BOARD MEETING DATE: March 3, 2017 AGENDA NO. 38

REPORT: Annual RECLAIM Audit Report for 2015 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-second 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 2015 Compliance Year is included with the report.

COMMITTEE: Stationary Source, February 17, 2017, Reviewed

RECOMMENDED ACTION:
Approve the attached annual report.

Wayne Nastri
Executive Officer

LT: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 and annual basis (*i.e.*, hold RTCs equal to or greater than their emissions). These facilities have the flexibility to manage how they meet their emission goals by installing emission controls, making process changes or trading RTCs amongst themselves. RECLAIM achieves its overall emission reduction goals provided aggregate RECLAIM emissions are no more than aggregate allocations.

RECLAIM Rule 2015 - Backstop Provisions requires 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 2015 (which encompasses the time period for Cycle 1 from January 1, 2015 to December 31, 2015 and for Cycle 2 from July 1, 2015 to June 30, 2016). Based on audited emissions in this report and previous annual reports, SCAQMD staff has determined that RECLAIM met its emissions goals for Compliance Year 2015, 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 2015, audited NOx emissions were 25% less than programmatic NOx allocations and audited SOx emissions were 26% less than programmatic SOx allocations.

Audit Findings

The audit of the RECLAIM Program's Compliance Year 2015 and trades of RTCs that occurred during calendar year 2016 show:

- ***Overall Compliance*** – Audited NOx and SOx emissions from RECLAIM facilities were significantly below programmatic allocations.

- ***Universe*** – The RECLAIM universe consisted of 272 facilities as of June 30, 2015. One facility was included, no facility was excluded, and five facilities in the RECLAIM universe shut down during Compliance Year 2015. Thus, 268 facilities were in the RECLAIM universe on June 30, 2016, the end of the Compliance Year 2015.

  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 five facilities that shut down, one facility sold its brand and demolished the facility, and two other facilities consolidated their operations into other company-owned RECLAIM facilities. The fourth facility cited more attractive utility of land and resources, cost of meeting air pollution regulations, including RECLAIM, Rule 1156 and the SCAQMD compliance burden, and an unfriendly business environment as the

reasons for shutdown. Finally, the fifth facility sold both their equipment and property. Staff attempted to contact its parent company for a more descriptive reason for the shutdown, but received no response.

- ***Facility Compliance*** – The vast majority of RECLAIM facilities complied with their allocations during the 2015 compliance year (94% of NOx facilities and 97% of SOx facilities). Eighteen facilities (six percent of total facilities) exceeded their allocations (17 facilities exceeded their NOx allocations, and one facility exceeded its SOx allocation) during Compliance Year 2015. The 17 facilities that exceeded their NOx allocations had total NOx emissions of 387.1 tons and did not have adequate allocations to offset 45.7 of those tons. The exceedances represent 0.47% of total RECLAIM NOx universe allocations and 11.8% of total NOx emissions from the 17 facilities. The one SOx facility that exceeded its SOx allocation had total SOx emissions of 2.7 tons and did not have adequate allocations to offset 0.2 tons. This exceedance represents 0.01% of total RECLAIM SOx universe allocations and 7.4% of total SOx emissions from this facility. Pursuant to Rule 2010(b)(1)(A), all 18 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 2015 allocations.

- ***Job Impacts*** – Based on a survey of the RECLAIM facilities, the RECLAIM program had minimal impact on employment during the 2015 compliance year, which is consistent with previous years. RECLAIM facilities reported an overall net gain of 1,329 jobs, representing 1.21% of their total employment. One of the five RECLAIM facilities that shut down during Compliance Year 2015 cited RECLAIM as a contributing factor to the decision to shut down. No other 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 2016 was lower in terms of number of trades (by 7%), lower with respect to volume (by 31%), and significantly lower with respect to total value (by 40%) when compared to calendar year 2015. A total of over $1.47 billion in RTCs has been traded since the adoption of RECLAIM, of which $118.6 million occurred in calendar year 2016 (compared to $197.1 million in calendar year 2015), excluding swaps. In calendar year 2016, there was a set of four trades between a RECLAIM facility that had discontinued its cement manufacturing operations, and its wholly-owned subsidiary. These trades were not at arms-length and RTC prices were set arbitrarily. As a result, they were excluded from RTC average price computations.

The annual average prices of discrete-year NOx and SOx RTCs for Compliance Years' 2015, 2016, and 2017 and infinite-year block (IYB) NOx and SOx RTCs traded in calendar year 2016 (excluding trades that were not at arms-length) were below the applicable review thresholds for average RTC prices. The annual average prices of RTCs traded during calendar years 2015 and 2016 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 2015 and 2016

	Average Price ($/ton)				**Review Thresholds ($/ton)**	
Year Traded	**2014 NOx RTC**	**2015 NOx RTC**	**2016 NOx RTC**	**2017 NOx RTC**	**Rule 2015 (b)(6)**	**Health and Safety Code §39616(f)**
2015	$1,039	$1,642	$2,833	$4,020	$15,000	$42,627
2016		$1,626	$2,932	$6,606		
Year Traded	**2014 SOx RTC**	**2015 SOx RTC**	**2016 SOx RTC**	**2017 SOx RTC**	**Rule 2015 (b)(6)**	**Health and Safety Code §39616(f)**
2015	$483	$380	None traded	None traded	$15,000	$30,691
2016		$540	$1,255	None traded		

Table 2 – Average Prices for IYB RTCs Traded during Calendar Years 2015 and 2016

RTCs	**Average Price ($/ton)**		**Review Threshold ($/ton) [Health and Safety Code §39616(f)]**
	Traded in 2015	Traded in 2016	
NOx	$199,685	$380,057	$639,399
SOx	$53,665	$50,000	$460,367

- ***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 2016 was less when compared to calendar year 2015. However, with respect to value and volume of SOx trades with price, investors' involvement increased. Investors were involved in 137 of the 196 discrete NOx trades with price, and 6 of the 8 discrete SOx trades with price. With respect to IYB trades, investors' participation was significant and investors were involved with 16 of 20 IYB NOx trades with price, and the one IYB SOx trade with price. Compared to calendar year 2015, investor holdings of total IYB NOx RTCs and IYB SOx RTCs increased from 1.9% to 3.1% for IYB NOx RTCs, and from 3.3% to 5.0% for IYB SOx RTCs at the end of calendar year 2016. Investors purchase RTCs, but are not RECLAIM facilities or brokers. (Brokers typically do not purchase RTCs, but facilitate trades.)

- ***Other Findings*** – RECLAIM also met other applicable requirements including meeting the applicable federal offset ratio under New Source Review and having no significant seasonal fluctuation in emissions. Additionally, there is no evidence that RECLAIM resulted in any increase in health impacts due to emissions of air toxics. RECLAIM facilities and non-RECLAIM facilities are subject to the same requirements for controlling air toxic emissions.

Attachment
Annual RECLAIM Audit Report for 2015 Compliance Year

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Annual RECLAIM Audit Report for 2015 Compliance Year

March 3, 2017

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SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

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Appointee

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EXECUTIVE OFFICER
Wayne Nastri

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)
DOGGR	Division of Oil, Gas, and Geothermal Resources
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
PPA	Purchase Power Agreement
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 2015 (January 1 through December 31, 2015 for Cycle 1 and July 1, 2015 through June 30, 2016 for Cycle 2 facilities). This annual audit report covers activities for the twenty-second 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, 2015, the overall changes in RECLAIM participants were 130 facilities included into the program, 70 facilities excluded from the program, and 182 facilities ceased operation. Thus, the RECLAIM universe consisted of 272 active facilities at the end of Compliance Year 2014 (December 31, 2014 for Cycle 1 facilities and June 30, 2015 for Cycle 2 facilities). During Compliance Year 2015 (January 1, 2015 through December 31, 2015 for Cycle 1 facilities and July 1, 2015 through June 30, 2016 for Cycle 2 facilities), one facility was included into the RECLAIM universe, no facility was excluded, and five facilities (one facility in both the NOx and SOx universes and four in the NOx universe only) shut down and are no longer in the active RECLAIM universe. These changes resulted in a net decrease of four facilities in the universe, bringing the total number of active RECLAIM facilities to 268 as of the end of Compliance Year 2015.

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 2015, the third year of implementation, the SOx allocation supply was reduced by 34% (or 4.0 tons/day, which is the same reduction as the previous compliance year) to 2,839 tons. There was no programmatic allocation reduction in NOx RTCs during Compliance Year 2015. However, on December 4, 2015, the Governing Board adopted amendments to NOx RECLAIM to phase in additional NOx reductions which began in Compliance Year 2016 and continue through Compliance Year 2022. The amendment will result in an overall NOx reduction of 45% (or 12 tons/day) when fully implemented for Compliance Year 2022 and beyond.

The overall NOx RTC supply increased by 11.6 tons and the SOx RTC supply decreased by 3.7 tons during Compliance Year 2015. These changes were due to allocation adjustments for clean fuel production pursuant to Rule 2002(c)(12).

In calendar year 2016, there was a set of four trades between a RECLAIM facility that had discontinued its cement manufacturing operations, and its wholly-owned subsidiary. These trades were not at arms-length and RTCs prices were set arbitrarily. As a result, they were considered as “swap trades" and were excluded from RTC average price computations. During calendar year 2016, there were 329 RTC trade registrations with a total value of $118.6 million traded, excluding the values reported for swap trades.

Since the inception of the RECLAIM program in 1994, a total value of over $1.47 billion dollars has been traded in the RTC trading market, excluding swap trades. RTC trades are reported to SCAQMD as either discrete-year RTC trades or infinite-year block (IYB) trades (trades that involve blocks of RTCs with a specified start year and continuing into perpetuity). In terms of volume traded in calendar year 2016, a total of 2,173 tons of discrete-year NOx RTCs, 617 tons of discrete-year SOx RTCs, 613 tons of IYB NOx RTCs and 392 tons of IYB SOx RTCs were traded. The RTC trading market activity decreased during calendar year 2016 compared to calendar year 2015, in terms of number of trades (by 7%), in total volume excluding swaps (by 31%), and in total value excluding swaps (by 40%).

The annual average prices of discrete-year NOx RTCs traded during calendar year 2016 were $1,626, $2,932, and $6,606 per ton for Compliance Years’ 2015, 2016, and 2017 RTCs, respectively. The annual average prices for discrete-year SOx RTCs traded during the same period were $540 and $1,255 per ton for Compliance Years’ 2015 and 2016 RTCs, respectively.

Prices for discrete-year NOx and SOx RTCs for all compliance years are still well below the $42,627 per ton of NOx and $30,691 per ton of SOx discrete-year RTCs pre-determined overall program review thresholds established by the Governing Board pursuant to Health and Safety Code §39616(f), as well as the $15,000 per ton threshold pursuant to Rule 2015(b)(6).

The annual average price during calendar year 2016 for IYB NOx RTCs was $380,057 per ton and the annual average price for IYB SOx RTCs was $50,000 per ton. Therefore, annual average IYB RTC prices did not exceed the $639,399 per ton of IYB NOx RTCs or the $460,367 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 2016. They were involved in 137 of the 196 discrete-year NOx trade registrations and six of the eight discrete-year SOx trade registrations with price. Investors were also involved in 16 of 20 IYB NOx and the one IYB SOx trade with price. Investors were involved in 63% of total value and 62% of total volume for discrete-year NOx trades, and 64% of total value and 54% of total volume for discrete-year SOx trades. In addition, investors were involved in 25% of total value and 19% of total volume for IYB NOx trades with price. An investor was involved in the sole IYB SOx trade with price. At the end of calendar year 2016, investors' holdings of IYB NOx RTCs and IYB SOx RTCs were significantly higher at 3.1% and 5.0% of the total RECLAIM RTCs, respectively, compared to that of calendar year 2015.

Chapter 3: Emission Reductions Achieved

For Compliance Year 2015, aggregate NOx emissions were below total allocations by 25% and aggregate SOx emissions were below total allocations by 26%. No emissions associated with breakdowns were excluded from reconciliation with facility allocations in Compliance Year 2015. 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 2015. With respect to the Rule 2015 backstop provisions, Compliance Year 2015 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 2015, a total of five NOx RECLAIM facilities had NSR NOx emission increases, and one SOx RECLAIM facility had an NSR SOx emission increase due to expansion or modification. Consistent with all prior compliance years, there were sufficient NOx and SOx RTCs available to allow for expansion, modification, and modernization by RECLAIM facilities.

RECLAIM is required to comply with federal NSR emissions offset requirements at a 1.2-to-1 offset ratio programmatically for NOx emission increases and a 1-to-1 offset ratio for SOx emission increases on a programmatic basis. In Compliance Year 2015, RECLAIM demonstrated federal equivalency with a programmatic NOx offset ratio of 39-to-1 and SOx offset ratio of 4,112-to-1 based on the compliance year's total unused allocations and total NSR emission increases for both NOx and SOx. 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 2015. 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 282 NOx RECLAIM facilities audited during Compliance Year 2015, a total of 265 facilities (94%) complied with their NOx allocations, and 32 of the 33 SOx facilities (97%) complied with their SOx allocations. Eighteen facilities exceeded their allocations (17 facilities exceeded their NOx allocations, and one facility exceeded its SOx allocation) during Compliance Year 2015. The 17 facilities that exceeded their NOx allocations had aggregate NOx emissions of 387.1 tons and did not have adequate allocations to offset 45.7 tons (or 11.8%) of their combined emissions. The one SOx facility that exceeded its SOx allocation had total SOx emissions of 2.7 tons and did not have adequate allocations to offset 0.2 tons (or 7.4%). The NOx and SOx exceedance amounts are relatively small compared to the overall NOx and SOx allocations for Compliance Year 2015 (0.47% of total NOx allocations and 0.01% 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 2015 allocations. The overall RECLAIM NOx and SOx emission reduction targets and goals were met for Compliance Year 2015 (*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 2015 employment survey data gathered from APEP reports, RECLAIM facilities reported a net gain of 1,329 jobs, representing 1.21% of their total employment. One of the five RECLAIM facilities that shut down during Compliance Year 2015 cited RECLAIM as a factor contributing to the decision to shutdown. No other facilities reported any 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 2015 NOx emissions decreased 2.7% relative to Compliance Year 2014, and Compliance Year 2015 SOx emissions were 3.7% less than the previous year. Quarterly calendar year 2015 NOx emissions fluctuated within 10% of the mean NOx emissions for the year. Quarterly calendar year 2015 SOx emissions fluctuated within seven 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 2016, 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 2015 Compliance Year Audit.

This report presents the annual program audit and progress report of RECLAIM's twenty-second compliance year (January 1 through December 31, 2015 for Cycle 1 and July 1, 2015 through June 30, 2016 for Cycle 2 RECLAIM facilities), also known as Compliance Year 2015. 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, 2015 (covered under the Annual RECLAIM Audit Report for 2014 Compliance Year), then discusses changes to the RECLAIM universe of sources in detail through the end of Compliance Year 2015.
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, 2015, the overall changes in RECLAIM participants were 130 facilities included into the program, 70 facilities excluded from the program, and 182 facilities ceased operation. Thus, the RECLAIM universe consisted of 272 active facilities at the end of Compliance Year 2014 (December 31, 2014 for Cycle 1 facilities and June 30, 2015 for Cycle 2 facilities). During Compliance Year 2015 (January 1, 2015 through December 31, 2015 for Cycle 1 facilities and July 1, 2015 through June 30, 2016 for Cycle 2 facilities), one facility was included into the RECLAIM universe, no facility was excluded, and five facilities (one facility in both the NOx and SOx universes and four in the NOx universe only) shut down and are no longer in the active RECLAIM universe. These changes resulted in a net decrease of four facilities in the universe, bringing the total number of active RECLAIM facilities to 268 as of the end of Compliance Year 2015.

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. Prior to an October 7, 2016 amendment of Rule 2002, facilities that shutdown were allowed to retain all of their RTC holdings and participate in the trading market. For NOx RECLAIM facilities listed in Tables 7 and 8 that shutdown on or after October 7, 2016, the Rule 2002 amendment established a methodology to calculate an amount of reduction that must be made to a facility's future years NOx RTC holdings. A shutdown facility may trade future year RTCs that remain after the RTC adjustment is completed, if any. If the calculated reduction amount exceeds a facility's holdings for any future compliance year, the facility must purchase and surrender sufficient RTCs to fulfill the entire reduction requirement. This situation may result if the facility previously sold its future year allocations.

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 activities/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, 2015 (the last day of Compliance Year 2014 for Cycle 2 facilities) were: the inclusion of 130 facilities (including 34 facilities created by partial change of operator of existing RECLAIM facilities), the exclusion of 70 facilities, and the shutdown of 182 facilities. Thus, the net change in the RECLAIM universe from October 15, 1993 through June 30, 2015 was a decrease of 122 facilities from 394 to 272 facilities. In Compliance Year 2015 (January 1, 2015 through December 31, 2015 for Cycle 1 facilities and July 1, 2015 through June 30, 2016 for Cycle 2 facilities), one facility was included, no facility was excluded, and five facilities shut down. These changes brought the total number of facilities in the RECLAIM universe to 268 facilities. The Compliance Year 2015 RECLAIM universe includes 237 NOx-only, no SOx-only, and 31 both NOx and SOx RECLAIM facilities. The list of active facilities in the RECLAIM universe as of the end of Compliance Year 2015 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 2015. Currently, there are 29 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

Five RECLAIM facilities permanently ceased operations in Compliance Year 2015. One sold its brand and demolished the facility. Staff was not able to obtain further clarification regarding the shutdown. Two other facilities consolidated their operations into other company-owned RECLAIM facilities. The fourth facility cited more attractive utility of land and resources, cost of meeting air pollution regulations, including RECLAIM, Rule 1156 and the SCAQMD

compliance burden, and an unfriendly business environment as reasons for shutdown. The fifth facility sold its equipment and property to a third party. Four of the five facilities permanently ceasing operations were in NOx RECLAIM and the remaining shutdown facility was in both NOx and SOx RECLAIM. Appendix C lists these facilities and provides brief descriptions of the reported reasons for their closures.

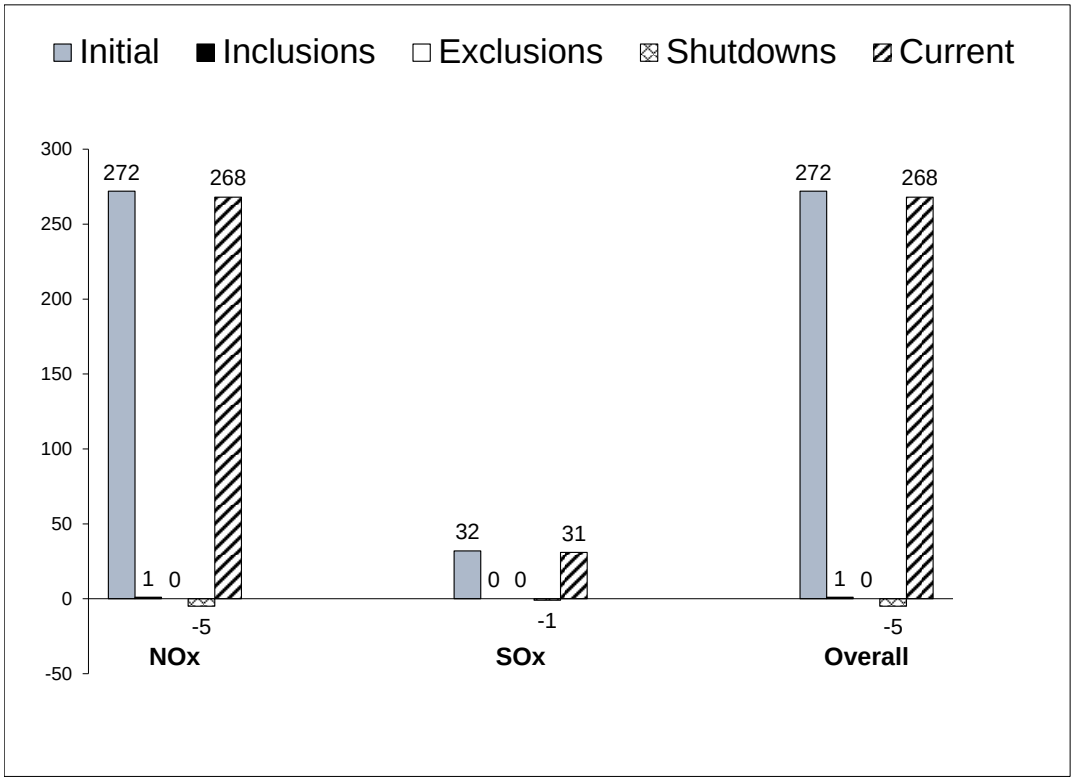
The above mentioned changes to the RECLAIM Universe resulted in a net decrease of four facilities in the RECLAIM universe during Compliance Year 2015. Table 1-1 summarizes overall changes in the RECLAIM universe between the start of the program and end of Compliance Year 2015 (December 31, 2015 for Cycle 1 facilities and June 30, 2016 for Cycle 2 facilities). Changes to the RECLAIM universe that occurred in Compliance Year 2015 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 2014	130	13	130
Exclusions **–** October 15, 1993 through Compliance Year 2014	-69	-4	-70
Shutdowns **–** October 15, 1993 through Compliance Year 2014	-181	-18	-182
Universe – June 30, 2015	272	32	272
Inclusions **–** Compliance Year 2015	1	0	1
Exclusions **–** Compliance Year 2015	0	0	0
Shutdowns **–** Compliance Year 2015	-5	-1	-5
Universe – End of Compliance Year 2015	268	31	268

* "Total Facilities" is <u>not</u> 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 2015



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 2015, the third year of implementation, the SOx allocation supply was reduced by 34% (or 4.0 tons/day, which is the same reduction as the previous compliance year) to 2,839 tons. There was no programmatic allocation reduction in NOx RTCs during Compliance Year 2015. However, on December 4, 2015, the Governing Board adopted amendments to NOx RECLAIM to phase in additional NOx reductions which began in Compliance Year 2016 and continue through Compliance Year 2022. The amendment will result in an overall NOx reduction of 45% (or 12 tons/day) when fully implemented for Compliance Year 2022 and beyond.

The overall NOx RTC supply increased by 11.6 tons and the SOx RTC supply decreased by 3.7 tons during Compliance Year 2015. These changes were due to allocation adjustments for clean fuel production pursuant to Rule 2002(c)(12).

In calendar year 2016, there was a set of four trades between a RECLAIM facility that had discontinued its cement manufacturing operations, and its wholly-owned subsidiary. These trades were not at arms-length and RTCs prices were set arbitrarily. As a result, they were considered as "swap trades" and were excluded from RTC average price computations. During calendar year 2016, there were 329 RTC trade registrations with a total value of $118.6 million traded, excluding the values reported for swap trades.

Since the inception of the RECLAIM program in 1994, a total value of over $1.47 billion dollars has been traded in the RTC trading market, excluding swap trades. RTC trades are reported to SCAQMD as either discrete-year RTC trades or infinite-year block (IYB) trades (trades that involve blocks of RTCs with a specified start year and continuing into perpetuity). In terms of volume traded in calendar year 2016, a total of 2,173 tons of discrete-year NOx RTCs, 617 tons of discrete-year SOx RTCs, 613 tons of IYB NOx RTCs and 392 tons of IYB SOx RTCs were traded. The RTC trading market activity decreased during calendar year 2016 compared to calendar year 2015, in terms of number of trades (by 7%), in total volume excluding swaps (by 31%), and in total value excluding swaps (by 40%).

The annual average prices of discrete-year NOx RTCs traded during calendar year 2016 were $1,626, $2,932, and $6,606 per ton for Compliance Years' 2015, 2016, and 2017 RTCs, respectively. The annual average prices for discrete-year SOx RTCs traded during the same period were $540 and $1,255 per ton for Compliance Years' 2015 and 2016 RTCs, respectively.

Prices for discrete-year NOx and SOx RTCs for all compliance years are still well below the $42,627 per ton of NOx and $30,691 per ton of SOx discrete-year RTCs pre-determined overall program review thresholds established by the Governing Board pursuant to Health and Safety Code §39616(f), as well as the $15,000 per ton threshold pursuant to Rule 2015(b)(6).

The annual average price during calendar year 2016 for IYB NOx RTCs was $380,057 per ton and the annual average price for IYB SOx RTCs was $50,000 per ton. Therefore, annual average IYB RTC prices did not exceed the $639,399 per ton of IYB NOx RTCs or the $460,367 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 2016. They were involved in 137 of the 196 discrete-year NOx trade registrations and six of the eight discrete-year SOx trade registrations with price. Investors were also involved in 16 of 20 IYB NOx and the one IYB SOx trade with price. Investors were involved in 63% of total value and 62% of total volume for discrete-year NOx trades, and 64% of total value and 54% of total volume for discrete-year SOx trades. In addition, investors were involved in 25% of total value and 19% of total volume for IYB NOx trades with price. An investor was involved in the sole IYB SOx trade with price. At the end of calendar year 2016, investors' holdings of IYB NOx RTCs and IYB SOx RTCs were significantly higher at 3.1% and 5.0% of the total RECLAIM RTCs, respectively, compared to that of calendar year 2015.

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 that existed prior to January 1, 1993, the allocation is calculated based on each facility's historic production levels as reported to SCAQMD in its annual emission reports (AERs), NOx emission factors listed in Tables 1, 3, and 6 of Rule 2002 or SOx emission factors in Tables 2 and 4 of Rule 2002 for the appropriate equipment category, any qualified[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 sole purpose of establishing New Source Review trigger level.

These allocations are issued as RTCs, denominated in pounds of NOx or SOx with a specified 12-month term. Each RTC may only be used for emissions occurring within the term of that RTC. The RECLAIM program has two staggered compliance cycles—Cycle 1 with a compliance period of January 1 through December 31 of each year, and Cycle 2 with a compliance period of July 1 of each year through June 30 of the following year. Each RECLAIM facility is

[1] Only external offsets provided at a one-to-one offset ratio after the base year used for allocation quantification purposes.

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.

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 2015 data, RTC trading and price data discussed in this chapter are for calendar year 2016.

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 2015 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

[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.

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 2015 did not receive any allocation based on reported emissions.

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 2015, the overall effect of adjusting NOx allocations to account for these differences was a total of 11.6 tons of NOx RTCs (0.1% of total NOx allocation for Compliance Year 2015) added to, and 3.7 tons of SOx RTCs (0.1% of total SOx allocation for Compliance Year 2015) deducted from, refineries' Compliance Year 2015 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 2015.

Conversions of Other Types of Emission Reduction Credits

Conversions of Mobile Source Emission Reduction Credits (MSERCs) and other types of emission reduction credits, other than regular stationary source ERCs issued under Regulation XIII – New Source Review, to RTCs are allowed under Rule 2008 – Mobile Source Credits, and several programs under Regulation XVI – Mobile Source Offset Programs and Regulation XXV – Intercredit Trading. Conversion of these credits to RTCs is allowed based on the respective approved protocol specified in each rule. Currently, Rules 1610 – Old-Vehicle Scrapping and 1612 – Credits for Clean On-Road Vehicles allow the creation of MSERCs. However, there are no State Implementation Plan (SIP) approved protocols for conversion of MSERCs to RTCs. No new RTCs were issued by conversion of other types of emission reduction credits in Compliance Year 2015.

Net Changes in RTC Allocations

The changes to RTC supplies described in the above sections resulted in a net increase of 11.6 tons of NOx RTCs (0.1% of the total) and a decrease of 3.7 tons of SOx RTCs (0.1% of the total) for Compliance Year 2015. Table 2-1 summarizes the changes in NOx and SOx RTC supplies that occurred in Compliance Year 2015 pursuant to Rule 2002.

Table 2-1
Changes in NOx and SOx RTC Supplies during Compliance Year 2015 (tons/year)

Source	NOx	SOx
Universe changes	0	0
Clean Fuel/Reformulated Gasoline	11.6	-3.7
Activity corrections	0	0
MSERCs	0	0
Net change	**11.6**	**-3.7**

Note: The data in this table represents the changes that occurred over the course of Compliance Year 2015 to the Compliance Year 2015 aggregate NOx and SOx RTC supplies originally issued pursuant to Rule 2002, not the difference between 2015 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

[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.

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.

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.

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 (45% reduction) when fully implemented in Compliance Year 2022. The reductions are being phased-in with 2 tons per day in Compliance Year 2016 and 2017, 3 tons per day in Compliance Year 2018, 4 tons per day in Compliance Year 2019, 6 tons per day in Compliance Year 2020, 8 tons per day in Compliance Year 2021 and 12 tons per day in Compliance Year 2022 and thereafter.

Figure 2-1 illustrates the total 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

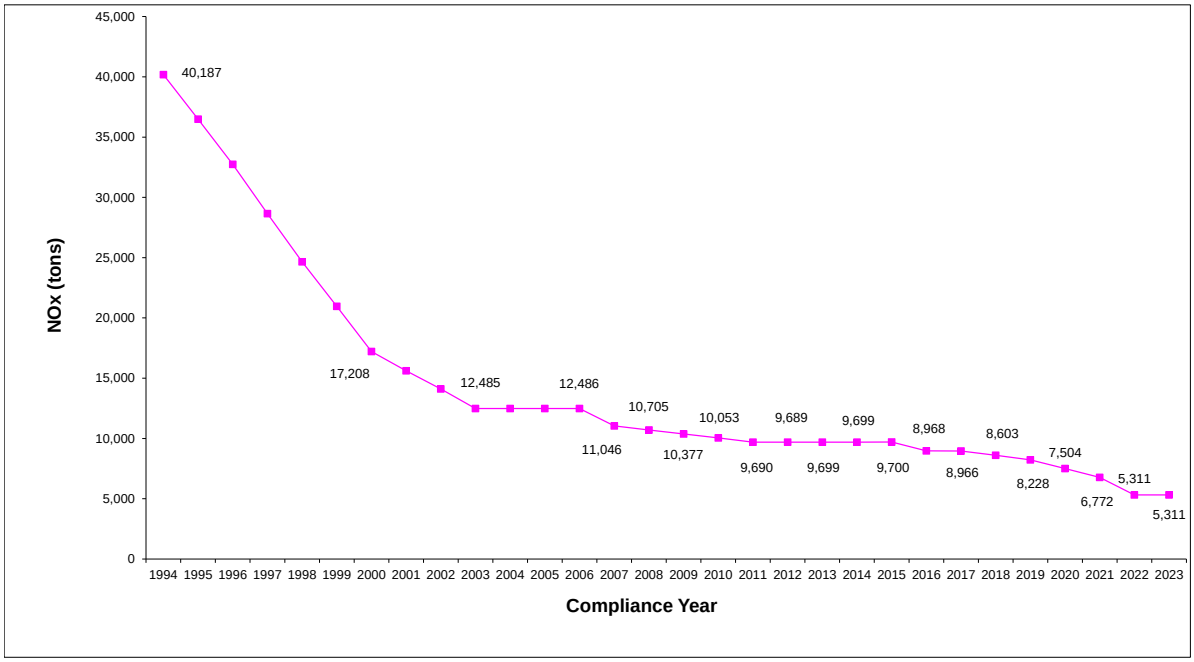
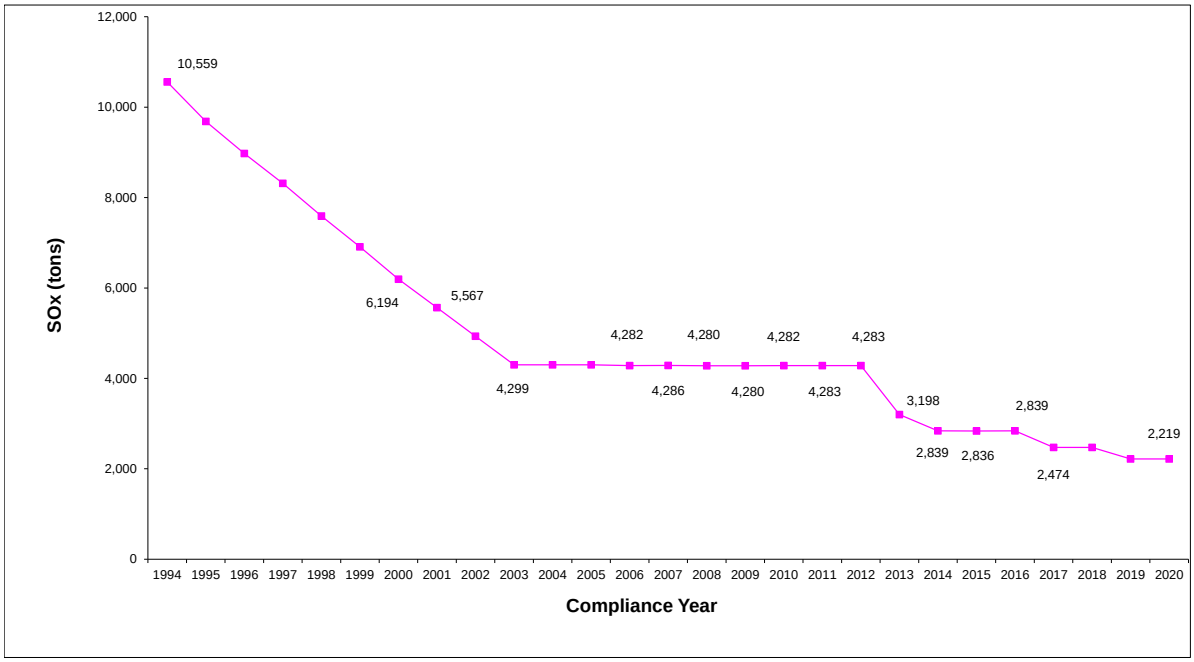


Figure 2-2
SOx RTC Supply



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 potential rule adoption activities for calendar year 2017.

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, therefore, are excluded from the calculation of annual average prices. Annual average prices for discrete-year RTCs are determined by averaging prices of RTCs for each compliance year, while the annual average price for IYB RTCs are determined based on the amount of IYB RTCs (*i.e.,* the amount of RTCs in the infinite stream) regardless of the start year.

RTC Price Thresholds for Program Review

Rule 2015(b)(6) specifies that, if the annual average price of discrete-year 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-year 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. Similarly, Rule 2002(f)(1)(H) specifies that in the event that the NOx RTC prices exceed $22,500 per ton (current compliance year credits) based on the 12-month rolling

average, or exceed $35,000 per ton (current compliance year credits) based on the 3-month rolling average calculated pursuant to subparagraph (f)(1)(E), the Executive Officer will report the determination to the Governing Board. If the Governing Board finds that the 12-month rolling average RTC price exceeds $22,500 per ton or the 3-month rolling average RTC price exceeds $35,000 per ton, then the Non-tradable/Non-usable NOx RTCs, as specified in subparagraphs (f)(1)(B) and (f)(1)(C) valid for the period in which the RTC price is found to have exceeded the applicable threshold, shall be converted to Tradable/Usable NOx RTCs upon Governing Board concurrence. For RTC trades occurring in calendar year 2016, the overall program review thresholds in 2016 dollars, pursuant to Health and Safety Code §39616(f), are $42,627 per ton of discrete-year NOx RTCs, $30,691 per ton of discrete-year SOx RTCs, $639,399 per ton of IYB NOx RTCs, and $460,367 per ton of IYB SOx RTCs.

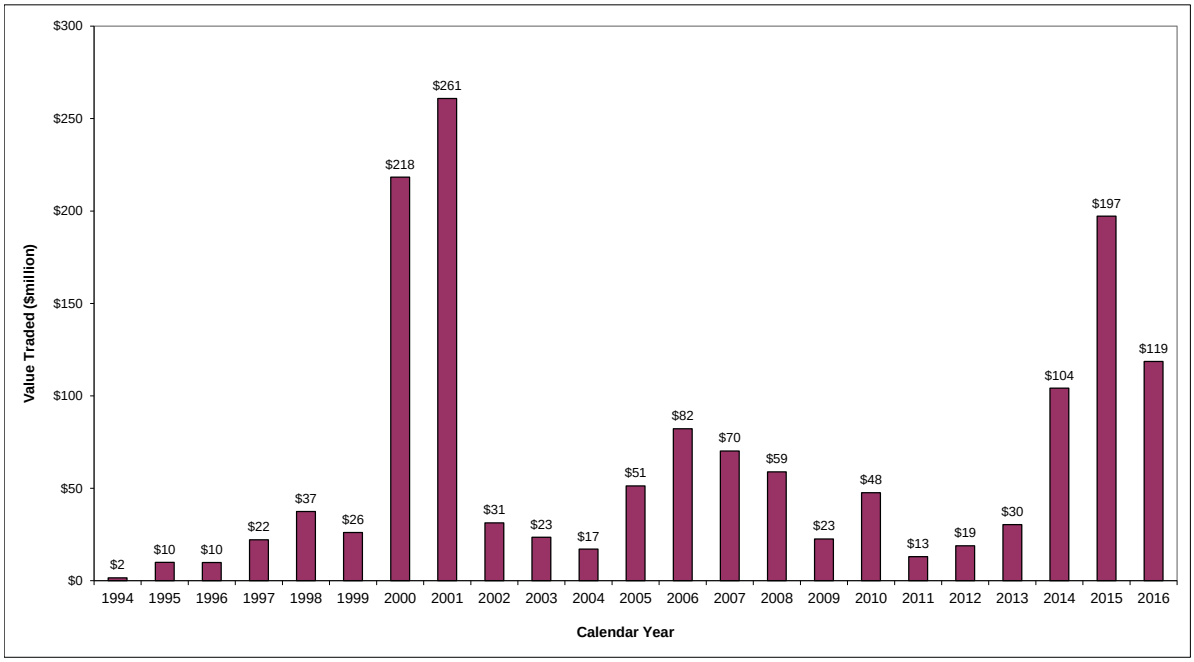
RTC Trading Activity Excluding Swaps

Overall Trading Activity

RTC trades include discrete-year and IYB RTCs traded with prices, discrete-year and IYB RTC transfers with zero price, and discrete-year and IYB RTC swap trades. The RTC market activity in calendar year 2016 was slightly lower (decreased by seven percent) when compared to the market activity in calendar year 2015 in terms of the number of trades. The calendar year 2016 trading activity—329 total registered trades (305 NOx trades and 24 SOx trades)—was slightly lower than the number of trades in calendar year 2015 (356 total registered trades; 335 NOx trades and 21 SOx trades).

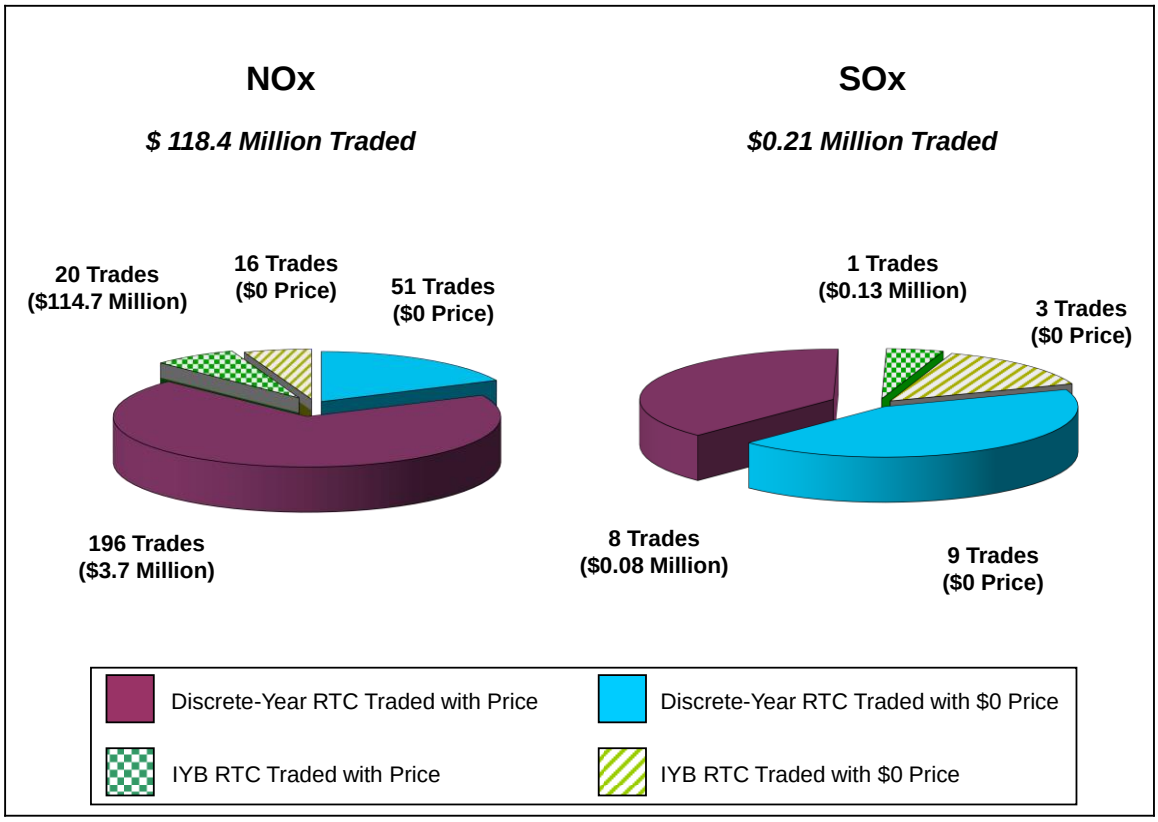
In comparison to calendar year 2015, the value traded in calendar year 2016 was substantially lower (decreased by 40%). Excluding swap trades, a total value of $118.6 million was traded in calendar year 2016 ($118.4 million for NOx and $0.21 million for SOx)—substantially lower than the total value of $197.1 million traded in calendar year 2015 ($193.1 million for NOx and $4.02 million for SOx). Figure 2-3 illustrates the annual value of RTCs traded in RECLAIM since the inception of the program.

Figure 2-3
Annual Trading Values for NOx and SOx (Excluding Swaps)



The total volume traded (excluding swap trades) in calendar year 2016 was 3,795 tons, which is 31% less than the 5,533 tons traded in calendar year 2015. With respect to volume traded (also excluding swap trades), the 2,790 tons of discrete-year RTCs traded in calendar year 2016 were substantially lower than the 3,891 tons of discrete-year RTCs traded in calendar year 2015. In calendar year 2016, there were 1,449 tons of discrete-year NOx RTCs and 134 tons of discrete-year SOx traded with price and 724 tons of discrete-year NOx and 483 tons of discrete-year SOx traded without price. In addition, the 1,005 tons of IYB RTCs traded in calendar year 2016 were also much lower than the 1,642 tons of IYB RTCs traded in 2015. There were 302 tons of IYB NOx and 2.5 tons of IYB SOx traded with price and 311 tons of IYB NOx traded with zero price and 390 tons of IYB SOx traded with zero price. Figure 2-4 summarizes overall trading activity (excluding swaps) in calendar year 2016 by pollutant. Additional information on the discrete-year and IYB trading activities, value, and volume are discussed later in this chapter.

Figure 2-4
Calendar Year 2016 Overall Trading Activity (Excluding Swaps)



There were 79 trades with zero price in calendar year 2016. 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 2016, the majority of trades with zero price were transfers between facilities under common ownership and facilities that underwent a change of operator.

Discrete-Year RTC Trading Activity

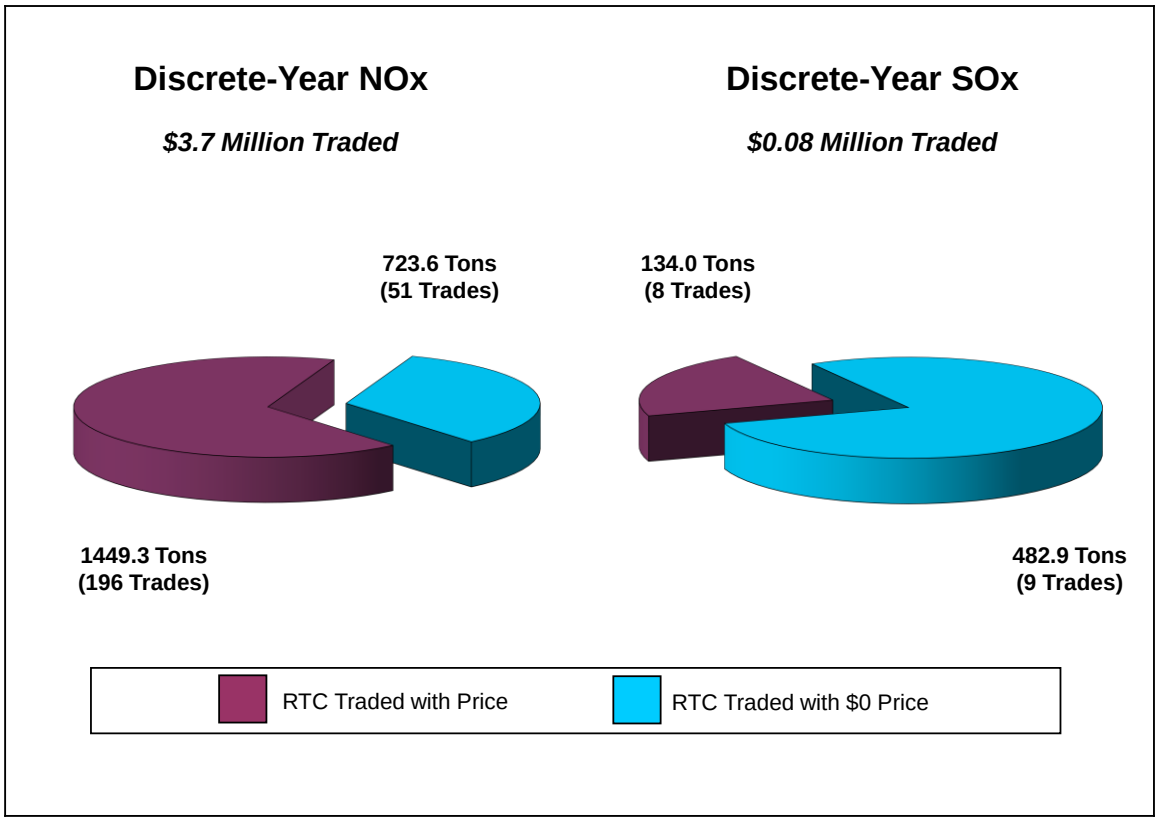
In calendar year 2016, there were a total of 247 discrete-year NOx RTC trades (196 trades with price and 51 trades with zero price) and 17 discrete-year SOx RTC trades (eight trades with price and nine trades with zero price), excluding swap trades. The trading of discrete-year NOx RTCs included RTCs for Compliance Years 2015 through 2017. The trading of discrete-year SOx RTCs included RTCs for Compliance Years 2015 and 2016.

Total discrete-year RTC trading values decreased in calendar year 2016. The 196 NOx trades with price totaled $3.7 million in value, down from $5.7 million in calendar year 2015. However, the eight discrete-year SOx trades with price

totaled $0.08 million in value, which is higher than the $0.02 million traded in calendar year 2015.

In calendar year 2016, the overall quantities of discrete-year NOx RTCs traded were 2,173 tons which is much lower than the 3,371 tons of NOx RTCs traded in calendar year 2015. The 617 tons of discrete-year SOx RTC traded in calendar year 2016 was higher than the 520 tons traded in calendar year 2015. There were 1,449 tons of discrete-year NOx traded with price in calendar year 2016, a significant decrease (40%) from the 2,396 tons of NOx in 2015. However, the 134 tons of discrete-year SOx RTCs traded in 2016 is much higher (185%) than the 47 tons of SOx RTCs traded in 2015. In addition, there were 724 tons of discrete-year NOx RTCs traded with zero price (decreased from 975 tons of NOx in 2015) and 483 tons of discrete-year SOx traded with zero price (a slight increase from 473 tons of SOx in 2015). Figure 2-5 illustrates the trading activity of discrete-year RTCs (excluding swaps) for calendar year 2016.

Figure 2-5
Calendar Year 2016 Trading Activity for Discrete-Year RTCs (Excluding Swaps)



IYB RTC Trading Activity

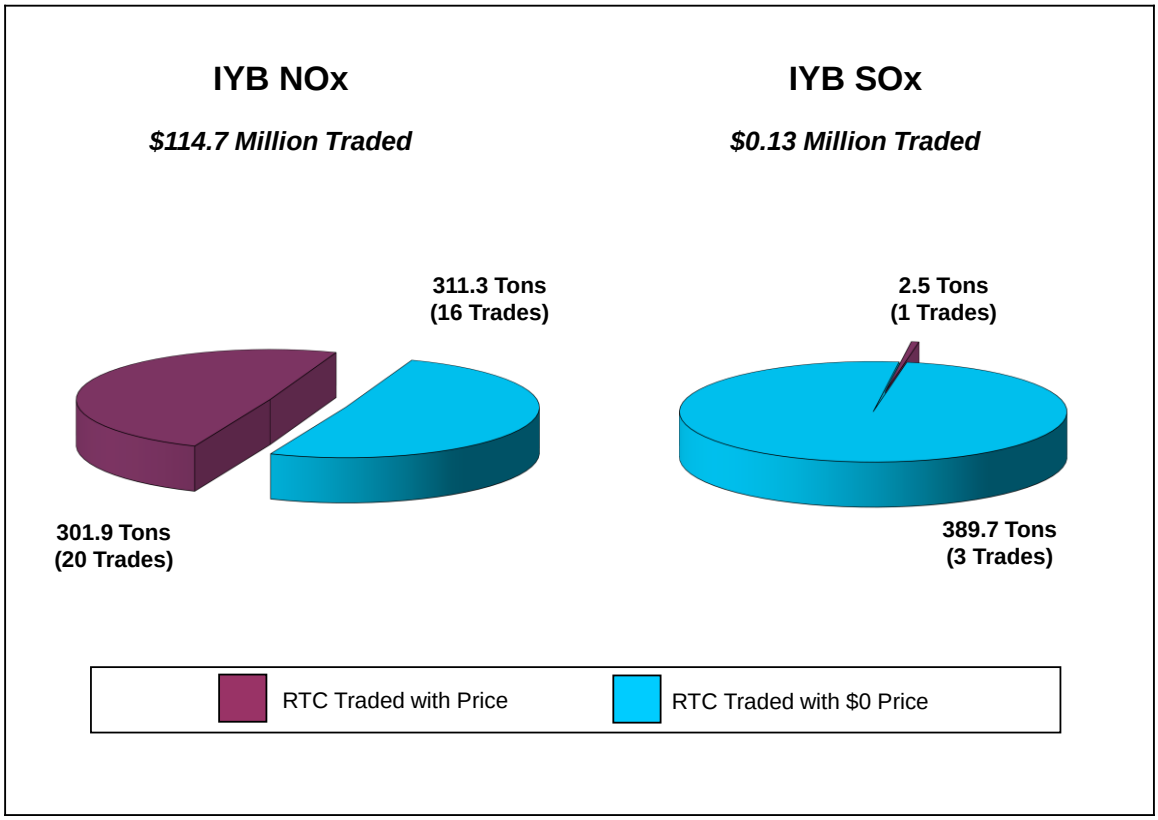
In calendar year 2016, there were 36 IYB NOx trades and four IYB SOx trades, excluding swaps. The IYB NOx trades included RTCs with Compliance Years 2015, 2016, 2017, and 2018 as start years, while the IYB SOx trades had RTCs with Compliance Years 2016and 2017 as start years. Of the 36 IYB NOx trades,

20 trades were with price and 16 trades were with zero price. Of the four IYB SOx trades, one was with price and three were with zero price.

The 20 IYB NOx trades with price totaling over $114.7 million in calendar year 2016 were much lower in value than the $187 million in 2015. The one IYB SOx RTC trades with price with total value of $0.13 million in calendar year 2016 was much lower than the value of $4.0 million traded in 2015.

The total quantity of 613 tons of IYB NOx traded in calendar year 2016 was significantly lower than the 1,234 tons traded in calendar year 2015. The quantity traded with price in calendar year 2016 was 302 tons, which was also significantly lower than the 939 tons traded with price in calendar year 2015. The total quantity of 392 tons of IYB SOx traded in calendar year 2016 was slightly lower than the 408 tons of IYB SOx traded in calendar year 2015. The quantity traded with price in calendar year 2016 was 2.5 tons, which was much lower than the 75 tons of IYB SOx traded with price in calendar year 2015. In calendar year 2016, there were also 311 tons of IYB NOx and 390 tons of IYB SOx traded without price. As described earlier, the majority of these transfers were between facilities under common ownership and facilities that had a change of operator. Figure 2-6 illustrates the calendar year 2016 IYB RTC trading activity excluding swap trades.

Figure 2-6
Calendar Year 2016 Trading Activity for IYB RTCs (Excluding Swaps)



Prior to the amendment of Rule 2007 – Trading Requirements in May 2001, swap information and details of discrete-year and IYB trades were not required to be provided by trade participants. In compiling data for calendar years 1994 through part of 2001, any trade registration involving IYB RTCs was considered as a single IYB trade and swap trades were assumed to be nonexistent. Trading activity since inception of the RECLAIM program is illustrated in Figures 2-7 through 2-10 (discrete-year NOx trades, discrete-year SOx trades, IYB NOx trades, and IYB SOx trades, respectively) based on the trade reporting methodology described earlier in this report.

Figure 2-7
Discrete-Year NOx RTC Trades (Excluding Swaps)

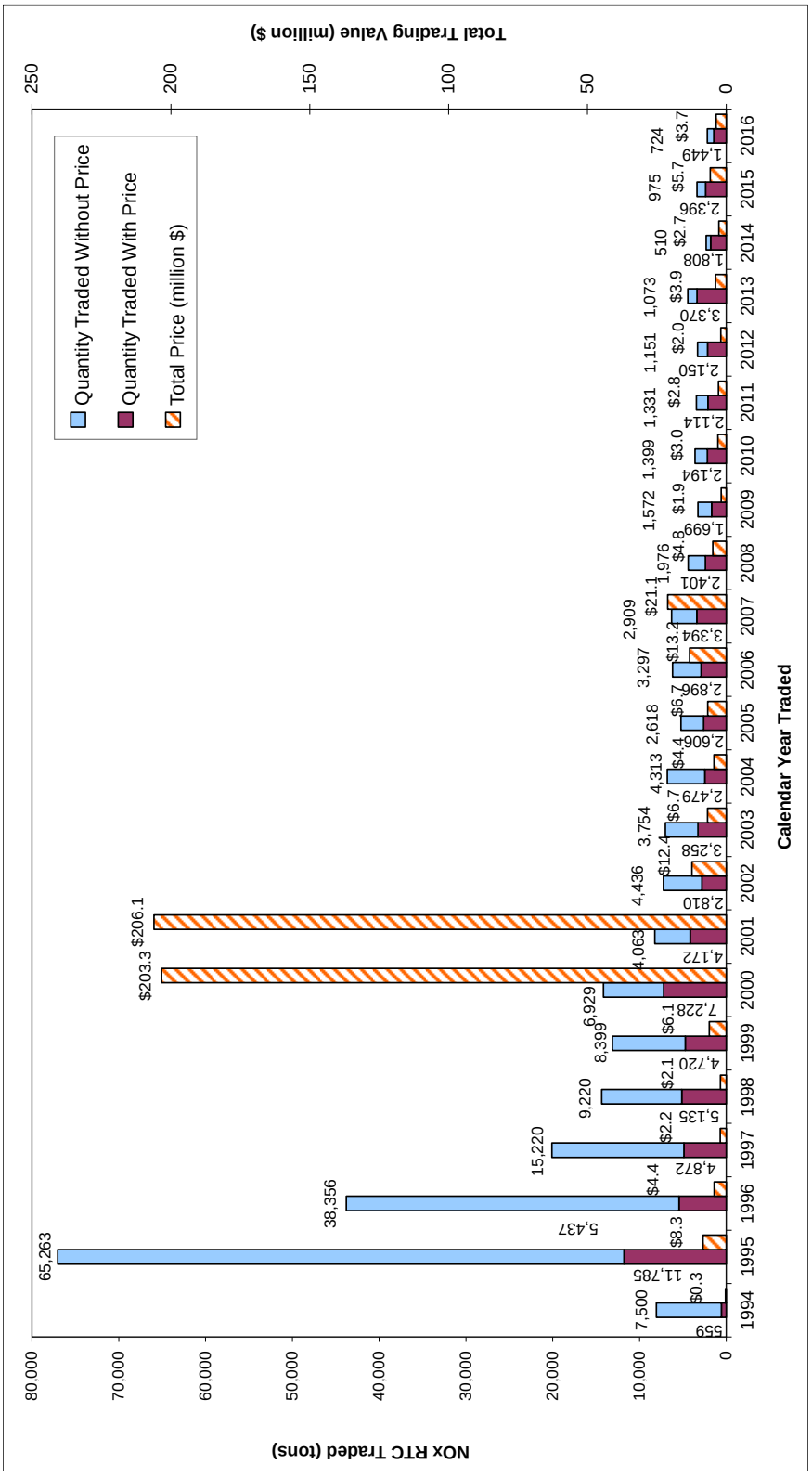


Figure 2-8
Discrete-Year SOx RTC Trades (Excluding Swaps)

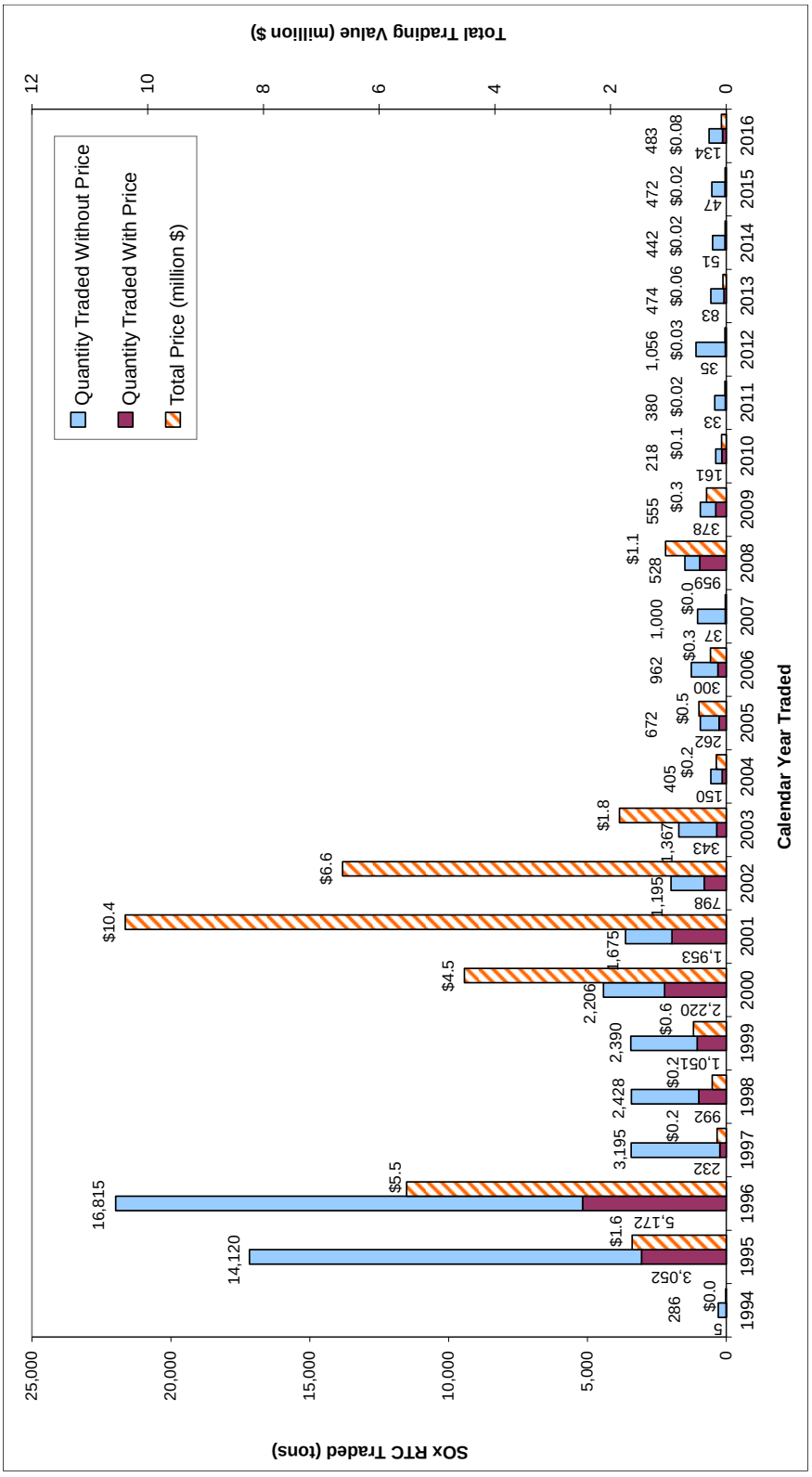


Figure 2-9
IYB NOx RTC Trades (Excluding Swaps)

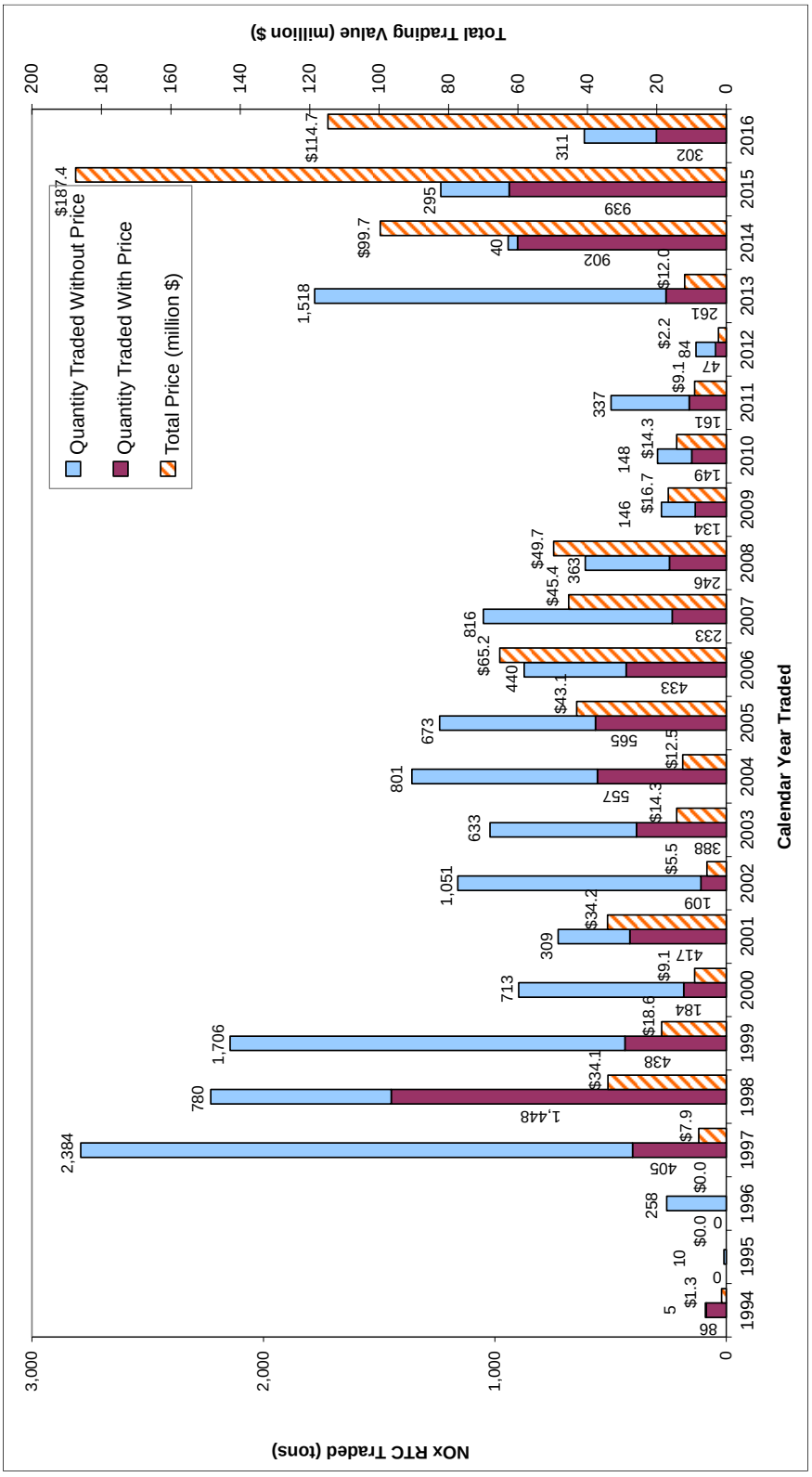
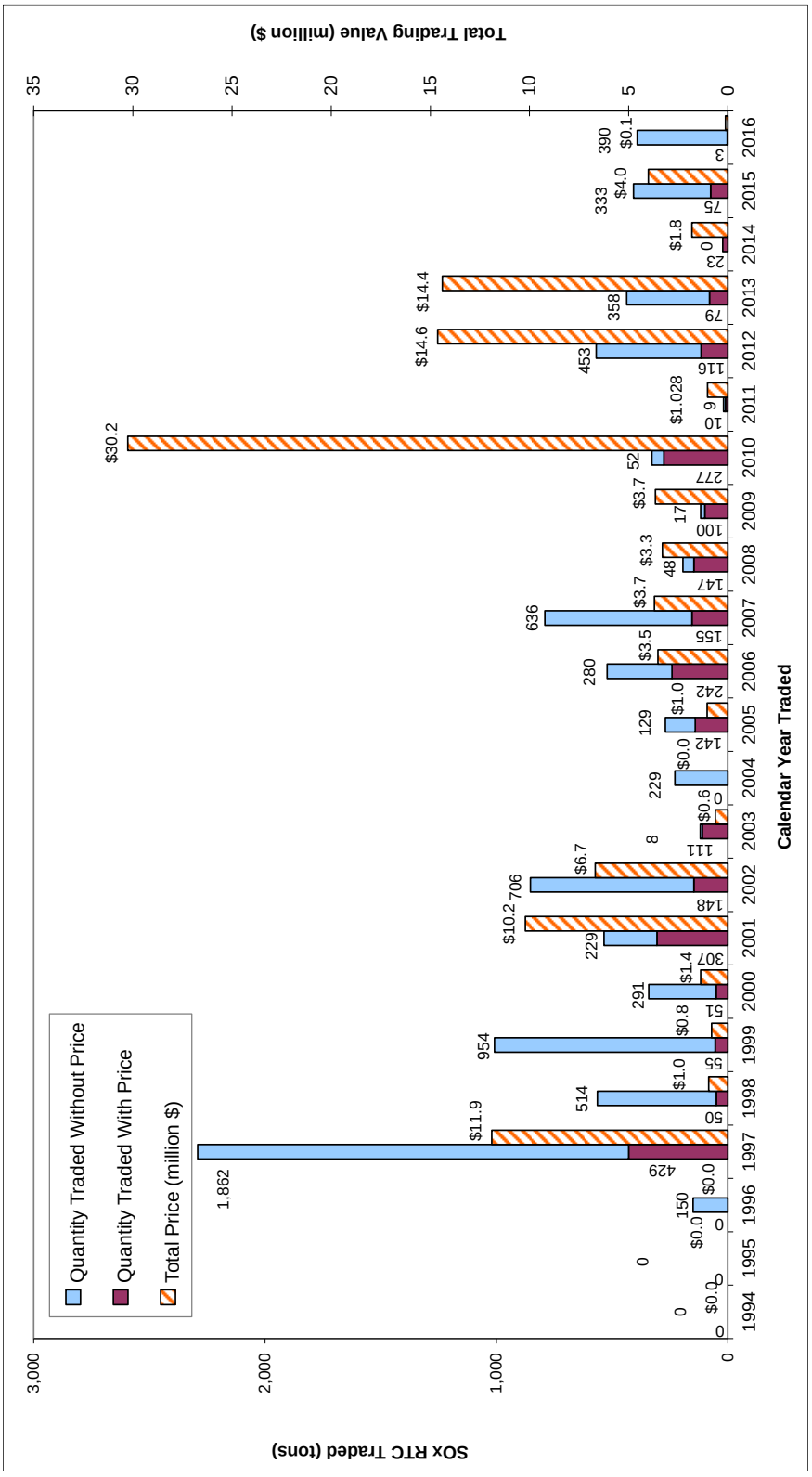


Figure 2-10
IYB SOx RTC Trades (Excluding Swaps)



Swap Trades

In addition to traditional trades of RTCs for a price, RTC swaps also occurred between trading partners. Most of the swap trades were exchanges of RTCs with different zones, cycles, expiration years, and/or pollutants. Some swaps involved a combination of RTCs and cash payment as a premium. There were also swaps of RTCs for ERCs. Trading parties swapping RTCs were required to report the agreed upon price of RTCs for each trade even though, with the exception of the above-described premiums, no money was actually exchanged. In calendar year 2016, there is set of four trades between a RECLAIM facility and its wholly-owned subsidiary that were also classified as swap trades (see detailed discussion later in this chapter). As a result, over $5.8 million in total value was reported from RTCs that were swapped in calendar year 2016, of which two trades involved swapping IYB NOx RTCs for IYB SOx RTCs and were collectively valued at a total of $0.36 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 trades with large values (*e.g.,* 2009) the inclusion of swap trades in the average trade price calculations would have resulted in calculated annual average prices dominated by swap trades, and therefore, potentially not representative of market prices actually paid for RTCs. Prices of swap trades are excluded from analysis of average trade prices because the values of the swap trades are solely based upon prices agreed upon between trading partners and do not reflect actual funds transferred. Tables 2-2 and 2-3 present the calendar years' 2001 through 2016 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-Year RTC Swapped with Price (tons)	Number of Swap Registrations with Price	Total Number of Swap Registrations
2001	$24.29	6.0	612.2	71	78
2002	$14.31	64.3	1,701.7	94	94
2003	$7.70	69.9	1,198.1	64	64
2004	$3.74	0	1,730.5	90	90
2005	$3.89	18.7	885.3	53	53
2006	$7.29	14.8	1,105.9	49	49
2007	$4.14	0	820.0	43	49
2008	$8.41	4.5	1,945.8	48	50
2009	$55.76	394.2	1,188.4	37	42
2010	$3.73	18.2	928.5	25	31
2011	$2.00	0	775.5	25	32
2012	$1.29	0	928.1	36	36
2013	$2.41	11.6	1,273.5	44	44
2014	$3.24	28.5	489.6	25	25
2015	$6.77	31.0	317.0	15	15
2016	$2.18	1.8	622.8	22	22

* 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-Year RTC Swapped with Price (tons)	Number of Swap Registrations with Price	Total Number of Swap Registrations
2001	$1.53	18.0	240.0	3	4
2002	$6.11	26.6	408.4	30	30
2003	$5.88	20.9	656.0	32	32
2004	$0.39	0	161.8	13	13
2005	$2.16	43.5	227.8	13	14
2006	$0.02	0	24.4	2	2
2007	$0.00	0	0	0	0
2008	$0.40	0	197.0	5	8
2009	$3.63	55.3	401.3	9	10
2010	$6.89	79.4	417.0	16	18
2011	$0.25	0	228.5	3	4
2012	$27.01	100.0	7.5	4	4
2013	$0.33	3.1	5.5	2	2
2014	$0.01	0.0	14.8	1	1
2015	$0	0.0	0	0	0
2016	$3.68	39.6	44.2	3	3

* Swaps without price are strictly transfers of RTCs between trading partners and their respective brokers. Information regarding swap trades was not required prior to May 9, 2001.

RTC Trade Prices (Excluding Swaps)

As staff was analyzing RTC trade prices, one set of trades stood out in terms of the reported prices. The set included four trades–one each for the transfer of discrete-year NOx RTCs, discrete-year SOx RTCs, IYB NOx RTCs and IYB SOx RTCs. The trades were submitted at the same time and were for the internal transfer of RTCs from one RECLAIM facility to its wholly-owned subsidiary, an apparent holding company for investment trades and not a RECLAIM facility. First, these trades of RTCs were odd in that the same subsidiary had previously transferred a majority of these same RTC's to its parent RECLAIM facility at no cost. That parent RECLAIM facility had discontinued its cement manufacturing operations and, therefore, did not need RTC's for that operation.

Second, the transactions were handled in an unusual fashion. After a shave is adopted (in this case, the December 2015 shave), a facility's pre-shave IYB RTCs become post-shave, a set of lesser IYB RTCs accompanied by discrete-year RTCs resulting from the shave. In trading post-shave RTCs, a facility normally sells its lesser IYB RTCs along with the resulting discrete-year RTCs in a lump trade, as District records show. In the internal trades, the discrete-year RTCs resulting from the shave were broken-out and sold separately to its wholly-owned investment subsidiary. Third, because the buyer is a wholly-owned subsidiary, the trades were not at arms-length. This makes the prices of these trades suspect, since they are not influenced by market prices. RTC prices set in this type of internal trade are analogous to "transfer prices" of goods and services exchanged among different entities under common ownership. It is important to distinguish transfer pricing from competitive market pricing, the latter of which corresponds to the market equilibrium where actual market supply satisfies the market demand. Due to compliance requirements set by financial regulations, transfer pricing usually reflects market prices to a reasonable degree (*i.e.*, the arm's length principle). However, as these regulations may not be applicable to RTC trades, it is less likely that the RTC prices in question were set in accordance with market prices.

Fourth, the traded prices for Compliance Years 2018 and after appear to be arbitrarily set. A comparison of the traded prices in the internal trade of discrete-year NOx RTCs to comparable RTCs of the same expirations shows that the prices for NOx RTCs in this internal trade are substantially higher with the only exception of Compliance Year 2015, as illustrated in Table 2-4 below. As seen in Table 2-4, starting with Compliance Year 2017, the internally traded prices are sometimes more than double the maximum market traded price of comparable RTCs. For Compliance Years 2020 and 2021, where the internally traded price exceeded the $15,000 per ton threshold specified under Rule 2015(b)(6), there were no comparable RTC's traded in the market for the calendar quarter prior to the trade submittal date of January 8, 2016. However, the sale prices for these two years were apparently based on the artificially high price of $10,000 per ton of Compliance Year 2017 RTCs. As shown in Table 2-4, the sale prices for the subsequent compliance years' RTCs, from 2018 through 2021, were arrived at by adding $3,000, $5,000, $7,000, and $8,000 per ton (or $1.50, $2.50, $3.50, and $4.00 per pound) respectively to the price for 2017 compliance year RTCs.

This also shows the arbitrariness of the sale prices set for the Compliance Years' 2020 and 2021 RTCs.

Finally, while discrete-year RTC trades for distant future compliance years may reflect to a certain degree the anticipated demand and supply in the RTC market, they can be also used as a risk management tool to hedge against potential RTC price volatilities, which may or may not materialize in future RTC market. If the trades were not internal, the increasing RTC price over the next compliance years could have reflected the buyer's assumption of an increasingly constricted supply of RTCs due to, *e.g.*, no facilities would install identified BARCT before 2021. However, in the case of internal trades, other factors related to the parent company's internal operations may have come into play, thus resulting in "transfer prices" that may not be reflective of the current and anticipated RTC market performances.

Table 2-4
Comparison of Prices for Discrete-Year NOx RTCs in Last Quarter of Calendar Year 2015 to Traded Prices of the Internal Trade

RTC Compliance Year	Maximum Price ($/ton)	Traded Price ($/ton)
2015	$3,700	$3,400
2016	$6,700	$7,000
2017	$4,200	$10,000
2018	$6,200	$13,000*
2019	$8,200	$15,000*
2020	No Trades	$17,000*
2021	No Trades	$18,000*

* There were no other trades of these compliance years' RTCs in 2016.

Based on the above analysis, it can be concluded that the internally traded prices for the discrete-year RTCs are not reflective of the market as intended under Rule 2015 (b)(6) because:

1. One single trade does not necessarily establish a market price. That single trade included a transfer of discrete-year credits from a RECLAIM facility to its wholly-owned subsidiary, which is an investment holding company, not a RECLAIM facility, and was not at arms-length and therefore not reflective of current and anticipated RTC market performance; and
2. The prices of almost all discrete-year RTC's sold in that single trade were about double the on-going market prices for comparable market-traded discrete-year RTCs, except for Compliance Years' 2020 and 2021 RTCs where there were no comparable trades.

Moreover, another reason for setting a market price threshold for review of the program is that market prices are a good indicator of the balance between supply and demand of a commodity such as RTCs. If there was an imbalance in the program, RTC prices would increase dramatically as in the case when California experienced an energy crisis and there was a surge in emissions from the energy sector. This is certainly not the case in Compliance Year 2015. Based on the

assessment of RTC supply in Compliance Year 2015 presented in Chapter 3 of this report, there are ample excess RTCs after accounting for all the emissions during the compliance year. In fact, emissions have remained relatively level since Compliance Year 2011. So, emission goals have been consistently met in the last five years and there is no basis to expect a shortage in RTC supply five years into the future, or Compliance Year 2020. Furthermore, there is no apparent increased demand for these RTCs since there is only one trade for these specific compliance years. In conclusion, since the prices reported for the transfer of RTCs in this set of four trades should not be regarded as market prices for the reasons cited above, these trades are classified as "swap trades", and are not included in the determination of annual average prices.

Discrete-Year RTC Prices

Table 2-5 lists the annual average prices for discrete-year NOx and SOx RTCs traded in 2016. The table shows that all annual average prices for discrete-year NOx and SOx RTCs were well below the $42,627 per ton of NOx and $30,691 per ton of SOx discrete-year RTCs pre-determined overall program review thresholds established by the Governing Board pursuant to Health and Safety Code §39616(f), and as well as, the $15,000 threshold specified under Rule 2015(b)(6) for reviews of the compliance aspects of the program.

Table 2-5
Annual Average Prices for Discrete-Year RTCs Traded In Calendar Year 2016

RTC Compliance Year	NOx Annual Average Price ($/ton)	SOx Annual Average Price ($/ton)
2015	$1,626	$540
2016	$2,932	$1,255
2017	$6,606	None Traded

For comparison purposes, Table 2-6 lists the annual average prices for discrete-year RTCs traded in calendar year 2016 (excluding swap trades) and also includes internal trades involving discrete-year RTCs that were not at arms-length and therefore do not reflect market prices (see discussions above).

Table 2-6
Annual Average Prices for Discrete-Year RTCs Traded In Calendar Year 2016 Including the Internal Trades

RTC Compliance Year	NOx Annual Average Price ($/ton)	SOx Annual Average Price ($/ton)
2015	$1,654.95	$594.31
2016	$2,984.47	$1,617.71
2017	$7,025.25	$3,000.00*
2018	$13,000.00*	$4,000.00*
2019	$15,000.00*	None Traded
2020	$17,000.00*	None Traded
2021	$18,000.00*	None Traded

* Only one trade was registered for RTCs valid for these compliance years' RTCs.

Rolling Average NOx and SOx RTCs Price Report

On December 4, 2015, the Governing Board amended Rule 2002 to change the 12-month rolling average price of NOx RTCs for all trades for the current compliance year, excluding RTC trades reported at no price and swap transactions, to a $22,500 per ton threshold. It also established a new $35,000 per ton threshold for the three-month rolling average price of current compliance year NOx RTCs and a $200,000 per ton "price-floor" threshold for the twelve-month rolling average price of IYB NOx RTCs that will become effective in 2019. The reporting of the three-month rolling average prices for current compliance year's NOx RTCs and the twelve-month rolling average prices of IYB NOx RTCs started on May 1, 2016.

The December 2015 amendments directed the Executive Officer to report to the Governing Board if (a) the cost of current compliance year NOx RTCs exceeds $22,500 per ton based on the twelve-month rolling average price, or (b) $35,000 per ton based on the three-month rolling average price. If either (a) or (b) above occurs, the Governing Board may convert the Non-tradable/Non-usable NOx RTCs valid for the period in which the RTC price(s) exceeded an applicable threshold to Tradable/Usable NOx RTCs pursuant to Rule 2002(f)(1)(H). Additionally, the Executive Officer's report to the Governing Board will include a "commitment and schedule to conduct a more rigorous control technology implementation, emission reduction, cost-effectiveness, market analysis, and socioeconomic impact assessment of the RECLAIM program." Furthermore, Rule 2002 (f)(1)(I) requires the Executive Officer to calculate the twelve-month rolling average price of IYB NOx RTCs. Beginning in Compliance Year 2019, the Executive Officer needs to report to the Governing Board when the price of IYB NOx RTCs falls below $200,000 per ton.

Starting January 2017, the Executive Officer is calculating and reporting the twelve-month rolling average prices for current compliance year SOx RTCs as required by the November 5, 2010 amendment to Rule 2002. The amendment established the $50,000 per ton of SOx RTC threshold. In the event that the SOx RTC price threshold is exceeded, the Governing Board will decide whether or not to convert any portion of the Non-tradable/Non-usable SOx RTCs to Tradable/Usable SOx RTCs.

Tables 2-7 through 2-10 lists the various rolling average prices[4] described above. The average NOx and SOx RTC prices have all remained well below the applicable reporting thresholds, and the IYB NOx price stayed above the $200,000 per ton "price-floor" threshold.

[4] Rolling average prices that were published since January 2017 included the internal trades. Since these trades are being classified as swap trades, the rolling average prices have been updated accordingly (see discussions above).

Table 2-7
Twelve-Month Rolling Average Prices of Compliance Year 2016 Discrete-Year NOx RTCs

Reporting Month	12-Month Period	Average Price ($/ton)
January 2016	January 2015 through December 2015	$2,833
February 2016	February 2015 through January 2016	$2,833
March 2016	March 2015 through February 2016	$3,032
April 2016	April 15 through March 2016	$3049
May 2016	May 2015 through April 2016	$3,078
June 2016	June 2015 through May 2016	$3,156
July 2016	July 2015 through June 2016	$3,174
August 2016	August 2015 through July 2016	$3,138
September 2016	September 2015 through August 2016	$3,191
October 2016	October 2015 through September 2016	$3,730
November 2016	November 2015 through October 2016	$3,546
December 2016	December 2015 through November 2016	$3,318
January 2017	January 2016 through December 2016	$2,932

Table 2-8
Three-Month Rolling Average Prices of Compliance Year 2016 Discrete-Year NOx RTCs

Reporting Month	12-Month Period	Average Price ($/ton)
May 2016	February 2016 through April 2016	$4,158
June 2016	March 2016 through May2016	$4,188
July 2016	April 2016 through June 2016	$4,304
August 2016	May 2016 through July 2016	$3,953
September 2016	June 2016 through August 2016	$3,747
October 2016	July 2016 through September 2016	$3,623
November 2016	August 2016 through October 2016	$2,778
December 2016	September 2016 through November 2016	$2,438
January 2017	October 2016 through December 2016	$2,741

Table 2-9
Twelve-Month Rolling Average Prices of Compliance Year 2016 IYB NOx RTCs

Reporting Month	12-Month Period	Average Price ($/ton)
May 2016	May 2015 through April 2016	$267,913
June 2016	June 2015 through May2016	$270,819
July 2016	July 2015 through June 2016	$365,654
August 2016	August 2015 through July 2016	$324,943
September 2016	September 2015 through August 2016	$324,449
October 2016	October 2015 through September 2016	$340,759
November 2016	November 2015 through October 2016	$376,628
December 2016	December 2015 through November 2016	$376,638
January 2017	January 2016 through December 2016	$380,057

Table 2-10
Twelve-Month Rolling Average Prices of Compliance Year 2016 Discrete-Year SOx RTCs

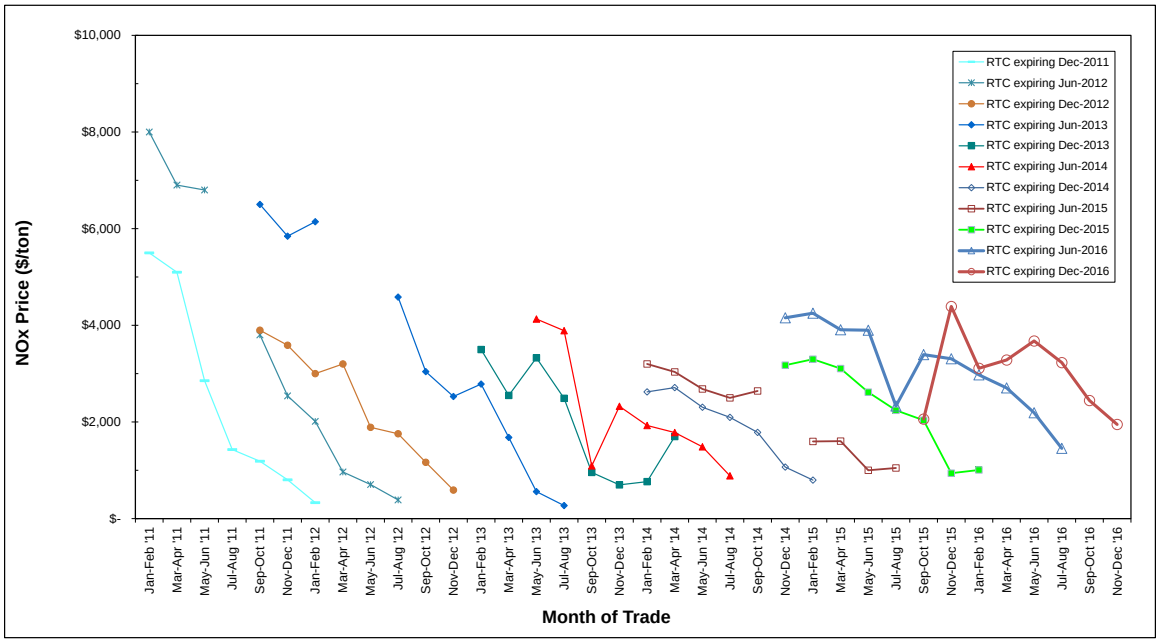
Reporting Month	12-Month Period	Average Price ($/ton)
January 2017	January 2016 through December 2016	$1,255

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 2016 followed the general trend of RTC prices declining over the course of the compliance year and the sixty-day trading period thereafter.

The bi-monthly average price for these near-expiration NOx RTCs is shown in Figure 2-11 to illustrate the general price trend for these RTCs. The general declining trend of RTC prices nearing and just past expiration indicates that there was an adequate supply to meet RTC demand during the final reconciliation period following the end of the compliance years. A similar analysis is not performed for the price of SOx RTCs nearing expiration because there are not enough SOx trades over the course of the year to yield meaningful data. For calendar year 2016, there were only nine discrete-year SOx trades with price for Compliance Years' 2015 and 2016 RTCs. These prices were flat throughout the year.

Figure 2-11
Bi-Monthly Average Price for NOx RTCs near Expiration



Note: Data is presented for a limited number of RTC expiration dates for graphical clarity.

IYB RTC Prices

The annual average price for IYB NOx RTCs traded in calendar year 2016 was $380,057 per ton, which is much higher than the annual average price of $199,685 per ton traded in calendar year 2015. This is expected since the IYB NOx RTCs traded in 2016 are those remaining RTCs after the application of the NOx reduction adopted by the Governing Board on December 4, 2015. The annual average price for IYB SOx RTCs traded in calendar year 2016 was $50,000 per ton, which is slightly lower than the $53,665 per ton traded in calendar year 2015. There was one IYB SOx trade with price totaling 2.5 tons in 2016, compared to the four IYB SOx trades and 75 tons traded in 2015. An investor purchased 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 2-11 and 2-12, respectively. In calendar year 2016, the annual average IYB RTC prices did not exceed the $639,399 per ton of NOx RTCs or the $460,367 per ton of SOx RTCs program review thresholds established by the Governing Board for IYB RTCs pursuant to California Health and Safety Code §39616(f).

Table 2-11
IYB NOx Pricing (Excluding Swaps)

Calendar Year	Total Reported Value ($ millions)	IYB RTC Traded with Price (tons)	Number of IYB Registrations With Price	Average Price ($/ton)
1994*	$1.3	85.7	1	$15,623
1995*	$0.0	0	0	N/A
1996*	$0.0	0	0	N/A
1997*	$7.9	404.6	9	$19,602
1998*	$34.1	1,447.6	23	$23,534
1999*	$18.6	438.3	19	$42,437
2000*	$9.1	184.2	15	$49,340
2001*	$34.2	416.9	25	$82,013
2002	$5.5	109.5	31	$50,686
2003	$14.3	388.3	28	$36,797
2004	$12.5	557.0	52	$22,481
2005	$43.1	565.3	71	$76,197
2006	$65.2	432.9	50	$150,665
2007	$45.4	233.5	25	$194,369
2008	$49.7	245.6	27	$202,402
2009	$16.7	134.2	14	$124,576
2010	$14.3	149.0	13	$95,761
2011	$9.1	160.7	29	$56,708
2012	$2.2	46.6	13	$48,146
2013	$12.0	260.9	17	$45,914
2014	$99.7	902.2	49	$110,509
2015	$187.4	938.5	47	$199,685
2016	$114.7	301.9	20	$380,057

* No information regarding swap trades was reported until May 9, 2001.

Table 2-12
IYB SOx Pricing (Excluding Swaps)

Calendar Year	Total Reported Value ($ millions)	IYB RTC Traded with Price (tons)	Number of IYB Registrations With Price	Average Price ($/ton)
1994*	$0.0	0	0	N/A
1995*	$0.0	0	0	N/A
1996*	$0.0	0	0	N/A
1997*	$11.9	429.2	7	$27,738
1998*	$1.0	50.0	1	$19,360
1999*	$0.8	55.0	3	$14,946
2000*	$1.4	50.6	5	$27,028
2001*	$10.2	306.8	8	$33,288
2002	$6.7	147.5	5	$45,343
2003	$0.6	110.9	1	$5,680
2004	$0.0	0.0	0	N/A
2005	$1.0	141.5	3	$7,409
2006	$3.5	241.7	12	$14,585
2007	$3.7	155.2	5	$23,848
2008	$3.3	146.8	5	$22,479
2009	$3.7	100.0	4	$36,550
2010	$30.2	277.0	10	$109,219
2011	$1.03	10.0	2	$102,366
2012	$14.6	116.2	4	$125,860
2013	$14.4	79.2	4	$181,653
2014	$1.8	22.5	4	$80,444
2015	$4.0	74.8	4	$53,665
2016	$0.13	2.5	1	$50,000

* 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 trades, one party pays a premium for the contingent right (option) to purchase RTCs owned by the other party at a pre-determined price within a certain time period. Until RTCs are transferred from seller to buyer, prices for options are not reported, because the seller is not paid for the actual RTCs, but only for the right to purchase the RTCs at a future date. These rights may or may not actually be exercised. RTC traders are obligated to report options to SCAQMD within five business days of reaching an agreement. These reports are posted on SCAQMD's website. There were no reported trades involving the contingent right to buy or sell RTCs in calendar year 2016.

In addition to mitigating emissions at RECLAIM facilities, RTCs were also used by facilities to satisfy variance conditions. During calendar year 2016, three RECLAIM facilities retired a total of 0.7 tons of NOx RTCs for this purpose. These consisted of discrete-year RTCs for Compliance Years 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 trades.

Investor Participation

In 2016 investors were actively involved in 137 of the 196 discrete-year NOx RTC trades with price, six of the eight discrete-year SOx RTC trades with price, and 16 of the 20 IYB NOx trades with price. An investor was also involved in the one IYB SOx trade with price.

Investors' involvement in discrete-year NOx and SOx trades registered with price in calendar year 2016 is illustrated in Figures 2-12 and 2-13. Figure 2-12 is based on total value of discrete-year NOx and SOx RTCs traded, and shows that investors were involved in 63% and 64%, respectively, of the discrete-year NOx and SOx trades reported by value. Figure 2-13 is based on volume of discrete-year RTCs traded with price and shows that investors were involved in 62% and 54% of the discrete-year NOx and SOx trades by volume, respectively. Figures 2-14 and 2-15 provide similar data for IYB NOx and SOx trades, and show that investors were involved in 25% of IYB NOx trades on a reported value basis, and 19% of IYB NOx trades on the basis of the volume traded with price. An investor was involved in the sole IYB SOx trade with price in calendar year 2016.

Figure 2-12
Calendar Year 2016 Investor-Involved Discrete-Year NOx and SOx Trades Based on Value Traded

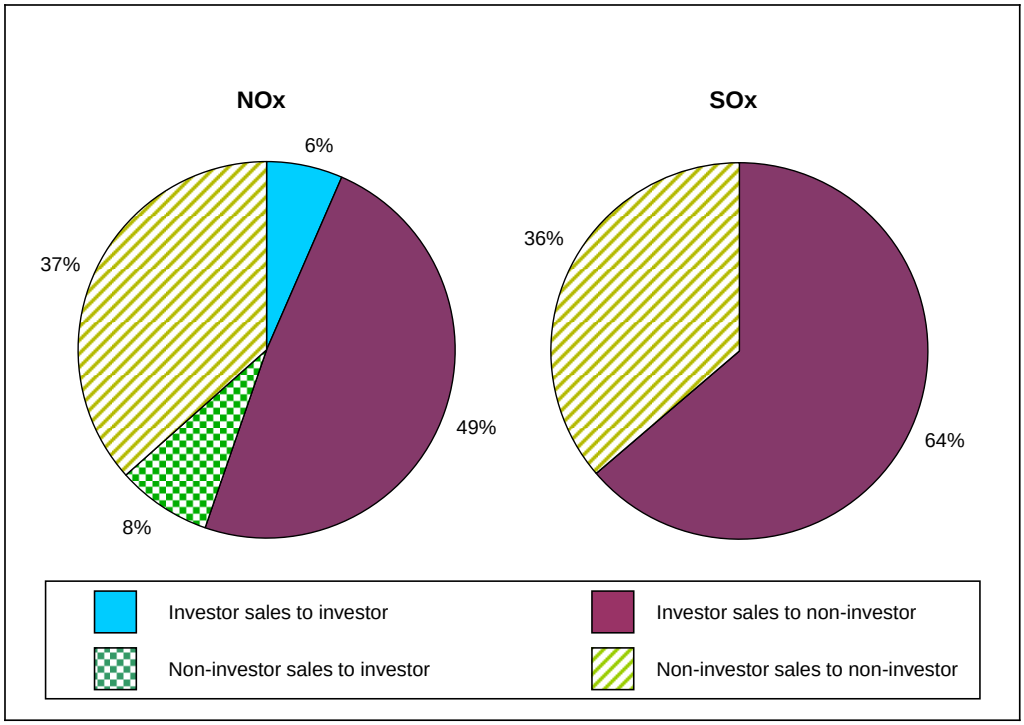


Figure 2-13
Calendar Year 2016 Investor-Involved Discrete-Year NOx and SOx Trades Based on Volume Traded with Price

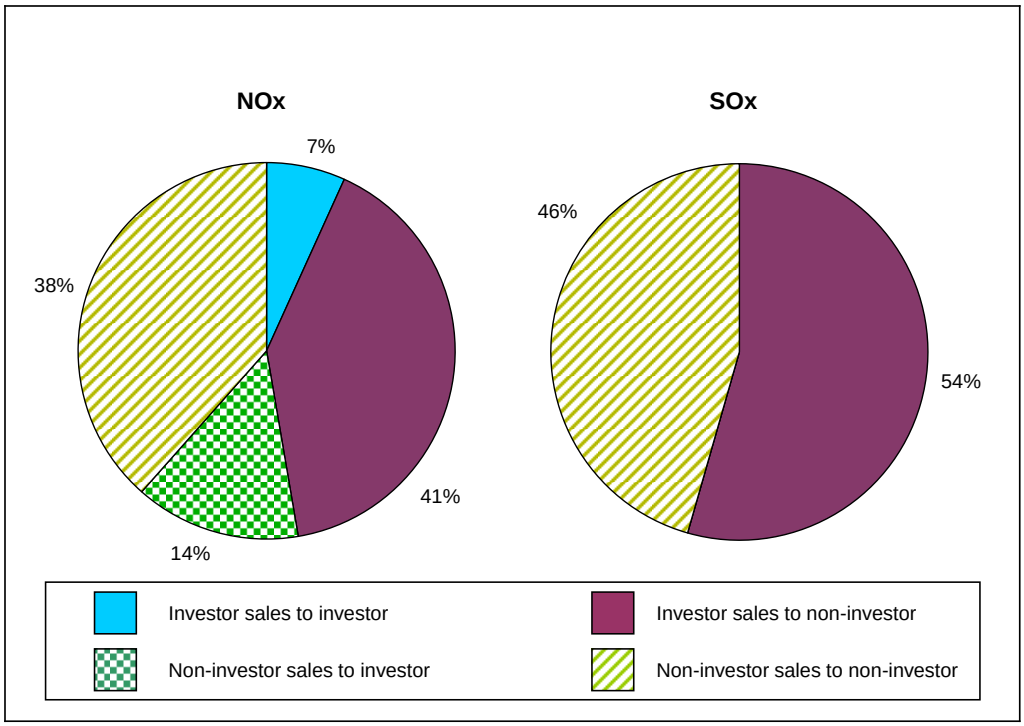


Figure 2-14
Calendar Year 2016 Investor-Involved IYB NOx and SOx Trades Based on Value Traded

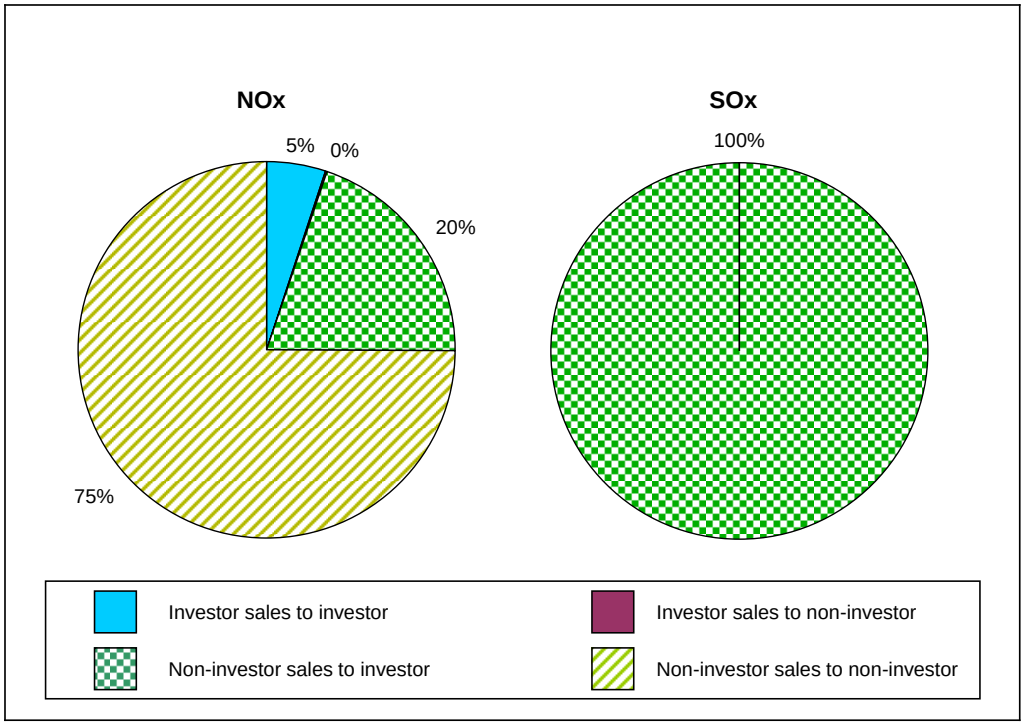
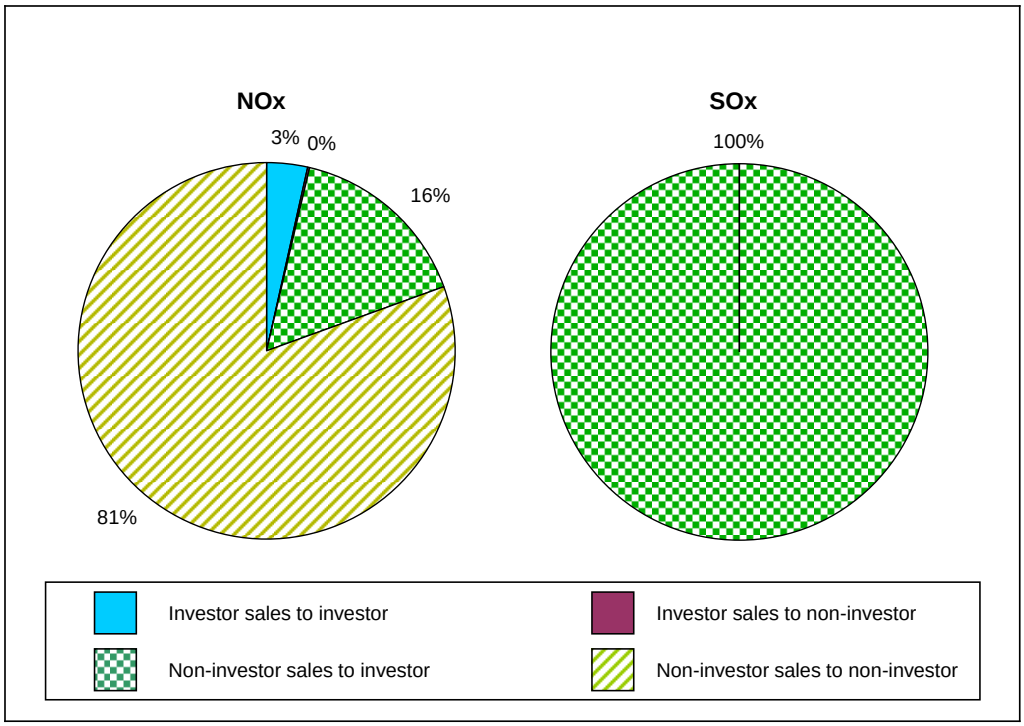


Figure 2-15
Calendar Year 2016 Investor-Involved IYB NOx and SOx Trades Based on Volume Traded with Price



As of the end of calendar year 2016, investors' holding of IYB NOx RTCs had increased to 3.1% compared to 1.9% at the end of calendar year 2015. 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 5.0% at the end of calendar year 2016 from 3.3% at the end of calendar year 2015. 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 five RECLAIM facilities that shut down during Compliance Year 2015. These five facilities all participated in the NOx RECLAIM program and held a total of 48.3 tons of IYB NOx RTCs and the one facility also participating in the SOx RECLAIM program held a total of 44.0 tons of IYB SOx. Currently, these facilities hold a total of 2.4 tons of IYB NOx RTCs and 0.01 tons of 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 2015, the total RECLAIM NOx emissions were 7,246 tons. If the future total NOx emissions increased to the Compliance Year 2007 level of 8,796 tons (the first year of the NOx allocation programmatic reduction adopted in January 2005), the NOx RTC surplus would be only 904 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 2016 the aggregate investors' holdings are 3.1% 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% 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, 2014, and 2015.

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. Furthermore, on October 7, 2016, the Governing Board approved amendments to prevent facility shutdown RECLAIM Trading Credits (RTCs) from entering the market and potentially delaying the installation of pollution controls at NOx RECLAIM facilities in order to bring this aspect of RECLAIM more in line with non-RECLAIM New Source Review. The December 2015 and October 2016 amendments 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 2015, aggregate NOx emissions were below total allocations by 25% and aggregate SOx emissions were below total allocations by 26%. No emissions associated with breakdowns were excluded from reconciliation with facility allocations in Compliance Year 2015. 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 2015. With respect to the Rule 2015 backstop provisions, Compliance Year 2015 aggregate NOx and SOx emissions were both well below aggregate allocations and, as such, did not trigger the requirement to review the RECLAIM program.

Background

One of the primary objectives of the annual RECLAIM program audits is to assess whether RECLAIM is achieving its targeted emission reductions. Those targeted emission reductions are embodied in the annual allocations issued to RECLAIM facilities. In particular, the annual allocations reflect required emission reductions initially from the subsumed command-and-control rules and control measures, as well as from subsequent reductions in allocations as a result of BARCT implementation. In January 2005 and December 2015, the Board adopted amendments to Rule 2002 to further reduce aggregate RECLAIM NOx allocations through implementation of the latest BARCT. The 2005 amendments resulted in cumulative NOx allocation reductions of 22.5% (2,811 tons/year, or 7.7 tons/day) from all RECLAIM facilities by Compliance Year 2011, with the biggest single-year reduction of 11.7% in Compliance Year 2007. The 2015 amendments will reduce NOx allocations by 45.2% (4,380 tons/year, or 12.0 tons/day) by Compliance Year 2022. The reductions are phased-in from Compliance Year 2016 through Compliance Year 2022.

The Board also amended Rule 2002 in November 2010 to implement BARCT for SOx. Specifically, the November 2010 amendments called for certain facilities' RECLAIM SOx allocations to be adjusted to achieve a 48% (2,081 tons/year, or 5.7 tons/day) overall reduction, with the reductions phased-in from Compliance Year 2013 through Compliance Year 2019. About 1,460 tons/year, or 4.0 tons/day (approximately 70% of the scheduled reduction), of SOx allocations were reduced by Compliance Year 2014. The next increment of reduction will be in Compliance Year 2017 and the last increment will be in 2019.

Emissions Audit Process

Since the inception of the RECLAIM program, SCAQMD staff has conducted annual program audits of the emissions data submitted by RECLAIM facilities to ensure the integrity and reliability of RECLAIM emission data. The process includes reviews of APEP reports submitted by RECLAIM facilities and audits of field records and emission calculations. The audit process is described in further detail in Chapter 5 – Compliance.

SCAQMD staff adjusts the APEP-reported emissions based on audit results, as necessary. Whenever SCAQMD staff finds discrepancies, they discuss the findings with the facility operators and provide the operators an opportunity to review changes resulting from facility audits and to present additional data or information in support of the data stated in their APEP reports.

This rigorous audit process, although resource intensive, reinforces RECLAIM's emissions monitoring and reporting requirements and enhances the validity and reliability of the final emissions data. The audited emissions are used to determine if a facility complied with its allocations. The most recent five compliance years' audited NOx emissions for each facility are posted on SCAQMD's web page after the audits are completed. All emissions data presented in this annual RECLAIM audit report are compiled from audited facility emissions.

Emission Trends and Analysis

RECLAIM achieves its emission reduction goals on an aggregate basis by ensuring that annual emissions are below total RTCs. It is important to understand that the RECLAIM program is successful at achieving these emission reduction goals even when some individual RECLAIM facilities exceed their RTC account balances, provided aggregate RECLAIM emissions do not exceed aggregate RTCs issued. Therefore, aggregate audited NOx or SOx emissions from all RECLAIM sources are the basis for determining whether the programmatic emission reduction goals for that 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 2014. 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 2014.

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 in Audited NOx Emissions	% Change in RECLAIM NOx Emissions	Number of Facilities Involved
2014	13,584	13,079	-505	-3.7%	-0.003%	1

Incorporating the above, Table 3-2 and Figure 3-1 show aggregate audited NOx emissions for Compliance Years 1994 through 2015. 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% of the aggregate allocations. Specifically, Compliance Year 2015 NOx emissions were below total allocations by 25%. Aggregate annual NOx emissions have remained relatively level since Compliance Year 2011.

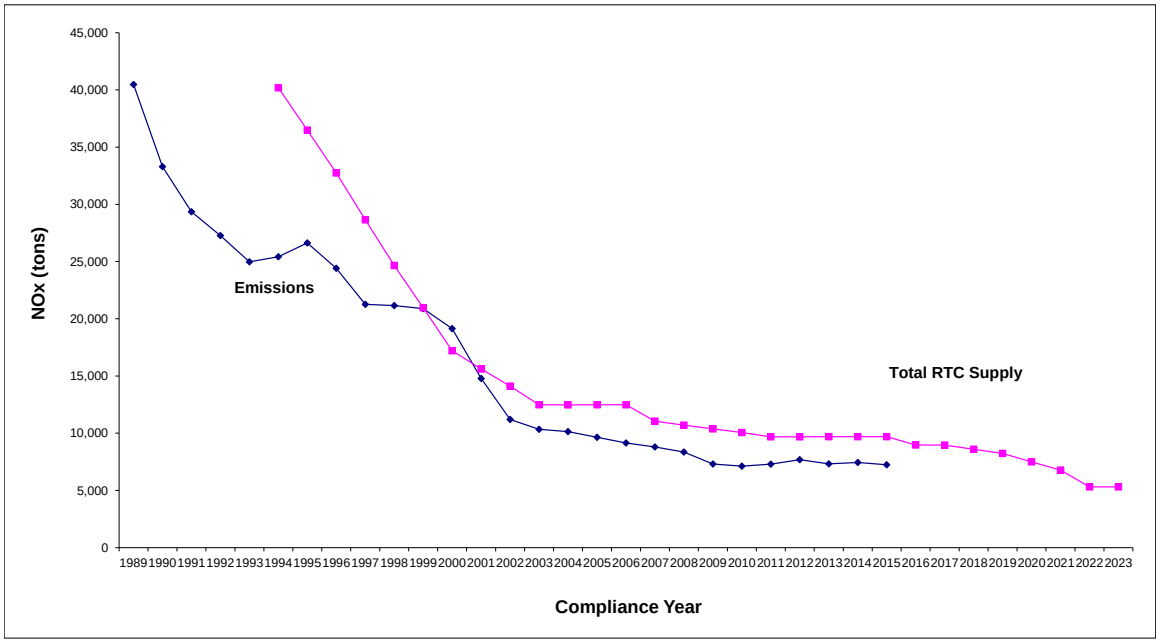
Table 3-2
Annual NOx Emissions for Compliance Years 1994 through 2015

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%	40,187	14,767	37%
1995	26,632	4.8%	36,484	9,852	27%
1996	24,414	-4.0%	32,742	8,328	25%
1997	21,258	-16%	28,657	7,399	26%
1998	21,158	-17%	24,651	3,493	14%
1999	20,889	-18%	20,968	79	0.38%
2000	19,148	-25%	17,208	-1,940	-11%
2001	14,779	-42%	15,617	838	5.4%
2002	11,201	-56%	14,111	2,910	21%
2003	10,342	-59%	12,485	2,143	17%
2004	10,134	-60%	12,477	2,343	19%
2005	9,642	-62%	12,484	2,842	23%
2006	9,152	-64%	12,486	3,334	27%
2007	8,796	-65%	11,046	2,250	20%
2008	8,349	-67%	10,705	2,356	22%
2009	7,306	-71%	10,377	3,071	30%
2010	7,121	-72%	10,053	2,932	29%
2011	7,302	-71%	9,690	2,388	25%
2012	7,691	-70%	9,689	1,998	21%
2013	7,326	-71%	9,699	2,373	24%
2014	7,447	-71%	9,699	2,252	23%
2015	7,246	-71%	9,700	2,454	25%

[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 2015, SOx emissions were below total allocations by 26%. 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 decreased by 80 tons (4%) in Compliance Year 2015 compared to SOx emissions in Compliance Year 2014.

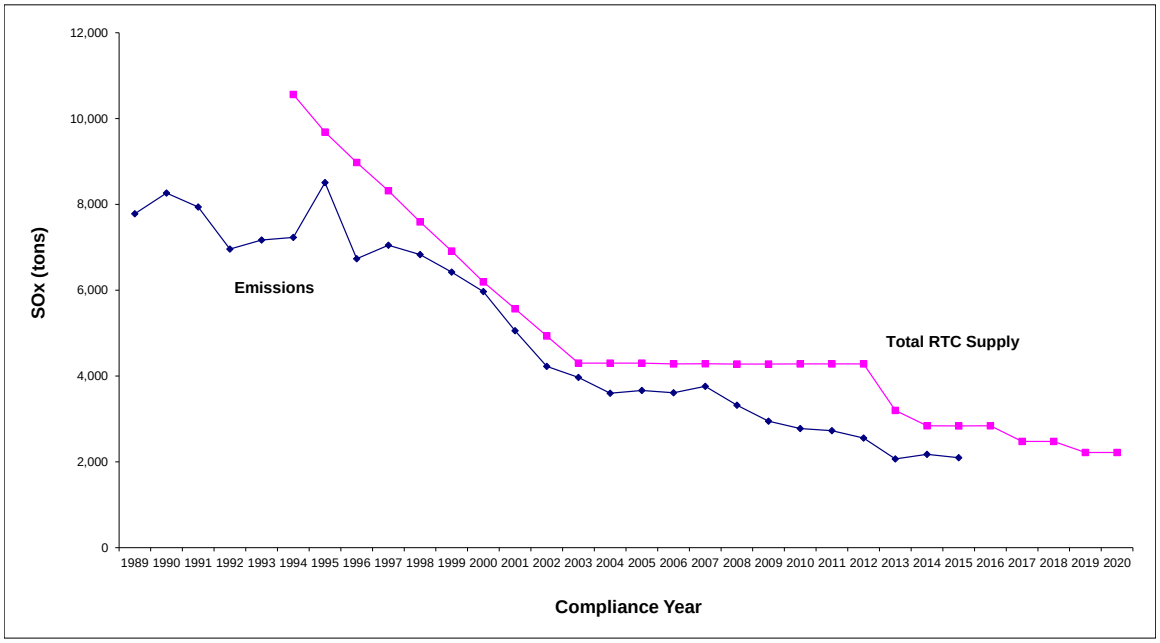
Table 3-3
Annual SOx Emissions for Compliance Years 1994 through 2015

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%	10,559	3,329	32%
1995	8,508	18%	9,685	1,177	12%
1996	6,731	-6.9%	8,976	2,245	25%
1997	7,048	-2.5%	8,317	1,269	15%
1998	6,829	-5.5%	7,592	763	10%
1999	6,420	-11%	6,911	491	7.1%
2000	5,966	-17%	6,194	228	3.7%
2001	5,056	-30%	5,567	511	9.2%
2002	4,223	-42%	4,932	709	14%
2003	3,968	-45%	4,299	331	7.7%
2004	3,597	-50%	4,299	702	16%
2005	3,663	-49%	4,300	637	15%
2006	3,610	-50%	4,282	672	16%
2007	3,759	-48%	4,286	527	12%
2008	3,319	-54%	4,280	961	22%
2009	2,946	-59%	4,280	1,334	31%
2010	2,775	-62%	4,282	1,507	35%
2011	2,727	-62%	4,283	1,556	36%
2012	2,552	-65%	4,283	1,731	40%
2013	2,066	-71%	3,198	1,132	35%
2014	2,176	-70%	2,839	663	23%
2015	2,096	-71%	2,836	740	26%

[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 2015, was Rule 1110.2 - Emissions from Gaseous- and Liquid-Fueled Engines. Amended on December 4, 2015, this rule extended the compliance deadline of January 1, 2016 for several biogas engine operators committed to installing control equipment because procurement and installation took longer than expected. The amendment also provided a compliance option for additional time with the payment of a compliance flexibility fee. Furthermore, U.S. EPA had raised concerns regarding the approvability of Rule 1110.2 into the State Implementation Plan because the existing breakdown provisions of the rule allowed unlimited emissions during reported breakdowns that were not subject to any enforcement action. This amendment addressed U.S.EPA's concerns on breakdowns and potential excess emissions without enforcement, by establishing a limit for exceedances due to breakdowns without enforcement action per calendar quarter. The amendment also removed existing rule language stating that certain breakdowns are not violations of the rule, and added U.S. EPA

[1] See Tables 1 and 2 of Rule 2001.

suggested language making clear that breakdowns may be subject to federal enforcement.

On June 3, 2016, Rule 1110.2, which was amended again to provide relief for one affected facility. This single facility, which operated two landfill gas-fired engines at the Prima Deshecha Landfill, was subject to a power purchase agreement (PPA) that expires on October 1, 2022, and could not economically meet the established compliance deadline of January 1, 2017. The amendments exempted the facility operator from the emission requirements of the rule, contingent upon the facility submitting a retirement plan for the permanent shutdown of all equipment subject to this rule at the expiration date of the PPA.

Neither the December 4, 2015 nor the June 3, 2016 amendments to Rule 1110.2 changed any category-wide equipment emissions limits. Rather, the limits for exceedances established in the December 4, 2015 amendment were for the express purpose of establishing excess emissions concentration thresholds for breakdowns (limiting no more than three per calendar quarter) to address U.S EPA's concern regarding unenforceable excess emissions from breakdowns. The June 3, 2016, amendment also did not impose a category-wide equipment emissions limit change. Rather, this amendment exempted a single non-RECLAIM facility from meeting its current command-and-control emission limit in exchange for the future permanent shutdown of all equipment subject to this rule at this facility. Since neither of these amendments to Rule 1110.2 affected category-wide emission limits and were administrative in nature, they did not result in any limitations requiring emission reductions on NOx or SOx sources at non-RECLAIM facilities. And, since Rule 2001 only exempts those provisions in identified rules applicable to NOx and SOx emissions at RECLAIM facilities, the recent amendments to Rule 1110.2 did not result in disproportionate impacts between RECLAIM and non-RECLAIM sources.

Other rules amended or adopted during Compliance Year 2015, but not subsumed by RECLAIM included Rules 1148.1 – Oil and Gas Production Wells, and Rule 1148.2 - Notification and Reporting Requirements for Oil and Gas Wells and Chemical Suppliers.

On September 4, 2015, the Governing Board amended Rule 1148.1. The amendment provided enforceable mechanisms to reduce odor nuisance potential from emissions associated with oil and gas production facility operations and also updated rule language to promote clarity, consistency and enforceability. The amendment required: 1) the use of odor mitigation best practices; 2) facilities located within 1,500 feet of a sensitive receptor to conduct and submit a specific cause analysis for any confirmed odor event; and 3) facilities with continuing odor issues to develop and implement an approved Odor Mitigation Plan.

Rule 1148.2 - Notification and Reporting Requirements for Oil and Gas Wells and Chemical Suppliers was also amended September 4, 2015. The purpose of this amendment was to establish requirements for owners or operators of oil and gas wells to notify the Executive Officer when conducting well drilling, well reworking, hydraulic fracturing, and other well production stimulation activities. The amendment also included reporting requirements for operators and chemical suppliers to report trade secret and non-trade secret chemicals used. The California Department of Conservation, through its Division of Oil, Gas, and Geothermal Resources (DOGGR) approved Well Stimulation Treatment

Regulations in response to the passage of Senate Bill 4 on December 30, 2014. Chemical reporting requirements for chemicals claimed as trade secret were different between the new DOGGR regulation and Rule 1148.2. Amended Rule 1148.2 included revisions to the chemical reporting requirements to be consistent with DOGGR's regulation.

In contrast to Rule 1110.2, Rules 1148.1 and 1148.2 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 2015, 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 Governing Board amended Regulation XX on December 4, 2015 to implement the 2012 AQMP Control Measure CMB-01 and adopted a programmatic 12 ton per day NOx RECLAIM trading credit (RTC) reduction (shave) from Compliance Years 2016 through 2022. The incremental shave schedule is 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.

The 2012 AQMP Control Measure CMB-01 sought to comply with California Health and Safety Code (H&SC) §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.

Among the proposed amendments considered in the December 4, 2015 Board package was a provision to require retirement of all NOx RTCs from complete facility closures or from equipment shutdowns that represent twenty - five percent or more of a facility's emissions for any quarter within the previous 2 compliance years. The objective of these shutdown provisions was to prevent NOx RTCs held by a shutdown facility from entering the market and potentially delaying the installation of pollution controls at other RECLAIM facilities. The Board did not adopt the proposed shutdown provisions and directed staff to return to the Board, after further analysis and discussion with RECLAIM stakeholders, with a proposal that would allow a closer alignment of shutdown credits in the RECLAIM program to requirements under command and control programs.

On October 7, 2016, the Governing Board adopted an amendment of Rule 2002 that included shutdown provisions that addressed the concerns of the Governing Board. The approved shutdown provisions apply only to facilities listed in Tables 7 and 8 of Rule 2002 that were issued initial NOx allocations by the SCAQMD. These facilities held over 90% of the total RTC supply. The revised shutdown provisions include a BARCT-based RTC discounting methodology for shutdown facilities that is more closely aligned to ERC discounting under command and control. When a subject facility shuts down, it will be required to surrender the amount of NOx RTCs equivalent to the difference between: (A) The average of

actual NOx emissions for the highest two of the last five years from equipment that is operated at a level greater than BARCT; and (B) The average NOx emissions from the same equipment that would have occurred if the equipment was operated at BARCT. The total RTC reduction cannot exceed the adjusted initial allocation issued to the shutdown facility by SCAQMD. If the calculated RTC reduction exceeds the facility's future year NOx RTC holdings, the owner or operator of the NOx RECLAIM shutdown facility is required to purchase and surrender a sufficient quantity of RTCs to fulfill the entire reduction requirement. Generally, the shortage was a result of previous sales of future RTCs, or deductions of future year RTCs due to exceedances. The amendments also incorporated exclusions from these provisions to allow facilities under the same ownership as of September 22, 2015 who have submitted a written declaration by November 7, 2016 identifying the facilities under the same ownership. Facilities under the declared same ownership will be allowed to use shutdown RTCs under certain conditions. In addition a provision was included to allow for planned non-operation for up to five years for facilities that met specific criteria.

Breakdowns

Pursuant to Rule 2004(i) – Breakdown Provisions, a facility may request that emission increases due to a breakdown not be counted towards the facility's allocations. In order to qualify for such exclusion, the facility must demonstrate that the excess emissions were the result of a fire or a mechanical or electrical failure caused by circumstances beyond the facility's reasonable control. The facility must also take steps to minimize emissions resulting from the breakdown, and mitigate the excess emissions to the maximum extent feasible. Applications for exclusion of unmitigated breakdown emissions from a facility's total reported annual RECLAIM emissions must be approved or denied by SCAQMD in writing. In addition, facilities are required to quantify unmitigated breakdown emissions for which an exclusion request has been approved in their APEP report.

As part of the annual program audit report, Rule 2015(d)(3) requires SCAQMD staff to determine whether excess emissions approved to be excluded from RTC reconciliation have been programmatically offset by unused RTCs within the RECLAIM program. If the breakdown emissions exceed the total unused RTCs within the program, any excess breakdown emissions must be offset by either: (1) deducting the amount of emissions not programmatically offset from the RTC holdings for the subsequent compliance year from facilities that had unmitigated breakdown emissions, proportional to each facility's contribution to the total amount of unmitigated breakdown emissions; and/or (2) RTCs obtained by the Executive Officer for the compliance year following the completion of the annual program audit report in an amount sufficient to offset the unmitigated breakdown emissions.

As shown in Table 3-4, a review of APEP reports for Compliance Year 2015 found that no facilities requested to exclude breakdown emissions from being counted against their allocations. Thus, for Compliance Year 2015, no additional RTCs are required to offset breakdown emissions pursuant to Rule 2015(d)(3).

Table 3-4
Breakdown Emission Comparison for Compliance Year 2015

Emittant	Compliance Year 2015 Unused RTCs (tons)	Unmitigated Breakdown Emissions[1] (tons)	Remaining Compliance Year 2015 RTCs (tons)
NOx	2,454	0	2,454
SOx	740	0	740

[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 five facilities (four NOx only facilities and one NOx and SOx facility) shut down in Compliance Year 2015. 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 2015, no existing facility elected to opt into the RECLAIM universe. However, one was 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 2015, no new facilities elected to opt into the

RECLAIM universe or was included into the RECLAIM universe pursuant to the Rule 2001 threshold. When a new facility joins the RECLAIM universe, it is required to obtain sufficient RTCs to offset its 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. Prior to the October 7, 2016 amendment of Rule 2002, shutdown facilities could retain its RTC holdings as an investment, transfer to another facility under common ownership, or trade on the market. Therefore, although the facility was no longer emitting, its RTCs could be used at another facility. Shutdown facilities had the opposite effect on the RTC market as did new facilities: the overall demand for RTCs was reduced while the supply remained constant. As reported in Chapter 1, five RECLAIM facilities (four NOx-only facilities and one NOx/ and SOx facility) shut down permanently in Compliance Year 2015.

A facility is excluded from the RECLAIM universe if SCAQMD staff determines that the facility was included in the program in error. In such cases, both the emissions and the RTCs that were issued to the facility for future years are withdrawn, thereby having a neutral impact on the RTC supply. Exclusions have the reverse effect of inclusions, in that the accounting of emissions is shifted from the RECLAIM universe of sources to the non-RECLAIM universe of sources.

Compliance Year 2015 NOx and SOx audited emissions and initial Compliance Year 2015 allocations for facilities that were shut down, excluded, or included into the program during Compliance Year 2015 are summarized in Tables 3-5 and 3-6.

Table 3-5
NOx Emissions Impact from the Changes in Universe (Tons)

Category	Compliance Year 2015 NOx Emissions (tons)	Initial Compliance Year 2015 NOx Allocations (tons)
Shutdown Facilities	2.0	66.4
Excluded Facilities	Not applicable	Not applicable
Included Facilities	7.9	0.0
RECLAIM Universe	7,246	9,700

Table 3-6
SOx Emissions Impact from the Changes in Universe (Tons)

Category	Compliance Year 2015 SOx Emissions (tons)	Initial Compliance Year 2015 SOx Allocations (tons)
Shutdown Facilities	0.0	44.1
Excluded Facilities	Not applicable	Not applicable
Included Facilities	Not applicable	Not applicable
RECLAIM Universe	2,096	2,836

Backstop Provisions

Rule 2015 requires that SCAQMD review the RECLAIM program and implement necessary measures to amend it whenever aggregate emissions exceed the aggregate allocations by five percent or more. Compliance Year 2015 aggregate NOx and SOx emissions were both below aggregate allocations as shown in Figures 3-1 and 3-2. Therefore, there is no need to initiate a program review due to emissions exceeding aggregate allocation in Compliance Year 2015.

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 2015, a total of five NOx RECLAIM facilities had NSR NOx emission increases, and one SOx RECLAIM facility had an NSR SOx emission increase due to expansion or modification. Consistent with all prior compliance years, there were sufficient NOx and SOx RTCs available to allow for expansion, modification, and modernization by RECLAIM facilities.

RECLAIM is required to comply with federal NSR emissions offset requirements at a 1.2-to-1 offset ratio programmatically for NOx emission increases and a 1-to-1 offset ratio for SOx emission increases on a programmatic basis. In Compliance Year 2015, RECLAIM demonstrated federal equivalency with a programmatic NOx offset ratio of 39-to-1 and SOx offset ratio of 4,112-to-1 based on the compliance year's total unused allocations and total NSR emission increases for both NOx and SOx. 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 2015. 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 SO_2 standards, SOx is a precursor to PM2.5. The Basin is in Serious Non-attainment with 2006 Federal 24-hours standard and 2012 Federal annual standard for PM2.5. The applicable offset ratio for PM2.5 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.

[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).

The same rule also requires all new RECLAIM facilities[2] and all other RECLAIM facilities that increase their annual allocations above the level of their starting allocations plus non-tradable/non-usable credits to provide sufficient RTCs to offset the annual potential emissions increase from new or modified source(s) at a 1-to-1 ratio at the commencement of each compliance year after the start of operation of the new or modified source(s). Although RECLAIM allows a 1-to-1 offset ratio for emissions increases, RECLAIM complies with the federal 1.2-to-1 offset requirement for NOx on an aggregate basis. This annual program audit report assesses NSR permitting activities for Compliance Year 2015 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 2015 shows that RECLAIM facilities were able to expand and modify their operations while complying with NSR requirements. During Compliance Year 2015, a total of five NOx RECLAIM facilities (all in Cycle 1) were issued permits to operate, which resulted in a total of 64.61 tons per year of NOx emission increases from starting operations of new or modified sources, and one SOx RECLAIM facility (Cycle 1) experienced 0.18 tons per year of SOx NSR emission increases that resulted from starting operations of new or modified permitted sources. These emission increases were calculated pursuant to Rule 2005(d) – Emission Increase. As in previous years, there were adequate unused RTCs (NOx: 2,454 tons, SOx: 740 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

[2] New facilities are facilities that received all District Permits to Construct on or after October 15, 1993.

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.

On November 3, 2016, EPA issued a proposed disapproval of the SCAQMD RACT demonstration submitted in July 2014 citing that the 2011 RECLAIM NOx emissions did not meet RACT requirements. This assessment was based on the staff report prepared for the 2015 NOx shave. The staff report showed sources operating in Compliance Year 2011 could have achieved lower emissions if all BARCT identified in 2005 were implemented for these sources. Regardless, whether or not the 2011 NOx emission goal should have been lower, staff believes that the November 2015 NOx shave and the rule amendment in October 2016 addressing equipment shutdown have adequately resolved any shortfall in RACT that may have existed in the 2005 NOx shave. Staff is in the process of discussing this with EPA in response to the proposed disapproval. Moreover, the offset ratio (39 to 1; see below) so far exceeds the required offset that there is still assurance that the 1.2 offset ratio is met.

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 five RECLAIM facilities resulted in 64.61 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 2015), 2,454 tons of Compliance Year 2015 NOx RTCs remained unused. Therefore, the Compliance Year 2015 NOx programmatic offset ratio calculated from this methodology is 39-to-1 as shown below:

$$\text{NOx Offset Ratio} = \left(1 + \frac{2{,}454 \text{ tons}}{64.61 \text{ tons}}\right)\text{-to-1}$$

$$= 39\text{-to-}1$$

Permits to operate issued to one RECLAIM facility resulted in 0.18 tons of SOx emission increase pursuant to Rule 2005(d). Additionally, as identified in Table 3-3 (Annual SOx Emissions for Compliance Years 1994 through 2015), 740 tons of Compliance Year 2015 SOx RTCs remained unused. Therefore, the Compliance Year 2015 SOx programmatic offset ratio calculated from this methodology is 4,112-to-1 as shown below:

$$\text{SOx Offset Ratio} = \left(1 + \frac{740 \text{ tons}}{0.18 \text{ tons}}\right)\text{-to-1}$$

$$= 4{,}112\text{-to-}1$$

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 740 tons of excess (unused) SOx RTCs for Compliance Year 2015. Since the offset ratio is 4,112-to-1, there is certainty that both the federally required SOx offset ratio and the California NNI requirement for SOx were satisfied.

BACT and modeling are also required for any RECLAIM facility that installs new equipment or modifies sources if the installation or modification results in an increase in emissions of RECLAIM pollutants. Furthermore, the RTC trading zone restrictions in Rule 2005 – New Source Review for RECLAIM, limit trades conducted to offset emission increases over the sum of the facility's starting allocation and non-tradable/non-usable credits to ensure net ambient air quality improvement within the sensitive zone, as required by state law.

The result of the review of NSR activity in Compliance Year 2015 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 2015,

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 2015, submitted modeling that demonstrated that SOx emissions from their major sources during 2015 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 2015. This facility submitted modeling that demonstrated that NOx emissions from their major sources during 2015 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 2015, no additional modeling analysis is required (*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 would not cause such an exceedance).

CHAPTER 5
COMPLIANCE

Summary

*Of the 282 NOx RECLAIM facilities audited during Compliance Year 2015, a total of 265 facilities (94%) complied with their NOx allocations, and 32 of the 33 SOx facilities (97%) complied with their SOx allocations. Eighteen facilities exceeded their allocations (17 facilities exceeded their NOx allocations, and one facility exceeded its SOx allocation) during Compliance Year 2015. The 17 facilities that exceeded their NOx allocations had aggregate NOx emissions of 387.1 tons and did not have adequate allocations to offset 45.7 tons (or 11.8%) of their combined emissions. The one SOx facility that exceeded its SOx allocation had total SOx emissions of 2.7 tons and did not have adequate allocations to offset 0.2 tons (or 7.4%). The NOx and SOx exceedance amounts are relatively small compared to the overall NOx and SOx allocations for Compliance Year 2015 (0.47% of total NOx allocations and 0.01% 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 2015 allocations. The overall RECLAIM NOx and SOx emission reduction targets and goals were met for Compliance Year 2015 (*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’s emission reports 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 2015, 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 emission and adjustment factors (*e.g.*, bias adjustment factors), failed to correct fuel usage to standard conditions, used emission calculation methodologies not

allowed under the rules, or used MDP inappropriately. 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 18 RECLAIM facilities failed to reconcile their emissions (17 NOx-only facilities and one NOx and SOx facility that only exceeded its SOx allocation). Thirteen of the 17 NOx-only facilities failed to secure sufficient RTCs during either the quarterly or annual reconciliation periods to cover their reported emissions. Four of these 13 NOx-only facilities with NOx exceedances based on reported emissions had additional exceedances because they under-reported their emissions and didn't hold sufficient RTCs to reconcile their audited emissions. The remaining four of the 17 facilities with NOx exceedances and the one NOx and SOx facility with a SOx exceedance 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: failure to properly correct measured fuel flow to standard conditions defined as one atmosphere of pressure and a temperature of 60°F or 68°F provided that the same temperature is used throughout the facility, failure to use correct mass conversion factor when fuel flow is corrected to 60°F for process units and large sources with concentration limits, failure to submit emissions for one of the four compliance quarters, failure to use fuel flow commiserate with maximum rated equipment capacity when using timer-based fuel flow determination, failure to use correct emission factor(s), incorrect use of a unit conversion factor, and failure to apply missing data procedures during periods of invalid fuel flow measurement(s).

Overall, the Compliance Year 2015 allocation compliance rates for facilities are 94% (265 out of 282 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 2014 were 96% and 97% for NOx and SOx RECLAIM facilities, respectively. The 17 facilities that had NOx emissions in excess of their individual NOx allocations had 387.1 tons of NOx emissions and did not have adequate RTCs to cover 45.7 of those tons (or 11.8%). The SOx facility that exceeded its SOx allocation and had total SOx emissions of 2.7 tons did not have adequate allocations to offset 0.2 tons (or 7.4%). The NOx and SOx exceedance amounts are relatively small compared to the overall allocations for Compliance Year 2015 (0.47% of aggregate NOx allocations and 0.01% of aggregate SOx allocations). Pursuant to Rule 2010(b)(1)(A), all 18 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 2015 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, 98 NOx facilities and 14 SOx facilities used MDP in reporting portions of their annual emissions during Compliance Year 2015. In terms of mass emissions, 6.9% of the total reported NOx emissions and 10.9% of the total reported SOx emissions in the APEP reports were calculated using MDP for Compliance Year 2015. 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)
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)
2015	6.9% (98 / 502)	10.9% (14 / 229)

* 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, 98 facilities reported NOx emissions using MDP in Compliance Year 2015. Even though the number of facilities is higher than in 1995, the percentage of emissions reported using MDP during Compliance Year 2015 is much lower than it was in 1995 (6.9% compared to 23%). Additionally, in terms of quantity, NOx emissions determined by the use of MDP in Compliance Year 2015 were about 8% of those in Compliance Year 1995 (502 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 7% of reported NOx annual emissions were calculated using MDP in Compliance Year 2015. 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 7% 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 2015, a significant portion of NOx MDP emissions data (74%) and majority of SOx MDP emissions data (96%) 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 61% of all permitted RECLAIM NOx and SOx sources during Compliance Year 2015, respectively, reported emissions for Compliance Year 2015 revealed that 78% of all RECLAIM NOx emissions and 99% 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 2015 and 2016 calendar years' passing rates for submitted 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 2015 and 2016 passing rates are calculated from RATA data submitted before January 14, 2016 and January 5, 2017, 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 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] The calculation of passing rates includes all RATAs submitted by January 13, 2016. Ninety-nine percent of these RATAs were submitted electronically.

[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 2016[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
366	100	101	100	15	100	50	100	361	100	366	99.7	93	100

[1] The calculation of passing includes all RATAs submitted by January 4, 2017. Ninety-nine percent of these RATAs were submitted electronically.

[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 at or near 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 2016 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 2017. 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 2015 employment survey data gathered from APEP reports, RECLAIM facilities reported a net gain of 1,329 jobs, representing 1.21% of their total employment. One of the five RECLAIM facilities that shut down during Compliance Year 2015 cited RECLAIM as a factor contributing to the decision to shutdown. No other facilities reported any 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 2015 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 2015 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 2015.

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 2015 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 2015 APEP reports and follow-up contacts with facilities. A total of 122 facilities reported 9,756 job gains, while 131 facilities reported a total of 8,427 job losses.

Net job losses were reported in two of the three categories: sales of products (57), and manufacturing (1,642), whereas net job gains were reported in the remaining category: non-manufacturing (3,028). Table 6-1 shows a total net gain of 1,329 jobs, which represents a net jobs increase of 1.21% at RECLAIM facilities during Compliance Year 2015.

Table 6-1
Job Impacts at RECLAIM Facilities for Compliance Year 2015

Description	Manufacture	Sales of Products	Non-Manufacture	Total[1]
Initial Jobs	40,454	1,011	68,521	109,986
Overall Job Gain	2,250	68	7,438	9,756
Overall Job Loss	3,892	125	4,410	8,427
Final Jobs	38,812	954	71,549	111,315
Net Job Change	-1,642	-57	3,028	1,329
Percent (%) Job Change	-4.06%	-5.64%	4.42%	1.21%
Facilities Reporting Job Gains	87	26	70	122
Facilities Reporting Job Losses	103	28	80	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 five RECLAIM facilities that were reported to have shut down or ceased operations in Compliance Year 2015 as listed in Appendix C. One facility was demolished after its brand had been sold to a third party. Staff attempted to contact the owners, but were unable to obtain further clarification regarding the reason for shutdown. Two other facilities consolidated their operations into other company-owned RECLAIM facilities. The fourth facility cited more attractive utility of land and resources, cost of meeting air pollution regulations, including RECLAIM, Rule 1156 and the SCAQMD compliance burden, and an unfriendly business environment as the reasons for shutdown. The fifth facility sold all equipment and property to a third party. RECLAIM staff attempted to contact the parent company for a more descriptive reason for the shutdown, but received no response.

These shutdowns led to a total loss of 201 jobs (139 manufacturing jobs, 42 sales jobs, and 20 non-manufacturing jobs, according to the submitted APEP reports. Of the five shutdown facilities, one facility claimed 30 job lost to RECLAIM and its compliance burden (refer to Appendix E). No other RECLAIM facilities attributed job gains or losses to RECLAIM for Compliance Year 2015.

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 2015 NOx emissions decreased 2.7% relative to Compliance Year 2014, and Compliance Year 2015 SOx emissions were 3.7% less than the previous year. Quarterly calendar year 2015 NOx emissions fluctuated within 10% of the mean NOx emissions for the year. Quarterly calendar year 2015 SOx emissions fluctuated within seven 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 2016, 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.

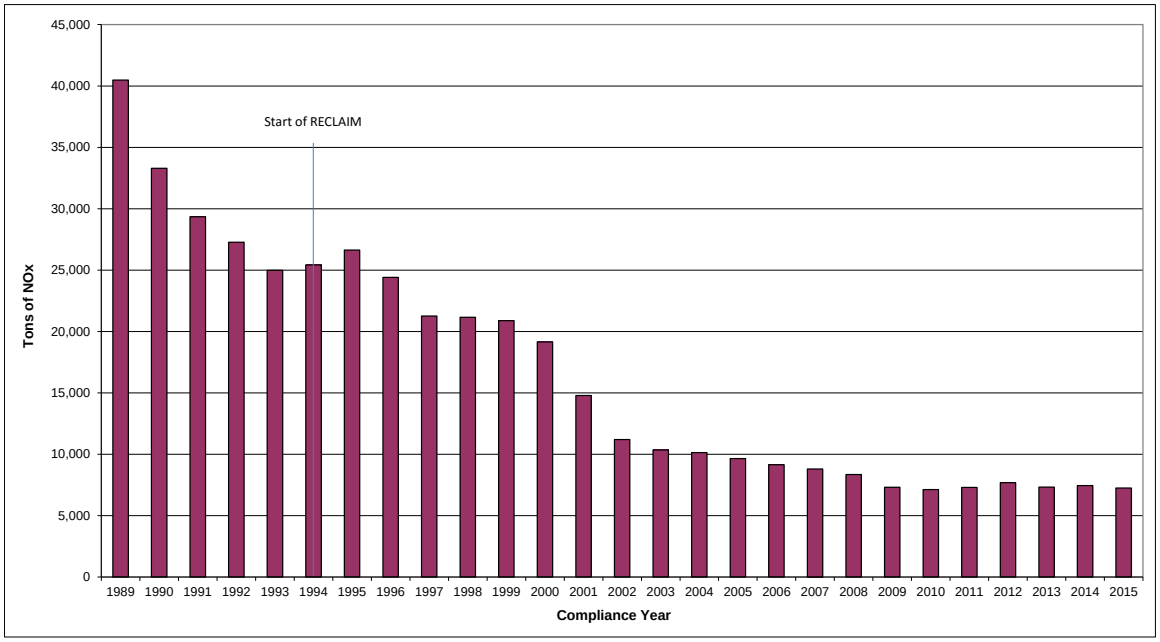
include all the quarterly emissions maps presented in previous annual program audit reports. This chapter addresses:

- Emission trends for RECLAIM facilities;
- Seasonal fluctuations in emissions;
- Per capita exposure to air pollution; and
- Toxics impacts.

Emission Trends for RECLAIM Sources

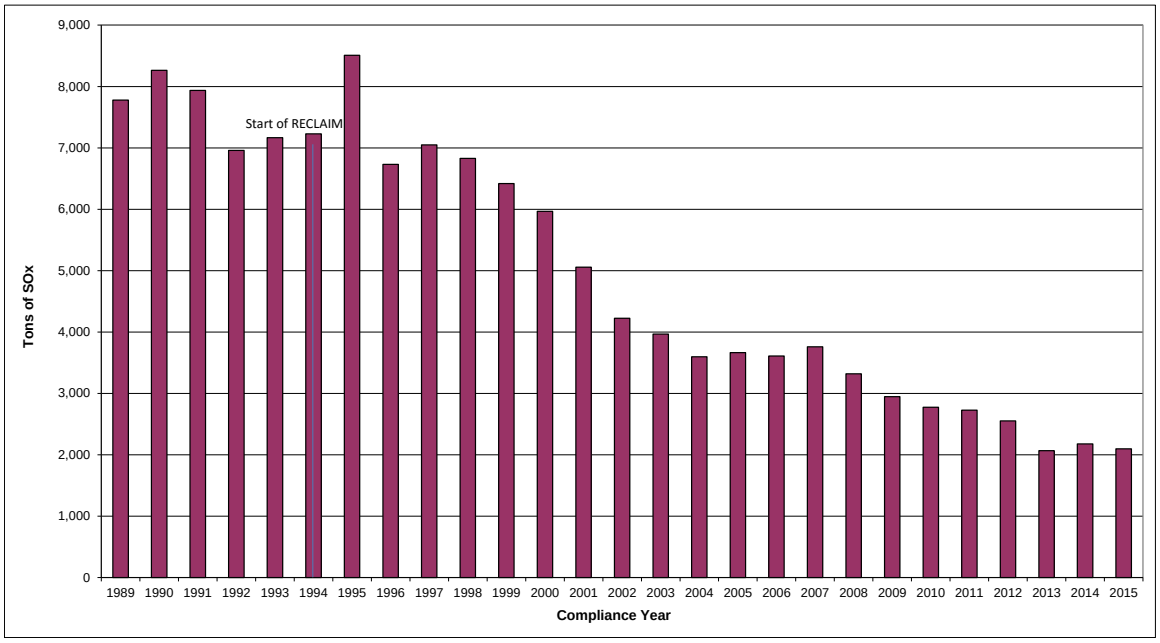
Concerns were expressed during program development that RECLAIM might cause sources to increase their aggregate emissions during the early years of the program due to perceived over-allocation of emissions. As depicted in Figures 7-1 and 7-2, which show NOx and SOx emissions from RECLAIM sources since 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 2015 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 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 2015 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 2015 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 2015 mean quarterly NOx emission level, which is the average of the aggregate audited emissions for each of the four quarters, and the 2015 audited quarterly emissions. Figure 7-4 compares the 2015 quarterly NOx emissions with the quarterly emissions from 2004 through 2014. During calendar year 2015, quarterly NOx emissions varied from six percent below the mean in

[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.

the first quarter (January through March) to about ten percent above the mean in the third quarter (July through September). Figure 7-4 shows that the calendar year 2015 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 2015 there has not been a significant shift in NOx emissions from the winter months to the summer months.

Figure 7-3
Calendar Year 2015 NOx Quarterly Emissions

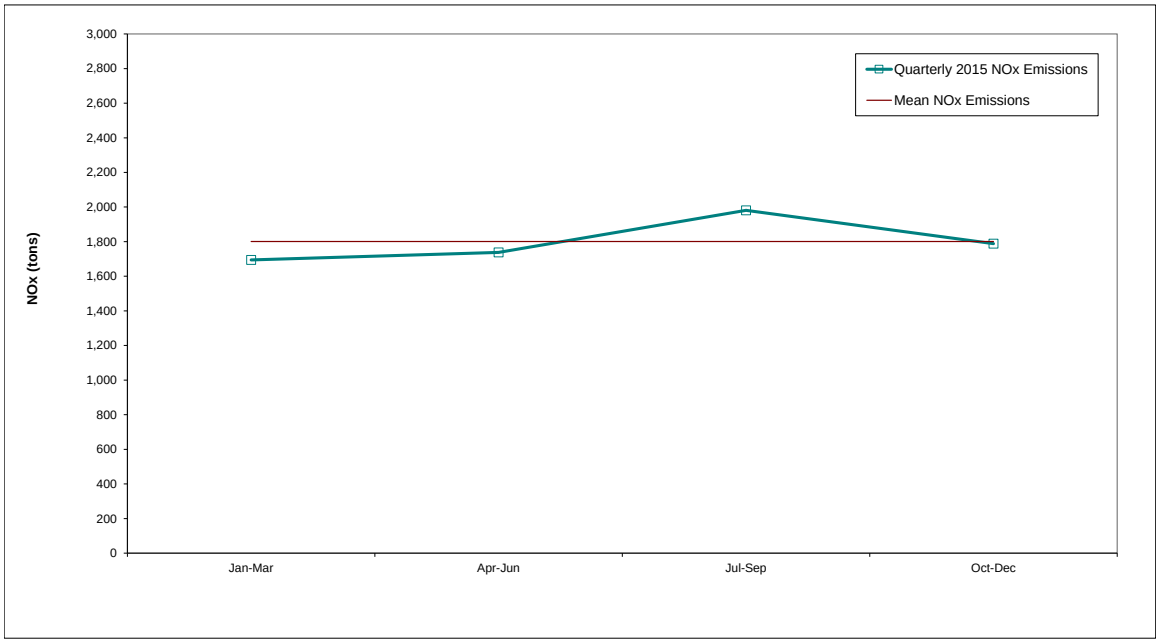
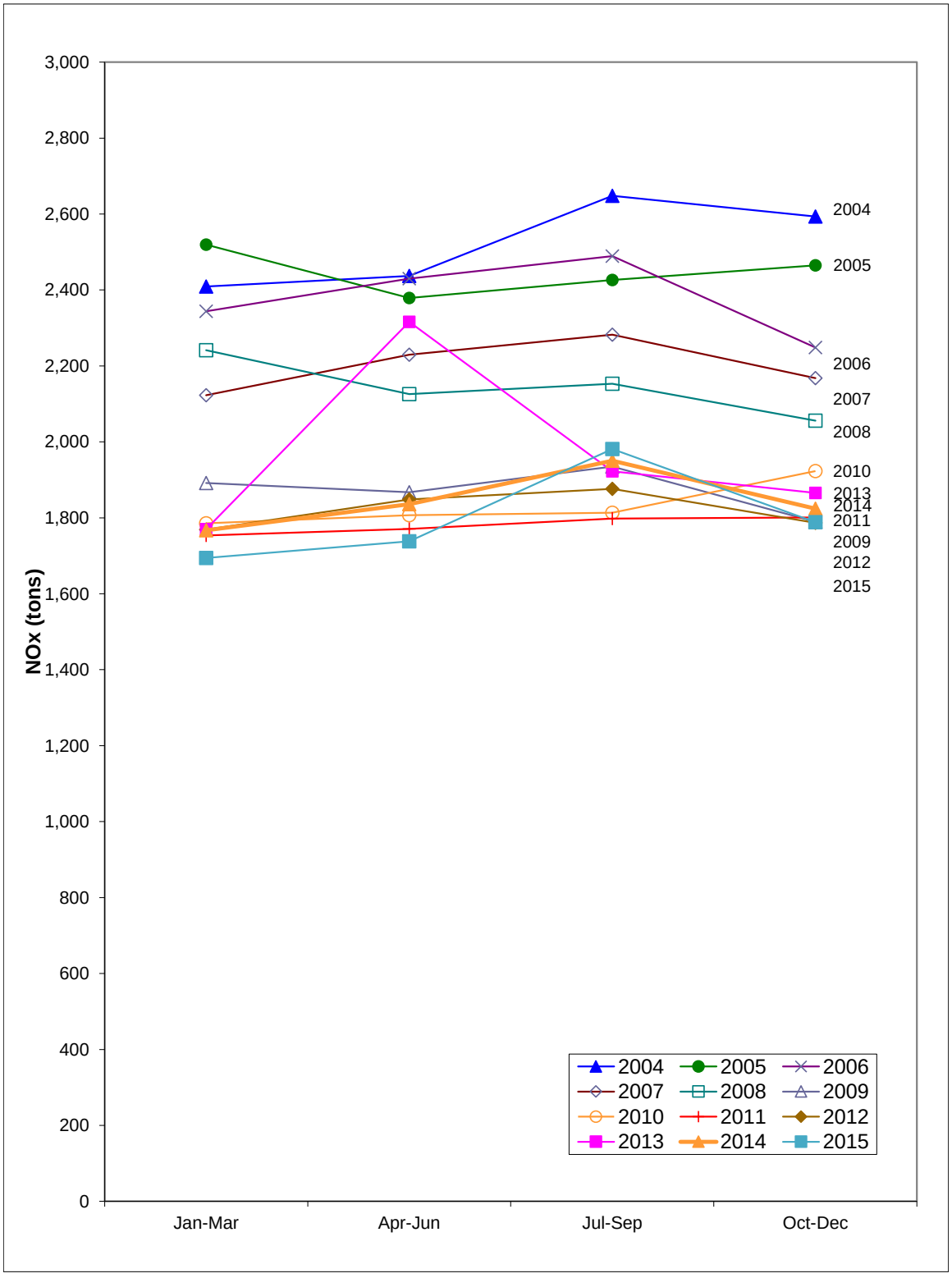


Figure 7-4
Quarterly NOx Emissions from Calendar Years 2004 through 2015



Similar to Figure 7-3 and 7-4 for NOx quarterly emissions, Figure 7-5 presents the 2015 mean quarterly SOx emissions and the 2015 audited quarterly emissions, while Figure 7-6 compares the 2015 quarterly SOx emissions with the quarterly emissions from 2004 through 2014. Figure 7-5 shows that quarterly SOx emissions during calendar year 2015 varied from about six percent above the mean in the fourth quarter (October to December) to seven percent below the mean in the first quarter (January to March). Figure 7-6 shows that the calendar year 2015 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 2015 there was not a significant shift in SOx emissions from the winter months to the summer months.

Figure 7-5
Calendar Year 2015 SOx Quarterly Emissions

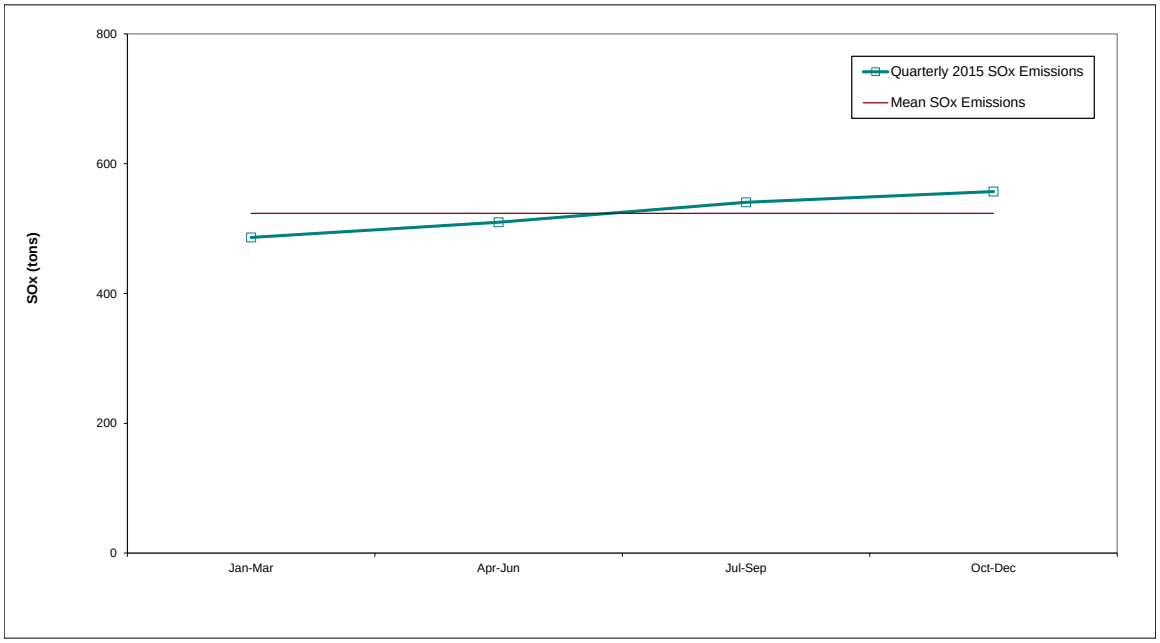
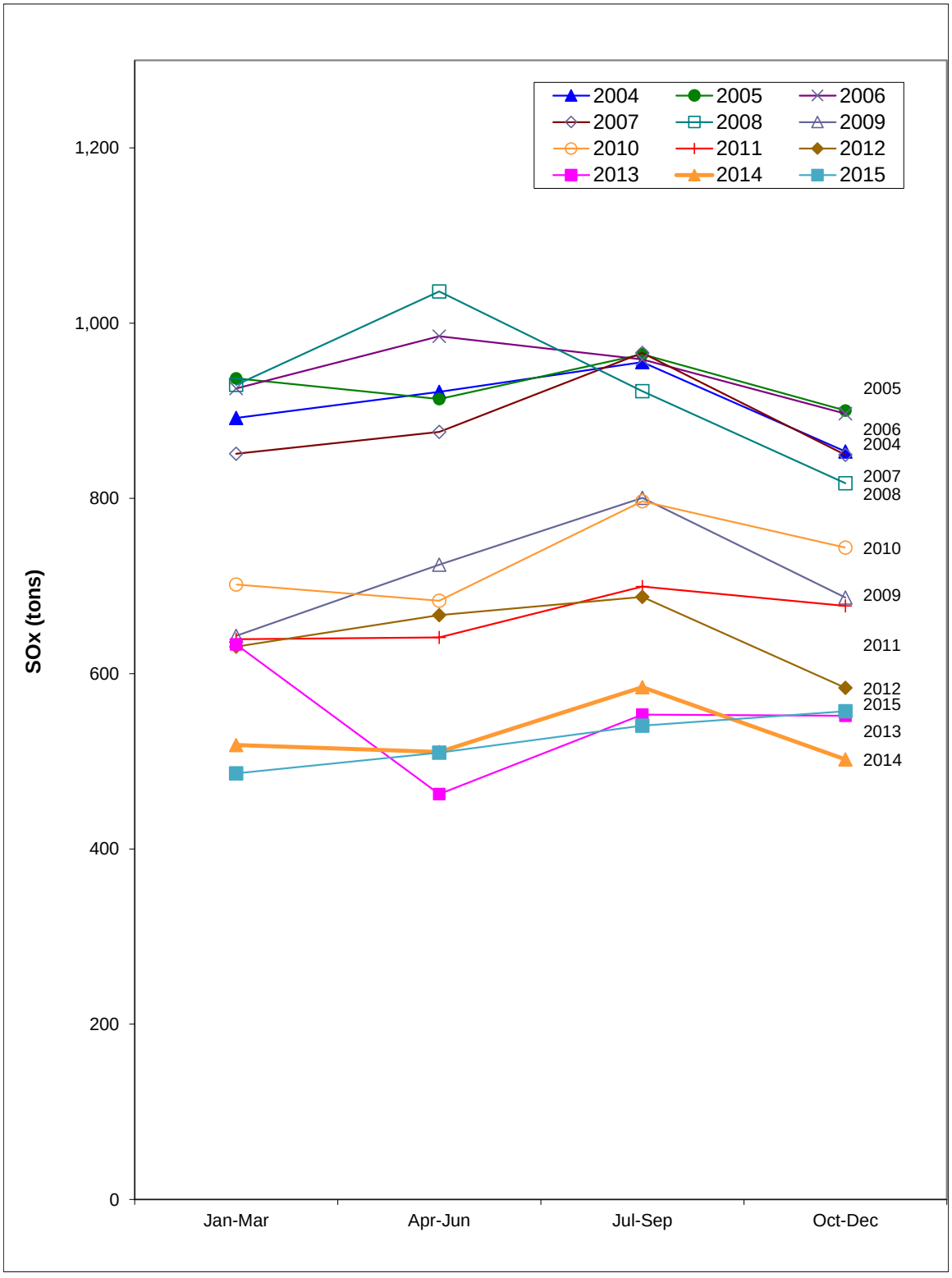


Figure 7-6
Quarterly SOx Emissions from Calendar Years 2004 through 2015



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 state 8-hour ozone standard of 0.070 ppm and the 1-hour standard of 0.09 ppm were exceeded.

In July 1997, the USEPA established an ozone National Ambient Air Quality Standard (NAAQS) of 0.085 ppm based on an 8-hour average measurement. As part of the Phase I implementation that was finalized in June 2004, the federal 1-hour ozone standard (0.12 ppm) was revoked effective June 2005. Effective May 27, 2008, the 8-hour NAAQS for ozone was reduced to 0.075 ppm. Table 7-1 shows monitoring results based on this 8-hour federal standard. Effective December 28, 2015, the 8-hour NAAQS for ozone was further reduced to 0.070 ppm, the level of the current California Ambient Air Quality Standard. Table 7-1 shows that the Basin exceeded both the newer 8-hour federal 0.07 ppm standard and the state 0.07 ppm standard by 132 days in 2016. Though the number of days in exceedance of the federal and state standards were the same this year, they were different in 2015. This difference could occur again in the future due to the differing language and methods for deriving exceedance days in the federal and state rules.

Table 7-1 summarizes ozone data for calendar years 2001 through 2016 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 the older 8-hour federal ambient ozone standards in calendar year 2016 were elevated from the previous two years, but still followed a persistent downward trajectory. The Basin's maximum ozone concentrations were very close to the lowest levels since 2001, based on the 8-hour averaging period.

Table 7-1
Summary of Ozone Data

Year	Days exceeding state 1-hour standard (0.09 ppm)	Days exceeding state 8-hour standard (0.07 ppm)	Days exceeding old federal 8-hour standard (0.075 ppm)	Days exceeding new federal 8-hour standard (0.07 ppm)	Basin Maximum 1-hour ozone concentration (ppm)	Basin Maximum 8-hour ozone concentration (ppm)
2001	121	156	132	N/A	0.191	0.146
2002	118	149	135	N/A	0.169	0.148
2003	133	161	141	N/A	0.216	0.200
2004	110	161	126	N/A	0.163	0.148
2005	111	142	116	N/A	0.163	0.145
2006	102	121	114	N/A	0.175	0.142
2007	99	128	108	N/A	0.171	0.137
2008	98	136	121	N/A	0.176	0.131
2009	100	131	113	N/A	0.176	0.128
2010	83	128	109	N/A	0.143	0.123
2011	94	127	107	N/A	0.160	0.136
2012	97	140	111	N/A	0.147	0.112
2013	92	123	106	N/A	0.151	0.122
2014	76	134	93	N/A	0.142	0.114
2015	72	116	83	113	0.144	0.127
2016	85	132	105	132	0.164	0.122

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

[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.

calendar year 2016, the actual per capita exposure for the Basin was 2.64 hours, which represents a 96.7% reduction from the 1986-88 baseline level.

Table 7-2
Per Capita Exposure to Ozone above the State One-Hour Standard of 0.09 ppm (hours)

Calendar Year	Basin	Los Angeles	Orange	Riverside	San Bernardino
1986-88 baseline[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	2.87	1.54	0.08	3.88	10.54
2010 actual	1.18	0.38	0.11	2.45	4.48
2011 actual	2.10	0.85	0.02	3.46	8.13
2012 actual	2.37	1.05	0.05	2.59	9.78
2013 actual	1.31	0.52	0.07	1.61	5.50
2014 actual	1.84	1.26	0.29	1.47	6.02
2015 actual	1.96	0.76	0.10	2.14	8.47
2016 actual	2.64	1.14	0.07	2.19	11.56
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 2015 Annual Report on the AB2588 Air Toxics "Hot

[4] The toxics prioritization procedures can be found at: http://www.aqmd.gov/home/regulations/compliance/toxic-hot-spots-ab-2588

Spots" program[5], staff has reviewed and approved 339 facility HRAs as of the end calendar year 2015. About 95% of the facilities have cancer risks below 10 in a million and 97% 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 53 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, 25 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% 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.

[5] The 2015 AB2588 Annual Report can be found at: http://www.aqmd.gov/docs/default-source/planning/risk-assessment/ab2588_annual_report_2015.pdf?sfvrsn=6

[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 2015 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
181505	2	AMERICAN AIRLINES INC	NOx
800196	2	AMERICAN AIRLINES 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
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
166073	1	BETA OFFSHORE	NOx
155474	2	BICENT (CALIFORNIA) MALBURG LLC	NOx
132068	1	BIMBO BAKERIES USA INC	NOx
1073	1	BORAL ROOFING LLC	NOx

Facility ID	Cycle	Facility Name	Program
150201	2	BREITBURN OPERATING LP	NOx
174544	2	BREITBURN OPERATING LP	NOx
25638	2	BURBANK CITY, BURBANK WATER & POWER	NOx
128243	1	BURBANK CITY,BURBANK WATER & POWER,SCPPA	NOx
179957	2	CA LOS ANGELES TIMES SQUARE LLC	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	SENTINEL ENERGY CENTER 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
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
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
113160	2	HILTON COSTA MESA	NOx
800066	1	HITCO CARBON COMPOSITES INC	NOx

Facility ID	Cycle	Facility Name	Program
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
180367	1	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
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
173290	1	MEDICLEAN	NOx
176952	2	MERCEDES-BENZ WEST COAST CAMPUS	NOx

Facility ID	Cycle	Facility Name	Program
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	SO CAL HOLDING, LLC	NOx
151594	1	OXY USA, INC	NOx
151601	1	CALIFORNIA RESOURCES PRODUCTION CORPORAT	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	POLYNT COMPOSITES USA INC	NOx
171107	2	PHILLIPS 66 CO/LA REFINERY WILMINGTON PL	NOx/SOx
171109	1	PHILLIPS 66 COMPANY/LOS ANGELES REFINERY	NOx/SOx
137520	1	PLAINS WEST COAST TERMINALS LLC	NOx
800416	1	PLAINS WEST COAST TERMINALS LLC	NOx
800417	2	PLAINS WEST COAST TERMINALS LLC	NOx
800419	2	PLAINS WEST COAST TERMINALS LLC	NOx
800420	2	PLAINS WEST COAST TERMINALS LLC	NOx

Facility ID	Cycle	Facility Name	Program
176708	2	ALTAGAS POMONA ENERGY INC.	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
179137	1	QG PRINTING II CORP	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
114997	1	RAYTHEON COMPANY	NOx
115172	2	RAYTHEON COMPANY	NOx
800371	2	RAYTHEON SYSTEMS COMPANY - FULLERTON OPS	NOx
20203	2	RECONSERVE OF CALIFORNIA-LOS ANGELES INC	NOx
180410	2	REICHHOLD LLC 2	NOx
52517	1	REXAM BEVERAGE CAN COMPANY	NOx
61722	2	RICOH ELECTRONICS INC	NOx
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
54402	2	SIERRA ALUMINUM COMPANY	NOx
85943	2	SIERRA ALUMINUM COMPANY	NOx
101977	1	SIGNAL HILL PETROLEUM INC	NOx

Facility ID	Cycle	Facility Name	Program
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
129497	1	THUMS LONG BEACH CO	NOx
800325	2	TIDELANDS OIL PRODUCTION CO	NOx
68118	2	TIDELANDS OIL PRODUCTION COMPANY ETAL	NOx

Facility ID	Cycle	Facility Name	Program
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
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	CITY OF VERNON, VERNON GAS & ELECTRIC	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 2015. The included facility is identified below, and the reason for inclusion is also provided.

Facility ID	Cycle	Facility Name	Market	Date	Reason
150201	2	BREITBURN OPERATING LP	NOx	7/7/2015	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 2015. 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	5814
Facility Name	Gainey Ceramics, Inc.
City and County	La Verne, Los Angeles County
SIC	3260
Pollutant(s)	NOx
1994 Allocation	26,626
Reason for Shutdown	Facility was demolished after the "Gainey" brand was bought by a 3rd party. Staff was unable to obtain further clarification regarding the facility shutdown.

Facility ID	145836
Facility Name	American Apparel Dyeing & Finishing, Inc.
City and County	Hawthorne, Los Angeles County
SIC	2299
Pollutant(s)	NOx
1994 Allocation	0
Reason for Shutdown	The company consolidated operations at another company-owned RECLAIM facility.

Facility ID	167066
Facility Name	Arlon Graphics L.L.C.
City and County	Santa Ana, Orange County
SIC	2672
Pollutant(s)	NOx
1994 Allocation	7,423
Reason for Shutdown	The company consolidated operations at another company-owned RECLAIM facility.

Facility ID	800182
Facility Name	Riverside Cement Co.
City and County	Riverside, Riverside County
SIC	3241
Pollutant(s)	NOx, SOx
1994 Allocation	NOx = 240,204; SOx = 122,284
Reason for Shutdown	The facility cited more attractive utility of land and resources, cost of meeting air pollution regulations, including RECLAIM, Rule 1156 and the SCAQMD compliance burden, and an unfriendly business environment as reasons for shutdown.

Facility ID	115041
Facility Name	Raytheon Company
City and County	El Segundo, Los Angeles County
SIC	3761
Pollutant(s)	NOx
1994 Allocation	32,796
Reason for Shutdown	Facility sold both their equipment and property. RECLAIM staff attempted to contact the parent company for a more descriptive reason for the shutdown, but received no response.

APPENDIX D
FACILITIES THAT EXCEEDED THEIR ANNUAL ALLOCATION FOR COMPLIANCE YEAR 2015

The following is a list of facilities that did not have enough RTCs to cover their NOx and/or SOx emissions in Compliance Year 2015 based on the results of audits conducted by SCAQMD staff.

Facility ID	Facility Name	Compliance Year	Emittant
15504	SCHLOSSER FORGE COMPANY	2015	NOx
18931	TAMCO	2015	NOx
19390	SULLY-MILLER CONTRACTING CO.	2015	NOx
20203	RECONSERVE OF CALIFORNIA-LOS ANGELES INC	2015	NOx
22911	CARLTON FORGE WORKS	2015	NOx
68118	TIDELANDS OIL PRODUCTION COMPANY ETAL	2015	NOx
114997	RAYTHEON COMPANY	2015	NOx
122666	A'S MATCH DYEING & FINISHING	2015	NOx
124723	GREKA OIL & GAS, INC	2015	NOx
131732	NEWPORT FAB, LLC	2015	NOx
138568	CALIFORNIA DROP FORGE, INC	2015	NOx
144455	LIFOAM INDUSTRIES, LLC	2015	NOx
153199	THE KROGER CO/RALPHS GROCERY CO	2015	NOx
172005	NEW-INDY ONTARIO, LLC	2015	NOx
173290	MEDICLEAN	2015	NOx
179137	QG PRINTING II CORP	2015	NOx
180367	LINN OPERATING, INC.	2015	NOx
800181	CALIFORNIA PORTLAND CEMENT CO	2015	SOx

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.

Facilities with reported job gains or losses attributed to RECLAIM:

Facility ID:	800182
Facility Name:	Riverside Cement Co.
City and County:	Riverside, Riverside County
SIC:	3241
Pollutant(s):	NOx, SOx
Cycle:	1
Job Gain:	0
Job Loss:	30
Comments:	Facility shut down on 12-28-2015. The facility claims job losses due to RECLAIM as “part of cost of doing business”, and cited more attractive utility of land and resources, cost of meeting air pollution regulations including Rule 1156 and the SCAQMD compliance burden, and an unfriendly business environment as reasons for shutdown.