the nine core technologies identified in this report. Potential projects for 2016 total $16.4 million, with anticipated leveraging of more than $3 for every $1 of Clean Fuels funding for total project costs of more than $66 million. The proposed projects may also be funded by revenue sources other than the Clean Fuels Program, especially VOC and incentive projects.

CLEAN FUELS PROGRAM
Background & 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. Due to these challenges, the state legislature enabled the SCAQMD to implement the Clean Fuels Program to accelerate the implementation and commercialization of clean fuels and advanced technologies. In 1999, state legislation was passed which amended and extended the Clean Fuels Program. Specifically, as stated in the California Health and Safety Code (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. The following section describes the panel of external experts that helps review the Clean Fuels Program.

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 approval of the required annual report prior to submittal to the SCAQMD Governing Board. Also in 1999, in light of the formation of the 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. Current membership changes to both advisory groups, if required, will be considered by the SCAQMD Board and its Technology Committee, respectively, as part of consideration of the 2015 Annual Report and 2016 Plan Update. The current members of the SB 98 Clean Fuels Advisory Group and Technology Advancement Advisory Group are listed in Appendix A, with any proposed changes, subject to SCAQMD Board approval, duly noted.

The review process of the Clean Fuels Program now includes at least two full-day retreats of the two Advisory Groups, typically in the summer and winter, review by other technical experts, review by the Technology Committee of the SCAQMD Governing Board, a public hearing of the Annual Report and Plan Update before the full SCAQMD Governing Board, along with adoption of a 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 finally submittal of the 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 emission reductions from both mobile and stationary sources beyond those expected using current technologies. Table 1 reflects NOx inventory in the 2012 base year and NOx inventory as projected by attainment year 2023, due to continued implementation of already adopted control measures. The need for advanced technologies and clean fuels is best illustrated by Figure 1 below, which identifies NOx emissions by category and identifies just how far those emissions must be reduced to meet federal standards by 2023 and 2031. The italicized source categories in Table 1 are the primary focus of the Clean Fuels Program.

Table 1: NOx Summer Planning Inventory - 2012 to 2023

2012 (base year)		2023 (without further control measures)	
Source Category	**NOx (tpd)**	**Source Category**	**NOx (tpd)**
HD Diesel Trucks	150	*HD Diesel Trucks*	45
Cars/Light-Duty Trucks/SUVs	82	*Off-Road Equipment*	45
Off-Road Equipment	76	*Ocean Going Vessels*	23
Ocean Going Vessels	30	*Locomotives*	23
Medium Duty Trucks	27	*Cars/Light-Duty Trucks/SUVs*	22
Buses	25	*Aircraft*	16
Locomotives	21	RECLAIM	15
RECLAIM	20	*Commercial Harbor Craft*	11
Commercial Harbor Craft	17	Manufacturing and Industrial	10
Residential Fuel Combustion	14	Residential Fuel Combustion	9
Aircraft	13	Service and Commercial	9
Service and Commercial	12	*Buses*	8
Manufacturing and Industrial	12	*Medium Duty Trucks*	8
Heavy Duty Gas Trucks	11	*Recreational Boats*	6
Recreational Boats	8	*Heavy Duty Gas Trucks*	5
All Other Sources	9	All Other Sources	10
	529		**265**

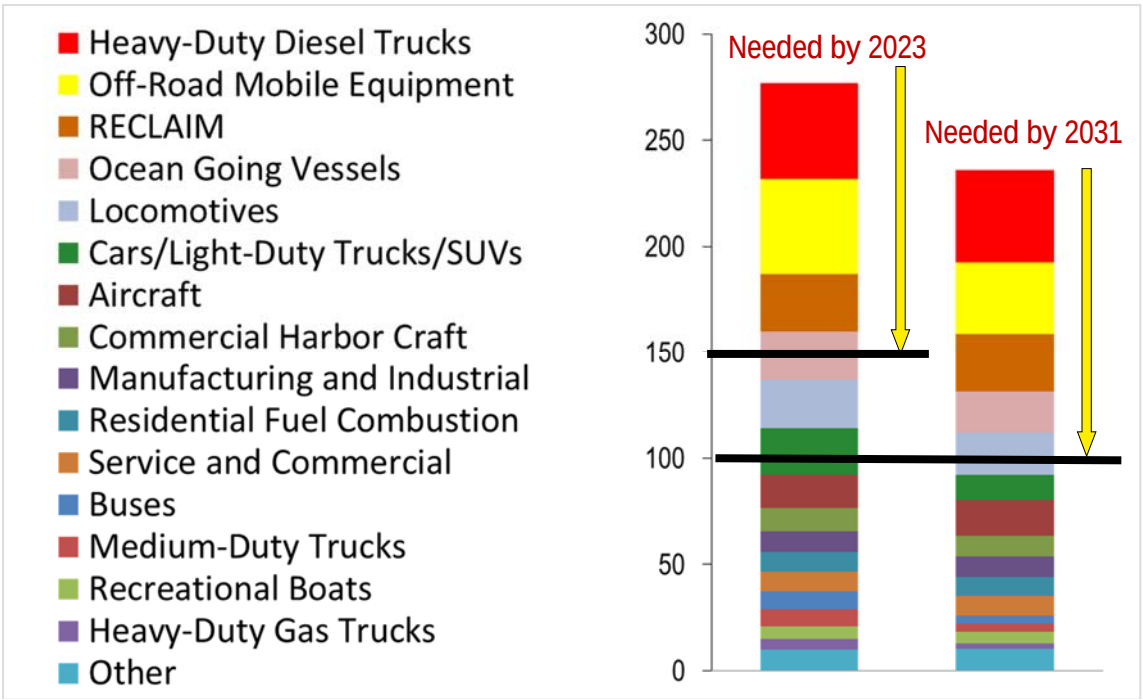

Figure 1: NOx Emission Reductions Needed as Projected in Preliminary 2016 AQMP[2]

[2] ***Data used to generate the table and chart above are from an inventory run on 1/7/16.***

Additionally, the following piechart reflects NOx contributors by sector, sharply illustrating the impact of mobile sources on air quality and why the preliminary 2016 AQMP calls for an approximate 50 percent reduction of NOx by 2023 as well as why this region is recognized as an extreme ozone nonattainment area.

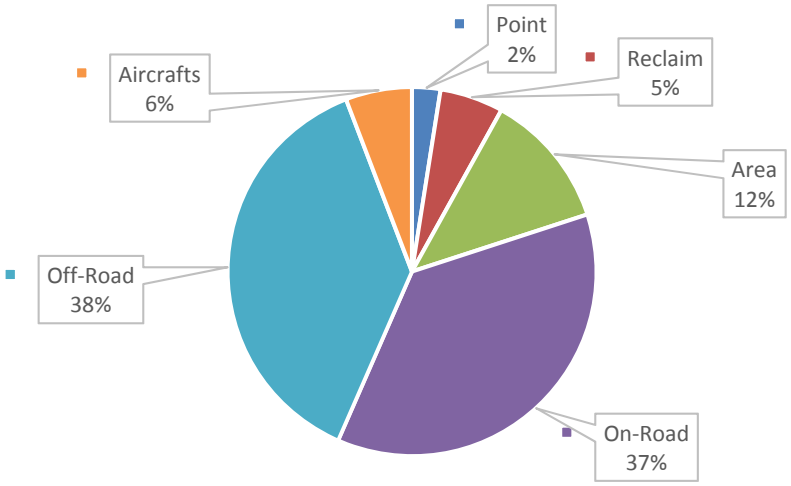

Figure 2: 2023 NOx Contributors by Sector

Finally, the following piechart reflects the relative contribution of directly emitted PM2.5 by source category to the 2023 emission inventory for an average annual day and does not include PM2.5 from secondary organic aerosols (SOAs) that may be generated as a result of emissions from on- and off-road equipment. A supplement to the 24-hour PM2.5 SIP will address further PM reductions to achieve attainment since the 24-hour PM2.5 standard was not attained in 2014 due to extreme drought conditions.

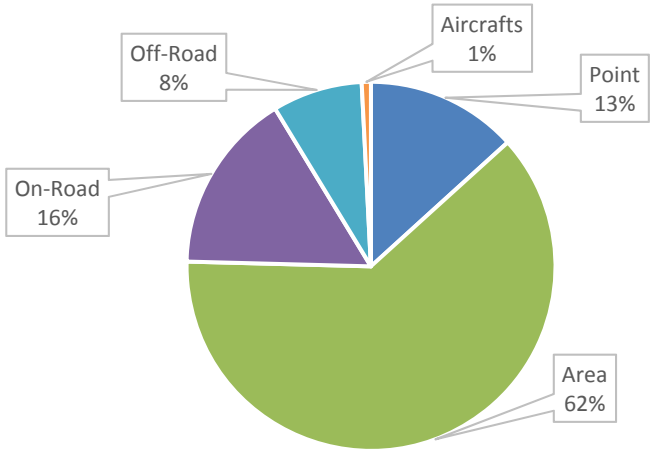

Figure 3: Directly Emitted 2023 PM2.5 Emissions (65 tpd)

To fulfill long-term emission reduction targets, the preliminary 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 (80 ppb, 8-hour average) and fine particulate matter, promulgated by the U.S. Environmental Protection Agency (U.S. EPA) in 1997 and 2006, are projected to require additional long-term control measures for both NOx and VOC. The preliminary 2016 AQMP's estimate of needed NOx reductions will require the SCAQMD Clean Fuels Program to encourage and accelerate advancement of cleaner, transformative transportation technologies that can be used as control strategies in the AQMP.

Health studies also indicate a greater need to reduce NOx emissions and toxic air contaminant emissions. For example, the goal of SCAQMD's Multiple Air Toxics Exposure Study (MATES) IV, initially launched in 2012, 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 early January 2015, Governor Brown's state-of-the-state address included ambitious goals to help meet California climate targets for 2030 and beyond, including increasing the amount of electricity generated from renewable sources from 33 to 50 percent and reducing the use of petroleum in cars and trucks by up to 50 percent from today's levels. Subsequently, in October 2015, the Governor signed SB 350 (De León) to codify the goals outlined in his January 2015 inaugural address, albeit prior to signature it was amended to remove the 50 percent reduction of petroleum use in cars and trucks. Nonetheless, SB 350 will still dramatically reshape California's energy economy. In July 2015 the Governor also issued an Executive Order to develop a California Sustainable Freight Action Plan to improve freight efficiency and transition to zero emission technologies.

The emission reductions needed for this region are outlined further in CARB's recent draft discussion document "Mobile Source Strategy" (October 2015)[3]. Specifically, the document calls for California to build upon its successful efforts to meet critical air quality and climate goals, as summarized below:

- Attaining federal health-based air quality standards for ozone in 2023 and 2031 in the South Coast and San Joaquin Valley, and fine particulate matter (PM2.5) standards in the next decade;
- Achieving GHG emission reduction targets of 40 percent below 1990 levels by 2030;
- Reducing our petroleum use by up to 50 percent by 2030;
- Minimizing health risk from exposure to toxic air contaminants; and
- Increasing energy efficiency and deriving 50 percent of our electricity from renewable sources by 2030.

The document focuses on mobile sources, both on- and off-road equipment, that are responsible for approximately 80 percent of smog-forming NOx emissions, 95 percent of diesel particulate matter emissions, and 50 percent of GHG emissions. 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 zero and near-zero) and deploying these

[3] http://www.arb.ca.gov/planning/sip/2016sip/2016mobsrc_dd.pdf

technologies into the fleet, requiring cleaner fuels, and ensuring continued clean performance in use. Actions to accelerate the deployment of cleaner technologies through incentives, efficiency increases in moving people and freight, and support for the use of advanced transportation technologies such as intelligent transportation systems and autonomous vehicles, are also needed. Taken together, these actions would provide the reductions necessary from mobile sources to achieve the air quality and climate goals outlined above.

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 Governing Board continues to aggressively carry out the Clean Fuels Program and promote alternative fuels through its Technology Advancement Office (TAO).

The Clean Fuels Program is intended to assist in the rapid development and deployment of progressively lower-emitting technologies and fuels through innovative public-private partnership. 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. The following sections describe program funding, provide a 2015 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.

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. For CY 2015 the funds available through each of these mechanisms were as follows:

- Mobile sources (DMV revenues) $13,001,831
- Stationary sources (emission fee surcharge) $332,791

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 4 (page 33) lists supplemental grants and revenues totaling $2.75 million for contracts executed in CY 2015. Table 5 (page 33) lists federal and state revenue totaling nearly $8.6 million awarded to the SCAQMD in 2015 for projects that will be part of the Clean Fuels Program or align well and will complement the Clean Fuels Program.

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 2015, the Clean Fuels Program leveraged each $1 to approximately $4 of outside funding. 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 act as a leader in technology development and commercialization in an effort to accelerate the reduction of criteria pollutants. 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 2015 are listed in Table 2 (page 16).

2015 Overview

This report summarizes the progress of the SCAQMD Clean Fuels Program for CY 2015. The SCAQMD Clean Fuels Program cosponsors projects to develop and demonstrate zero, near-zero and low-emission clean fuels and advanced technologies and to promote commercialization and deployment of promising or proven technologies in Southern California. 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 2015. During the period between January 1 and December 31, 2015, the SCAQMD executed 69 new contracts, projects or studies and modified 9 continuing projects adding additional dollars during CY 2015 that support clean fuels and advanced zero, near-zero and low-emission technologies. The SCAQMD Clean Fuels Program contribution for these projects was approximately $10.7 million, inclusive of $2.75 million received into the Clean Fuels Fund as cost-share for contracts executed in this reporting period, with total project costs of nearly $47.3 million. These projects address a wide range of issues with a diverse technology mix. 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 4, page 33), but also funds awarded to the SCAQMD for projects to be included in the Clean Fuels Program or which align well and are complementary to the Clean Fuels Program ($8.56 million in 2015, see Table 5). More details on this financial summary can be found later in this report. The SCAQMD will continue to pursue federal and state funding opportunities in 2016 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 acting as 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:

- Electric and Hybrid Vehicle Technologies and Infrastructure (emphasizing electric and hybrid electric trucks and container transport technologies with zero emission operation)
- Hydrogen and Fuel Cell Technologies and Infrastructure
- Engine Systems (emphasizing heavy-duty alternative and renewable fuel engines for truck and rail applications)
- Fueling Infrastructure and Deployment (predominantly natural gas and renewable fuels)
- Health Impacts, Emissions and Fuel Studies
- Stationary Clean Fuels Technologies
- Emission Control Technologies
- Outreach and Technology Transfer

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 turned a great deal of their attention to climate change, the SCAQMD has remained committed to developing, demonstrating and commercializing zero and near-zero emission technologies. Fortunately many, if not the majority, of technology sectors that address our need for NOx 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. The ultimate challenge for the SCAQMD is to identify project or technology opportunities in which its available funding can make a difference in achieving progressively cleaner air in the Basin. To do this, the SCAQMD employs a number of outreach and networking activities. These 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 Technology Advancement Office 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 2016 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 NOx technologies and clean energy alternatives such as fuel cells, solar power and other renewable energy systems. The focus on recent years has been on zero and near-zero emission technologies to reduce emissions from mobile sources, which contribute to more than 80 percent of the current NOx 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.

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 consistency with program goals and funding constraints. The core technologies for the SCAQMD programs that meet both the funding constraints as well as preliminary 2016 AQMP needs for achieving clean air are briefly described below.

Electric and 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. At the federal level, there is also the continued push for PEVs through the EV Everywhere Program.

As a result, there is now a window of opportunity to leverage state and federal activities in the development and deployment of technologies that can accelerate advanced electric and hybrid technologies, including medium- and heavy-duty hybrid vehicle deployment, energy storage technologies, development of medium- and heavy-duty hybrid emission certification cycles, battery durability testing and establishment of driver use patterns. Such technology developments, if successful, are considered *enabling* because they can be applied to a variety of fuels (e.g., gasoline, natural gas, biofuels and hydrogen) and propulsion systems (e.g., ICEs, batteries and fuel cells). In particular, utilizing electric drive technologies to enable zero emission mile capable heavy-duty trucks for goods movement remains a top priority. Electric and hybrid technologies are also being explored to address one of the SCAQMD's 2015-16 Goals and Priority Objectives, which is to continue development and demonstration of zero-emission goods movement technologies.

While EV adoption has surpassed 184,000 vehicles in California, according to the PEV Collaborative, there is still a need for charging infrastructure in order to achieve the fleet penetration required for clean air. The CPUC recently approved Southern California Edison's (SCE's) $22 million "Charge Ready" pilot program to support installation of as many as 1,500 EV charging stations in their service territory. The SCAQMD will work with SCE to identify the best strategy for EV infrastructure (e.g., destination and residential charging) to complement this new program.

Hydrogen and Mobile Fuel Cell Technologies and Infrastructure

Toyota and Hyundai have commercialized light-duty fuel cell vehicles in 2015, Honda announced plans to introduce a fuel cell vehicle in 2016, and numerous others have plans to commercialize

their own in the near future. The greatest challenge 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 51 stations funded by CEC by the end of 2015, six non-retail and six retail were operational, but all 51 are expected to be operational by the end of 2016 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. Their July 2015 findings report that there were 179 fuel cell vehicles registered in California, a 43% growth from 2013 estimates, with CEC indicating there this number should grow to 300 by the end of 2015. However, CARB surveys of automakers project 10,500 fuel cell vehicles in California by the end of 2018 and 34,300 by the end of 2021. Clearly, the SCAQMD must continue to support the infrastructure required to refuel the demonstration fuel cell vehicles, but is also actively engaged in finding alternatives to the costly and potential longer term fuel cell power plant technology. As mentioned previously, plug-in hybrid technology could help enable fuel cells by reducing the capacity, complexity and cost of the fuel cell vehicle system.

Engine Systems

Medium- and heavy-duty on-road vehicles contributed approximately 33 percent of the Basin's NOx based on preliminary 2016 AQMP data. More importantly, on-road heavy-duty diesel trucks account for 33 percent of the on-road mobile source PM2.5, which has known toxic effects. These figures notably do not include the significant contribution from off-road mobile sources, which emit 155 tons per day of NOx and 7.9 tons per day of PM2.5 emissions in the Basin. 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 diesel and potentially other renewable liquid fuels such as dimethyl ether (DME), for applications in heavy-duty transport trucks, transit and school buses, rail operations, and refuse collection and delivery vehicles to meet future federal emission standards. The SCAQMD's FY 2015-16 Goals and Priority Objectives also includes development and demonstration of next-generation natural gas engines/hybrid vehicles with the goal of developing engines 75-90 percent cleaner than the current emissions standard for NOx. Additionally, options for integrating with hybrid systems and alternative fuels need to be explored to provide additional NOx reductions.

Fueling Infrastructure and Deployment

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. The objectives of the SCAQMD are to

expand the infrastructure to support zero and near-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). Changes to the Carl Moyer Program as a result of SB 513 (chaptered October 2015) may help stimulate deployment of alternative and natural gas vehicles and related infrastructure. The Clean Fuels Program will continue to examine opportunities where current incentive funding is either absent or insufficient.

Health Impacts, Emissions and Fuel 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. Considering the transition to alternative and renewable fuels, accelerated by federal and state requirements, 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 NOx and PM2.5 emissions and a detailed review of other potential toxic tailpipe emissions, for alternative fuel and diesel engines, especially in the heavy-duty sector, as well as light- and heavy-duty engines that operate on renewable fuels or higher compression spark-ignited 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.

Recently, the SCAQMD funded a study to evaluate PM2.5 formation from gasoline direct injection (GDI) engines and from varying ethanol blends to better understand the chemical composition of PM and health impacts of PM from a wider variety of fuels and vehicle technologies. The results from this study are expected to provide important information about the potential impacts of mid-level and high-level ethanol and iso-butanol blends on emissions and air quality during the near- and medium-term implementations of renewable fuel regulations, including assessing the health consequences of population exposure to GDI light-duty vehicle traffic sources in Southern California.

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.

Emission 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 diesel applications. 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.

Outreach and Technology Transfer

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 emission 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.

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 conventional 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 4 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.

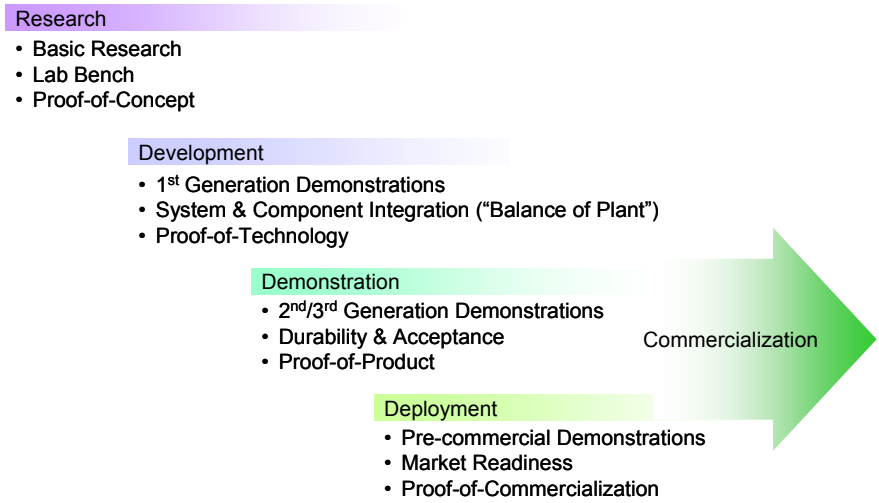

Figure 4: Stages of Clean Fuels Program Projects

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

- Emission Solutions: 7.6L (NG)
- Cummins Westport: low-NOx natural gas ISL G 8.9L engines (0.2 & 0.02 g/bhp-hr)
- Westport Power: ISX 15L (LNG), Westport GX 15 L (dual fuel)
- Detroit Diesel: Series 60G (CNG/LNG), Series 50G (CNG/LNG);
- John Deere: 6068 (CNG), 6081 (CNG);
- Mack: E7-400G (LNG); and
- Clean Air Partners/Power Systems (Caterpillar): 3126B (Dual Fuel), C-10 (Dual Fuel), C-12 (Dual Fuel).

➢Fuel Cell Development and Demonstrations

- Ballard Fuel Cell Bus (first of its kind);
- Light-duty passenger fuel cell vehicles (Toyota Mirai, Hyundai Tucson, Honda Clarity);
- SunLine Transit Agency Advanced Fuel Cell Bus projects;
- Commercial stationary fuel cell demonstration with UTC and SoCalGas (first of its kind); and
- 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).

- Electric and Hybrid Electric Vehicle Development and Demonstrations
  - EPRI hybrid vehicle evaluation study;
  - Hybrid electric vehicle demonstrations with SCE, UC Davis and AC Propulsion;
  - Plug-in Hybrid Electric Van with EPRI, DaimlerChrysler and SCE;
  - Hybrid electric delivery trucks with NREL, FedEx and UPS;
  - Proterra battery electric transit bus and fast charging system;
  - Municipal battery electric utility truck;
  - 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;
  - LACMTA battery electric buses;
  - Electric school buses with V2G capability; and
  - TransPower battery electric heavy-duty truck and yard hostlers.
- Aftertreatment Technologies for Heavy-Duty Vehicles
  - Johnson Matthey and Engelhard trap demonstrations on buses and construction equipment; and
  - Johnson Matthey SCRT and SCCRT NOx and PM reduction control devices on heavy-duty on-road trucks.

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 (pages 1-2), 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 U.S. DOE and several of its 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 and local gas and electric utilities. 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 California Plug-In Electric Vehicle (PEV) Collaborative, the California Hydrogen Business Council (CHBC) the Electric Power Research Institute (EPRI), the Electric Drive Transportation Association (EDTA), the SoCalEV Collaborative, the West Coast Collaborative, which is part of the National Clean

Diesel Campaign, and the Transportation Research Board. 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 2015 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. Such partnerships are essential to address commercialization barriers and to help expedite the implementation of advanced low emission technologies. Table 2 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 2014 Project Summaries (beginning page 35) contained within this report.

Table 2: SCAQMD Major Funding Partners in CY 2015

Research Funding Organizations	Major Manufacturers/Providers
California Air Resources Board	Cummins Inc.
California Energy Commission	Cummins Westport, Inc.
National Renewable Energy Laboratory	Ports of Los Angeles & Long Beach
U.S. Department of Energy	Gas Technology Institute
U.S. Environmental Protection Agency	Southern California Gas Company
	University of California Riverside/ CE-CERT
	Other California Universities (Irvine, LA, San Diego)
	US Hybrid Corporation
	Toyota

The following two subsections broadly address the SCAQMD's impact and benefits by describing specific examples of accomplishments and commercial—or near-commercial—products supported by the Clean Fuels Program in CY 2015. 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 include: (a) development and demonstration of zero emissions goods movement technologies; and (b) development, integration and demonstration of ultra-low emission natural gas engines for heavy-duty vehicle applications.

Develop and Demonstrate Zero Emissions Goods Movement Technologies System

Heavy-duty diesel trucks in the South Coast Air Basin remain a significant source of emissions with adverse health impact, especially in the surrounding communities along the goods movement corridors near the Ports of Los Angeles and Long Beach and next to major freeways. In order to mitigate the impact and attain stringent federal ambient air quality standards for the

region, SCAQMD has been aggressively promoting and supporting the development and deployment of advanced zero emission cargo transport technologies, in partnership with the Southern California Regional Zero Emission Truck Collaborative, comprised of the Los Angeles Metropolitan Transportation Authority, the Ports of Los Angeles and Long Beach, the Southern California Association of Governments, and the Gateway Cities Council of Governments.

Figure 5: TransPower Electric Drive Drayage (EDD) Trucks

With a grant from the DOE's Zero Emission Cargo Transport (ZECT) Program in 2012, the SCAQMD has been working with Transportation Power (TransPower) and US Hybrid, locally based EV system integrators, to develop Class 8 battery electric trucks (BETs) for demonstration in real-world drayage operations to evaluate the trucks' performance and durability to support demanding drayage duty cycles. To date, TransPower has completed and deployed four BETs in field demonstration with drayage fleets at the Ports of Los Angeles and Long Beach, including Total Transportation Services and California Cartage Company. With an estimated range of 80–100 miles, these BETs are deployed in near-dock and local operations within a 20-mile radius from the Ports and have been providing dependable service with positive feedback from fleet drivers on its quiet and smooth operations. US Hybrid is currently on-road testing their first BET with a plan to deploy it in drayage service in early 2016.

Building on the success of the ZECT project, SCAQMD applied for and received a $9.75 million grant from the DOE in 2014 to demonstrate additional electric drayage truck technologies. This project, termed ZECT II, launched in 2015 and involves development and demonstration of five different electric truck platforms, consisting of three fuel cell electric trucks and two types of plug-in hybrid electric trucks (PHETs) as follows:

- BAE Systems will develop a battery electric truck with a hydrogen fuel cell range extender leveraging the expertise of BAE Systems and Ballard Power Systems to test their hybrid electric fuel cell propulsion system, currently used for transit buses, in drayage applications. The truck will have 30 kg of hydrogen on-board to provide approximately 110 miles of range per fueling.

- TransPower will develop two battery electric trucks with hydrogen fuel cell range extenders. These trucks will utilize TransPower's proven ElecTruck drive system with a small fuel cell to provide approximately 150 miles of range. One truck will be equipped with a 30 kW fuel cell and the other with a 60 kW fuel cell, enabling a direct comparison of both variants.

- US Hybrid will develop two fuel cell electric trucks powered by an 80 kW hydrogen fuel cell generator. Each truck is estimated to have 20 kg of hydrogen storage to provide up to 150 miles in drayage operations.

- BAE Systems and Kenworth will develop one PHET with a CNG range extender and catenary-connect capability. The proposed technical concept provides a well-balanced blend of all-electric and CNG-based operation to provide a system that can operate in zero emission (all-electric) mode and in a conventional hybrid electric mode using CNG.

- International Rectifier will develop a PHET, and ultra-fast chargers for use in or near the Ports. The vehicle concept will be capable of operating in a zero emission (all-electric) mode in and around the Ports of Los Angeles and Long Beach. Outside that predetermined Zero Emissions Zone, the Class 8 PHET would switch from all-electric to hybrid-electric mode where the vehicle would operate at higher efficiencies to reduce diesel fuel consumption.

In addition, two PHET technologies were recently added to the 2012 ZECT project having replaced two of the four originally awarded technologies. TransPower will develop two CNG PHETs, each with 30-40 miles of all-electric range (AER) and 150-200 miles of total operating range. US Hybrid will also develop three LNG PHETs by converting LNG drayage trucks with their proprietary hybrid electric drive system to provide up to 40 miles in AER mode and 150-200 miles of range.

Between the ZECT and ZECT II projects, SCAQMD has engaged leading EV integrators and truck OEMs to develop a variety of electric drayage trucks, consisting of eleven zero emission trucks – six battery electric and five fuel cell electric trucks – and seven hybrid electric trucks with extended range using CNG, LNG or diesel ICEs. These demonstrations will yield valuable data and understanding of the capability, benefits as well as limitations of advanced electric trucks in real world drayage operations and help to accelerate the introduction of the technologies into the cargo transport sector. Furthermore, leveraging the technologies and expertise gained from the ZECT projects, SCAQMD will seek opportunities to fund a larger-scale demonstration of zero and near-zero emission cargo transport trucks including a recent application to a grant solicitation from CARB for Zero Emission Drayage Truck Projects under the Low Carbon Transportation Greenhouse Gas Reduction Fund Investment. The project, awarded in early 2016,will demonstrate up to 43 zero emission capable drayage trucks involving four major truck OEMs: BYD, Kenworth, Peterbilt, Volvo, in a truly comprehensive statewide demonstration program in partnership with four other major air districts: Bay Area AQMD, San Joaquin Valley APCD, San Diego APCD and Sacramento Metropolitan AQMD. These trucks will provide drayage service at various ports throughout the state.

Figure 6: Drayage Truck Connected to Demonstration Catenary System in Carson

Lastly, SCAQMD has an ongoing project with Siemens Industry Inc. (Siemens) to develop and demonstrate an overhead catenary system (OCS) using their eHighway wayside power technology for heavy-duty trucks. The demonstration involves one mile of catenary power lines in both directions along Alameda Street in the City of Carson with four catenary accessible trucks from Volvo, TransPower and BAE/Kenworth. The trucks will demonstrate a variety of architectures such as diesel hybrid, CNG hybrid and battery electric. 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. The Siemens' pantograph system will allow for seamless connection and detachment from the catenary power source. When entering the catenary system corridor, the pantograph system will verify the presence of catenary lines and allow the driver to raise the pantograph from within the cab of the truck. Upon leaving the catenary lane, the pantograph will automatically retract and the truck will switch to on-board power systems.

The infrastructure portion of the project is in the construction phase with a scheduled completion in the second quarter of 2016. Both trucks–one battery electric and one CNG hybrid–being developed by TransPower were completed in 2015; the Volvo diesel hybrid truck will be completed in mid-2016; and the BAE/Kenworth CNG hybrid truck is scheduled for completion in 2017. In October 2015, one of TransPower's trucks was tested at an off-the-street OCS track in Carson to validate the truck's ability to operate on battery and catenary power.

Develop and Demonstration Ultra Low-Emission Natural Gas Engines for Heavy-Duty Vehicle Applications

Heavy-duty on-road diesel vehicles are currently one of the largest sources of NOx emissions in the South Coast Air Basin. This source category is still projected to be one of the largest contributors to NOx emissions, even as the legacy fleet of older and higher polluting vehicles are retired from operation and replaced by the vehicles meeting the most stringent emission levels required by 2010 emissions standards. NOx reductions in excess of 50% will be needed to meet future federal ambient air quality standards for ozone. The development of ultra-low NOx emission engines would significantly reduce emissions from this source category and assist the region in meeting federal ambient air quality standards. Diesel engines have not achieved the necessary ultra-low emission levels. Natural gas engines, however, have shown promise of achieving significant emission reductions from the current 0.2 g/bhp-hr NOx standard. In addition, since natural engines are currently in mass production, it is likely that commercial scale adoption of ultra low-emission natural engines can be achieved sooner and at lower cost than will be possible with zero emission technologies.

Figure 7: ISL-G Near-Zero Natural Gas Engine

SCAQMD, with funding from the California Energy Commission and the Southern California Gas Company, awarded contracts to three companies to develop engines meeting the CARB Optional NOx Standard of 0.02 g/bhp-hr. The engines cover a range of power and vehicle applications that represent a significant fraction of the on-road heavy duty vehicle population. During 2015, the Cummins Westport 8.9-liter ISL-G NZ (near zero) engine was certified by CARB as meeting the 0.02 g/bhp-hr NOx standard. This engine will begin production in 2016 and will be available to fleets ordering vehicles for delivery later this year as well as those repowering existing vehicles. The technology developed for the ISL engine will be applied in a new project with Cummins Westport to develop and demonstrate the 11.9-liter ISX-G engine to meet the 0.02 g/bhp-hr NOx standard.

Figure 8: Truck with ISL-G-NZ Ultra Low-NOx Engine

Development of a new Cummins 15-liter natural gas engine was carried out in 2015 with results also showing emissions below the 0.02 g/bhp-hr level. Commercialization of this engine,

however, is likely to occur later than the Cummins Westport engines due to higher investment needed for a new engine.

Finally, a team consisting of the Gas Technology Institute, Power Solutions International (PSI) and Ricardo will develop an ultra-low NOx emission engine based on PSI's existing 8.8-liter V8 natural gas engine. This engine is suitable for Class 4-6 trucks currently powered by diesel engines. This project is co-sponsored by SCAQMD and the Southern California Gas Company.

In order to establish market demand for these near zero engines, CARB also adopted optional emission standards of 0.02 g/bhp-hr to enable incentive funding and is modifying incentive programs to increase the funding limits. SCAQMD has issued a program announcement offering funds for these vehicles and expects to provide significant funding as more engine become available.

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.

The following projects contracted during the CY 2015 reporting period illustrate the impact of the SCAQMD's technology deployment and commercialization efforts and include: (a) electric/hybrid vehicle and infrastructure deployment and commercialization efforts in 2015; and (b) hydrogen infrastructure rollout efforts in 2015.

Electric/Hybrid Vehicle and Infrastructure Deployment and Commercialization Efforts in 2015

The continued deployment of near-zero and zero emission electric and hybrid electric vehicles and technologies along with the supporting infrastructure play a key role in moving us ever closer to attaining future air quality standards. Several contracts executed in 2015 bring their own unique contribution to the proliferation of future electric/hybrid technologies and infrastructure.

NREL's Commercial Zero Emission Vehicle (ComZEV) project aims to facilitate the reduction of NOx and GHG emissions through the development of a plan for the commercialization of advanced vehicle technologies in this region. A detailed technology and economics-based roadmap will be developed, focusing on identifying barriers and opportunities to match advanced technology options to key commercial medium- and heavy-duty vehicle vocations. The technology options to be evaluated include battery electric vehicles, fuel cell vehicles, catenary/induction electric propulsion systems, and compressed and liquid natural gas internal combustion engines and gas turbines.

The University of California Riverside (UCR) campus serves as a research test bed and demonstration site for plug-in vehicles that can be directly integrated with smart grid technology. A contract was executed with the UCR/College of Engineering-Center for Environmental Research & Technology (CE-CERT) for the evaluation and demonstration of advanced charging technologies and associated vehicle activity to further demonstrate the effectiveness of PEV deployment as part of a smart grid system. PEV utilization will be greatly increased by incorporating advanced charging strategies and/or technologies such as V2G.

Figure 9: UCR's 4 MWs of Photovoltaic Panels Constructed for Sustainable Integrated Grid Initiative

The rapid growth in the number of PEVs purchased and the announcement of longer range (larger battery) PEVs highlights the greater need for residential charging. To help meet the goals set forth in the ZEV Action Plan, further incentives for PEV infrastructure are needed. In response to this need, SCAQMD launched a Residential EV Charging Incentive Pilot Program in December 2015. This program utilizes $500,000 in Clean Fuels funding and $500,000 in Mobile Source Air Pollution Reduction Review Committee (MSRC) funding. Rebates of $250 or $500 for low-income residents are offered to offset the cost of hardware for residential Level 2 chargers. Costs for Level 2 chargers range from $400 to $800 per charger. An online application streamlines the process to apply for the incentives. Chargers will need to be permanently installed and in place for a minimum of three years. Tenants in multi-family dwellings or condominiums can also have chargers installed with the permission of the property owner.

The Rebate Program also includes resources coordinated through local utility agency programs, so that applicants are automatically steered to their local utility EV charger rebate program if a more generous incentive towards hardware and/or installation costs is offered by the local utility. Applicants that are ineligible for their local utility rebate program will be able to apply to the SCAQMD rebate program. Outreach efforts to local residents and to residents of disadvantaged communities are being launched to provide information about the EV charger rebate program through the SCAQMD website, social media, environmental fairs and events, conferences on alternative fuel technologies, and targeted outreach to EV dealers, local governments and councils of government, EV charger manufacturers and OEMs. With current funding, up to 4,000 rebates could be offered, with potentially additional funding being made available to expand the pilot EV charger program.

Figure 10: Residential Level 2 EV Charger

Additional efforts were undertaken in 2015 with several contracts executed out of the Clean Fuels Fund for the installation of electric charging infrastructure and site selection for a DC fast charge network. More information on these various contracts can be found in the Project Summaries section (page 35).

As a separate initiative to accelerate the adoption of PEVs, particularly for residents of disadvantaged communities, SCAQMD started offering the Replace Your Ride Program in July 2015 to help residents purchase newer, less polluting vehicles. This Enhanced Fleet Modernization Program (promoted as the Replace Your Ride Program) was funded with $4.23 million from SCAQMD, MSRC, CARB Greenhouse Gas Reduction Relief Fund (GGRF) and AB 118 Enhanced Fleet Moderation Program, but greatly complements efforts being undertaken

through the Clean Fuels Program. This Program quickly became oversubscribed and has a significant waiting list. In December 2015, the SCAQMD was awarded another $6.4 million in GGRF funding (see Table 5, page 33) to extend the Replace Your Ride Program and make it available to additional residents of disadvantaged communities.

In another effort complementing the Clean Fuels Program, the SCAQMD is upgrading the workplace charging at its Diamond Bar Headquarters to provide more workplace, guest and public charging. SCAQMD currently has 26 Level 2 chargers and one DC fast charger which were installed between 2011 and 2012. However, with well over 60 PEVs owned by SCAQMD employees, as well as the many visitors and members of the public who charge at the facility, the number of available chargers is not sufficient to meet demand. To address this concern SCAQMD initiated plans for the upgrade and expansion of its PEV support infrastructure by the installation of up to 110 level 2 EV chargers at its facility. As the host of multiple alternative fueling stations including Level 2 and DC fast chargers, hydrogen and CNG infrastructure, there is a need to provide additional charging but to also manage the various sources of demand at the facility to avoid demand charges during peak hours in the summer months. The SCAQMD's upgrade, including networking and integration into the building's energy management system, is intended to act as a showcase to promote EV charging and will include development of a set of best practices on installation of workplace charging, policies and integration with demand response, as a guidance document for larger facilities.

Collectively, these PEV and infrastructure projects enable greater penetration of these technologies to the mainstream general public and to residents of disadvantaged communities, going beyond the early adopter stage, and allowing them to experience first-hand how these technologies work. Automakers and EV infrastructure manufacturers, government agencies, and advocacy groups will gain valuable feedback into how to continue to improve and further refine these technologies.

Figure 11: Existing Level 2 Chargers under SCAQMD's Solar Carport

Hydrogen Infrastructure Rollout Efforts in 2015

The SCAQMD has identified the development and deployment of hydrogen infrastructure as one of the agency's top priorities in order to attain federal air quality standards. Hydrogen infrastructure is consistent with the goods movement strategy for zero-emission trucks and infrastructure proposed in SCAG's 2016 Goods Movement Appendix to the Draft 2016-2040 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), released December 2015, as well as the joint CARB, SCAQMD and SJVAPCD "Vision for Clean Air: A Framework for Air Quality and Climate Planning". Zero-emission truck deployment is proposed through the year 2040 to meet goals outlined in the Draft 2016-2040 RTP/SCS.

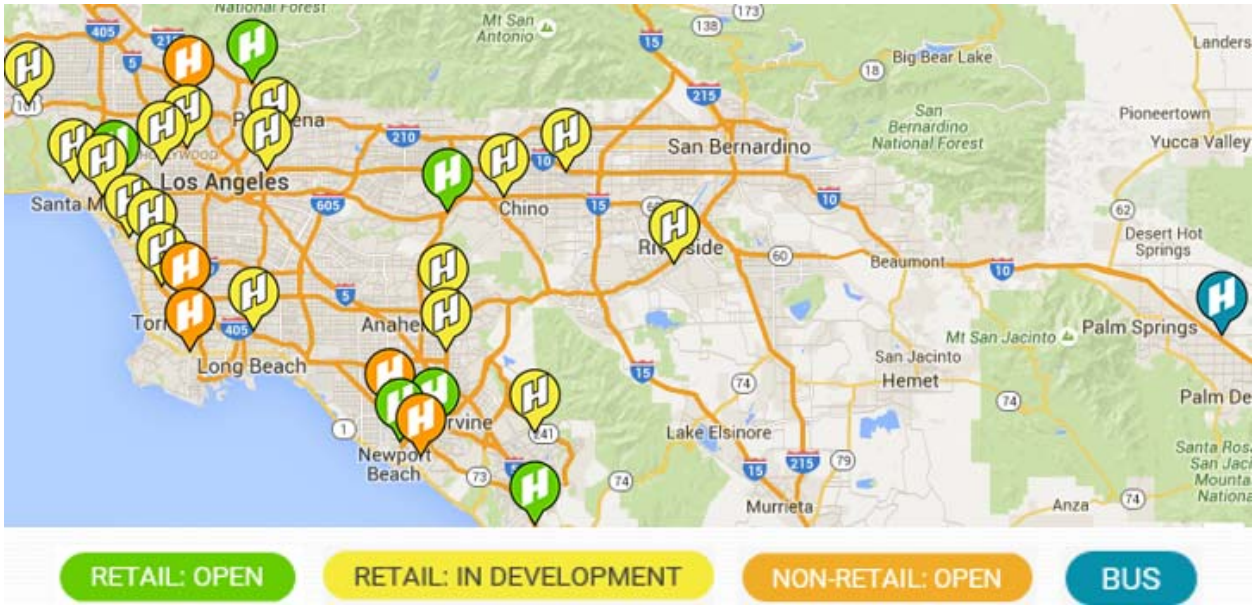

Figure 12: Hydrogen Infrastructure Rollout in the SCAQMD

Source: California Fuel Cell Partnership - http://cafcp.org/stationmap

As part of the planned statewide rollout of new and upgraded hydrogen fueling stations, there are seven open retail stations, five open non retail stations, and 20 stations and a mobile fueler in the process of being constructed and/or upgraded within the South Coast Air Quality Management District in the 2016-2017 timeframe. The newest rollout of hydrogen fueling stations are those that are retail hydrogen stations, typically embedded within an existing gasoline station. Examples of recently opened retail hydrogen stations include the Arco station in La Canada Flintridge and Chevron station in West Los Angeles; retail stations to be opened in 2016-2017 include the Shell station in Torrance, 76 station in Ontario, and Hyundai Chino station. Examples of retail hydrogen stations are shown below.

Figure 13: La Canada Flintridge Retail Hydrogen Station, Located at Arco Gas Station

Figure 14: West Los Angeles Retail Hydrogen Station, Located at Chevron Gas Station

Retail hydrogen stations include point of sale (POS) dispensers capable of conducting retail transactions for the sale of hydrogen on a per kg basis using credit cards, fueling at 350 bar and 700 bar, 35 kg/day in Type A for 70 Mpa fills, and nominal capacity of 100 kg – 200 kg/day. These stations would comply with SAE J2601:2014 and J2719:2011 standards for hydrogen fueling protocol and hydrogen quality. Collectively, the stations would meet Renewable Portfolio Standard (RPS) requirements for providing hydrogen fuel with at least 33% renewable hydrogen. Some of the stations such as the Hyundai Chino station are providing 100% renewable fuel. The renewable hydrogen requirement is fulfilled by solar, energy storage, or renewable energy certificates providing 100% renewable electricity to the station such as for local generation using an electrolyzer or reformer, or by the delivery of 33% or 100% renewable hydrogen produced by a central natural gas reformer, or by a mix of local generation and delivered hydrogen.

Figure 15: Torrance Retail H2 Station, Located at Shell Gas Station

California Department of Food and Agriculture, Division of Weights and Measures (DMS) must pre-certify POS dispensers so that stations can legally sell hydrogen by the kg to refuel fuel cell vehicles. DMS convened a Pre-Rulemaking workshop in August 2013 and further developed test procedures for certifying dispensers to sell hydrogen, while the Governor's Office fast tracked legislation in April 2014. CEC, through its Alternative and Renewable Fuel and Vehicle Technology Program provided $4 million to DMS to develop test standards, equipment, and instrumentation for the commercial sale of hydrogen. This has allowed DMS to carry out field test procedures for hydrogen dispensers as new stations are commissioned. Several other agencies have supported the field testing effort including CARB ($50,000), California Fuel Cell

Partnership ($150,000), CEC ($150,000), and SCAQMD ($100,000). Several stations have already undergone field testing during the station opening process to become designated as open retail or open non-retail stations; these stations include West Sacramento, Diamond Bar, West Los Angeles, University of California Irvine, Coalinga, San Juan Capistrano, San Jose, Costa, Mesa, and Santa Monica (Cloverfield Blvd.). DMS will produce a final report of its field testing effort on hydrogen dispensers in October 2016.

Figure 16: Orange County Sanitation District Non-Retail H2 Station, Located with CNG Station

The intent of the new rollout of retail hydrogen stations is to accelerate the deployment of fuel cell vehicles in the near-term, and for fuel cell trucks and buses in the longer term, once standards for hydrogen fueling protocol and hydrogen quality are worked out between OEMs, station operators, government agencies, and other key stakeholders.

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2015 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 6), 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 Governing 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, 2015.

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 January 1 through December 31, 2015, a total of 78 contracts, projects or studies that support clean fuels were executed or amended, as shown in Table 3 (page 30). The major technology areas summarized are (listed in order of funding priority during the CY): engine systems, electric/hybrid technologies and infrastructure, hydrogen and mobile fuel cell technology and infrastructure, outreach and technology transfer, fuels and emission studies, emission control technologies, and fueling infrastructure and deployment. The distribution of funds based on technology area is shown graphically in Figure 17 (page 28). 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 2015 reporting period are shown below with the total projected project costs:

- SCAQMD Clean Fuels Fund Contribution $10,659,033
- Total Cost of Clean Fuels Projects $47,284,929

Each year, the SCAQMD Governing Board approves funds to be transferred to the General Fund Budget for Clean Fuels administration. For 2015, the Board transferred $1 million for workshops, conferences, co-sponsorships and outreach activities as well as postage, supplies and miscellaneous costs for participation in special conferences. Only the funds committed by December 31, 2015, are included within this report. Any portion of the Clean Fuels Funds not spent by the end of Fiscal Year 2015-16 ending June 30, 2016, 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 2015 totaling $2.75 million is listed within Table 4 (page 33).

Appendix B lists the 112 Clean Fuels Fund contracts that were open and active as of January 1, 2016.

For Clean Fuels executed and amended contracts, projects and studies in 2015, the average SCAQMD contribution is approximately 22 percent of the total cost of the projects, identifying that each dollar from the SCAQMD was leveraged with nearly four dollars of outside investment. The typical leverage amount is $3-$4 for every $1 of SCAQMD Clean Fuels funds, but 2015 notably had a couple of significant contracts, significant both in funding and in the impact they hopefully will make in strides toward developing and commercializing clean transportation technologies.

During 2015, the distribution of funds for SCAQMD executed contracts, purchases and contract amendments with additional funding for the Clean Fuels Program totaling approximately $10.7 million are shown in **Figure 17** below.

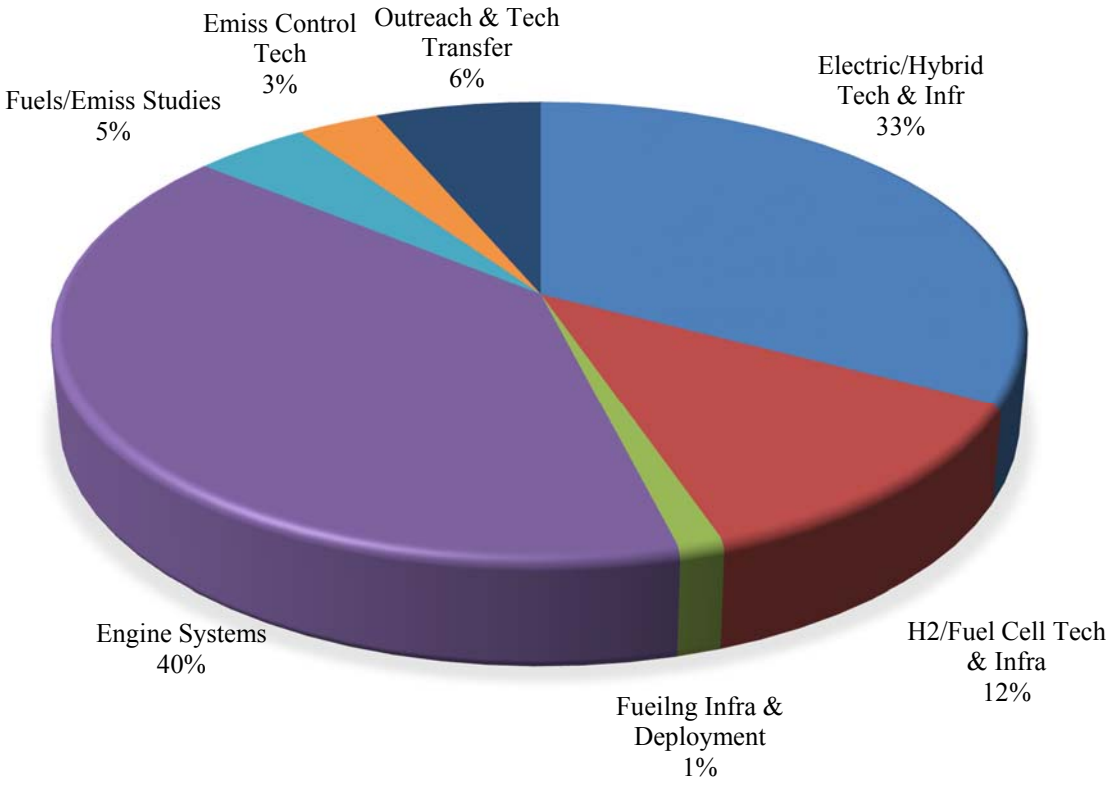

Figure 17: Distribution of Funds for Executed Clean Fuels Projects CY 2015 ($10.7 million)

Table 3 (page 30) provides a breakdown of this $10.7 million in executed contracts. Table 4 (page 33) provides information on outside funding recognized and received into the Clean Fuels Fund ($2.75 million) for contracts executed in CY 2015. Additionally, the SCAQMD continued to seek funding opportunities and Table 5 (page 33) lists the additional $8,560,056 awarded in 2015 for projects that will be implemented as part of the Clean Fuels Program or which align well or will be complementary to the Clean Fuels Program.

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, 2015, the firm of Simpson and

Simpson, CPAs 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. Simpson and Simpson CPAs 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 78 new and continuing contracts, projects and studies that received SCAQMD funding in 2015 are summarized in Table 3, together with the funding authorized by the SCAQMD and by the collaborating project partners.

Table 3: Contracts Executed or Amended (w/$) between January 1 & December 31, 2015

Contract	Contractor	Project Title	Start Term	End Term	SCAQMD $	Project Total $
Electric/Hybrid Technologies and Infrastructure						
10659	Electric Power Research Institute	Data Collection to Further Evaluate Performance and Operational Benefits to Optimize Fleet of Medium-Duty Plug-In Hybrid Vehicles	07/27/10	09/30/16	250,000	844,678
13433	U.S. Hybrid Corporation	Develop and Demonstrate Two Class 8 Zero-Emission Electric Trucks	06/26/13	09/30/17	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
14336 & 15665	Los Angeles Department of Water & Power & City of Santa Monica	Install and Upgrade EV Charging Infrastructure (Administer SoCalEV Infrastructure Project)	07/31/15	04/03/16	0	1,383,409
15382	ChargePoint, Inc.	Install Electric Charging Infrastructure	01/23/15	01/22/17	162,000	162,000
15448	University of California Los Angeles	Site Selection for DC Fast Charge Network	04/21/15	04/30/16	10,000	10,000
15650	University of California San Diego	Develop and Demonstrate Forecasting for Larger Solar Arrays with Storage and EV Charging	07/17/15	01/16/18	98,908	1,655,278
15680	National Renewable Energy Laboratory	ComZEV – Develop Detailed Technology and Economics-Based Assessment for Heavy-Duty Advanced Technology Development	08/28/15	08/27/16	500,000	500,000
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	09/30/17	195,326	2,103,446
16047	U.S. Hybrid Corporation	ZECT: Develop and Demonstrate Three Class 8 LNG Plug-In Hybrid Electric Drayage Trucks	11/06/15	09/30/17	22,896	1,996,675
Direct Pay	Varies	Establish Residential EV Charging Incentive Pilot Program	09/04/15	09/04/15	500,000	1,000,000
Direct Pay	Clean Fuel Connection, Inc.	EV Charger Installation	03/18/15	03/18/15	5,196	5,196
Direct Pay	ATVLS, Inc.	EV Charger Installation	07/01/15	07/01/15	21,155	21,155
Hydrogen and Mobile Fuel Cell Technologies and Infrastructure						
10046	Air Products and Chemicals, Inc.	Develop and Demonstrate Renewable Hydrogen Energy and Fueling Station	12/21/09	11/01/15	75,000	275,000
13155	Fletcher Jones Motor Cars Inc.	Lease Two F-Cell Mercedes Benz Fuel Cell Vehicles for Two Years	02/08/13	02/08/17	14,598	14,598

Table 3: Contracts Executed or Amended (w/$) between January 1 & December 31, 2015

Contract	Contractor	Project Title	Start Term	End Term	SCAQMD $	Project Total $
Hydrogen and Mobile Fuel Cell Technologies and Infrastructure (cont'd)						
13400	Energy Independence Now	Develop Hydrogen Station Investment Plan and Assess Policies and Incentives for Implementation	04/05/13	12/31/15	80,000	125,000
14684	California Department of Food and Agriculture, Division of Measurement Standards	Conduct Hydrogen Station Site Evaluations for Site Certifications for Commercial Sale of Hydrogen	12/11/15	12/31/16	100,000	450,000
15596	US Hybrid	Transfer of Ownership of One Gaseous Hydrogen Electrolyzer, Compressor, Storage Tanks and Associated Hydrogen Equipment	04/15/15	12/31/15	0	0
15599	City of Burbank	Bill of Sale and Transfer of Hydrogen Station Equipment	03/19/15	03/19/15	0	0
15609	ITM Power, Inc.	Installation of Riverside Renewable Hydrogen Fueling Station	10/06/15	10/05/19	200,000	2,934,184
15611	Ontario CNG Station, Inc.	Installation of Ontario Renewable Hydrogen Fueling Station	07/10/15	07/09/20	200,000	2,710,000
15619	H2 Frontier Inc.	Installation of Chino Renewable Hydrogen Station	12/04/15	12/03/20	200,000	4,666,979
15641	Hardin Hyundai	Three-Year Lease of 2015 Tucson Fuel Cell Vehicle	06/15/15	06/14/18	22,862	22,862
15666	Bevilacqua-Knight, Inc.	Participate in CaFCP for CY 2015 and Provide Support for Regional Coordinator	01/01/15	12/31/15	137,800	2,080,808
16039	Lawrence Livermore National Laboratory	Demonstrate Prototype Hydrogen Sensor and Electronics Package	12/10/15	02/09/17	175,000	350,000
16151	Toyota Motor Sales USA	No-Cost Loan of 2015 Toyota Mirai Fuel Cell Vehicle	12/15/15	01/05/16	0	0
16171	Longo Toyota	Three-Year Lease of 2015 Toyota Mirai Fuel Cell Vehicle	12/15/15	12/14/18	24,567	24,567
Direct Pay	Gas Technology Institute	Repair Hydrogen Quality Sampling Adaptor	08/11/15	08/11/15	2,410	2,410
Direct Pay	Toyota Motor Sales USA	Purchase One 2016 Toyota Mirai Fuel Cell Vehicle	12/01/15	12/01/15	56,688	56,688
Engine Systems						
15626	Cummins Westport, Inc.	Develop, Integrate and Demonstrate Ultra Low-Emission Natural Gas Engines for On-Road Heavy-Duty Vehicles	07/10/15	12/31/16	3,500,000	7,233,000
15632	Gas Technology Institute	Develop Ultra Low-Emission Natural Gas Engine for On-Road Medium-Duty Vehicles	09/01/15	06/30/17	750,000	1,800,000
Fueling Infrastructure and Deployment (NG/RNG)						
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

Table 3: Contracts Executed or Amended (w/$) between January 1 & December 31, 2015

Contract	Contractor	Project Title	Start Term	End Term	SCAQMD $	Project Total $
Fuels/Emissions Studies						
15607	University of California Riverside/CE-CERT	Innovative Transportation System Solutions for NOx Reductions in Heavy-Duty Fleets	12/19/15	11/30/16	79,980	139,980
15623	University of California Riverside/CE-CERT	Ozone and SOA Formation from Gasoline and Diesel Compounds	10/02/15	06/30/16	75,000	480,338
15625	University of California Riverside/CE-CERT	Evaluate SOA Formation Potential from Light-Duty GDI Vehicles	10/02/15	06/30/17	149,972	224,972
15636	University of California Riverside/CE-CERT	Evaluate PEV Utilization Through Advanced Charging Strategies in a Smart Grid System	12/15/15	02/14/17	170,000	270,000
Emission Control Technologies						
15347	West Virginia University Research Corporation	Develop Retrofit Technology for Natural Gas Engines and In-Use Emissions Testing of On-Road Heavy-Duty Trucks	01/09/15	11/08/15	340,000	490,000
Outreach & Technology Transfer						
05128	Mid-Atlantic Research Institute LLC	Technical Assistance for Development, Outreach and Commercialization of Advanced Heavy-Duty and Off-Road Technologies	08/08/05	03/31/17	30,000	30,000
13194	Clean Fuel Connection, Inc.	Technical Assistance with Alternative Fuels, Renewable Energy and EVs, Program Activities for AFVs, Lawn Mower Exchange, Conferences and Outreach	12/07/12	09/30/16	60,000	60,000
13198	Gladstein, Neandross & Associates LLC	Technical Assistance with Alternative Fuels, Emissions Analysis and On-Road Sources	12/14/12	12/31/16	60,000	60,000
14185	Three Squares Inc.	Conduct Education Outreach for the Basin DC Fast Charging Network Project	04/11/14	10/31/16	40,000	40,000
15507	Jerald Cole	Technical Assistance with Alternative Fuels, Emissions Analysis, and Combustion Technologies	01/09/15	01/08/17	30,000	80,000
15516	Cordoba Corporation	Technical Assistance with Construction of Zero Emissions Goods Movement Demonstration Project	03/27/15	03/31/18	74,500	74,500
15610	Goss Engineering, Inc.	Conduct Engineering Services at SCAQMD Headquarters	06/02/15	06/01/16	50,000	50,000
16055	University of California Irvine	Cosponsor Solar Decathlon – Develop and Demonstrate Solar-Powered House at 2015 U.S. DOED Solar Decathlon	11/05/15	02/29/16	50,000	730,000
Direct Pay	Transportation Research Board	Participation for CY 2015 Membership in Transportation Research Board	01/01/15	12/31/15	32,500	256,000

Table 3: Contracts Executed or Amended (w/$) between January 1 & December 31, 2015

Contract	Contractor	Project Title	Start Term	End Term	SCAQMD $	Project Total $
Direct Pay	Various	Cosponsor 24 Conferences, Workshops & Events plus 5 Memberships and 1 Subscription	01/01/15	12/31/15	257,571	5,892,585

Table 4: Supplemental Grants/Revenue Received into the Clean Fuels Fund (31) in CY 2015

Revenue Agreement #	Revenue Source	Project Title	Contractor	SCAQMD Contract #	Award Total $
#14146	Southern California Gas Company	Develop, Integrate and Demonstrate Ultra-Low Emission Natural Gas Engines for On-Road Heavy-Duty	Cummins Westport	15626	500,000
#15022 & #15574	CEC/ AB 118 600-13-008 & PIER 500-12-012	Develop, Integrate and Demonstrate Ultra-Low Emission Natural Gas Engines for On-Road Heavy-Duty Vehicles	Cummins Westport	15626	2,000,000
#15683	Southern California Gas Company	Develop Detailed Technology and Economics Based Assessment for Heavy-Duty Advanced Technology Development	National Renewable Energy Laboratory	15680	250,000
Table 4 lists revenue recognized by SCAQMD into the Clean Fuels Fund (31) only if the pass-through contract was executed during the reporting CY (2015).					**2,750,000**

Table 5: Summary of Federal & State Funding Awarded between Jan. 1 & Dec. 31, 2015

Awarding Entity or Program	Award Date	Purpose	Contractors	Award Total $/Fund
U.S. EPA/ CATI	06/05/15	Develop and Demonstrate Warehouse Rooftop Solar Systems Incorporating Storage and EV Charging; Develop and Demonstrate EV Charging Infrastructure to Support Class 8 Electric Drayage Trucks	University of California San Diego; Transportation Power Inc.	500,000 Fund 17
U.S. EPA/ DERA	08/12/15	On-Road Heavy-Duty Vehicle and Transport Refrigeration Unit Engine Replacement Projects; School Bus Replacement Projects	Multiple Contractors/School Districts	1,160,056 Funds 17 & 80
CARB or BAR	12/29/15	Implementation of the Retire and Replace Component of Enhanced Fleet Modernization Program	Various	1,400,000 Fund 56
CARB or BAR	12/29/15	Implementation of Vehicle Retire and Replace Plus-Up Program	Various	5,000,000 Fund 56
Southern California Gas Company	10/02/15	Develop, Integrate and Demonstrate 11.9L Ultra Low-Emission Natural Gas Engine for On-Road Heavy-Duty Vehicles	Cummins Westport Inc.	500,000 Fund 31
Table 5 provides a comprehensive summary of revenue awarded to SCAQMD during the reporting CY (2015) if it will be considered part of, or complementary to, the Clean Fuels Program, regardless of whether the pass-through contract has been executed.				**8,560,056**

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Project Summaries by Core Technologies

The following represents summaries of the contracts, projects and studies executed, or amended with additional dollars, in 2015. They are listed in the order found in Table 3 below by category and contract number. The summaries provide the project title, contractors and subcontractors, SCAQMD cost-share, cosponsors and their respective contributions, contract term and a description of the projects as required by H&SC Section 40448.5.1(d).

Electric/Hybrid Technologies

10659: Data Collection to Further Evaluate Performance and Operational Benefits to Optimize Fleet of Medium-Duty Plug-In Hybrid Vehicles

Contractor: Electric Power Research Institute	SCAQMD Cost-Share	$ 250,000
	Cosponsor	
	Electric Power Research Institute	594,678
Term: 07/27/10 – 09/30/16	Total Cost:	$ 844,678

In 2012 the SCAQMD, in partnership with the DOE, leveraged their previous investments in PHEV development to build a test fleet of PHEV vehicles. The vehicles took advantage of the non-recurring engineering work already invested in the development of Eaton's PHEV drive system. A contract was executed with EPRI to Develop and Demonstrate Fleet of Medium Duty Plug-In Hybrid Electric Vehicles. The vehicles have been delivered to customers and the DOE project ended in June, 2015. Due to delays and additional costs in obtaining CARB and US EPA certification for the vehicles there has not been enough time or funds available to collect, analyze and report on data generated by the vehicles. EPRI has estimated costs to complete the data analysis and reporting requirement of the project to be $844,678 and is requesting SCAQMD to cost share $250,000. The project will collect, analyze and disseminate data from the vehicles for one year.

13433: Develop and Demonstrate Two Class 8 Zero-Emission Electric Trucks

Contractor: US Hybrid Corporation	SCAQMD Cost-Share	$ 75,000
	Cosponsor	
	San Pedro Bay Port's Technology Advancement Program	75,000
Term: 06/26/13 – 09/30/17	Total Cost:	$ 150,000

In October 2012, US Hybrid was awarded $943,810, as part of the ZECT I grant, to develop two battery electric drayage trucks. US Hybrid initially planned to use off-board chargers to support these trucks during demonstration. However, based on input from fleet operators and available EV charging infrastructure at the demonstrator sites, US Hybrid has opted to integrate their electric trucks with an on-board charger to offer simpler charging logistics as well as cost savings for fleet operators. This contract modification is for US Hybrid to develop and integrate a 60 kW on-board charger into each of the two ZECT I demonstration trucks.

14052: Lease of Two Plug-In Hybrid Electric Vehicles

Contractor: Altec Capital Services, LLC	SCAQMD Cost-Share	$ 61,302
Term: 01/02/15 – 01/11/20	Total Cost:	$ 61,302

The Plug-In Hybrid Medium-Duty Truck Demonstration and Evaluation Program was sponsored by the DOE using American Recovery and Reinvestment Act of 2009 funding as well as the SCAQMD. The purpose of the program was to develop a path to migrate plug-in hybrid vehicle technology to medium-duty vehicles by demonstrating and evaluating vehicles in diverse applications. Two of these VIA trucks are being demonstrated at SCAQMD for this project. The VIA design is a series PHEV system. The electric motor provides all the propulsion power directly to the wheels. The gasoline engine provides torque to a generator that provides power to the battery pack and traction motor. The vehicles have up to 47 miles of all-electric range before the engine turns on and provides load-follower torque to the driveshaft while running in charge-sustaining mode. The general assembly process is that VIA purchases completed 2014 trucks from Chevrolet, eliminates the transmissions, and replaces them with generators. A motor and gearbox are attached to the prop-shaft for traction torque, and two inverters are used to control the generator and the motor.

14336 & 15665: Install & Upgrade EV Charging Infrastructure (Administer SoCalEV Infrastructure Project)

Contractor: Los Angeles Department of Water and Power; City of Santa Monica	SCAQMD Cost-Share	$ 0
	Cosponsors	
	CEC	840,750
	SoCalEV Collaborative	542,659
Term: 07/31/15 – 04/30/16	Total Cost:	$ 1,383,409

State, federal and local funds are currently being invested to support battery and plug-in electric vehicles (EVs) and associated charging infrastructure. There was a need to upgrade and expand electric vehicle infrastructure. In 2013, the LADWP asked the SCAQMD to administer the project, which was previously awarded $840,750 by CEC. In 2013, the SCAQMD executed the first five agreements – Memorandum of Agreement (MOA) – with members of the SoCalEV Regional Collaborative to install as well as upgrade existing public EV charging infrastructure at key Southern California locations. In 2014, the SCAQMD executed 12 more agreements, and in 2015 another two agreements. SoCalEV Regional Collaborative members are providing cost-share towards hardware and installation expenses through in-kind labor and/or subcontractors. Data will be collected on charger utilization, charging user patterns, operating costs, electricity used and real-world electric range. By April 2016, 319 Level 2 chargers are expected to be installed at workplaces, destinations, universities, and other key locations.

15382: Install Electric Charging Infrastructure

Contractor: ChargePoint, Inc.	SCAQMD Cost-Share	$ 162,000
Term: 01/23/15 – 01/22/17	Total Cost:	$ 162,000

In order to accelerate the adoption of electric vehicles, SCAQMD executed contracts with the two major manufacturers of Level 2 chargers— ECOtality and ChargePoint, Inc. The intent of these contracts was to install additional public charging infrastructure by incentivizing the cost of hardware and/or installation by providing an incentive of $1,000/charger installed. ECOtality completed installing the majority of its Level 2 charging stations in 2012. The remaining funds in the ECOtality contract were transferred to ChargePoint. ChargePoint has installed approximately 80 Level 2 chargers and is scheduled to complete their work by the end of 2016.

15448: Site Selection for the Basin DC Fast Charging Network

Contractor: University of California Los Angeles Luskin Center	SCAQMD Cost-Share	$ 10,000
Term: 04/21/15 – 04/30/16	Total Cost:	$ 10,000

The UCLA Luskin Center was part of a CEC proposal team to provide site selection services for DC fast charging sites as part of the Basin DC Fast Charging Network. Although 26 sites were originally proposed to CEC, several sites dropped out of the project. As part of site substitution process, the UCLA Luskin Center ran their site selection model to determine the best sites to fulfill multiple criteria including proximity to major freeways or roads, proximity to retail locations, sites with comparable dwell times, and sites which would be predicted to have high charger utilization rates.

15650: Develop and Demonstrate Solar Forecasting for Larger Solar Arrays with Storage and EV Charging

Contractor: University of California San Diego	SCAQMD Cost-Share	$ 98,908
	Cosponsors	
	U.S. EPA	400,000
	CEC	999,984
	California Public Utilities Commission	156,386
Term: 07/17/15 – 01/16/18	Total Cost:	$ 1,655,278

Inherent variability of solar output can impair power quality and grid reliability with wide voltage swings and feeder net load variability in the presence of partial cloud cover that must be matched with fossil generation resources. Plug-in electric vehicles (PEVs) along with other storage technologies can buffer the inherent variability of wind and solar renewable energy sources in the electric system with imaging systems that prepare systems for partial cloud cover. Using sky imaging systems with solar generation can help reduce the amount of storage needed to support variability from solar generation and allow solar generation provide less intermittency on the electrical grid with decreasing reliance on flexible fossil generation resources. Under this project UC San Diego has deployed high accuracy, short-term solar forecasting technologies to allow commercial and industrial ratepayers to maximize their available rooftop space for PV installations, reviewed the potential installation area available on warehouse spaces in the Basin with nearby grid feeder circuits, and reviewed use cases that co-optimize building electrical demand loads with flexible workplace PEV charging and energy storage. A demonstration of the solar forecasting system coupled with solar generation, electrical loads, and charging is being developed.

15680: ComZEV: Develop Detailed Technology and Economics-Based Assessment for Heavy-Duty Advanced Technology Development

Contractor: National Renewable Energy Laboratory	SCAQMD Cost-Share *(partially received as pass-through funds)*	$ 500,000
Term: 08/28/15 – 08/27/16	Total Cost:	$ 500,000

The objective of the Commercial Zero-Emission Vehicle (ComZEV) project is to facilitate the reduction of NOx and GHG emissions through 2050 through the development of a plan for the commercialization of advanced vehicle technologies in the SCAQMD jurisdictional area. Specifically, a detailed technology and economics based roadmap will be developed, focusing on identifying barriers and opportunities to match advanced technology options to key commercial medium- and heavy-duty vehicle vocations. The technology options to be evaluated include battery electric vehicles, fuel cell vehicles, catenary/induction electric propulsion systems, and compressed natural gas and liquid natural gas internal combustion engines and gas turbines. The $500,000 funding includes $250,000 from the Southern California Gas Company recognized into the Clean Fuels Fund.

16022: ZECT II: Develop and Demonstrate One Class 8 CNG Hybrid Electric Drayage Truck

Contractor: Gas Technology Institute	SCAQMD Cost-Share	$ 1,578,802
	Cosponsors	
	U.S. DOE *(received as pass-through funds into Fund 61)*	2,813,637
	Gas Technology Institute	311,438
	Other Partners	923,442
Term: 12/04/15 – 06/30/20	Total Cost:	$ 5,627,319

This project is one of the DOE-funded Zero Emission Cargo Transport II demonstration projects to promote and accelerate deployment of zero emission capable cargo transport technologies in the South Coast Air Basin. Under project management by Gas Technology Institute, BAE Systems will work with Kenworth to develop a CNG hybrid electric drayage truck with optional catenary capability for demonstration in real world drayage operations at the Ports of Los Angeles and Long Beach. The proposed technical concept provides a system with a well-balanced blend of all electric and CNG-based hybrid operation that can operate in zero emission (all-electric) mode in sensitive zones, such as disadvantaged communities around the Ports and along major goods movement corridors, and in a conventional hybrid electric mode using a CNG generator to provide an operating range of up to 250 miles and power output comparable to that of conventional Class 8 drayage trucks.

16046: ZECT: Develop and Demonstrate Two Class 8 CNG Plug-In Hybrid Electric Drayage Trucks

Contractor: Transportation Power, Inc.	SCAQMD Cost-Share	$ 195,326
	Cosponsors	
	U.S. DOE *(received as pass-through funds into Fund 61)*	958,120
	CEC	900,000
	Transportation Power, Inc.	50,000
Term: 12/04/15 – 09/30/17	Total Cost:	$ 2,103,446

This project is for one of the two technologies that were added to the first Zero Emission Cargo Transport (ZECT I) project in 2015. Transportation Power (TransPower) will develop two Class 8 CNG plug-in hybrid electric drayage trucks with zero emission operation capability for demonstration in revenue drayage service with fleet operators at the Ports of Los Angeles and Long Beach. Using a CNG generator in a series hybrid drive configuration, these hybrid trucks will be designed to provide comparable power and torque to those of conventional drayage trucks with a targeted range of 200 miles, including 30-40 all-electric miles. The hybrid technology to be used in this project leverages the advanced electric drive system TransPower has developed for their battery electric trucks, which are currently in demonstration with fleet partners in the South Coast Air Basin. TransPower will also utilize commercially available and widely used CNG engines and components to make the hybrid drive technology more cost-competitive and well-positioned for commercialization.

16047: ZECT: Develop and Demonstrate Three Class 8 LNG Plug-In Hybrid Electric Drayage Trucks

Contractor: US Hybrid Corporation	SCAQMD Cost-Share	$ 22,896
	Cosponsors	
	U.S. DOE *(received as pass-through funds into Fund 61)*	925,000
	CEC	450,000
	TTSI	630,000
	US Hybrid Corporation	90,000
Term: 11/06/15 – 09/30/17	Total Cost:	$ 1,996,675

This project is for the other zero emission truck technology that was added to the ZECT I demonstration project in 2015. US Hybrid will convert three Class 8 liquefied natural gas (LNG) drayage trucks into plug-in hybrid electric trucks with zero emission operation capability for demonstration with fleet operators at the Ports of Los Angeles and Long Beach. US Hybrid will leverage a parallel hybrid electric drive system they have developed for refuse trucks to design a hybrid electric drive system well-suited for port drayage truck operations with comparable or higher power output to that of conventional trucks and a targeted range of 200 miles, including 30-40 all-electric miles.

Direct Pay: Establish Residential EV Charging Incentive Pilot Program

Contractor: Varies	SCAQMD Cost-Share	$ 500,000
	Cosponsor	
	MSRC/AB 2766 Discretionary Fund Program	500,000
Term: 09/04/15 – 09/04/15	Total Cost:	$ 1,000,000

SCAQMD launched a Residential EV Charging Incentive Pilot Program in December 2015 utilizing $500,000 from the Clean Fuels Fund and $500,000 in MSRC funding. Rebates of $250 or $500 (low income residents) are being offered to buy down the cost of hardware for residential Level 2 chargers. Costs for Level 2 chargers range from $400 - $800 per charger. Applicants will fill out a one-page online application and provide proof of charger purchase, lease or purchase of a new or used electric vehicle, utility bill, permit or certification of self-installation with an existing 240V outlet, and photo of the installed charger. Chargers will need to be permanently installed and in place for a minimum of three years. Tenants in multi-family dwellings or condominiums can install chargers with the permission of the property owner, manager or HOA.

Direct Pay: EV Charger Installation

Contractor: Clean Fuel Connection, Inc.	SCAQMD Cost-Share	$ 5,196
Term: 03/18/15 – 03/18/15	Total Cost:	$ 5,196

This project provides funds for the demonstration of Level 2 electric vehicle chargers from several manufacturers including ChargePoint, Clipper Creek, LiteOn, AeroVironment, and BTC Power, Inc. Clean Fuel Connection, Inc. purchased and installed Level 2 chargers at various locations. These chargers have been utilized extensively by SCAQMD Board members, staff, and the general public.

Direct Pay: EV Charger Installation

Contractor: ATVLS, Inc.	SCAQMD Cost-Share	$ 21,155
Term: 07/01/15 – 07/01/15	Total Cost:	$ 21,155

This project provides funds for the demonstration of Level 2 chargers from several manufacturers including ChargePoint, Clipper Creek, LiteOn, AeroVironment, and BTC Power, Inc. ATVLS, Inc. purchased and installed two Level 2 chargers at the City of Wildomar City Hall to provide public charging in an underserved location in the Inland Empire. Additional public charging infrastructure in more remote locations assisted in extending charging corridors throughout the region.

Hydrogen and Mobile Fuel Cell Technologies and Infrastructure

10046: Develop and Demonstrate Renewable Hydrogen Energy and Fueling Station

Contractor: Air Products and Chemicals, Inc.	SCAQMD Cost-Share	$ 75,000
	Cosponsor	
	CARB	200,000
Term: 12/21/09 – 11/01/15	Total Cost:	$ 275,000

Air Products and Chemicals, Inc. was selected by CARB under a solicitation to install a new 350/700 bar hydrogen refueling station at Orange County Sanitation District which was supplied by 100% renewable hydrogen and 100% renewable electricity produced utilizing a molten carbonate fuel cell. The SCAQMD joined the project cofunding the fuel cell and station operation. The hydrogen produced was purified using a hydrogen purification system. The molten carbonate fuel cell system and purification system installed at the water treatment facility under a DOE Cooperative Agreement. The hydrogen fueling station was operated by the National Fuel Cell Research Center and the University of California, Irvine and was co-located with an existing, publicly accessible compressed natural gas fueling station. The hydrogen station was designed to dispense 100 kg/day of hydrogen and achieved a single 4.5 kg fill in 3 minutes from the 700 bar dispenser, achieved 3 consecutive 5 kg fills from the 700 bar dispenser in 45 minutes and achieved 3 consecutive 5 kg fills from the 350 bar dispenser in 25 minutes.

13155: Lease Two F-Cell Mercedes Benz Fuel Cell Vehicles for Two Years

Contractor: Fletcher Jones Motor Cars Inc.	SCAQMD Cost-Share	$ 14,598
Term: 02/08/13 – 02/08/17	Total Cost:	$ 14,598

The SCAQMD extended the lease for two Mercedes F-Cell fuel cell vehicles from Fletcher Jones MotorCars which is conveniently located near the UC Irvine hydrogen fueling station. SCAQMD previously demonstrated Mercedes A-class (smaller) F-Cell vehicles from 2005 to 2009. Mercedes produced about 200 F-Cells as part of this pilot program in the US and Europe. This B-Class F-Cell provides 136 hp and a top speed of 106 mph. Range is improved to about 200 miles compared to the previous A-Class version when refueling at a higher pressure of 700 bar. The vehicles are used in our alternative fuel vehicle fleet to demonstrate new clean fuel vehicles to public and private organizations to promote zero- and low-emission technologies. The lease extension is at a reduced rate compared to the original contract amount of $30,397 for 2 years.

13400: Develop Hydrogen Station Investment Plan and Assess Policies and Incentives for Implementation

Contractor: Energy Independence Now	SCAQMD Cost-Share	$ 80,000
	Cosponsors	
	CaFCP *(received as pass-through funds from CEC into Fund 55 in 2014)*	20,000
	Toyota	25,000
Term: 04/05/13 – 12/31/15	Total Cost:	$ 125,000

Energy Independence Now (EIN), in partnership with SCAQMD, embarked on a project to develop a Hydrogen Network Investment Plan (H2NIP) in order to examine market success factors relative to the launch of fuel cell vehicles (FCV) and infrastructure. The project was broken into two phases. Phase I was completed in 2013. Phase II, funded through a contract amendment executed in 2015, developed an assessment of fuel incentives and renewable hydrogen in California that included findings on hydrogen-related environmental credits, key actions needed to further develop California's Low Carbon Fuel Standard (LCFS) and U.S. EPA's Renewable Fuel Standard (RFS) incentives, and highlighted concerns and drivers for the renewable hydrogen market. The final version of the plan, 'Crediting Hydrogen: Fuel Incentives and Renewable Hydrogen Investment in California' was completed in November 2014. EIN provided hydrogen stakeholders with appropriate information to capture a full range of monetary benefits that are currently available through the LCFS program, an assessment of the current and future impacts of the renewable hydrogen requirements, and alternative options to better incentivize renewable hydrogen investments.

14684: Conduct Hydrogen Station Site Evaluations for Site Certification for Commercial Sale of Hydrogen

Contractor: California Department of Food and Agriculture, Division of Measurement Standards	SCAQMD Cost-Share	$ 100,000
	Cosponsor	
	CaFCP	150,000
	CARB	100,000
	CEC	100,000
Term: 12/11/15 – 12/31/16	Total Cost:	$ 450,000

The California Department of Food and Agriculture, Division of Measurement Standards has requested cofunding to conduct site evaluations at ten hydrogen fueling stations leading to certification of the station for the commercial sale of hydrogen. Hydrogen dispensers certified under this program can then be used at multiple locations in California with a simple one day test similar to gasoline station annual evaluation.

15596: Transfer of Ownership of One Gaseous Hydrogen Electrolyzer, Compressor, Storage Tanks and Associated Hydrogen Equipment

Contractor: US Hybrid Corporation	SCAQMD Cost-Share	$ 0
Term: 04/15/15 – 12/31/15	Total Cost:	$ 0

The transfer of hydrogen equipment from the Five Cities Burbank hydrogen station to US Hybrid did not take place since there was an alternate use for the storage tanks as part of the SCAQMD CNG station upgrade.

15599: Bill of Sale and Transfer of Hydrogen Station Equipment

Contractor: City of Burbank	SCAQMD Cost-Share	$ 0
Term: 03/19/15 – 03/19/15	Total Cost:	$ 0

The City of Burbank formally transferred ownership of the Five Cities Burbank hydrogen station equipment to SCAQMD in order to facilitate the transfer of various pieces of hydrogen equipment to US Hybrid. However, it was subsequently determined to use the storage tanks for the SCAQMD CNG station upgrade.

15609: Installation of Riverside Renewable Hydrogen Fueling Station

Contractor: ITM Power, Inc.	SCAQMD Cost-Share	$ 200,000
	Cosponsors	
	CEC	2,125,000
	ITM Power, Inc.	217,125
	Powertech Labs	232,059
	City of Riverside	160,000
Term: 10/06/15 – 10/05/19	Total Cost:	$ 2,934,184

ITM Power, Inc (ITM) is installing a retail hydrogen station at the City of Riverside fleet yard. This hydrogen station will be co-located with a CNG station and a DC fast charging station for CNG and electric vehicles. The Riverside station will be a renewable station that will fulfill Renewable Portfolio Standard (RPS) requirement for CEC-funded stations, with 33% of the hydrogen being produced locally with an electrolyzer supplied with 100% renewable electricity. The remaining 66% of the hydrogen will be delivered. The station will have a nominal capacity of 100 kg/day, with 35 kg/hour in Type A for 70Mpa fills. The Riverside station can be easily expanded and if needed, could become a 100% renewable station at an additional cost. New 350 bar and 700 bar point of sale (POS) dispensers are being upgraded to allow for the sale of hydrogen as retail transactions using credit cards. The station will meet SAE J2601:2014 and J2719:2011 standards for hydrogen fueling protocol and hydrogen quality. The station is scheduled to be completed in 2016.

15611: Installation of Ontario Renewable Hydrogen Fueling Station

Contractor: Ontario CNG Station, Inc.	SCAQMD Cost-Share	$ 200,000
	Cosponsors	
	CEC	2,125,000
	Ontario CNG Station, Inc.	351,000
	Stratos Fuel LLC	34,000
Term: 07/10/15 – 07/09/20	Total Cost:	$ 2,710,000

Ontario CNG Station, Inc. is installing a retail hydrogen station at a gas station in the City of Ontario, next to the Ontario airport. The hydrogen station is co-located with a CNG station and E85 fueling station, and will also host a DC fast charging station later in 2016. The onsite electrolyzer will produce 65 kg/day, with the remaining 35 kg/day provided through 100% renewable delivered hydrogen in order to meet the RPS requirement for CEC-funded stations. The station will have a nominal capacity of 100 kg/day, with 35 kg/hour I Type A for 70Mpa fills. Capacity at this station could be easily increased if needed, could become a 100% renewable station through the use of renewable energy certificates (REC) for electricity and purchase of additional 100% renewable hydrogen. New 350 bar and 700 bar POS dispensers are being

upgraded to allow for the sale of hydrogen as retail transactions using credit cards. The station will meet SAE J2601:2014 and J2719:2011 standards for hydrogen fueling protocol and hydrogen quality. The station is scheduled to be completed in 2016, and is waiting for a major transformer upgrade by Southern California Edison at this site to accommodate demand by the upgraded hydrogen and CNG stations, and the future DC fast charger.

15619: Installation of Chino Renewable Hydrogen Station

Contractor: H2 Frontier Inc.	SCAQMD Cost-Share	$ 200,000
	Cosponsors	
	CEC	3,000,000
	H2 Frontier Inc.	266,925
	Powertech Labs	500,027
	ITM Power, Inc.	700,027
Term: 12/04/15 – 12/03/20	Total Cost:	$ 4,666,979

H2 Frontier Inc. is installing a 100% renewable hydrogen station at the Hyundai Hydrogen Generating Facility in the City of Chino. The Hyundai Chino station will be one of the few 100% renewable stations in the South Coast Air Basin, and will fulfill Renewable Portfolio Standard (RPS) requirement for CEC-funded stations. Electricity will be 100% renewable through the use of RECs and will be locally generated with an on-site electrolyzer. Delivered 100% renewable hydrogen may be used when the electrolyzer is out of service. The station will have a nominal capacity of 100 kg/day, with 35 kg/hour in Type A for 70Mpa fills. The Chino station can be easily expanded. Its close proximity to the Hyundai off-road testing facility will be used for chassis dynamometer testing and increased durability testing routes adjacent to the station. New 350 bar and 700 bar point of sale (POS) dispensers are being upgraded to allow for the sale of hydrogen as retail transactions using credit cards. The station will meet SAE J2601:2014 and J2719:2011 standards for hydrogen fueling protocol and hydrogen quality. The station is scheduled to be completed in the 2016-2017 timeframe.

15641: Three-Year Lease of 2015 Tucson Fuel Cell Vehicle

Contractor: Hardin Hyundai	SCAQMD Cost-Share	$ 22,862
Term: 06/15/15 – 06/14/18	Total Cost:	$ 22,862

SCAQMD has been working with Hyundai America Technical Center Inc. to become a partner in their fuel cell vehicle demonstration program and has participated in on-road testing of their Tucson fuel cell electric vehicle in a program funded by a grant from the U.S. DOE. Hyundai started limited production of the 2015 Tucson fuel cell vehicle for retail lease only through three specially trained dealerships in our region; Hardin Hyundai is the closest dealership which minimizes emissions for service visits. The Hyundai Tucson fuel cell vehicle is a five-passenger SUV that travels 265 miles before refueling with 70 MPa gaseous hydrogen and has EPA estimated fuel economy of 50 mpg. The vehicle is part of SCAQMD's alternative fuel vehicle fleet to demonstrate new clean fuel vehicles to public and private organizations to promote low-emission technologies.

15666: Participate in CaFCP for CY 2015 and Provide Support for Regional Coordinator

Contractor: Bevilacqua-Knight, Inc.	SCAQMD Cost-Share	$ 137,800
	Cosponsors	
	7 automakers; 5 government agencies; 1 fuel cell provider, and 9 associate and 14 affiliate members	1,943,008
Term: 01/01/15 - 12/31/15	Total Cost:	$ 2,080,808

In April 1999, the California Fuel Cell Partnership (CaFCP) was formed with eight members; SCAQMD joined and has participated since 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 Bevilacqua-Knight, Inc. (BKi) for their portion of the CaFCP's administration. In 2015, the SCAQMD Board contributed $87,800 for membership and up to $50,000, along with four cubicles at SCAQMD Headquarters, to provide support for the CaFCP Regional Coordinator.

16039: Demonstrate Prototype Hydrogen Sensor and Electronics Package

Contractor: Lawrence Livermore National Laboratory	SCAQMD Cost-Share	$ 175,000
	Cosponsor	
	U.S. DOE	175,000
Term: 12/10/15 – 02/09/17	Total Cost:	$ 350,000

Lawrence Livermore National Laboratory (LLNL), in conjunction with Los Alamos National Laboratory, has developed a novel, miniature, solid-state electrochemical sensor with the potential to meet requirements for sensitivity, durability, reliability and operational (environment) requirements at a low enough cost for wide-scale deployment. Cofunding from SCAQMD will enable additional testing by LLNL at a hydrogen station within our region.

16151: No-Cost Loan of 2015 Toyota Mirai Fuel Cell Vehicle

Contractor: Toyota Motor Sales USA	SCAQMD Cost-Share	$ 0
Term: 12/15/15 – 01/05/16	Total Cost:	$ 0

One Toyota Mirai fuel cell vehicle was loaned to SCAQMD for a short term for no cost to accommodate elevated interest in this new vehicle.

16171: Three-Year Lease of 2015 Toyota Mirai Fuel Cell Vehicle

Contractor: Longo Toyota	SCAQMD Cost-Share	$ 24,567
Term: 12/15/15 – 12/14/18	Total Cost:	$ 24,567

SCAQMD has worked with Toyota to demonstrate their previous Highlander fuel cell demonstration vehicle through a program with UC Irvine. Toyota started production of the 2016

Mirai fuel cell 4-passenger sedan. The vehicle is available for retail lease through four specially trained dealerships in our region; Longo Toyota is the closest dealership which minimizes emissions for service visits. The Mirai fuel cell vehicle travels 312 miles before refueling with 70 MPa gaseous hydrogen and has EPA estimated fuel economy of 67 mpg. The vehicle will be placed into our alternative fuel vehicle fleet to demonstrate new clean fuel vehicles to public and private organizations to promote low-emission technologies.

Direct Pay: Repair Hydrogen Quality Sampling Adaptor

Contractor: Gas Technology Institute	SCAQMD Cost-Share	$ 2,410
Term: 08/11/15 – 08/11/15	Total Cost:	$ 2,410

NREL loaned the hydrogen quality sampling adapter to SCAQMD to conduct sampling at hydrogen stations in our region to support the development of new test methods under contract 15020 with UC Irvine. Service available only through Gas Technology Institute was needed before the equipment could be returned to NREL.

Direct Pay: Purchase One 2016 Toyota Mirai Fuel Cell Vehicle

Contractor: Toyota Motor Sales USA	SCAQMD Cost-Share	$ 56,688
Term: 12/01/15 – 12/01/15	Total Cost:	$ 56,688

SCAQMD has worked with Toyota to demonstrate their previous Highlander fuel cell demonstration vehicle through a program with UC Irvine. Toyota started production of the 2016 Mirai fuel cell 4-passenger sedan. The vehicle is available for retail purchase or lease through four specially trained dealerships in our region; Longo Toyota is the closest dealership which minimizes emissions for service visits. The Mirai fuel cell vehicle travels 312 miles before refueling with 70 MPa gaseous hydrogen and has EPA estimated fuel economy of 67 mpg. One Mirai was purchased since it is the first fuel cell vehicle available for purchase in California, and since there is an additional $15,000 incentive available for purchase (not lease) of fuel cell vehicles by public fleets serving disadvantaged communities. The vehicle will be placed into our alternative fuel vehicle fleet to demonstrate new clean fuel vehicles to public and private organizations to promote low-emission technologies.

Engine Systems

15626: Develop, Integrate and Demonstrate Ultra Low-Emission Natural Gas Engines for On-Road Heavy-Duty Vehicles

Contractor: Cummins Westport, Inc.	SCAQMD Cost-Share *(partially received as pass-through funds)*	$ 3,500,000
	Cosponsor	
	Cummins Westport, Inc.	3,733,000
Term: 07/10/15 – 12/31/16	Total Cost:	$ 7,233,000

Heavy-duty on-road diesel vehicles are projected to be the top source of NOx emissions in the South Coast Air Basin (SCAB) in 2023 contributing approximately 50 tons per day of NOx. The early development of ultra-low emission engines that emit 90% lower NOx emissions than

current emission standards, would significantly reduce emissions from this on-road source category and assist the region in meeting federal ambient air quality standards in 2023 and later years. Natural gas fueled engines have demonstrated the ability to meet these low emissions standards now while diesel engines have not. This project will apply technology developed for 8.9-liter natural gas engines to 12-liter natural gas engines that are (1) suitable for on-road heavy-heavy duty vehicle applications such as Class 8 trucks and buses; (2) commercially viable; (3) capable of being certified to the CARB Optional NOx standard of 0.02 g/bhp-hr, and 4) capable of NH3 emissions and fuel economy penalties compared to diesel engines as low as possible. The project includes engine and after-treatment system development, integration into vehicles, and field demonstration leading to commercialization in production vehicles by 2018.

15632: Develop Ultra Low-Emission Natural Gas Engine for On-Road Medium-Duty Vehicles

Contractor: Gas Technology Institute	SCAQMD Cost-Share	$ 750,000
	Cosponsors	
	Ricardo	50,000
	PSI	750,000
	Southern California Gas Company	250,000
Term: 09/01/15 – 06/30/17	Total Cost:	$ 1,800,000

Heavy-duty on-road diesel vehicles are projected to be the top source of NOx emissions in the South Coast Air Basin (SCAB) in 2023 contributing approximately 50 tons per day of NOx. Light-heavy and medium-heavy heavy duty diesel on-road buses and trucks are projected to contribute approximately 18 of the 50 tons per day of NOx in the heavy duty diesel category. The development of ultra-low emission engines that emit 90% lower NOx than current standards for these smaller vehicles would significantly reduce their emissions and assist the region in meeting federal ambient air quality standards in the coming years. Natural gas fueled engines have demonstrated the ability to meet these low emissions standards while diesel engines have not. The objective of this project is to develop an 8.8-liter natural gas engine and associated exhaust after-treatment technology that is (1) suitable for on-road light- and medium-heavy duty vehicle applications such as Class 4-6 trucks and buses; (2) commercially viable; (3) capable of being certified to the CARB Optional NOx standard of 0.02 g/bhp-hr, and (4) NH3 emissions and fuel economy penalties as low as possible. The project does not include vehicle integration and demonstration activities.

Fueling Infrastructure & Deployment (NG/RNG)

16076: Deployment of One Heavy-Duty Natural Gas-Powered Paratransit Vehicle

Contractor: Coachella Valley Association of Governments	SCAQMD Cost-Share	$ 140,000
Term: 12/11/15 – 12/11/19	Total Cost:	$ 140,000

In July 2015, the Board approved funding of $140,000 to support the purchase and deployment of one heavy-duty CNG-powered paratransit vehicle for the purpose of providing alternative fuel powered ground transportation in the Coachella Valley region. The vehicle will be deployed for a minimum of three years through the Coachella Valley Association of Governments' (CVAG) Administration Department with the purpose of providing shuttle services to the homeless. The

intended operator of this vehicle is CVAG's approved operator of Roy's Desert Resource Center (DRC) located in North Palm Springs, CA. The vehicle to be deployed is a 32-foot Class E bus with wheelchair lift and two ADA positions and will be built by Creative Bus Sales. The vehicle will be built on a Ford F550 chassis, powered by a 6.8L Ford V-10 gasoline engine that will be converted to dedicated CNG using a CARB-certified system. The vehicle will be equipped with 54 GGE of fuel storage. The project is expected to provide support of CNG vehicle deployment and demonstrate emission reductions in this region.

Fuels/Emissions Studies

15607: Innovative Transportation System Solutions for NOx Reductions in Heavy-Duty Fleets

Contractor: University of California Riverside/CE-CERT	SCAQMD Cost-Share	$ 79,980
	Cosponsor	
	University of California Riverside/CE-CERT	60,000
Term: 12/19/15 – 11/30/16	Total Cost:	$ 139,980

The objective of this project is to develop a new intelligent routing system for heavy-duty trucks, specifically designed to minimize NOx emissions and fuel consumption. This routing system will be built upon CE-CERT's previous research in eco-routing algorithms for light-duty vehicles by incorporating heavy-duty truck energy and emissions data using appropriate models. This application will provide drivers eco-friendly routes with optimal speed to travel based on traffic and road conditions. CE-CERT will field test the application to validate its accuracy and effectiveness including comparison analysis of the estimated NOx emissions with real world NOx emission measurements.

15623: Ozone and SOA Formation from Gasoline and Diesel Compounds

Contractor: University of California Riverside/CE-CERT	SCAQMD Cost-Share	$ 75,000
	Cosponsor	
	University of California Riverside/CE-CERT via CARB 13-302	405,338
Term: 10/02/15 – 06/30/16	Total Cost:	$ 480,338

Low Vapor Pressure (LVP) compounds are often unaccounted for in air models and emission inventories because of their low volatility. However, recent studies indicate that some LVP components of gasoline and diesel are also reactive and may play a significant role in the formation of ozone and PM2.5 including secondary organic aerosol (SOA). Recent observations from the CalNex study observe that the SOA fraction is most strongly correlated with evaporative and tailpipe gasoline vehicle emissions. While SOA formation from some gasoline components have been individually studied under controlled conditions, studies of the atmospheric fate of lower-volatility compounds in gasoline and diesel are somewhat limited. Given changes in fuel formulations, increased knowledge on the impact of reactivity on SOA formation, potential evaporative and tailpipe losses to the atmosphere, and improved experimental photochemical chambers and instrumentation, a new study of whole gasoline and diesel vapor aerosol formation

would provide beneficial insight. Building on the CARB-funded research program for the study of LVP compounds, UCR CE-CERT will evaluate the evaporation characteristics as well as quantify ozone and SOA formation potential from the LVP compounds in gasoline and diesel. This pilot study is a fuel-related expansion of the on-going research with CARB. Whole gasoline and diesel mixtures will be oxidized inside a state-of-the-art large Teflon chamber, leading to the formation of SOA. Measurements of SOA production will be used to evaluate the performance of SOA formation estimation tools. This will lead to more accurate predictions of SOA formation from specific LVP precursors. In addition, UCR CE-CERT will investigate the chemical composition of SOA from gasoline and diesel vapors using mass spectrometry.

15625: Evaluate SOA Formation Potential from Light-Duty GDI Vehicles

Contractor: University of California Riverside/CE-CERT	SCAQMD Cost-Share	$ 149,972
	Cosponsor	
	University of California Riverside/CE-CERT	75,000
Term: 10/02/15 – 06/30/17	Total Cost:	$ 224,972

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 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. This project proposes 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. This study covers testing of four (4) GDI vehicles over Unified Cycle using in tank fuel, and another four (4) vehicles using three types of fuels with different ethanol blending (E10 and E20 for three conventional GDIs, and E10 and E85 for one GDI-FFV. The results of this study will provide valuable information on primary and secondary particulate emissions including SOA from in-use GDI vehicles and help to facilitate a discussion on potential mitigation strategies.

15636: Evaluate PEV Utilization through Advanced Charging Strategies in a Smart Grid System

Contractor: University of California Riverside/CE-CERT	SCAQMD Cost-Share	$ 170,000
	Cosponsor	
	University of California Riverside/CE-CERT	100,000
Term: 12/15/15 – 02/14/17	Total Cost:	$ 270,000

As part of SCAQMD's efforts in deploying in-basin renewable distributed electricity generation with energy storage to support electric transportation technologies, UCR CE-CERT was awarded a contract to initiate the "Sustainable Integrated Grid Initiative" project in late 2012. This project has been deployed and is now in operation at the UCR campus. This project serves as a research test bed and demonstration site for Plug-In Vehicles (PEVs) that can be directly integrated with smart grid technology. UCR/CE-CERT continues to expand their programs focused on transportation emissions, their measurement and mitigation. Based on the relevance and potential

to address SCAQMD's priorities to reduce NOx and PM emissions from transportation sources this contract was awarded to UCR/CE-CERT for the evaluation and demonstration of advanced charging technologies and associated vehicle activity to further demonstrate the effectiveness of PEV deployment as part of a smart grid system. PEV utilization will be greatly increased by incorporating advanced charging strategies and/or technologies such as V2G. With Riverside Public Utilities as a cofunding partner this project will incorporate and evaluate Vehicle-to-Grid Strategies; PEV Activity Analysis and Charge; Light Duty Vehicle DC Fast Charging and Heavy Duty PEV Transit Vehicle DC Fast Charging.

Emission Control Technologies

15347: Develop Retrofit Technology for Natural Gas Engines and In-Use Emissions Testing of On-Road Heavy-Duty Trucks

Contractor: West Virginia University Research Corporation	SCAQMD Cost-Share	$ 340,0000
	Cosponsors	
	CARB	100,000
	West Virginia University Research Corporation	50,000
Term: 01/09/15 – 11/08/15	Total Cost:	$ 490,000

In December 2010, the Board awarded a contract to West Virginia University (WVU) to conduct in-use emissions testing, and if needed, to evaluate emission-reduction potential of retrofit technology on existing and new on-road heavy-duty vehicles. While the test results revealed that test vehicles' in-use emissions were lower than the 2010 U.S. EPA in-use or not-to-exceed emissions standards, ammonia emissions from natural gas vehicles were found to be significantly higher than expected due to the nature of spark-ignited engines. The initial evaluations of technologies to reduce emissions from natural gas engines indicate that a selective catalytic reduction (SCR) system is capable of reducing ammonia and further reducing NOx emissions. However, additional work is required to develop, optimize, and enhance the SCR system's performance and durability. In October 2011, the Board amended the December 2010 award and added a new task to assess real-world in-use emissions from a 70,000-pound loaded 2010 U.S. EPA compliant heavy-duty diesel vehicle as the vehicle was driven over a 2,500-mile route between Morgantown WV and Riverside CA. The real-world in-use emissions assessment showed that the combined diesel particulate filter and SCR system achieved low levels of PM and NOx emissions for over 90% of the 2,500-mile trip characterized by mostly sustained freeway operation. The real-world in-use test results necessitate a need to enhance the assessment study to cover urban traffic conditions that are characteristic of heavy-duty vehicle operations in the South Coast Air Basin. In September 2013, the Board awarded a contract to WVU for $340,000 to develop, optimize, and enhance the SCR system to reduce ammonia and NOx emissions from a heavy-duty natural gas engine and conduct real-world in-use emissions testing of heavy-duty vehicles, each loaded to approximately 70,000 pounds, while driven over typical drayage truck routes in the Basin.

Outreach & Technology Transfer

05128: Technical Assistance for Development, Outreach and Commercialization of Advanced Heavy-Duty and Off-Road Technology

Contractor: Mid-Atlantic Research Institute LLC	SCAQMD Cost-Share	$ 30,000
Term: 08/08/15 – 03/31/17	Total Cost:	$ 30,000

In August 2015, Mid-Atlantic Research Institute LLC was tasked under an existing level-of-effort contract to assist WVU (another SCAQMD contractor) to develop, optimize and enhance the SCR system's performance and durability, specifically for addressing ammonia emissions.

13194: Technical Assistance with Alternative Fuels, Renewable Energy and EVs, Program Related Activities for AFVs, Lawn Mower Exchange, Conferences and Outreach

Contractor: Clean Fuel Connection Inc.	SCAQMD Cost-Share	$ 60,000
Term: 12/07/12 – 09/30/16	Total Cost:	$ 60,000

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 (CFC) is providing technical assistance with alternative fuels, renewable energy and electric vehicles to promote, assess, expedite, and deploy the development and demonstration of advanced, low- and zero-emissions mobile and stationary technologies. This modification to increase available funds under this existing Contract is for administrative support to enable the range of activities involved in implementing the Clean Fuels Program and associated complimentary programs as needed. Support is necessary to enhance or expand existing program-related activities associated with performing or meeting program objectives such as: alternative fuel vehicles (AFVs) demonstration program; lawn mower exchange program; technical conferences; and other outreach activities.

13198: Technical Assistance with Alternative Fuels, Emissions Analysis and On-Road Sources

Contractor: Gladstein, Neandross & Associates LLC	SCAQMD Cost-Share	$ 60,000
Term: 12/14/12 – 12/31/16	Total Cost:	$ 60,000

This contract extension adds $60,000 to continue to leverage staff resources with specialized outside expertise. Gladstein, Neandross & Associates LLC (GNA) has previously assisted SCAQMD with implementing a wide-array of incentive programs to deploy lower-emitting heavy-duty vehicles and advanced transportation technologies. Under this contract, GNA will provide technical expertise across a broad spectrum of emission reduction technologies, including alternative and renewable fuels, emissions analysis and heavy-duty on-road sources.

14185: Conduct Education Outreach for the Basin DC Fast Charging Network Project

Contractor: Three Squares Inc.	SCAQMD Cost-Share	$ 40,000
Term: 04/11/14 – 10/31/16	Total Cost:	$ 40,000

Three Squares Inc. was selected through an RFP process to conduct an education outreach campaign for customers of the Basin DC Fast Charging Network to educate customers on the differences between Level 1, Level 2 and DC fast charging; benefits of public charging to increase electric vehicle miles traveled; availability of public charging to supplement residential and/or workplace charging; environmental benefits associated with the use of plug-in electric vehicles and electrical vehicle infrastructure; and charging etiquette such as not parking in a space dedicated to electric vehicles when not charging or not staying over posted time limits. Three Squares Inc. has created a SoCalFast website to collect information on charging and make it easily accessible to mainstream consumers and is reaching out to coordinate with local governments, utilities, OEMs, advocacy groups, and event organizers to publicize installations of DC fast chargers as they are installed in the South Coast Air Basin. Three Squares Inc. will organize ribbon cuttings as each DC fast charger comes online, both separately and as part of an overall traditional and social media campaign.

15507: Technical Assistance with Alternative Fuels, Emissions Analysis and Combustion Technologies

Contractor: Jerald Cole	SCAQMD Cost-Share	$ 30,000
	Cosponsor	
	CEC *(received as pass-through funds into Fund 63 in 2013)*	50,000
Term: 01/09/15 – 01/08/17	Total Cost:	$ 80,000

Jerald Cole of Hydrogen Ventures is conducting an evaluation of upgraded hydrogen equipment and meters for the hydrogen stations undergoing upgrades through CEC and SCAQMD cofunding efforts. This evaluation will discuss the relative effectiveness and merits of point-of-sale (POS) dispensers and software; ability of stations to meet SAE J2601:2014 and J2719:2011 standards for hydrogen fueling protocol and hydrogen quality; performance expectations for retail stations such as reliability/up time, back to back fills, and hydrogen purity; and meeting the needs of customers taking delivery of commercially available FCVs. This evaluation will assess all stations undergoing upgrades in the 2015-2018 timeframe.

15516: Technical Assistance with Construction of Zero Emissions Goods Movement Demonstration Program

Contractor: Cordoba Corporation	SCAQMD Cost-Share	$ 74,500
Term: 03/27/15 – 03/31/18	Total Cost:	$ 74,500

Cordoba Corporation has been enlisted to provide technical assistance and consulting services for the Overhead Catenary Truck Demonstration. Siemens, the principle contractor for that project is in need of assistance in the redesign of the infrastructure. Cordoba will provide construction

consulting services and also review, assess and make recommendations on the overall construction portion of the project.

15610: Conduct Engineering Services at SCAQMD Headquarters

Contractor: Goss Engineering, Inc.	SCAQMD Cost-Share	$ 50,000
Term: 06/02/15 – 06/01/16	Total Cost:	$ 50,000

Goss Engineering, Inc. was selected through an informal bid process to provide engineering and construction planning services for the installation of up to 100 Level 2 chargers at SCAQMD headquarters. Technical assistance services included the development of load testing of electric panels, detailed construction plans to obtain a permit for the EV charger installation project with the City of Diamond Bar, evaluation of installation proposals, slope analysis for compliance with ADA accessibility guidelines, short circuit study, and revisions to the construction plans and permit process as required.

16055: Cosponsor Solar Decathlon – Develop and Demonstrate Solar-Powered House at 2015 U.S. DOE Solar Decathlon

Contractor: University of California Irvine	SCAQMD Cost-Share	$ 50,000
	Cosponsors	
	Southern California Edison	150,000
	Five Points Properties	100,000
	The Irvine Company	230,000
	City of Irvine	200,000
Term: 11/05/15 – 02/29/16	Total Cost:	$ 730,000

The biennial U.S. Department of Energy Solar Decathlon competition brings together university teams from across the country with homes they have designed and built that are powered by the sun. The homes must achieve other metrics such as, having low water usage, producing more energy than they consume, power an electric vehicle for specific duty cycles, and maintain comfortable living conditions. The 2015 competition held in October brought together seventeen teams at the Orange County (OC) Great Park with their houses to compete against each other under ten different contests. This co-sponsorship helped TeamOC design and build their competition house entitled Casa Del Sol. TeamOC was a collaboration with students and professors from UC Irvine, Chapman University, Irvine Valley College, and Saddleback College. Over a two year period, students and professors with support from local businesses designed and built their house with inspiration from the California Poppy. The official state flower of California closes its petals during nighttime, cold, or cloudy weather and opens during favorable daylight weather conditions. Some unique energy design features of the home included, horizontally rotating shades, a solar thermal hot water system providing heat for the clothes dryer, use of DC from solar panels to directly charge the electric vehicle along with other DC loads such as cell phones, and a 3-D printing room that created many of the homes lighting fixtures.

Direct Pay: Participation for CY 2015 Membership in Transportation Research Board

Contractor: Transportation Research Board	SCAQMD Cost-Share	$ 32,500
	Cosponsors	
	SCAQMD's Legislative & Public Affairs Office	32,500
	Core Program Participating Members	191,000
Term: 01/01/15 – 12/31/15	Total Cost	$ 256,000

In 2015 the SCAQMD supported the Transportation Research Board (TRB) by participating as a member. The mission of the TRB is to promote innovation and progress in transportation through research. In an objective and interdisciplinary setting, TRB facilitates the sharing of information on transportation practice and policy by researchers and practitioners; stimulates research and offers research management services that promote technical excellence; provides expert advice on transportation policy and programs; and disseminates research results broadly and encourages their implementation. TRB's varied activities annually engage more than 7,000 engineers, scientists, and other transportation researchers and practitioners from the public and private sectors and academia, all of whom contribute their expertise in the public interest by participating on TRB committees, panels and task forces. TRB is one of six major divisions of the National Research Council (NRC) - a private, nonprofit institution that is jointly administered by the National Academy of Sciences, the National Academy of Engineering and the Institute of Medicine - and is the principal operating agency of the National Academies in providing services to the government, the public and the scientific and engineering communities. Sponsors and affiliates provide support for TRB core programs and activities. Sponsors are the major source of financial support for TRB's core technical activities. Federal, state, and local government agencies and professional societies and organizations that represent industry groups are eligible to be TRB sponsors. TRB's annual expenditures for program activities exceed $90 million.

Direct Pay: Cosponsor 24 Conferences, Workshops & Events plus 5 Memberships and 1 Subscription

Contractor: Various	SCAQMD Cost-Share	$ 257,571
	Cosponsors	
	Various	5,635,014
Term: 01/01/15 – 12/31/15	Total Cost	$ 5,892,585

The SCAQMD regularly participates in and hosts or cosponsors conferences, workshops and events. These funds provide support for the 24 conferences, workshops and events sponsored throughout 2015 as follows: Coordinating Research Council's 2015 Real World Emissions Workshop in March; Coordinating Research Council's 2015 Mobile Source Air Toxics Workshop in February; UC Davis's Asilomar 2015 Conference on Transportation & Energy Policy; 2015 Women in Green Forum in August; CTE's International Fuel Cell Bus Workshop in February; UC Irvine's ICEPAG/MGS in March; SCAQMD's Hydrogen Station Grand Opening in March; UC Riverside's PEMS Conference in March; RadTech International's Ultraviolet and Electron Beam West 2015 Conference in March; GNA's Rethink Methane Symposium in June;

CSC Foundation's California Science Fir Awards in May; CleanTechOC's 2015 Symposium; Coordinating Research Council's 2015 Life Cycle Analysis Workshop in October; Adopt-A-Charger's National Drive Electric Week event in September; Burke Rix Communications' Southern California Energy & Water Summit in September; Platia Productions' Santa Monica AltCar Expo in September; Sequoia Foundation's California Asthma Research Conference in October; METRANS Transportation Center's International Urban Freight Conference in October; Clean Fuels Advisory Group participation fees for retreats in January and September; Fuel Cell Seminar & Energy Expo in November; CalETC's LA Auto Show in November; Fuel Cell Seminar booth participation; November Sensor Workshop speaker fees; and finally AWMA's 2016 International Atmospheric Optics Conference to be held in September 2016. Additionally, for 2015 four memberships were renewed for participation in the PEV Collaborative, the Fuel Cell & Hydrogen Energy Association, the Electric Drive Transportation Association, and the Air & Waste Management Association, and four 2016 one membership was renewed toward the end of CY 2015 for the Fuel Cell & Hydrogen Energy Association. One two-year subscription was also renewed for Automotive News.

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PROGRESS AND RESULTS IN 2015

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-emission technology developments in automobiles, transit buses, medium- and heavy-duty trucks and off-road applications. These vehicle-related efforts have focused on: 1) advancements in engine design, electric power trains, energy storage/conversion devices (e.g., fuel cells and batteries); and 2) implementation of clean fuels (e.g. natural gas, propane and hydrogen) including associated infrastructure. Stationary source projects have included a wide array of advanced low NOx technologies and clean energy alternatives, such as fuel cells, solar power and other renewable energy systems.

Table 6 provides a list of 47 projects and contracts completed in 2015. Summaries of the completed technical projects are included in Appendix C. Selected projects which represent a range of key technologies from near-term to long-term are highlighted below.

Volvo Plug-In Hybrid Urban Delivery Truck Technology Demonstration

Using hybrid trucks for drayage application (and other local and regional haul applications) can reduce emissions and lowers fuel use significantly. The objective of this project with Volvo Technology of America was to develop, build and demonstrate a prototype Class 8 heavy-duty plug-in hybrid drayage truck with significantly reduced emissions and fuel use. The truck features a 6x2 Mack chassis at 60,000 GCW with the proprietary hybrid driveline, a new energy optimized battery, external charging interface and newly developed energy management and control systems suitable for port drayage application. By utilizing plug-in hybrid technology, fully zero-emission electric mode is possible for limited distances at low speeds, such as in a predetermined zero emission geo-fence. The integration of a plug-in hybrid powertrain with downsized engine (11L in lieu of 13L), along with several improvements to the complete vehicle efficiency are expected to add up to approximately 30% improvement in fuel economy.

The project was completed in July 2015 with a final demonstration of the concept vehicle on a simulated drayage route around Volvo's North American headquarters in Greensboro, NC. The route included all traffic conditions typical of drayage operation in Southern California as well as geo-fences defined to showcase the zero emission capabilities of the truck. The test vehicle successfully completed four consecutive trips with a gross combined weight of 44,000 lb., covering approximately 2 miles out of a total distance of 9 miles per trip in the Zero Emission geo-fence.

This project demonstrates new complete vehicle solutions that can offer significant benefits when applied to a specific duty cycle. This could lead to a change in policymaking for the transportation industry, focusing on reducing real-world emissions impacts of the overall transport solution instead of focusing on individual technologies. Volvo's future work will focus

on improving their analytical tools to better capture engine and exhaust after-treatment component behavior under start-stop or low speed conditions. Volvo believes that this will help identify robust strategies to control the complex plug-in hybrid energy management algorithms in order to maximize the emissions and energy benefits of the vehicle compared to its baseline.

Figure 18: Volvo's PHEV Drayage Truck

Develop, Integrate and Demonstrate Heavy-Duty Natural Gas Engines and Vehicles

On-road natural gas engines are now being used in limited basis as an alternative to diesel engines in transit, refuse and goods movement applications. While the number of these engines has grown, there is still a need to develop natural gas engines in the 11- to 14-liter range to fill the wide array of fleet applications currently served by diesel engines. In 2011, the Board awarded a contract to DOE's National Renewable Energy Laboratory to administer the development, integration and demonstration of heavy-duty natural gas engines and vehicles. The primary objectives of this project included the following:

- Develop a new, high-efficiency, high-performance, high-versatility, low-emissions, heavy-duty 11.9 liter natural gas engine and three-way catalyst after-treatment;
- Certify the new engine at or below EPA/CARB 2010 on-highway emission standards;
- Achieve fuel efficiency within 5-15% of comparable EPA/CARB 2010 on-highway certified diesel engines;
- Commercially launch the resulting "ISX12 G" engine by the end of 2012;
- Achieve OEM availability in a range of vehicles commonly used by fleet operators in the North American regional haul and vocational Class 8 truck and tractor market.

Cummins Westport Inc. (CWI), working as a subcontractor for NREL, successfully completed the project and has developed a heavy-duty, spark-ignited, stoichiometric, cooled exhaust gas recirculation (SI-EGR) natural gas engine certified to EPA/CARB heavy-duty on-highway 2013 emission standards. The SI-EGR engine development is based on the Cummins heavy-duty 11.9 liter diesel engine platform. CWI successfully released the ISX12 G engine to Limited Production manufacturing with ratings up to 350 HP and 1,450 lb-ft beginning in April 2013. This engine is targeted at regional haul tractor and vocational (e.g. refuse collection, concrete

Figure 19: ISX12 G Beta Engine

mixer) truck customers. The ISX12 G engine also meets the U.S. EPA greenhouse gas legislated requirements and EMD+ (Engine Manufacturer's Diagnostics) certification. CWI finalized the product development and validation work for additional engine performance ratings following Limited Production release and began shipping ISX12 G engines with ratings up to 400 HP and 1450 lb-ft in August 2013.

Throughout the ISX12 G engine development program, CWI worked closely with numerous Class 8 truck and tractor OEMs to support their ISX12 G vehicle integration programs. As of the conclusion of this project, the ISX12 G engine is available as a factory-installed option in a number of Class 8 truck & tractor models from many OEMs, including Autocar, Freightliner, Kenworth, Mack, Peterbilt and Volvo.

Figure 20: Trucks Used in Demonstration

Develop Retrofit Technology for Natural Gas Engines and In-Use Emissions Testing of On-Road Heavy-Duty Trucks

In December 2010, the Board awarded a contract to West Virginia University (WVU) to conduct in-use emissions testing, and if needed, to evaluate emission-reduction potential of retrofit technology on existing and new on-road heavy-duty vehicles. While the test results revealed that test vehicles' in-use emissions were lower than the 2010 U.S. EPA in-use or not-to-exceed emissions standards, ammonia emissions from natural gas vehicles were found to be significantly higher than expected due to the nature of spark-ignited engines. The initial evaluations of technologies to reduce emissions from natural gas engines indicate that a selective catalytic reduction (SCR) system is capable of reducing ammonia and further reducing NOx emissions. In October 2011, the Board amended the December 2010 award and added a new task to assess real-world in-use emissions from a 70,000-pound loaded 2010 U.S. EPA compliant heavy-duty diesel vehicle as the vehicle was driven over a 2,500-mile route between Morgantown WV and Riverside CA. The real-world in-use emissions assessment showed that the combined diesel particulate filter and SCR system achieved low levels of PM and NOx emissions for over 90% of the 2,500-mile trip characterized by mostly sustained freeway operation. The real-world in-use test results necessitate a need to enhance the assessment study to cover urban traffic conditions that are characteristic of heavy-duty vehicle operations in the South Coast Air Basin. In September 2013, the Board awarded a contract to WVU to develop, optimize, and enhance the SCR system to reduce ammonia and NOx emissions from a heavy-duty natural gas engine and conduct real-world in-use emissions testing of heavy-duty vehicles, each loaded to approximately 70,000 pounds, while driven over typical drayage truck routes in the Basin.

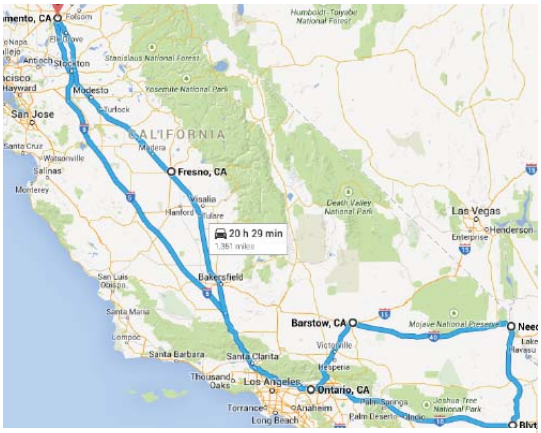

Figure 21: Test Routes for Phase I Study

WVU evaluated real-world emissions from 7 heavy-duty diesel vehicles fueled by diesel and natural gas using a transportable emissions measurement system (TEMS) and a suite of portable emissions measurement system (PEMS)

and investigated multiple pathways of using a passive SCR system for abatement of ammonia and NOx emissions from three-way catalyst (TWC) equipped on-road natural gas engines. The test routes represented real-world driving conditions in the Basin, and the data were segregated into five types of operation, including hill climb, extended highway, regional, local, and near-dock. The test vehicles were operated to and from the ports between Ontario, CA and Ports of LA. The resulting trip were categorized as regional, near-dock and local. Further, additional testing in Irvine, was included as a local urban delivery operation. The study included a MY 2008 Diesel truck to establish baseline emissions for a non-SCR equipped vehicle. Figure 2 shows the distance-specific NOx emissions from the test vehicles over the road measured using the TEMS. The results show that the highway operation resulted in the lowest emissions from all vehicles. Vehicle 7 showed the lowest emissions on highway operating conditions. The near-dock operation characterized by extended idle and creep mode operation resulted in the highest NOx emissions from the diesel vehicles. The average NOx emissions of diesel vehicles using DPF and SCR were 96% lower than a MY 2008 diesel vehicle over the regional cycle. The natural gas truck emissions were 50% lower than DPF-SCR equipped diesel over the regional cycle. The natural gas vehicle showed 88% lower NOx emissions during near-dock port operation compared to the average of all DPF-SCR equipped diesel vehicles.

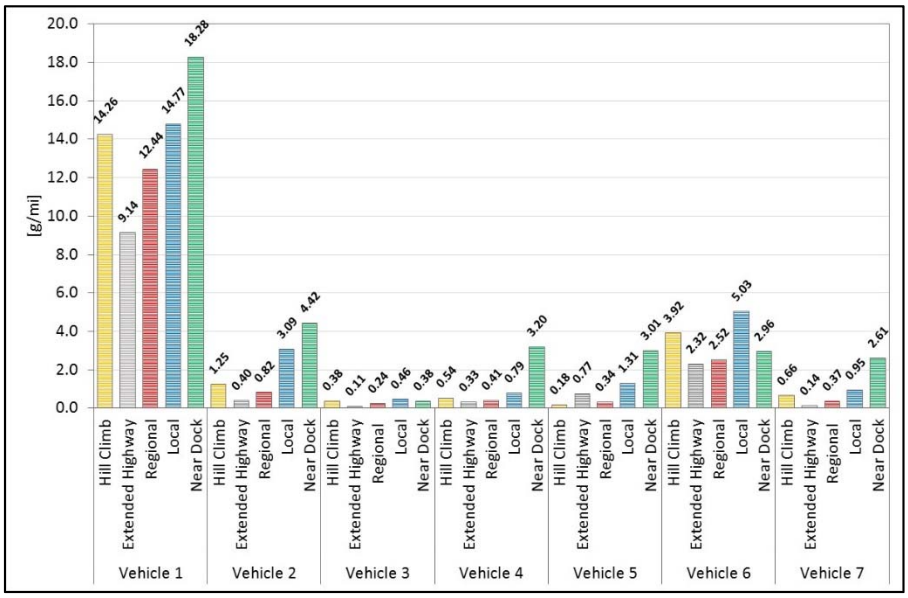

Figure 22: Distance-Specific NOx Emissions from the 7 Test Vehicles

In investigating the SCR system, WVU employed the SCR catalyst as a passive ammonia storage system that can use the NOx slip from TWC as a source to regenerate the stored ammonia while further reducing NOx. NOx slip will be an important issue with aging of TWC in a natural gas engine. An aging catalyst will have lower selectivity to NOx reduction and as a result have increased NOx emissions. Therefore a passive SCR system with TWC as the on-board ammonia storage can effectively lower the NOx profile of CNG through its useful life. For this purpose an old transit bus engine (MY 2009 Cummins ISLG 280) was procured to demonstrate the retrofit technology. The engine was tested in WVU engine laboratory at Morgantown, WV. Three SCR catalysts with varying SCR formulations were fitted downstream of the TWC to absorb the ammonia emissions from TWC as well as reduce NOx slip from the aged TWC. The figure below shows the ammonia and NOx reductions from the three different SCR formulations tested in the study. SCR 2 formulation showed the highest NOx conversion efficiency of 56.9% and the lowest NH3 reduction of 63.6%. While the SCR 3 formulation resulted in the highest NH3 reduction of 82.5% with slight reduction in NOx conversion to 53.9% compared to SCR 2 formulation. As a further extension to this Phase WVU is working with engine controls to change the air-fuel ratio (AFR) of the stoichiometric engine between rich mode (NH3 production mode) and lean mode (NH3 regeneration mode). It is believed that this approach could result in an engine calibration that could run on a leaner air fuel

ratio for enhanced fuel economy. This could potentially increase the operating range of a stoichiometric natural gas engine. The figure below shows the results of the AFR control strategy on the reduction NOx and NH3 emissions from a passive SCR system. The figure shows the increase in ammonia emissions when AFR shifts to rich or close to stoichiometric operation. This mode will be used to load the SCR catalyst with ammonia. Following 80-100% loading of the SCR catalyst, the AFR was shifted to slightly lean mode. This mode drops the ammonia production from the TWC to close to zero, while increasing the TWC out NOx emissions. However, the ammonia stored in the SCR is capable of reducing NOx to near-zero levels. However, the results also show a significant optimization of this strategy is required to develop a strategy that is highly efficient in fuel consumption, lower NOx and ammonia. WVU is conducting an in-depth study, beyond the scope of this project to develop this approach further.

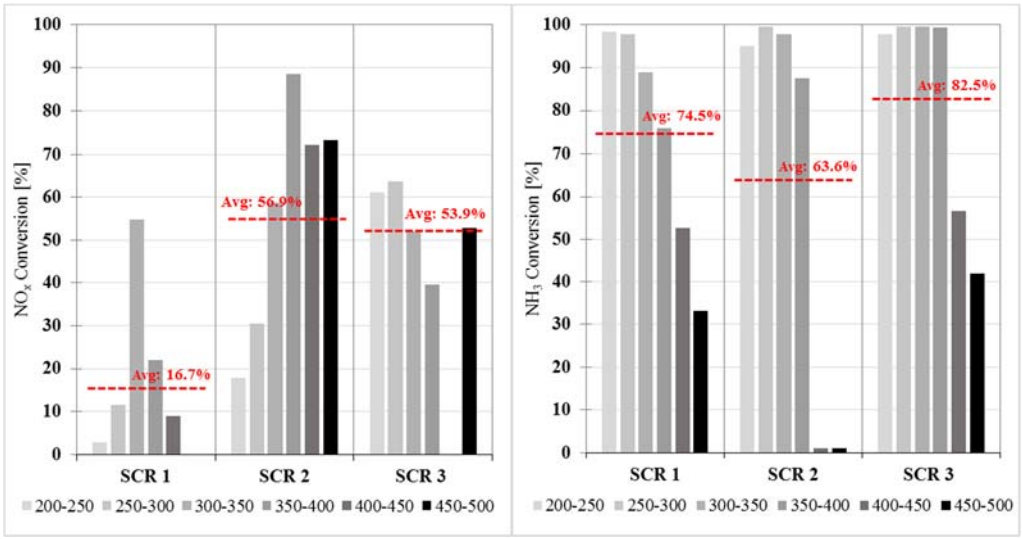

Figure 23: NOx and NH3 reduction efficiency results for varying temperature bins of three different tested zeolite SCR catalysts over an FTP cycle; [SCR 1] Iron (Fe) based low cell density zeolite catalyst, [SCR 2] Iron (Fe) based high cell density zeolite catalyst

Demonstration of Stationary Fuel Cells

In California, a substantial potential exists to capture generator waste heat with an absorption chiller and provide air conditioning to meet a wide spectrum of applications that have significant cooling demands throughout the year. Such combined cooling, heat and power (CCHP) systems offer benefits of increased energy efficiency and reduced emissions of both criteria pollutants and Greenhouse Gases (GHGs). Needed is an ultra-clean, integrated generator/absorption chiller product to enable the California market.

The SCAQMD contracted with UC Irvine which designed and developed a CCHP fuel cell system that was installed at the UC Irvine Medical Center (UCIMC). This system integrates a highly efficient, high-temperature molten carbonate fuel cell with an exhaust-fired absorption chiller, which utilizes the exhaust heat from the fuel cell to generate cooling. The system provides 1.4 MW of reliable, clean electricity and 200 tons of cooling to the medical centers building, while producing virtually zero criteria pollutants. Overall the system is expected to achieve an efficiency approaching 70%. The goal of this project was to provide a "showcase" installation that will inform the California architectural and developer communities of the attributes of fuel cell-based CCHP technology.

The system was installed by UCI's contractor the OHR Company, and was commissioned in December 2015 after completion of the interconnection agreement with Southern California

Edison. The project addressed CCHP technology with the combined benefits of reducing the emissions of GHGs and criteria pollutant emissions associated with electricity generation, distribution and use, enhancing California's economy through technology advancement, employment, and education, reducing the cost-of-electricity, and increasing the reliability and power quality of electricity.

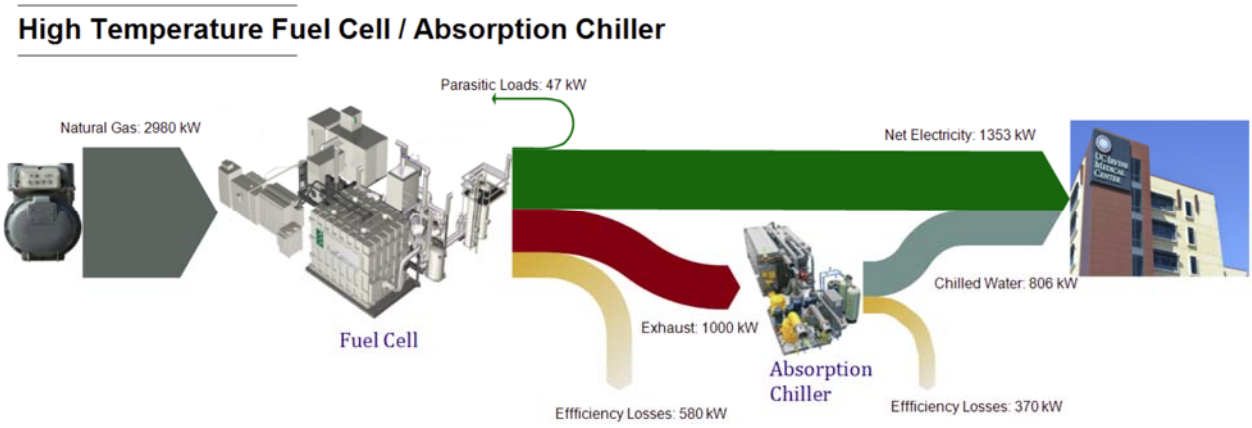

Figure 24: UCI's CCHP System with Absorption Chiller Design

Table 6: Projects Completed between January 1 & December 31, 2015

Contract	Contractor	Project Title	Date
Electric/Hybrid Technologies and Infrastructure			
08219	A123Systems Inc.	Develop and Demonstrate Ten Plug-In Hybrid Electric Vehicles	Jun-2015
11204	AC Propulsion Inc.	Electric Conversion of Medium-Duty Fleet Vehicles	Nov-2015
12862	Volvo Technology of America	Develop Class 8 Drayage Plug-In Hybrid Heavy-Duty Vehicle	Apr-2015
13042	South Bay City Council of Governments	Demonstrate Battery Electric Vehicles	May-2015
13251†	Selman Chevrolet Company	Lease Two 2012 or Newer Chevrolet Volt Extended-Range Electric Vehicles for Three Years	Nov-2015
13418	City of Claremont	SoCalEV Ready EV Charger Installations	Dec-2015
13419	California State University Los Angeles	SoCalEV Ready EV Charger Installations	Dec-2015
13420	University of California Irvine	SoCalEV Ready EV Charger Installations	Dec-2015
13421	County of Los Angeles	SoCalEV Ready EV Charger Installations	Jun-2015
14053†	Electric Power Research Institute	Plug-In Hybrid EV Fleet Participation Agreement	Jul-2015
14074	City of Santa Monica	SoCalEV Ready EV Charger Installations	Jun-2015
14095	City of Covina	SoCalEV Ready EV Charger Installations	Dec-2015
14153	University of California Santa Barbara	SoCalEV Ready EV Charger Installations	Jun-2015
14199	Clean Fuel Connection, Inc.	SoCalEV Ready EV Charger Installations	Dec-2015
14201	California State University San Bernardino	SoCalEV Ready EV Charger Installations	Jun-2015
14207	City of Palmdale	SoCalEV Ready EV Charger Installations	Jun-2015
14208	City of Lake Elsinore	SoCalEV Ready EV Charger Installations	Jun-2015
14209	California State Polytechnic University Pomona	SoCalEV Ready EV Charger Installations	Jun-2015
14210	California State University Long Beach, Office of Research and Sponsored Programs	SoCalEV Ready EV Charger Installations	Jun-2015
14236	California State University Fullerton	SoCalEV Ready EV Charger Installations	Jun-2015

Table 6: Projects Completed between January 1 & December 31, 2015

Contract	Contractor	Project Title	Date
Hydrogen and Mobile Fuel Cell Technologies and Infrastructure			
10046	Air Products and Chemicals, Inc.	Develop and Demonstrate Renewable Hydrogen Energy and Fueling Station	Nov-2015
10061	Hydrogenics Corporation	Maintenance and Data Management for the SCAQMD Hydrogen Fueling Station	Jan-2015
10066†	National Renewable Energy Laboratory	CRADA: Loan a 70 MPa Hydrogen Quality Sampling Apparatus to SCAQMD	Dec-2015
12155†	University of California Irvine	Lease Toyota Fuel Cell Hybrid Vehicle	Dec-2015
13259	Air Products and Chemicals, Inc.	"Five Cities" Program to Demonstrate Hydrogen Fueling Station Operation and Maintenance	Mar-2015
13400	Energy Independence Now	Develop Hydrogen Station Investment Plan and Assess Policies and Incentives for Implementation	Dec-2015
14622	California State University Long Beach, Office of Research and Sponsored Programs	CSULB Student Educational Project to Demonstrate Graphene Fuel Cell Catalysts	May-2015
15020	University of California Irvine	Develop Sampling and Testing Protocols for Analyzing Impurities in Hydrogen	Oct-2015
15419†	SunLine Transit Agency	Disposition of Dispenser from Hydrogenics Station Demonstration at SCAQMD	Dec-2015
15596†	U.S. Hybrid	Transfer of Ownership of One Gaseous Hydrogen Electrolyzer, Compressor, Storage Tanks and Associated Hydrogen Equipment	Dec-2015
15599†	City of Burbank	Bill of Sale and Transfer of Hydrogen Station Equipment	Mar-2015
15666	Bevilacqua-Knight, Inc.	Participate in CaFCP for CY 2015 and Provide Support for Regional Coordinators	Dec-2015
Engine Systems			
13168	National Renewable Energy Laboratory	CRADA: Develop, Integrate and Demonstrate Heavy-Duty Natural Gas Engines and Vehicles	Dec-2015
Fueling Infrastructure and Deployment (NG/RNG)			
07243	City of Commerce	Purchase and Install New Public Access L/CNG Fueling Station	Dec-2015
07309	Post Company Grading	Repower One Off-Road Construction Vehicle	Jun-2015
07312	Mesa Contracting Corporation	Repower 11 Off-Road Construction Vehicles	Jun-2015

Table 6: Projects Completed between January 1 & December 31, 2015

Contract	Contractor	Project Title	Date
Fuels/Emissions Studies			
07236	National Renewable Energy Laboratory	Investigate the Role of Lubricating Oil on PM Emissions from Vehicles	Dec-2015
Stationary Clean Fuel Technologies			
09303	Permacity Solar	Install an Approximate 40kW (AAC) Crystalline Silicon System at SCAQMD Headquarters	Jan-2015
13030	University of California Irvine	Demonstrate a 300 kW Molten Fuel Cell with an Exhaust-Fired Absorption Chiller	Apr-2015
Emission Control Technologies			
15347	West Virginia University Research Corporation	Develop Retrofit Technology for Natural Gas Engines and In-Use Emissions Testing of On-Road Heavy-Duty Trucks	Nov-2015
Outreach and Technology Transfer			
09337†	Mark Weekly, CPA	Follow-Up Assessment of SCAQMD's Compliance with Special Revenue Funds	Jan-2015
11028†	Martin Kay	Technical Assistance on Stationary Source Control Measures and Future Consultation on TAO Activities	Dec-2015
11484	Gladstein, Neandross & Associates LLC	Operate Truck Outreach Centers – Trucking Information Points (FIPS)	Jan-2015
12486†	ICF Resources LLC	Technical Assistance with Goods Movement and Zero-Emission Transportation Technologies	Sep-2015
15505†	Coordinating Research Council, Inc.	Cosponsor 25th Annual CRC Real-World Emissions Workshop	Jun-2015
15506†	Coordinating Research Council, Inc.	Cosponsor the 2015 CRC Mobile Source Air Toxics Workshop	May-215
16029†	Three Squares Inc.	Cosponsor 2015 The Women in Green Forum	Nov-2015

†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.

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CLEAN FUELS PROGRAM
2016 PLAN UPDATE

The Clean Fuels Program (Program) was first created in 1988, along with the SCAQMD's Technology Advancement Office (TAO). Funding for the Program is received through a $1 motor vehicle registration fee. The Clean Fuels Program continually seeks to support the development and deployment of zero and near-zero emission technologies over a broad array of applications and spanning near- and long-term implementation. Planning has been and remains 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 based on the region's ongoing need for emissions reductions and develops a Plan Update for the upcoming calendar year (CY) targeting near-term projects to help achieve those reductions.

Overall Strategy

The overall strategy of the SCAQMD's Clean Fuels Program is based primarily on technology needs identified through the AQMP process and the SCAQMD Board's directives to protect the health of residents in Southern California, which encompasses approximately 16.8 million people (nearly half the population of California). The AQMP is the long-term "blueprint" that defines:

- basin-wide emission reductions needed to achieve federal ambient air quality standards;
- regulatory measures to achieve those reductions;
- timeframes to implement these proposed measures; and
- technologies required to meet these future proposed regulations.

The preliminary 2016 AQMP projects that an approximate 50 percent reduction in NOx is required by 2023 and a 65 percent reduction by 2031, the majority of which must come from mobile sources. These emission reduction needs are further identified in CARB's recent draft discussion document "Mobile Source Strategy" (October 2015). Moreover, the SCAQMD is currently only one of two regions in the nation recognized as an extreme ozone nonattainment area (the other is San Joaquin Valley). Ozone (a key component of smog) is created by a chemical reaction between NOx and VOCs emissions at ground level. This is especially noteworthy because the largest contributor to ozone is NOx emissions, and mobile sources (on- and off-road as well as aircraft and ships) contribute to more than three-fourths of the NOx emissions in this region. Furthermore, NOx and VOC emissions also lead to the formation of PM2.5, particulate matter measuring 2.5 microns in size as contained in a cubic meter of air, expressed as micrograms per cubic meter ($\mu g/m^3$).

The preliminary 2016 AQMP includes integrated strategies and measures to demonstrate attainment of the following National Ambient Air Quality Standards (NAAQS):

- 8-hour Ozone (75 parts per billion or ppb) by 2031
- Annual PM2.5 (12 $\mu g/m^3$) by 2021-2015
- 8-hour Ozone (80 ppb) by 2023 (updated from the 2012 AQMP)
- 1-hour Ozone (120 ppb) by 2022 (updated from the 2012 AQMP)
- 24-hour PM2.5 (35 $\mu g/m^3$) by 2019 (updated from the 2012 AQMP)

The 2016 AQMP will also take an initial look at the emission reductions needed to meet the new federal 8-hour ozone air quality standard of 70 ppb anticipated to be attained by 2037.

The daunting challenge to reduce NOx and PM2.5 require the Clean Fuels Program to encourage and accelerate advancement of transformative fuel and transportation technologies, leading the way for commercialization of progressively lower-emitting fuels and vehicles. The NOx and VOC emission sources of greatest concern to this region are heavy-duty on-road and off-road vehicles. To underscore this concern, the 2013 Vehicle Technologies Market Report[4], released in early 2014 by the Oak Ridge National Laboratory for the Department of Energy, and corroborated by EMFAC 2011 projections, notes that Class 8 trucks comprise 41% of the medium- and heavy-duty truck fleet but consume 78% of the fuel use in this sector. This is especially significant since the report also notes that Class 8 truck sales have continued to increase significantly since 2009. Given the relationship between NOx, ozone and PM2.5, the 2016 Plan Update must emphasize emission reductions in all these areas.

Since the last AQMP, it has become clear that the effect of moving containers through the Ports of Los Angeles and Long Beach and the subsequent movement of goods throughout the region not only have a dramatic impact on air quality but also the quality of life in the communities along the major goods movement corridors. 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 movement technologies, such as electric trucks, plug-in hybrid trucks with all-electric range, zero emission container transport technologies, trucks operating from wayside power including catenary technology and heavy-duty technologies. The findings from the MATES IV[5], which included local scale studies near large sources such as ports and freeways, reinforce the importance of these impacts and the need for transformative transportation technologies, especially near the ports and goods movement corridor.

For over 20 years, a key strategy of the Clean Fuels Program has been its implementation as a public-private partnership in conjunction with private industry, technology developers, academic institutions, research institutions and government agencies. This public-private partnership has allowed the Program to leverage its funding with $3-$4 of spending on R&D projects to every $1 of SCAQMD funds. However, while the SCAQMD aggressively seeks leverage funds to accomplish more with every dollar, it also strives to act as a leader in technology development and commercialization in an effort to accelerate the reduction of criteria pollutants.

As the state and federal governments have turned a great deal of their attention to climate change, the SCAQMD has remained committed to developing, demonstrating and commercializing zero and near-zero emission technologies. Fortunately many, if not the majority, of technology sectors that address our need for NOx reductions also garner greenhouse gas (GHG) reductions. Due to these "co-benefits," we have been successful in partnering with the state and federal grants.

Funding Scope

This 2016 Plan Update includes projects to develop, demonstrate and commercialize a variety of technologies, from near-term to long-term, that are intended to provide solutions to the emission control measures identified in the preliminary 2016 AQMP to address the increasing challenges this region is facing to meet air quality standards, including:

[4] http://cta.ornl.gov/vtmarketreport/index.shtml

[5] http://www.aqmd.gov/home/library/air-quality-data-studies/health-studies/mates-iv

1) new and changing federal requirements, such as the recently adopted lower federal 8-hour ozone standard of 70 ppb;
2) implementation of new technology measures; and
3) continued development of economically sound compliance approaches.

The scope of projects in the 2016 Plan Update also needs to remain sufficiently flexible to address new challenges and proposed methodologies that are identified in the preliminary 2016 AQMP, consider dynamically evolving technologies, and incorporate new research and data. The latter, for example, includes the findings from the MATES IV study, which was undertaken to update the emissions inventory of toxic air contaminants, measure the concentration of ultrafine particles and black carbon (an indicator of diesel particulate emissions), and conduct a regional modeling effort to characterize risk to health across the Basin.

Finally, the co-benefits of technologies should also be considered in light of the increasing call for action by the federal government and California's Governor to reduce carbon and greenhouse gases. These actions include President Obama's Climate Action Plan, which notes in the June 2015 progress report that any delays in tackling climate change will come at a huge price (e.g., national security and the economy). But more recently and significantly to this region are Governor Brown's actions including: 1) his Executive Order issued last spring setting a new interim goal to reduce GHGs 40 percent below 1990 levels by 2030, the most ambitious target in North America; 2) his remarks last fall outlining goals to reduce black carbon by 50 percent (and methane and hydrofluorocarbons or HFCs by 40 percent) below current levels by 2030; and 3) his January 2015 state-of-the-state address in which he called for an increase in the amount of electricity generated from renewable sources from 33 to 50 percent as well as reducing the use of petroleum in cars and trucks by up to 50 percent from today's levels. Notably, SB 350 (De León), which the Governor signed last fall, would have codified the Governor's goals outlined in his January 2015 inaugural address, but was amended to remove the 50 percent reduction of petroleum use in cars and trucks. SB 350 still dramatically reshapes California's energy economy, and the Governor has noted his office still has the authority to reduce oil use in vehicles without the bill.

The Clean Air Act, in addition to providing for specific control measures based on known technologies and control methods, has provisions for more general measures based on future, yet-to-be-developed technologies. These "black box" measures are provided under Section 182(e)(5) of the Clean Air Act for regions that are extreme non-attainment areas, such as the South Coast Basin. In the past, some of the technologies that have been developed and demonstrated in the Clean Fuels Program may have served as control measures for the "black box." However, the 2016 AQMP calls for elimination on the reliance of these "black box" (future technologies) to the maximum extent possible.

Within the core technology areas defined later in this section, there exists a range of projects that represent near-term to long-term efforts. The SCAQMD Clean Fuels Program tends to support development, demonstration and technology commercialization efforts, or deployment, rather than fundamental research. The general time-to-product for these efforts, from long-term to near-term, is described below.

- Most technology *development* projects are expected to begin during 2016 with durations of about two years. Additional field demonstrations to gain long-term verification of performance, spanning up to two years, 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 2019-2020. 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 2020 or later.

- More mature technologies, those ready to begin field *demonstration* in 2016, are expected to result in a commercial product in the 2017-2018 timeframe. 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.
- *Deployment* or technology commercialization efforts focus on increasing the utilization of clean technologies in conventional applications. It is often difficult to transition users to a non-traditional technology or fuel, 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.

Core Technologies

As previously noted, the SCAQMD Clean Fuels Program maintains flexibility to address dynamically evolving technologies incorporating the latest state-of-the-technology progress. Over the years, the SCAQMD has provided funding for projects for a wide variety of low and zero emission projects. In order to meet the upcoming 2023 8-hour ozone standard, the areas of zero and near-zero emission technologies need to be emphasized. The working definition of "near-zero" is an order of magnitude lower than the existing 0.2 g/bhp-hr NOx or 0.02 g/bhp-hr NOx, close to a combined cycle power plant emissions rate. This effort can be seen in the following sections and in the proposed funding distribution in Figure 25 (page 77). The major core technology areas are identified below with specific project categories discussed in more detail in the following sections. The core technology areas identified reflect the staff's forecast for upcoming projects and needs within the basin but is not intended to be considered a budget.

Not all project categories will be funded due to cost-share constraints, and focus will be on the control measures identified in the 2012 AQMP and potentially the Draft 2016 AQMP, with consideration for availability of suitable projects. The technical areas identified below are clearly 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 implementation of cleaner alternative technologies in the Basin. A concerted effort is continually made to form private partnerships to leverage Clean Fuels funds. For example, staff anticipates there will be upcoming opportunities to leverage state funding through the California Clean Truck, Bus and Off-Road Vehicle and Equipment Technology Program (created by SB 1204, chaptered in September 2014), which designates money from the state's cap-and-trade program for development, demonstration and early commercialization of zero and near-zero emission truck, bus and off-road vehicles, and the Low Carbon Transportation Greenhouse Gas Emission Reduction Fund, which includes funding for zero-emission drayage trucks and truck and bus pilot projects, especially in disadvantaged communities. Finally, 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 an electric drive train with a fuel cell operating on hydrogen fuel or an internal combustion engine operating on natural gas or another alternative fuel as a range extender.

These priorities may shift during the year in keeping with the diverse and flexible "technology portfolio" approach. Changes in priority may occur to: (1) capture opportunities such as cost-sharing by the state government, the federal government, or other entities; or (2) address specific technology issues which affect residents within the SCAQMD's jurisdiction.

The following nine core technology areas are listed by current SCAQMD priorities based on the goals for 2016.

Electric/Hybrid Technologies & Infrastructure

If the region expects to meet the federal standards for PM2.5 and ozone, a primary focus must be on zero and near-zero emission technologies. A leading strategy to achieve these goals is the wide-scale implementation of electric drive systems for all applicable technologies. With that in mind, the SCAQMD supports projects to address the main concerns regarding cost, battery lifetime, travel range, charging station infrastructure and original equipment manufacturer (OEM) commitment. Integrated transportation systems can encourage further reduction of emissions by matching the features of electric vehicles (zero emissions, zero start-up emissions, modest 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.

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 Association (LACMTA) to identify technologies that could be beneficial to and garner support from all stakeholders. Specific technologies include zero emission trucks (using batteries and/or fuel cells), near-zero emission trucks with all-electric range using wayside power (catenary or roadbed electrification) or with 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. In fact, last year, the California Cleaner Freight Coalition, in a report entitled *Moving California Forward: Zero and Low-Emissions Freight Pathways*[6] pointed out that the short distances between freight hubs make electrification a viable option for local freight haul heavy-duty trucks, and in some cases, for on-dock rail which could eliminate some local freight truck trips altogether.

There is a high level of major automobile manufacturers' activity to develop and introduce hybrid-electric technologies in light-, medium- and heavy-duty applications as well as off-road equipment. In particular, there are increasing numbers of diesel- and gasoline-fueled hybrid-electric vehicles and multiple models of light-duty plug-in hybrid and battery electric vehicles (BEVs). Such vehicles offer the benefits of higher fuel economy and range, as well as lower emissions. Hybrid electric technology is not limited to gasoline and diesel engines and can be coupled with natural gas engines (including natural gas engines operating on renewable natural gas), microturbines, and fuel cells for further emission benefits. Additionally, continued advancements in the light-duty arena which, while there is commercially available product, is not yet mainstream technology, may have applications for medium- and heavy-duty vehicles. In fact, the goal of SB 1275 (de León), chaptered in September 2014 establishing the Charge Ahead California Initiative, is to bring one million zero and near-zero emission electric vehicles to California by 2023 as well as to ensure that disproportionally impacted communities benefit from this transition toward cleaner transportation.

[6] http://www.ucsusa.org/sites/default/files/legacy/assets/documents/clean_vehicles/Moving-California-Forward-Executive-Summary.pdf

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 hybrid 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 hybrid 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;
- demonstration of niche application battery electric vehicles, including school and transit buses 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 web-based reservation systems that allow multiple users;
- demonstration of hydraulic hybrid vehicles in heavy-duty cycles with frequent stop-and-go operations, e.g., refuse haulers;
- development of streamlined implementation procedures to prepare and accelerate EV market penetration and commercialization; and
- demonstration and installation of EV infrastructure to support the electric and hybrid-electric vehicle fleets currently on the roads or soon entering the market, and to reduce cost, improve convenience and integrate with renewable energy and building demand management strategies (e.g., vehicle-to-grid or vehicle-to-building functionality).

Hydrogen & Fuel Cell Technologies & Infrastructure

The SCAQMD supports hydrogen infrastructure and fuel cell technologies as one option in our technology portfolio and is dedicated to assisting federal and state government programs to deploy light-duty fuel cell vehicles (FCVs) by supporting the required refueling infrastructure.

In mid-2014 the California Fuel Cell Partnership (CaFCP), with which the SCAQMD works closely as a participating member to further commercialize fuels cells for transportation and installation of the required infrastructure, published the Hydrogen Progress, Priorities and Opportunities (HyPPO)[7]. The HyPPO builds upon CaFCP's 2012 roadmap describing the first network of commercial hydrogen stations in California, which calls for 68 hydrogen fueling stations in cluster communities at specific destinations by 2016. The state's current goal, however, is 100 stations for launching a commercially self-sustaining network to support the growing number of fuel cell vehicles to implement the state's ZEV Action Plan. Over the last three years CEC funding awards using AB 8 dollars, along with financial support from SCAQMD, have made significant inroads to creating the growth path to 100 hydrogen stations. Additional support to encourage renewable hydrogen will be needed. Furthermore, the CaFCP is currently finalizing a medium-/heavy-duty vehicle action plan in coordination with multiple members.

Calendar Years 2015-2017 are a critical timeframe for the introduction of FCVs. In 2015, Toyota commercialized the first FCV available to consumers for purchase, with Hyundai being the first to already offer a FCV for lease in 2014. Honda, along with other OEMS, has also disclosed plans to commercialize FCVs in 2016. Since hydrogen refueling 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 Division of Measurement Standards to establish standardized measurements for hydrogen fueling started in 2014, additional efforts to offer hydrogen for sale to general consumers are still needed. In addition, new business models and new sources of funding

[7] http://cafcp.org/sites/default/modules/pubdlcnt/pubdlcnt.php?file=http://cafcp.org/sites/files/Roadmap-Progress-Report2014-FINAL.pdf&nid=2560

besides grants for construction need to be explored 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, and with refueling reliability matching those of existing gasoline and diesel fueling stations.

Commencing late 2012, the CEC, which based its AB 118 hydrogen funding strategy on CaFCP's roadmap and the University of California, Irvine's Advanced Power and Energy Program, issued multiple Program Opportunity Notices for hydrogen fuel infrastructure and to date has awarded funding for 51 new hydrogen fueling stations plus operation and maintenance grants for a few of the original older stations. Additionally, the SCAQMD is currently implementing a $6.7 million CEC grant awarded in 2013 to upgrade and refurbish four of the existing hydrogen fueling stations to ensure legacy stations continue operation as FCVs become available in the market. In 2014, the SCAQMD also received an award of $300,000 from CEC to implement a plan for hydrogen readiness in early market communities and that effort is currently underway. The SCAQMD will work closely with state agencies to implement these programs and continue efforts to upgrade and refurbish existing hydrogen infrastructure.

The 2016 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;
- 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;
- demonstration of fuel cell vehicles in controlled fleet applications in the Basin; and
- development and implementation of strategies with government and industry to build participation 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.

Engine Systems

Natural gas engines are experiencing huge market growth due to the low cost of fuel. In order to achieve the emission reductions required for the South Coast Air Basin, the internal combustion engines (ICEs) used in the heavy-duty sector will require emissions of 90% lower than the 2010 standards. Future projects will support the development, demonstration and certification of engines that can achieve these massive emission reductions using an optimized systems approach. Specifically, these projects are expected to target the following:

- development of ultra-low emission, natural gas engines for heavy-duty vehicles and high horsepower applications;
- continued development and demonstration of 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; and
- development and demonstration of engine systems that employ advance fuel or alternative fuels, engine design features, improved exhaust or recirculation systems, and aftertreatment devices.

Fueling Infrastructure and Deployment

The importance of natural gas, renewable natural gas and related refueling infrastructure cannot be overemphasized for the realization of large deployment of alternative fuel technologies. 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, along with partial or complete transition to renewable natural gas delivered through the pipeline. 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 establishes a target to double the energy efficiency in electricity and natural gas end uses by 2030.

Active participation in the development of National Fire Protection Association (NFPA) fire and safety codes and standards, evaluation of the cost and economics of the new fuels, public education and training and emergency response capability are just a few areas of the funded efforts that have overcome public resistance to these new technologies. 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 reduction 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, Emissions and Fuel 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). 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, can contribute to higher NO_x 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. Therefore, a couple of years ago the SCAQMD funded studies to investigate the physical and chemical composition and toxicological potential of tailpipe PM emissions from

biodiesel and ethanol fueled vehicles to better understand their impact on public health. Studies continued 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 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. One such fuel that the Clean Fuels Program is interested in pursuing is dimethyl ether (DME). This synthetic fuel can be made from renewable natural gas resources and has characteristics similar to gas-to-liquids fuels, i.e., high cetane, zero aromatics and negligible emissions of particulate matter. Volvo has considered commercializing Class 8 trucks using DME, and staff would like to ensure these trucks have lower NOx than the existing standard. A study in the 2015-2016 timeframe on DME is being proposed.

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 emissions studies using biofuels, including DME to evaluate in-use emission composition;
- in-use emissions 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; and
- analysis of fleet composition and its associated impacts on criteria pollutants.

Stationary Clean Fuel Technologies

Although stationary source emissions are small compared to mobile sources in the South Coast Air Basin, there are areas where cleaner fuel technology can be applied to reduce NOx, 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 NOx, 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.

The use of renewable feedstocks for energy production is a possible option to provide sustainable power for future needs while reducing greenhouse gas emissions and achieving domestic energy diversity. One of the projects that the SCAQMD recently supported in this effort was a bench scale demonstration project using a steam hydrogasification process to produce natural gas from biomass and biosolid (sewage sludge) feedstocks. Steam Hydrogasification Reaction (SHR) has been developed to produce various forms of energy products from carbonaceous resources. SHR is capable of handling wet feedstocks like sludge, does not require expensive oxygen plants and has been demonstrated to be most efficient and cost-effective compared to other conventional gasification technologies. This project successfully demonstrated that the SHR process coupled with a water-gas shift (WGS) reactor can produce gas containing up to 90% methane.

Additionally, alternative energy storage could be achieved through vehicle-to-grid or vehicle-to-building technologies. The University of California Riverside's Sustainable Integrated Grid Initiative, funded in part by the SCAQMD and launched in 2014, 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., low NOx burners, fuel cells or microturbines);
- exploration of renewables as a source for cleaner stationary technologies;
- evaluation, development and demonstration of advanced control technologies for stationary sources; and
- vehicle-to-grid or vehicle-to-building demonstration projects to develop sustainable, low emission energy storage alternatives.

Emission 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 particulate matter (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 dual fuel engines and advanced aftertreatment technologies for mobile applications (including diesel particulate traps and selective catalytic reduction catalysts); and
- development and demonstration of low-VOC and PM lubricants for diesel and natural gas engines.

Outreach and Technology Transfer

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 emission 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.

Target Allocations to Core Technology Areas

Figure 25 below presents the potential allocation of available funding, based on SCAQMD projected program costs of $16.4 million for all potential projects. The expected actual project expenditures for 2016 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 2016 will be based on this

proposed allocation, the quality of proposals received and evaluation of projects against standardized criteria and ultimately SCAQMD Governing Board approval.

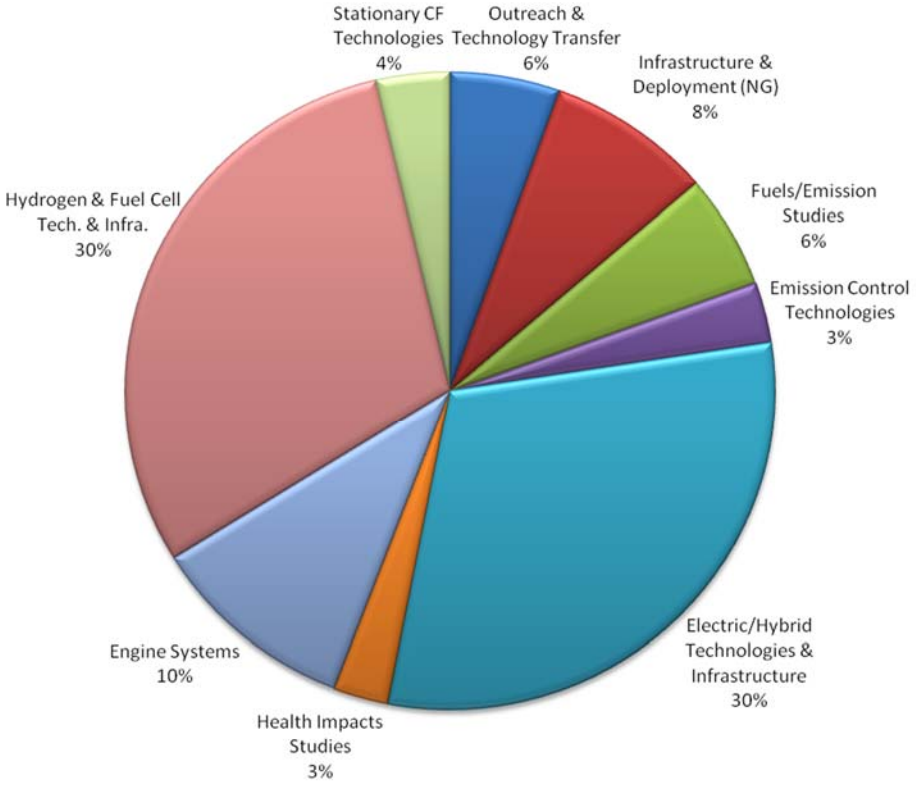

Figure 25: Projected Cost Distribution for Potential SCAQMD Projects in 2016 ($16.4M)

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PROGRAM PLAN UPDATE FOR 2016

This section presents the Clean Fuels Program Plan Update for 2016. 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 7 summarizes potential projects for 2016 as well as the distribution of SCAQMD costs in some areas as compared to 2015. The funding allocation continues the focus toward development and demonstration of zero and near-zero emission technologies including the infrastructure for such technologies. For the 2016 Plan, the SCAQMD shifts some emphasis onto electric and hybrid-electric technologies in order to take advantage of funding opportunities afforded by the Greenhouse Gas Reduction Fund Program and the need to continue electrifying goods movement technologies. Focus will continue concurrently on hydrogen and fuel cells given sustained activities by federal and state government and the anticipated roll out of fuel cell vehicles in 2016-2017. A small funding shift to Fueling Infrastructure and Deployment (natural gas and renewable fuels) is also recommended, with modest decreases in other areas given awards over the last year or two. As in prior years, the funding allocations again align well with the SCAQMD's FY 2015-16 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 development 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 7 (page 81).

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 7: Summary of Potential Projects for 2016

Proposed Project	Expected SCAQMD Cost $	Expected Total Cost $
Electric/Hybrid Technologies & Infrastructure		
Demonstrate Light-Duty Plug-In Hybrid & Battery Electric Vehicles and Infrastructure	700,000	1,500,000
Develop and Demonstrate Medium- and Heavy-Duty Hybrid Vehicles and Infrastructure	2,000,000	6,000,000
Demonstrate Alternative Energy Storage	300,000	2,000,000
Develop and Demonstrate Electric Container Transport Technologies	2,000,000	6,000,000
Subtotal	$5,000,000	$15,500,000
Hydrogen and Fuel Cell Technologies and Infrastructure		
Develop and Demonstrate Operation and Maintenance Business Case Strategies for Hydrogen Stations	350,000	4,000,000
Develop and Demonstrate Distributed Hydrogen Production and Fueling Stations	1,500,000	5,000,000
Develop and Demonstrate Medium- and Heavy-Duty Fuel Cell Vehicles	3,000,000	10,000,000
Demonstrate Light-Duty Fuel Cell Vehicles	100,000	100,000
Subtotal	$4,950,000	$19,100,000
Engine Systems		
Develop and Demonstrate Advanced Alternative Fuel Medium- and Heavy-Duty Engines and Vehicles	1,500,000	3,000,000
Develop and Demonstrate Alternative Fuel and Clean Conventional Fueled Light-Duty Vehicles	200,000	1,500,000
Subtotal	$1,700,000	$4,500,000
Fueling Infrastructure and Deployment (NG/RNG)		
Deploy Natural Gas Vehicles in Various Applications	500,000	2,000,000
Develop, Maintain & Expand Natural Gas Infrastructure	350,000	2,000,000
Demonstrate Natural Gas Manufacturing and Distribution Technologies Including Renewables	500,000	7,000,000
Subtotal	$1,350,000	$11,000,000
Fuels/Emission Studies		
Conduct In-Use Emissions Studies for Advanced Technology Vehicle Demonstrations	300,000	800,000
Conduct Emissions Studies on Biofuels and Alternative Fuels	400,000	1,000,000

Table 7: Summary of Potential Projects for 2016 **(cont'd)**

Proposed Project	Expected SCAQMD Cost $	Expected Total Cost $
Fuels/Emission Studies (cont'd)		
Identify and Demonstrate In-Use Fleet Emissions Reduction Technologies & Opportunities	250,000	2,000,000
Subtotal	$950,000	$3,800,000
Stationary Clean Fuel Technologies		
Develop and Demonstrate Reliable, Advanced Emission Control Technologies, and Low Emission Monitoring Systems and Test Methods	150,000	500,000
Develop and Demonstrate Clean Stationary Technologies	250,000	750,000
Develop and Demonstrate Renewables-Based Energy Generation Alternatives	200,000	1,000,000
Subtotal	$600,000	$2,250,000
Emission Control Technologies		
Develop and Demonstrate Advanced Aftertreatment Technologies	300,000	5,000,000
Demonstrate On-Road Technologies in Off-Road and Retrofit Applications	250,000	1,000,000
Subtotal	$550,000	$6,000,000
Health Impacts Studies		
Evaluate Ultrafine Particle Health Effects	150,000	2,000,000
Conduct Monitoring to Assess Environmental Impacts	150,000	500,000
Assess Sources and Health Impacts of Particulate Matter	150,000	300,000
Subtotal	$450,000	$2,800,000
Outreach and Technology Transfer		
Assess and Support Advanced Technologies and Disseminate Information	500,000	800,000
Support Implementation of Various Clean Fuels Vehicle Incentive Programs	400,000	400,000
Subtotal	$900,000	$1,200,000
TOTALS FOR POTENTIAL PROJECTS	**$16,400,000**	**$66,150,000**

Technical Summaries of Potential Projects

Electric/Hybrid Technologies & Infrastructure

Proposed Project: Demonstrate Light-Duty Plug-In Hybrid & Battery Electric Vehicles and Infrastructure

Expected SCAQMD Cost: $700,000

Expected Total Cost: $1,500,000

Description of Technology and Application:

All of the major automobile manufacturers are currently developing and commercializing hybrid-electric vehicles, which now come in a variety of fuel economy and performance options. These commercial hybrid EVs integrate a smaller internal combustion engine, battery pack and electric drive motors to improve fuel economy (e.g., Chevy Volt) or performance (e.g., Lexus RX400h).

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. In 2009, CARB adopted Plug-In Hybrid Electric Vehicle Test Procedure Amendments and Aftermarket Parts Certification and several automobile manufacturers have announced demonstration or early production plans of "blended" plug-in hybrid electric, extended-range electric vehicles (E-rEV), or highway capable 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. The recent adoption of revised recommended practice SAE J1772 enables passenger vehicles to charge from 110/120V AC (Level 1), 220/240V AC (Level 2), and faster 440/480V DC charging using a common conductive connector in 30 minutes or less in the U.S. and Europe. The impact of fast charging on battery life and infrastructure costs is not well understood and will be evolving as three fast DC systems (SAE combo, CHAdeMO and Tesla) compete for international market share.

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.

Recently, automakers have commercialized fuel cell vehicles, with some concepts with plug-in charge capability. Development 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.

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.

This project category is to develop and demonstrate: 1) various PEV architectures; 2) anticipated costs for such architectures; 3) customer interest and preferences for each alternative; 4) prospective commercialization issues and strategies for various alternatives; 5) integration of the technologies into prototype vehicles and fleets; 6) infrastructure (especially in conjunction with

the DOE, CEC and local utilities) to demonstrate the potential clean air benefits of these types of vehicles; 7) support for local government outreach and charging installation permit streamlining; and 8) evaluation of any new promising light-duty vehicle propulsion technologies or fuels.

Potential Air Quality Benefits:

The preliminary 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, customer acceptability of the technology, etc. 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 Medium- and Heavy-Duty Hybrid Vehicles and Infrastructure

Expected SCAQMD Cost: $2,000,000

Expected Total Cost: $6,000,000

Description of Technology and Application:

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 are where most emissions reductions are required, especially for the in-use fleet due to low turnover. This project category is to investigate 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 such as lithium-ion; and hydraulic energy storage technologies where applicable. 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, clean diesel, or even 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.

Federal Recovery Act funding combined with state and local support has 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.

Potential Air Quality Benefits:

The preliminary 2016 AQMP identifies zero- or near-zero emitting vehicles as a key attainment strategy. Hybrid technologies have the potential to redirect previously wasted kinetic energy into useable vehicle power. This proposed project category will evaluate various hybrid systems and fuel combinations to identify their performance and emissions benefits. Given the variety of hybrid systems under development, it is critical to determine the true emissions and performance of these prototypes, especially if both emissions and fuel economy advantages are achieved.

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 near-zero emitting vehicles in the South Coast Basin, which is a high priority of the AQMP.

Proposed Project: Demonstrate Alternative Energy Storage

Expected SCAQMD Cost: $300,000

Expected Total Cost: $2,000,000

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, additional technology consisting of nickel sodium chloride, lithium-ion and lithium iron phosphate batteries have shown robust performance. Other technology manufacturers have also developed energy storage devices including 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 further benefits. 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 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 project will support several projects for development and demonstration of different types of low emission hybrid vehicles using advanced energy 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.

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 preliminary 2016 AQMP. This project is expected 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: $2,000,000

Expected Total Cost: $6,000,000

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. Such systems could be stand-alone systems that use magnetic levitation (maglev), linear synchronous motors or linear induction motors on dedicated guideways. A more near-term design could use existing roadways that are electrified with catenary electric lines or linear electric motors to move containers on modified trucks equipped to run on electricity. In both scenarios, containers are transported relatively quietly and without direct emissions. The footprints for such systems are similar to conventional rail systems but have reduced impact on adjacent property owners including noise and fugitive dust. These systems can even be built above or adjacent to freeways or on elevated guideways. These container freight systems are not designed to carry any operators on the guideways, where the over-the-roadway system may require the operator to actively control the transport of the containers.

One of the container transportation concepts the SCAQMD is actively pursuing is the eHighway catenary hybrid truck system by Siemens Mobility. Siemens and their partners have developed a catenary system and hybrid electric trucks to utilize the catenary for zero emission transport of containers. The hybrid drive system will extend the operating range of the truck beyond the all-electric range of the catenary system, thus enabling the truck to perform regional drayage operations and bridge gaps in catenary infrastructure as it is deployed on a regional level. The proposed Siemens pantograph system will allow for seamless connection and disconnection from the catenary wires. When entering the catenary system corridor, the pantograph system will verify the presence of catenary lines and allow the driver to raise the pantograph from within the cab of the truck. Upon leaving the catenary system, the pantograph automatically retracts and the truck switches to on-board power systems. The on-board power systems could be a range of technologies, including batteries, fuel cells, or internal combustion engines. In addition, SCAQMD is administering a project to develop and demonstrate zero emission drayage trucks for goods movement operations, consisting of three different battery electric truck technologies and a fuel cell hybrid electric truck platform. This project is funded by a $4.2 million award from Department of Energy to promote the deployment of zero emission cargo transport technologies. These trucks can be also upfitted to connect to wayside power via a catenary or LSM system in the future. Recently, CARB awarded SCAQMD more than $23 million towards the development, demonstration and deployment of up to 43 trucks for goods movement, either with all electric operation or all electric range within disadvantaged communities. The total project cost is approximately $40 million, with the remainder funds cost-shared between five sister air quality agencies, OEMs and demonstration sites.

In addition to these technologies, there are other options for electric container applications such as dual-mode locomotives, hybrid electric technologies with battery storage, a battery tender car, magnetic levitation, fuel cell propulsion systems and other wayside power alternatives. This project 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 preliminary 2016 AQMP proposes to reduce emissions from this activity by modernizing the fleet and retrofitting NOx and PM emission controls on older trucks. An alternative approach, especially for local drayage to the nearby intermodal facilities, is to use advanced container transport systems that use electric propulsion for the containers on fixed guideways or modified trucks able to operate on electricity which will eliminate local diesel truck emissions. The emission benefits have not yet been estimated because the fate of the displaced trucks has not been determined.

Hydrogen and Fuel Cell Technologies & Infrastructure

Proposed Project: Develop and Demonstrate Operation and Maintenance Business Case Strategies for Hydrogen Stations

Expected SCAQMD Cost: $350,000

Expected Total Cost: $4,000,000

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 limited fuel cell vehicle production announcements by Hyundai, Toyota and Honda for 2014-2015.

In mid-2014 the CaFCP published the *Hydrogen Progress, Priorities and Opportunities* (HyPPO) report, an update of their roadmap describing the first network of commercial hydrogen stations in California.

In 2015, Hyundai and Toyota commercialized fuel cell vehicles, with Honda and other OEMs to initiate delivery in 2016.

Additional work in this project category would develop a plan to secure long-term funding to complete the hydrogen fueling network build-out, provide details how funding can be invested, assess alternative revenue streams such as renewable incentives, propose alternative financing structures to leverage/extend CEC funding, and support 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 preliminary 2016 AQMP identifies the use of alternative fuels and zero emission transportation technologies as necessary 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, 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 an important strategy to attain air quality goals, requires a well-planned and robust hydrogen fueling infrastructure. This SCAQMD project with additional funding from other 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 will lead to substantial reductions in NO~~x~~, VOC, CO, PM and toxic air contaminants from vehicles.

Proposed Project: Develop and Demonstrate Distributed Hydrogen Production and Fueling Stations

Expected SCAQMD Cost: $1,500,000

Expected Total Cost: $5,000,000

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 major challenge to the entry and acceptance of direct-hydrogen fuel cell vehicles is the limited number of hydrogen refueling 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 increased dispensing pressure of 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 (biomass, digester gas, etc.).

Home Refueling Appliances: Home refueling/recharging is an attractive advancement for alternative clean fuels due to the limited conventional refueling infrastructure. This project would evaluate a hydrogen home refueler for cost, compactness, performance, durability, emission characteristics, ease of assembly and disassembly, maintenance and operations. Other issues such as building permits, building code compliance and UL ratings for safety would also be evaluated. It is estimated that approximately 50,000 fuel cell vehicles will be deployed by 2017 in California and the majority of these vehicles will be 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.

Potential Air Quality Benefits:

The preliminary 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 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 NOx, 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: $10,000,000

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 being mentioned by battery experts as a way of reducing costs and 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. 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 SCAQMD launched demonstrations of Zero Emission Container Transport (ZECT) technologies. In 2015 staff launched ZECT II to develop and demonstrate additional fuel cell truck platforms and vehicles.

This category may include projects in the following applications:

On-Road:
- Transit Buses
- Shuttle Buses
- Medium- & Heavy-Duty Trucks

Off-Road:
- Vehicle Auxiliary Power Units
- Construction Equipment
- Lawn and Garden Equipment
- Cargo Handling Equipment

Potential Air Quality Benefits:

The preliminary 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.

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. 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.

Potential Air Quality Benefits:

The preliminary 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.

Engine Systems

Proposed Project: Develop and Demonstrate Advanced Alternative Fuel Medium- and Heavy-Duty Engines and Vehicles

Expected SCAQMD Cost: $1,500,000

Expected Total Cost: $3,000,000

Description of Technology and Application:

The objective of this proposed project is to support development and certification of near commercial prototype low-emission heavy-duty alternative fuel engine technologies and demonstration of these technologies in on-road vehicles. The NOx 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 advance fuel or alternative fuels, engine design features, improved exhaust or recirculation systems, and aftertreatment devices that are optimized using a system approach. This project is expected to result in several projects, including:

- 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
- anticipated fuels for these projects include but are not limited to CNG, LNG, LPG, emulsified diesel and GTL fuels. The project proposes to expand field demonstration of these advanced technologies in various vehicle fleets operating with different classes of vehicles.

The use of alternative fuel in heavy-duty trucking applications has been demonstrated in certain local fleets within the Basin. These vehicles typically require 200-300 horsepower engines. Higher horsepower alternative fuel engines are beginning to be introduced. However, vehicle range, 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 350 HP or more is limited. Continued development of cleaner dedicated natural gas or other alternative fuel engines such as natural gas-hydrogen blends over 350 HP would increase availability to end-users and provide additional emission reductions.

Potential Air Quality Benefits:

This project is intended to expedite the commercialization of low-emission alternative fuel heavy-duty engine technology in California, 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 NOx. Clean alternative fuels, such as natural gas, or natural gas blends with hydrogen 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.

Proposed Project: Develop and Demonstrate Alternative Fuel and Clean Conventional Fueled Light-Duty Vehicles

Expected SCAQMD Cost: $200,000

Expected Total Cost: $1,500,000

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, bio-diesel and ultra low-sulfur diesel, and compressed air technologies. The potential vehicle projects may include:

- certification of CNG light-duty sedans and pickup trucks used in fleet services;
- resolution of higher concentration ethanol (E-85) affect on vehicle fueling system ("permeation issue");
- certification of E85 vehicles to SULEV standards;
- assessment of "clean diesel" vehicles, including hybrids and their ability to attain SULEV standards; and
- assessment of compressed air technologies.

Other fuel and technology combinations may also be considered under this category.

Potential Air Quality Benefits:

The preliminary 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.

Fueling Infrastructure and Deployment (NG/RNG)

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 in agreement 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: $350,000

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 and incorporate advancing concepts to increase the overall number of such fueling stations in strategic locations throughout the Basin including the Ports, 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 begin to age and deteriorate. This project offers an incentive to 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 NOx, VOC, CO, PM and toxic compound emissions from mobile sources. Such increased penetration of NGVs will provide direct emissions reductions of NOx, VOC, CO, PM and air toxic compounds throughout the Basin.

Proposed Project: Demonstrate Natural Gas Manufacturing and Distribution Technologies Including Renewables

Expected SCAQMD Cost: $500,000

Expected Total Cost: $7,000,000

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 production facilities out-of-state increases the fuel cost anywhere 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 closer, 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. Renewable feed stocks including landfill gas, green waste and waste gases can be processed to yield LNG or CNG.

Industry and government agree that LNG promises to capture a significant share of the heavy-duty vehicle and engine market. LNG is preferred for long distance trucking as it provides twice the energy per unit volume as CNG. This translates to longer driving ranges and lower-weight vehicle fuel storage.

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 2014, 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. This would make LNG fueled heavy-duty vehicles more available to the commercial market leading to direct reductions in NOx, PM and toxic compound emissions.

Fuels/Emission 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 a unique 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 will be highly 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. These positive results 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 conduct a characterization of application specific drive cycles to best match different transportation technologies to 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.

Proposed Project: Conduct Emissions Studies on Biofuels and Alternative Fuels

Expected SCAQMD Cost: $400,000

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 AB 32, AB 1007 and the Low-Carbon Fuel Standard. It's noteworthy to mention that in 2013 the Low-Carbon Fuel Standard was upheld by the U.S. Court of Appeals for the Ninth Circuit and subsequently in June 2014 opponents were denied further appeal by the Supreme Court. 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, 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 has recently amended the 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.

DME is another fuel which requires evaluation of in-use emissions, especially NOx, in light of Volvo's announcement in 2015 that they will commercialize class 8 trucks using DME in the near future. Furthermore, 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.

Potential Air Quality Benefits:

If 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 AB 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 (NOx 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 NOx emissions that may exacerbate the Basin's ozone problem.

Proposed Project: Identify and Demonstrate In-Use Fleet Emissions Reduction Technologies and Opportunities

Expected SCAQMD Cost: $250,000

Expected Total Cost: $2,000,000

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 which can be economically 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; and
- development, deployment and demonstration of smart vehicle telematic systems

The second phase of the project is to validate the technology or strategy on a larger demonstration project over a longer period of time.

An effort to be launched in 2016 will be a first-in-the-nation demonstration of advanced optical remote sensing technologies to better assess and measure emissions from refineries, ships and other sources. These demonstration projects will help measure emissions at lower levels and in near real-time than previously possible, helping enhance future air quality modeling and decision-making. This effort will involve three projects to quantify fugitive emissions from large refineries and other sources of VOCs, such as gas stations, oil wells, marine vessels and rail yards.

Potential Air Quality Benefits:

Many of the technologies identified can be applied to light-duty 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: $150,000

Expected Total Cost: $500,000

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 NOx 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 NOx 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 recent 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_x, 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 O2 sensor known as a wide-band O2 sensor, is another alternative that can be analyzed. Another technical approach might be to deploy technology utilizing the O2 signature of a post-catalyst O2 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_x 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 NOx and/or CO emissions above levels required in their permits. Projects could potentially reduce a significant class of NOx 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. 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 and ICEs);
- low-Btu gas technologies (e.g., digester, landfill, or diary 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: $200,000

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 and mobile applications. The technologies to be considered include thermal, photovoltaic and other solar energy technologies; wind energy systems; energy storage and conservation 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 substantially 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 preliminary 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.

Emission Control Technologies

Proposed Project: Develop and Demonstrate Advanced Aftertreatment Technologies

Expected SCAQMD Cost: $300,000

Expected Total Cost: $5,000,000

Description of Technology and Application:

There are a number of aftertreatment technologies which have shown substantial emission 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 emission 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 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 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: $1,000,000

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 NOx in 2004 to 0.2 g/bhp-hr NOx 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 NOx. 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.

Health Impacts Studies

Proposed Project: Evaluate Ultrafine Particle Health Effects

Expected SCAQMD Cost: $150,000

Expected Total Cost: $2,000,000

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.

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 Particulate Matter

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, initiated in mid-2012, included an air monitoring program, an updated emissions inventory of toxic air contaminants and a regional modeling effort to characterize risk across the Basin. In addition 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.

This project category would include other related studies, 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.

Outreach and Technology Transfer

Proposed Project: Assess and Support Advanced Technologies and Disseminate Information

Expected SCAQMD Cost: $500,000

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;
- advanced technology vehicle demonstrations;
- 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: $400,000

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 NOx 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
Fabiola P. Lao	Coalition for Clean Air
Dr. Alberto Ayala	California Air Resources Board
Pending	U.S. Department of Energy
Dr. John Froines	Professor Emeritus University of California, Los Angeles
Gretchen Hardison	Los Angeles Department of Water and Power; Chair of Technical Advisory Committee of the Mobile Source Air Pollution Reduction Review Committee
Pending	Southern California Edison
Philip J. Hodgetts	Clean Air Now
Randall Lewis	Lewis Group of Companies
Tim Olson	California Energy Commission
Pending	Western States Petroleum Association
Cherif Youssef	Southern California Gas Company

SB 98 Clean Fuels Advisory Group

Dr. Matt Miyasato, Chair	SCAQMD
Robert Bienenfeld	American Honda Motor Company Inc
Dr. Blair Folsom	Independent Consultant in Combustion Technology
Dr. Mridul Gautam	West Virginia University, Adjunct Professor, & University of Nevada-Reno
Dr. Fritz Kalhammer	Independent Consultant in Energy and Process Technology
Dr. Melanie Marty	California Environmental Protection Agency, Office of Environmental Health Hazard Assessment
Dr. Wayne Miller	University of California, Riverside, College of Engineering, Center for Environmental Research and Technology
Dr. Vernon Roan	University of Florida, Professor Emeritus
Dr. Scott Samuelsen	University of California, Irvine, Combustion Laboratory/National Fuel Cell Research Center
Dr. Robert Sawyer	Sawyer Associates
Kevin Walkowicz	National Renewable Energy Laboratory
Dr. Nicholas Vanderborgh	Independent Consultant in Fuel Cell Technologies
Michael Walsh	Independent Consultant in Motor Vehicle Pollution Control

Appendix B

Open Clean Fuels Contracts as of January 1, 2016

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Contract	Contractor	Project Title	Start Term	End Term	SCAQMD $	Project Total $
Electric/Hybrid Technologies and Infrastructure						
08063	Quantum Fuel Systems Technologies Worldwide, Inc.	Develop & Demonstrate 20 Plug-In Hybrid Electric Vehicles	01/22/08	02/29/16	2,165,613	2,885,266
10659	Electric Power Research Institute	Data Collection to Further Evaluate Performance and Operational Benefits to Optimize Fleet of Medium-Duty Plug-In Hybrid Vehicles	07/27/10	09/30/16	250,000	844,678
11606	Odyne Systems, LLC	Develop and Demonstrate Plug-In Hybrid Electric Drive System for Medium- and Heavy-Duty Vehicles	07/08/11	11/30/16	494,000	2,599,000
11615	Parker Hannifin Corporation	Develop & Demonstrate Up to Four Heavy-Duty Hydraulic Hybrid Vehicles	01/18/13	08/31/16	250,000	2,000,000
12028	Electric Vehicle International, Inc.	Demonstrate and Replace UPS Diesel Delivery Trucks with Zero-Emission Medium-Duty Trucks	09/09/11	09/08/17	1,400,000	4,872,000
13058	Capstone Turbine Corporation	Develop Microturbine Series Hybrid System for Class 7 Heavy-Duty Vehicle Applications	08/12/13	03/30/16	360,000	1,210,000
13396	Transportation Power Inc.	Develop and Demonstrate Seven Class 8 Zero Emission Electric Trucks	04/19/13	12/31/16	375,000	2,285,368
13404	Penske Honda of Ontario	Lease Two Honda Fit Electric Vehicles for Three Years	05/02/13	05/01/16	31,307	31,307
13410	Selman Chevrolet Company	Lease Three 2013 Chevrolet Volt Extended-Range Electric Vehicles for Three Years	04/03/13	04/02/16	41,084	41,084
13426	Transportation Power, Inc.	Develop & Demonstrate Catenary Class 8 Trucks (1 Electric & 1 CNG Platform)	06/07/13	06/06/16	2,617,887	3,182,795
13429	Longo Toyota	Lease One Toyota RAV4 Electric Vehicle for Three Years	04/19/13	04/18/16	19,618	19,618
13433	U.S. Hybrid Corporation	Develop and Demonstrate Two Class 8 Zero-Emission Electric Trucks	06/26/13	09/30/17	75,000	150,000
13439	City of Carson	MOU for Catenary Zero Emission Goods Movement Project	10/01/13	09/30/16	0	0
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	07/13/18	5,500,000	14,780,000
14156	Galpin Motors Inc. (Galpin Ford)	Lease of Two Fusion Energi and One C-Max Energi PHEVs for a Three-Year Period	01/28/14	01/27/17	49,298	49,298
14184	Clean Fuel Connection Inc.	DC Fast Charging Network Provider	04/04/14	06/30/20	250,000	1,318,000
14052	Altec Capital Services, LLC	Lease of Two Plug-In Hybrid Electric Vehicles	01/02/15	01/01/20	61,302	61,302
14202	Adopt-A-Charger	SoCalEV Infrastructure MOA to Install & Upgrade EV Charging Infrastructure	04/14/14	04/30/16	0	0
14204	Associated of Los Angeles	SoCalEV Infrastructure MOA to Install & Upgrade EV Charging Infrastructure	10/10/14	04/30/16	0	0

Contract	Contractor	Project Title	Start Term	End Term	SCAQMD $	Project Total $
Electric/Hybrid Technologies and Infrastructure (cont'd)						
14222	Odyne Systems,LLC	Develop and Demonstrate Plug-In Hybrid Electric Retrofit System for Class 6 to 78 Trucks	04/24/14	04/23/16	389,000	2,226,571
14224	Complete Coach Works	Develop and Test Retrofit All Electric Transit Bus	04/24/14	02/28/17	395,000	867,182
14256	National Strategies LLC	Develop and Demonstrate Vehicle-2-Grid Technology	09/05/14	03/04/18	250,000	3,377,689
14323	Selman Chevrolet Company	Lease Two 2014 Chevrolet Volt Extended-Range Electric Vehicles for Three Years	03/28/14	03/27/17	30,932	30,932
14336	Los Angeles Department of Water & Power	Install and Upgrade EV Charging Infrastructure (Administer SoCalEV Infrastructure Project)	07/31/15	04/03/16	0	0
15021	Transportation Power Inc.	Upgrade and Demonstrate Two Electric Yard Tractors	07/14/14	12/31/16	75,000	405,000
15382	ChargePoint, Inc.	Install Electric Charging Infrastructure	01/23/15	01/22/17	162,000	162,000
15448	University of California Los Angeles	Site Selection for DC Fast Charge Network	04/21/15	04/30/16	10,000	10,000
15650	University of California San Diego	Develop and Demonstrate Solar Forecasting for Larger Solar Arrays with Storage and EV Charging	07/17/15	01/16/18	98,908	1,655,278
15665	City of Santa Monica	Install and Upgrade EV Charging Infrastructure (Administer SoCalEV Infrastructure Project)	07/31/15	04/03/16	0	0
15680	National Renewable Energy Laboratory	ComZEV – Develop Detailed Technology and Economics-Based Assessment for Heavy-Duty Advanced Technology Development	08/28/15	08/27/16	500,000	500,000
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	09/30/17	195,326	2,103,446
16047	U.S. Hybrid Corporation	ZECT: Develop and Demonstrate Three Class 8 LNG Plug-In Hybrid Electric Drayage Trucks	11/06/15	09/30/17	22,896	1,996,675
Hydrogen and Mobile Fuel Cell Technologies and Infrastructure						
11150	Hydrogen Frontier, Inc.	Maintenance & Operation of City of Burbank Hydrogen Fueling Station	11/24/10	01/23/16	475,000	1,635,000
10482	California State University Los Angeles	Install and Demonstrate PEM Electrolyzer, Providing Hydrogen Fueling for Vehicles and Utilizing the Technology in the Engineering Technology Curriculum at the University	03/04/11	10/03/17	250,000	1,662,000
11555	University of California Los Angeles	Construct Hydrogen Fueling Infrastructure	12/07/12	12/31/19	400,000	2,589,990

Contract	Contractor	Project Title	Start Term	End Term	SCAQMD $	Project Total $
Hydrogen and Mobile Fuel Cell Technologies and Infrastructure (cont'd)						
12075	Linde, LLC	Expand Hydrogen Fueling Infrastructure	11/02/12	11/02/18	250,000	2,732,177
13155	Fletcher Jones Motor Cars (Mercedes-Benz)	Lease Two F-Cell Fuel Cell Vehicles for Two Years	02/08/13	02/08/17	44,995	44,995
14139	Hyundai America Technical Center Inc.	No-Cost Lease of Fuel Cell Vehicle for Two Years	12/13/13	12/31/17	0	0
14684	California Department of Food and Agriculture, Division of Measurement Standards	Conduct Hydrogen Station Site Evaluations for Site Certifications for Commercial Sale of Hydrogen	12/11/15	12/31/16	100,000	100,000
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	09/14/17	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
15619	H2 Frontier Inc.	Installation of Chino Renewable Hydrogen Station	12/04/15	12/03/20	200,000	4,558,274
15641	Hardin Hyundai	Three-Year Lease of 2015 Tucson Fuel Cell Vehicle	06/15/15	06/14/18	22,862	22,862
16039	Lawrence Livermore National Laboratory	Demonstrate Prototype Hydrogen Sensor and Electronics Package	12/10/15	02/09/17	175,000	350,000
16151	Toyota Motor Sales USA	No-Cost Loan of 2015 Toyota Mirai Fuel Cell Vehicle	12/15/15	01/05/16	0	0
16171	Longo Toyota	Three-Year Lease of 2015 Toyota Mirai Fuel Cell Vehicle	12/15/15	12/14/18	24,567	24,567
Engine Systems						
14364	Cummins Inc.	Develop, Integrate and Demonstrate Ultra-Low Emission Natural Gas Engines for On-Road Heavy-Duty Vehicles	07/14/14	08/20/16	2,061,000	3,869,000
15626	Cummins Westport, Inc.	Develop, Integrate and Demonstrate Ultra Low-Emission Natural Gas Engines for On-Road Heavy-Duty Vehicles	07/10/15	12/31/16	3,500,000	7,233,000
15632	Gas Technology Institute	Develop Ultra Low-Emission Natural Gas Engine for On-Road Medium-Duty Vehicles	09/01/15	06/30/17	750,000	1,800,0000
Infrastructure and Deployment						
05250	Downs Commercial Fueling, Inc.	Purchase & Install New L/CNG Fueling System at Commercial Fueling Station in Temecula	11/04/05	04/30/16	203,137	833,333

Contract	Contractor	Project Title	Start Term	End Term	SCAQMD $	Project Total $
Infrastructure and Deployment (cont'd)						
06042	University of California Los Angeles	Upgrade Existing CNG Public Access Station with Dispenser & Card Reader	09/05/06	12/31/16	15,921	31,842
06084	Clean Energy	Upgrade Existing LNG Facility to L/CNG at Riverside County Waste Management Dept's Aqua Mansa Facility in Riverside	04/13/06	02/28/16	120,000	400,000
06091	City of Whittier	Purchase & Install New Public Access CNG Fueling Station at City Yard	03/18/06	12/31/16	150,000	450,000
07153	Foothill Transit	Purchase & Install New Public Access CNG Refueling Station in Irwindale	11/02/09	06/30/16	250,000	3,350,000
07246	USA Waste of California, Inc., dba L.A. Metro	Purchase & Install New LNG Storage Tank at Long Beach LNG Refueling Station	12/24/08	06/30/17	200,000	440,000
07320	Orange County Transportation Authority	Install New CNG Station in the City of Santa Ana	12/21/07	03/31/16	350,000	5,841,729
08043	University of California Los Angeles	Public Access CNG Refueling Station Upgrade for UCLA Transportation	05/02/08	12/31/16	140,000	350,000
08044	Beaumont Unified School District	Install Limited Access CNG Refueling Station	03/05/09	12/31/16	288,000	615,994
08098	Redlands Unified School District	Purchase & Install New CNG Refueling Station	01/25/08	12/31/17	525,000	700,000
09165	California Cartage Company	Deployment of 2010 Emissions Standards Compliant LNG Trucks	10/31/08	07/31/16	358,000	11,880,000
09218	Rim of the World Unified School District	Install Mountain Safety Equipment on Five New CNG School Buses	01/05/10	12/31/16	65,850	65,850
09364	Rim of the World Unified School District	Construct & Install a CNG Fueling Station	12/30/10	12/31/16	257,000	425,000
10067	Rim of the World Unified School District	Install Mountain Safety Equipment on Seven New CNG School Buses	12/21/09	12/31/16	92,190	92,190
11548	Clean Energy (novated from Mansfield Gas Equipment Systems)	Buydown Incentive Program for CNG Home Refueling Appliance "Phill"	09/07/12	01/31/16	60,000	356,000
12135	Placentia-Yorba Linda Unified School District	Upgrade CNG Fueling Station	11/18/11	11/30/17	60,000	60,000
12267	West Covina Unified School District	Upgrade CNG Fueling Facility	10/12/12	12/31/17	60,000	60,000
12851	Clean Energy	Install, Operate and Maintain Three LNG Fueling Stations (Fontana, Coachella and Perris)	10/05/12	12/31/18	1,400,000	4,277,323
12852	City of Covina	Construct Public Access CNG Fueling Stations	10/12/12	12/31/18	200,000	618,429
12853	Rainbow Disposal Co. Inc.	Upgrade CNG Fueling Station	03/08/13	12/31/18	200,000	400,000
12854	Waste Management, Inc.	Upgrade LNG Fueling Station at Baldwin Park Facility	08/17/12	12/31/18	300,000	1,588,100
13401	Nite-Hawk Sweepers LLC	Demonstrate Natural Gas-Powered Parking Lot Sweepers	08/28/13	05/31/16	90,000	200,000

Contract	Contractor	Project Title	Start Term	End Term	SCAQMD $	Project Total $
Infrastructure and Deployment (cont'd)						
14219	City of West Covina	Upgrade CNG Station at City Yard	05/15/14	06/15/17	200,000	618,429
14311	Southern California Gas Company	Install and Maintain CNG Fueling Station in Murrieta for SoCalGas	07/11/14	12/31/17	217,000	1,385,000
15438	United Parcel Service, Inc.	Refurbish/Upgrade Ontario UPS LCNG Infrastructure	12/31/14	06/30/18	246,707	484,535
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
Fuels/Emission Studies						
10722	University of California Riverside/CE-CERT	Re-Establish Testing Facility & Quantify PM Emission Reductions from Charbroiling Operations	08/06/10	03/31/16	60,000	60,000
13402	University of California Davis-Office of Research	Next Sustainable Transportation Energy Pathways (STEPS) Program	05/02/14	07/01/16	120,000	2,760,000
14162	National Renewable Energy Laboratory	Utilization of Fleet DNA Approach and Capabilities to Provide Vehicle Vocational Analysis in SCAQMD	02/26/14	06/30/17	174,985	199,985
15607	University of California Riverside/CE-CERT	Innovative Transportation System Solutions for NOx Reductions in Heavy-Duty Fleets	12/19/15	11/30/16	79,980	139,980
15623	University of California Riverside/CE-CERT	Ozone and SOA Formation from Gasoline and Diesel Compounds	10/02/15	06/30/16	75,000	480,338
15625	University of California Riverside/CE-CERT	Evaluate4 SOA Formation Potential from Light-Duty GDI Vehicles	10/02/15	06/30/16	149,972	224,972
15636	University of California Riverside/CE-CERT	Evaluate PEV Utilization Through Advanced Charging Strategies in a Smart Grid System	12/15/15	02/14/17	170,000	270,000
Stationary Clean Fuels Technology						
10723	Eastern Municipal Water District	Retrofit Digester Gas Engine with NO_x Tech Aftertreatment Emission Control Technology	03/16/12	03/31/16	85,000	889,000
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
Health Impacts Studies						
12208	University of California Riverside/CE-CERT	Determine the Physical and Chemical Composition and Associated Health Effects of Tailpipe PM Emissions	01/21/12	01/31/16	175,000	1,375,000
12865	University of California Los Angeles	Develop Quantitative Cellular Assays for Use in Understanding the Chemical Basis of Air Pollutant Toxicity	06/08/12	07/31/16	368,457	368,457
14171	Southern California Research Center/Allergy & Asthma Associates of Southern California	Risk of Incident Asthma Among Children from In-Utero Exposures to Traffic Related Pollutants	09/22/14	03/21/16	99,670	317,119

Contract	Contractor	Project Title	Start Term	End Term	SCAQMD $	Project Total $
Health Impacts Studies (cont'd)						
14172	University of California Irvine	The Relation of Airway and Systemic Oxidative Stress to Particulate Air Pollution Exposures in an Elderly Cohort	02/17/14	08/16/16	159,974	376,368
Outreach and Technology Transfer						
00069	Walsh Consulting	Technical Assistance Relating to the Use of Alternative Fuels in Mobile Sources	02/17/00	02/28/16	35,000	35,000
05128	Mid-Atlantic Research Institute LLC	Development, Outreach & Commercialization of Advanced Heavy-Duty and Off-Road Technologies	08/08/05	03/31/17	70,000	70,000
07062	The Tioga Group, Inc.	Technical Assistance Related to Air Quality Impacts of Regional Goods	12/19/06	11/30/16	58,000	58,000
08210	Sawyer Associates	Technical Assistance on Mobile Source Control Measures and Future Consultation on TAO Activities	02/22/08	02/28/16	25,000	25,000
09252	JWM Consulting Services	Technical Assistance with Review & Assessment of Advanced Technologies, Heavy-Duty Engines, and Conventional & Alternative Fuels	12/20/08	06/30/16	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	05/31/16	75,000	75,000
12380	The Tioga Group	Technical Assistance Related to Emissions, Advanced Technologies and Goods Movement	04/13/12	04/30/16	25,000	25,000
12381	Integra Environmental Consulting Inc.	Technical Assistance Related to Emission Inventories, Goods Movement and Off-Road Sources	04/06/12	04/30/16	110,000	110,000
12453	Tech Compass	Technical Assistance with Alternative Fuels, Fuel Cells, Emissions Analysis and Aftertreatment Technologies	06/21/12	05/30/16	75,000	75,000
13194	Clean Fuel Connection Inc.	Technical Assistance with Alternative Fuels, Renewable Energy and Electric Vehicles	12/07/12	09/30/16	140,000	140,000
13198	Gladstein, Neandross & Associates, LLC	Technical Assistance with Alternative Fuels, Emissions Analysis and On-Road Sources	12/14/12	12/13/16	135,000	135,000
13408	University of California Irvine	Demonstrate Building Integration of Electric Vehicles, Photovoltaics and Stationary Fuel Cells	09/30/13	09/30/16	150,000	270,000
14185	Three Squares Inc.	Conduct Education Outreach for the Basin DC Fast Charging Network Project	04/11/15	10/31/16	89,183	89,183

Contract	Contractor	Project Title	Start Term	End Term	SCAQMD $	Project Total $
Outreach and Technology Transfer (cont'd)						
15344	Clean Fuel Connection, Inc.	Technical Assistance with Alternative Fuels, Electric Vehicles, Charging and Fueling Infrastructure and Renewable Energy	09/22/14	09/22/16	60,000	60,000
15369	Breakthrough Technologies Institute, Inc.	Technical Assistance with Low- and Zero-Emission Vehicles, Fuel Cells, Stationary Applications and Emissions Analysis	11/07/14	11/06/16	30,000	30,000
15380	ICF Resources LLC	Technical Assistance with Goods Movement, Alternative Fuels and Zero-Emission Transportation Technologies	12/12/14	12/11/16	30,000	30,000
15415	Gladstein, Neandross & Associates, LLC	Technical Assistance with Alternative Fuels and Fueling Infrastructure, Emissions Analysis and On-Road Sources	11/07/14	11/06/16	60,000	60,000
15507	Jerald Cole	Technical Assistance with Alternative Fuels, Emissions Analysis, and Combustion Technologies	01/09/15	01/08/17	30,000	30,000
15516	Cordoba Corporation	Technical Assistance with Construction of Zero Emissions Goods Movement Demonstration Project	03/27/15	03/31/18	74,500	74,500
15610	Goss Engineering, Inc.	Conduct Engineering Services at SCAQMD Headquarters	06/02/15	06/01/16	50,000	50,000
16055	University of California Irvine	Cosponsor Solar Decathlon – Develop and Demonstrate Solar-Powered House at 2016	11/05/15	02/29/16	50,000	730,000

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Appendix C

Final Reports for 2015

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SCAQMD Contract #08219 **June 2015**

Develop and Demonstrate Ten Plug-In Hybrid Electric Vehicles

Contractor
A123Systems (formerly Hymotion, Inc.)

Cosponsor
SCAQMD

Project Officer
Lisa Mirisola

Background

There has been increasing support for PHEVs from a wide array of organizations, including electric utilities, environmental groups, energy independence organizations, and other air districts. Several automobile manufacturers have also announced plans to investigate the technology but voice concerns about the battery durability in terms of calendar and cycle life.

Project Objective

At its November 3, 2006 meeting, the SCAQMD Governing Board approved RFP #P2007-14 to design, engineer, convert, test, certify, demonstrate, and maintain for 60 months 30 plug-in hybrid electric vehicles with supporting infrastructure at up to 15 demonstration sites in the South Coast Air Basin. At the March 2, 2007 meeting, the Governing Board awarded funding to A123Systems Inc. (formerly Hymotion, Inc.) to convert ten new Toyota Prius vehicles to plug-in hybrid electric vehicles using advanced nanophosphate lithium-ion battery systems and controls.

Technology Description

Similar to commercially available hybrid-electric vehicles, PHEVs utilize a battery pack and an electric motor in concert with an internal combustion engine. PHEVs, however, can employ a larger battery pack which can be designed to extend the electric portion of the driving cycle, providing improved fuel economy, lower greenhouse gas emissions, and reduced petroleum dependence. The larger battery pack must be fully recharged external to the vehicle so a charger, plug, and energy management system must be integrated into the vehicle. This design is an example of a blended strategy that provides electric range in limited, low power demand situations, but not miles of dedicated all-electric range now available from major automakers. This system is intended as an aftermarket product for installation at repair shops and dealerships.

Status

CARB Executive Order D-647-1 issued September 8, 2008 limited sales of 500 units of A123 L5 BREM OVCC for 2004 – 2009 Toyota Prius. The L5 BREM OVCC conversion system includes a lithium-ion add-on battery pack, a current sensor, battery temperature sensors, and a controller. Two of the 500 units allowed were converted by local subcontractor The Dr. in Fountain Valley, California for this SCAQMD demonstration program, and delivered to SCAQMD August 7, 2009.

Figure 1: A123 Plug-In Hybrid Conversion

One of these converted vehicles was tested at a Chrysler facility in Michigan from July – November 2010, but was unable to prove compliance with new CARB requirements necessary for commercialization as an aftermarket product in California. No additional vehicles were converted for SCAQMD. A123 notified SCAQMD on January 18, 2011 that they abandoned the process for CARB certification and do not have resources to continue supporting this demonstration project with SCAQMD.

Results

Idaho National Lab compared fuel economy data from 180 A123 converted Prius (including one at SCAQMD) with stock Prius performance and found fuel efficiency improvement from 44 mpg to 49 mpg overall. Results are posted at http://avt.inl.gov/.

Figure 2: Data loggers were installed in the two converted vehicles and feedback on charging, trips, and current status were available from Gridpoint V2Green screens.

Benefits

The A123 converted plug-in hybrids' greatest value was as outreach tools to begin to educate the public and show the potential for plug-in hybrids before commercial plug-in hybrids were introduced in December 2010 by General Motors (Chevrolet Volt) and Toyota (Prius PHV).

Project Costs

The total cost for this project was $962,667 with SCAQMD cost-share not to exceed $622,667 and in-kind cofunding to be provided by Aerovironment ($100,000) for the fast-charging demonstration and from participating cities ($240,000) for Prius conversions. However, this project was terminated early and unspent funds totaled $497,667, which included all in-kind cofunding.

Commercialization and Applications

During the term of this contract, plug-in hybrid electric passenger vehicles have been commercialized by Ford, General Motors, Toyota, and many other automakers. The business case for aftermarket conversion of hybrid passenger vehicles to plug-in hybrid is not currently attractive for additional investment or commercialization. A123 declared Chapter 11 bankruptcy in 2012, and was purchased by Chinese auto supplier Wanxiang Group in 2013. After emerging from Chapter 11 bankruptcy in 2013, A123 refocused its business on low-voltage lithium-ion batteries used by automakers for weight savings and to power other MPG-lowering technologies. This is a diversion from its original plan of manufacturing large lithium-ion battery packs to power electric vehicles, though it still does that work for the Chinese market. In the low-voltage market, A123 supplies automakers such as Daimler AG with 12-volt starter batteries and 48-volt microhybrid batteries, which are used in various technologies.

SCAQMD Contract #11204 **November 2015**

Electric Conversion of Medium-Duty Fleet Vehicles

Contractor
AC Propulsion Inc.

Cosponsors
AC Propulsion Inc.
Comcast
SCAQMD

Project Officer
Brian Choe

Background
Medium-duty vehicles (8,500 to 14,000 pounds Gross Vehicle Weight Rating) are responsible for a disproportionate amount of emissions in the South Coast Air Basin (Basin). These vehicles account for 5% of the vehicle population, but are responsible for approximately 12% of the 2014 on-road mobile source NOx emissions according to the 2012 AQMP. Electrification of vehicles in this segment will provide considerable reductions in emissions with substantial benefits to the surrounding communities along their service routes. However, successful deployment of electric vehicles in this segment requires that specific vocations be properly matched to take advantage of their attributes. Hence, SCAQMD strongly supports demonstration of electric vehicles in a variety of vocations and duty cycles to identify matching applications and to promote commercialization of zero-emission transportation technologies.

Project Objective
AC Propulsion, a Southern California-based developer and manufacturer of electric vehicle propulsion systems, partnered with Comcast to develop and demonstrate medium-duty electric service vans to evaluate their viability in commercial service. The project was to convert three Comcast service vans to electric propulsion for demonstration in two stages. AC Propulsion converted a first prototype for a precursory evaluation by Comcast prior to converting the rest. Upon successful assessment of the prototype, AC Propulsion was to build the remaining two demonstration vehicles, addressing any deficiencies identified by Comcast.

Technology Description
The electric drive system developed by AC Propulsion was used to convert Ford E250 vans supplied by Comcast, utilizing a proprietary power electronics unit that maximizes efficiency over a broad operating range with regenerative braking capability. The propulsion system is powered by a 180 kW AC induction motor with a 41 kWh lithium-ion battery pack to provide an operating range of approximately 80 miles. The battery pack can be recharged in 7 hours with Level 2 and in 3.5 hours with a fast charger. The vehicles are also equipped with a Vehicle-to-Grid interface to charge back to the grid during emergencies or high-demand charge periods.

Comcast Electric Service Van

Status
AC Propulsion completed conversion of all three Comcast service vans to EVs but experienced delays in the deployment of the vehicles due to coordination challenges with project partners. Despite the delay, the electric vans were finally deployed in commercial service but they were not operated as planned. This was largely due to the fact that Comcast changed their operation mode from maintaining the vehicles at a central location to allowing drivers to take them home after their shifts. Without EVSEs to charge the vehicles at home, the drivers opted to switch back to conventional service vans and the electric vehicles were left unused. AC Propulsion has sought other

partners to demonstrate the electric vans without any success. As a result, AC Propulsion requested to terminate this project in November 2015.

Results

As requested by AC Propulsion, this project is terminated without having completed vehicle demonstration in commercial service. However, AC Propulsion intends to continue investigating options to repurpose these vehicles in related projects and is currently in discussion with University of Delaware to use them in a vehicle-to-grid study program.

Benefits

Electrification of medium-duty vehicles, including service vans and delivery trucks, will help to advance electric and hybrid technologies in transportation sectors, providing substantial reductions in both criteria pollutants and greenhouse gases.

Project Costs

The total project cost was initially estimated at $755,767 with SCAQMD funding $300,000, with the remaining $455,767 cost-shared between AC Propulsion ($355,767) and Comcast ($100,000). Since the project was terminated without having completed vehicle demonstration, SCAQMD retained $75,000 of the $300,000 award.

Commercialization and Applications

Although the project was terminated without field demonstration, a prototype has been successfully tested by Comcast with positive feedback. AC Propulsion plans to continue development and refinement of the electric drive system with a goal to ultimately commercialize the system or its components.

SCAQMD Contract #12862 **April 2015**

Develop and Demonstrate Class 8 Drayage Plug-In Hybrid Heavy-Duty Vehicle

Contractor
Volvo Technology of America & Volvo Group

Cosponsors
Volvo Technology of America, Inc.
U.S. DOE
SCAQMD

Project Officer
Joe Impullitti

Background
To attain federal ozone standards and to reduce the adverse health impacts of near-road emissions along freight corridors in the South Coast Basin, SCAQMD co-sponsors development and deployment of advanced clean cargo transport technologies.

Project Objective
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.

Technology Description
The truck features a 6x2 Mack chassis at 60,000 gross combination weight (GCW) with the proprietary hybrid driveline, a new energy-optimized battery, external charging interface and newly developed energy management and control systems suitable for port drayage application. Using hybrid trucks for drayage application (and other local and regional haul applications) can reduce emissions and lowers fuel use significantly. By utilizing plug-in hybrid technology, fully zero-emission electric mode is possible for limited distances at low speeds, such as in a predetermined zero-emission geofence. The integration of a plug-in hybrid powertrain with downsized engine (11L in lieu of 13L), along with several improvements to the complete vehicle efficiency are expected to add up to approximately 30% improvement in fuel economy in a drayage cycle containing a mix of the driving patterns described in the report "Characterization of Drayage Truck Duty Cycles at the Port of Long Beach and Port of Los Angeles." Using clean electricity from the Southern California grid to externally recharge the hybrid battery and offset the least efficient operating points of the engine is also expected to result in approximately 30% reduction of greenhouse gas (GHG) emissions.

Status
The project delivered a working prototype plug-in hybrid truck along with a first evaluation of the efficiency and emission potentials of the technology. The project was completed in July 2015 with a final demonstration of the concept vehicle on a simulated drayage route around Volvo's North American headquarters in Greensboro, NC. The route included all traffic conditions typical of drayage operation in Southern California as well as geofences defined to showcase the zero-emission capabilities of the truck. The demonstrator successfully completed four consecutive trips with a gross combined vehicle weight (GCVW) of 44,000 lb., covering approximately 2 miles out of a total distance of 9 miles per trip in the Zero Emission (ZE) geofence. The final report is on file with complete technical details of the project. The only unanticipated problems encountered during the project were delays in the vehicle retrofit due to premature failures of critical prototype components, which required a 7-month no-cost extension to the original contract.

Demonstration Drayage Truck Loading a Container

Results

This vehicle is expected to use approximately 30% less fuel than a typical drayage truck in daily operation, and it is designed to allow full electric operation whenever operating in a marine terminal in the ports of Los Angeles / Long Beach.

This project took a well-to-wheels approach in order to estimate the greenhouse gas (GHG) emissions from drayage vehicles. The CO2 equivalent emissions from the grid power were obtained from the [eGRID] database. Since this vehicle is to be used in the Los Angeles Port area only, the values of CO2 equivalent emissions from the [eGRID] database are equal to 0.339Kg/KWH. The CO2 equivalent emissions from one gallon of diesel fuel are 12.725Kg/gallon. Based on these numbers we estimated that drayage PHEV usage will result in GHG emission reduction of approximately 25%, which is in line with the initial project goals.

Even though we weren't able to complete detailed simulations of tailpipe emissions for this concept truck, our general prediction is that the overall NOx output, measured in units of volume or weight per mile, will be reduced drastically but that the NOx emissions measured in g/bhp-hr may initially increase in such a PHEV as compared to a conventional vehicle. The overall emission reduction is a result of the much lower fuel use, but multiple factors can lead to a potential increase in brake specific emissions: the frequent restarts of the engine are a new challenge when it comes to controlling engine-out emissions, and cooling down of the engine and aftertreatment components during zero-emission operation can result in lower average NOx conversion levels in the SCR system; depending on how the hybrid driveline is controlled, the engine could operate in higher brake specific NOx output load points more frequently than the equivalent conventional powertrain.

Our future work will therefore focus on improving our analytical tools to better capture engine and exhaust aftertreatment component behavior under start-stop or low-speed conditions. We believe that this will help identify robust strategies to control the complex plug-in hybrid energy management algorithms in order to maximize the emissions and energy benefits of the vehicle compared to its baseline.

Benefits

This project demonstrates new complete-vehicle solutions that can offer significant benefits when applied to a specific vehicle application.

The customer truck data collection performed during this project to create a detailed drayage duty cycle with accurate altitude and performance metrics was critical to ensure that the system simulations could guide the selection of most suited concept and provide representative insight in emission reduction potential. We will be publishing this detailed duty cycle, along with observations and recommendations regarding improvement opportunities, to aid other projects focusing on improving the emissions and fuel use of drayage trucks in the ports of Los Angeles and Long Beach.

As a result of work performed in this project an invention was filed to the U.S. Patent Office: PCT/US2015/026009 (Weight based aerodynamic deflector control).

Project Costs

This project was completed on target with a total cost of $2.4M as follows:

Funding Partner	Funding Amount	Funding Percent
SCAQMD	$216,000	9%
U.S. DOE	$984,000	41%
Volvo Technology of America, Inc.	$1,200,000	50%
Total	**$2,400,000**	**100%**

Commercialization and Applications

This project supported the submission in 2013 of a new proposed standard for charging interface of heavy vehicles: SAE J3068. The concept truck showcases components included in this proposal. The technical sub-committee had made significant progress at the time of writing of this report, with several key players represented in the area of electrification across North America.

SCAQMD Contract #13042 **May 2015**

Demonstrate Full-Speed Battery Electric Vehicles

Contractor
South Bay Cities Council of Governments (SBCCOG)

Cosponsor
SCAQMD

Project Officer
Lisa Mirisola

Background
Achieving federal and state clean air standards, as well as reducing greenhouse gas emissions to meet climate action goals in Southern California, will require emission reductions from both mobile and stationary sources, passenger cars and light trucks that account for most of these emissions. New zero-emission technologies such as slow-speed Neighborhood Electric Vehicle (NEVs) and full-speed Battery Electric Vehicles (BEVs) have been proposed to meet these sustainability goals and to reduce dependence on petroleum products used to fuel internal combustion engine (ICEs) vehicles. For many residents within the geographic boundaries of the SCAQMD, many trips and even commutes are relatively (five miles or less) local and can be accomplished with the replacement of an ICE vehicle with either an NEV or BEV into a household vehicle fleet.

Project Objective
This follow-on local-use vehicle (LUV) program entitled "Drive the Future" was intended to complement SBCCOG's NEV study through an examination of the household use and market of full-speed BEVs to residents, businesses and municipalities in the South Bay sub-region. The project objective was to answer these three questions:

1. Are BEVs sufficient to meet the mobility and transportation needs of South Bay residents?
2. Does the usage have the potential to produce significant environmental and economic benefits?
3. What policies and initiatives can accelerate the market for BEVs?

Technology Description
Battery electric vehicles are full-sized, freeway speed, zero-emission automobiles powered by a stored on-board battery pack; all BEVs are range limited by the size and number of the battery packs that are designed for each vehicle. The range of BEVs varies from the sub-category of slow-speed NEVs, that can travel up to 25 total miles per charge, to mid-range BEVs whose range is approximately 80 to 100 miles, to long-range BEVs with a range of greater than 200 miles. The BEVs tested in the study were mid-range and had approximately 80 miles of range.

One of four BEVs Used in Study

BEVs must be plugged-in to some sort of electrical outlet for recharging. All BEVs can be charged using a common household outlet – Level 1 (110v), as well as Level 2 (220/240v) outlets available through charging networks throughout the region. Some BEVs are also outfitted with an adaptor that allows for Level 3 (440 or DC fast charging). The time required to re-charge varies by type of charging with Level 1 taking the longest time; Level 2 about half as long as Level 1; and DC 3 fast charging significantly faster to charge than Level 2 (approximately 20 minutes to recharge from zero to eighty percent battery capacity.)

Status
The active demonstration phase of the project was completed in January 2015. There were four main activities: 1) preparation (leasing vehicles, arranging insurance, acquiring and installing GPS, recruiting, and selecting and training participants);

2) active demonstration (47 households drove a BEV for up to 2 months per household); 3) data processing and analysis (GPS generated a data point every minute each vehicle was "on" creating millions of geo-data points that were mapped, summarized in tables and interpreted); and 4) reporting. Unanticipated problems included occasional unreliability of the GPS system used to track some vehicles which led to changes in installation protocol; poorly maintained driver logs which required additional staff time to call drivers for interpretation; and complex travel patterns and destinations which required more staff time to interpret and analyze.

Results

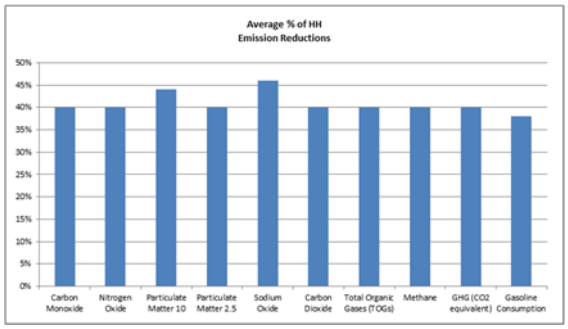


Table 1: Average Household BEV Emissions Reductions

The objectives did not involve any specific emissions reduction targets. However, emissions reduction per household is one outcome the project sought to measure; the resulting average household reductions in criteria pollutants and GHG emissions were high compared to reasonable expectations.

The study also revealed that the addition and use of a BEV to a household could meet most household mobility needs (including commuting to work). The NEV findings demonstrated that around 19% of household gas-powered vehicle miles traveled (VMT) could be replaced by an NEV. Because BEVs are longer range, they are able to account for 38% of household VMT. Aside from the relative difference in range as compared to their ICE vehicles, there were no performance tradeoffs in mobility.

Benefits

Immediate benefits include replacing 2,180 gallons of gasoline, reducing participants 'pump' costs by $8,720, and reducing most pollutants by 40%.

Potential benefits include giving BEVs a high level of public exposure, while documenting environmental impacts and customer responses that can help make this vehicle market strategically attractive to original equipment manufacturers (OEMs) and policy makers.

Potential benefits also include expanding the BEV market in order for more households to reduce gasoline consumption, CO2, particulate matter, carbon monoxide and carbon dioxide emissions by up to 40% over current gas-powered vehicles.

Project Costs

Project costs totaled $512,545, with SCAQMD's contribution at $320,000.

	Actual Cost (Including in-kind by SBCCOG)	**SCAQMD Project Budget**
Total	$512,545	$320,000
Labor	$385,112	$190,452
GPS	$16,000	$16,466
Insurance	$22,003	$19,082
Vehicle Acquisition	$85,796	$94,000
Vehicle Unplanned	$1,014	$0
Other Expenses	$2,620	$0

Table 2: Project Cost Breakdown

Commercialization and Applications

The SBCCOG will post the report on its website, make presentations to the electric drive industry, South Bay cities, and offer them to SCAG, L.A. Metro and governmental entities such as the Strategic Growth Council and the California Air Resources Board.

There are about 275,000 "secondary" vehicles driven by South Bay residents. Presenting viable options to replace them with BEVs or NEVs is the market target. To accomplish that, a public education initiative to "right size" vehicle choices is planned.

SCAQMD Contracts #13418, et al. **December 2015**

SoCalEV Ready EV Charger Installations

Contractor
Various SoCalEV partner organizations

Cosponsor
SCAQMD
CEC

Project Officer
Patricia Kwon

Background
The Southern California Regional Plug-In Electric Vehicle Plan (SoCalEV) is a regional collaborative among cities, utilities, automakers, local and regional government agencies, businesses and others in the region who are actively engaged in supporting and building the necessary infrastructure for the commercial launch of electric vehicles. The SoCalEV Ready project was funded by a CEC grant to deploy 319 Level 2 electric vehicle (EV) charging stations throughout the South Coast Air Quality Management District in all four counties. These chargers were deployed starting in 2013, with all installations completed no later than April 2016.

Project Objective
Under multiple contracts or memorandums of agreement (MOAs) executed with SoCalEV partners, these chargers are sited at local government agencies, universities, hospitals, and cultural destinations to create greater availability of public charging infrastructure. Installations were performed either by SoCalEV partners or contracted installers with experience in commercial installations. CEC funds were used for a portion of the costs associated with hardware and/or installation, and SoCalEV partners used their own funds as required cost sharing (39%) for the CEC grant to pay remaining costs. SoCalEV partners that completed their installations include the Cities of Claremont, Covina, Lake Elsinore and Palmdale; County of Los Angeles; California State University campuses at Fullerton, Long Beach, Los Angeles, and San Bernardino; California Polytechnic Pomona; and University of California Irvine.

Figure 1: Los Angeles Zoo, DCFC and Level 2 EVSE

Figure 2: City of Palmdale Level 2 EVSE

Technology Description
EV charging stations were commercially available technology including Level 2 (240V) charging stations with SAE J1772 connectors and DC (480V) fast charging stations with CHAdeMO and SAE Combo connectors. These connectors worked with all of the EVs available on the market: all EVs can use the J1772 connector for Level 2 charging. Japanese EVs use the CHAdeMO connector while American/European EVs use the SAE Combo connector for DC fast charging.

Figure 3: Leo Carrillo State Park Level 2 EVSE

Status

The majority of installations have been completed by December 2015. SoCalEV partners are providing charger utilization data and documenting lessons learned on this project. CEC sent a program evaluator in November 2015 to visit a dozen sites to confirm charger performance and high level of utilization. The MOAs under this project are as follows:

SoCalEV Partner	Contract #
City of Claremont	13418
California State University Los Angeles	13419
University of California Irvine	13420
County of Los Angeles	13421
City of Santa Monica	14074
City of Covina	14095
University of California Santa Barbara	14153
Clean Fuel Connection, Inc.	14199
Cal State University San Bernardino	14201
City of Palmdale	14207
City of Lake Elsinore	14208
Cal State Polytechnic University Pomona	14209
Cal State University Long Beach	14210
Cal State University Fullerton	14236

Results

Data on the chargers is being collected and will be included in a final report to CEC due in April 2016. An example of charger utilization data provided by SoCalEV partners includes Table 1 below for chargers installed at California State University Los Angeles.

Table 1: Charger Utilization at CSULA

Benefits

This project was important in increasing the deployment of public charging infrastructure at a variety of locations. It has also assisted in making EV infrastructure more visible to the general public and significantly increasing the electric range of EVs to allow for longer and more frequent trips and vehicle miles traveled.

Project Costs

The CEC grant provided funding towards hardware and/or installation in the amount of $840,750 with SoCalEV partners providing additional cost sharing in the amount of $542,659. Total project costs were $1,383,409. In addition to the 319 funded installations, SoCalEV partners took the opportunity to install additional Level 2 charging stations. Two DC fast charging stations were installed at the Los Angeles Zoo and Los Angeles International Airport through a partnership with Los Angeles Department of Water and Power and Adopt a Charger.

Commercialization and Applications

Level 2 and DC fast charging stations are fully available commercial technologies which have been and will continue to be deployed for a variety of purposes including residential, public, workplace, and destination charging. This deployment project assisted in accelerating the availability of public charging infrastructure which is much needed to go beyond the early adopter stage and have the technology embraced by the general public.

SCAQMD Contract #10046 **November 2015**

Develop and Demonstrate Renewable Hydrogen Energy and Fueling Station

Contractor

Air Products and Chemicals, Inc. (APCI)

Cosponsors

California Air Resources Board
FuelCell Energy, Inc.
Orange County Sanitation District (OCSD)
SCAQMD
Southern California Gas Company
U.S. Department of Energy

Project Officer

Joseph Impullitti

Background

The implementation of zero-emission vehicles is a key component in the effort to attain air quality standards in the South Coast Air Basin. The production and use of renewable hydrogen in fuel cell vehicles will be keys to meeting goals for reducing emissions of both criteria pollutants and greenhouse gases.

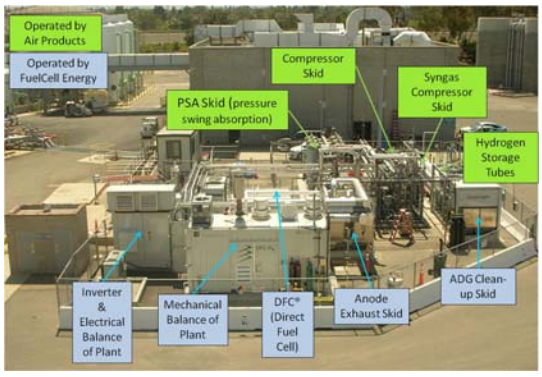
Project Objective

SCAQMD provided cost-sharing to augment U.S. DOE and CARB funding awarded to Air Products and Chemicals, Inc. (APCI) to construct, install and operate a first-of-a-kind Hydrogen Energy Station, which would use a high-temperature fuel cell to coproduce hydrogen and electricity generated from anaerobic digester gas at the Orange County Sanitation District (OCSD) facility in Fountain Valley, CA. Electricity would be returned to the host site, and hydrogen would be sent to a publicly accessible hydrogen fueling station. Development of the Hydrogen Energy Station which was deployed at OCSD was funded under a U.S. DOE Cooperative Agreement (DOE $5,950,000, non-federal $6,590,000), which included a stage-gate approach involving steps of concept feasibility, preliminary system design, and detailed engineering design/construction/shop validation.

Technology Description

Digester gas from the wastewater treatment plant is first cleaned and conditioned before being fed to the Hydrogen Energy Station, which incorporated FuelCell Energy's Direct Fuel Cell (DFC®) technology. The DFC® unit is a molten carbonate-based fuel cell system capable of simultaneously reforming hydrocarbon feedstocks to syngas (hydrogen, CO and CO_2), while producing power and process heat. The fuel cell is designed to produce 300 kW without hydrogen coproduction and 250 kW along with 100 kilograms per day of hydrogen.

The syngas produced by the DFC® is further processed into purified hydrogen using APCI's pressure swing adsorption process. Purified hydrogen is then supplied to the hydrogen fueling station, which includes compression and storage systems sized for the 100 kilograms per day production rate (which can serve 20 to 30 cars per day). APCI's proprietary fueling protocol (of which four patents are cited in the SAE hydrogen fueling TIR J-2601) is utilized to cascade fill from the storage tubes to the vehicles. The station utilizes two dispenser hoses (one at H35/5,000 psi pressure and one at H70/10,000 psi pressure). The H70 gas is cooled to temperatures approaching -40 degree C so that refueling times of 3 to 4 minutes can be achieved.



Hydrogen Energy Station at OCSD

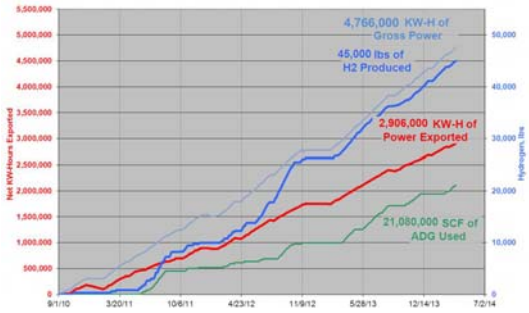
Status

SCAQMD joined the project in December 2009 during site engineering efforts. Site construction was completed in July 2010, and the Hydrogen Energy Station was shipped from FuelCell Energy's facilities in Danbury, CT, where the system had undergone over 8,000 of shop validation testing. Initial operation of the Hydrogen Energy Station on natural gas began on September 13, 2010, reaching a rate 300 kW net AC power on September 20, 2010, as part of the fuel cell's power conditioning process. The hydrogen purification system underwent its first test at 50% rates on September 23, 2010. The hydrogen fueling station was also installed in the fall of 2010, with the dispenser sited adjacent to an existing CNG dispenser located in the entry area to the OCSD facility. Commissioning of the hydrogen fueling station took place in March 2011, with the digester gas clean-up system installed in May 2011. Clean digester gas was first generated on May 25, 2011, and the three-year operating program was completed on May 31, 2014. At the same time auto manufacturers began rolling out their production fuel cell vehicles, SCAQMD and CARB determined there would be a strong need for hydrogen to support the fleet of new hydrogen-powered vehicles so the two agencies pooled their funding to continue operating the station, using delivered hydrogen, through September 2015. Using funding from other sources APCI will continue its operation serving fuel cell vehicle customers through October 2016.

Results

Power quality issues were encountered at the site from the initial commissioning of the Hydrogen Energy Station through early 2012; these were resolved as a result of efforts by OCSD and the National Fuel Cell Research Center at the University of California, Irvine (UCI), which was responsible for data analysis and education and outreach under the CARB program.

Other key performance results include efficiency (greater than the target value of 50%), performance of the digester gas clean-up system (no breakthrough of contaminants to the fuel cell), and emissions at 5% of the 2007 CARB limit for NOx and < 1% of the limit for CO. Use of the hydrogen fueling station increased over time, reaching an average of 5 fueling events per day in early 2014. This average continued through the end of the project, with 860 fueling events from July to November 2015.



Three-Year Operation Results

Benefits

Deployment of fuel cell electric vehicles (FCEVs) is a key element toward achieving goals to reduce levels of criteria pollutants in the South Coast Air Basin. Manufacturers of FCEVs have provided survey figures to state agencies indicating their plans to deploy tens of thousands of light-duty cars into the South Coast Air Basin in the 2015-2107 timeframe. In order to meet this goal, reliable hydrogen fueling stations are needed to provide confidence to automakers and their potential customers. Local, reliable sources of renewable hydrogen will be needed to meet state requirements for renewable energy content, and demonstrations of technologies such as the Hydrogen Energy Station are necessary to provide operating data for scale-up to MW scale power production with its corresponding hydrogen coproduction that are expected to achieve the target economics for both major products.

Project Costs

Original project costs were $8,436,735, as follows: CARB, $2,700,000; U.S. DOE, $2,077,284; SCAQMD, $750,000 (9%); FuelCell Energy, $51,979; and APCI, $2,857,472. However, CARB and SCAQMD augmented this funding ($200,000 and $75,000, respectively) to continue station operation through November 2015 under this contract.

Commercialization and Applications

Demonstration testing of fueling station equipment and novel hydrogen production systems at relevant usage rates is critical to gain the learnings necessary for rollout of hydrogen refueling infrastructure to the general public. In addition, APCI and FuelCell Energy are seeking to develop project opportunities to utilize the next product platform for the molten carbonate fuel cell (1.4 MW) which could be configured for hydrogen coproduction.

SCAQMD Contract #10061 **January 2015**

Maintenance and Data Management for the SCAQMD Hydrogen Fueling Station

Contractor
Hydrogenics Corporation

Cosponsor
SCAQMD

Project Officer
Larry Watkins/Lisa Mirisola

Background
The implementation of zero-emission vehicles (ZEVs) and related infrastructure is a key component in the effort to achieve healthful air quality in the South Coast Air Basin. Fuel Cell Vehicle (FCV) technology is emerging at an accelerated pace and related hydrogen fueling infrastructure will play a crucial role in this effort

Originally constructed by Stuart Energy, the subject fueling station produced hydrogen from on-site electrolysis and has been operational at SCAQMD in Diamond Bar, CA, since 2004. Hydrogenics Corporation (Hydrogenics) acquired Stuart Energy in 2005 and took responsibility for station maintenance.

Project Objective
Hydrogenics maintained the hydrogen fueling station in Diamond Bar, California (see Fig. 1) to provide 5,000 psi (350 Bar) hydrogen for hydrogen-fueled Prius vehicles developed under the Five-Cities demonstration project 04185 which has been completed, as well as fuel cell vehicles from Honda, Mercedes, and Toyota used in SCAQMD's demonstration fleet.

Technology Description
The station was designed to produce 24 kg/day, with storage at 6250 psi. Hydrogen was dispensed from an FTI International Group, Inc. dispenser by SCAQMD staff and other drivers trained by Stuart and/or Hydrogenics. Access was controlled by PIN codes.

Status
This contract term was 10/30/09 to 1/31/15. Maintenance and management services included 1) Train designated SCAQMD staff in the proper use of the fueling dispenser, card-lock system and vehicle fueling procedures; 2) Repair unsafe or inoperable equipment or parts of the fueling system as needed; 3) Provide fueling and summary station use reports.

The station was decommissioned in 2014, and all above-ground equipment was declared obsolete and/or compressor oil contaminated and removed by Hydrogenics, except for two items which SCAQMD designated for reuse. The FTI dispenser was provided at no cost to Sunline Transit to use as spare parts for the only other remaining identical FTI dispenser known to SCAQMD to extend the life of their fueling station. The hydrogen storage tubes were retained at SCAQMD in the hopes that they could be reconditioned and reused for upgrading our CNG station.

Figure 1: Hydrogen Station at SCAQMD

Results
From 2005 through 2013, this hydrogen station was used a total of 3223 times and dispensed a total of 4,035 kilograms (+/- 10%) of hydrogen. Maintenance of the stations was manageable and rarely caused disruption to the passenger vehicle users. Annual usage was reported 2009 – 2013 (see Table 1).

Year	H2 Dispensed (Kg)	Fills
2009	465	362
2010	97	74
2011	166	137
2012	122	87
2013	81	57
TOTAL	**931**	**717**

Table 1: Hydrogen Dispensed 2009 - 2013

In 2010, an electrical panel malfunction resulted in shutdown of the station, with no injuries. As a precaution, hydrogen pressure in storage was slowly reduced to about 200 psi, but no other damage was found in the system. The manufacturer of the gas control panel had gone out of business. However, Hydrogenics manufactured control panels superior to the defunct panel and installed one at SCAQMD.

The production capacity of the electrolyzer was reduced to about 12 kg/day in 2010 to extend the life of the fueling station until the SCAQMD site was scheduled for upgrade.

Benefits

This station was recognized by CARB as the first station in Southern California designed for passenger cars on the new hydrogen highway network in California.

This project was an important step toward the use of renewable energy sources, particularly hydrogen. The installation of the station allowed SCAQMD to monitor the fueling patterns and witness how a hydrogen fueling station is maintained. The project provided important lessons learned on station operation and maintenance costs which can be applied to future commercial stations serving light-duty FCVs.

Project Costs

The total cost of this contract was $468,000, fully funded by the Clean Fuels Fund. Some in-kind costs were absorbed by Hydrogenics.

Commercialization and Applications

This hydrogen fueling station was designed to support a small fleet of vehicles (fewer than 10 cars) operating at 350 bar tank pressure. The current generation of FCVs requires 700 bar hydrogen pressure to achieve the desired range for consumer acceptance.

Deployment and operation of this station with others in California led to greater commitments of FCVs, with additional public funding for hydrogen stations in California.

Hydrogenics is a member of the California Fuel Cell Partnership and has over 60 years of experience designing, manufacturing, building and installing hydrogen systems. Hydrogenics recently supplied a new 65 kg/day electrolysis system with project partners for CSULA (see Fig. 2).

Further reduction in cost and additional technical improvements are needed to scale-up hydrogen fueling as additional fuel cell vehicles are introduced.

Figure 2: Hydrogen Produced with Hydrogenics Electrolysis System at CSULA

SCAQMD Contract #13259 **March 2015**

"Five Cities" Program to Demonstrate Hydrogen Fueling Station Operation and Maintenance

Contractor
Air Products and Chemicals, Inc. (APCI)

Cosponsor
SCAQMD

Project Officer
Larry Watkins/Patricia Kwon

Background

The implementation of zero-emission vehicles (ZEVs) is a key component in the effort to achieve healthful air quality in the South Coast Air Basin. Fuel Cell Vehicle (FCV) technology is emerging at an accelerated pace and related fueling infrastructure will play a crucial role in this effort.

Project Objective

Under Contract #05165, SCAQMD allocated a total of $3.89 million towards funding the "Five Cities" Program for the installation and operation of a network of five hydrogen fueling stations throughout the Basin to support the operation of FCVs and electric-hybrid internal combustion engine vehicles converted to use hydrogen as the fuel. Contract #13259 extended the Program to support continued operation and maintenance.

Figure 1: Santa Ana Mobile Fueler Station

Figure 2: Riverside Electrolyzer Station

Technology Description

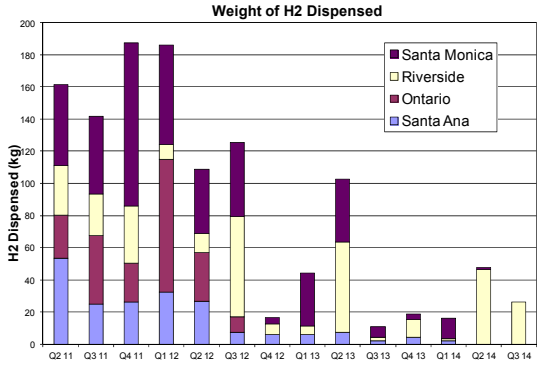
During the initial five-year period of performance, Air Products designed, built and installed stationary fueling sites supplied by an integral proton exchange membrane (PEM) electrolyzer system for Riverside, Burbank and Santa Monica, and a self-contained, transportable fueling unit that was refilled at an APCI hydrogen production facility for the Santa Ana and Ontario sites. These stations were supplied in support of the SCAQMD "Five Cities" Program to fuel hydrogen ICE and fuel cell vehicles in the South Coast Air Basin.

Status

The Burbank station concluded its participation in the demonstration program in 2009 as part of a station upgrade and was not included under this maintenance and operation contract; however, it continues to operate today under another operator. The mobile fueler in Ontario completed participation in 2012 and the mobile fueler in Santa Ana in May 2014. The stations at Santa Monica and Riverside completed participation in 2015. A station is planned at a retail location within two blocks of the Santa Monica site and recent plans were announced to upgrade the Riverside station.

Results

From March 2011 through September 2014, the hydrogen fuel stations were used a total of 885 times and dispensed a total of 1,267 kilograms (+/- 10%) of hydrogen. Maintenance of the stations was manageable and rarely caused disruption to the users.



H2 Dispensed Mar2011-Sep2014

Benefits

This project was an important step toward the use of renewable energy sources, particularly hydrogen. The installation of the projects allowed SCAQMD to monitor the fueling patterns at each of the sites and witness how a hydrogen fueling station is run. The projects have successfully demonstrated the use of electrolysis, which if supplied with a renewable source of electricity, is a clean way to produce hydrogen. The project provided important lessons learned on station operation and maintenance costs which can be applied to future commercial stations serving light-duty FCVs.

Project Costs

The total contract value, fully funded by the SCAQMD, for this follow-on maintenance and operation contract to provide continued support of the "Five Cities" Program was $390,000. No additional costs beyond hydrogen delivery costs (for the Santa Ana station) and station maintenance costs (for Riverside and Santa Monica) were encountered.

Commercialization and Applications

The stations in the "Five Cities" Program were all designed to support small fleets of vehicles (less than 10 cars) operating at 350 bar tank pressure. The current generation of FCVs requires 700 bar hydrogen pressure to achieve the desired range for consumer acceptance. Station designs have been developed using both delivered hydrogen *and* onsite production via electrolysis that dispense at 700 bar and provide a renewable fuel to the customer.

Deployment and operation of the Stations led to greater acceptance of FCVs as demonstrated by upgrades or additions of 700 bar hydrogen stations.

Given the challenges for deployment of early-market light-duty vehicle fueling infrastructure, the "Five Cities" Program provided important lessons learned on station costs, production/supply modes and customer feedback. Public and private stakeholders have used this information to develop follow-on plans for the future which include the rollout of 100 hydrogen fueling stations in the California market over the 2013-2023 timeframe.

SCAQMD Contract #13400 **December 2015**

Develop Hydrogen Network Investment Plan and Assess Policies and Incentives for Implementation

Contractor

Energy Independence Now (EIN)

Cosponsors

SCAQMD
Energy Foundation
CARB
California Fuel Cell Partnership
Toyota
Emmett Foundation
Andrew Sabin Family Foundation
Daimler
Patagonia

Project Officer

Larry Watkins & Patricia Kwon

Background

Hydrogen fuel cell electric vehicles (FCEVs) represent a crucial component of the State of California's strategy to meet federal air quality standards and state zero emission vehicle and greenhouse gas (GHG) emissions targets. [1] The substantial emissions benefits associated with FCEVs can only be realized if sufficient hydrogen fueling infrastructure is available to support these vehicles.

EIN, in partnership with SCAQMD, embarked on a project to develop a Hydrogen Network Investment Plan (H2NIP) in order to examine market success factors relative to the looming launch of FCEV vehicles and support infrastructure. The project was broken into two phases. Phase I focused on pre-commercial market dynamics relating to infrastructure and Phase II focused on fuel incentives and market dynamics for renewable hydrogen.

Phase I Project Objectives

This phase was created to develop a consensus-based H2NIP that delineates key actions needed to facilitate a successful market launch of hydrogen FCEVs. The goal was to create a common platform for stakeholders to identify, demonstrate and justify options to optimize incentives for hydrogen fueling stations as well as establish network level policies to ensure stations remain open and growth can be sustained.

Phase I Status

The final version H2NIP was completed in October 2013. It is publically available on EIN's website and is currently serving as a resource for multiple state agencies.[2]

Phase I Results

The H2NIP establishes a baseline understanding of current pre-commercial market dynamics. As an example, Figure 1 below illustrates market risk assumed by the first 68 fueling stations. If these baseline stations were in place by 2017, and FCEV market uptake is slow (1/4 of CARB's ZEV Likely Compliance Scenario is shown here), many stations would be under-utilized for years – a recipe for sustained negative cash flows.

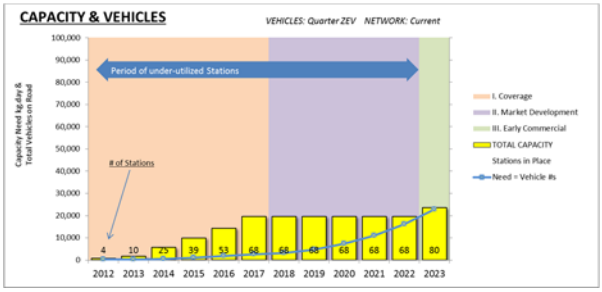


Figure 1: Market Risk

The baseline understanding of the current market serves as the foundation for a series of 15 recommendations aimed at overcoming the challenge associated with deploying a new infrastructure system. Critical near-term recommendations focus on building marketplace certainty and providing the risk protection needed to motivate early market investment to establish the baseline coverage network.

[1] See US Clean Air Act, California's Global Warming Solutions Act (AB 32), CARB's ZEV Regulation, and Executive Order B-16-2012

[2] http://www.einow.org/images/stories/factsheets/h2nip_full_paper_final.pdf

In addition to the recommendations established in the H2NIP report, EIN developed a robust Microsoft Excel-based H2NIP Model to test the impact of a variety of incentives and market scenarios on a station investor's (both public and private) bottom line.

Phase I Costs

A small portion of funding from Phase I to develop the H2NIP were carried over to fund the beginning of the implementation phase. Approximately $10K of this funding was deployed at the end of 2012. This funding matches what EIN planned at the onset of the project.

Phase I Cost-Share (Actual)	
SCAQMD	$50K
Energy Foundation*	$27K
CARB	$25K
CaFCP	$25K
Toyota	$25K
Emmett Foundation*	$20K
Daimler	$15K
Sabin Foundation*	$15K
Patagonia*	$8K
Total	**$210K**
**EIN Donors*	

Phase II Project Objectives

This phase was created to develop an assessment of fuel incentives and renewable hydrogen in California that delineates findings on hydrogen-related environmental credits, outlines key actions needed to further develop California's Low Carbon Fuel Standard (LCFS) and U.S. EPA's Renewable Fuel Standard (RFS) incentives and to highlight context, concern and drivers for the renewable hydrogen market. LCFS program credits are issued to promote a 10% reduction in carbon intensity of the state transportation fuel mix by 2020, while RFS credits are issued to renewable fuel producers to reduce GHG nationwide.

Phase II Status

The final version of the plan, 'Crediting Hydrogen: Fuel Incentives and Renewable Hydrogen Investment in California' was completed in November 2014. It is publically available on EIN's website and is currently serving as a resource for multiple state agencies.[3]

Phase II Results

EIN worked to investigate the current barriers and opportunities associated with the LCFS credits and renewable hydrogen requirements (SB 1505) and propose recommendations to the hydrogen and fuel cell community on ways to address them.

Work included the briefing paper 'Crediting Hydrogen: Fuel Incentives and Renewable Hydrogen Investment in California'; presentations highlighting findings and eliciting feedback and input on priorities, including detailed financial analysis of the projected values of LCFS credits, as described in the CaFCP 2014 work plan; and meetings to discuss findings and the viability of options to facilitate LCFS and SB 1505 streamlining.

The ultimate outcome is two-fold: 1) EIN provided hydrogen stakeholders with appropriate information to capture a full range of monetary benefits that are currently available to them through the LCFS program, and 2) EIN provided an assessment of the current and future impacts of the renewable hydrogen requirements and explored alternative options to better incentivize renewable hydrogen investments.

Ultimately, further research into renewable hydrogen pathways, economics and incentive structures is necessary in order to establish and validate viable actions that stakeholders can take to ensure that the FCEV community maximizes reductions in carbon emissions and other pollutants with adverse impacts to public well-being. This work is of critical importance in the developmental phase of support infrastructure.

Phase II Costs

The table below represents the cost-share EIN used to perform Phase II. This funding matches what EIN planned at the onset of the project phase.

Phase II Cost-Share (Actual)	
SCAQMD	$80K
CaFCP	$20K
Toyota	$25K
Total	**$125K**

[3] http://www.einow.org/images/stories/factsheets/ein_creditinghydrogen.pdf

SCAQMD Contract #14622 **May 2015**

CSULB Student Educational Project to Demonstrate Graphene Fuel Cell Catalysts

Contractor

California State University, Long Beach (CSULB) Foundation, Center for Energy and Environmental Research and Services (CEERS)

Cosponsors

SCAQMD

Project Officer

Alfonso Baez

Background

Proton exchange membrane fuel cells (PEMFC) convert hydrogen to electricity efficiently, with water as their main waste product. Their small size and low operating temperature (~70-85^{o}C) make PEMFCs ideal for automotive applications, replacing the engine. They could also be used in larger stationary or locomotive applications. Two materials that are challenges for this technology to realize commercialization are: platinum (Pt) catalysts and Nafion PEMs. Both materials are high cost and have durability issues. In addition, the performance of the Pt catalyst needs to be improved to realize greater conversion efficiency in PEMFCs. The major motivation for this study was to find dramatically less expensive cathode catalysts for PEMFC than pure Pt, while maintaining or improving the high performance for the Oxygen Reduction Reaction (ORR) exhibited by Pt.

Previous studies have examined the performance of the ORR by replacing Pt with a non-Pt catalyst. An example would be to replace Pt by palladium (Pd) alloys. The studies found that the Pd alloy catalysts performed better than pure Pd. However, their performances are still worse than Pt. Another strategy is to replace Pt with a Pt alloy that contains nickel (Ni) or cobalt (Co). Pt3Ni and Pt3Co are found to have improved ORR performance over pure Pt while reducing the Pt loading by 25%. However, these catalysts suffer from durability issues, as it was found that the Co or Ni leach into the fuel cell electrolyte during operation.

For PEMFC to become commercially available, it would need an ideal ORR catalyst with improved performance, lower cost, and improved durability. The iodine-edged graphene catalysts can potentially fill this role as the catalysts were found to have 33% higher current than Pt catalysts. These catalysts maintained 85.6–87.4% of their initial current after 10,000 cycles compared to 62.5% for Pt electrodes when tested in an alkaline environment. Thus, further research to test these catalysts in a complete fuel cell system is much needed to demonstrate improved performance and durability.

Project Objective

The objective of the project was to investigate the performance of iodine-edged graphene catalysts for PEMFC under operating fuel cell conditions and compare the results with the performances of the traditional catalysts.

The followings tasks were followed to meet the objectives of the investigation. Each task was broken up into one of three categories: Catalyst Synthesis, membrane-electrode assembly (MEA), and Simulation.

Task 1 - Synthesis of iodine-edged graphene catalysts (Catalyst Synthesis) and Perform ORR binding energy calculation of iodine-edged graphene catalysts.
Task 2 - Construct individual MEA with Pt and with iodine-edged graphene catalysts.
Task 3 - Perform ORR barrier calculation of iodine-edged graphene catalysts.
Task 4 - Assemble and test complete fuel cells with both Pt and iodine-edged graphene catalysts.
Task 5 - Propose atomistic model on the chemical advantage of iodine-edged graphene catalysts.
Task 6 - Use the insights gleaned from the atomistic model to improve experimental results.
Task 7 - Data assessments. Submission of the draft final report.

Technology Description

All experiments were performed in the chemical engineering laboratory at CSULB. Iodine-edged graphene catalysts were synthesized from graphene oxide and iodine purchased commercially. They were incorporated into a Membrane Electrode Assembly (MEA) consisting of catalyst, carbon and Nafion. The MEA was placed into a fuel cell stack assembly where H2 and O2 gas reacted

electrochemically. The current and voltage were recorded to determine the efficiency. The experiments were also performed for a standard PEMFC with Pt catalysts. This part of the investigation provided the baseline data for comparing the new catalysts to the existing commercial catalysts.

Density functional theory (DFT) calculations were performed to calculate the binding energy of ORR species (O, O2, OOH, H2O, OH) on iodine-edged graphene catalysts. In addition, the barriers of the ORR were calculated to compare the theoretical performance of these catalysts versus Pt, which was previously calculated. This provided an atomistic understanding on how and in what environment the iodine-edged graphene catalysts perform better than Pt.

Status

The project has been completed and the final report was submitted in May 2013. There was one final batch of catalyst still untested.

Results

Commercially available Pt and graphene catalysts from Fuel Cell Etc were tested to obtain the baseline data. CSULB group also manufactured a Pt and six graphene membrane electrode assemblies (MEA), the latter with different compositions, to compare outputs with the baseline data. All MEAs were tested under three different conditions; open circuit, 1 mA and 10 mA loadings. Results show a maximum of 0.35 volts for the CSULB MEA as compared to a slightly higher than 0.7 volt for the commercially available MEA.

X-ray diffraction was used to analyze the synthesis. The sample consists of 100% graphite initially, and should not have contained any graphite after the synthesis. The first sample contained a large graphite peak. The performance was poor. Afterwards, the ball-mill time was increased to 14 days, which made the sample better. Still, the performance was not as good as the collaborator's. Finally, for sample #3, a new ball mill with RPM of 1500 was purchased. This was able to remove all graphite peaks.

The binding energy of various ORR intermediates on graphene was calculated. In addition to calculating the binding energy of these species on bare graphene, the possibility of oxygen as a species underneath to see how it will affect the binding energy was investigated. Table 1 provides the binding energies.

Binding Energy (eV)	O	OH	OOH	OO	H_2O
Oxidized Graphene	2.02	2.25	0.22	unstable	unstable
Graphene	0.86	0.49	unstable	unstable	unstable
Pt	3.68	2.28	1.52	1.28	0.22

Table 1: Calculated binding energy of graphene and graphene-O. Comparison is made of binding energy of previously calculated results for Pt.

The data shows that the binding energy is greatly facilitated by O species on the underside. This theory explains a couple of phenomenon found in graphene fuel cells:

1. It explains why graphene is needed as a catalyst rather than normal graphite. Because graphite only allows binding on one side, the other side is not exposed to oxygen, which will enhance binding and lead to catalytic activity.

2. Graphene type fuel cells typically work better in basic conditions vs. acidic. This explains why a base environment is advantageous, because base will not dissolve oxides, which seems to facilitate the fuel cell reaction.

The graphene fuel catalyst results showed a lower voltage than Pt. This was explained by the acidic environment of the PEMFC tested, which are incompatible with graphene catalysts.

Benefits

Compared to platinum, graphene and iodine are both abundant materials. If the potential of this catalyst could be realized in a complete fuel cell system, the cost of fuel cells would decrease significantly, resulting in improved commercialization of fuel cell technology and reduction in ambient air pollution.

Project Costs

The project was completed with funding from the SCAQMD for $28,000 and cost-share contributions in the form of space and laboratory equipment and additional person-hours.

Commercialization and Applications

Further steps are required to refine the manufacturing process and improve the performance of the graphene and iodine catalyst, before commercialization. Strategies need to be developed at the atomic level to dope the graphene, so that the intermediate OOH species can be stable in an acidic environment, where there are no adsorbed oxides.

SCAQMD Contract #15020 **October 2015**

Develop Sampling and Testing Protocols for Analyzing Impurities in Hydrogen

Contractor
University of California, Irvine

Cosponsor
SCAQMD

Project Officers
Raul Dominguez, Rudy Eden & Lisa Mirisola

Background

Hydrogen is an alternative transportation fuel that is expected to play a role in reducing both fossil fuel usage and air pollutants including greenhouse gases (GHGs). The SCAQMD is committed to the promotion and facilitation of alternative fuel usage including hydrogen in support of its mission to attain healthy air in the Los Angeles basin. Use of hydrogen as a motor vehicle fuel requires the ability to verify that the fuel can satisfy SAE J2719 and the California Code of Regulations (CCR), Title 4, Division 9, Chapter 6, Article 8, Sections 4180-4181 – Hydrogen fuel quality requirements.

Project Objective

SCAQMD sought to demonstrate the ability of measuring contaminants in hydrogen to the specifications defined in SAE J2719 and the CCR by identifying analytic instrumentations and demonstrating their ability to meet hydrogen vehicle fuel quality measurement requirements. Work under this contract was to identify and develop several methods to determine and quantify "trace contaminants" present in hydrogen intended as an alternative transportation fuel for motor vehicles. The challenge is to detect contaminants at the concentrations specified in the SAE J2719 and the CCR. The three primary targeted tasks under the contract were: 1) to evaluate existing analytical methodologies and instrumentation available at the University of California Irvine (UCI) for suitability by analyzing some of the "trace contaminants" (H_2O, CO, CO_2, THC, TH, NH_3, HCOOH, and TS) listed in SAE J2917 and the CCR for hydrogen automotive fuel (proof of concept); 2) to investigate alternative technologies and instrumentation to perform analysis of trace contaminants in hydrogen fuel, including cavity ring-down spectroscopy (CRDS), proton transfer reaction-mass spectrometry (PTR-MS) and/or other technologies; and 3) to develop and submit recommendations on instrumentation needed to establish a hydrogen fuel test center and develop standard operating procedures (SOPs) for sample collection and analytical methods.

Technology Description

Formaldehyde was collected with a DNPH cartridge and analyzed with high-performance liquid chromatography (HPLC). Extensive chamber study (at UCI) and a field study (at CSULA) demonstrated the success in determining formaldehyde to the required concentration stipulated in SAE J2719 and the CCR. Multiple sampling times and flow rates were tested. The two most ideal sampling times and flow rates found were 120 minutes with a flow of 1 L/min hydrogen or 80 minutes with a flow of 1.5 L/min hydrogen. Although formaldehyde was not found in the H_2 from the CSULA fueling station, chamber studies suggest that this methodology satisfies the SAE J2719 and CCR requirements.

Proof of concept was established by collecting hydrogen on August 29 and September 3, 2014, at the Newport Shell station and analyzing trace contaminants with existing analytical methodologies and instrumentation available at UCI. Over the two days, multiple samples were collected using the hydrogen quality sampling adapter (HQSA), which was interfaced with step-down regulator to collect smaller canisters. Also, an ammonia (NH_3) cartridge developed by Professor Barbara Finlayson-Pitt's group was used to collect and determine the NH_3 content in the same H_2 fuel. The NH_3 trapped in the cartridge was analyzed with ion-chromatography (IC). Professor Donald R. Blake's non-methane hydrocarbon (NMHC) system [consisting of five columns/detectors (two FIDs - Flame Ionization Detectors, two ECDs - Electron Capture Detectors, and a MS - Mass Spectrometer) in three-gas chromatographs (GCs)] was used to determine

total hydrocarbons (THC) and halogenated hydrocarbons (TH).

Results

On average, H_2 from the Newport station consisted of approximately 407 part-per-trillion (ppt) of TH (particularly perchloroethylene), 539 ppt of THC (particularly toluene) and 3 ppb of NH_3. Also, during the sampling procedure, high water content was observed. However, water could not be quantified with instrumentations used at the time. The analysis demonstrated that existing analytical methodologies and instrumentations available at UCI were capable of measuring some of the target analytes required by SAE J2719 and the CCR.

Demonstration of the proof of concept initiated the second task, which is to investigate the suitability in using other instrumentations and technologies to determine other contaminants in hydrogen (such as carbon monoxide (CO), carbon dioxide (CO_2), methane (CH_4), formaldehyde and water). PTR–MS and fourier transform infrared spectroscopy (FTIR) were two alternative technologies investigated under this phase of the contract. As an alternative technology, DNPH cartridge sample collection followed by HPLC analysis was used to analyze formaldehyde in H_2. Commercially available CRDS was another technology proposed for investigation; however, a functional CRDS was unavailable, therefore, analysis for total sulfur (TS) using CRDS could not be performed.

PTR-MS is one of the alternative technologies used as a real-time VOC analyzer. The results indicated that PTR-MS, without modification, cannot be used to analyze VOCs under high H_2 content via hydrogen fuel. A pre-concentrator, such as a Markes International or Entech thermal desorber, could be used to pre-concentrate fuel contaminants (e.g. VOCs) and remove excess H_2 prior to PTR-MS analysis. On the other hand, FTIR used as a competing alternative technology successfully determined the CO, CO_2, and CH_4 concentration and satisfied SAE 2719 and CCR requirements. Detailed analysis and validation using FTIR from MKS Instruments were conducted under this contract.

The following table summarizes measurement objectives as defined in SAE 2719 compared to actual measurements under this contract.

Constituent	Limits	J2719 Minimum Analytical Detection Limit	Contract #15020 Determined Detection Limit
Water	5	0.5	0.12
Total hydrocarbons (C_1 basis)	2	0.1	0.1
Carbon dioxide	2	0.1	0.1
Carbon monoxide	0.2	0.2	0.01
Formaldehyde	0.01	0.01	0.01
Ammonia	0.1	0.1	0.02

Benefits

The SCAQMD or other entities can perform analysis of "trace contaminants" in H_2 fuel to satisfy the criteria in SAE J2719 or the CCR.

Project Costs

SCAQMD provided full funding totaling $114,500 from the Clean Fuels Fund for this contract.

Commercialization and Applications

Contract outputs included a list of instrumentations and associated vendors needed to satisfy the requirements listed in SAE J2719 and the CCR. The deliverables include standard operating procedures (SOPs) and Operation Assistance Guides for the HQSA, FTIR, NMHC system, DNPH cartridge and NH_3 cartridge usage. The final report also recommends further investigations to determine the feasibility of analyzing other contaminants listed in SAE J2719 such as helium, nitrogen and particulate matter in motor vehicle grade hydrogen.

SCAQMD Contract #15666 **December 2015**

Participate in California Fuel Cell Partnership for CY 2015 and Provide Support for Regional Coordinator

Contractor
Bevilacqua-Knight, Inc.

Cosponsors
7 automakers; 6 government agencies;
1 technology provider;
8 associate members; and
14 affiliate members

Project Officer
Lisa Mirisola

Background
Established with eight members in 1999, the California Fuel Cell Partnership (CaFCP) is a collaboration in which private and public entities are independent participants. It is not a joint venture, legal partnership or unincorporated association. Therefore, each participant contracts with Bevilacqua-Knight, Inc. (BKi) for their portion of CaFCP administration. SCAQMD joined the CaFCP in April 2000, and the CaFCP currently includes 36 organizations interested in demonstrating fuel cell vehicle and fueling infrastructure technology.

Project Objectives
Several key goals for 2015:

- Convene CaFCP members and stakeholders in a common forum to discuss challenges and opportunities, exchange experiences and knowledge, and advance group sharing and progress. Build and expand trust among members via open communication. Maintain and enable the organization to achieve its mission and goals.
- Collaborate to identify and address emerging challenges and translate into comprehensive and durable solutions. Retain the flexibility to address issues quickly as they arise, in the interest of advancing all members and industry.
- Communicate, educate, inform and promote H2 & FCEVs benefits and opportunities to key outside stakeholders and general public for increased and continued support. Become readily recognized as the face of the industry for trustworthy information and assistance.

Status
The members of the CaFCP intend to continue their cooperative demonstration efforts and have set goals through 2016, subject to a budget approved annually. This final report covers the SCAQMD Contract #15666 for 2015 membership. This contract was completed on schedule.

Representatives from BAE Systems and Ballard talk with staff of Orange County Transportation Authority and other transit agencies during CaFCP-organized tour of four fuel cell electric buses under construction at El Dorado facility in Riverside.

Technology Description
The CaFCP members together or individually are demonstrating fuel cell passenger cars and transit buses and associated fueling infrastructure in California. The passenger cars include Daimler's B Class F-CELL, GM's Chevy Fuel Cell Vehicle, Honda's Clarity FCX and FCV, Hyundai's Tucson, Nissan's XTrail, Toyota's Mirai and FCHV-*adv* and VW/Audi's Golf Sportwagen HyMotion and A7 h-tron. The fuel cell transit

buses include 12 placed at AC Transit (Van Hool buses with UTC fuel cells) and 4 placed at Sunline Transit (1 Ballard/New Flyer and 3 Ballard/BAE/ElDorado).

Results

Specific accomplishments include:

- Automotive members placed over 500 fuel cell passenger vehicles on California roads from 1999 through 2015, including the first retail customers starting in 2005;
- Transit agency members have demonstrated 28 fuel cell buses since 1999, with 19 currently in operation (see technology description);
- There are six retail and six other public hydrogen fueling stations in operation in California. There are also 40 in development in California;
- CaFCP staff and members continue to train local fire departments and work with emergency response organizations to coordinate with state and national efforts;
- CaFCP, the Governor's Office of Business and Economic Development and the California Energy Commission, continue briefing city staff across the state of California to optimize station permitting.
- CaFCP, GO-BIZ, CEC and others, hosted briefings and permitting workshops across the state for local government staff and elected officials.

Benefits

Compared to conventional vehicles, fuel cell vehicles can offer zero or near-zero smog-forming emissions, reduced water pollution from oil leaks, higher efficiency and much quieter and smoother operation. If alternative or renewable fuels are used as a source for hydrogen, fuel cell vehicles will also encourage greater energy diversity, lower greenhouse gas emissions (CO_2) and lower criteria emissions.

By combining efforts, the CaFCP can accelerate and improve the commercialization process. The members have a shared vision about the potential of fuel cells as a practical solution to California's environmental issues and similar issues around the world. The CaFCP provides a unique forum where technical and interface challenges can be identified early, discussed, and potentially resolved through cooperative efforts.

Project Costs

Auto members provide vehicles, the staff and facilities to support them. Energy members engage in fueling infrastructure activities. The CaFCP's annual operating budget is about $2 million, and includes facility operating costs, program administration, joint studies and public outreach and education. Each member makes an annual contribution of approximately $85,000 towards the common budget. Some government agencies contribute additional in-kind products and services. SCAQMD provides an additional $50,000 annually to support a Southern California Regional Coordinator and provides office space for additional staff in-kind at SCAQMD. SCAQMD's contribution for 2015 was $134,800.

Commercialization and Applications

While research by multiple entities will be needed to reduce the cost of fuel cells and improve fuel storage and infrastructure, the CaFCP can play 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.

From 2013 to 2016, CaFCP's goals relate to Preparing for Market Launch through coordinated individual and collective effort. During this fourth phase, CaFCP members, individually or in groups, will focus on important goals.

- Prepare for larger-scale manufacturing, which encompasses cost reduction, supply chain and production.
- Work on the customer channel, including identifying and training dealers and service technicians.
- Reduce costs of station equipment, increase supply of renewable hydrogen at lower cost, and develop new retail station approaches.
- Support cost reduction through incentives and targeted RD&D projects.
- Continue research, development and demonstration of advanced concepts in renewable and other low-carbon hydrogen.
- Provide education and outreach to the public and community stakeholders on the role of FCEVs and hydrogen in the evolution to zero-emission electric drive.

SCAQMD Contract #13168 **December 2015**

CRADA: Develop, Integrate and Demonstrate Heavy-Duty Natural Gas Engines and Vehicles

Contractor

National Renewable Energy Laboratory

Cosponsors

SCAQMD
CEC
U.S. DOE
SoCalGas

Project Officer

Adewale Oshinuga

Background

On-road natural gas engines are now being used on a limited basis as an alternative to diesel engines in transit, refuse, and goods movement applications. While the number of these engines has grown, there is still a need to develop natural gas engines in the 11- to 14-liter range to fill the wide array of fleet applications currently served by diesel engines. As such, on March 4, 2011, the Board awarded a contract to the DOE's National Renewable Energy Laboratory to administer the development, integration, and demonstration of heavy-duty natural gas engines and vehicles.

Project Objective

The primary objectives of this project included the following:

- Develop a new, high-efficiency, high-performance, high-versatility, low-emissions, heavy-duty 11.9 liter natural gas engine and three-way catalyst after-treatment;
- Certify the new engine at or below EPA / CARB 2010 on-highway emission standards;
- Achieve fuel efficiency within 5-15% of comparable EPA/CARB 2010 on-highway certified diesel engines; and
- Achieve OEM availability in a range of vehicles commonly used by fleet operators in the North American regional haul and vocational Class 8 truck and tractor market.

Technology Description

The engine technology is a spark-ignited stoichiometric natural gas engines with cooled exhaust gas circulation (EGR) and a three-way catalyst (TWC) after-treatment system. The cooled EGR systems reduce engine NOx emissions by mixing incoming fresh air with a measured quantity of cooled exhaust gas to lower peak combustion temperature. The TWC converts NOx, CO, and HC to nitrogen, carbon dioxide, and water in the presence of a catalyst.

Status

Cummins Westport, Inc., (CWI), working as a subcontractor to NREL, successfully completed the project and developed a 11.9-liter ISX12 G engine as a spark-ignited, stoichiometric, cooled exhaust gas recirculation (SI-EGR), natural gas engine certified to the EPA/CARB heavy-duty on-highway 2013 emission standards. CWI commercially launched the ISX12 G engine with ratings up to 350 HP and 1450 lb-ft beginning in mid-April 2013, and with ratings up to 400 HP and 1450 lb-ft in August 2013. This engines will be used in refuse, transit and Class 8 heavy-duty truck applications.

ISX12 G Engine

Results

The ISX12 G engine meets EPA greenhouse gas legislated requirements and Engine Manufacturer's Diagnostics (EMD+) certification. The ISX12 G engine met final certification (including Deterioration Factor) at:

- 0.15 g/bhp-hr NOx for both EPA and CARB
- 0.03 g/bhp-hr NMHC for both EPA and CARB
- 8.4 g/bhp-hr (EPA) and 8.7g/bhp-hr (CARB) CO
- Less than 0.003 g/bhp-hr PM

Benefits

The ISX12 G engine is certified to the EPA/CARB heavy-duty on-highway 2013 emission standards and also meets EPA greenhouse gas legislated requirements and Engine Manufacturer's Diagnostics (EMD+) certification. It is now being used as alternative to diesel engines in various applications which require high-horsepower engines.

Project Costs

This project was originally part of a natural gas engine development and demonstration program for three projects. The program cost was estimated to be $15,245,000, of which SCAQMD provided $2,555,000 in addition to $500,000 in cofunding from SoCalGas. The U.S. DOE, CEC, and private partners provided the remaining $12,190,000 in direct funding and in-kind contributions. The other two projects were discontinued because one subcontractor went out of business, and the other lacked financial support. Since the program was not completed, the cost of this project was $3,607,651, of which SCAQMD provided $797,629.

Commercialization and Applications

The ISX12 G engine is now available as a factory-installed option in a number of Class 8 truck and tractor models from different OEMs including Autocar, Freightliner, Kenworth, Mack, Peterbilt, and Volvo. This engine will be used in refuse, transit and Class 8 heavy-duty truck applications.

SCAQMD Contract #07243 **December 2015**

Purchase and Install New Public Access L/CNG Fueling Station

Contractor
City of Commerce

Cosponsors
Federal Transit Administration
MSRC/AB 2766 Discretionary Program
Caltrans
SCAQMD
City of Commerce

Project Officer
Larry Watkins/Phil Barroca

Background
To comply with SCAQMD's fleet rules, the City of Commerce began to transition its transit fleet to CNG. In 2003, the City of Commerce began planning for the installation of a new L/CNG facility. The new station would provide convenient, local refueling for the City's 11 CNG transit buses, which since 2009 had been fueling at a CNG station in Bellflower, as well as accommodate City plans to expand its natural gas fleet. It would also allow for refueling by other local alternative fuel fleets including private waste sanitation companies, taxicabs and limos and could be a convenient refueling location for Port drayage trucks. The site chosen was the Los Angeles County Sanitation District's Waste-to-Energy facility located at 5940 Shelia Street in the City of Commerce. The site is near the intersection of Washington Boulevard and Interstate 5.

Project Objective
The objective of this project was to design, construct and commission a new publicly accessible L/CNG refueling station that would serve the needs of the City of Commerce and other private and municipal fleet users. The station would also help achieve the goal of reducing air pollution in and around the Commerce community as well as continue development of the Interstate Clean Transportation Corridor (ICTC), which fosters alternative fuel vehicle infrastructure development for heavy-duty vehicles throughout California and into Nevada, Utah and Arizona.

Technology Description
The L/CNG fueling station consists of a 15,000 LNG storage vessel mounted on a containment area designed to accommodate a second vessel in the future. Fuel is produced in Boron, CA, with LNG trailers filling the storage vessel by means of a dedicated LNG transfer pump. The LNG tank feeds LNG to a single submerged-type multi-purpose LNG pump that delivers LNG to both an LNG dispenser and to a high pressure reciprocating L/CNG pump. The LNG system includes an LNG conditioner (saturation coil) designed to maintain the saturation pressure between 65 and 125 psig within the storage vessel. The station includes one LNG dispenser located adjacent to the containment area. CNG is produced by pumping the LNG through a high-pressure vaporizer to produce CNG, which is odorized and stored in a bank of high-pressure storage containers (high, mid and low). The CNG storage supplies CNG through a CNG priority panel to two dual-hose CNG dispensers–one transit type and one regular type–located on a new CNG dispenser island. A Programmable Logic Control system is integrated to control all LNG/LCNG functions. The station also includes a card reader for credit card purchases.

Status
After a three-year process, the station was commissioned in August 2010.

Figure 1: New L/CNG Fueling Station

In November 2007 the City of Commerce was granted a Categorical Exclusion by FTA to construct its station and an RFP to solicit design-build proposals was released on September 2, 2008. The City Council awarded the contract to General Physics and a ground-breaking ceremony was held on April 29, 2010. Construction included site preparation, civil work, demolition and/or relocation of existing facility equipment, and the new station included all equipment, controls, containment areas, piping, electrical connections, paving, fencing, lighting, signage, and landscaping. The start of construction was delayed because the soil at the existing site was not dense enough to support the weight of the L/CNG station so the contractor had to re-compact the soil at the site before construction began. Further delays were caused by a lengthy permit review process and inclement weather. The station opened 24/7 to the general public in September 2010, with a formal ribbon-cutting ceremony conducted on August 5, 2010. The SCAQMD contract ended December 31, 2015, after five years of reporting.

Results

When the City introduced its new CNG transit fleet in early 2009, it resulted in a 90 percent reduction in emissions over the old diesel buses. The new L/CNG station has now allowed the City to fuel transit buses within one mile of its Transportation Department facility, realizing a reduction of 90 cents per gallon in costs or an estimated annual savings in fuel costs of $80,000.

Figure 2: City of Commerce transit bus fueling at the new L/CNG station

Annual throughput was estimated at 347,000 gallons of LNG by the end of the third full year of operation. This table reflects actual throughput during the five years of reporting required by the SCAQMD.

Year	City	Third Party	Total LNG Sales in GGE
2011	92,627	115,915	208,542
2012	98,707	395,539	494,246
2013	115,420	804,707	920,127
2014	125,064	999,830	1,124,894
2015	131,056	846,952	978,008

Benefits

In addition to enhancing the regions clean fuel infrastructure, the new L/CNG station is one more step towards reducing dependence on imported oil, with 98 percent of the LNG fuel used at the station coming from domestic fuel sources.

Project Costs

SCAQMD's cost-share was eight percent of the total.

FUNDING SOURCE	AMOUNT
Federal Transit Administration	$2,198,997
Caltrans	$273,577
MSRC/AB 2766 Discretionary Fund	$350,000
SCAQMD-Clean Fuels	$250,000
City of Commerce, Transportation Development Act, Article 4	$110,674
City of Commerce, Measure R Clean Fuels & Miscellaneous	$38,739
City of Commerce, Capital Improvement Program	$68,602
TOTAL	**$3,290,589**

Commercialization and Applications

The new L/CNG fueling station is similar to other stations in Southern California; however, its location specifically helps foster growth in the regional heavy-duty natural gas vehicle fleet. In fact, the 1,000 new LNG trucks deployed in 2011 nearby the Ports of Los Angeles and Long Beach will now have a convenient fueling location near the BNSF and Union Pacific railyards in Commerce.

SCAQMD Contract #07309 **June 2015**

Repower One Off-Road Construction Vehicle

Contractor
Post Company Grading

Cosponsor
SCAQMD
Post Company Grading

Project Officer
Vasken Yardemian

Background
Based on the California Air Resources Board (CARB) OFFROAD 2006 emission model, there were approximately 68,600 diesel-powered off-road construction vehicles in the South Coast Air Basin in 2006, which together produced approximately 120 tons of NOx and 7.5 tons of PM emissions per day. In order to reduce diesel emissions of NOx and PM, the SCAQMD has provided incentive funding to operators of diesel-powered off-road construction vehicles to go beyond regulatory requirements to repower, or replace their engines with newer and cleaner ones.

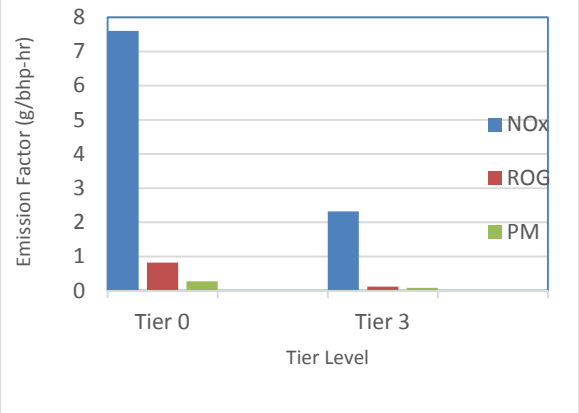
On April 6, 2007, the SCAQMD Board awarded a contract to Post Company Grading to repower one Tier 0 diesel-powered dozer (off-road construction vehicle) with a new Tier 3 diesel engine in an amount not to exceed $92,244 from the Clean Fuels Fund. This project was one of several funded projects as part of a required match for the Carl Moyer Air Quality Standards Attainment Program (Carl Moyer Program) and was administered according to the 2005 Carl Moyer Program Guidelines.

Project Objective
The purpose of this project is to reduce emissions from construction equipment through the repower of one diesel engine dozer to meet the CARB Tier 3 emission standards of 2.32 g/bhp-hr of NOx, 0.12 g/bhp-hr of ROG and 0.088 g/bhp-hr of PM10.

Technology Description
A repower is the replacement of the existing engine with a new lower-emission CARB-certified engine. The repower consisted of removing the existing engine and accessory components and installing a new engine and associated accessory components. The repower was performed by Quinn CAT, an independent Caterpillar dealership using Caterpillar factory engine and accessories along with specially fabricated components (brackets, wire harnesses, hoses, etc.) needed to fit the new engine into the existing vehicle.

Repower is typically more cost effective in reducing emissions than replacing a vehicle, due to the higher cost of a new vehicle compared to just a new engine. The emission reduction from Tier 0 to Tier 3 is 70% for NOx, 85% for ROG (reactive organic gases) and 68% for PM. The following chart illustrates the difference in emissions between Tier 0 and Tier 3 engine emission factors.

Figure 1: Carl Moyer Program Emission Factors



Status
The project was scheduled to be completed by June 2008. However due to the economic downturn of the construction industry and the

non-availability of Tier 3 engines, SCAQMD agreed on an extension of the contract till November 2008. The dozer was placed in service thereafter. The Contractor made all the operational information for the vehicle available to SCAQMD including the annual hours of operation. According to the Contractor, the vehicle performed well; however, it ran hot from time to time. No major problems to report. The project life was seven years.

Figure 2: Caterpillar D9N Dozer Repowered to Tier 3

Results

The repowered vehicle was inspected by SCAQMD to confirm that the repower was completed properly, the old engine was permanently destroyed and the repowered vehicle was fully operational.

Benefits

The emissions benefit of the repower was calculated according to the Carl Moyer Program Guidelines. The Tier 3 engine in the repowered dozer was estimated to reduce emissions by 2.24 tons per year of NOX+ROG and 0.07 tons per year of PM10 compared to the original Tier 0 engine.

Project Costs

The total actual cost of the project was $121,942. The cost of the new Tier 3 engine and parts was $95,900 and the labor cost was $26,041. SCAQMD's funding contribution was $92,244, paid to the contractor from the Clean Fuels Fund. Originally the project cost was estimated at $140,344. However, Quinn CAT, the repowering company, issued a $15,000 discount on the labor.

Commercialization and Applications

Repower technologies using Tier 3 diesel engines for off-road construction vehicles are commercially available for a variety of off-road equipment. The current emission standard is Tier 4 and repowers using Tier 4 engines are generally not technically feasible in older off-road vehicles. Preference is now being given to replacement projects using new equipment meeting Tier 4 standards.

SCAQMD Contract #07312 **June 2015**

Repower of 11 Off-Road Construction Vehicles

Contractor
Mesa Contracting Corporation

Cosponsor
SCAQMD
Mesa Contracting Corporation

Project Officer
Mark Coleman

Background
Based on the California Air Resources Board (CARB) OFFROAD 2006 emission model, there were approximately 68,600 diesel-powered off-road construction vehicles in the Basin in 2006, which together produced approximately 120 tons per day of NO_x and 7.5 tons per day of PM emissions. In order to reduce diesel emissions the SCAQMD has provided incentive funding to operators of diesel powered off-road construction vehicles to upgrade to cleaner technology.

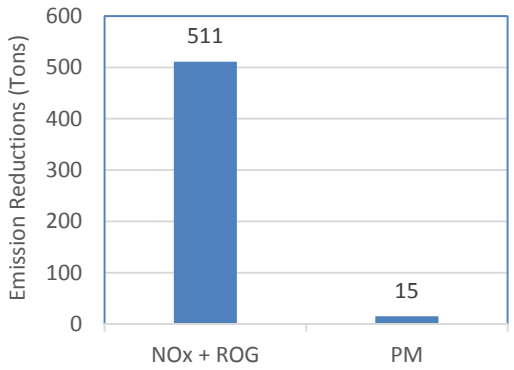
On April 6, 2007, the SCAQMD Board awarded a contract to Mesa Contracting Corporation to repower thirteen Tier 0 diesel-powered off-road construction vehicles with new Tier 3 diesel engines in an amount not to exceed $1,062,007 from the Clean Fuels Fund. This project was one of several funded as part of a required match for Carl Moyer Memorial Air Quality Standards Attainment Program (Carl Moyer Program) projects and was administered according to the 2005 Carl Moyer Program Guidelines.

Project Objective
The purpose of this contract was to reduce emissions from diesel powered off-road construction vehicles by repowering them to meet CARB Tier 3 emission standards, the most stringent at that time.

Technology Description
Repower is the replacement of the existing engine with a new lower-emission CARB-certified engine. The repower consisted of removing the existing engines and accessory components and installing new engines and accessory components. The repower was performed by an independent Caterpillar mechanic using Caterpillar factory engines and accessories, and using specially fabricated components (brackets, wire harnesses, hoses, etc.) needed to fit the new engine into the existing vehicle.

Repower is more cost effective in reducing emissions than replacing the vehicle due to the much higher cost of a new vehicle compared to the cost of a new engine. The following chart illustrates the repowered construction equipment emission reductions for the seven-year project life.

Figure 1: Emission Reductions for Repower of 11 Off-Road Vehicles



Status
Eleven scrapers of the type shown below were repowered in 2008. Beginning in 2008, construction activity was substantially reduced due to the severe economic recession. As a result, the contractor did not repower the remaining off-road construction vehicles. Unspent contract funds were returned to the Clean Fuels Program Fund for use on other projects.

Figure 2: Caterpillar 651B Scraper Repowered to Tier 3

Results

The repowered vehicles were inspected by SCAQMD to verify that the repower was completed properly, the old engines were destroyed, and the repowered equipment was fully operational.

Benefits

The emission benefits of the repowers were calculated according to the Carl Moyer Program Guidelines. The Tier 3 engines were estimated to reduce emissions by 73 tons/year NOx+ROG and 2.2 tons/year PM compared to the original Tier 0 engines.

Project Costs

A total of $898,622 from the Clean Fuels Program Fund was paid to the contractor. In addition, the contractor paid another $320,654 for a total project cost of $1,219,276. A total of $163,385 was returned to the Clean Fuels Program Fund.

Commercialization and Applications

Repower technologies using Tier 3 diesel engines for off-road construction vehicles are commercially available for a variety of off-road equipment. The current emission standard is Tier 4 and repowers using Tier 4 engines are generally not technically feasible in older off-road vehicles. Preference is now being given to replacement projects using new equipment meeting Tier 4 standards.

SCAQMD Contract #07236 **December 2015**

Collaborative Lubricating Oil Study on Emissions (CLOSE)

Contractor
National Renewable Energy Laboratory (NREL)

Cosponsors
Southwest Research Institute (SWRI)
Desert Research Institute (DRI)

Project Officer
Joseph Impullitti

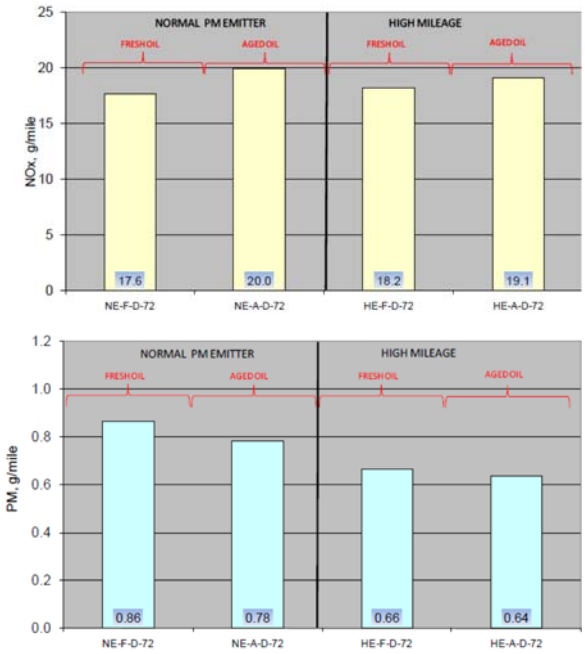
Background
According to official government inventories, mobile sources currently account for a third of the directly emitted PM2.5 emissions in California's South Coast Air Basin (SoCAB), with gasoline-powered vehicles accounting for less than 10% (CARB, 2008). However, model predictions have shown that gasoline-powered vehicles may account for 60% of the total predicted secondary organic aerosols (SOA) in the SoCAB during summer (Kleeman et al., 2007).

Project Objective
The objective of this project was to conduct chemical and physical characterizations of particulate matter (PM) emissions from a limited number of vehicles fueled respectively with gasoline, E10, diesel, biodiesel, and natural gas while operating on fresh and used crankcase lubricants in an effort to investigate methodologies to indicate how fuels and crankcase lubricants contribute to the formation of PM and semi-volatile organic compound (SVOC) emissions in vehicle exhaust.

Technology Description
This project was initiated to characterize particulate matter (PM) emissions from four vehicle types operating on multiple fuels and lubricants at two test temperatures. The four vehicle types studied were: light-duty gasoline passenger cars, medium-duty diesel trucks, heavy-duty natural gas fueled transit buses, and heavy-duty diesel transit buses. Two vehicles of each vehicle type were selected and studied: one normal PM emitting vehicle and one high PM emitting (or high mileage) vehicle. PM characterizations were carried out to investigate whether the relative contribution of lubricant to particulate could be estimated, and whether the lubricant contribution to PM changed with different fuels and lubricant compositions.

Status
The CLOSE project was a pilot program to investigate methodologies to indicate how fuels and crankcase lubricants contribute to the formation of particulate matter (PM) and semi-volatile organic compounds (SVOC) in vehicle exhaust. It was conducted with a very limited number of vehicles, some of which did not have the latest engine and emission system technology, and no vehicles in this study were equipped with particle traps. The results of this study are not representative of the whole fleet of on-road vehicles. Long term lubricant effects on engine and after-treatment were not investigated in this study.

Results
Average regulated gaseous emissions, PM emissions, and fuel consumption rates while operating the vehicles with fresh and aged oil are included. Standard deviations and co-variances of the replicate tests are also provided (each replicate being comprised of one cold start and one hot start heavy-duty driving cycle [HDDC] test). All heavy-duty emission tests were conducted at a nominal 72ºF ambient temperature. Repeatability of the emissions from the replicate tests was good. As shown in Fig. 1, hydrocarbon rates measured from the normal emitter (NE) bus on aged oil showed the greatest variability between the two replicate tests with a covariance of 15 percent. NOx emissions from the NE also exhibited higher variability with a covariance of 11 percent on fresh oil. In addition, hydrocarbon emissions from the high mileage (HM) bus with high blow-by on aged oil showed a covariance of 11 percent, but all other emission rates exhibited lower variability with co-variances below 10 percent.



NOx and PM Comparative of Fresh and Aged Oil

For the normally-operating light-duty gasoline and medium-duty diesel vehicles and for both heavy-duty natural gas vehicles, fresh oil produced more particles than aged oil. The opposite trend occurred with the light- and medium-duty high PM emitters. This effect was not readily apparent with the heavy-duty diesel vehicles. One explanation could be that, since the lubricant represented a much smaller fraction of the total PM (around 20 percent) in the HD diesel vehicles, the effect was lost in the precision of the testing methodology.

In many cases, emitted PM was incompletely accounted for with chemical analyses. It is possible that some fraction of unburned and/or partially combusted fuel and oil, or some polar fraction of PM, was not measured with the analytical techniques used in this program.

Follow-up studies should assess the methods of PM allocations used in this study on vehicles representing the diverse spectrum between normal emitters and high emitters, and should estimate the precision of the allocations obtained by running multiple analyses. Vehicles should be tested with fuels without hopanes and steranes in order to help clarify the potential confounding (or lack thereof) when markers are parented by both fuel and lubricant. Studies should be conducted to understand the relative frequency of various types and intensities of 'high emitters' to facilitate modeling of the on-road vehicle fleet.

Future Work

Future work could consider testing emissions from diesel vehicles equipped with normally-functioning particle filters to determine if this type of after-treatment system produces similar results. Also, it would be informative to utilize the latest engine and emissions system hardware for all the vehicles to determine if the considerable efforts by regulators and OEMs have impacted PM levels. Noting that aged lubricants sometimes produce less PM than fresh oil, it would be interesting to investigate the effects of base oil volatility and type (i.e., mineral-based versus synthetic) on PM and SVOC formation.

Project Costs

The total cost of the project was $446,887. The table below shows the breakdown of the funding for the project:

Funding Source	Amount
SCAQMD	$100,000
CARB	$100,000
NREL	$246,887
Total:	$446,887

Commercialization and Applications

The U.S. Environmental Protection Agency (EPA) revised the National Ambient Air Quality Standards (NAAQS) for PM10 and PM2.5 in October 2006, revoking the annual PM10 standard and lowering the 24-hour PM2.5 standard to 35 µg/m3. The existing annual 24-hour standards for PM10 and PM2.5 (150 µg/m3 and 15 µg/m3, respectively) were retained. Control plans for the 2006 standards are to be submitted to EPA in the 2012-13 timeframe for areas that are in nonattainment. In preparing these plans, State and local agencies are using emissions models and chemical transport models to identify and evaluate potential emission reduction measures.

To supplement current knowledge of particulate emissions from mobile sources, and to investigate methods to identify the sources of compounds which make up particulate, the CLOSE project was undertaken with support from Federal, State, and local government agencies and industry.

SCAQMD Contract #09303 **January 2015**

Install an Approximate 40kW (AAC) Crystalline Silicon System at SCAQMD Headquarters

Contractor
PermaCity Solar

Cosponsor
SCAQMD

Project Officer
Patricia Kwon

Background

On October 3, 2008, the Board approved the execution of contracts to install two new photovoltaic (PV) systems at the SCAQMD facility in Diamond Bar, CA. The SCAQMD currently owns and operates two solar PV installations, an 80 kW (AC) system on the main building and a 20 kW solar carport.

Project Objectives

The objective of this project was to compare the performance of thin film and crystalline silicon PV modules, as well as add solar capacity for the facility. The project demonstrated two different PV technologies on the roof above the conference center. SCAQMD tested the performance and reliability of the two systems under similar light conditions. This contract report is for the PermaCity contract effort.

Technology Description

For the PermaCity crystalline silicon system, 144 Schott ASE-300DGF/50-310 (310 watt) modules and an SMA America ST 42 (277 volt) inverter (96% efficiency) were installed for an overall system output of 44.64 kW DC. This system utilized multi-crystalline photovoltaic modules, as compared to Solar Integrated Technologies' (SIT's) amorphous thin film modules, tilted at a 15 degree angle.

Status

This project was completed on June 17, 2009. During the project, there were some delays in the delivery of equipment. This issue was solved by working as efficiently as possible to keep the crew on schedule despite the delayed delivery. Since there were two separate systems and one rebate, a combined single line diagram was submitted to the City of Diamond Bar for permitting. The existing SCAQMD single line diagram was several years old and did not include four turbine engines so the single line diagram was updated. SIT was contracted to re-roof underneath the modules, delaying the project by two days. Southern California Edison mandated an unanticipated $1,041 new meter charge that was split between PermaCity and SIT.

One of the inverters utilized in PermaCity's Sunny Tower inverter malfunctioned and had to be repaired and later replaced in January 2010, as well as a broken Schott module replaced under warranty in February 2010. Data for this inverter had not been reporting since September 2009, and began reporting again in February 2010.

SCAQMD, Fat Spaniel Technologies, and PermaCity collaborated on the monitoring system and solar kiosk. In July 2010, the kiosk was upgraded to Solar Plant Vision from Fat Spaniel to separately monitor the performance of the two new solar installations as well as the first 80 kW solar installation. The kiosk experienced intermittent problems since its installation in August 2009 due to the kiosk being overloaded from too much data. Later the kiosk was replaced and upgraded by Solar City to run on a new Windows software platform and replace the 100 kW SatCon inverter gateway providing performance monitoring of the 80 kW system. Three solar PV systems totaling 160 kW were installed on the rooftop of SCAQMD's Diamond Bar headquarters building in May 2006

(80 kW), July 2009 (40 kW) and December 2009 (40 kW). The performance and production statistics of the three systems were monitored and displayed on an interactive touch-screen kiosk in the main lobby ground-level entrance.

Results

Over its lifetime, the PermaCity crystalline silicon solar installation will produce 2,764,320 kilowatt hours of electricity, preventing release of 3,427,764 pounds of C02 to be released into the air, 1,106 tons of coal to be burned and will save the equivalent of 442 acres of forest. Production data for both system is shown in Figure 1.

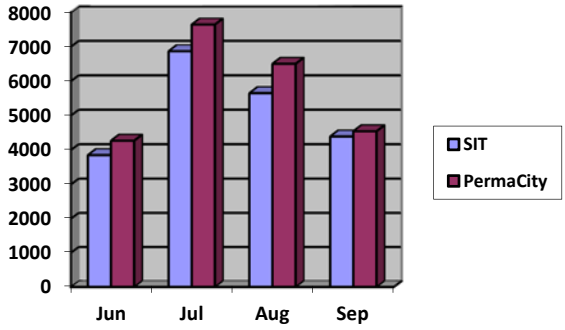


Figure 1: Solar Production

Benefits

Estimated CO2 reductions for both solar PV installations are approximately 78 tons/year using the California GREET model. The solar installation will, over the course of its lifetime, prevent release of 3,427,764 pounds of C02 to be released into the air, 1,106 tons of coal to be burned and will save the equivalent of 442 acres of forest. These numbers were reached by utilizing the GREET model, an emissions reduction calculator provided by the EPA[1].

The environmental cost of production for these modules is offset after between 1.5 - 3 years of energy production[2]. Since crystalline modules, unlike most thin film modules, do not utilize toxic cadmium in their production, there is no environmental concern regarding contamination.

Project Cost

The costs of this installation was on budget. As this was a project for SCAQMD, the entire cost of the system which totaled $387,162 was paid by SCAQMD. The entire Performance Based Incentive from Southern California Edison was received over a five-year period ending in 2015.

Commercialization and Applications

Both crystalline and thin film solar modules are already commercial products. They have both demonstrated their efficacy and applications in the renewable energy generation field. The increased demand for renewable energy has led to mass production of solar modules making them an affordable, widely available commercial product. However based on the performance of both technologies at the SCAQMD headquarters facility, it appears that multi-crystalline silicon modules performed better overall than thin film silicon modules.

[1] http://www.epa.gov/RDEE/energy-resources/calculator.html

[2] Alsema, E.A.; Wild - Scholten, M.J. de; Fthenakis, V.M. *Environmental impacts of PV electricity generation - a critical comparison of energy supply options* ECN, September 2006; 7p. Presented at the 21st European Photovoltaic Solar Energy Conference and Exhibition, Dresden, Germany, 4-8 September 2006.

SCAQMD Contract #13030 **April 2015**

Demonstrate a 300kW Molten Fuel Cell with an Exhaust-Fired Absorption Chiller

Contractor
University of California, Irvine

Cosponsors
California Energy Commission
FuelCell Energy
Southern California Gas Company
UC Irvine Medical Center
SCAQMD

Project Officer
Joseph Impullitti

Background
In California, a substantial potential exists to capture generator waste heat with an absorption chiller and provide air conditioning to meet a wide spectrum of applications that have significant cooling demands throughout the year. Such combined cooling, heat and power (CCHP) systems offer benefits of increased energy efficiency and reduced emissions of both criteria pollutants and greenhouse gases (GHGs). Needed is an ultra-clean, integrated generator/absorption chiller product to enable the California market.

Project Objective
The objectives of the project were to (1) design, deploy, commission, and operate a megawatt class high temperature fuel cell/absorption chiller (HTFC/AC) system, (2) characterize the criteria and pollutant emission reductions, (3) develop complementary HTFC/AC performance and economic models, (4) deploy a wide array of monitoring sensors to capture performance and inform the system models, (5) evaluate the performance and market value of the product in California, and (6) advance market engagement.

Technology Description
High-temperature fuel cells (HTFCs) have an unusually high electrical efficiency and high-quality exhaust heat temperature, and emit virtually zero criteria pollutants. The high quality heat can be recovered through absorption chilling (AC) for air conditioning and thereby (1) displace electricity required today for electric chillers, (2) substantially reduce the emission of criteria pollutants and GHGs, and (3) increase the reliability and reduce operating costs for the customer.

The strategy integrated a FuelCell Energy 1.4MW high temperature molten carbonate fuel cell with a BROAD 200 ton absorption chiller. A critical care facility, the UC Irvine Medical Center (UCIMC), was selected for the installation. For market engagement, a dedicated conference room was equipped to present the system design and operating principles, as well as the current and historic performance to developers and energy managers.

Status
The system and economic models were completed and utilized to design the HTFC/AC system. For the purposes of scaling, a 300kW/40Ton system was considered as well as the 1.4MW/200Ton system actually deployed. A Power Purchase Agreement was successfully negotiated between FuelCell Energy and UCIMC, and funds from the California

Figure 1: Fuel Cell

Figure 2: Absorption Chiller

Public Utilities Commission Self-Generation Incentive Program (SGIP) were successfully reserved. The system was installed under the leadership of the Otto H. Rosentreter Company, and the system is on track for commissioning in December 2015 upon completion of the interconnection agreement with Southern California Edison.

While a number of unscheduled hurdles delayed the original schedule of deployment, two were especially challenging. The first was the suspension of the SGIP that began in December 2010 and lasted more than a year before the revised SGIP process was fully implemented. The second was the interconnection agreement that was initially scheduled to be completed within months but extended to one year.

Results

The performance and economics models were applied to calculate the following projected emissions and costs associated with HTFC/AC installations.

Air Pollutant	CO_2	NO_x	SO_x
Emission Level (lb/MWh)	854	0.0087	0.00009

If the electricity and chilling generated to serve all of the commercial building loads in the Southern California Edison (SCE) service territory were generated by HTFC/AC technology, CO2 emissions would decrease by 3,272 million metric tons per year, NOx emissions would decrease by 5,470 metric tons, and SOx emissions would decrease by 171 metric tons.

Cost	FCE 1.4 MW DFC1500
Installation Cost ($/kW)	3300
Fixed Operation and Maintenance Cost ($/kW-yr)	200
Levelized Cost of Electricity (LCOE) ($/MWh)	101

The levelized cost of electricity (LCOE) goes down as the capacity factor of the installation goes up. The more the system operates, the greater the output of useful products and the lower the LCOE. The LCOE is minimized when the HTFC operates around-the-clock as a base load generator and the chiller maximizes the use of the high-quality heat. A sensitivity test, conducted to evaluate the impact of future HTFC/AC system scenarios, revealed that the fuel cell efficiency and natural gas price had the biggest effect on LCOE, with lower natural gas price and higher fuel cell efficiency resulting in a lower LCOE.

Due to the delay in installation and commissioning, no data on the unit operation are currently available. Data will be gathered from the installation at the UCIMC to both document performance and evaluate the model predictions. This activity is scheduled to commence in December, 2015.

Benefits

HTFC/AC technology has the combined benefits of (1) reducing the emissions of GHGs and criteria pollutant emissions associated with electricity generation, distribution and use, (2) enhancing the economy through technology advancement, employment, and education, (3) reducing the cost-of-electricity, and (4) increasing the reliability and power quality of electricity.

Project Costs

The total project cost was $35.1M. The project was funded by the California Energy Commission, Southern California Gas Company, the SGIP, the UCIMC, FuelCell Energy, and the SCAQMD. The contribution from the SCAQMD was $257,500.

Commercialization and Applications

An objective of the project is to enable the HTFC/AC market, a technology particularly well-suited to California. To accomplish this, a practical installation of HTFC/AC technology was completed at a highly visible location, a metering network was integrated into the design to monitor the performance of the system and components of the system, and a conference room was established to showcase the technology to the market. Market penetration is expected to lead to capital and O&M cost reductions, and facilitate corresponding GHG and criteria pollutant emissions reductions.

The knowledge and experience derived from this project has the potential to benefit the public by furthering the understanding of HTFC/AC technology. The fuel cell and absorption chiller is readily available through FuelCell Energy and BROAD U.S.A. Incorporated, respectively. This technology can be implemented at any location which has access to natural gas or biogas.

SCAQMD Contract #15347 **November 2015**

Develop Retrofit Technology for Natural Gas Engines and In-Use Emissions Testing of On-Road Heavy-Duty Trucks

Contractor

West Virginia University

Cosponsors

SCAQMD
CARB

Project Officer

Adewale Oshinuga

Background

The SCAQMD funded a research program at West Virginia University (WVU) to develop a retrofit technology for stoichiometric natural gas engines capable of simultaneous reduction of NOx and ammonia emissions. In addition, the study jointly funded a program with CARB to evaluate heavy-duty diesel vehicle emissions during real-world operating conditions using a transportable CVS measurement system.

Project Objective

The study was divided into two phases, a) Phase I: evaluate real-world emissions from seven heavy-duty diesel vehicles fueled by diesel and natural gas using a transportable emissions measurement system (TEMS) and a suite of portable emissions measurement systems (PEMS), b) Phase II: research multiple pathways of a passive SCR system for abatement of ammonia and NOx emissions from three-way catalyst (TWC) equipped on-road natural gas engines.

Technology Description

Phase I: Seven vehicles were tested primarily in Southern California on desert routes, freeway operation, and port drayage operation simulated at the Ports of L.A., urban delivery routes in Irvine and in Central Valley over the Interstate 99 corridor. Vehicles were tested using the TEMS, which houses a full-scale dilution tunnel with laboratory-grade emissions analyzers. In addition, the study used three different PEMS instruments, namely, Horiba OBS 2200, SEMTEC DS and the AVL MOVES system. A high-speed FTIR was used for measuring real-time greenhouse gas and ammonia emissions from the vehicles. The test routes represented real-world driving conditions in Southern California. The study included a MY 2008 diesel truck to establish baseline emissions for a non-SCR equipped vehicle.

Phase II: WVU tested three SCR formulations provided by Corning and AP Exhaust. The formulation varied in cell density and catalyst loading. The hypothesis of Phase II was to employ SCR catalyst as a passive ammonia storage system that can use the NOx slip from TWC as a source to regenerate the stored ammonia while further reducing NOx. An aging catalyst will have lower selectivity to NOx reduction and as a result have increased NOx emissions. Therefore, a passive SCR system with TWC as the onboard ammonia storage can effectively lower the NOx profile of CNG through its useful life.

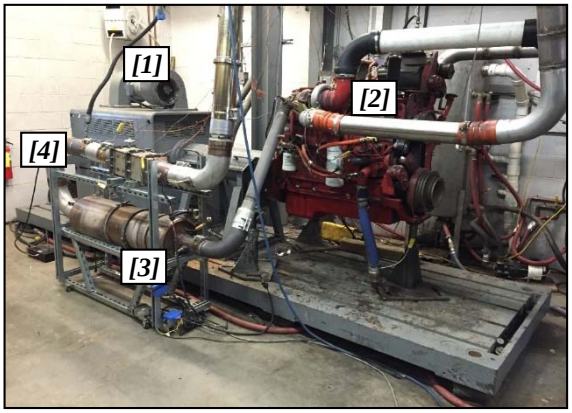


Figure 1: WVU Engine Testing Laboratory; [1] AC 300HP high speed dynamometer, [2] Cummins ISLG320, [3] Three-way Catalyst (TWC), [4] Passive selective catalyst reduction (SCR) for NH3 and NOx reduction

The project was successfully completed and the final report is being prepared. Extensive data from real-world testing of heavy-duty vehicles were collected from Phase I and a retrofit ammonia and NOx abatement technology was developed as part of Phase II.

Results

Phase I: The results show that the highway operation resulted in the lowest emissions from all vehicles. Vehicle 7 (DPF-SCR equipped) showed the lowest emissions on highway operating conditions. The near-dock operation characterized by extended idle and creep mode operation resulted in the highest NOx emissions from the diesel vehicles. The average NOx emissions of diesel vehicles using DPF and SCR were 96% lower than a MY 2008 diesel vehicle over the regional cycle. The natural gas truck emissions were 50% lower than DPF-SCR equipped diesel over the regional cycle. The natural gas vehicle (vehicle 3) showed 88% lower NOx emissions during near-dock port operation compared to the average of all DPF-SCR equipped diesel vehicles.

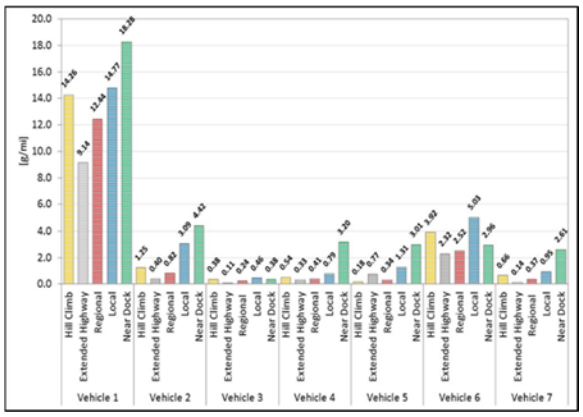


Figure 2: shows the distance-specific NOx emissions from the test vehicles over the road measured using the TEMS

Phase II: SCR 2 formulation showed the highest NOx conversion efficiency of 56.9% and the lowest NH3 reduction of 63.6%, while the SCR 3 formulation resulted in the highest NH3 reduction of 82.5%, with slight reduction in NOx conversion to 53.9% compared to SCR 2 formulation. As a further extension to this Phase, WVU is working with engine controls to change the air-fuel ratio (AFR) of the stoichiometric engine between rich mode (NH3 production mode) and lean mode (NH3 regeneration mode). It is believed that this approach could result in an engine calibration that could run on a leaner air fuel ratio for enhanced fuel economy. This could potentially increase the operating range of a stoichiometric natural gas engine.

In development of the passive SCR strategy it was found that the current pathway would vastly benefit from OEM input with engine calibrations tuned to regenerate and absorb ammonia emissions from TWC. Continuing work is done by WVU, beyond the scope of project.

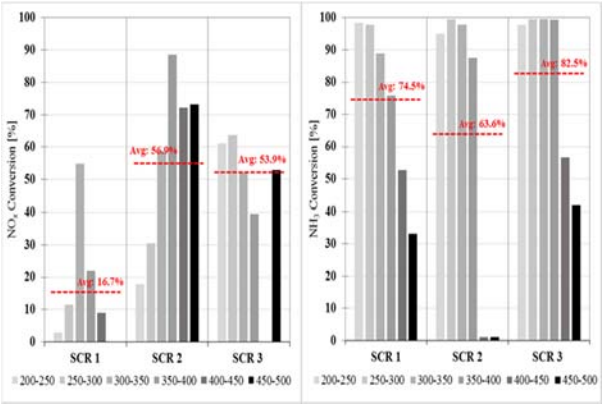


Figure 3: NOx and NH3 reduction efficiency results for varying temperature bins of three different tested zeolite SCR catalysts over an FTP cycle; [SCR 1] Iron (Fe) based low cell density zeolite catalyst, [SCR 2] Iron (Fe) based high cell density zeolite catalyst

Benefits

Phase I results show the advantages of CNG vehicles in urban goods movement applications with their low NOx characteristics. Phase II results show that a passive SCR strategy is a viable pathway to reduce simultaneously both ammonia and NOx slip from stoichiometric NG vehicles.

Project Costs

The total project cost was $490,000, with cofunding as follows: WVU, $50,000; CARB, $100,000; and SCAQMD, $390,000. The project was completed within the allocated budget.

Commercialization and Applications

The approach of frequently changing AFR to optimize ammonia and NOx reduction will also result in leaner operation of NG vehicles leading to a lower NG fuel consumption. However, implementation and commercialization of this strategy requires significant involvement by the OEM to provide calibration control of the engine. WVU proposes to approach Cummins Westport with the proposed strategy in order to evaluate its efficacy on a production engine.

SCAQMD Contract #11484 **January 2015**

Operate Truck Outreach Centers - Trucking Information Points (TIPs)

Contractor

Gladstein, Neandross & Associates LLC (GNA)
Advanced Transportation Technology & Energy Network of the California Community Colleges (ATTE)

Cosponsors

SCAQMD
U.S. DOE

Project Officer

Lori Berard

Background

The Trucking Information Points (TIPs) program is designed to reach heavy-duty truck owner-operators in the South Coast Air Basin. This demographic group was specifically targeted because they typically lack the time and resources to keep up to date on changing and developing regulations and policies that are germane to their livelihood. Outreach information includes regulations, funding opportunities, and resources to learn about advanced transportation technologies and training opportunities. To reach this group of truck owners and operators, an extensive website was created (www.tipsfortrucks.com) that links into information kiosks located at two customer service centers with support from a toll-free hotline for inquiries. The service centers are strategically located at the Port of Long Beach Terminal Access Center (TAC) and another at a truck maintenance and service center, J&R Fleet Services in Bloomington, CA, within the Inland Empire. The TIPs service centers are free-standing, computerized information kiosks equipped with connection to the tipsfortrucks.com website, touch screen browsing, and printing capabilities.

Project Objective

GNA's objective was to create bi-lingual, easy to understand terminology relating to specific regulations, funding opportunities, and advanced transportation technologies, and to place this information on the web and in easily accessible places for the target audience of small-fleet or single-truck owner-operators engaged in goods movement within the South Coast Air Basin.

The purpose of this project is to help the clientele to be better equipped to assess their regulatory status and to understand the technology and equipment solutions that they may need. Ultimately, the TIPs program will enable truck owner-operators to maintain their course of business while helping California to reach its emission reduction goals.

TIPs kiosk at J&R Fleet Servicesin Bloomington, CA

Technology Description

This project involves the design and content of an information web site (www.tipsfortrucks.com) and two stand-alone kiosks with the following components:

- Touch-screen display monitor
- Wi-Fi and hard-wire internet connection
- Internal black and white printer with paper spool

- Targeted signage displaying website prominently
- Website featuring regulatory language from the California Air Resources Board and the SCAQMD, funding opportunity descriptions for California opportunities, and advanced transportation technologies and training resources.

Status and Results

GNA has installed the kiosks at J&R Fleet Services, just east of the junction of Interstates 10 and 15 in Bloomington, California and at the Port of Long Beach, Terminal Access Center in Long Beach, California.

The website is up and running with all of the relevant information displayed in English and in Spanish. Users have been accessing the information from many locations, and new users are added each quarter.

Kiosk Usage Statistics	Quarter 1	Quarter 2
Sessions	87	20
Users	34	10
Page Views	643	109
Pages / Session	7.39	5.45
Avg Session Duration	00:03:18	00:00:48
% New Sessions	29.89%	45%

Benefits

The successful installation of the information kiosks has placed informational resources where the disparate and highly mobile target demographic group frequent and congregate the most. Whether or not the drivers have the time to browse the information where the kiosks stand, they are exposed to the web address and may access the crucial information wherever they have internet connectivity. For the purposes of outreach, this project achieves the goal of providing the best effort to support this community of drivers. For the first time, the small-fleet and single-truck owner operators have a resource to help them advance their small businesses and stay compliant.

The information is structured in a robust way where amendments and changes can be made rapidly. The way that the project is designed, there can be revisions and changes that can be 'pushed out' to the web site and kiosk in real time.

Project Costs

The original task-based fixed fee contract for the Truck Outreach Centers was for $150,000. The actual time and expenses GNA dedicated to this contract as of August 25, 2015 is $239,849.53. The extended period of time to finalize the website and kiosk content was the most critical component of the cost overruns. The timely information on technology, grant funding and regulations requires periodic updates in order to stay current and was supported by an $8,000 per quarter ($32,000 per year) budget dedicated toward this task.

Commercialization and Applications

This project has created a platform that can further extend its own outreach.

Creating a list serve

The information can be extended and pushed out to users who opt in to a list serve. This list serve can blast out emails for program announcements about events, training opportunities, changes to regulations, or announcements for funding opportunities. This will gradually build a base of users that can be reached directly.

Mobile friendly web browsing option for the website

Many of the goods movement drivers do not have computers at home, and instead use their phones to access the internet. Formatting the website for "mobile friendly" use would allow drivers greater ease of use to read the content and interact with the website when they are looking at a smaller screen.

Phone App

A phone app platform would provide the most directly accessible information on a smart phone, and would allow the program to interact with the users' phone. It would make it possible for the TIPs program to send 'push' notifications directly to the driver without the driver having to look anything up or sign onto a website. This could be very helpful for program announcements such as funding availability and important due dates and deadlines for programs and regulations.

Appendix D

List of Acronyms

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LIST OF ACRONYMS

AC-absorption chiller
AFRC—air/fuel ratio control
AFVs—Alternative Fuel Vehicles
APCD—Air Pollution Control District
AQMD—Air Quality Management District
AQMP—Air Quality Management Plan
ARB—Air Resources Board
ARRA—American Recovery & Reinvestment Act
AWMA—Air & Waste Management Association
BACT—Best Available Control Technology
BSNOx—brake specific NOx
BMS—battery management system
CAAP—Clean Air Action Plan
CAFR—Comprehensive Annual Financial Report
CARB—California Air Resources Board
CATI—Clean Air Technology Initiative
CCF—California Clean Fuels
CDFA/DMS—California Department of Food & Agriculture/Division of Measurement Standards
CEC—California Energy Commission
CE-CERT—College of Engineering – Center for Environmental Research and Technology
CEMS—continuous emission monitoring system
CFCI—Clean Fuel Connection, Inc.
CFD—computational fluid dynamic
CNG—compressed natural gas
CO_2—carbon dioxide
CO—carbon monoxide
CRT—continuously regenerating technology
DC—direct connection
CY—calendar year
DCM—dichloromethane
DEG—diesel equivalent gallons
DGE—diesel gallon equivalents
DF—deterioration factor
DMS—Division of Measurement Standards
DMV—Department of Motor Vehicles
DOC—diesel oxidation catalysts
DOE—Department of Energy
DOT—Department of Transportation
DPF—diesel particulate filters
DRI—Desert Research Institute
ECM—emission control monitoring
EGR—exhaust gas recirculation
EPRI—Electric Power Research Institute
ESD—emergency shut down
EV—electric vehicle
FCV—fuel cell vehicle
FTA—Federal Transit Administration
FTP—federal test procedures
OBD—On-Board Diagnostics
g/bhp-hr—grams per brake horsepower per hour
GC/MS—gas chromatography/mass spectrometry
GGE—gasoline gallon equivalents
GHG—Greenhouse Gas
GTL—gas to liquid
H&SC—California Health and Safety Code
HCCI—Homogeneous Charge Combustion Ignition
HCNG—hydrogen-compressed natural gas (blend)
HDDT—highway dynamometer driving schedule
HD-FTP—Heavy-Duty Federal Test Procedure
HDV—heavy-duty vehicle
HEV—Hybrid electric vehicle
HPDI—High Pressure Diesel Injection
HT—high throughput
HTFCs-high-temperature fuel cells
HTPH—high throughput pretreatment and enzymatic hydrolysis
ICE—internal combustion engine
ICEV—internal combustion engine vehicle
ICTC—Interstate Clean Transportation Corridor
LCFS—Low Carbon Fuel Standard
Li—lithium ion
LIMS—Laboratory Information Management System
LNG—liquefied natural gas
LPG—liquefied petroleum gas or propane
LSV—low-speed vehicle
MATES—Multiple Air Toxics Exposure Study
MECA—Manufacturers of Emission Controls Association
MPFI—Multi-Port Fuel Injection
MPG—miles per gallon
MSRC—Mobile Source Air Pollution Reduction Review Committee
MSW—municipal solid wastes
MY—model year
MTA—Metropolitan Transportation Authority (Los Angeles County "Metro")
NAAQS-National Ambient Air Quality Standards
NAFA—National Association of Fleet Administrators
NFPA—National Fire Protection Association
NCP—nonconformance penalty
NEV—neighborhood electric vehicles
NextSTEPS—Next Sustainable Transportation Energy Pathways
NGV—natural gas vehicle
NHTSA—Natural Highway Traffic Safety Administration
NMHC—non-methane hydrocarbon
NO—nitrogen monoxide
NO_2—nitrogen dioxide

LIST OF ACRONYMS (cont'd)

$NO + NO_2$—nitrous oxide
NOPA—Notice of Proposed Award
NOx—oxides of nitrogen
NREL—National Renewables Energy Laboratory
OCTA—Orange County Transit Authority
OEM—original equipment manufacturer
PAH—polyaromatic hydrocarbons
PbA—lead acid
PCM—powertrain control module
PEMFC—proton exchange membrane fuel cell
PEV—plug-in electric vehicle
PHEV—plug-in hybrid vehicle
PM—particulate matter
PM2.5—particulate matter ≤ 2.5 microns
PM10—particulate matter ≤ 10 microns
ppm—parts per million
ppb—parts per billion
RDD&D (or RD3)—research, development, demonstration and deployment
RFS—renewable fuel standards
RI—reactive intermediates
RRC—rolling resistance co-efficient
RTA—Riverside Transit Agency
SCAB—South Coast Air Basin or "Basin"
SCAQMD—South Coast Air Quality Management District
SCE—Southern California Edison
SCR—selective catalytic reduction
SI—spark ignited
SIP—State Implementation Plan
SOAs—secondary organic aerosols
SoCalGas—Southern California Gas Company (A Sempra Energy Utility)
SULEV—super ultra-low emission vehicle
TAO—Technology Advancement Office
TC—total carbon
THC—total hydrocarbons
TO—task order
tpd—tons per day
TRB—Transportation Research Board
TSI—Three Squares, Inc.
UDDS—urban dynamometer driving schedule
$\mu g/m^3$—microgram per cubic meter
U.S.EPA—United States Environmental Protection Agency
U.S. —United States
ULEV—ultra low emission vehicle
VMT—vehicle miles traveled
VOC—volatile organic compounds
WVU—West Virginia University
ZEV—zero emission vehicle

CHAPTER IV
ANNUAL RECLAIM AUDIT REPORT
FOR 2014 COMPLIANCE YEAR

BOARD MEETING DATE: March 4, 2016 AGENDA NO. 39

REPORT: Annual RECLAIM Audit Report for 2014 Compliance Year

SYNOPSIS: The annual report on the NOx and SOx 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-first 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 2014 Compliance Year is included with the report.

COMMITTEE: Stationary Source, February 19, 2016, Reviewed

RECOMMENDED ACTION:
Approve the attached annual report.

Barry R. Wallerstein, D.Env.
Executive Officer

MN:DL

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 NOx and SOx. 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 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 SCAQMD staff to conduct annual program audits to assess various aspects of the program and to verify that program objectives are met. SCAQMD staff has completed audits of facility records and completed the annual audit of the RECLAIM program for Compliance Year 2014 (which encompasses the time period for Cycle 1 from January 1, 2014 to December 31, 2014 and for Cycle 2 from July 1, 2014 to June 30, 2015). Based on audited emissions in this report and previous annual reports, SCAQMD staff has determined that RECLAIM met its emissions goals for Compliance Year 2014, 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 2014, audited NOx emissions were 23% less than programmatic NOx allocations and audited SOx emissions were 23% less than programmatic SOx allocations.

Audit Findings

The audit of the RECLAIM Program's Compliance Year 2014 and trades of RTCs that occurred during calendar year 2015 show:

- ***Overall Compliance*** – Audited NOx and SOx emissions from RECLAIM facilities were significantly below programmatic allocations.

- ***Universe*** – The RECLAIM universe consisted of 275 facilities as of June 30, 2014. One facility was included, no facility was excluded, and four facilities in the RECLAIM universe shut down during Compliance Year 2014. Thus, 272 facilities were in the RECLAIM universe on June 30, 2015, the end of the Compliance Year 2014.

  One facility was newly included in NOx RECLAIM because they reported NOx emissions from permitted sources in excess of four tons a year. Of the four facilities that shut down, one facility was sold and consolidated its operations with its parent company, whereas another facility had all equipment removed from the site and abandoned the property. The third facility's representative was unwilling to provide any reason for the shutdown other than it was because they are no longer making rocket engines. This property was sold for development. The fourth facility shut down and filed for bankruptcy.

- ***Facility Compliance*** – The vast majority of RECLAIM facilities complied with their allocations during the 2014 compliance year (96% of NOx facilities and 97% of SOx facilities). Twelve facilities (4% of total facilities) exceeded their allocations (11 facilities exceeded their NOx allocations, and one facility exceeded its SOx allocation) during Compliance Year 2014. The 11 facilities that exceeded their NOx allocations had total NOx emissions of 140.1 tons and did not have adequate allocations to offset 32.4 of those tons. The exceedances represent 0.33% of total RECLAIM NOx universe allocations and 23.1% of total NOx emissions from the 11 facilities. The one SOx facility that exceeded its SOx allocation had total SOx emissions of 311.1 tons and did not have adequate allocations to offset 26.3 tons. This exceedance represents 0.93% of total RECLAIM SOx universe allocations and 8.5% of total SOx emissions from this facility. Pursuant to Rule 2010(b)(1)(A), all 12 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 2014 allocations.

- ***Job Impacts*** – Based on a survey of the RECLAIM facilities, the RECLAIM program had minimal impact on employment during the 2014 compliance year, which is consistent with previous years. RECLAIM facilities reported an overall net gain of 266 jobs, representing 0.26% of their total employment. None of the four RECLAIM facilities that shut down during Compliance Year 2014 cited RECLAIM as a contributing factor to the decision to shut down. No facilities reported a gain or loss of jobs due to RECLAIM. The job loss and job gain data are compiled strictly from reports submitted by RECLAIM facilities, and SCAQMD staff is not able to verify the accuracy of the reported job impacts data.

- ***Trading Activity*** – The RTC trading market activity during calendar year 2015 was comparable in terms of number of trades, higher with respect to volume (by 38%), but substantially higher with respect to total value (by 89%) when compared to calendar year 2014. A total of over $1.34 billion in RTCs has been traded since the adoption of RECLAIM, of which $197.1 million occurred in calendar year 2015 (compared to $104.2 million in calendar year 2014), excluding swaps.

  The average annual prices of infinite-year block (IYB) and all compliance years discrete-year NOx and SOx RTCs traded in calendar year 2015 were below the applicable review thresholds for average RTC prices. The average annual prices of RTCs traded during calendar years 2014 and 2015 are summarized and compared to the applicable thresholds in Tables 1 and 2 below:

Table 1 – Average Prices for Discrete-Year RTCs Traded during Calendar Years 2014 and 2015

	Average Price ($/ton)				Review Thresholds ($/ton)	
Year Traded	**2013 NOx RTC**	**2014 NOx RTC**	**2015 NOx RTC**	**2016 NOx RTC**	**Rule 2015(b)(6)**	**Health and Safety Code §39616(f)**
2014	$1,065	$1,910	$3,779	None traded	$15,000	$41,591
2015		$1,039	$1,642	$2,833		
Year Traded	**2013 SOx RTC**	**2014 SOx RTC**	**2015 SOx RTC**	**2016 SOx RTC**	**Rule 2015(b)(6)**	**Health and Safety Code §39616(f)**
2014	$378	$400	None traded	None traded	$15,000	$29,946
2015		$483	$380	None traded		

Table 2 – Average Prices for IYB RTCs Traded during Calendar Years 2014 and 2015

	Average Price ($/ton)		Review Threshold ($/ton)
RTCs	**Traded in 2014**	**Traded in 2015**	**[Health and Safety Code §39616(f)]**
NOx	$110,509	$199,685	$623,866
SOx	$80,444	$53,665	$449,184

- ***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 2015 was greater when compared to calendar year 2014. However, with respect value and volume of SOx trades with price, investors' involvement decreased. Investors were involved in 147 of the 201 discrete NOx trades with price, and 2 of the 6 discrete SOx trades with price. With respect to IYB trades, investors' participation was significant and were involved with 44 of 47 IYB NOx trades with price, and all of the 4 IYB SOx trades with price. Compared to calendar year 2014, investor holdings of total IYB NOx RTCs decreased from 4.9% to 1.9%, but increased for total IYB SOx RTCs from 0.9% to 3.3% at the end of calendar year 2015. Investors are those who purchase RTCs but are not RECLAIM facilities or brokers. (Brokers typically do not actually purchase RTCs but facilitate transactions.)

- ***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.

Attachment
Annual RECLAIM Audit Report for 2014 Compliance Year

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Annual RECLAIM Audit Report for 2014 Compliance Year

March 4, 2016

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SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

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EXECUTIVE OFFICER
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TABLE OF CONTENTS

Tables

Appendices

LIST OF ABBREVIATIONS

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
CCR	California Code of Regulations
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
EGF	Electricity Generating Facility
ERC	Emission Reduction Credit
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
SOON	Surplus Off-Road Opt-In for NOx
SSC	Stationary Source Committee
TAC	Toxic Air Contaminant
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound
WATERS	Web Access To Electronic Reporting System

EXECUTIVE SUMMARY

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 2014 (January 1 through December 31, 2014 for Cycle 1 and July 1, 2014 through June 30, 2015 for Cycle 2 facilities). This annual audit report covers activities for the twenty-first 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, 2014, the overall changes in RECLAIM participants were 129 facilities included into the program, 70 facilities excluded from the program, and 178 facilities ceased operation. Thus, the RECLAIM universe consisted of 275 active facilities at the end of Compliance Year 2013 (December 31, 2013 for Cycle 1 facilities and June 30, 2014 for Cycle 2 facilities). During Compliance Year 2014 (January 1, 2014 through December 31, 2014 for Cycle 1 facilities and July 1, 2014 through June 30, 2015 for Cycle 2 facilities), one facility was included into the RECLAIM universe, no facility was excluded, and four facilities (one facility in both the NOx and SOx universes and three in the NOx universe only) shut down and are no longer in the active RECLAIM universe. These changes resulted in a net decrease of three facilities in the universe, bringing the total number of active RECLAIM facilities to 272 as of the end of Compliance Year 2014.

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 2014, the second year of implementation, the SOx allocation supply was reduced by 34% (or 4.0 tons/day, which is an additional 1.0 ton/day reduction from the previous compliance year) to 2,839 tons. There was no programmatic allocation reduction in NOx RTCs during Compliance Year 2014. However, on December 4, 2015, the Governing Board adopted amendments to NOx RECLAIM to phase in additional NOx reductions beginning in Compliance Year 2016 and continue through Compliance Year 2022. The amendment resulted in an overall NOx reduction of 45% (or 12 tons/day) when fully implemented for Compliance Year 2022 and beyond.

The overall NOx RTC supply increased by 11.3 tons and the SOx RTC supply decreased by 0.6 tons during Compliance Year 2014. The changes were due to allocation adjustments for clean fuel production pursuant to Rule 2002(c)(12).

During calendar year 2015, there were 356 registered RTC transactions with a total value of over $197 million traded, excluding the values reported for swap transactions. Since the inception of the RECLAIM program in 1994, a total value of over $1.34 billion dollars has been traded in the RTC trading market, excluding swap transactions. RTC trades are reported to SCAQMD as either 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). In terms of volume traded in calendar year 2015, a total of 3,371 tons of discrete NOx RTCs, 520 tons of discrete SOx RTCs, 1,234 tons of IYB NOx RTCs and 408 tons of IYB SOx RTCs were traded. The RTC trading market activity during calendar year 2015 compared to calendar year 2014 was about the same in terms of number of trades, higher in total volume (increased by 47%), and substantially higher in total value (increased by 89%).

The annual average prices of discrete-year NOx RTCs traded during calendar year 2015 were $1,039 per ton for Compliance Year 2014 RTCs, $1,642 per ton for Compliance Year 2015 RTCs, and $2,833 per ton for Compliance Year 2016 RTCs. The annual average prices for discrete-year SOx RTCs traded during the same period were $483 per ton for Compliance Year 2014 RTCs, and $380 per ton for Compliance Year 2015 RTCs. Therefore, the annual average prices for discrete NOx and SOx RTCs for all compliance years remained well below the $15,000 per ton threshold to evaluate and review the compliance aspects of the program set forth in SCAQMD Rule 2015, as well as the $41,591 per ton of NOx and $29,946 per ton of SOx discrete RTCs pre-determined overall program review thresholds established by the Governing Board pursuant to Health and Safety Code §39616(f).

The annual average price during calendar year 2015 for IYB NOx RTCs was $199,685 per ton and the annual average price for IYB SOx RTCs was $53,665 per ton. Therefore, annual average IYB RTC prices did not exceed the $623,866 per ton of IYB NOx RTCs or the $449,184 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 2015. They were involved in 147 of the 201 discrete NOx trade registration and two of the six discrete SOx trade registrations with price. Investors were also involved in 44 of 47 IYB NOx and all four of the IYB SOx trades with price. Investors were involved in 91% of total value and 79% of total volume for discrete NOx trades,

and 37% of total value and 31% of total volume for discrete SOx trades. In addition, investors were involved in 92% of total value and 91% of total volume for IYB NOx trades with price. Investors were involved in all IYB SOx trades with price. At the end of calendar year 2015, investors' holdings of IYB NOx RTCs and IYB SOx RTCs were 1.9% and 3.3% of the total RECLAIM RTCs, respectively.

Chapter 3: Emission Reductions Achieved

For Compliance Year 2014, aggregate NOx emissions were below total allocations by 23% and aggregate SOx emissions were below total allocations by 23%. No emissions associated with breakdowns were excluded from reconciliation with facility allocations in Compliance Year 2014. 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 2014. With respect to the Rule 2015 backstop provisions, Compliance Year 2014 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 2014, a total of eight NOx RECLAIM facilities had NSR NOx emission increases, and no SOx RECLAIM facilities had NSR SOx emission increases 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 2014, RECLAIM demonstrated federal equivalency with a programmatic NOx offset ratio of 73-to-1 based on the compliance year's total unused allocations and total NSR emission increases for NOx. 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 2014. 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. Compliance with the federally-required offset ratio also demonstrates compliance with any applicable state NNI requirements for new or modified sources. 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). The same BACT guidelines are used to determine applicable BACT to RECLAIM and non-RECLAIM facilities.

Chapter 5: Compliance

Of the 276 NOx RECLAIM facilities audited during Compliance Year 2014, a total of 265 facilities (96%) complied with their NOx allocations, and 32 of the 33 SOx facilities (97%) complied with their SOx allocations. Twelve facilities exceeded their allocations (11 facilities exceeded their NOx allocations, and one facility exceeded its SOx allocation) during Compliance Year 2014. The 11 facilities that exceeded their NOx allocations had aggregate NOx emissions of 140.1 tons and did not have adequate allocations to offset 32.4 tons (or 23.1%) of their combined emissions. The one SOx facility that exceeded its SOx allocation had total SOx emissions of 311.1 tons and did not have adequate allocations to offset 26.3 tons (or 8.5%). The NOx and SOx exceedance amounts are relatively small compared to the overall NOx and SOx allocations for Compliance Year 2014 (0.33% of total NOx allocations and 0.93% of total SOx allocations). The exceedances from these facilities did not impact the overall RECLAIM emission reduction goals. 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 2014 allocations. The overall RECLAIM NOx and SOx emission reduction targets and goals were met for Compliance Year 2014 (*i.e.*, aggregate emissions for all RECLAIM facilities were well below aggregate 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 2014 employment survey data gathered from APEP reports, RECLAIM facilities reported a net gain of 266 jobs, representing 0.26% of their total employment. None of the four RECLAIM facilities that shut down during Compliance Year 2014 cited RECLAIM as a factor contributing to the decision to shutdown. No facilities reported a gain or loss of jobs due to RECLAIM.

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 2014 NOx emissions increased 1.7% relative to Compliance Year 2013, and Compliance Year 2014 SOx emissions were 5.3% more than the previous year. Quarterly calendar year 2014 NOx emissions fluctuated within 6 percent of the mean NOx emissions for the year. Quarterly calendar year 2014 SOx emissions fluctuated within 11 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 2014, 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.

INTRODUCTION

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 (NOx) and oxides of sulfur (SOx) 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 2014 Compliance Year Audit.

This report presents the annual program audit and progress report of RECLAIM's twenty-first compliance year (January 1 through December 31, 2014 for Cycle 1 and July 1, 2014 through June 30, 2015 for Cycle 2 RECLAIM facilities), also known as Compliance Year 2014. 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, 2014 (covered under the Annual RECLAIM Audit Report for 2013 Compliance Year), then discusses changes to the RECLAIM universe of sources in detail through the end of Compliance Year 2014.
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 NOx and SOx.
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

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, 2014, the overall changes in RECLAIM participants were 129 facilities included into the program, 70 facilities excluded from the program, and 178 facilities ceased operation. Thus, the RECLAIM universe consisted of 275 active facilities at the end of Compliance Year 2013 (December 31, 2013 for Cycle 1 facilities and June 30, 2014 for Cycle 2 facilities). During Compliance Year 2014 (January 1, 2014 through December 31, 2014 for Cycle 1 facilities and July 1, 2014 through June 30, 2015 for Cycle 2 facilities), one facility was included into the RECLAIM universe, no facility was excluded, and four facilities (one facility in both the NOx and SOx universes and three in the NOx universe only) shut down and are no longer in the active RECLAIM universe. These changes resulted in a net decrease of three facilities in the universe, bringing the total number of active RECLAIM facilities to 272 as of the end of Compliance Year 2014.

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 NOx and/or SOx emissions from permitted sources above the four ton per year threshold; or
- It ceases to be categorically excluded and its reported NOx and/or SOx 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).

RECLAIM facilities that permanently go out of business are removed from the active emitting RECLAIM universe, but may retain their remaining RTCs and participate in the trading market.

Staff has periodically initiated the process of reviewing past Annual Emission Reports (AERs) from non-RECLAIM facilities to determine applicability of RECLAIM pursuant to Rule 2001(b) – Criteria for Inclusion in RECLAIM. Commencing in 2012, an annual review process was implemented. This facility inclusion process begins with SCAQMD staff compiling a list of non-RECLAIM (pollutant-specific) facilities that emitted NOx or SOx emissions greater than or equal to four tons per year, as reported under the AER program, for potential inclusion into RECLAIM. This part of the process involves screening for emissions only from equipment that are subject to RECLAIM (*e.g.*, emissions from on-site, off-road mobile sources are not included). From this initial list, each facility's business activity/operations are evaluated based on SCAQMD's records for possible categorical exemption pursuant to Rule 2001(i). Facilities that qualify under these categorical exemptions are removed from the list. The remaining facilities are informed of their potential inclusion into RECLAIM and are given the opportunity to provide records to demonstrate why the facility should not be included under RECLAIM. This may include additional information about the facility's operations that would qualify it for categorical exemption from RECLAIM pursuant to Rule 2001(i), or correcting their AER-reported emissions with supporting documentation. Once a facility has qualified for inclusion, a draft facility permit is prepared, sent to the facility for comments, finalized and issued.

Universe Changes

In the early years of the RECLAIM program, 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, facilities that were not part of the original universe were subsequently added to the program based on the inclusion criteria mentioned above. The overall changes to the RECLAIM universe from the date of adoption (October 15, 1993) through June 30, 2014 (the last day of Compliance Year 2013 for Cycle 2 facilities) were: the inclusion of 129 facilities (including 34 facilities created by partial change of operator of existing RECLAIM facilities), the exclusion of 70 facilities, and the shutdown of 178 facilities. Thus, the net change in the RECLAIM universe from October 15, 1993 through June 30, 2014 was a decrease of 119 facilities from 394 to 275 facilities. In Compliance Year 2014 (January 1, 2014 through December 31, 2014 for Cycle 1 facilities and July 1, 2014 through June 30, 2015 for Cycle 2 facilities), one facility was included, no facility was excluded, and four facilities shut down. These changes brought the total number of facilities in the RECLAIM universe to 272 facilities. The Compliance Year 2014 RECLAIM universe includes 240 NOx-only, no SOx-only, and 32 both NOx and SOx RECLAIM facilities. The list of active facilities in the RECLAIM universe as of the end of Compliance Year 2014 is provided in Appendix A.

Facility Inclusions and Exclusions

One facility was included in NOx RECLAIM pursuant to Rule 2001(b) – Criteria for Inclusion in RECLAIM because it reported NOx emissions from permitted sources in excess of four tons a year. Appendix B lists the facility and the reason for its inclusion. No facility was excluded from the RECLAIM universe during Compliance Year 2014. Currently, there are 23 facilities in various stages of the inclusion review process. Additional inclusions will be addressed in future RECLAIM annual program audits as facility eligibility is confirmed. Per Rule 2001(c)(2), a facility is subject to RECLAIM provisions on the date a facility permit containing RECLAIM requirements is issued.

Facilities Permanently Ceasing Operations

Four RECLAIM facilities permanently ceased operations in Compliance Year 2014. One facility was sold and consolidated its operations with its parent company. A second facility had all equipment removed from the site and abandoned the property. Staff attempted to contact the owners, but were unable to obtain further clarification regarding the reason for shutdown. The third facility's representative was unwilling to provide any reason for the shutdown other than it was because they are no longer making rocket engines. The property was sold for development. The fourth facility shut down and filed for bankruptcy. Again, staff attempted to contact the owners, but were unable to obtain further clarification regarding the reason for shutdown. None of these facilities cited RECLAIM as a cause for their shutting down. Three of the four facilities permanently ceasing operations were in NOx RECLAIM only. The remaining facility was in both NOx and SOx RECLAIM. Appendix C lists these facilities and provides brief descriptions of the reported reasons for their closures.

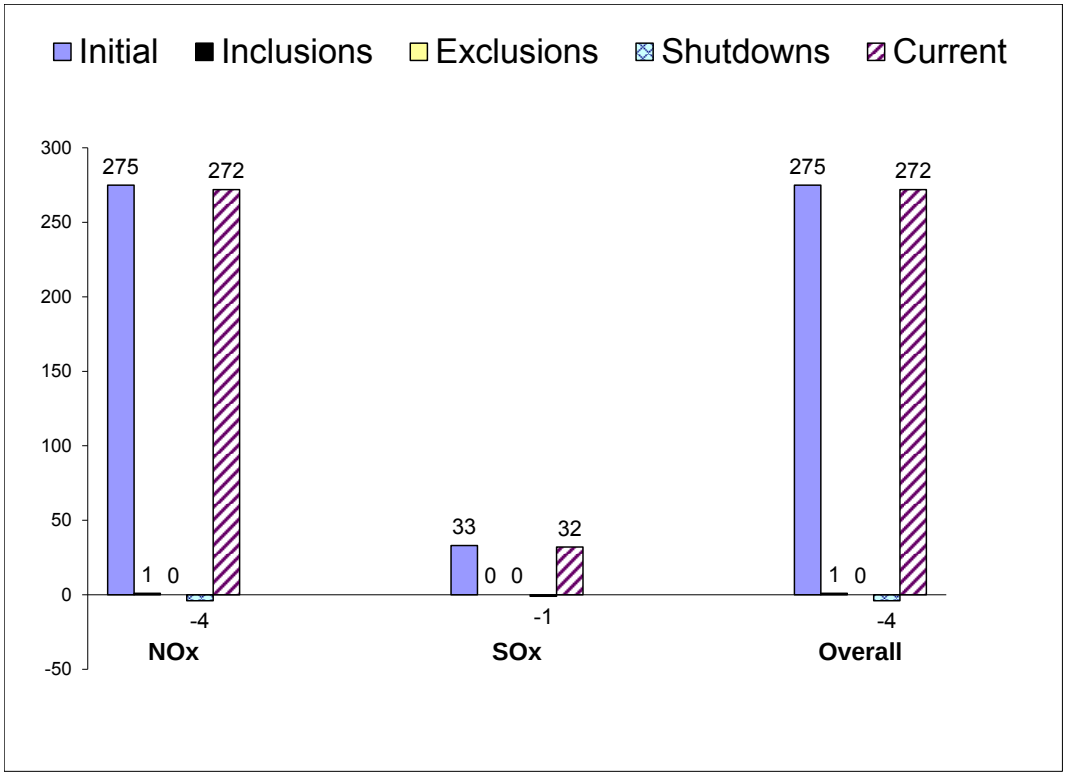
The above mentioned changes to the RECLAIM Universe resulted in a net decrease of three facilities in the RECLAIM universe during Compliance Year 2014. Table 1-1 summarizes overall changes in the RECLAIM universe between the start of the program and end of Compliance Year 2014 (December 31, 2014 for Cycle 1 facilities and June 30, 2015 for Cycle 2 facilities). Changes to the RECLAIM universe that occurred in Compliance Year 2014 are illustrated in Figure 1-1.

Table 1-1
RECLAIM Universe Changes

	NOx Facilities	SOx Facilities	Total* Facilities
Universe – October 15, 1993 (Start of Program)	392	41	394
Inclusions **–** October 15, 1993 through Compliance Year 2013	129	13	129
Exclusions **–** October 15, 1993 through Compliance Year 2013	-69	-4	-70
Shutdowns **–** October 15, 1993 through Compliance Year 2013	-177	-17	-178
Universe – June 30, 2014	275	33	275
Inclusions **–**Compliance Year 2014	1	0	1
Exclusions **–**Compliance Year 2014	0	0	0
Shutdowns **–**Compliance Year 2014	-4	-1	-4
Universe – End of Compliance Year 2014	272	32	272

* "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 2014



CHAPTER 2
RTC ALLOCATIONS AND TRADING

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 2014, the second year of implementation, the SOx allocation supply was reduced by 34% (or 4.0 tons/day, which is an additional 1.0 ton/day reduction from the previous compliance year) to 2,839 tons. There was no programmatic allocation reduction in NOx RTCs during Compliance Year 2014. However, on December 4, 2015, the Governing Board adopted amendments to NOx RECLAIM to phase in additional NOx reductions beginning in Compliance Year 2016 and continue through Compliance Year 2022. The amendment resulted in an overall NOx reduction of 45% (or 12 tons/day) when fully implemented for Compliance Year 2022 and beyond.

The overall NOx RTC supply increased by 11.3 tons and the SOx RTC supply decreased by 0.6 tons during Compliance Year 2014. The changes were due to allocation adjustments for clean fuel production pursuant to Rule 2002(c)(12).

During calendar year 2015, there were 356 registered RTC transactions with a total value of over $197 million traded, excluding the values reported for swap transactions. Since the inception of the RECLAIM program in 1994, a total value of over $1.34 billion dollars has been traded in the RTC trading market, excluding swap transactions. RTC trades are reported to SCAQMD as either 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). In terms of volume traded in calendar year 2015, a total of 3,371 tons of discrete NOx RTCs, 520 tons of discrete SOx RTCs, 1,234 tons of IYB NOx RTCs and 408 tons of IYB SOx RTCs were traded. The RTC trading market activity during calendar year 2015 compared to calendar year 2014 was about the same in terms of number of trades, higher in total volume (increased by 47%), and substantially higher in total value (increased by 89%).

The annual average prices of discrete-year NOx RTCs traded during calendar year 2015 were $1,039 per ton for Compliance Year 2014 RTCs, $1,642 per ton for Compliance Year 2015 RTCs, and $2,833 per ton for Compliance Year 2016 RTCs. The annual average prices for discrete-year SOx RTCs traded during the same period were $483 per ton for Compliance Year 2014 RTCs, and $380 per ton for Compliance Year 2015 RTCs. Therefore, the annual average prices for discrete NOx and SOx RTCs for all compliance years remained well below the $15,000 per ton threshold to evaluate and review the compliance aspects of the program set forth in SCAQMD Rule 2015, as well as the $41,591 per ton of NOx and $29,946 per ton of SOx discrete RTCs pre-determined overall program review thresholds established by the Governing Board pursuant to Health and Safety Code §39616(f).

The annual average price during calendar year 2015 for IYB NOx RTCs was $199,685 per ton and the annual average price for IYB SOx RTCs was $53,665 per ton. Therefore, annual average IYB RTC prices did not exceed the $623,866 per ton of IYB NOx RTCs or the $449,184 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 2015. They were involved in 147 of the 201 discrete NOx trade registration and two of the six discrete SOx trade registrations with price. Investors were also involved in 44 of 47 IYB NOx and all four of the IYB SOx trades with price. Investors were involved in 91% of total value and 79% of total volume for discrete NOx trades, and 37% of total value and 31% of total volume for discrete SOx trades. In addition, investors were involved in 92% of total value and 91% of total volume for IYB NOx trades with price. Investors were involved in all IYB SOx trades with price. At the end of calendar year 2015, investors' holdings of IYB NOx RTCs and IYB SOx RTCs were 1.9% and 3.3% of the total RECLAIM RTCs, respectively.

Background

SCAQMD issues each RECLAIM facility 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 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 Table 2 and 4 of Rule 2002 for the appropriate equipment category, any qualified[1] external offsets previously provided by the facility, and any unused Emission Reduction Credits (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 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.

[1] 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 2014 data, RTC trading and price data discussed in this chapter are for calendar year 2015.

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 be 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[2], 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. The SCAQMD Governing Board may adopt additional rules that affect RTC supply. Changes in the RTC supply during Compliance Year 2014 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 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 NOx or SOx in a year, any RTCs it was issued upon entering RECLAIM are removed from the market upon its exclusion.

The sole NOx facility included in Compliance Year 2014 was not eligible to receive any allocations because it was established after 1994, the start of RECLAIM.

[2] 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.

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 NOx and 42.3 tons of SOx for Compliance Year 1999, 101.8 tons of NOx and 41.4 tons of SOx for Compliance Year 2000, and 98.4 tons of NOx and 40.2 tons of SOx 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 NOx allocations, the NOx 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 2014, the overall effect of adjusting NOx allocations to account for these differences was a total of 11.3 tons of NOx RTCs (0.1% of total NOx allocation for Compliance Year 2014) added to, and 0.6 tons of SOx RTCs (less than 0.1% of total SOx allocation for Compliance Year 2014) deducted from, refineries' Compliance Year 2014 holdings.

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[3]. There were no changes in RTC allocations due to activity corrections in Compliance Year 2014.

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

[3] 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.

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 2014.

Net Changes in RTC Allocations

The changes to RTC supplies described in the above sections resulted in a net increase of 11.3 tons of NOx RTCs (0.1% of the total) and a decrease of 0.6 tons of SOx RTCs (less than 0.1% of the total) for Compliance Year 2014. Table 2-1 summarizes the changes in NOx and SOx RTC supplies that occurred in Compliance Year 2014 pursuant to Rule 2002.

Table 2-1
Changes in NOx and SOx RTC Supplies during Compliance Year 2014 (tons/year)

Source	NOx	SOx
Universe changes	0	0
Clean Fuel/Reformulated Gasoline	11.3	-0.6
Activity corrections	0	0
MSERCs	0	0
Net change	**11.3**	**-0.6**

Note: The data in this table represents the changes that occurred over the course of Compliance Year 2014 to the Compliance Year 2014 aggregate NOx and SOx RTC supplies originally issued pursuant to Rule 2002, not the difference between 2014 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 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 NOx Reductions for RECLAIM (NOx) calling for additional NOx 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 NOx, 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 NOx allocations from all RECLAIM facilities. The reductions were phased in commencing in Compliance Year 2007 and have been fully implemented since Compliance Year 2011.

Similarly, the 2012 AQMP adopted by the Governing Board in 2012, included Control Measure CMB-01- Further NOx Reductions for RECLAIM that identified a

new group of RECLAIM NOx emitting equipment that should be reviewed for new BARCT. The rule making process for the amendment to the NOx 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 NOx per day when fully implemented in Compliance Year 2022. The reductions are to be phased-in beginning 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.

On November 5, 2010, the Governing Board adopted changes to the RECLAIM program implementing the 2007 AQMP Control Measure CMB-02 – Further SOx Reductions for RECLAIM (SOx). These amendments resulted in a BARCT-based overall reduction of 5.7 tons SOx 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 SOx is an essential part of the South Coast Air Basin's effort in attaining the federal 24-hour average PM2.5 standard by the year 2020.

Figure 2-1 illustrates the total NOx RTC supply through the end of Compliance Year 2023 incorporating all the changes discussed above. Figure 2-2 illustrates the total SOx RTC supply through the end of Compliance Year 2020 incorporating the changes discussed.

Figure 2-1
NOx RTC Supply

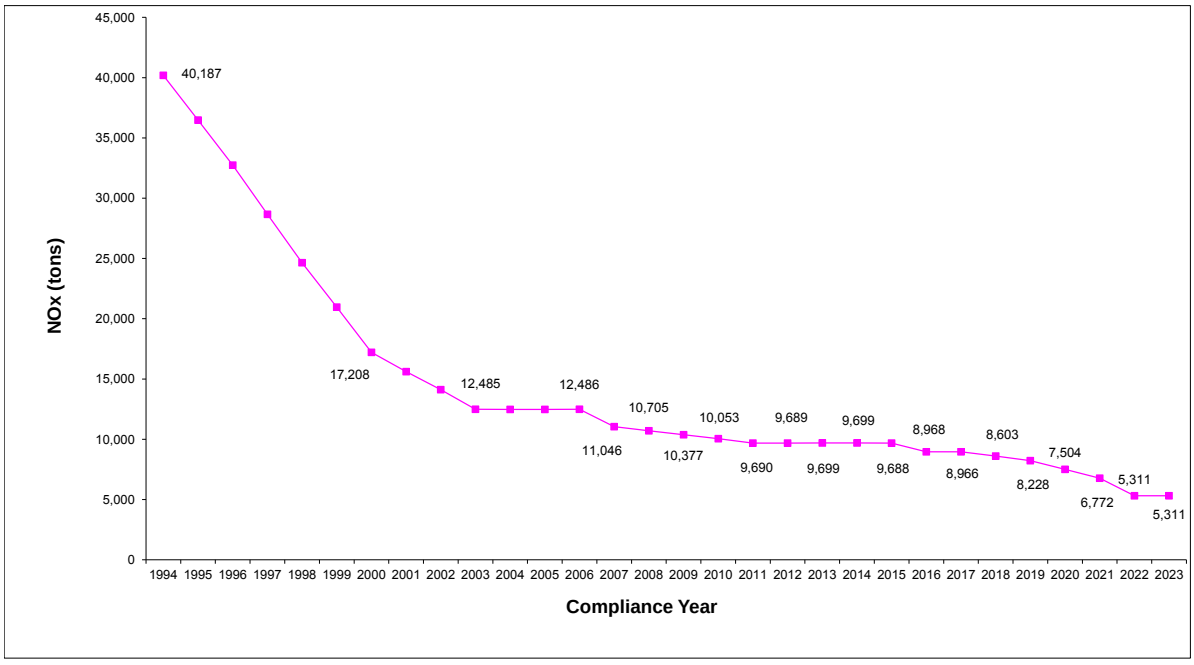
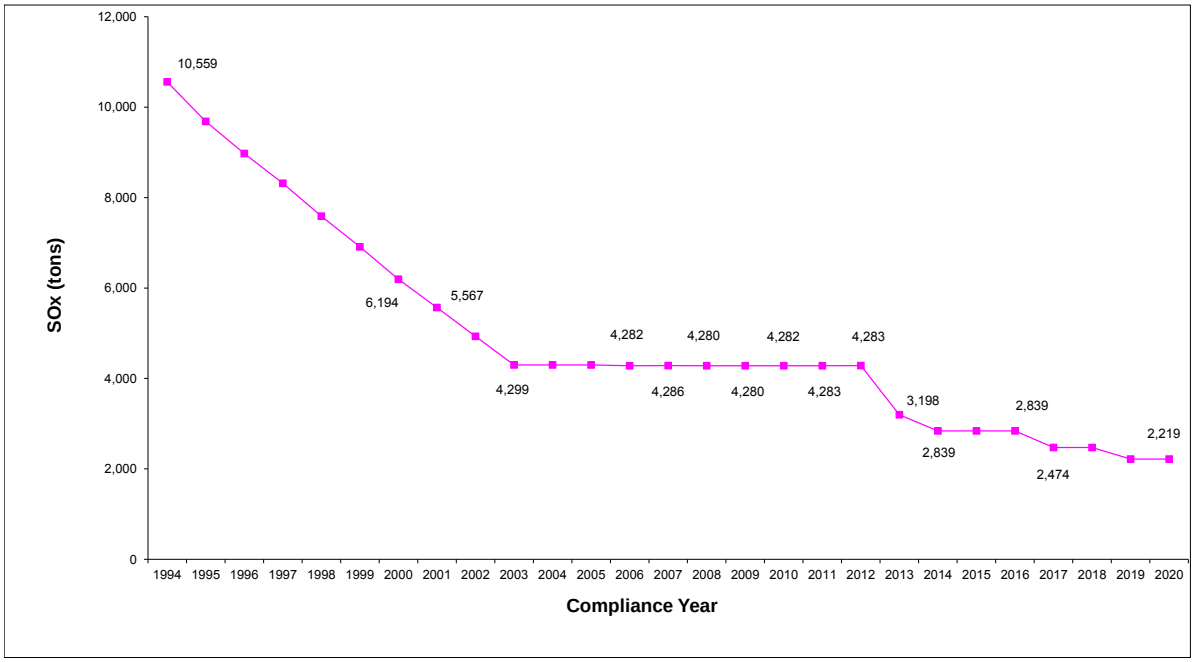


Figure 2-2
SOx RTC Supply



Upcoming Proposals for Credit Generation

Proposed Rule 2511 – Credit Generation Program for Locomotive Head End Power Unit Engines and Proposed Rule 2512 – Credit Generation Program for Ocean-Going Vessels at Berth are two potential rules that could generate credits for the RECLAIM program. Proposed Rule 2511 would allow generation of emission reduction credits through the voluntary repowering of diesel–fueled auxiliary head end power generating units on passenger locomotives with cleaner engines. Proposed Rule 2512 would allow generation of credits for emission through the control of exhaust emissions from auxiliary engines and/or boilers used on Ocean-Going Vessels while at berth in a commercial marine port. Both of these proposed rules are listed on the Rule and Control Measure Forecast as rule activities for calendar year 2016.

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. In this report, the annual average prices for discrete-year RTCs are averaged in dollars per ton of RTCs for each compliance year, while the average price for IYB RTCs are averaged as a total dollar value per ton of IYB RTCs.

RTC Price Thresholds for Program Review

Rule 2015(b)(6) specifies that, if the annual average price of discrete NOx or SOx 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 SOx 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. For RTC transactions occurring in calendar year 2015, the overall program review thresholds in 2015 dollars are $41,591 per ton of discrete-year NOx RTCs, $29,946 per ton of discrete-year SOx RTCs, $623,866 per ton of IYB NOx RTCs, and $449,184 per ton of IYB SOx RTCs.

RTC Trading Activity Excluding Swaps

Overall Trading Activity

RTC trades include discrete and IYB RTCs traded with prices, discrete and IYB RTC transfers with zero price, and discrete and IYB RTC swap trades. The RTC market activity in calendar year 2015 was comparable to the market activity in calendar year 2014 in terms of the number of transactions. The calendar year 2015 trading activity—356 total registered trade transactions (335 NOx trades and 21 SOx trades)—was slightly lower than the number of trade transactions in calendar year 2014 (362 total registered trade transactions; 344 NOx trades and 18 SOx trades).

In comparison to calendar year 2014, the value traded in calendar year 2015 was substantially higher (increased by 89%). Excluding swap trades, a total value of almost $197.1 million was traded in calendar year 2015 ($193.1 million for NOx and $4.02 million for SOx)—substantially higher than the total value of $104.2 million traded in calendar year 2014 ($102.4 million for NOx and $1.8 million for SOx). As illustrated in Figure 2-3, 2015 experienced the highest annual value of RTCs traded in RECLAIM since the California energy crisis that happened in 2000-2001. The increase in the total value traded was due to the much higher price for IYB NOx RTCs traded in 2015, likely a result of the on-going NOx allocation reduction discussions that culminated in the Governing Board's adoption of the December 4, 2015 rule amendment. Figure 2-4 summarizes overall trading activity (excluding swaps) in calendar year 2015 by pollutant.

With respect to volume traded (also excluding swap trades), the 3,891 tons of discrete RTCs traded in calendar year 2015 were substantially higher than the 2,811 tons of discrete RTCs traded in calendar year 2014 (increased by 38%). In calendar year 2015, there were 2,396 tons of discrete NOx RTCs and 47 tons of discrete SOx traded with price and 975 tons of discrete NOx and 473 tons of discrete SOx traded without price. In addition, the 1,642 tons of IYB RTCs traded in calendar year 2015 were also much higher than the 965 tons of IYB RTCs traded in 2014 (increased by 70%). There were 939 tons of IYB NOx and 75 tons of IYB SOx traded with price and 295 tons of IYB NOx traded with zero price and 333 tons of IYB SOx traded with zero price. Additional information on the discrete and IYB trading activities, value, and volume are discussed later in this chapter.

There were 83 trades with zero price in calendar year 2015. 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 2015, the majority of trades with zero price were transfers between facilities under common ownership and facilities that had a change of operator.

Figure 2-3
Annual Trading Values for NOx and SOx (Excluding Swaps)

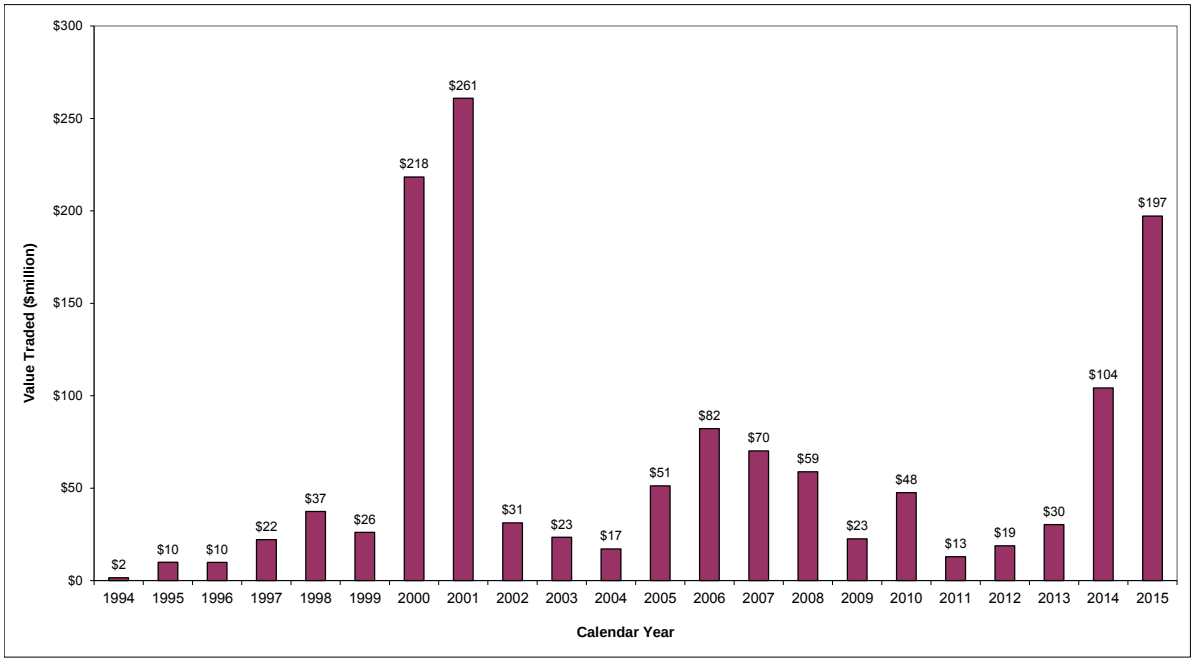
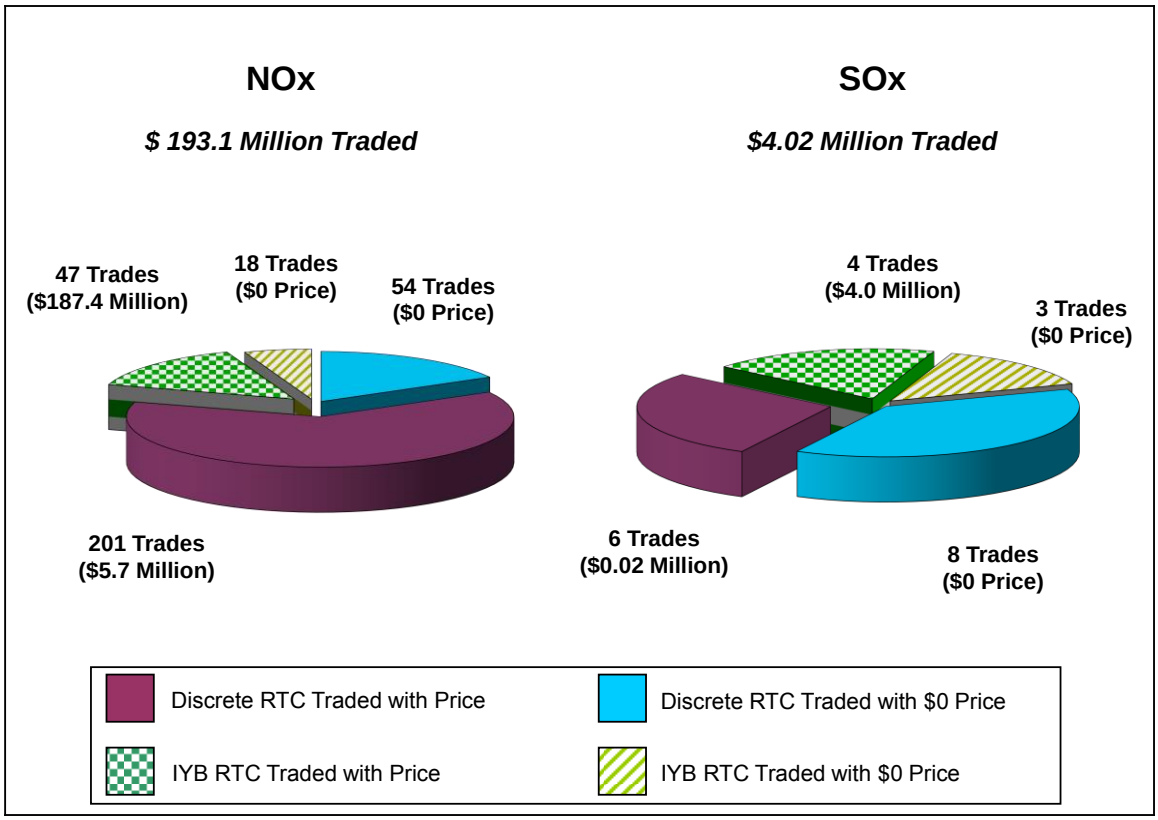


Figure 2-4
Calendar Year 2015 Overall Trading Activity (Excluding Swaps)



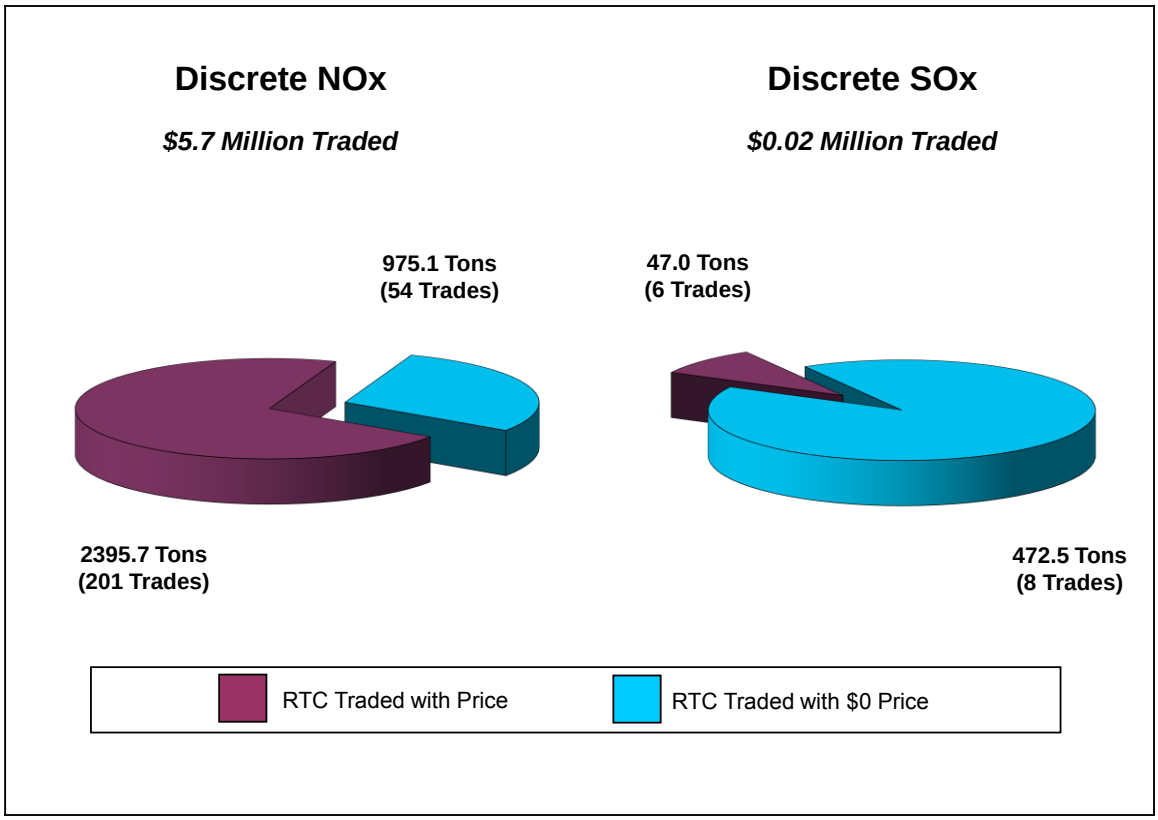
Discrete RTC Trading Activity

In calendar year 2015, there were a total of 255 discrete NOx RTC trades (201 trades with price and 54 trades with zero price) and 14 discrete SOx RTC trades (six trades with price and eight trades with zero price), excluding swap trades. The trading of discrete NOx RTCs included RTCs for Compliance Years 2014 through 2019. The trading of discrete SOx RTCs included RTCs for Compliance Years 2014 and 2015.

Discrete RTC trading values increased in calendar year 2015. The 201 NOx trades with price totaled $5.7 million in value, up from $2.7 million in calendar year 2014. The six discrete SOx trades with price totaled $0.02 million in value, which is equal to the $0.02 million traded in calendar year 2014.

In calendar year 2015, the overall quantities of discrete NOx and SOx RTCs traded were 3,371 tons and 520 tons, respectively. These quantities were all higher than those traded in calendar year 2014 (2,318 tons of NOx RTCs and 493 tons of SOx RTCs). There were 2,396 tons of discrete NOx traded with price in calendar year 2015, an increase from 1,808 tons of NOx in 2014. However, the 47 tons of discrete SOx RTCs traded in 2015 is lower than the 51 tons of SOx RTCs traded in 2014. In addition, there were 975 tons of discrete NOx RTCs and 473 tons of discrete SOx traded with zero price, an increase from 510 tons of NOx and 442 tons of SOx in 2014. Figure 2-5 illustrates the trading activity of discrete RTCs (excluding swaps) for calendar year 2015.

Figure 2-5
Calendar Year 2015 Trading Activity for Discrete RTCs (Excluding Swaps)



IYB RTC Trading Activity

In calendar year 2015, there were 65 IYB NOx trades and seven IYB SOx trades. The IYB NOx trades included varying start years through Compliance Year 2020, while the IYB SOx trades had Compliance Years 2015, 2016 and 2017 as start years. Of the 65 IYB NOx trades, 47 trades were with price and 18 trades were with zero price. Of the seven IYB SOx trades, four were with price and three were with zero price.

The 47 IYB NOx trades with price totaling over $187 million in calendar year 2015 were much higher in value than the 49 trades with price for $99.7 million in 2014. The four IYB SOx RTC trades with price totaling $4.0 million in calendar year 2015 were also much higher in value than the four trades and $1.8 million traded in 2014.

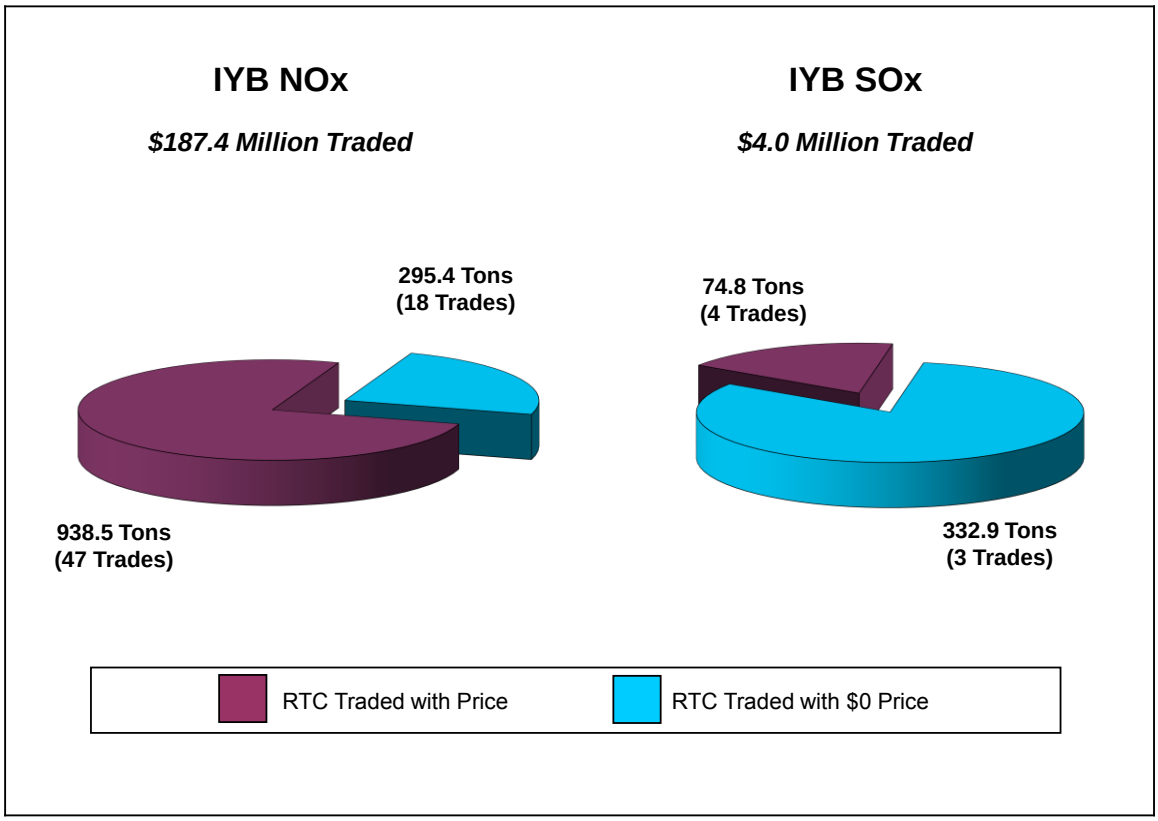
The total quantity of 1,234 tons of IYB NOx traded in calendar year 2015 was higher than the 942 tons traded in calendar year 2014. The quantity traded with price in calendar year 2015 was 939 tons, which is slightly higher than the 902 tons traded with price in calendar year 2014.

The total quantity of 408 tons of IYB SOx traded in calendar year 2015 was much higher than the 23 tons of IYB SOx traded in calendar year 2014. The quantity traded with price in calendar year 2015 was 75 tons, also much higher than the 23 tons of IYB SOx traded with price in calendar year 2014. A significant portion

of the IYB SOx traded with price (55%) was due to the shutdown of a battery recycling plant.

In calendar year 2015, 295 tons of IYB NOx were traded without price compared to only 40 tons in calendar year 2014. Similarly, 333 tons of IYB SOx were traded without price in calendar year 2015, while none were traded without price in calendar year 2014. As described earlier, the majority of these transfers are between facilities under common ownership and facilities that had a change of operator. Figure 2-6 illustrates the calendar year 2015 IYB RTC trading activity excluding swap trades.

Figure 2-6
Calendar Year 2015 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 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 NOx trades, discrete 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 NOx RTC Trades (Excluding Swaps)

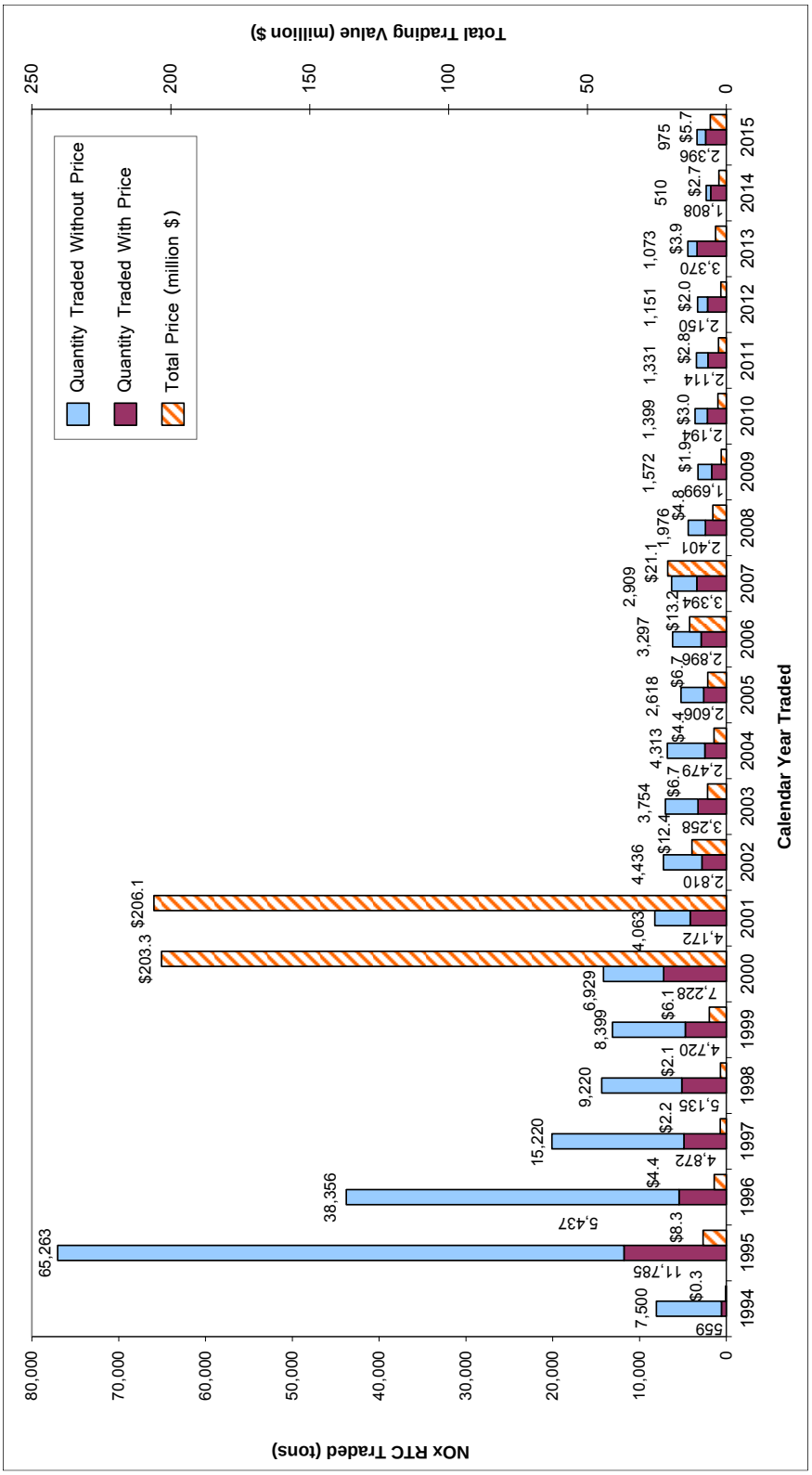


Figure 2-8
Discrete SOx RTC Trades (Excluding Swaps)

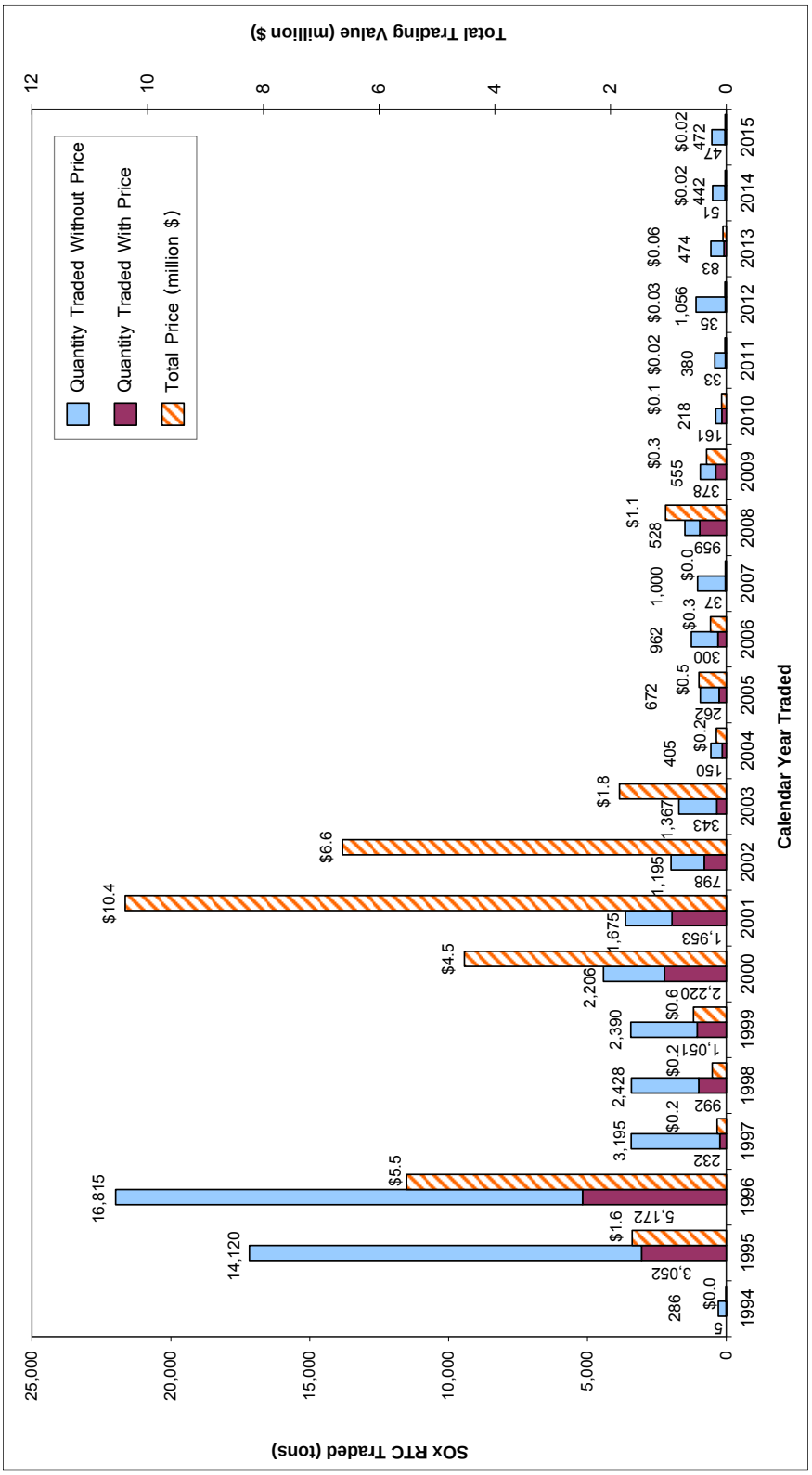


Figure 2-9
IYB NOx RTC Trades (Excluding Swaps)

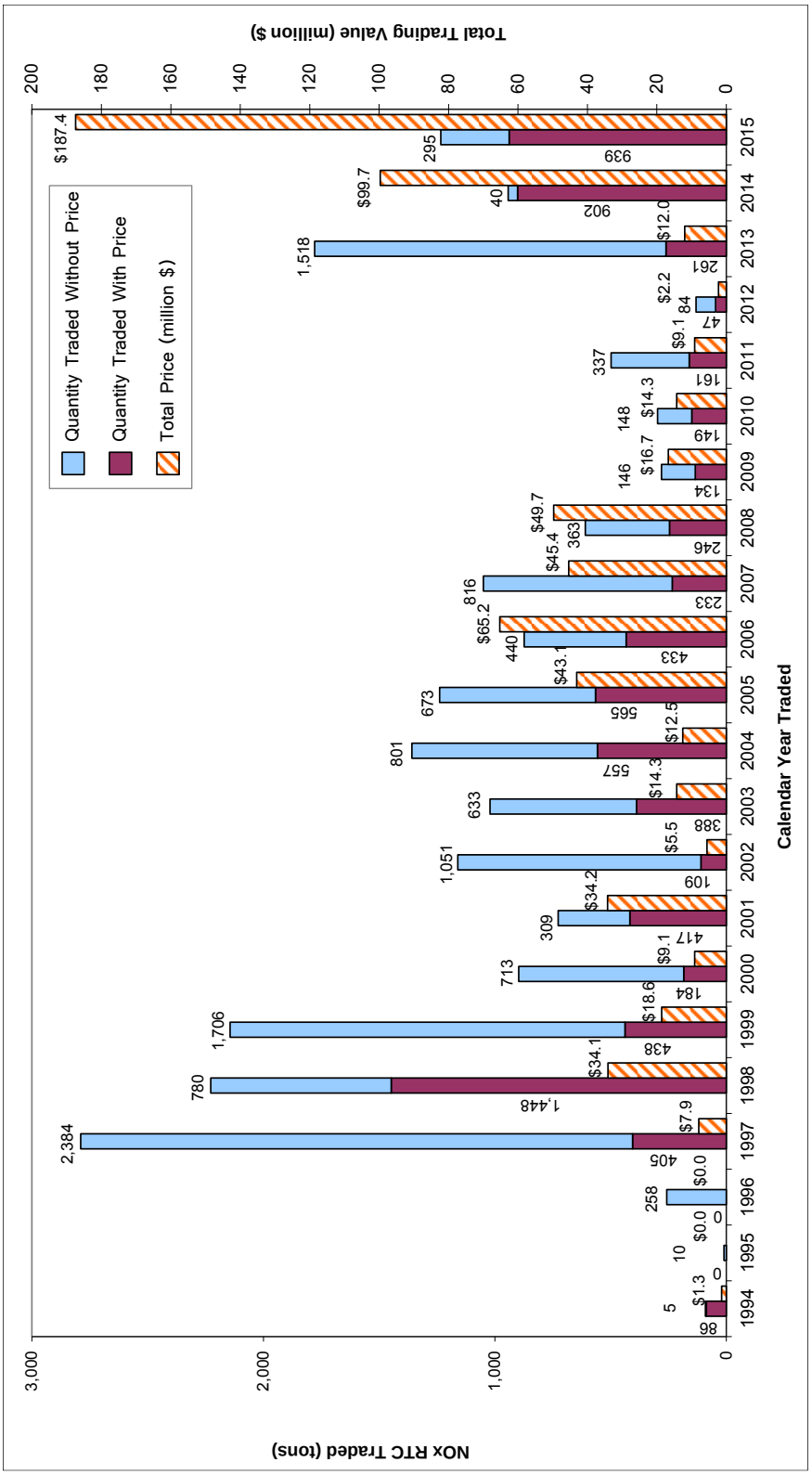
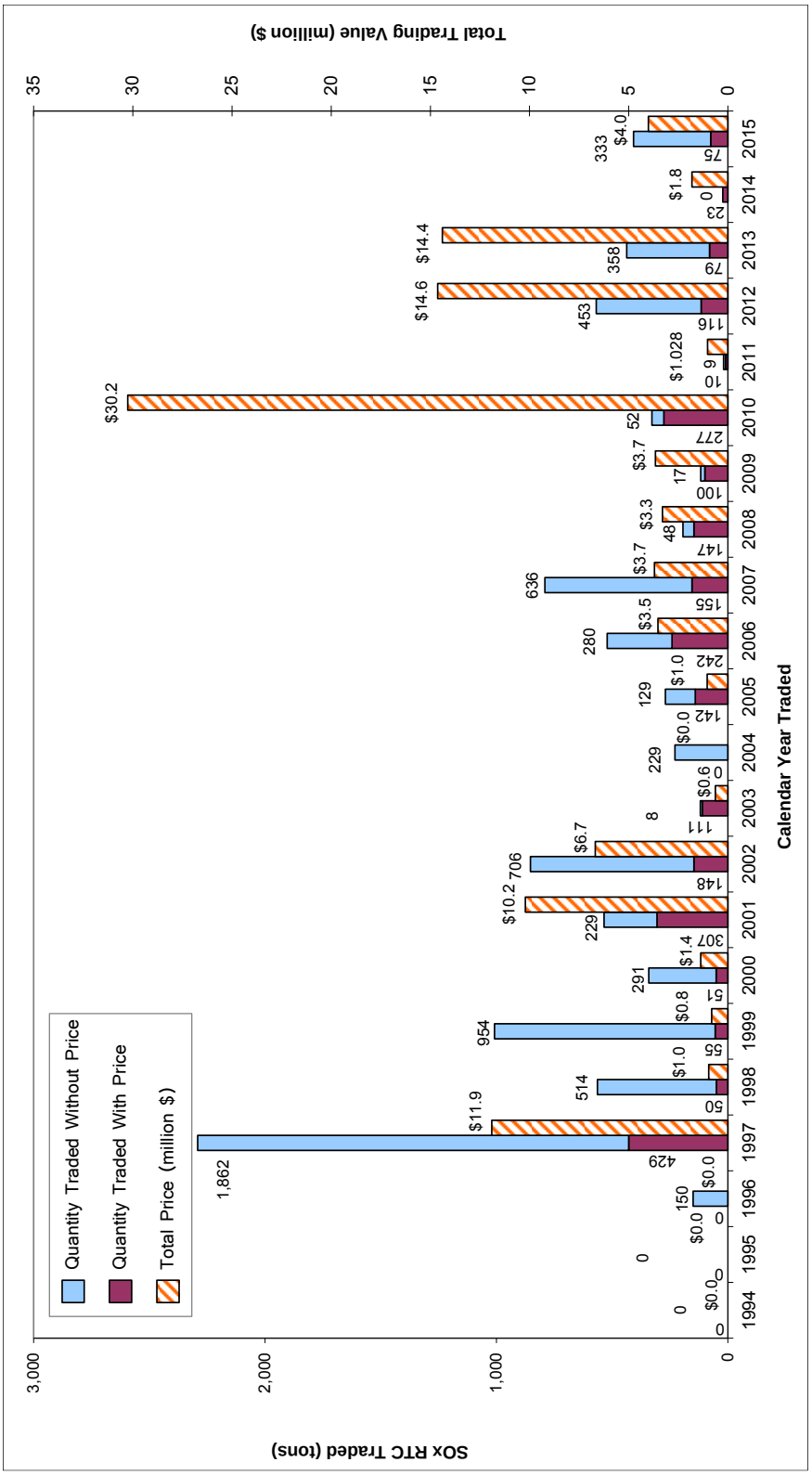


Figure 2-10
IYB SOx RTC Trades (Excluding Swaps)



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. Over $6.8 million in total value was reported from RTCs that were swapped in calendar year 2015, of which four swap trades involved trading IYB NOx RTCs for PM10 ERCs and were collectively valued at a total of $6.09 million. 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 transactions with large values (*e.g.,* 2009) the inclusion of swap transactions in the average trade price calculations would have resulted in calculated annual average prices dominated by swap transactions, 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 2-2 and 2-3 present the calendar years 2001 through 2015 RTC swaps for NOx and SOx, respectively.

Table 2-2
NOx Registrations Involving Swaps*

Year	Total Value ($ millions)	IYB RTC Swapped with Price (tons)	Discrete 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

* 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 2-3
SOx Registrations Involving Swaps*

Year	Total Value ($ millions)	IYB RTC Swapped with Price (tons)	Discrete 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

* 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

Discrete-Year RTC Prices

In calendar year 2015, the annual average prices for discrete-year NOx RTCs were $1,039 per ton for Compliance Year 2014, $1,642 per ton for Compliance Year 2015, $2,833 per ton for Compliance Year 2016, $4,020 per ton for Compliance Year 2017, $6,006 per ton for Compliance Year 2018, and $8,067 per ton for Compliance Year 2019. The calendar year 2015 annual average prices for discrete-year SOx RTCs were $483 per ton for Compliance Year 2014, and $380 per ton for Compliance Year 2015. There was no trading of Compliance Year 2016 and after SOx RTCs in calendar year 2015.

Figures 2-11 and 2-12 present the annual average prices for discrete-year NOx and SOx RTCs during calendar years 2007 through 2015, respectively. Note that prices for a Compliance Year's RTCs may also be shown for the calendar year after those RTCs expired, since the average price for each compliance year is based on sales of both Cycle 1 RTCs expiring in December of that year, as well as Cycle 2 RTCs expiring in June of the following year. Furthermore, Cycle 1 RTCs expiring in December may be traded during the 60-day reconciliation period following the expiration date, which extends into the next calendar year.

Annual average prices in calendar year 2015 for discrete NOx and SOx RTCs for all compliance years remained well below the $15,000 per ton threshold to evaluate and review the compliance aspects of the program set forth by SCAQMD Rule 2015, as well as the $41,591 per ton of NOx and $29,946 per ton of SOx discrete RTCs pre-determined overall program review thresholds established by the Governing Board pursuant to Health and Safety Code §39616(f).

Figure 2-11
Annual Average Prices for Discrete-Year NOx RTCs during Calendar Years 2007 through 2015

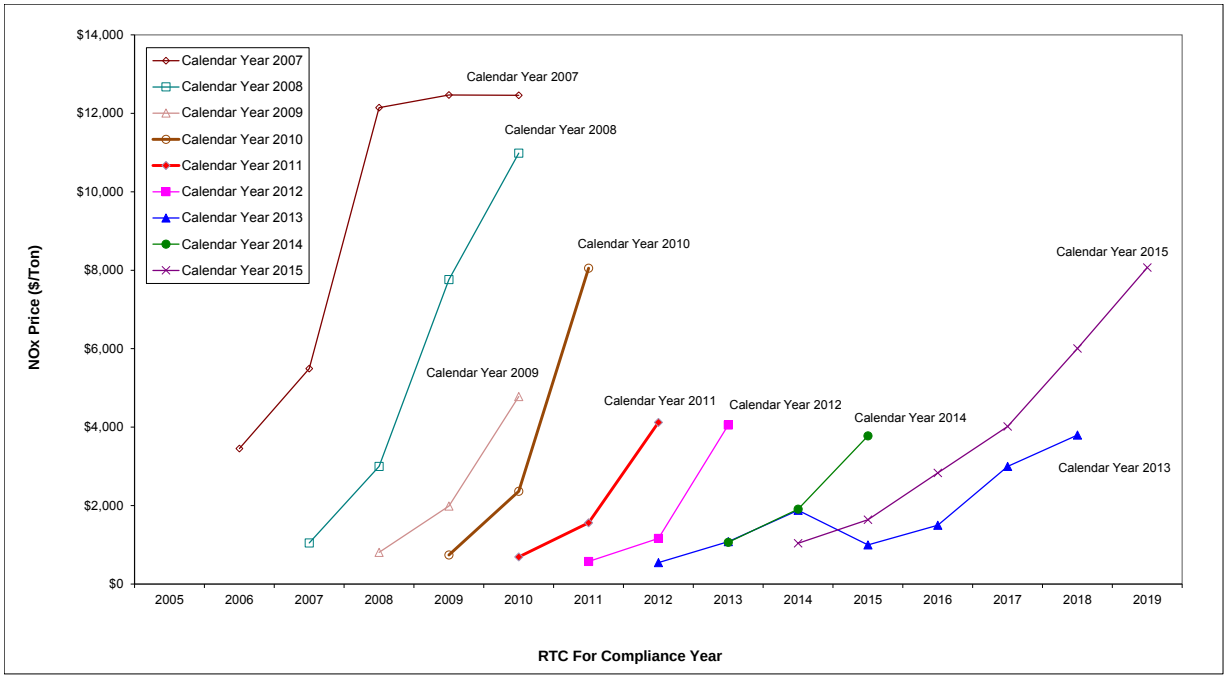
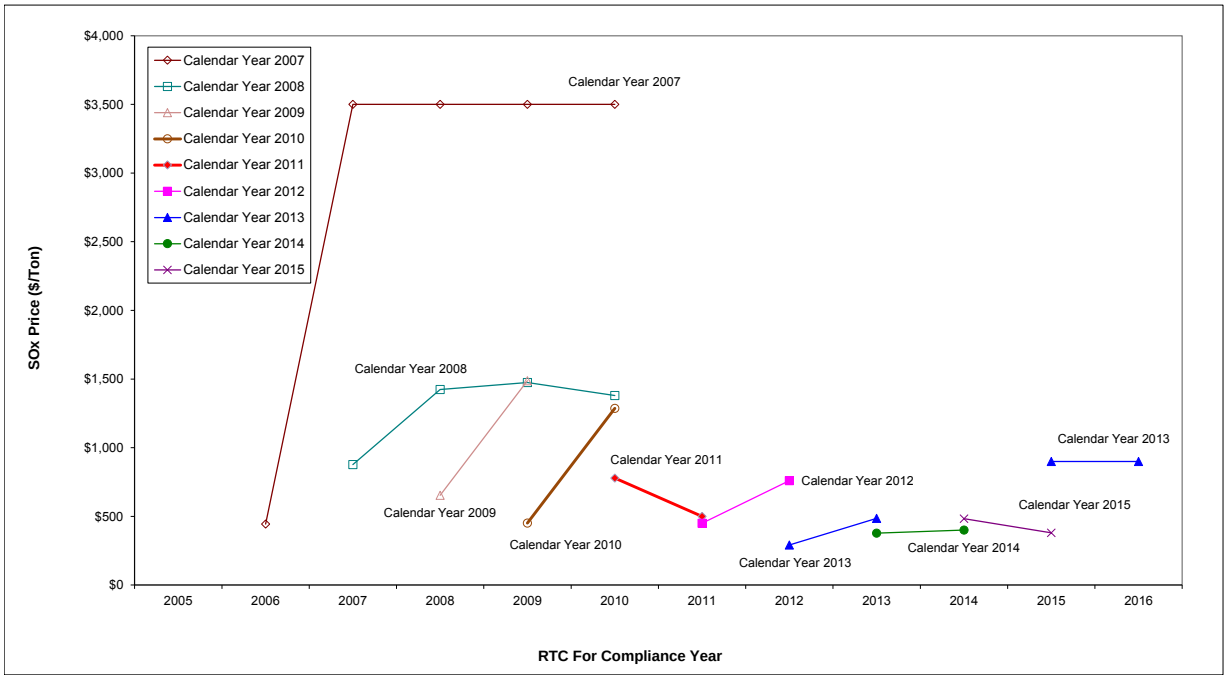


Figure 2-12
Annual Average Prices for Discrete-Year SOx RTCs during Calendar Years 2007 through 2015



Twelve-Month Rolling Average Prices of Compliance Year 2015 NOx RTCs

The January 2005 RECLAIM amendments directed the Executive Officer to calculate the 12-month rolling average price of NOx RTCs ("rolling average price") "for all trades for the current compliance year" excluding "RTC transactions reported at no price." Swap transactions are also excluded from the calculation of rolling average prices.

In the event that the rolling average price exceeds $15,000 per ton, the Executive Officer is required to report the rolling average price to the Governing Board. If the Governing Board determines that the rolling average price exceeds $15,000 per ton, SCAQMD is required to review the compliance aspects of the RECLAIM program. In its resolution amending Rule 2002(f) on January 7, 2005, the Governing Board directed the Executive Officer to report the NOx RTC 12-month rolling average price data to the Stationary Source Committee (SSC) at least quarterly. Accordingly, such reports have been prepared by SCAQMD staff and submitted to the SSC on a quarterly basis. To date, the twelve-month rolling average prices have been far below and have not exceeded the $15,000 per ton threshold. Staff continues to monitor the twelve-month rolling average price of current-year NOx RTCs on a monthly basis and report the rolling average prices to the Stationary Source Committee on a quarterly basis.

On December 4, 2015, the Governing Board amended Rule 2002(f)(1)(H) to change the twelve-month rolling average price threshold to $22,500 per ton for NOx RTCs. In order to have a quicker response trigger, the Governing Board also adopted a three-month rolling average price threshold of $35,000 per ton commencing on May 1, 2016. If NOx RTC prices exceeded either of these levels, a report to the Governing Board and program review will be required.

As shown in Table 2-4, the twelve-month rolling average prices of Compliance Year 2015 NOx RTCs started decreasing noticeably from August 2015 through the end of the year. Throughout 2015, the twelve-month rolling average prices did not exceed the $15,000 per ton threshold specified in Rule 2002(f). Therefore, it was not necessary for the Executive Officer to report the rolling average price to the Governing Board or for the Governing Board to require a compliance audit.

Table 2-4
Twelve-Month Rolling Average Prices of Compliance Year 2015 NOx RTCs

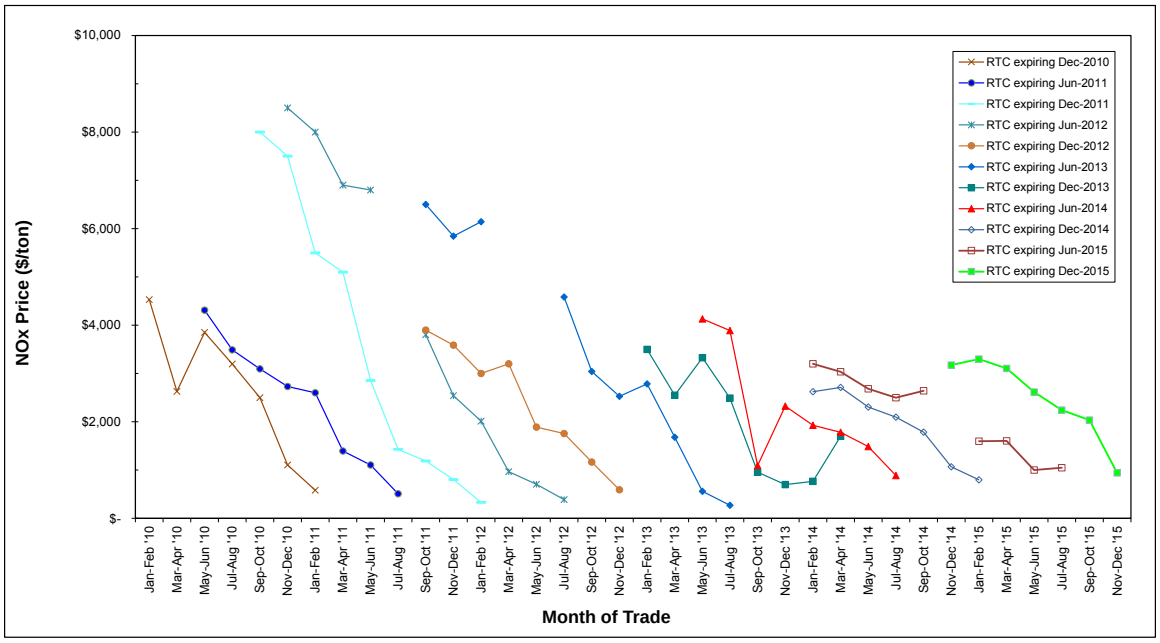
Reporting Month	12-Month Period	Average Price ($/ton)
January 2015	January 2014 through December 2014	$3,779
February 2015	February 2014 through January 2015	$3,800
March 2015	March 2014 through February 2015	$3,800
April 2015	April 2014 through March 2015	$3,800
May 2015	May 2014 through Apr 2015	$3,755
June 2015	June 2014 through May 2015	$3,722
July 2015	July 2014 through June 2015	$3,625
August 2015	August 2014 through July 2015	$2,734
September 2015	September 2014 through August 2015	$2,603
October 2015	October 2014 through September 2015	$2,600
November 2015	November 2014 through October 2015	$2,449
December 2015	December 2014 through November 2015	$1,890
January 2016	January 2015 through December 2015	$1,642

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 2015 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 2-13 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 2015, there were only six discrete SOx trades with price and these prices were flat throughout the year.

Figure 2-13
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 2015 was $199,685 per ton, which is much higher than the annual average price of $110,509 per ton traded in calendar year 2014. The annual average price for IYB SOx RTCs traded in calendar year 2015 was $53,665 per ton, which is lower than the $80,444 per ton traded in calendar year 2014. There were four IYB SOx trades with price totaling 75 tons in 2015, compared to the 22.5 tons traded in 2014. Two investors purchased all the IYB SOx traded with price. 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 2-5 and 2-6, respectively. In calendar year 2015, the annual average IYB RTC prices did not exceed the $623,866 per ton of NOx RTCs or the $449,184 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).

The December 4, 2015 Rule 2002 amendment requires staff to prepare the twelve-month rolling average price report for IYB NOx RTCs. Commencing in 2019, if the twelve-month rolling average IYB NOx price falls below $200,000 per ton, staff would report this finding to the Governing Board.

Table 2-5
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

* No information regarding swap trades was reported until May 9, 2001.

Table 2-6
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

* No information regarding swap trades was reported until May 9, 2001.

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 transactions, 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 two reported trades involving the contingent right to buy or sell RTCs in calendar year 2015.

As in prior years, RTCs were used in other programs during calendar year 2015. Six facilities surrendered a total of 67.3 tons of NOx RTCs and 0.2 tons of SOx RTCs. Nineteen tons of the NOx RTCs and all the SOx RTCs were retired to satisfy variance conditions. Two facilities surrendered 48.3 tons of NOx RTCs as part of the California Environmental Quality Act (CEQA) requirement to mitigate

the emissions impact from construction projects. These consisted of discrete year RTCs for Compliance Years 2014, 2015, and 2016.

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 facilitate transactions.

Investor Participation

In 2015 investors were actively involved in 147 of the 201 discrete NOx RTC trades with price, two of the six discrete SOx RTC trades with price, and 44 of the 47 IYB NOx trades with price. Investors were also involved in all of the four IYB SOx trades with price.

Investors’ involvement in discrete NOx and SOx trades registered with price in calendar year 2015 is illustrated in Figures 2-14 and 2-15. Figure 2-14 is based on total value of discrete NOx and SOx RTCs traded, and shows that investors were involved in 91% and 37%, respectively, of the discrete NOx and SOx trades reported by value. Figure 2-15 is based on volume of discrete RTCs traded with price and shows that investors were involved in 79% and 31% of the discrete NOx and SOx trades by volume, respectively. Figures 2-16 and 2-17 provide similar data for IYB NOx and SOx trades, and show that investors were involved in 92% of IYB NOx trades on a reported value basis, and 91% of IYB NOx trades on the basis of the volume traded with price. Investors were involved in all IYB SOx trades with price in calendar year 2015.

Figure 2-14
Calendar Year 2015 Investor-Involved Discrete NOx and SOx Trades Based on Value Traded

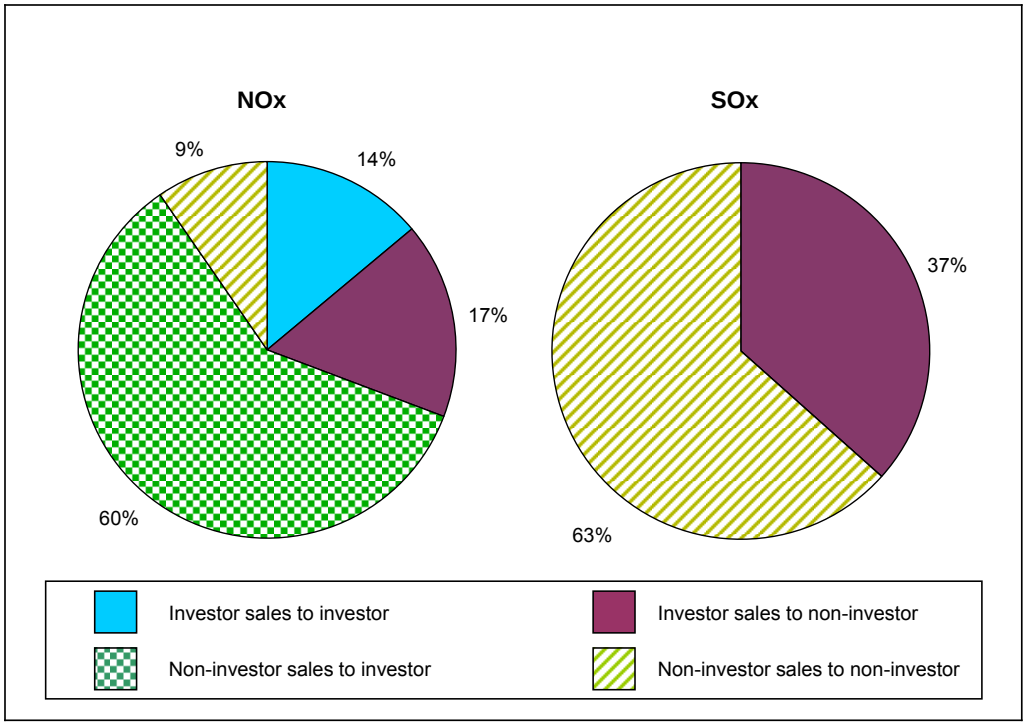


Figure 2-15
Calendar Year 2015 Investor-Involved Discrete NOx and SOx Trades Based on Volume Traded with Price

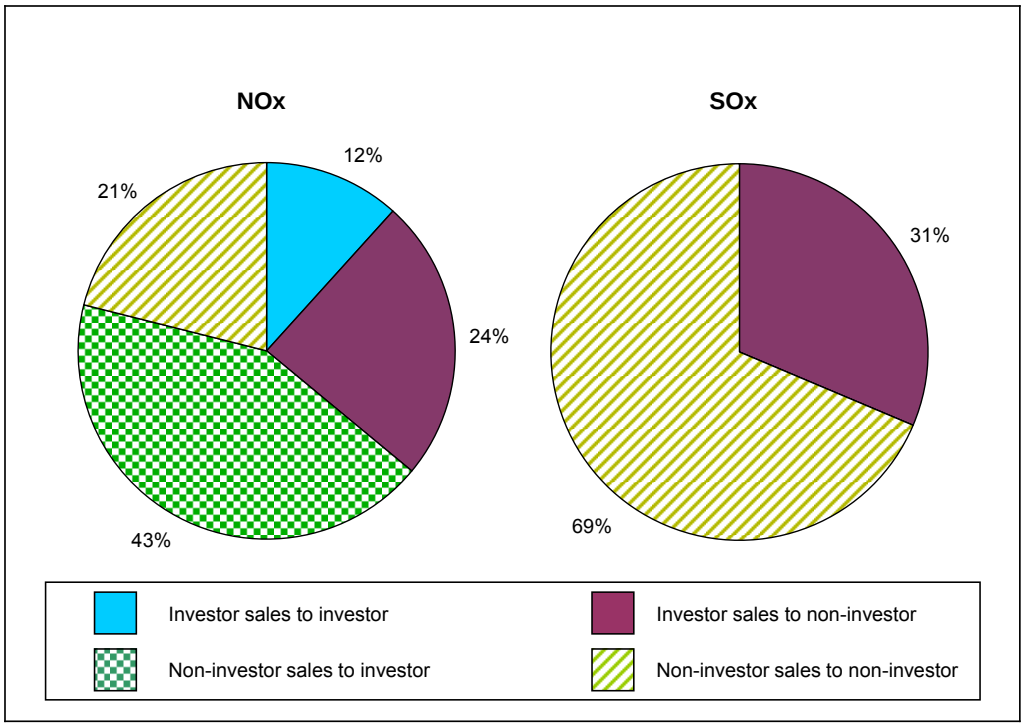


Figure 2-16
Calendar Year 2015 Investor-Involved IYB NOx and SOx Trades Based on Value Traded

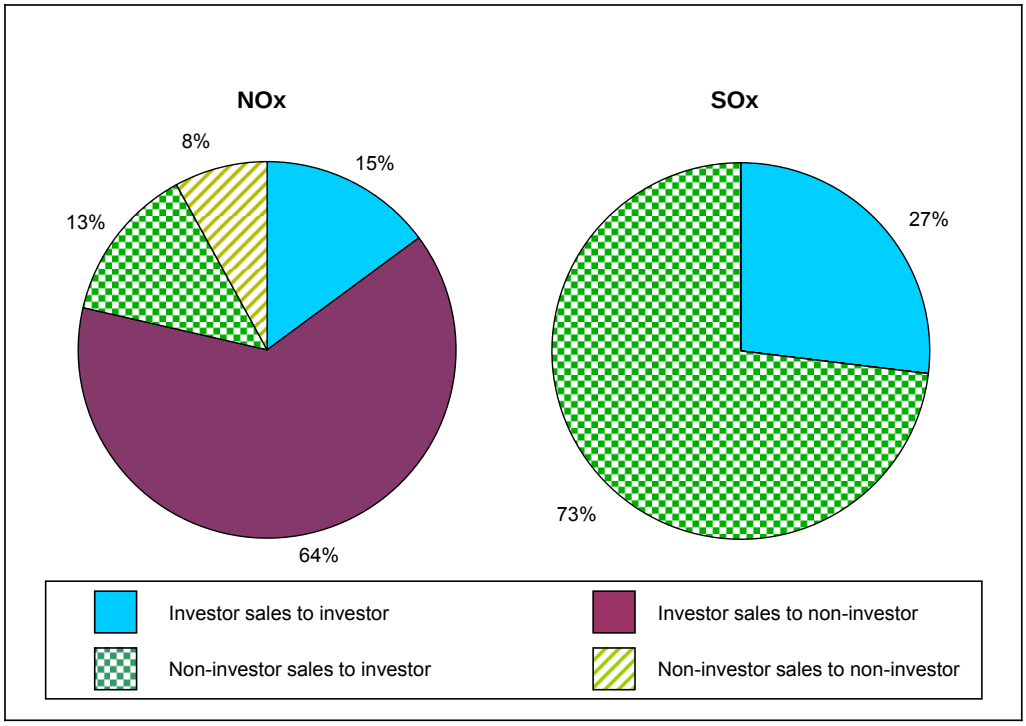
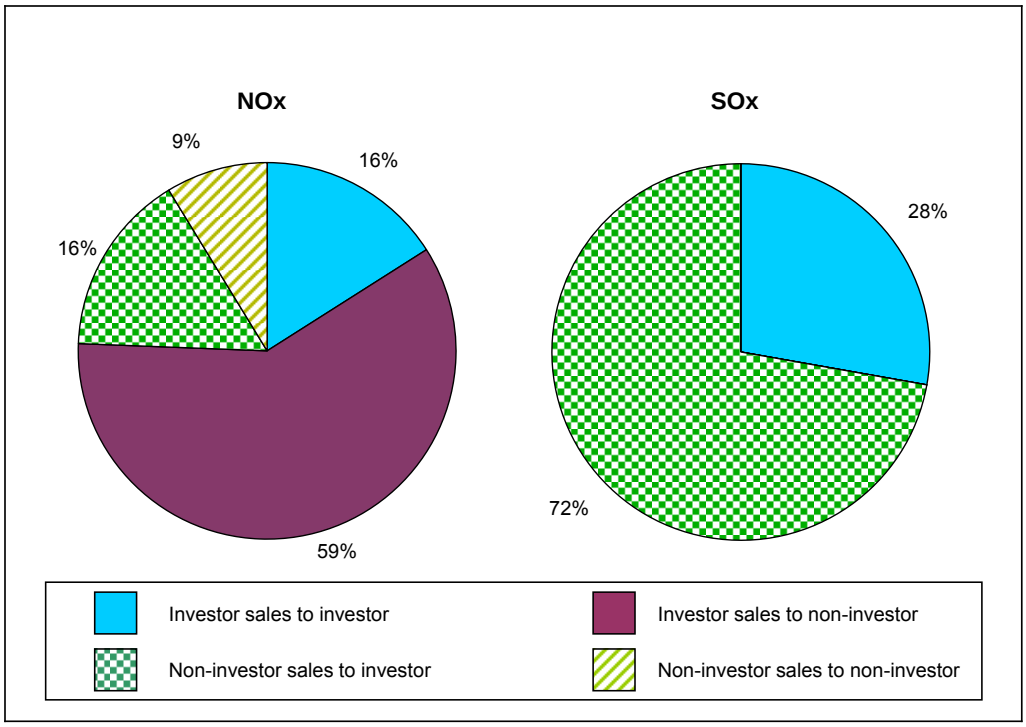


Figure 2-17
Calendar Year 2015 Investor-Involved IYB NOx and SOx Trades Based on Volume Traded with Price



As of the end of calendar year 2015, investors' holding of IYB NOx RTCs had decreased to 1.9% compared to 4.6% at the end of calendar year 2014. 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 increased to 3.3% at the end of calendar year 2015 from 0.9% at the end of calendar year 2014. 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 2014. These four facilities all participated in the NOx RECLAIM program and held a total of 179.0 tons of IYB NOx RTCs and the one facility also participating in the SOx RECLAIM program held a total of 110.9 tons of IYB SOx. Currently, these facilities hold a total of 1.7 tons of IYB NOx RTCs and no IYB SOx RTCs. All IYB NOx and SOx RTCs sales from these shutdowns occurred prior to calendar year 2015.

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 2014, the total RECLAIM NOx emissions were 7,447 tons. If the future total NOx emissions increased to the Compliance Year 2007 level of 8,796 tons (as illustrated in Figure 7-1), the NOx RTC surplus would be only 903 tons (9% of allocation), which is almost in line with the 10% compliance margin reportedly held by RECLAIM facilities.

To put investors' holdings in context, at the end of calendar year 2015 the aggregate investors' holdings are 1.9% of IYB NOx RTCs. While it can be argued that the holding of IYB NOx RTCs by investors as a group is small relative to the total supply of IYB NOx RTCs, and given the recent rule

amendment that reduced allocations by 45.3% to be achieved in future years, there is no clear basis to estimate the level of IYB RTCs available for sale by non-investors. IYB RTCs represent a critical aspect of the program because these streams of RTCs are sought after to support growth at new or existing facilities. Active facilities are less likely to sell their future year RTCs as IYB. As a result, new RECLAIM facilities or facilities with modifications resulting in emissions increases are potentially at the mercy of investors holding IYB RTCs. Investors have the ability to purchase RTCs at any time so there is the potential for investors' holdings of IYB NOx RTCs to increase in the future.

On the other hand, overall emissions in RECLAIM will certainly change and can be affected by various factors including installation of more emission control equipment, production changes, inclusion of additional facilities into the RECLAIM universe, and shifts in industry sectors and in the economy, in general. Staff anticipates that there are two primary mechanisms that drive a facility to implement additional control technologies: Implementation of Best Available Control Technology (BACT) when existing sources reach the end of their useful lives and are replaced, and demand for RTCs approaching the supply driving up RTC prices and incentivizing the installation of emission controls. The first of these mechanisms will occur gradually over time and the second is likely to be significant when RECLAIM facilities increase production or the supply of RTCs decreases as a result of amendments to Rule 2002 implementing BARCT as discussed in Chapter 3. The first iteration of amending Rule 2002 to reduce the NOx RTC supply to reflect changes in BARCT was adopted by the Governing Board in January 2005 and phased in from Compliance Year 2007 through Compliance Year 2011. The first iteration for SOx (adopted November 2010 with phased implementation commencing in Compliance Year 2013 and full implementation starting with Compliance Year 2018) is currently underway. SOx RECLAIM facilities had ample notice and have been able to keep aggregate SOx emissions below aggregate allocations without significant price increases in Compliance Years 2013 and 2014. On December 4, 2015, the Governing Board amended Rule 2002 to implement BARCT by reducing the NOx RTC supply for Compliance Year 2016 and after, as further discussed in Chapter 3. SCAQMD is working with stakeholders to develop proposed amendments to Regulation XX involving the surrender of RTCs held by RECLAIM facilities when they shutdown equipment or the whole facility to bring this aspect of RECLAIM more in line with non-RECLAIM New Source Review. The December 2015 amendments and the current rule development effort are expected to put pressure on RECLAIM facility operators to reduce emissions so as to keep them below their RTC holdings. It is too soon to tell how the market will respond to these amendments, but if adequate emissions controls are not implemented in a timely manner there is the potential for a seller's market for NOx RTCs to develop, which would make RTCs held by investors increasingly important to the market, as described above. SCAQMD staff will continue to monitor market activity and prices throughout the implementation and will report back to the Governing Board regularly.

The significance of investors' holdings will certainly depend on the ability of RECLAIM facilities to generate adequate emissions reductions in time to dampen the effect of a sellers' market that may exist if demand surges in a short period of time, as it did during the California energy crisis of 2000-2001. Proposals to generate emission reduction credits from sources outside of RECLAIM (*i.e.*, mobile and area sources) can also dampen sudden price increases. SCAQMD

staff continues to monitor investor participation in the market to ensure that such participation does not adversely impact the RECLAIM program.

CHAPTER 3
EMISSION REDUCTIONS ACHIEVED

Summary

For Compliance Year 2014, aggregate NOx emissions were below total allocations by 23% and aggregate SOx emissions were below total allocations by 23%. No emissions associated with breakdowns were excluded from reconciliation with facility allocations in Compliance Year 2014. 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 2014. With respect to the Rule 2015 backstop provisions, Compliance Year 2014 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) 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 45.3% (4,380 tons per day) by Compliance Year 2022. The reductions are phased-in from Compliance Year 2016 through Compliance Year 2022.

The Board also amended Rule 2002 in November 2010 to implement changes in BARCT for SOx. Specifically, the November 2010 amendments called for certain facilities' RECLAIM SOx allocations to be adjusted to achieve a 48% (2,081 tons/year) overall reduction, with the reductions phased-in from Compliance Year 2013 through Compliance Year 2019. About 1,460 tons/year (approximately 70% of the scheduled reduction) of SOx allocations were reduced by Compliance Year 2014.

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 emittant are met each year.

Since the last annual report, one facility's previous year audit was re-opened based on reassessment of the facility's records and all information available to the SCAQMD. The re-opened audit affected the facility's NOx emissions reported for Compliance Year 2013. Table 3-1 summarizes the change to the audited emissions for the impacted facility. This audit change caused a decrease of less than 0.002% in the overall audited RECLAIM NOx emissions for Compliance Year 2013.

Table 3-1
Summary of Re-Opened Audits

Compliance Year	Original Audited NOx Emissions (lbs)	Updated Audited NOx Emissions (lbs)	Change in Audited NOx Emissions (lbs)	% Change	% Change in RECLAIM NOx Emissions	Number of Facilities Involved
2013	11,618	11,353	-265	-2.3%	-0.002%	1

Table 3-2 and Figure 3-1 show aggregate audited NOx emissions for Compliance Years 1994 through 2014. 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. Since Compliance Year 2007, the first year of the programmatic reduction in RECLAIM NOx allocations that was adopted by the Governing Board as part of the January 2005 rule

amendments, the unused NOx RTCs have been at least 20 percent of the aggregate allocations. Specifically, Compliance Year 2014 NOx emissions were below total allocations by 23%. Aggregate annual NOx emissions have remained relatively level since a large drop in Compliance Year 2009.

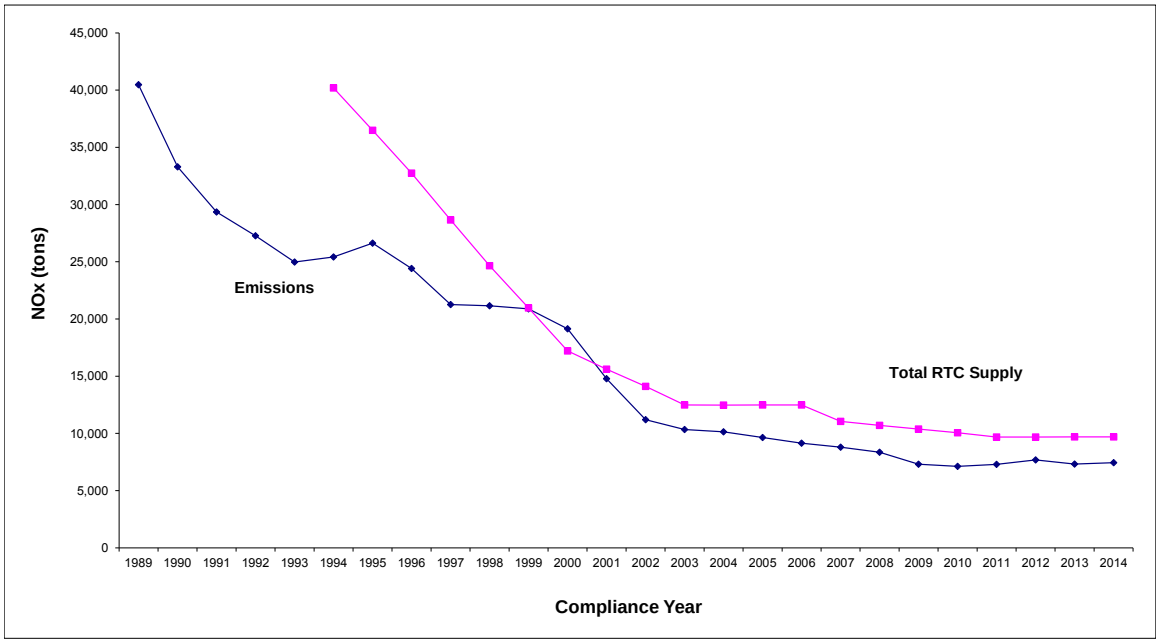
Table 3-2
Annual NOx Emissions for Compliance Years 1994 through 2014

Compliance Year	Audited Annual NOx Emissions[1] (tons)	Audited Annual NOx Emissions Change from 1994 (%)	Total NOx RTCs[2] (tons)	Unused NOx RTCs (tons)	Unused NOx RTCs (%)
1994	25,420	0%	40,186	14,766	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%

[1] 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.

[2] Total RTCs = Allocated RTCs + RTCs from ERC conversion.

Figure 3-1
NOx Emissions and Available RTCs



Similar to Table 3-2 and Figure 3-1 for NOx, Table 3-3 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 3-3 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 2014, SOx emissions were below total allocations by 23%. The unused SOx RTCs from Compliance Year 2008 and on has remained in excess of 20%. 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. Based on audited emission data, annual SOx emissions increased by 110 tons (5%) in Compliance Year 2014 compared to SOx emissions in Compliance Year 2013.

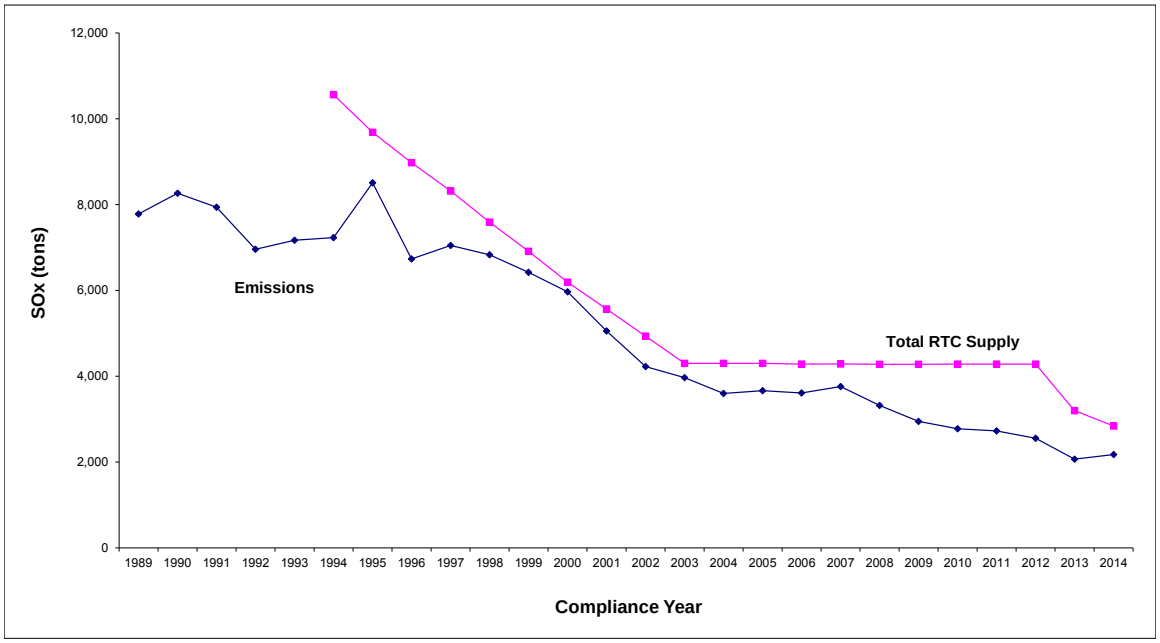
Table 3-3
Annual SOx Emissions for Compliance Years 1994 through 2014

Compliance Year	Audited Annual SOx Emissions[1] (tons)	Audited Annual SOx Emissions Change from 1994 (%)	Total SOx RTCs[2] (tons)	Unused SOx RTCs (tons)	Unused SOx RTCs (%)
1994	7,230	0%	10,336	3,106	30%
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%

[1] 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.

[2] 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[1] 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.

The only rule subsumed by RECLAIM and amended during Compliance Year 2014, was Rule 1325 – Federal PM2.5 New Source Review Program. Amended on December 5, 2014, this rule incorporated by reference federal requirements that are applicable to major polluting facilities, defined by rule as sources with actual emissions of, or the potential to emit, 100 tons per year or more of PM2.5 or its precursors. Amended Rule 1325 incorporated administrative changes to definitions, provisions, and exclusions in response to comments received from the U.S. EPA regarding SIP approvability of the rule. Specifically, these requirements addressed the definition of major source, significant emissions rate, offset ratios, the applicability requirements of Lowest Achievable Emission Rate (LAER), facility compliance, offsets, and the control of PM2.5 precursors. Typographical corrections and other minor clarifications were also included.

These amendments to Rule 1325 were administrative in nature and did not result in any limitations on NOx or SOx sources at non-RECLAIM facilities. And since

[1] See Tables 1 and 2 of Rule 2001.

Rule 2001 only exempts those provisions in identified rules applicable to NOx and SOx emissions at RECLAIM facilities, the recent amendments to Rule 1325 did not result in disproportionate impacts between RECLAIM and non-RECLAIM sources.

Rule 1153.1 – Emissions of Oxides of Nitrogen from Commercial Ovens was adopted on November 7, 2014 and contained a specific exemption to exclude RECLAIM NOx sources from its applicability. This rule applies to equipment such as food ovens, roasters, and smokehouse ovens with new NOx emissions limits while phasing in compliance based on a 20 year equipment life, and incorporating an 800 ppm carbon monoxide emission limit. Rule 1153.1 is the BARCT rule for this group of equipment under the traditional command and control approach. Under RECLAIM, sources are not subject to source-specific emission limits but are bound by the programmatic goals as specified by the Allocations. Equivalency to command and control is evaluated and implemented as part of the BARCT review process on a programmatic basis (*e.g.*, the three BARCT reviews that resulted in reductions of RECLAIM NOx and SOx allocations).

Other rules amended or adopted during Compliance Year 2014, but not subsumed by RECLAIM include Rule 2449 – Control of Oxides of Nitrogen Emissions from Off-Road Diesel Vehicles, Rule 1111 – Reduction of NOx Emissions from Natural-Gas-Fired, Fan-Type Central Furnaces, Regulation IX – Standards of Performance for New Stationary Sources (NSPS), and Regulation X – National Emission Standards for Hazardous Air Pollutants (NESHAPS).

In May 2008, the Governing Board adopted Rule 2449 – Control of Oxides of Nitrogen Emissions from Off-Road Diesel Vehicles, implementing the Surplus Off-Road Opt-In for NOx (SOON) provisions of the State In-Use Off-Road Diesel Vehicle Regulation, which allow air districts to opt-in to the SOON Program to achieve additional NOx reductions from off-road diesel vehicles. On December 14, 2011, CARB amended the In-Use Off-Road Diesel Vehicle Regulation and removed Section 2449.2 of Title 13 of the California Code of Regulations (CCR). As part of that action, CARB renumbered the SOON Provision Section from 2449.3 to Section 2449.2. As a result, on July 11, 2014, Rule 2449 was amended to revise the reference to the SOON provisions provided in the In-Use Off-Road Diesel Vehicle Regulation from Section 2449.3 to Section 2449.2 of Title 13 of the California Code of Regulations.

On September 5, 2014, Rule 1111 – Reduction of NOx Emissions from Natural-Gas-Fired, Fan-Type Central Furnaces was amended. The purpose for amending Rule 1111 was to delay the compliance date for condensing (high efficiency) furnaces until April 1, 2015, in order to provide manufacturers additional time for testing new furnace designs and submitting and receiving approval of alternate compliance plans for selling non-compliant condensing furnaces. Additionally, the amendment provided for a mitigation fee-based compliance option to allow up to three years' delay for residential furnace manufacturers that require additional time to produce furnaces that meet the 14 ng/Joule emission limit. The mitigation fee will be used to mitigate the air emissions impacts of the delay.

On April 3, 2015, Regulations IX – Standards of Performance for New Stationary Sources (NSPS) and X – National Emission Standards for Hazardous Air

Pollutants (NESHAPS) were amended to incorporate new or amended federal standards that had been enacted by U.S. EPA for stationary sources. Historically, the Governing Board adopted NSPS (40 CFR 60) and NESHAPS (40 CFR 61) into Regulations IX and X, by reference, to provide stationary sources with a single source of information for determining which federal and local requirements apply to their specific operations. Actions by U.S. EPA, primarily from July 1, 2011 to December 31, 2014, included new performance standards for certain oil and gas operations not covered by previous EPA regulation as well as amendments to previous provisions of twelve NSPS standards and two NESHAPS standards. The amendments to Regulations IX and X incorporated these U.S. EPA NSPS and NESHAPS actions, respectively, into SCAQMD's regulations.

In contrast to Rule 1325 and 1153.1, Rules 2449, 1111, and Regulations IX and X, were not subsumed under RECLAIM and contained no exemptions from their applicability for RECLAIM NOx or SOx sources. Since the requirements of these amended rules apply equally to both RECLAIM and non-RECLAIM facilities, 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, amendments to rules during Compliance Year 2014, both subsumed by RECLAIM and rules not subsumed by RECLAIM, 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

The rule amendment process was initiated in 2012 and continued through Compliance Year 2014 to implement the 2012 AQMP Control Measure CMB-01, which seeks to comply with California Health and Safety Code §40440 in regards to implementation of BARCT and to bring the Basin into attainment with the federal 24-hour PM2.5 standard by 2019 and the federal ozone ambient air quality standards by 2023 and 2031. This effort culminated in a staff proposal to amend the RECLAIM Program which was presented to the Governing Board on December 4, 2015.

The rule amendment process was one of the most comprehensive rule amendment efforts. The process took more than three years and included five briefings for the Stationary Source Committee, 14 Working Group meetings, multiple meetings with various stake holders and air pollution control manufacturers, and input from two engineering consultants. Feasible BARCT identified for the refinery sector included fluid catalytic cracking units, boiler or heaters greater than 40 mmbtu/hr, gas turbines, coke calciners, and sulfur recovery and tail gas incinerators. For the non-refinery sector, new BARCT levels were proposed for container glass melting furnaces, cement kilns, sodium silicate furnaces, metal melting furnaces greater than 150 mmbtu/hr, and gas turbines and ICEs not located on the outer continental shelf. The staff proposal would have resulted in a 14 tons per day of NOx emission reductions in the RTC supply by Compliance Year 2022 with a schedule of incremental reductions starting from Compliance Year 2016.

On December 4, 2015, the Governing Board voted to adopt a reduction of 12 tons per day and with an incremental reduction schedule of 2 tons per day in

2016, 0 tons per day in 2017, 1 ton per day in 2018, 1 ton per day in 2019, 2 tons per day in 2020, 2 tons per day in 2021, and 4 tons per day in 2022. Other program modifications included

- Three different groups of RTC holders with different rates of reductions—the first group included major refineries and RTC investors, the second group included the balance of the largest NOx RTC holders representing 90% of the RTC supply (*i.e.*, all NOx RTC holders were sorted by the amount of IYB NOx RTCs held from largest holdings to smallest, and the second group was formed by moving down the list and including all those not in the first group until 90% of the IYB supply was in the first and second group), and the third group included the remaining RTC holders. RTC holdings are reduced by 56.3% for the first group, 41.7% for the second group, and zero percent for the third group;
- A Regional NSR Holding Account for certain electricity generating facilities (EGFs) to hold a portion of the reduced RTCs from these facilities. The specified EGFs may apply their portion of the reduced RTCs toward their hold requirements as imposed by Rule 2005 – New Source Review for RECLAIM;
- Provisions to allow use of RTCs in the Regional NSR Holding Account by any EGF during a Governor-declared State of Emergency related to electricity demand or power grid instability within the SCAQMD jurisdictional boundaries. Any EGF seeking such access to the Regional NSR Holding Account will have to demonstrate that it qualifies pursuant to Rule 2002(f)(4). Available RTCs from this account will be distributed in proportion to the amount requested to qualified participants until the supply is exhausted. Within 60 days of the end of the quarter in which a State of Emergency was declared by the Governor, the Executive Officer is to report to the Governing Board on the quantity of RTCs distributed from the Regional NSR Holding Account, any adverse impacts on the RECLAIM program, and any changes to help correct these impacts;
- Provisions for re-activating an incremental portion of the reduced RTCs, which are designated as Non-Tradable/Non-Usable RTCs, in specific cases. The Governing Board may decide on such re-activation if the three-month rolling average price for current compliance year NOx RTCs exceed $35,000 per ton or the 12-month rolling average price for current compliance year NOx RTCs exceed $22,500 per ton;
- A reporting requirement for the Executive Officer starting in Compliance Year 2019—the Executive Officer is to report to the Governing Board if the 12-month rolling average price for IYB NOx RTC falls below $200,000 per ton;
- A requirement for a report to the Governing Board in response to RTC prices exceeding the thresholds described above. The report shall include a commitment and a schedule to assess control technology implementation, emission reduction, cost-effectiveness, market analysis, and socioeconomic impacts. Such report is to be submitted to the Governing Board at a public hearing no more than 90 days after the Executive Officer determination;

- Provisions that allow an operator of an electricity generating facility that is existing as of December 4, 2015 or has been subject to NOx RECLAIM for at least 10 years to opt-out of the RECLAIM program if all of its NOx emissions for the most recent three compliance years are from equipment that meets current BACT or BARCT for NOx. Once opted-out of RECLAIM, the facility is not allowed to re-enter RECLAIM;
- Provisions to issue NOx Allocations for existing facilities entering RECLAIM after December 5, 2015 based on current BARCT emission factors as represented in tables listed in Rule 2002;
- A delay in relative accuracy testing audit due dates for specified situations;
- Alternative emission calculations for small NOx sources that are exempt from permit requirements[2]--NOx emission calculations based on certified emission levels are added for sources that are certified to certain emission levels by EPA, ARB or SCAQMD; and
- Standard Conditions for temperature[3] – adding 60°F as an alternative temperature setting as the standard condition in addition to the existing standard of 68°F under RECLAIM program, provided the same standard is used throughout a RECLAIM facility. All natural gas usages as recorded by gas company meters are expressed at 60°F. Allowing use of 60°F as the standard provides more straightforward emission determinations and recordkeeping for sources that determine fuel usage incorporating Gas Company meters readings.
- A prohibition on use of Annual Emission Report (AER) data submitted more than five years after its original due date for determining Allocations for existing facilities entering RECLAIM—AER reports provide information regarding equipment, process, and production rates which form the basis for determining Allocations for existing facilities as discussed in Chapter 2. The five year limit is imposed to ensure information availability for staff to audit and determine accuracy of the AER reports

The Governing Board did not adopt staff proposed provisions that would remove RTCs from the RECLAIM Program equivalent to emissions from equipment and facilities that have shut down. Instead, the Governing Board directed staff to continue discussions with stake holders to refine the proposal, and submit to the Board a proposal at a later date. This effort is currently underway. Finally, the Board Resolution also directed staff to follow-up on the extent and impact that future power demands may have on EGFs.

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

[2] This amendment was affirmed by the Governing Board on February 5, 2016.

[3] This amendment was adopted by the Governing Board on February 5, 2016.

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 2014 found that no facilities requested to exclude breakdown emissions from being counted against their allocations. Thus, for Compliance Year 2014, no additional RTCs are required to offset breakdown emissions pursuant to Rule 2015(d)(3).

Table 3-4
Breakdown Emission Comparison for Compliance Year 2014

Emittant	Compliance Year 2014 Unused RTCs (tons)	Unmitigated Breakdown Emissions[1] (tons)	Remaining Compliance Year 2014 RTCs (tons)
NOx	2,252	0	2,252
SOx	663	0	663

[1] Data for unmitigated breakdown emissions (not counted against Allocation) as reported under APEP reports.

Impact of Changing Universe

As discussed in Chapter 1, one facility was included into and no facilities were excluded from the NOx universe, no facilities were included or excluded from the SOx universe, and four facilities (three NOx only and one NOx and SOx) shut down in Compliance Year 2014. 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 2014, no existing facilities elected to opt into the RECLAIM universe or were included into the RECLAIM universe based on the Rule 2001 threshold of actual NOx and/or SOx emissions greater than or equal to four tons per year.

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 NOx or SOx 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 2014, no new facilities elected to opt into the RECLAIM universe, but one new facility, as defined by Rule 2000, 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 NOx or SOx 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.

The shutdown of a RECLAIM facility results in a reduction in actual emissions. The shut down facility retains its RTC holdings, which it may continue to hold as an investment, transfer to another facility under common ownership, or trade on the market. Therefore, although the facility is no longer emitting, its RTCs may be used at another facility. Shutdown facilities have the opposite effect on the RTC market as do new facilities: the overall demand for RTCs is reduced while the supply remains constant. As reported in Chapter 1, four RECLAIM facilities (three NOx-only facilities and one NOx/SOx facility) shut down permanently in Compliance Year 2014. As discussed earlier in this chapter, a Rule 2002 amendment proposal that will remove RTCs from the RECLAIM Program equivalent to emissions from equipment and facilities that have shut down is currently being refined for submittal to the Governing Board during 2016.

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. No facilities were excluded in Compliance Year 2014.

In summary, inclusion of new facilities and the shutdown of RECLAIM facilities, change the demand for RTCs without changing the supply[4], while exclusions of existing facilities make corresponding changes to both the demand and the supply, thereby mitigating their own impact on the markets and shifting emissions between the RECLAIM and non-RECLAIM universes.

Compliance Year 2014 NOx and SOx audited emissions and initial Compliance Year 2014 allocations for facilities that were shut down, excluded, or included into the program during Compliance Year 2014 are summarized in Tables 3-5 and 3-6.

Table 3-5
NOx Emissions Impact from the Changes in Universe (Tons)

Category	Compliance Year 2014 NOx Emissions (tons)	Initial Compliance Year 2014 NOx Allocations (tons)
Shutdown Facilities	0.1	180.2
Excluded Facilities	Not applicable	Not applicable
Included Facilities	1.3	0.0
RECLAIM Universe	7,447	9,699

Table 3-6
SOx Emissions Impact from the Changes in Universe (Tons)

Category	Compliance Year 2014 SOx Emissions (tons)	Initial Compliance Year 2014 SOx Allocations (tons)
Shutdown Facilities	0.0	110.9
Excluded Facilities	Not applicable	Not applicable
Included Facilities	Not applicable	Not applicable
RECLAIM Universe	2,176	2,839

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, or whenever the annual average price of RTCs exceeds $15,000 per ton. Compliance Year 2014 aggregate NOx and SOx emissions were both below aggregate allocations as shown in Figures 3-1 and 3-2. At the same time, annual average prices for NOx and SOx RTCs in calendar year 2014 were below $15,000 per ton, as shown in Chapter 2. Therefore, there is no need to initiate a program review.

[4] Facilities that were initially permitted after the October 1993 adoption of RECLAIM and that provided NOx or SOx ERCs to offset their emissions are issued RTCs corresponding to the ERCs provided.

CHAPTER 4
NEW SOURCE REVIEW ACTIVITY

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 2014, a total of eight NOx RECLAIM facilities had NSR NOx emission increases, and no SOx RECLAIM facilities had NSR SOx emission increases 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 2014, RECLAIM demonstrated federal equivalency with a programmatic NOx offset ratio of 73-to-1 based on the compliance year's total unused allocations and total NSR emission increases for NOx. 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 2014. 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. Compliance with the federally-required offset ratio also demonstrates compliance with any applicable state NNI requirements for new or modified sources. 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). 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[1].

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.*, NOx and VOC). The federal offset requirement for major SO_2 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 SOx standards, SOx is a precursor to PM10 which is a non-attainment air pollutant in the Basin. The applicable offset ratio for PM10 is at least 1-to-1, thus, the applicable offset ratio for SOx 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 SOx and state NNI requirements for both SOx and NOx. 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. The same rule also requires all new RECLAIM facilities[2] and all other RECLAIM

[1] Federal NSR applies to federal major sources (sources with the potential to emit at least 10 tons of NOx or 100 tons of SOx per year for the South Coast Air Basin) and state NNI requirements apply to all NOx sources and to SOx 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 NOx or SOx emissions, some RECLAIM facilities have actual emissions much less than 4 tons per year).

[2] New facilities are facilities that received all District Permits to Construct on or after October 15, 1993.

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. This annual program audit report assesses NSR permitting activities for Compliance Year 2014 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 2014 shows that RECLAIM facilities were able to expand and modify their operations while complying with NSR requirements. During Compliance Year 2014, a total of eight NOx RECLAIM facilities (five in Cycle 1 and three in Cycle 2) were issued permits to operate, which resulted in a total of 31.21 tons per year of NOx emission increases from starting operations of new or modified sources, and no SOx RECLAIM facilities experienced a SOx NSR emission increase 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: 2,252 tons, SOx: 663 tons; see Chapter 3) in the RECLAIM universe available for use to offset these 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 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 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 eight RECLAIM facilities resulted in 31.21 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 2014), 2,252 tons of Compliance Year 2014 NOx RTCs remained unused. Therefore, the Compliance Year 2014 NOx programmatic offset ratio calculated from this methodology is 73-to-1 as shown below:

$$\text{Offset Ratio} = \left(1 + \frac{2{,}252 \text{ tons}}{31.21 \text{ tons}}\right)\text{-to-1}$$

$$= 73\text{-to-1}$$

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. 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 SOx is 1-to-1. Since RECLAIM facilities are required to secure, at a minimum, adequate RTCs to cover their actual emissions, the SOx 1-to-1 offset ratio is met automatically provided there is no programmatic exceedance of aggregate SOx allocations for that compliance year. As stated earlier in Chapter 3, there were 663 tons of excess (unused) SOx RTCs for Compliance Year 2013. Therefore, there is certainty that both the federally required SOx offset ratio and the California NNI

requirement for SOx were satisfied and a separate calculation of the SOx offset ratio is not necessary.

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 2014 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 NOx or SOx 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 2014, three RECLAIM facilities were subject to the 40 ton modeling requirement; two facilities for NOx emissions, and one for SOx emissions.

This modeling is performed with an EPA approved air dispersion model to assess the impact of a facilities NOx or SOx 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 facilities NOx or SOx emission increases are added to the highest background NOx or SOx 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 SOx facility, which had an initial SOx allocation in 1994 and exceed this initial allocation by more than 40 tons in Compliance Year 2014, submitted modeling that demonstrated that SOx emissions from their major sources during 2014 will not cause an exceedance of any state or federal SO_2 AAQS. One of the NOx facilities had an initial NOx allocation in 1994 and exceeded this initial allocation by more than 40 tons in Compliance Year 2014. This facility submitted modeling that demonstrated that NOx emissions from their major sources during 2014 will not cause an exceedance of any state or federal NO_2 AAQS. The other NOx facility, which had no initial allocation in Compliance Year 1994 and whose NOx emissions were above the 40 ton per year threshold, modeled NOx emissions at a much higher emission level prior to its recent commissioning.

This initial modeling determined that the annual NOx emission increase would not cause an exceedance of state or federal NO_2 AAQS. Since the initial modeling was conducted at a much higher emission level than what the facility emitted in 2014, this facility did not require additional modeling analysis (*i.e.*, the fact that modeling conducted during the permitting process demonstrated that emissions at the potential to emit level would not cause an exceedance of the state or federal AAQS for NO_2 provides certainty that the much lower actual emissions level did not cause such an exceedance).

CHAPTER 5
COMPLIANCE

Summary

*Of the 276 NOx RECLAIM facilities audited during Compliance Year 2014, a total of 265 facilities (96%) complied with their NOx allocations, and 32 of the 33 SOx facilities (97%) complied with their SOx allocations. Twelve facilities exceeded their allocations (11 facilities exceeded their NOx allocations, and one facility exceeded its SOx allocation) during Compliance Year 2014. The 11 facilities that exceeded their NOx allocations had aggregate NOx emissions of 140.1 tons and did not have adequate allocations to offset 32.4 tons (or 23.1%) of their combined emissions. The one SOx facility that exceeded its SOx allocation had total SOx emissions of 311.1 tons and did not have adequate allocations to offset 26.3 tons (or 8.5%). The NOx and SOx exceedance amounts are relatively small compared to the overall NOx and SOx allocations for Compliance Year 2014 (0.33% of total NOx allocations and 0.93% of total SOx allocations). The exceedances from these facilities did not impact the overall RECLAIM emission reduction goals. 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 2014 allocations. The overall RECLAIM NOx and SOx emission reduction targets and goals were met for Compliance Year 2014 (*i.e.*, aggregate emissions for all RECLAIM facilities were well below aggregate 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 to ensure their integrity and reliability. 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 2014, these inspections revealed that some facilities did not obtain or record valid monitoring data, were unable to substantiate reported emissions with valid records, failed to submit emission reports when due, made errors in quantifying their emissions (*e.g.*, arithmetic errors), used incorrect 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 used MDP

inappropriately. Other common mistakes included reporting non-RECLAIM emissions and/or omitting reportable emissions. 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 12 RECLAIM facilities failed to reconcile their emissions (11 NOx-only facilities and one NOx and SOx facility that only exceeded its SOx allocation). Seven of these 12 facilities (six NOx-only facilities and the one NOx/SOx facility that exceeded its SOx allocations) failed to secure sufficient RTCs during either the quarterly or annual reconciliation periods to cover their reported emissions. Three of the six NOx-only facilities had additional exceedances because they under-reported their emissions and didn't hold sufficient RTCs to reconcile their audited emissions. Of the eleven facilities with NOx exceedances, the remaining five facilities (NOx-only) had exceedances solely because they under-reported their emissions and didn't hold sufficient RTCs to reconcile their audited emissions. Reasons for under-reported NOx emissions include one or more of the following: utilization of incorrect moisture content to convert measured stack flow to dry stack flow, failure to correct measured fuel flow to standard conditions, failure to account for quarterly NOx emissions from a piece of NOx emitting equipment, failure to use correct equipment rating, failure to use correct emission factor(s), and failure to use applicable missing data procedures.

Overall, the Compliance Year 2014 allocation compliance rates for facilities are 96% (265 out of 276 facilities) for NOx RECLAIM and 97% (32 out of 33 facilities) for SOx RECLAIM. For purposes of comparison, the allocation compliance rates for Compliance Year 2013 were 97% and 94% for NOx and SOx RECLAIM facilities, respectively. The 11 facilities that had NOx emissions in excess of their individual NOx allocations had 140.1 tons of NOx emissions and did not have adequate RTCs to cover 32.4 of those tons (or 23.1%). The SOx facility that exceeded its SOx allocation and had total SOx emissions of 311.1 tons did not have adequate allocations to offset 26.3 tons (or 8.5%). The NOx and SOx exceedance amounts are relatively small compared to the overall allocations for Compliance Year 2014 (0.33% of aggregate NOx allocations and 0.93% of aggregate SOx allocations). Pursuant to Rule 2010(b)(1)(A), all twelve facilities had their respective NOx or SOx Allocation exceedances deducted from their annual emissions allocations for the compliance year subsequent to SCAQMD's determination that the facilities exceeded their Compliance Year 2014 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"[1] 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[2].

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, 97 NOx facilities and 13 SOx facilities used MDP in reporting portions of their annual emissions during Compliance Year 2014. In terms of mass emissions, 3.3% of the total reported NOx emissions and 3.0% of the total reported SOx emissions in the APEP reports were calculated using MDP for Compliance Year 2014. 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).

[1] Based on uncontrolled emission factor at maximum rated capacity of the source and 24 hours per day.

[2] 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)
2008	7.6% (86 / 625)	7.5% (9 / 242)
2009	7.8% (103 / 554)	13.8% (15 / 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)

* 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, 97 facilities reported NOx emissions using MDP in Compliance Year 2014. Even though the number of facilities is higher than in 1995, the percentage of emissions reported using MDP during Compliance Year 2014 is much lower than it was in 1995 (3.3% compared to 23%). Additionally, in terms of quantity, NOx emissions in Compliance Year 2014 were about 4% of those in Compliance Year 1995 (247 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 3% of reported NOx annual emissions were calculated using MDP in Compliance Year 2014. 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 3% 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 2014, a significant portion of NOx MDP emissions data (41%) and majority of SOx MDP emissions data (93%) 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 NOx sources into major sources, large sources, process units, and equipment exempt from obtaining a written permit pursuant to Rule 219. All SOx 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 63% of all permitted RECLAIM NOx and SOx sources during Compliance Year 2014, respectively, reported emissions for Compliance Year 2014 revealed that 81% of all RECLAIM NOx emissions and 98% 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 ±20% for pollutant concentration, ±15% for stack flow rate, and ±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 2014 and 2015 calendar years' passing rates for RATAs of certified CEMS for NOx and SOx concentration, total sulfur in fuel gas concentrations, stack flow rate (in-stack monitors and F-factor based calculations), and NOx and SOx mass emissions. However, the tables do not include SOx 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 2014 and 2015 passing rates are calculated from RATA data submitted before January 16, 2105 and January 14, 2016, 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 2014[1]

Concentration						Stack Flow Rate				Mass Emissions			
NOx		SO_2		Total[2] Sulfur		In-Stack Monitor		F-Factor Based Calc.		NOx		SOx[3]	
No.	% Pass	No.	% Pass	No.	% Pass	No.	% Pass	No.	% Pass	No.	% Pass	No.	% Pass
351	100	83	100	13	100	47	100	390	100	351	100	46	100

[1] All passing rates calculated from data submitted before January 16, 2015 and may exclude some data from the fourth quarter calendar year 2014.

[2] Includes Cylinder Gas Audit (CGA) tests.

[3] Does not include SOx emissions calculated from total sulfur analyzers.

Table 5-4
Passing Rates Based on RATAs of Certified CEMS in 2015[1]

Concentration						Stack Flow Rate				Mass Emissions			
NOx		SO_2		Total[2] Sulfur		In-Stack Monitor		F-Factor Based Calc.		NOx		SOx[3]	
No.	% Pass	No.	% Pass	No.	% Pass	No.	% Pass	No.	% Pass	No.	% Pass	No.	% Pass
373	100	93	100	13	100	42	100	379	100	373	100	80	100

[1] All passing rates calculated from data submitted before January 14, 2016 and may exclude some data from the fourth quarter of calendar year 2015. All test audits were submitted electronically in 2015

[2] Includes Cylinder Gas Audit (CGA) tests.

[3] 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_2 concentration, stack flow rate, and mass emissions were all 100%. The passing rates for total sulfur analyzers were also 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. All RATA results for calendar year 2015 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.

When the RECLAIM program first began, the ability to electronically transmit emissions data to SCAQMD's Central Station via modem was considered state-of-the-art technology. However, that technology is now antiquated and finding replacement components (*e.g.,* slower baud-rate modems) is becoming increasingly difficult. As such, SCAQMD is evaluating options to either upgrade or replace the current Central Station. SCAQMD plans to initiate a Working Group during 2016. Key factors that need to be considered include ease of implementation and cost impacts on RECLAIM facilities and SCAQMD. Any proposed alternative must be broadly applicable, be capable to support automatic daily transmission of reports without any human intervention, and allow adequate time for testing and implementation. Progress on this effort will be presented in future annual program audit reports.

CHAPTER 6
REPORTED JOB IMPACTS

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 2014 employment survey data gathered from APEP reports, RECLAIM facilities reported a net gain of 266 jobs, representing 0.26% of their total employment. None of the four RECLAIM facilities that shut down during Compliance Year 2014 cited RECLAIM as a factor contributing to the decision to shutdown. No facilities reported a gain or loss of jobs due to RECLAIM.

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 2014 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 2014 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 2014.

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 2014 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 2014 APEP reports and follow-up contacts with facilities. A total of 128 facilities reported 7,052 job gains, while 131 facilities reported a total of 6,786 job losses.

Net job gains were reported in two of the three categories: sales of products (34), and manufacturing (382), whereas net job losses were reported in the remaining category: non-manufacturing (150). Table 6-1 shows a total net gain of 266 jobs, which represents a net jobs increase of 0.26% at RECLAIM facilities during Compliance Year 2014.

Table 6-1
Job Impacts at RECLAIM Facilities for Compliance Year 2014

Description	Manufacture	Sales of Products	Non-Manufacture	Total[1]
Initial Jobs	35,945	885	66,368	103,198
Overall Job Gain	2,631	163	4,258	7,052
Overall Job Loss	2,249	129	4,408	6,786
Final Jobs	36,327	919	66,218	103,464
Net Job Change	382	34	-150	266
Percent (%) Job Change	1.06%	3.84%	-0.23%	0.26%
Facilities Reporting Job Gains	87	20	76	128
Facilities Reporting Job Losses	98	22	72	131

[1] 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 in Table 6-1 include four RECLAIM facilities that were reported to have shut down or ceased operations in Compliance Year 2014 as listed in Appendix C. One facility was sold and consolidated its operations with its parent company. A second facility had all equipment removed from the site and abandoned the property. Staff attempted to contact the owners, but were unable to obtain further clarification regarding the reason for shutdown. The third facility's representative was unwilling to provide any reason for the shutdown other than it was because they are no longer making rocket engines. The property was sold for development. The fourth facility shut down and filed for bankruptcy. Again, staff attempted to contact the owners, but were unable to obtain further clarification regarding the reason for shutdown. These shutdowns led to a loss of 29 manufacturing jobs and 38 non-manufacturing jobs according to the submitted APEP reports. However, none of the Compliance Year 2014 job losses were attributed to RECLAIM (refer to Appendix E). None of the operating RECLAIM facilities attributed job gains or losses to RECLAIM for Compliance Year 2014.

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

Summary

Audited RECLAIM emissions have been in an overall downward trend since the program's inception. Compliance Year 2014 NOx emissions increased 1.7% relative to Compliance Year 2013, and Compliance Year 2014 SOx emissions were 5.3% more than the previous year. Quarterly calendar year 2014 NOx emissions fluctuated within 6 percent of the mean NOx emissions for the year. Quarterly calendar year 2014 SOx emissions fluctuated within 11 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 2014, 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.

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[1], and

[1] The quarterly emission maps can be found at: http://www.aqmd.gov/home/programs/business/about-reclaim/quarterly-emission-maps.

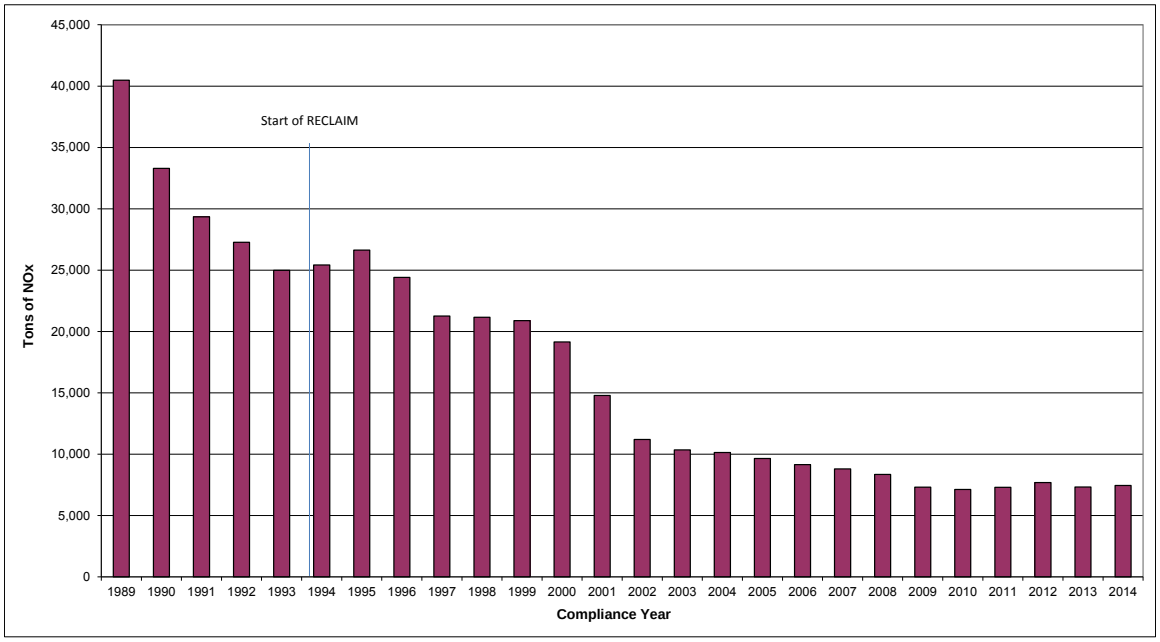
include all the quarterly emissions maps presented in previous annual program audit reports. This chapter addresses:

- Emission trends for RECLAIM facilities;
- Seasonal fluctuations in emissions;
- Per capita exposure to air pollution; and
- Toxics impacts.

Emission Trends for RECLAIM Sources

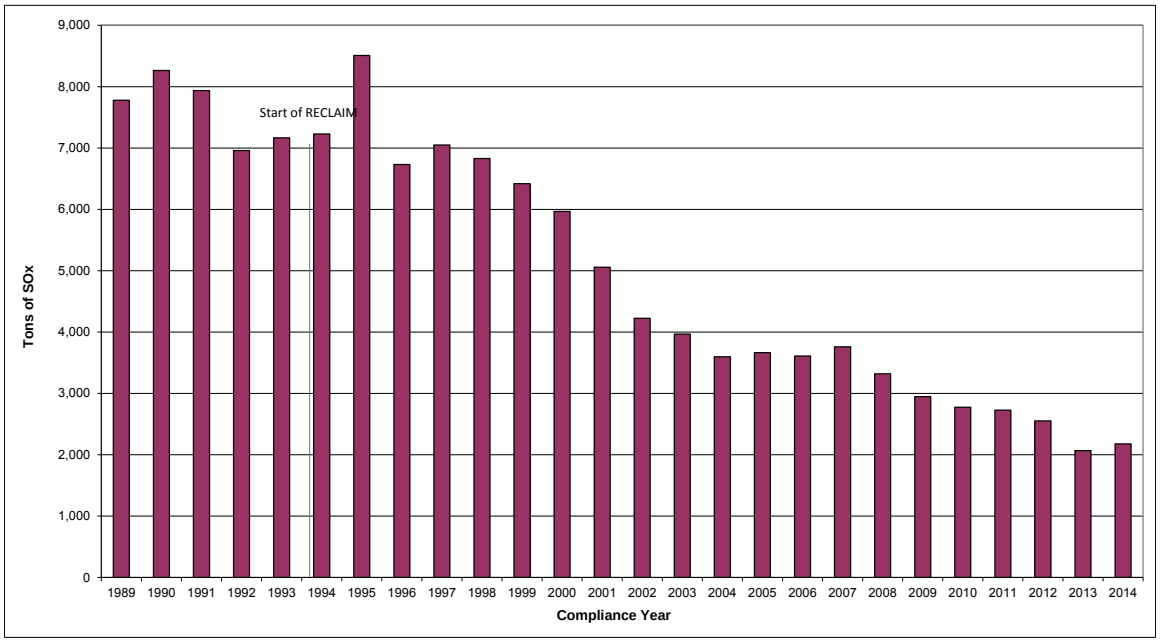
Concerns were expressed during program development that RECLAIM might cause sources to increase their aggregate emissions during the early years of the program due to perceived over-allocation of emissions. As depicted in Figures 7-1 and 7-2, which show NOx and SOx emissions from RECLAIM sources since 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.

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 2014 have fluctuated within a narrow range (7,121 – 7,691 ton/yr, or < ± 4% of the mid point). As shown in Table 3-2 and Figure 3-1, these emission levels are much lower than the programmatic goals. Since Compliance Year 1995, annual SOx emissions have also followed a general downward trend, except for slight increases in Compliance Years 1997, 2005, 2007, and now in 2014 compared to each respective previous compliance year.

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 2014 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 2014 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.[2]

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 2014 mean quarterly NOx emission level, which is the average of the aggregate audited emissions for each of the four quarters, and the 2014 audited quarterly emissions. Figure 7-4 compares the 2014 quarterly NOx emissions with the quarterly emissions from 2003 through 2013. During calendar year 2014, quarterly NOx emissions varied from 4 percent below the mean in the

[2] 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.

first quarter (January through March) to about 6 percent above the mean in the third quarter (July through September). Figure 7-4 shows that the calendar year 2014 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 2014 there has not been a significant shift in NOx emissions from the winter months to the summer months.

Figure 7-3
Calendar Year 2014 NOx Quarterly Emissions

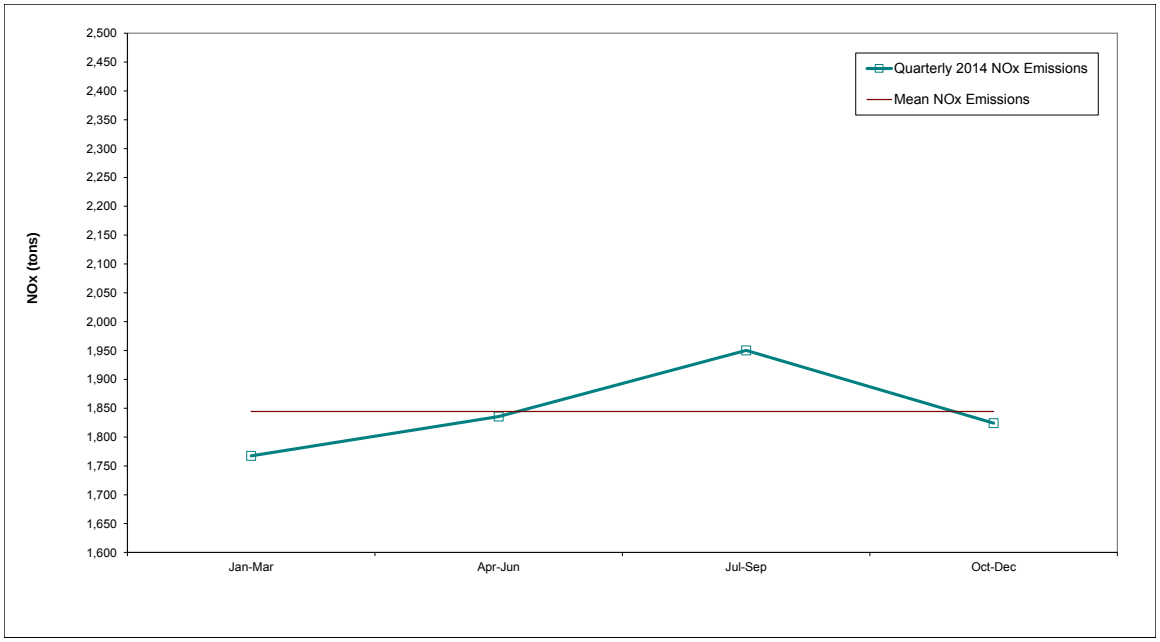
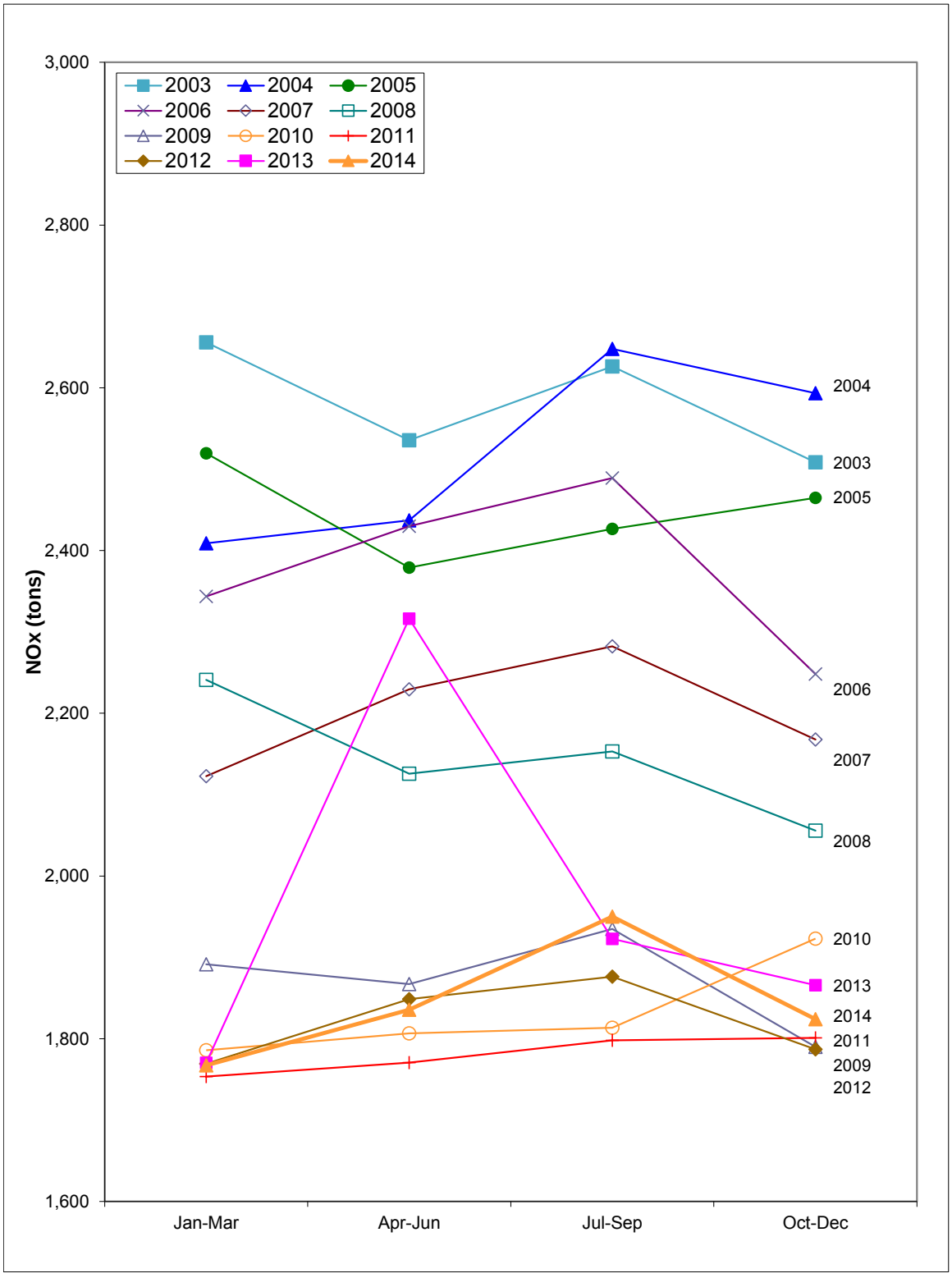


Figure 7-4
Quarterly NOx Emissions from Calendar Years 2003 through 2014



Similar to Figure 7-3 and 7-4 for NOx quarterly emissions, Figure 7-5 presents the 2014 mean quarterly SOx emissions and the 2014 audited quarterly emissions, while Figure 7-6 compares the 2014 quarterly SOx emissions with the quarterly emissions from 2003 through 2013. Figure 7-5 shows that quarterly SOx emissions during calendar year 2014 varied from about 11 percent above the mean in the third quarter (July to September) to 5 percent below the mean in the fourth quarter (October through December). Figure 7-6 shows that the calendar year 2014 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 2014 there was not a significant shift in SOx emissions from the winter months to the summer months.

Figure 7-5
Calendar Year 2014 SOx Quarterly Emissions

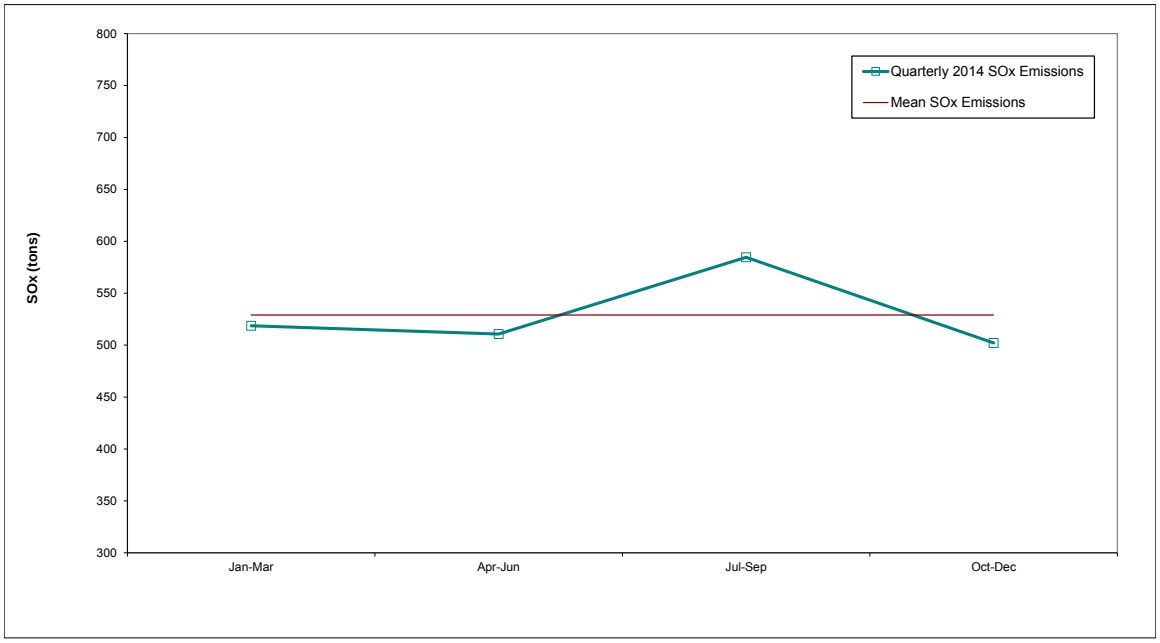
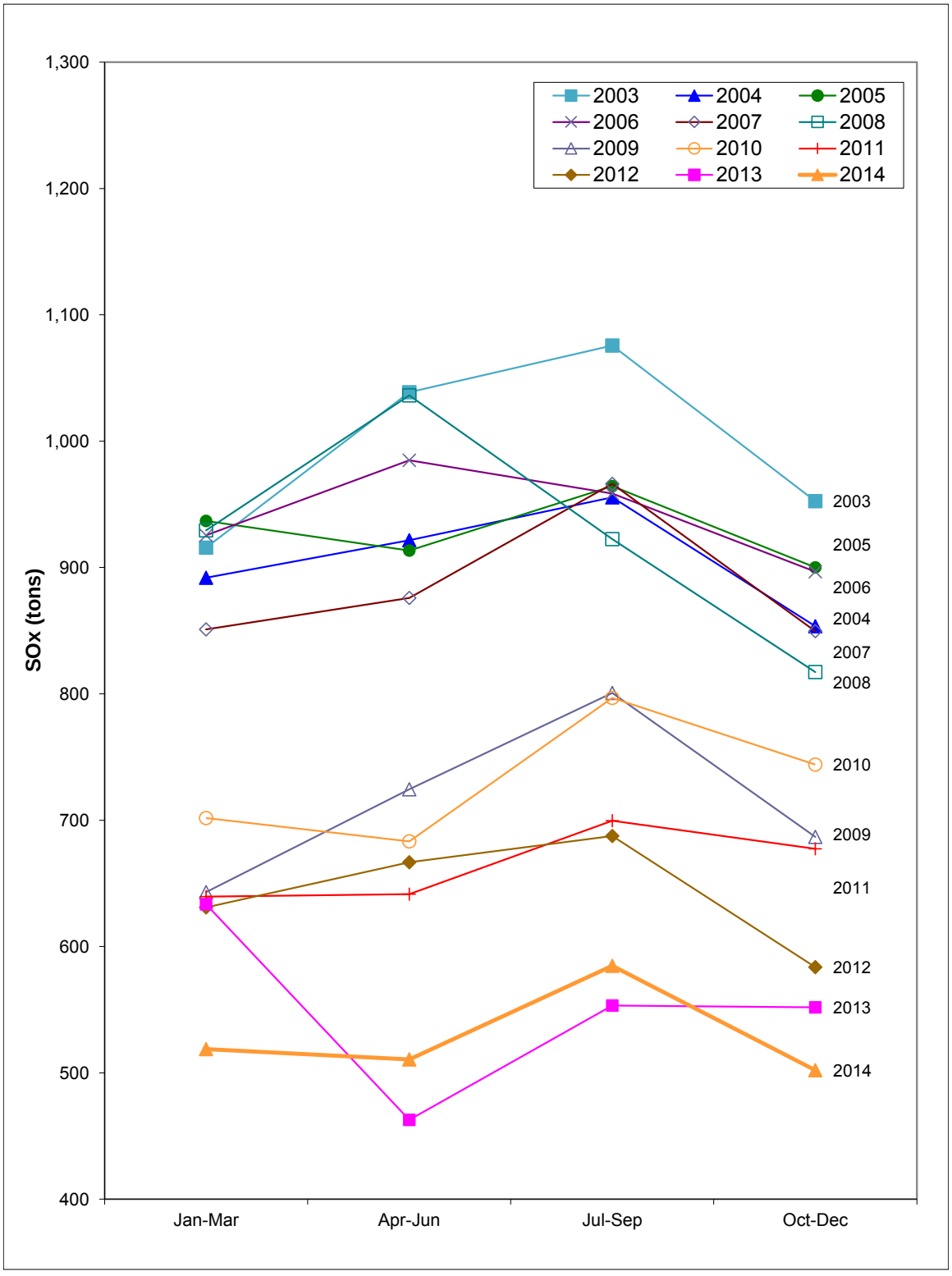


Figure 7-6
Quarterly SOx Emissions from Calendar Years 2003 through 2014



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 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 new 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 a new 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 revised 8-hour federal standard. As of December 28, 2015, the 8-hour NAAQS for ozone has been further reduced to 0.070 ppm, the level of the current California Ambient Air Quality Standard. Table 7-1 shows that the Basin exceeded the federal 8-hour 0.07 ppm standard 113 days and the state 0.07 ppm standard 116 days in 2015. The number of days of exceedance of the federal and state standards differ even though the standards are numerically equal due to 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 2015 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 the 1-hour state and 8-hour federal ambient ozone standards in calendar year 2015 were the lowest since calendar year 2001. The Basin's maximum ozone concentrations were very close to the lowest levels since 2001, based on both the 1-hour and 8-hour averaging periods.

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

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"[3]) 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 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 2015, the actual per capita exposure for the Basin was 1.96 hours, which represents a 97.6% reduction from the 1986-88 baseline level.

[3] 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.

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[1]	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	2.872	1.538	0.078	3.884	10.539
2010 actual	1.184	0.377	0.107	2.451	4.476
2011 actual	2.099	0.848	0.015	3.456	8.125
2012 actual	2.366	1.050	0.050	2.587	9.776
2013 actual	1.314	0.519	0.067	1.609	5.497
2014 actual	1.837	1.263	0.293	1.472	6.022
2015 actual	1.962	0.760	0.101	2.135	8.473
1997 target[2]	48.3	45.5	16.3	56.5	115.6
2000 target[3]	40.2	37.9	13.6	47	96.3

[1] Average over three years, 1986 through 1988.

[2] 60% of the 1986-88 baseline exposures.

[3] 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 NOx or SOx emission increases are also required to be equipped with BACT, which minimizes to the extent feasible NOx and SOx 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, NOx, SOx, 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[4] into one of three categories: low, intermediate, or high priority. Facilities ranked with low priority are exempt from future reporting. Facilities ranked with intermediate 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 2014 Annual Report on the AB2588 Air Toxics "Hot Spots" program[5], staff has reviewed and approved 335 facility HRAs as of the end calendar year 2014. About 95 percent of the facilities have cancer risks

[4] The toxics prioritization procedures can be found at: http://www.aqmd.gov/home/regulations/compliance/toxic-hot-spots-ab-2588

[5] The 2014 AB2588 Annual Report can be found at: http://www.aqmd.gov/docs/default-source/planning/risk-assessment/annual_report_2014.pdf

below 10 in a million and 97 percent 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 50 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, 24 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[6]. Monitoring conducted at that time indicated that the basin-wide population-weighted air toxics exposure was reduced by 57 percent 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 NOx and SOx 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. Staff will continue to monitor and assess toxic impacts as part of future annual program audits.

[6] 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

APPENDIX A
RECLAIM UNIVERSE OF SOURCES

The RECLAIM universe of active sources as of the end of Compliance Year 2014 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
800196	2	AMERICAN AIRLINES INC	NOx
145836	2	AMERICAN APPAREL DYEING & FINISHING, INC	NOx
156722	1	AMERICAN APPAREL KNIT AND DYE	NOx
21598	2	ANGELICA TEXTILE SERVICES	NOx
74424	2	ANGELICA TEXTILE SERVICES	NOx
16642	1	ANHEUSER-BUSCH LLC., (LA BREWERY)	NOx/SOx
117140	2	AOC, LLC	NOx
124619	1	ARDAGH METAL PACKAGING USA INC.	NOx
167066	1	ARLON GRAPHICS L.L.C.	NOx
174406	1	ARLON GRAPHICS LLC	NOx
12155	1	ARMSTRONG WORLD INDUSTRIES INC	NOx
122666	2	A'S MATCH DYEING & FINISHING	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
119907	1	BERRY PETROLEUM COMPANY	NOx
166073	1	BETA OFFSHORE	NOx
155474	2	BICENT (CALIFORNIA) MALBURG LLC	NOx

Facility ID	Cycle	Facility Name	Program
132068	1	BIMBO BAKERIES USA INC	NOx
1073	1	BORAL ROOFING LLC	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
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
119104	1	CALMAT CO	NOx/SOx
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
16978	2	CLOUGHERTY PACKING LLC/HORMEL FOODS CORP	NOx
38440	2	COOPER & BRAIN - BREA	NOx
68042	2	CORONA ENERGY PARTNERS, LTD	NOx
152707	1	CPV SENTINEL LLC	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

Facility ID	Cycle	Facility Name	Program
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
132071	1	DEAN FOODS CO. OF CALIFORNIA	NOx
47771	1	DELEO CLAY TILE CO INC	NOx
800037	2	DEMENNO/KERDOON	NOx
125579	1	DIRECTV	NOx
800189	1	DISNEYLAND RESORT	NOx
174371	2	DP3 HANGARS, LLC	NOx
142536	2	DRS SENSORS & TARGETING SYSTEMS, INC	NOx
178639	1	ECO SERVICES OPERATIONS LLC	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
17344	1	EXXONMOBIL OIL CORP	NOx
25058	2	EXXONMOBIL OIL CORP	NOx
800089	1	EXXONMOBIL OIL CORPORATION	NOx/SOx
800094	1	EXXONMOBIL OIL CORPORATION	NOx
95212	1	FABRICA	NOx
11716	1	FONTANA PAPER MILLS INC	NOx
175154	2	FREEPORT-MCMORAN OIL & GAS	NOx
175191	1	FREEPORT-MCMORAN OIL & GAS	NOx
346	1	FRITO-LAY, INC.	NOx
2418	2	FRUIT GROWERS SUPPLY CO	NOx
142267	2	FS PRECISION TECH LLC	NOx
5814	1	GAINEY CERAMICS INC	NOx
153033	2	GEORGIA-PACIFIC CORRUGATED LLC	NOx
176934	1	GI TC IMPERIAL HIGHWAY, LLC	NOx
124723	1	GREKA OIL & GAS, INC	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

Facility ID	Cycle	Facility Name	Program
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
124808	2	INEOS POLYPROPYLENE LLC	NOx/SOx
129816	2	INLAND EMPIRE ENERGY CENTER, LLC	NOx
157363	2	INTERNATIONAL PAPER CO	NOx
169678	1	ITT CANNON, LLC	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
36909	2	LA CITY, DEPARTMENT OF AIRPORTS	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
151394	2	LINN OPERATING INC	NOx
151532	2	LINN OPERATING, INC	NOx
152054	1	LINN WESTERN OPERATING INC	NOx
151415	2	LINN WESTERN OPERATING, INC	NOx
115314	2	LONG BEACH GENERATION, LLC	NOx
17623	2	LOS ANGELES ATHLETIC CLUB	NOx
58622	2	LOS ANGELES COLD STORAGE CO	NOx
125015	2	LOS ANGELES TIMES COMMUNICATIONS LLC	NOx
800080	2	LUNDAY-THAGARD COMPANY	NOx/SOx
38872	1	MARS PETCARE U.S., INC.	NOx
14049	2	MARUCHAN INC	NOx
3029	2	MATCHMASTER DYEING & FINISHING INC	NOx
2825	1	MCP FOODS INC	NOx

Facility ID	Cycle	Facility Name	Program
173290	1	MEDICLEAN	NOx
94872	2	METAL CONTAINER CORP	NOx
155877	1	MILLERCOORS, LLC	NOx
12372	1	MISSION CLAY PRODUCTS	NOx
11887	2	NASA JET PROPULSION LAB	NOx
115563	1	NCI GROUP INC., DBA, METAL COATERS OF CA	NOx
40483	2	NELCO PROD. INC	NOx
172005	2	NEW- INDY ONTARIO, LLC	NOx
12428	2	NEW NGC, INC.	NOx
131732	2	NEWPORT FAB, LLC	NOx
18294	1	NORTHROP GRUMMAN CORP, AIRCRAFT DIV	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
35302	2	OWENS CORNING ROOFING AND ASPHALT, LLC	NOx/SOx
7427	1	OWENS-BROCKWAY GLASS CONTAINER INC	NOx/SOx
169754	1	OXY USA INC	NOx
151594	1	OXY USA, INC	NOx
151601	1	OXY USA, INC.	NOx
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	PAPER-PAK INDUSTRIES	NOx
800183	1	PARAMOUNT PETR CORP	NOx/SOx
800168	1	PASADENA CITY, DWP	NOx
168088	1	PCCR USA	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

Facility ID	Cycle	Facility Name	Program
800420	2	PLAINS WEST COAST TERMINALS LLC	NOx
176708	2	POMONA POWER GENERATION LLC	NOx
11435	2	PQ CORPORATION	NOx/SOx
7416	1	PRAXAIR INC	NOx
42630	1	PRAXAIR INC	NOx
152501	1	PRECISION SPECIALTY METALS, INC.	NOx
136	2	PRESS FORGE CO	NOx
105903	1	PRIME WHEEL	NOx
132191	1	PURENERGY OPERATING SERVICES, LLC	NOx
132192	1	PURENERGY OPERATING SERVICES, LLC	NOx
173392	1	QUAD/GRAPHICS MARKETING, LLC	NOx
8547	1	QUEMETCO INC	NOx/SOx
19167	2	R J. NOBLE COMPANY	NOx
3585	2	R. R. DONNELLEY & SONS CO, LA MFG DIV	NOx
20604	2	RALPHS GROCERY CO	NOx
115041	1	RAYTHEON COMPANY	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
15544	2	REICHHOLD INC	NOx
52517	1	REXAM BEVERAGE CAN COMPANY	NOx
61722	2	RICOH ELECTRONICS INC	NOx
800182	1	RIVERSIDE CEMENT CO	NOx/SOx
800113	2	ROHR, INC.	NOx
18455	2	ROYALTY CARPET MILLS INC	NOx
4242	2	SAN DIEGO GAS & ELECTRIC	NOx
161300	2	SAPA EXTRUDER, INC	NOx
155221	2	SAVE THE QUEEN LLC (DBA QUEEN MARY)	NOx
15504	2	SCHLOSSER FORGE COMPANY	NOx
14926	1	SEMPRA ENERGY (THE GAS CO)	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

Facility ID	Cycle	Facility Name	Program
54402	2	SIERRA ALUMINUM COMPANY	NOx
85943	2	SIERRA ALUMINUM COMPANY	NOx
101977	1	SIGNAL HILL PETROLEUM INC	NOx
119596	2	SNAK KING CORPORATION	NOx
43201	2	SNOW SUMMIT INC	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 FACI	NOx
14871	2	SONOCO PRODUCTS CO	NOx
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
2083	1	SUPERIOR INDUSTRIES INTERNATIONAL INC	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
148340	2	THE BOEING COMPANY-BUILDING 800 COMPLEX	NOx
14736	2	THE BOEING COMPANY-SEAL BEACH COMPLEX	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
11119	1	THE GAS CO./ SEMPRA ENERGY	NOx
153199	1	THE KROGER CO/RALPHS GROCERY CO	NOx
97081	1	THE TERMO COMPANY	NOx
109914	1	THERMAL REMEDIATION SOLUTIONS, LLC	NOx
800330	1	THUMS LONG BEACH	NOx

Facility ID	Cycle	Facility Name	Program
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
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
9755	2	UNITED AIRLINES INC	NOx
73022	2	US AIRWAYS 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	VEOLIA ENERGY LOS ANGELES, INC	NOx
11034	2	VEOLIA ENERGY LOS ANGELES, INC	NOx
14502	2	VERNON CITY, LIGHT & POWER DEPT	NOx
148896	2	CALIFORNIA RESOURCES PRODUCTION CORP	NOx
148897	2	CALIFORNIA RESOURCES PRODUCTION CORP	NOx
151899	2	CALIFORNIA RESOURCES PRODUCTION CORP	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

As discussed in Chapter 1, one facility was added to the RECLAIM universe in Compliance Year 2014. The included facility is identified below, and the reason for inclusion is also provided.

Facility ID	Cycle	Facility Name	Market	Date	Reason
109914	1	THERMAL REMEDIATION SOLUTIONS, LLC	NOx	4/1/2014	Reported emissions from permitted sources exceeded four tons NOx in a year

APPENDIX C
RECLAIM FACILITIES CEASING OPERATION OR EXCLUDED

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 2014. 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	10094
Facility Name	Atlas Carpet Mills Inc.
City and County	Commerce, Los Angeles County
SIC	2273
Pollutant(s)	NOx
1994 Allocation	9,114
Reason for Shutdown	This company was sold and consolidated its operation with its parent company. Of two Atlas Carpet Mills' facilities, this facility was the dyehouse operation, which is no longer being used. The other facility, which provides finishing operations, is still in business.

Facility ID	90957
Facility Name	J Pacific Inc, Delta Dyeing & Finishing
City and County	Los Angeles, Los Angeles County
SIC	2260
Pollutant(s)	NOx
1994 Allocation	0
Reason for Shutdown	Facility president reported to SCAQMD inspector that the facility had shut down. Per inspector's report dated on 1/22/2015, all equipment was removed and the building was abandoned. Staff was unable to obtain further clarification regarding the facility shutdown.

Facility ID	175124
Facility Name	Aerojet Rocketdyne of DE, Inc.
City and County	Canoga Park, Los Angeles County
SIC	3764
Pollutant(s)	NOx
1994 Allocation	7,048
Reason for Shutdown	Facility ceased making rocket engines and was permanently shut down. The company's representative was unwilling to provide information regarding the reason for shutdown. The land was sold for development.

Facility ID	800373
Facility Name	Lakeland Development Company
City and County	Santa Fe Springs, Los Angeles County
SIC	4953
Pollutant(s)	NOx/SOx
1994 Allocation	1,083,844 NOx / 739,296 SOx

Reason for Shutdown	Facility filed for bankruptcy and was sold in 2013. The remaining land was sold to another party in June 2014. Staff was unable to obtain further clarification regarding the facility shutdown.

APPENDIX D
FACILITIES THAT EXCEEDED THEIR ANNUAL ALLOCATION FOR COMPLIANCE YEAR 2014

The following is a list of facilities that did not have enough RTCs to cover their NOx and/or SOx emissions in Compliance Year 2014 based on the results of audits conducted by SCAQMD staff.

Facility ID	Facility Name	Compliance Year	Emittant
1744	KIRKHILL - TA COMPANY	2014	NOx
3585	R. R. DONNELLEY & SONS CO, LA MFG DIV	2014	NOx
7411	DAVIS WIRE CORP	2014	NOx
8582	SO CAL GAS CO/PLAYA DEL REY STORAGE FACILITY	2014	NOx
11119	THE GAS CO./ SEMPRA ENERGY	2014	NOx
53729	TREND OFFSET PRINTING SERVICES, INC	2014	NOx
115563	NCI GROUP INC., DBA, METAL COATERS OF CA	2014	NOx
119907	BERRY PETROLEUM COMPANY	2014	NOx
122666	A'S MATCH DYEING & FINISHING	2014	NOx
153033	GEORGIA-PACIFIC CORRUGATED LLC	2014	NOx
171109	PHILLIPS 66 COMPANY/LOS ANGELES REFINERY	2014	SOx
174371	DP3 HANGARS, LLC	2014	NOx

APPENDIX E
REPORTED JOB IMPACTS ATTRIBUTED TO RECLAIM

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.

During Compliance Year 2014, no facility reported actual job gains or losses attributable to RECLAIM.