CHAPTER 3
EMISSION REDUCTIONS

Summary

Aggregate NOx and SOx emissions from RECLAIM facilities continued to decrease from the inception of RECLAIM through Compliance Year 2002. RECLAIM is back on track to achieving the reduction goals after the effect of the California 2000 energy crisis subsided. Compliance Year 2002 aggregate NOx emissions from all RECLAIM facilities were below allocations by more than 20 percent. On the other hand, aggregate SOx emissions were under allocations by slightly more than 10 percent.

In response to the energy crisis' effects on the RECLAIM NOx market, the AQMD Governing Board adopted rule amendments in May 2001 to stabilize RTC prices. The amendments included provisions to curtail RTC demand as well as increasing RTC supply. Rule 2009 requires power producing facilities to install Best Available Retrofit Control Technologies and to file compliance plans to project emissions through Compliance Year 2005. Rule 2009.1 requires compliance plans or forecast reports from certain RECLAIM facilities to show how they would comply with annual allocations through Compliance Year 2005. In Compliance Year 2002 actual emissions from facilities subject to these two rules were lower than those projected under compliance plans and forecast reports. The Governing Board also adopted Rule 2020 – RECLAIM Reserve, which established the RECLAIM Air Quality Investment Program (AQIP), the Emissions Mitigation Fee Program, and the State Emission Reduction Credit Bank. These three programs were set up to provide eligible facilities with emission reduction credits. In Compliance Year 2002, no facility requested emission reduction from any of these three programs.

Background

One major objective of the RECLAIM program audit is to assess whether RECLAIM is achieving its targeted emission reductions. The annual allocations given to RECLAIM facilities reflect the required emission reductions mirroring the reductions anticipated under the command-and-control rules. As such, RECLAIM is designed to achieve by 2003 the same level of emissions reductions as would have been achieved in aggregate by implementing the subsumed rules and command-and-control measures. From 2003 on, the level of allocation remains the same for each year thereafter.

In 2000, power producing facilities increased their power generation in response to the California energy crisis. The corresponding increases in NOx emissions caused a sudden surge in the NOx RTC prices that adversely impacted other RECLAIM participants and the overall objective of the program. To correct this problem, the Governing Board amended Regulation XX to bifurcate power producing facilities from the rest of the RECLAIM program participants to stabilize the RTC prices. Power producing facilities are still subject to the requirements of the RECLAIM Program except that they cannot purchase

additional RTCs to offset their emissions. Instead these facilities may participate, if needed, in the Emission Mitigation Fee Program. The Board also adopted Rule 2020 – RECLAIM Reserve, to provide a reserve of NOx emission reductions that can be used for the RECLAIM Air Quality Investment Program (RECLAIM AQIP), Emission Mitigation Fee Program, or natural gas turbine power plant peaking sources. A program review as required under Rule 2020 (k) – Program Review, is included in this chapter.

Emissions Audit Process

AQMD has conducted annual audits on the data submitted by RECLAIM facilities for the past nine compliance years to ensure the integrity and reliability of the data. The process begins when each facility submits a comprehensive Annual Permit Emissions Program (APEP) report within sixty days of the end of each compliance year. AQMD staff then reviews the APEP reports to assess the accuracy of reported emissions. This process includes field inspections to check the equipment, monitoring devices, and operational records. It also involves verification of emissions data reported during the course of the year (daily, monthly, quarterly, and annually).

These audits have revealed that some facilities have made errors in quantifying their emissions, such as arithmetic errors, use of inappropriate emission factors, or inappropriate use of missing data substitution. Consequently, the reported emissions in the APEP reports for those facilities were adjusted to correct the errors. Whenever AQMD staff found discrepancies, they were discussed with the facility operators. In cases where staff feels that the facility may have additional input, facilities were provided an opportunity to review the changes and to present additional data or arguments in support of the data in their APEP reports. This kind of rigorous audit process reinforces RECLAIM's emissions monitoring and reporting requirements and enhances the validity and reliability of the reported emissions data.

Emission Trends and Analysis

RECLAIM achieves its emission reduction goals on an aggregate basis by ensuring that aggregate annual emissions are below allocations. Allocations are based on projected emission levels in 2003 if the rules and control measures identified in the AQMP that RECLAIM subsumed were implemented.

Table 3-1 summarizes emissions from RECLAIM facilities for each of the first nine compliance years. Emissions data for Compliance Year 2002 contained in this report have been compiled based on the available audited emissions combined with emissions extracted from the APEP or QCER reports for those facilities with audits still under review.

Table 3-1
Annual NOx Emissions[1] for Compliance Years 1994 through 2002

	1994	1995	1996	1997	1998	1999	2000	2001	2002
Annual Emission (ton)	25,314	25,764	24,796	21,786	20,982	20,775	20,491	15,721	10,943
% Change from 1994	0 %	+1.8 %	-2.0 %	-13.9 %	-17.1 %	-17.9 %	-19.1 %	-37.9 %	-56.8 %
Total RTCs[2] (ton)	40,127	36,031	32,017	27,919	24,678	21,013	17,197	15,693	~~14,105~~14,044
RTC Left Over (ton)	14,813	10,267	7,221	6,133	3,696	238	-3,294	-28	~~3,162~~3,101
% Excess RTCs	37 %	28 %	23 %	22 %	15 %	1.1 %	-19 %	-0.18 %	22 %

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 = Allocations + Converted ERCs

Table 3-1 shows that there were excess RTCs left over after accounting for emissions for the first six compliance years (1994 through 1999). Therefore, RECLAIM facilities have not exceeded their NOx allocations on an aggregate basis for these initial years. However, beginning in Compliance Year 2000, power producing facilities operated at a production level significantly higher than their past operation levels due to California's energy crisis. The high production level continued into Compliance Year 2001 but has significantly declined through Compliance Year 2002. Table 3-2 illustrates the impact of NOx emissions from the power producing facilities on the overall RECLAIM NOx allocations in Compliance Year 2000. Table 3-3 categorizes Compliance Year 2002 emissions in the same fashion as Table 3-2 to illustrate emission trend between 2000 and 2002. Although power producing facilities were initially allocated 1,904 tons of NOx RTCs for Compliance Year 2002 based on their historical operations, these facilities only emitted 1,047 tons of NOx in Compliance Year 2002. This level was almost 5,800 tons (85%) less than the emissions from power producing facilities in Compliance Year 2000. The decrease in emission was due to the combination of a lower production level and the installation of NOx control equipment at power producing facilities. There was also appreciable reduction in emissions from non-power producing facilities even though to a lesser extent. Non-power producing facilities emitted only 9,896 tons of NOx which is approximately 3,800 tons (28%) less than their emissions in Compliance Year 2000. Thus, both sectors contributed to the decreases in emissions between Compliance Years 2000 and 2002.

Table 3-2
Impact of NOx Emissions from Power Producing Facilities on the Overall NOx Allocations for Compliance Year 2000

	Compliance Year 2000				
	Non-Power Producing Facilities (a)		Power Producing Facilities (b)		All Facilities (a) + (b)
	RTCs Held	Initial Allocations	RTCs Held	Initial Allocations	
Allocations (tons)	12,345	14,895	4,852	2,302	17,197
Emissions (tons)	13,703		6,788		20,491
Difference (Exceedance)	(1,358)	1192	(1,936)	(4,486)	(3,294)

Table 3-3
NOx Emissions for Compliance Year 2002

	Compliance Year 2002				
	Non-Power Producing Facilities (a)		Power Producing Facilities (b)		All Facilities (a) + (b)
	RTCs Held	Initial Allocations	RTCs Held	Initial Allocations	
Allocations (tons)	12,450~~12,511~~	12,140~~12,201~~	1,594	1,904	14,044~~14,105~~
Emissions (tons)	9,896		1,047		10,943
Difference (Exceedance)	2,554~~2,615~~	2,244~~2,305~~	547	857	3,101~~3,162~~

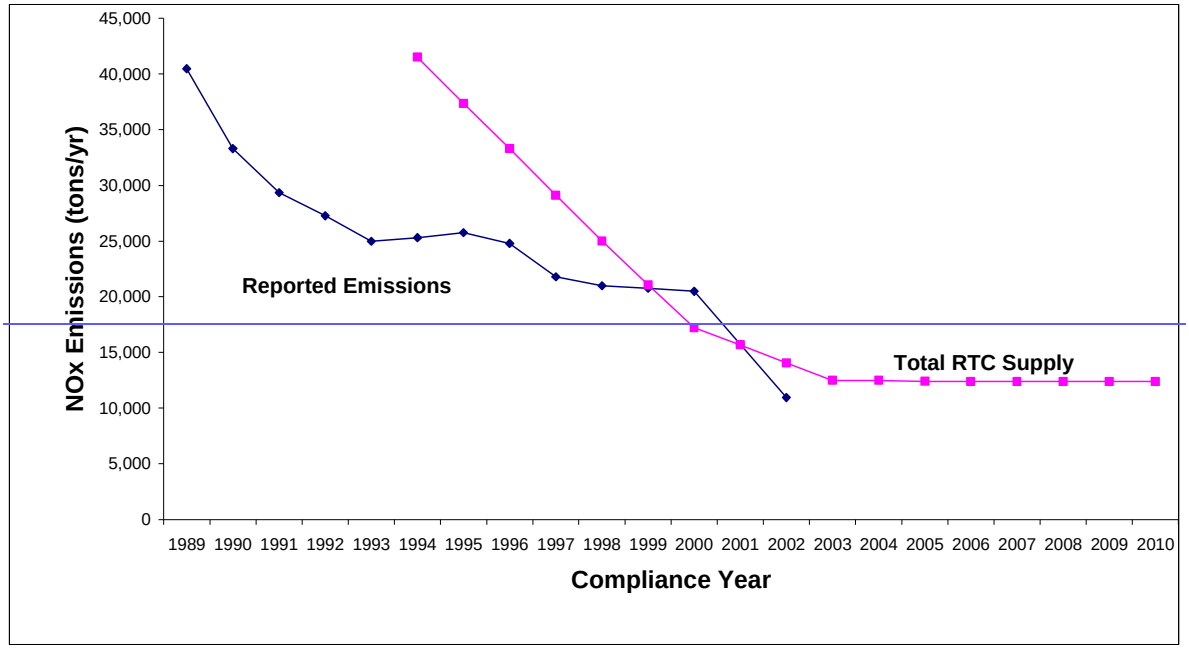
As shown in Table 3-4, RECLAIM facilities have not exceeded their SOx allocations on an aggregate basis during any of the nine completed compliance years (1994 through 2002). This indicates that RECLAIM met its programmatic SOx emission reduction goals and demonstrated equivalency in SOx emissions reduction compared to the traditional command-and-control measures. Table 3-4 shows that SOx emissions in Compliance Year 2002 continued the declining trend and decreased approximately 40 percent from 7,232 tons in 1994 to 4,374 tons in 2002. Figures 3-1 and 3-2 illustrate the comparison of emissions and the RTC supply for NOx and SOx respectively.

Table 3-4
Annual SOx Emissions[1] for Compliance Years 1994 through 2002

	1994	1995	1996	1997	1998	1999	2000	2001	2002
Annual Emission (ton)	7,232	8,064	6,484	6,464	6,793	6,378	6,009	5,003	4,374
% Change from 1994	0%	+11.5%	-10.3%	-10.6%	-6.1 %	-11.8%	-16.9%	-30.8%	-39.5%
Total RTCs[2] (ton)	10,365	9,612	8,894	8,169	7,577	6,911	6,185	5,557	4,924
RTC Left Over(ton)	3,133	1,548	2,410	1,705	784	533	176	554	550
% Excess RTCs	30 %	16%	27 %	21%	10 %	8 %	3 %	10 %	11 %

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 = Allocations + Converted ERCs

Figure 3-1
NOx Emissions and Available RTCs



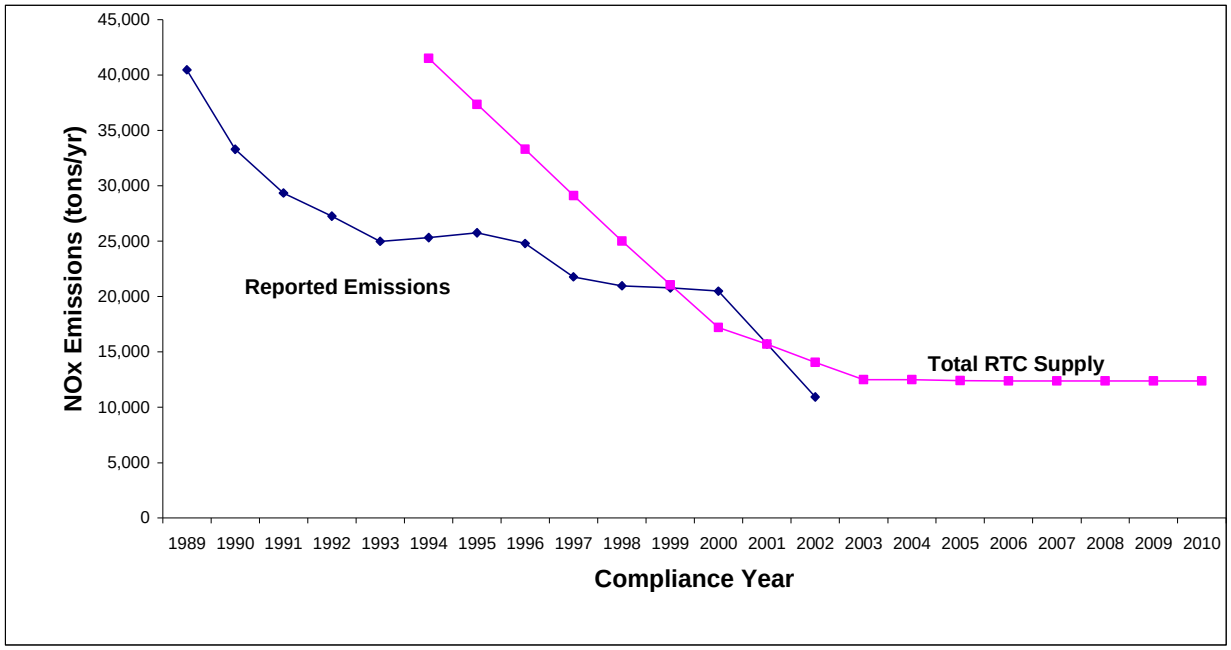
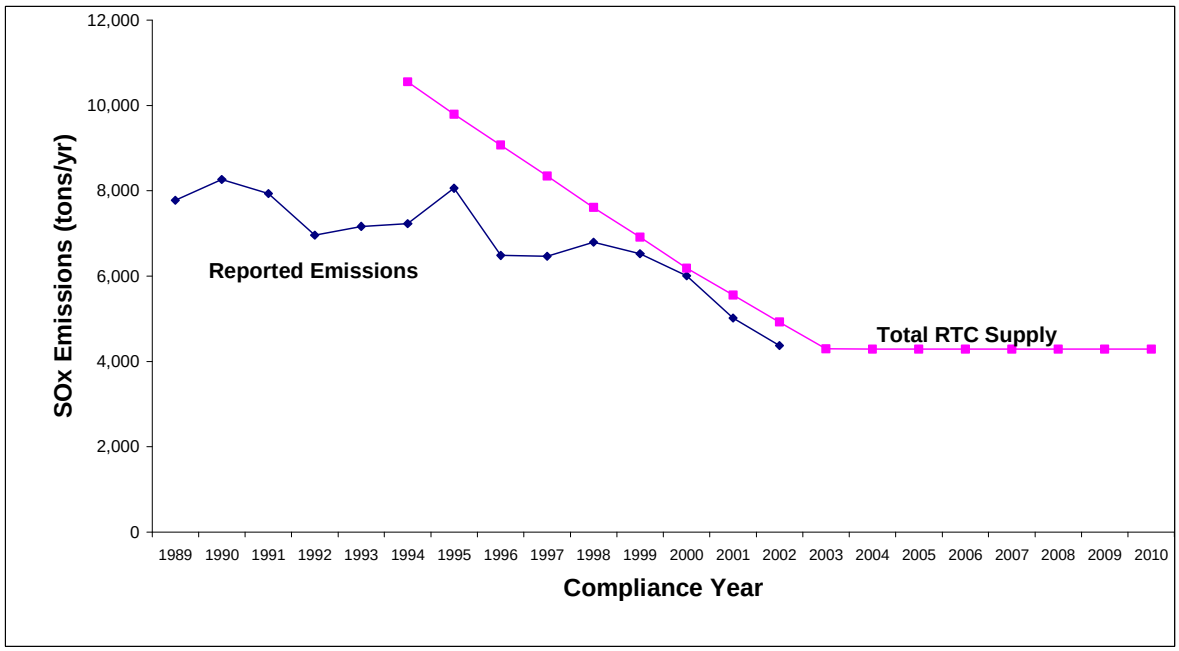


Figure 3-2
SOx Emissions and Available RTCs



Comparison to Command-and-Control Rules

As mentioned previously, RECLAIM subsumed a number of command-and-control rules[1], and sought to achieve equivalent reductions as these subsumed rules. RECLAIM facilities are exempt from the requirements of these rules as

[1]See Tables 1 and 2 of Rule 2001

they are applicable to NOx or SOx emissions. No change was made to these subsumed rules during Compliance Year 2002.

Program Amendments

Rule 2015 – Backstop Provisions, requires that the AQMD review the program and implement necessary measures to amend the program whenever aggregate emissions exceed the allocations by five percent or more, or whenever the average price of RTCs exceed $15,000 per ton. A program review was initiated in 2000 upon recognition of the RTC shortage and the surge of RTC prices. This effort culminated in the amendments of the RECLAIM rules on May 11, 2001, to implement the following key backstop measures:

- Isolating power producing facilities from the rest of the RECLAIM facilities;
- Requiring power producing facilities to submit compliance plans delineating schedule for installation of Best Available Retrofit Control Technology (BARCT) on power producing facilities by the end of 2003;
- Requiring facilities with 50 tons or more NOx emissions to submit compliance plans specifying approaches to complying with the facility allocations;
- Requiring facilities with NOx emissions between 25 and 50 tons to submit forecast reports demonstrating compliance with annual allocation for Compliance Years 2002 through 2005;
- Requiring timely registration of RTC trades to provide RECLAIM facilities with better price information;
- Creating an Emission Mitigation Fee Program to provide a means for power producing facilities to comply with annual allocations;
- Creating an Air Quality Investment Program (AQIP) to provide small RECLAIM facilities with needs for additional emission reduction credits;
- Creating a reserve of emission reductions to support the Emission Mitigation Fee Program and AQIP.

As shown in Chapter 2, annual average prices for NOx and SOx RTC prices were below the $15,000 per ton level. In addition, Compliance Year 2002 aggregate NOx and SOx emissions were both below aggregate allocations as shown in Figures 3-1 and 3-2.

Compliance Plans and Forecast Reports

The May 2001 rule amendments included provisions for compliance plans to be submitted by power producing facilities (Rule 2009 – Compliance Plan for Power Producing Facilities) and by non-power producing facilities with NOx emissions of 50 tons or more in Compliance Year 1999 or any compliance year thereafter (Rule 2009.1(b) – Compliance Plans and Forecasts Reports for Non-Power Producing Facilities). The compliance plans were due by September 1, 2001. A report was presented to the Governing Board on November 9, 2001, presenting data collected under these compliance plans and the expected compliance with

allocations for power producing and non-power producing sectors through Compliance Year 2005. Forecast reports are also required under Rule 2009.1(e) – Forecast Reports, from non-power producing facilities with annual NOx emissions between 25 and 50 tons.

In Compliance Year 2001, there are 14 power producing facilities subject to Rule 2009, 42 facilities subject to the Rule 2009.1 compliance plans requirement, and 24 facilities subject to the Rule 2009.1 forecast reports requirement. Table 3-5 lists the Compliance Years 2000 and 2002 emissions from the three groups of facilities and compares them to the projected 2002 emissions as specified under the compliance plans or forecast reports and also to their RTC holdings. The table shows all three groups of facilities were able to achieve lower emissions than those projected for Compliance Year 2002. Aggregate emissions from the three groups were also below their individual aggregate RTC holdings that can be used to reconcile with the emissions. Based on Compliance Year 2002 emissions, three additional facilities exceeded the 50-ton annual NOx emission level and are required to file compliance plans under Rule 2009.

Table 3-5
Comparison of 2002 Emissions for Facilities Subject to Compliance Plans Requirement

Facility Category	Power Producing Facilities (tons)	Non-Power Producing Facilities with Annual Emissions ≥ 50 tons (tons)	Non-Power Producing Facilities with Annual Emissions between 25 and 50 tons (tons)
Compliance Year 2000 Reported Emissions	6,786	10,227	802
Compliance Year 2002 Reported Emissions	1,047	8,110	464
Projected Emissions for 2002	3,043	9,191	534
RTC Holdings Available for Compliance Year 2002 Emissions	1,765	8,736	637

Rule 2020 – RECLAIM Reserve

The May 2001 rule amendments also included mechanism to increase RTC supplies. Under Rule 2020, the Board established a Reserve of emission reduction for use in the RECLAIM Air Quality Investment Program (RECLAIM AQIP), the Emission Mitigation Fee Program, and natural gas turbine power plant peaking source. These programs are available only through Compliance Year 2004.

The RECLAIM AQIP is set up for structural buyers of RTCs who may obtain available emission reductions from the program by demonstrating their eligibility and paying a participation fee of $7.50 per pound of NOx emissions. Structural buyers are RECLAIM facilities that are either new facilities built after October

1993 or facilities with annual emissions of less than six tons, and meet certain conditions contained under Rule 2000 (c)(74). The amendments have been effective in stabilizing NOx RTC prices, which have been significantly lower than the $7.50 per pound level since the rules were amended. Therefore, no request for emission reductions was received under the RECLAIM AQIP.

The Emission Mitigation Fee Program is available only to power producing facilities that meet the requirements under Rule 2004(o) – Emission Mitigation Fee Program for Power Producing Facilities. A power producing facility may obtain emission reductions from the Emission Mitigation Fee Program provided it has not sold since January 11, 2001, any NOx RTCs valid for the compliance year that it is requesting emission reductions. An equivalent amount of NOx RTCs is deducted from the requesting facility's future year allocations (up to two years from the compliance year requested) to protect the environment. When emission reductions are available under the Emission Mitigation Fee Program, the reductions are distributed to the participants on a prorated basis to replace the future allocations that were deducted up-front. Four power producing facilities requested emission reductions during Calendar Year 2001. No request was received since then.

The sources of emission reductions for the RECLAIM Reserve include emission reduction projects that meet the requirements of State Implementation Plan (SIP) approved pilot credit generation rules and the State Emission Reduction Credit Bank. Table 3-7 lists the pilot credit generation rules adopted by the Board and their SIP approval status.

Table 3-7
Pilot Credit Generation Rules

Rule Description	Approval Status (Approval Date)
Rule 1612.1 – Mobile Source Credit Generation Pilot Program	Approved (2/7/2002)
Rule 1631 - Pilot Credit Generation Program for Marine Vessels	Original Rule Approved (2/7/2002) 10/2002 Amendments (11/24/2003)
Rule 1632 - Pilot Credit Generation Program for Hotelling Operations	Approved (2/7/2002)
Rule 1633 – Pilot Credit Generation Program for Truck/Trailer Refrigeration Units	Approved (2/7/2002)
Rule 1634 – Pilot Credit Generation Program for Truck Stops	~~Pending EPA Review~~Approved (11/24/03)
Rule 2507 – Pilot Credit Generation Program for Agricultural Pumps	Approved (2/7/2002)

The AQMD Governing Board authorized funding of projects under the Emission Mitigation Fee Program and the RECLAIM AQIP for credits generation in

accordance with Rules 1612.1, 1631 and 2507. No project has been initiated under the other pilot credit generation programs. One project was approved by the Governing Board in Calendar Year 2003. This project consisted of replacing 37 Class 7/8 diesel-fueled trucks with compressed natural gas (CNG) fueled trucks and re-powering eight marine vessels. When fully implemented, this project is expected to generate a total of 61.4 tons per year of NOx emission reductions. At the same time, the Board also approved a change in a previously approved project under Rule 2507. The change was made to replace the existing project because the contractor was unable to fulfill the commitment. The new project is expected to generate approximately 60 tons of NOx reductions annually without any increase in project cost when compared to the existing project. Table 3-8 lists the details of ~~this~~ the projects.

Table 3-8
Emission Reduction Project Approved in Calendar Year 2003

Contractor	Location	Description	Rule	Expected NOx Reductions (tons)
City of Ontario	Ontario	15 CNG Class 7/8 refuse haulers	1612.1	12
City of Long Beach	Long Beach	22 CNG Class 7/8 refuse haulers	1612.1	13
Seaboard Marine	District Waters	Re-power 3 marine vessels	1631	19
OceanAir	District Waters	Re-power 5 marine vessels	1631	18
Air Quality Management Services	Coachella Valley	Electrify 34 agricultural pumps	2507	60
			Total	122

During the first three quarters of Calendar Year 2003, 30 re-powered marine vessels were generating emission reduction credits. Based on the reported fuel consumption, these vessels generated an aggregate of 275.5 tons of emission reduction. However, the submitted records have not been fully audited and the emission reductions have not been credited under the Emission Mitigation Fee Program. If the submitted records are fully substantiated, there will be a total of 247.9 tons of emission reduction available for the Mitigation Fee Program after the rule required ten percent retirement. Table 3-9 lists the details of the emission reductions achieved during the first three quarters of Calendar Year 2003. At the time of preparing this report, data for the fourth quarter have not been compiled. The projects involving replacement of diesel fuel trucks and agricultural pumps were just started in 2003. Activity reports from these projects

have just recently been submitted. The amount of actual emission reductions has not been verified and no credit from these projects has been deposited in the RECLAIM Reserve.

Table 3-9 Emission Reductions Achieved Pursuant to Rule 1631 during First Three Quarters in Calendar Year 2003 [1]

Contractor	Number of Marine Vessels[2]	Location of Reduction Project	Total NOx Reductions[3] (tons)	10% Retirement[4] (tons)	NOx RTCs Available (tons)
Ocean Air Environmental	22	District Waters	253.2	25.3	227.9
Seaboard Marine	8	District Waters	22.3	2.2	20.1
		Total:	275.5	27.5	247.9

[1] This data was provided by Technology Advancement Office. As of date of preparation of this report, records for the fourth quarter activities have not been fully compiled.
[2] Number of marine vessels currently generating credits.
[3] Records submitted to support these emission reductions are being audited. No emission reduction credits have been deposited into the Mitigation Fee Program. The level of emission reduction may change after completion of audits.
[4] Ten percent of all credits generated are retired for the benefit of the environment pursuant to rule requirements.

PureEnergy Operating Services, LLC. operates two facilities (Drew Substation and Century Substation) in Colton. Each of these two facilities has eight natural gas-fired peaking turbines. These facilities opted into the NOx RECLAIM program in Compliance Year 2001. Both facilities qualified and applied to use the emissions reductions from the State Emission Reduction Credit Bank. Each facility was issued 58 tons (totaling 116 tons) per year of non-tradeable NOx RTCs for the period of May 2, 2001 through October 31, 2003. However, the facilities only emitted 18 tons of NOx emissions during Compliance Year 2002. As these are non-tradeable RTCs, they can only be used to offset emissions at the facilities. Therefore, for purposes of determining programmatic compliance, only Allocations equivalent to the emissions at these facilities were included. Aside from this use, there was no request for emission reduction from the reserve received in Calendar Year 2003.

The Governing Board authorized the Executive Officer to use funds collected from power producing facilities to purchase excess RTCs from RECLAIM market to offset allocation deductions due to participation in the AQMD Executive Order and the Emission Mitigation Fee Program and emissions excluded from the Governor Executive Order. Purchases were made over four separate periods during the year-end reconciliation periods. A total of 1,410 tons of excess RTCs were purchased. As a result, all deductions of future allocations as required under the AQMD Executive Order and the Emission Mitigation Fee Program from the participating facilities were fully replaced with the purchased RTCs.

Impact of Changing Universe

As discussed in Chapter 1, changes to the NOx RECLAIM universe during Compliance Year 2002 were: four new facilities opted into RECLAIM, two new facilities were created, one existing facility was excluded, and four facilities ceased operations. All of the changes involved NOx facilities. Staff conducted an analysis to evaluate the impact on emissions reductions due to such changes in the RECLAIM universe.

When a new facility is constructed and its NOx or SOx emissions exceed four tons per year, it is brought into the RECLAIM universe. Such facilities are required to obtain sufficient RTCs to offset their NOx or SOx emissions. These RTCs must be obtained through the trading market and are not issued to the facility (external offsets used, if any, to obtain permits are converted to RTCs). Such facilities increase the overall demand for the fixed supply of RTCs because they increase total RECLAIM emissions without increasing the total supply of RTCs.

The shutdown of a RECLAIM facility results in a reduction in actual emissions. The shutdown facility retains its RTC holdings, which it may continue to hold as an investment, transfer to another facility under common ownership, or trade on the market. Therefore, although the facility is no longer emitting, its RTCs may be used at another facility. This has the opposite effect on the RTC market as does a new facility — in this case the overall demand for RTCs is reduced while the supply remains constant.

There is no net effect on the overall RECLAIM program when a facility splits into two. A facility is excluded from the Universe if it is determined that the circumstance that caused the inclusion changed or was found to be inaccurate. The RTCs that were issued to the facility for the future years are also withdrawn. This also decreases the supply of RTCs.

Some facilities that did not initially meet the inclusion criteria subsequently chose to enter the program. These facilities were issued RTC allocations based upon their operational history using the same methodology as was used for the facilities in the initial universe. 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. They also change the rules and requirements that apply to the affected facilities.

In short, new facilities and shutdown facilities change the demand for RTCs without changing the supply while exclusions and inclusions make corresponding changes to both the demand and the supply, thereby mitigating their own impact on the markets.

Table 3-10 summarizes NOx emissions from new facilities and facilities that were shut down, excluded from the program, or included into the program for the Compliance Year 2002. One of the shutdown facilities previously went through a partial change of ownership. At that time, all the allocations issued to the original facility were transferred to the five newly formed facilities. The facility shut down at this time did not retain any initially allocated RTCs. Therefore, the data presented in Table 3-10 does not include those allocations.

Table 3-10
NOx Emissions Impact from the Changes in Universe (Tons)

Category	2002 NOx Emissions (tons)	2002 NOx Initial Allocations (tons)	2003 NOx Initial Allocations (tons)
Shutdown Facilities[1]	3.3	104.2	92.5
Excluded Facilities[2]	N/A	0.9	0.8
Included Facilities	80.2	101.8	90.3
RECLAIM Universe	10,943	~~14,105~~14,044	~~12,598~~12,482

1. Included in these facilities that shut down were three facilities that had previously undergone partial change of ownership in Compliance Year 1998. At that time, all the allocations were transferred to the new operator. Therefore, these figures do not include any of those allocations.
2. Only one facility was excluded from the RECLAIM program during Compliance Year 2002. This facility did not submit RECLAIM emissions reports following exclusion.