

4.0 CONTROL MEASURES

This section discusses the control measures implemented, or expected to be implemented in New Jersey, in the Ozone Transport Region (OTR), or nationally. This section explains the terminology related to control measures used throughout Chapters 5 and 6; provides a summary of how the control measures were identified; and gives a brief synopsis of each control measure considered in Chapters 5 and 6. A summary of the control measures is shown in Table 4.1. The benefits from the implementation of these measures, and the benefit calculations, are discussed in the State's attainment demonstration in Chapter 5 and in the Reasonable Further Progress (RFP) analysis in Chapter 6. Note that this chapter only provides a discussion of control measures not included in the baseline emission inventory. Existing controls, such as the New Jersey inspection and maintenance (I/M) program for gasoline vehicles prior to the initiation of mandatory on-board diagnostic inspections, existing reasonably available control technology (RACT) rules, and federal reformulated gasoline (RFG), are not included in this chapter. These controls are included in the 2002 baseline inventory.

Table 4.1: Control Measures

<u>Control Measures</u>	<u>Sector</u>
Pre-2002 with benefits achieved Post-2002 - On the Books	
<i>New Jersey</i>	
NOx Budget Program (SIP Call)	Point
New Source Review (NSR)	Point
<i>Federal</i>	
Residential Woodstove NSPS	Area
Onboard Refueling Vapor Recovery (ORVR) beyond Stage II	Area/Onroad
Tier 1 Vehicle Program	Onroad
National Low Emission Vehicle Program (NLEV)	Onroad
Tier 2 Vehicle Program/Low Sulfur Fuels	Onroad
HDDV Defeat Device Settlement	Onroad
HDDV Engine Standards	Onroad
Nonroad Diesel Engines	Nonroad
Large Industrial Spark-Ignition Engines Over 19 Kilowatts	Nonroad
Recreational Vehicles (includes snowmobiles, off-highway motorcycles and all-terrain vehicles)	Nonroad
Diesel Marine Engines over 37 kilowatts	Nonroad
Phase 2 Standards for Small Spark-Ignition Handheld Engines at or below 19 kilowatts	Nonroad
Phase 2 Standards for New Nonroad Spark-Ignition Nonhandheld Engines at or below 19 kilowatts	Nonroad
Post-2002 - On the Books	
<i>New Jersey Measures Done Through a Regional Effort</i>	
Consumer Products 2005	Area

<u>Control Measures</u>	<u>Sector</u>
Architectural Coatings 2005	Area
Portable Fuel Containers 2005	Area and Nonroad
Mobile Equipment Repair and Refinishing	Area
Solvent Cleaning	Point and Area
NO _x RACT rule 2006 (includes distributed generation)	Point and Area
<i>New Jersey Only Measures</i>	
Stage I and Stage II (Gasoline Transfer Operations)	Area
On-Board Diagnostics (OBD) - (I/M) Program for Gasoline Vehicles	Onroad
New Jersey Heavy Duty Diesel Rules Including “Not-To-Exceed” (NTE) Requirements	Onroad
<i>Federal</i>	
USEPA MACT Standards including Industrial Boiler/Process Heater MACT	Point
CAIR	Point
Refinery Enforcement Initiative	Point
<u>Post-2002 - Beyond on the Way</u>	
<i>New Jersey Measures Done Through a Regional Effort</i>	
Consumer Products 2009 Amendments	Area
Portable Fuel Containers 2009 Amendments	Area and Nonroad
Asphalt Paving	Area
Adhesives and Sealants	Area and Point
Asphalt Production	Point and Area
Glass Manufacturing	Point
Certain Categories of ICI Boilers	Point
Refinery Rules	Point
High Electrical Demand Day Program	Point
<i>New Jersey Only Measures</i>	
Petroleum Storage Tank Measures	Point and Area
USEPA CTGs (5 categories)	Point and Area
Case by Case VOC and NO _x Emission Limit Determinations (FSELS/AELs)	Point
Municipal Waste Combustors	Point
Refineries – Process Heaters and Boilers	Point
New Jersey Low Emission Vehicle (LEV) Program	Onroad
Diesel Idling	Onroad
Diesel Inspection and Maintenance	Onroad
<i>Federal</i>	
New Nonroad Engine Standards	Nonroad

4.1 Terminology

On The Books (OTB) – “On the Books (OTB)” control measures (State or Federal) are control measures that were a) adopted before 2002, but have implementation dates after 2002 or obtain benefits after 2002, due to turnover of products, equipment, or vehicles (the benefits from these measures are not included in the State’s 2002 base year emissions inventory); or b) adopted and implemented after 2002. An example of an OTB measure for New Jersey is the NO_x Budget Program, which went into effect May 1, 1999; a lower cap was required effective May 1, 2003. Examples of other OTB measures in New Jersey are the six “shortfall”¹ measures that were adopted by New Jersey, and several of its neighboring states, between 2003 and 2005 in order to meet the 1-hour ozone standard. These include regulations on Architectural and Industrial Maintenance Coatings (AIM), Consumer Products, Portable Fuel Containers (PFCs), Mobile Equipment Repair and Refinishing (MERR), Solvent Cleaning and additional NO_x controls, including the distributed generation initiatives.

On the Way (OTW) – The six “shortfall” measures discussed in the definition of the OTB were developed by the Ozone Transport Commission (OTC) specifically to address United States Environmental Protection Agency (USEPA)-identified deficiencies in the 1-hour ozone attainment demonstrations of several OTC states. New Jersey, New York, Delaware, Maryland and Pennsylvania, five of the “shortfall” states, adopted rules to implement these measures before the modeling inventory was prepared. However, other OTC states committed to propose these rules and were in the process of proposal/adoption when the modeling inventory was prepared. With approval of the states, the OTC and the Mid-Atlantic/Northeast Visibility Union (MANE-VU) called these rules that were not yet adopted on the way (OTW), assuming they would be proposed, adopted and implemented by 2009, and to distinguish them from the next round of potential rulemakings. This terminology does not apply to New Jersey, as all of the OTC shortfall rules were adopted in New Jersey prior to the development of the modeling inventory.

Beyond On The Way (BOTW) – These control measures (state, regional, or federal) will be proposed by New Jersey and will include those measures that were identified as part of the effort to reach attainment by June 15, 2010.²

¹ NJDEP. Mid-Course Review for the New Jersey Portion of the Philadelphia-Southern New Jersey and New York-Northern New Jersey 1-Hour Ozone Nonattainment Areas. New Jersey Department of Environmental Protection, January 2005.

² According to USEPA guidance, areas that have an attainment date of no later than June 15, 2010 must implement the emission reductions needed for attainment no later than the beginning of the 2009 ozone season (June 2009). Source: USEPA. Guidance on the Use of Models and Other Analyses in Attainment Demonstrations for the 8-hour Ozone NAAQS, United States Environmental Protection Agency, October 2005.

4.2 On the Books Controls

The following section provides descriptions of the New Jersey and Federal OTB measures that were included in the State's attainment demonstration and RFP demonstration.

4.2.1 New Jersey

Pre-2002 with benefits achieved Post-2002 – On the books

New Jersey NO_x Budget Program (SIP Call): On September 27, 1994, the OTC agreed to develop a regional program to achieve significant reductions in oxides of nitrogen (NO_x) emissions from large combustion sources. This program called for the establishment of a NO_x cap and trade program, as well as the establishment of an emissions cap or “budget” for all affected sources that in total must not be exceeded during each control period, beginning in 1999. The NO_x SIP Call is a similar regional NO_x reduction measure designed by the USEPA, in part, as a result of the Ozone Transport Assessment Group's (OTAG) final recommendation report addressing ozone transport over the Eastern United States.³ New Jersey adopted its NO_x Budget Program⁴ in 1998. The base emission budget of 17,340 tons of NO_x was established. This was approximately 65% less than 1990 emission levels and was termed Phase II. In 2003, the NO_x SIP Call replaced Phase III of the OTC's program with a reduction of the base emission budget to 8,200 tons. The NO_x SIP Call also expanded the geographical area beyond the Ozone Transport Region to the south and the west. The NO_x SIP Call will continue through the ozone season of 2008, at which point it will be superseded by the Clean Air Interstate Rule (CAIR). The NO_x Budget Program covers primarily electric generating units (EGUs) and some non-EGUs. The equipment covered by the NO_x Budget Program include fossil fuel fired indirect heat exchangers with a maximum rated heat input capacity of at least 250 million British thermal units (MMBtu) per hour and electric generating units with a rated output of at least 15 megawatts (MW). The USEPA approved the State's NO_x SIP Call program on May 22, 2001.⁵

New Source Review: The Clean Air Act (CAA), 42 U.S.C. § 7503, requires new or modified major sources to install the Lowest Achievable Emission Rate (LAER) control equipment and obtain greater than one for one emission offsets in order to locate in a nonattainment area. Thus, the NSR program provides continual emission reductions to help improve the air quality in the nonattainment area and further downwind. In New Jersey, any significant new, reconstructed, or modified significant source is required to install state of the art (SOTA) control technology (similar to Best Available Control Technology (BACT) or LAER). SOTA also results in reductions in the actual emissions from the facilities.

³ USEPA. 1998 Ozone Transport Assessment Group (OTAG) Final Report. United States Environmental Protection Agency, Ozone Transport Assessment Group. Accessed from: <http://www.epa.gov/ttn/naaqs/ozone/rto/otag/finalrpt/>.

⁴ N.J.A.C. 7:27-31

⁵ 66 Fed. Reg. 28063 (May 22, 2001).

Post 2002 – On the books

New Jersey Measures Done Through a Regional Effort

Consumer Products 2005: The NJDEP adopted amendments to its consumer products rules at N.J.A.C. 7:27-24 on May 3, 2004. Consumer products are those items sold to retail customers for personal, household, or automotive use, along with the products marketed by wholesale distributors for use in commercial or institutional settings such as beauty shops, schools and hospitals. Consumer products include hundreds of individual products, including personal care products, household products, automotive aftermarket products, adhesives and sealant, Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) related insecticides, and other miscellaneous products. Volatile organic compound (VOC) emissions from these products are the result of the evaporation of propellant and organic solvents during use. The rule amendments were based on an OTC model rule dated November 29, 2001, which was based on several historical California Air Resources Board (CARB) rules and other data. The original New Jersey rule was adopted in November 1995. The USEPA National rule was adopted in September 1998.

The New Jersey adopted amendments set limits, effective January 1, 2005, on the VOC content of several consumer products such as air fresheners, automotive brake cleaners, carpet and upholstery cleaners, household adhesives, floor wax strippers and hairspray. The USEPA approved the New Jersey State Implementation Plan (SIP) revision including these rule amendments on January 25, 2006.⁶ The NJDEP anticipates proposing additional amendments to its consumer products rules as a BOTW measure.

Architectural Coatings 2005: The NJDEP adopted amendments to its architectural coatings rules at N.J.A.C. 7:27-23 on June 21, 2004. Architectural coatings include, but are not limited to, paints, varnishes, stains, industrial maintenance coatings, and traffic coatings. An architectural coating⁷ is applied in the field at the site of installation, rather than in a shop or factory where pollution control equipment may be installed. These amendments were based on an OTC model rule dated February 26, 2002, which was based on the CARB Suggested Control Measures (SCM), June 2000. The original New Jersey rule was adopted in 1989. The USEPA national rule was adopted in September 1998.

The New Jersey amendments set limits on the VOC content of architectural coatings, effective January 1, 2005. The USEPA approved the New Jersey SIP revision including these rule amendments on November 30, 2005.⁸

⁶ 71 Fed. Reg. 4045 (January 25, 2006).

⁷ “Coating” is defined at N.J.A.C. 7:27-23 as a material applied onto or impregnated into a substrate for protective, decorative, or functional purposes. Such materials include, but are not limited to, paints, varnishes, sealers, and stains.

⁸ 70 Fed. Reg. 71774 (November 30, 2005).

Portable Fuel Containers 2005: The NJDEP adopted a new portable fuel container (PFC) rule at N.J.A.C. 7:27-24 on May 3, 2004. PFCs are designed for transporting and storing fuel from a retail distribution to a point of use and the eventual dispensing of the fuel into equipment. Commonly referred to as “gas cans,” these products come in a variety of shapes and sizes with nominal capacities ranging in size from less than one gallon to over six gallons. VOC emissions from PFCs are classified by five different activities: transport-spillage, diurnal emissions, permeation, and equipment refueling vapor displacement and spillage emissions. Diurnal evaporative emissions are the largest category. Diurnal evaporative emissions are evaporative emissions resulting from the daily cycling of ambient temperatures. This new rule was based on an OTC model rule dated March 6, 2001, which was based on CARB’s PFC rule, which took effect January 2001.

Specifically, the New Jersey adopted rule contains requirements that address VOC emissions from PFCs, effective January 1, 2005. The rule requires that PFCs and/or spouts have a permeability not to exceed 0.4 grams/gallon/day, be equipped with an automatic shut-off device and an automatic device that closes and seals when it is removed from the fuel tank. The rule also requires that a PFC have a fuel flow rate and fill level standards. The USEPA approved the New Jersey SIP revision including this rulemaking on January 25, 2006.⁹ The NJDEP anticipates proposing amendments to its portable fuel container rules as a BOTW measure.

Mobile Equipment Repair and Refinishing (Autobody refinishing): The NJDEP adopted amendments to its autobody refinishing rules at N.J.A.C. 7:27-16.7 (old section number) and 16.12 (new section number) on June 2, 2003. These amendments were based on an OTC model rule dated March 6, 2001. Various limits in the previous New Jersey rule became effective between 1982 and 1990, but were not applicable to smaller facilities. The rule addresses VOC emissions from autobody refinishing operations.

The New Jersey autobody refinishing amendments establish requirements for using higher efficiency coating application equipment, such as high volume-low pressure paint guns, spray gun cleaning equipment that minimizes solvent loss, and enclosed spray gun cleaning. The USEPA national rule, effective September 11, 1998, regulates the VOC content of primers and coatings applied in autobody refinishing operations. The NJDEP amendments maintain the Federal VOC content limit for the paints used, but expands the scope of facilities to which this rule applies. The USEPA approved the New Jersey SIP revision including these rule amendments on July 2, 2004.¹⁰

Solvent Cleaning (Degreasing): The NJDEP adopted amendments to its solvent cleaning rules at N.J.A.C. 7:27-16.6 on June 2, 2003. The adopted amendments contain requirements to address VOC emissions from both vapor and cold solvent metal parts cleaning operations. Vapor cleaning machines are generally used in manufacturing operations, and the rules for these machines are based on Maximum Achievable Control Technology (MACT). Cold cleaners are smaller units more typically used in automobile

⁹ 71 Fed. Reg. 4045 (January 25, 2006).

¹⁰ 69 Fed. Reg. 40321 (July 2, 2004).

repair and maintenance facilities and in industrial maintenance shops. These new requirements were based on an OTC model rule dated March 6, 2001, which was based on the Federal MACT standard for chlorinated solvent vapor degreasers, and on regulatory programs already in place in several States, including Maryland and Illinois.

Specifically, the New Jersey amended requirements apply to vapor cleaning machines using either halogenated or non-halogenated solvents and apply to machines with a solvent surface area greater than one square foot. The adopted amendments require that the solvents used in cold cleaning machines containing greater than one liter of solvent not exceed a volatility of one millimeter of mercury. The USEPA approved the New Jersey SIP revision including these rule amendments on July 2, 2004.¹¹

NO_x RACT Rule 2006 (includes distributed generation): The NJDEP adopted amendments to N.J.A.C. 7:27-19, Control and Prohibition of Air Pollution from NO_x, on September 8, 2005. The amendments were based on the OTC's March 6, 2001 model rules to control NO_x emissions tied to shortfall measures. The OTC model rules were created as the result of the agreement formally set forth in a "Memorandum of Understanding Among the States of the Ozone Transport Commission Regarding the Development of Specific Control Measures to Support Attainment and Maintenance of the Ozone National Ambient Air Quality Standards" (MOU), which was approved by the OTC on June 1, 2000. Specifically, the New Jersey amendments apply to owners and operators of stationary sources of NO_x emissions, including industrial/commercial/institutional (ICI) boilers, combustion turbines, and reciprocating engines. Owners and operators of such sources are required to achieve the emission limit specified in the rules or to comply instead with alternative requirements, such as an emission averaging plan, an alternative maximum allowable emission rate or a plan for phased compliance (repowering or use of innovative technology). In addition, moderate size boilers (boilers with a maximum gross heat input rate of at least 50 MMBtu per hour but less than 250 MMBtu per hour) are required to have an annual tune up. The amendments also regulate distributed generation¹² of electricity, consistent with the OTC recommendation in its March 28, 2001 "Resolution of the States of the Ozone Transport Commission Concerning the Creation of incentives for Additional Distributed Generation of Electric Power." On March 14, 2007, the USEPA proposed approval of the New Jersey SIP revision, including these rule amendments.¹³ The comment period on that proposed approval closed on April 14, 2007.

¹¹ 69 Fed. Reg. 40321 (July 2, 2004).

¹² Distributed generation is a system composed of generation located near the energy consumer's site that may be highly integrated with the electric grid to provide multiple benefits on both sides of the utility meter. Source: CECA. Distributed Generation Facts, Consumer Energy Council of America, <http://www.cecarf.org/Programs/DG/DGFacts.html>.

¹³ 72 Fed. Reg. 11812 (March 14, 2007).

New Jersey Only Measures

Stage I Vapor Recovery and Stage II Vapor Recovery (Gasoline Transfer Operations):

The NJDEP adopted amendments to its gasoline transfer rules at N.J.A.C. 7:27-16.3 on June 2, 2003. The adopted amendments address VOC emissions from gasoline transfer operations, otherwise known as Stage I and Stage II. A Stage I vapor recovery system is a system that limits the discharge to the atmosphere of gasoline vapors displaced during the transfer of gasoline from a storage vehicle to a storage tank. A Stage II vapor recovery system is a system that limits the discharge to the atmosphere of gasoline vapors displaced during the dispensing of gasoline into motor vehicle fuel tanks. The adopted amendments were based partly on CARB's enhanced vapor recovery rules as discussed in their February 4, 2000 Enhanced Vapor Recovery Report.

Specifically, the New Jersey adopted amendments increase the required efficiency of the Stage I vapor recovery system from 90 to 98 percent and require annual testing of the Stage I and Stage II systems.¹⁴ The amendments also require the installation of pressure/vacuum relief valves on atmospheric vent pipes, the installation of mini-boots on vapor assist systems, maintenance of the vapor recovery system to ensure that the system is vapor tight and leak free, and the use of unihoses at new stations. The USEPA approved the New Jersey SIP revision including these rule amendments on July 2, 2004.¹⁵

On-Board Diagnostics (I/M) Program for Gasoline Vehicles

A number of changes to New Jersey's I/M program for gasoline vehicles were implemented after 2002. The two program changes that materially impacted vehicle emissions were the extension for the new vehicle emission inspection from one inspection cycle (i.e., 2 years) to two inspection cycles (i.e., 4 years) and the initiation of mandatory on-board diagnostic (OBD) inspections for model year 1996 and newer vehicles. The OBD test largely replaced the dynamometer based Acceleration Simulation Mode (ASM5015) exhaust test for these newer vehicles. New Jersey submitted a Final SIP revision that contained the results of performance standard modeling for these I/M program changes on November 27, 2002.¹⁶ The USEPA subsequently approved this SIP revision.¹⁷

¹⁴ N.J.A.C. 7:27-16.3 requires that Stage II vapor recovery systems reduce the total applicable VOC emissions into the outdoor atmosphere by no less than 95 percent of the concentration of applicable VOC by volume in the air-vapor mixture displaced during the transfer of gasoline.

¹⁵ 69 Fed. Reg. 40321 (July 2, 2004).

¹⁶ NJDEP. Enhanced Inspection and Maintenance (I/M) Program for the State of New Jersey Revised Performance Standard Modeling SIP Revision. New Jersey Department of Environmental Protection. November 27, 2002. Available at http://www.state.nj.us/dep/baqp/sip/4year/4yrexempt_fin.doc.

¹⁷ 68 Fed. Reg. 7704 (February 18, 2003).

New Jersey Heavy Duty Diesel Rules Including “Not-To-Exceed” (NTE) Requirements

The NJDEP adopted new rules and amendments on October 28, 2001 to N.J.A.C. 7:27-26 that added requirements for new heavy-duty diesel vehicles (HDDVs) equipped with model year 2005 and newer heavy-duty diesel engines (HDDEs) sold in New Jersey. Specifically, the rulemaking required these new HDDEs to be certified as meeting California’s HDDE requirements. These requirements include both the federal emission standards applicable to all model year 2004 and newer HDDEs, plus a number of testing procedures which the USEPA required for model year 2007 and newer HDDEs. The NTE test procedure is so called because it is used to demonstrate that an engine does not exceed, under a wide variety of operating conditions, an emissions cap of 1.25 times the Federal Test Procedure emission standard. For this reason, the California requirements are often referred to as the NTE requirements. California promulgated these NTE requirements to address a temporal gap of two years between the end of the requirements set forth in the consent decrees entered into by seven major HDDE manufacturers and the effective date of equivalent federal testing requirements. It was anticipated that the adoption of the NTE requirements by states regulating the majority of HDDEs sold in the United States would encourage and provide incentive for engine manufacturers to produce only engines meeting the NTE requirements.

On October 25, 2005, the NJDEP adopted new rules, rule amendments, recodifications and repeals of rule provisions to clarify and supplement the existing requirements for the sale, for use or registration in New Jersey, of certain HDDVs and HDDEs, model years 2007 and later. The rulemaking did not impose any new standards for model year 2007 and later HDDEs per se; rather, it served to clarify the finer points of the application of CARB-certification requirements to model year 2007 and beyond, since CARB’s standards for those model years are significantly different from the NTE requirements and standards for model years 2005 and 2006 and were not discussed in the NJDEP’s 2001 rulemaking. In addition, a prohibition of the practice known as “stockpiling” was added. Stockpiling is the practice of purchasing vehicles and/or engines earlier than necessary in order to avoid more stringent emission standards. Finally, the NJDEP added provisions that would, in the event that the provisions of the Federal 2007 rule are not in effect, require recordkeeping and reporting of the sale, for use in New Jersey, of model year and later HDDEs.

4.2.2 Federal

Pre-2002 with benefits achieved Post 2002 – On the books

Residential Woodstove New Source Performance Standards (NSPS): The USEPA New Source Performance emission standards for new wood burning stoves¹⁸ and fireplace inserts have not been updated since they were implemented in 1992. These standards are 7.5 grams per hour for non-catalytic controlled units and 4.1 grams per hour for catalytic controlled units. There are no control requirements for fireplace inserts or wood stove units installed prior to 1992, and these units emit from 30 to 70 grams per hour. The USEPA indicates that they do not have any plans to update the NSPS anytime soon. Instead, the USEPA is choosing to focus on voluntary wood stove change-out programs, rather than new standards.

Onboard Refueling Vapor Recovery (ORVR) Beyond Stage II: The USEPA published regulations requiring ORVR¹⁹ standards for the control of vehicle refueling emissions in 1994.²⁰ ORVR works by routing refueling vapors to a carbon canister on the vehicle and is estimated to achieve a 95-98 percent reduction in VOC emissions for those vehicles equipped with ORVR. ORVR was required to be installed on some new vehicles in 1998, and was required in all new vehicles in 2006.

Tier 1 Vehicle Program: Pursuant to 42 U.S.C. §7521, the USEPA promulgated regulations which revised the tailpipe/extended useful life standards of the Federal Motor Vehicle Control Program (FMVCP) for light duty vehicles and light duty trucks.²¹ These standards, known as Tier I, were implemented in phases beginning with the 1994 model year. The Tier 1 standards encompassed pollutants previously regulated (that is, carbon monoxide, nitrogen oxides, and particulate matter), as well as the addition of non-methane hydrocarbons (NMHC), hydrocarbons measured on a non-methane basis. The standards themselves are a function of vehicle class, pollutant, useful life, engine cycle, and fuel. The Tier I rulemaking also established new intermediate and full useful life²² levels for light-duty vehicles and light-duty trucks, as well as new vehicle weight classes. The regulation affected petroleum and methanol-fueled motor vehicles.

National Low Emission Vehicle Program (NLEV): The NLEV²³ program required automobile manufacturers to meet more stringent new car standards, starting with the 1999 model year in the OTC states and starting with the 2001 model year in the

¹⁸A wood burning stove is defined as a free standing enclosed wood-burning unit, vented to the atmosphere, and designed to provide heat to a home. In contrast, a fireplace insert is defined as a self-enclosed unit that sits within a masonry structure, vented to the atmosphere, that is not designed as a primary heating source for a home. The USEPA emission standards do not cover masonry-constructed fireplaces without fireplace inserts, but these unique fireplaces are thought to account for a very small segment of the wood burning conducted in the New Jersey.

¹⁹ For more information on ORVR, see the USEPA's web page on "*Commonly Asked Questions About ORVR*" available at <http://www.epa.gov/otaq/regs/ld-hwy/onboard/orvrq-a.txt>.

²⁰ 59 Fed. Reg. 16262 (April 6, 1994).

²¹ 56 Fed. Reg. 25724 (June 5, 1991).

²² Useful life is the number of years that the vehicle is expected to be in use.

²³ For more information on NLEV, see USEPA website at <http://www.epa.gov/otaq/lev-nlev.htm>.

remainder of the nation except for California. New Jersey committed to participate in the NLEV Program ending with model year 2006, except as provided in 40 C.F.R. §86.1707. However, if by no later than December 15, 2000, the USEPA did not adopt standards at least as stringent as the NLEV standards for model years 2004, 2005 or 2006, the State's participation in NLEV would extend only until the model year 2004. The USEPA promulgated its Tier II new motor vehicle standards commencing with model year 2004 on February 10, 2000. These standards are more stringent than the NLEV standards provided for in 40 C.F.R. Part 86, subpart R. As such, New Jersey's participation in the NLEV program extended through the model year 2006, after which New Jersey came under the Federal Tier II program. New Jersey subsequently adopted the Low Emission Vehicle II (LEV II) program, which becomes effective for vehicles delivered for sale in New Jersey on and after January 1, 2009. A discussion of New Jersey's LEV II program is included in Section 5.3.1.

Tier 2 Vehicle Program/Low Sulfur Fuels: On February 10, 2000, the USEPA promulgated rules for its comprehensive TierII/Low Sulfur Gasoline program.²⁴ These regulations are designed to treat a vehicle and its fuel as a system, resulting in multiple efforts to reduce highway source emissions. In addition to requiring new tailpipe emissions standards for all passenger vehicles, sport utility vehicles (SUVs), minivans, vans and pick-up trucks, the USEPA simultaneously promulgated regulations to lower the sulfur standard in gasoline. These regulations phased in between 2004 - 2007.

Heavy Duty Diesel Vehicle (HDDV) Defeat Device Settlement: On October 22, 1998, the U.S. Department of Justice and the USEPA announced a settlement with seven major diesel engine manufacturers to resolve claims that they installed computer software on 1993 through 1998 model year heavy-duty diesel engines which was designed to disengage the engine's emission control system during highway driving.²⁵ The settlement, involving Caterpillar, Inc., Cummins Engine Company, Detroit Diesel Corporation, Mack Trucks, Inc., Navistar International Transportation Corporation, Renault Vehicles Industries, s.a., and Volvo Truck Corporation, included an \$83.4 million total penalty. The settlement also required the manufacturers to offer software updates (chip reflash) at no cost to the truck owners at the time of engine rebuild.

Heavy Duty Diesel Vehicle (HDDV) Engine Standards²⁶: On July 31, 2000, the USEPA issued a final rule for the first phase of its two-part strategy to significantly reduce harmful diesel emissions from heavy-duty trucks and buses. This rule finalized new diesel engine standards beginning in 2004, for all diesel vehicles over 8,500 pounds. Additional diesel standards and test procedures in this final rule began in 2007. This new rule required heavy-duty gasoline engines to meet new, more stringent standards starting no later than the 2005 model year. According to the USEPA, these new standards require gasoline trucks emit 78 percent less NOx and hydrocarbons, and diesel trucks to emit 40

²⁴ 65 Fed. Reg. 6698 (February 10, 2000).

²⁵ For more information, see USEPA's web page on Heavy Duty Diesel Engine Consent Decree Documents at www.epa.gov/Compliance/resources/cases/civil/caa/diesel/condec.html.

²⁶ For more information, see the USEPA's Office of Transportation and Air Quality web site at <http://www.epa.gov/otaq/hd-hwy.htm>.

percent less NO_x and hydrocarbons, than current models. The second phase of the program required cleaner diesel fuels and even cleaner engines, reducing air pollution from trucks and buses by another 90 percent. The USEPA issued the final rule, to take effect in 2006-2007 on January 18, 2001.²⁷

Nonroad Diesel Engines: In June 1994, the USEPA promulgated regulations to control VOC, NO_x and carbon monoxide emissions from diesel-powered compression ignition engines at or greater than 50 horsepower (hp) (i.e., bulldozers).²⁸ These Tier 1 standards phased in from 1996 to 2000. In October 1998, the USEPA promulgated regulations to control VOC, NO_x and carbon monoxide (CO) emissions from diesel-powered compression ignition engines for all engine sizes.²⁹ This rule includes Tier 1 standards for engines under 50 horsepower (hp) (i.e., lawn tractors), Tier 2 standards for all engine sizes, and more stringent Tier 3 standards for engines rated over 50 hp. The new Tier 3 standards are expected to lead to control technologies similar to those that will be used by manufacturers of highway heavy-duty engines to comply with the 2004 highway engines standards.³⁰ The new Tier 1 standards were phased in between the years 1999 and 2000, Tier 2 standards between 2001 and 2006, and Tier 3 between 2006 and 2008.

Large Industrial Spark-Ignition Engines over 19 kilowatts: Spark-ignition nonroad engines are mostly powered by liquefied petroleum gas, with others operating on gasoline or compressed natural gas. These engines are used in commercial and industrial applications, including forklifts, electric generators, airport baggage transport vehicles, and a variety of farm and construction applications.

In September 2002, the USEPA adopted new standards to regulate these engines.³¹ The emission standards are two-tiered. The Tier 1 standards, which started in 2004, are based on a simple laboratory measurement using steady-state procedures. The Tier 2 standards starting in 2007 are based on transient testing in the laboratory, which ensures that the engines will control emissions when they operate under changing speeds and loads in the different kinds of equipment.

Also included is an option for manufacturers to certify their engines to different emission levels to reflect the fact that decreasing NO_x emissions tend to increase carbon monoxide emissions (and vice versa). In addition to these exhaust-emission controls, manufacturers must take steps starting in 2007 to reduce evaporative emissions, such as using pressurized fuel tanks. Tier 2 engines are also required to have engine diagnostic capabilities that alert the operator to malfunctions in the engine's emission-control system. Finally, the rule also includes special standards to allow for measuring emissions without removing engines from equipment.

²⁷ 66 Fed. Reg. 5002 (January 18, 2001).

²⁸ 59 Fed. Reg. 31306 (June 17, 1994).

²⁹ 63 Fed. Reg. 56968 (October 23, 1998).

³⁰ USEPA. Regulatory Announcement: New Emission Standards for Nonroad Diesel Engines. United States Environmental Protection Agency Office of Mobile Sources, EPA420-F-98-034, August 1998.

³¹ 67 Fed. Reg. 68241 (November 8, 2002).

Recreational Vehicles: Recreational vehicles include snowmobiles, off-highway motorcycles, and all-terrain-vehicles (ATVs). In September 2002, the USEPA adopted new standards to regulate nonroad recreational engines and vehicles.³² These standards are presented in Table 4.2.

Table 4.2: Summary of Emission Standards for Recreational Vehicles

Vehicle	Model year	Emission standards		Phase-in
		HC g/kW-hr	CO G/kW-hr	
Snowmobile	2006	100	275	50%
	2007 through 2009	100	275	100%
	2010	75	275	
	2012*	75	200	
		HC+NO _x g/km	CO g/km	
Off-highway Motorcycle	2006	2.0	25.0	50%
	2007 and later	2.0	25.0	100%
ATV	2006	1.5	35.0	50%
	2007 and later	1.5	35.0	100%

*Or equivalent per 40 C.F.R. §1051.103

Federal Compression Ignition Marine Engine Regulations (Commercial Marine Engines)^{33, 34}: In 1999, the USEPA promulgated regulations for commercial marine diesel engines over 37 kilowatts (kW), including engines with per cylinder displacement up to 30 liters.³⁵ This rule established VOC and NO_x emission standards, starting in 2004, for new engines with per cylinder displacement up to 2.5 liters. This rule also established standards in 2007 for engines with per cylinder displacement between 2.5 and 30 liters.³⁶ The engines covered by this rule are divided into two categories: Category 1: rated power at or above 37 kW - specific displacement of less than 5 liters per cylinder. These engines are primarily found in fast ferries. Category 2: rated power at or above 37 kW - specific displacement greater than or equal to 5, but less than 30, liters per cylinder. These engines are primarily found in tug and towboats.

³² 67 Fed. Reg. 68241 (November 8, 2002).

³³ For more information, see the USEPA's regulatory announcement on Emission Standards for New Commercial Marine Diesel Engines at <http://www.epa.gov/otaq/regs/nonroad/marine/ci/fr/f99043.pdf>.

³⁴ The USEPA has not finalized Tier 2 standards for Category 3 commercial marine engines. The USEPA will promulgate final Tier 2 standards for Category 3 engines on or before December 17, 2009. ("Category 3" means relating to a marine engine with a specific engine displacement greater than or equal to 30 liters per cylinder). Source: 40 C.F.R. §§ 94.1, 94.8; 72 Fed. Reg. 20948 (April 27, 2007).

³⁵ 64 Fed. Reg. 73300 (December 29, 1999).

³⁶ USEPA. Technical Highlights: Organization of Gasoline and Diesel Marine Engine Emission Standards. United States Environmental Protection Agency Office of Mobile Sources, EPA420-F-99-046. December 1999.

Federal Small Spark Ignition Engine Regulations: In July 1995, the USEPA promulgated the first phase of its regulations to control emissions from new nonroad spark ignition engines.³⁷ This regulation established VOC and carbon monoxide emission standards for all model year 1997³⁸ and newer nonroad spark ignition engines that have a gross power output at or below 19 kilowatts. These engines are used principally in lawn and garden equipment, including, but not limited to, lawn mowers, leaf blowers, trimmers, chainsaws, and generators. In March 1999, the USEPA promulgated Phase 2 regulations to control emissions from new nonroad spark ignition engines.³⁹ These regulations established tighter VOC and NO_x standards for non-handheld equipment such as lawn mowers and commercial turf equipment. The new standards were phased in between the years 2001 and 2007. In March 2000, the USEPA promulgated additional Phase 2 regulations to control emissions from new nonroad spark ignition engines.⁴⁰ This regulation established tighter VOC, NO_x, and carbon monoxide standards for handheld equipment such as string trimmers (i.e., weedwhackers), leaf blowers and chainsaws. The new standards were phased in between the years 2002 to 2007.

Post 2002 – Federal On the Books

USEPA Maximum Achievable Control Technology (MACT) Standards⁴¹: MACT is the level of control required for hazardous air pollutants (HAPs)^{42,43} under 42 U.S.C. § 7412 of the Clean Air Act. Specifically, 42 U.S.C. § 7412 of the Clean Air Act requires that emission standards for hazardous air pollutant (HAP) categories be promulgated on a 2-, 4-, 7- or 10-year schedule, but not later than 10 years after the date of the enactment of the Clean Air Act Amendments of 1990. The USEPA established these standards. Generally the MACT standard only applies to sources that are considered major sources of HAP, i.e., sources with plant-wide potential to emit more than 10 tons per year of any individual HAP or 25 tons per year of aggregate HAPs. HAPs are substances that cause serious health effects. These health effects include cancer, birth defects, nervous system problems and death due to massive accidental releases.⁴⁴ Several of the regulated HAPs are also VOCs, which are precursors to the formation of ozone. Therefore, a reduction in HAPs can also lead to a reduction in VOCs.

³⁷ 60 Fed. Reg. 34581 (July 3, 1995).

³⁸ *ibid*; Model year 1997 is defined as “The 1997 model year will run from January 2, 1996 to December 31, 1997.”

³⁹ 64 Fed. Reg. 15207 (March 30, 1999).

⁴⁰ 65 Fed. Reg. 24268 (April 25, 2000).

⁴¹ For a list of all the MACT standards, visit USEPA’s Air Toxics website at <http://www.epa.gov/ttn/atw/mactfnlalph.html>.

⁴² Substances listed in 1990 Clean Air Act Title I, Sec. 112(b).

⁴³ For more information, visit the USEPA’s Air Toxics website at <http://www.epa.gov/ttn/atw/mactfnlalph.html>.

⁴⁴ United States Environmental Protection Agency’s Plain English Guide to the Clean Air Act, April 1993.

Industrial Boiler/Process Heater MACT: On September 13, 2004, the USEPA established a MACT that applies to industrial, commercial, and institutional units firing solid fuel (coal, wood, waste, biomass) which have a design capacity greater than 10 MMBtu/hr and are located at a major source of HAPs.⁴⁵ See the discussion on HAPS under USEPA MACT Standards.

Clean Air Interstate Rule(CAIR): CAIR is the USEPA's attempt to address the interstate transport of ozone and fine particulate precursors by requiring emission reductions of sulfur dioxide (SO₂) and oxides of NO_x. The CAIR expects to obtain these reductions from large electric generating units (EGUs greater than 25 MW) through three cap-and-trade programs: ozone season NO_x, annual NO_x and annual SO₂. The CAIR ozone season NO_x cap and trade program essentially replaces the NO_x Budget Program with lower caps and an expanded geographical region to the south and west of the NO_x SIP Call region. The CAIR also creates new annual NO_x and SO₂ cap and trade programs. New Jersey is adopting new rules for the CAIR NO_x Trading Program in the summer of 2007, which will allow New Jersey to allocate NO_x allowances to New Jersey sources with similar equations used in the NO_x Budget Program beginning 2009.

Refinery Enforcement Initiative: The USEPA and various state and local agencies have negotiated, or are in the process of negotiating, Consent Decrees with the major refineries on the East Coast to elicit emission reductions from five major refinery processes. The processes are Fluid Catalytic Cracking Units (FCCUs) and Fluid Coking Units (FCUs), Process Heaters and Boilers, Flare Gas Recovery, Leak Detection and Repair (LDAR), and Benzene/Wastewater. The New Jersey refineries impacted by the settlements include Sunoco, Conoco Phillips, Valero, and Citgo Asphalt Refining Company.

For FCCUs/FCUs, the Consent Decree control requirements generally require the installation of wet gas scrubbers for SO₂ control, and selective catalytic reduction (SCR), selective non-catalytic reduction (SNCR), or optimization studies to reduce NO_x emissions.

For process boilers/heaters, the control requirements for SO₂ emissions generally require the elimination of burning solids/liquid fuels. For NO_x emissions, the control requirements generally apply to units greater than 40 MMBtu per hour capacity or larger. In many cases, the Consent Decrees establish NO_x emission reduction objectives across a number of refineries that are owned by the same firm. Therefore, the companies have some discretion in deciding which individual boilers/heaters to control as well as the control techniques to apply.

The Consent Decrees also included enhanced leak detection and repair programs (e.g., reducing the defined leak concentration) increased monitoring frequency, and other requirements.

Finally, the settlements are expected to produce additional SO₂, NO_x and VOC emissions reductions for flare gas recovery and wastewater operations. While the Consent Decrees

⁴⁵ 69 Fed. Reg. 55217 (September 13, 2004).

have various phase-in dates, significant emission reductions from five major refinery processes are expected prior to the 2009 ozone season.

4.3 Beyond On The Way Controls

The following sections discuss how state beyond on the way (BOTW) measures (both regional initiatives and state only) were identified and provides descriptions of the BOTW measures included in the State's attainment demonstration and RFP demonstration.

4.3.1 Identifying Measures

New Jersey participated in a wide variety of processes aimed at identifying viable control measures that could be implemented in time to help the State reach its 8-hour ozone attainment goal by June 15, 2010. The following section briefly discusses those processes, and the measures identified as viable through those processes that the State is moving forward to propose.

4.3.1.1 Regional Activities

New Jersey is an active member of four regional organizations, each with a unique focus with respect to either geographic area, air pollution concern or both. These organizations include:

The Ozone Transport Commission (OTC), a multi-state organization created under the Clean Air Act to advise the USEPA on ozone transport issues and develop and implement regional solutions to the ground-level ozone problem in the Northeast and Mid-Atlantic regions.

Mid-Atlantic Regional Air Management Association (MARAMA), a non-profit association of ten state and local air pollution control agencies whose mission is to strengthen the skills and capabilities of member agencies and to help them work together to prevent and reduce air pollution in the Mid-Atlantic Region.

Northeast States for Coordinated Air Use Management (NESCAUM), a nonprofit association of air quality agencies in the Northeast designed to provide scientific, technical, analytical, and policy support to the air quality programs of the eight Northeast states.

The Mid-Atlantic/Northeast Visibility Union (MANE-VU), which was formed by the Mid-Atlantic and Northeastern states, tribes, and federal agencies to coordinate regional haze planning activities for the region.

All of these organizations had an active role in the technical support work associated with this proposed SIP revision. MANE-VU supported the regional inventory work that was utilized in the regional modeling effort (see Chapter 5). NESCAUM focused on control

measures more closely linked with fine particulate matter (PM_{2.5}) and regional haze reductions (mainly low sulfur fuel for industrial commercial and residential facilities). The OTC and MARAMA coordinated regional control measure identification efforts specific to ozone reductions. Their efforts and the results of those efforts are summarized in the following sections.

4.3.1.2 Ozone Transport Commission (OTC)

New Jersey worked with other jurisdictions in the Ozone Transport Region to explore reasonable control measures for potentially significant emission reductions. To accomplish this, the OTC staff and member jurisdictions formed workgroups to: 1) review mobile, point, and area source categories, 2) identify candidate source categories, and 3) consider potential control strategies for those source categories to reduce NO_x, VOC and SO₂ emissions.

Each OTC workgroup focused on a different sector (mobile/point/area) and compiled a list of viable control measures from sources published by the USEPA and various regional associations, OTC member state-specific control strategies already in place, and emission control initiatives from states outside the Ozone Transport Region, such as California. Then using 2002 emission inventories as the base year, the workgroups determined projected 2009 emission reductions based on currently existing controls including Federal rules, adoption of previous OTC model rules by member jurisdictions, enforcement settlements, and other state-specific control measures, and incorporated estimated growth of inventories. Based on the review of the list of control measures and the emission inventories, the workgroups developed a preliminary list⁴⁶ of candidate control measures thought to be most effective in reducing emission levels throughout the ozone transport region.

From this preliminary list, the OTC workgroups developed white papers, summarizing key facts about the relevant control alternatives. The white papers provided information such as descriptions of source categories and candidate control measures, 2002 base year emissions, 2009 projected emissions after implementation, preliminary cost estimates, current federal and state regulations, recommended method of implementation, applicability and geographic impact. Some of the papers reflected inter-regional efforts such as those by the MARAMA for refineries, and the NESCAUM for heating oil, and super-regional discussions with the Midwest Regional Planning Organization (MWRPO) regarding Industrial, Commercial and Institutional (ICI) boilers and Electric Generating Units (EGUs). Using a scale of recommendations from 1 (definitely recommended) to 5 (not recommended), the member jurisdictions ranked the relative importance of the source categories and control strategies based on a qualitative assessment of the information presented in the white papers. After consideration of the estimated costs and magnitude of reductions potentially achievable for the selected emission sources, the OTC member jurisdictions identified reasonable control measures for a variety of source categories. Both during and after the ranking process, the OTC received written

⁴⁶ To review the preliminary list of OTC-identified control measures that were further evaluated for potential emission reductions, see the OTC web site at <http://www.otcair.org/document.asp?fview=Report>.

comments from stakeholders, held public meetings, and interfaced with impacted industries to better understand the source categories and how to regulate them effectively. The final list of source categories recommended by OTC for member jurisdictions to consider for emission reductions in developing their 8-hour ozone SIPs are presented in Table 4.3.

Table 4.3: Final OTC Control Measure Source Categories⁴⁷

Sector	Source Category
Area	Adhesives, Sealants, Adhesive Primers, and Sealant Primers (Industrial)
Area	Cutback and Emulsified Asphalt Paving
Area	Consumer Products
Area	Portable Fuel Containers
Area and Point	Asphalt Production Plants
Area and Point	Industrial/Commercial/Institutional (ICI) Boilers >250 MMBtu/hour
Area and Point	ICI Boilers 100-250 MMBtu/hour
Area and Point	ICI Boilers 25-100 MMBtu/hour
Area and Point	ICI Boilers <25 MMBtu/hour
Point	Glass Furnaces
Point	Cement Plants
Onroad Mobile	Diesel Truck Chip Reflash
Onroad Mobile	Regional Fuel based on Reformulated Gasoline Options

Those unshaded source categories in Table 4.3 are included for consideration in New Jersey’s SIP revision entitled “Reasonably Available Control Technology (RACT) for the 8-Hour Ozone National Ambient Air Quality Standard (NAAQS) and other Associated State Implementation Plan (SIP) Revisions for the Fine Particulate Matter National Ambient Air Quality Standard (NAAQS), Regional Haze, and the Clean Air Act Requirements on Transport of Air Pollution,” which was finalized on August 1, 2007. The shaded categories are not included in New Jersey’s RACT SIP. A hearing on the proposed SIP revision was held on March 19, 2007, and New Jersey reviewed and responded to the comments received from the public on those RACT-related control measures. For more on New Jersey’s RACT process, see Section 4.3.1.4.3. It is anticipated that New Jersey’s RACT rules will be proposed shortly after the SIP adoption, which occurred on August 1, 2007.

For three of the OTC measures (adhesives and sealant, consumer products and portable fuel containers), the OTC drafted model rules. In addition, the NESCAUM developed a model rule for diesel chip reflash for state use, and this program was included in the OTC’s final Technical Support Document. For the remaining measures shown in Table 4.3, the OTC developed emission limits and rule specification guidance. Finally, the

⁴⁷ The following programs that are listed in Table 4.3 are not discussed in New Jersey’s final SIP document: 1) Regional Fuel based on Reformulated Gasoline Options is not discussed because there is already a mandatory program required by Section 211(k) of the Clean Air Act in New Jersey. 2) Cement Plants are not discussed because there are no cement plants in New Jersey. 3) Diesel Chip Reflash is not discussed because the OTC states, including New Jersey, are considering possible actions to increase the number of chip reflash installations of HDDVs in the Northeast.

OTC member states recently signed a Memorandum of Understanding (MOU) (Appendix C1) that addresses emissions associated with high electrical demand days (HEDD) to compliment already existing and future cap-and-trade programs with respect to electrical generation. This regional HEDD program will address the peak load emissions from the electrical generation sector on a seasonal basis. A brief summary of all the OTC-identified control measures is included in the following subsection. For more information about the OTC control measure identification process, or the control measures identified for implementation through this process, please see Appendix C2.

New Jersey and other OTC member jurisdictions have resolved to pursue necessary and appropriate rulemakings to implement the emission reduction percentages, emission rates or technologies for the categories listed in Table 4.3 that are consistent with guidelines found in OTC Resolution 06-02 adopted on June 7, 2006, and amended on November 15, 2006, found in Appendix C3, as well as the High Electrical Demand Days MOU found in Appendix C1. The suggested compliance date for these guidelines is January 1, 2009, or as soon as practicable.

OTC Identified Beyond on the Way (BOTW) Measures:

Consumer Products 2009 Amendments: As discussed in Section 4.2.1, on May 3, 2004, New Jersey adopted amendments to its consumer product rules at N.J.A.C. 7:27-24 based on the OTC 2001 model rule. The OTC prepared amendments to their 2001 model rule based on the CARB 2005 amendments. New Jersey plans to propose amendments to its existing rule based on the OTC 2007 model rule. In July 2005, the CARB amended their consumer products rules. The new amendments to the CARB rule affected 18 categories of consumer products (14 new categories, including subcategories, with new product category definitions and VOC limits; one previously regulated category with a more restrictive VOC limit; and two previously regulated categories with additional requirements) such as electrical cleaners, footwear or leather care products, and toilet/urinal products. The OTC 2007 model rule does not include CARB's regulation for the second tier shaving gels and antistatic aerosols. For more details on this future rulemaking, see Appendix C2 and the OTC 2007 model rule.⁴⁸

Portable Fuel Containers 2009 Amendments: As discussed in Section 4.2.1, on May 3, 2004, New Jersey adopted new rules to regulate PFCs at N.J.A.C. 7:27-24 based on the OTC 2001 model rule. Subsequent to New Jersey adoption, the CARB adopted a second set of amendments to its PFC rules in two phases. The OTC prepared amendments to their 2001 model rule based on the CARB 2006 amendments. New Jersey plans to propose amendments to its existing rule based on the OTC 2007 model rule.

The first phase of CARB amendments was filed on January 13, 2006, and became effective on February 12, 2006. For Phase I, the CARB amended their PFC regulation to address the use of utility jugs and kerosene containers that are sometimes used by consumers for gasoline. The second phase of the amendments was filed on September

⁴⁸ The OTC 2007 model rule is available at http://www.otcair.org/projects_details.asp?FID=99&fview=stationary

11, 2006, and became effective on October 11, 2006. These amendments include the following:

1. Eliminate the requirement for an auto shutoff.
2. Eliminate fuel flow rate and fill level standards.
3. Eliminate one opening standard.
4. Establish a certification program for PFCs.
5. Change permeability standard from 0.4 grams ROG /gallon-day to 0.3 grams/gallon-day.

In addition, in February 2007, the USEPA finalized a national regulation to reduce hazardous air pollutant emissions from mobile sources, which is comparable to the CARB rules for gasoline PFCs. For more details on this future rulemaking, see Appendix C2 and the OTC 2007 model rule.⁴⁹

Adhesives and Sealants: Adhesives and sealants are used in product manufacturing, packaging, construction, and installation of metal, wood, rubber, plastic, ceramics, or fiberglass materials. An adhesive is any material used to bond two surfaces together. A sealant is a material with adhesive properties that is used primarily to fill, seal, waterproof or weatherproof gaps or joints between two surfaces. VOC emissions in this category are primarily from industrial and commercial operations, such as wood product manufacturers, upholstery shops, adhesive retailers, and architectural trades, such as building construction, floor covering installation and roof repair.

The Federal, CARB, OTC and NJDEP consumer products rules, discussed in Section 4.2.1 and in the preceding paragraphs, regulate “household” adhesives. The OTC developed a model rule in 2007, based on CARB’s 1998 model rule. New Jersey plans to propose new adhesive and sealant rules based on the OTC 2007 model rule. In December 1998, the CARB developed a model rule for adhesives and sealants sold in larger containers and used primarily in commercial and industrial applications, titled “Determination of Reasonably Available Control Technology (RACT) and Best Available Retrofit Control technology (BARCT) for Adhesives and Sealants.” The CARB model rule regulates the application of adhesives, sealants, adhesive primers and sealant primers by providing options for applicators to either use a product with a VOC content equal to or less than a specified limit or to use add-on controls. The rule also sets VOC limits for certain categories of adhesives and sealants, has requirements for cleanup solvents, and surface preparation solvents and requires that VOC containing materials must be stored or disposed of in closed containers. For more details on this future rulemaking, see Appendix C2 and the OTC 2007 model rule.⁵⁰

⁴⁹ *ibid.*

⁵⁰ *ibid.*

Asphalt Paving: Asphalt is used to pave, seal and repair surfaces such as roads, parking lots, driveways, walkways and airport runways. Asphalt paving is grouped into three general categories: hot-mix, cutback, and emulsified. Hot-mix asphalt is the most commonly used asphalt. Hot-mix asphalt produces minimal VOC emissions because its organic components have high molecular weights and low vapor pressures. Cutback asphalt is used as a tack coat between old and new layers of hotmix asphalt, in seal operations, in priming new roadbeds for hot-mix applications and in cold-mix applications for pavement repair. Emulsified asphalt is used in most of the same applications as cutback asphalt, but is a lower VOC alternative to cutback asphalt. In December 1977, the USEPA published a Control Technique Guideline (CTG) for the use of cutback asphalt. The CTG recommended replacing cutback asphalt binders with emulsified asphalt during the ozone season. In 1979, the USEPA added a specification for emulsified asphalt to its CTG recommendations to limit the content of oil distillate in emulsified asphalt to no higher than 7 percent oil distillate.

The NJDEP plans to propose amendments to its rules at N.J.A.C. 7:27-16.19 in order to lower VOC emissions from cutback and emulsified asphalt paving applications. The existing rule, based on the the USEPA CTG, bans cutback and emulsified asphalt use from April 16 through October 14, unless:

- they are used solely as a penetrating prime coat;
- the material is a cold-mix, stockpile material used for pavement repair;
- the user can demonstrate that there are no emissions of VOCs from the asphalt under conditions of normal use; or,
- the emulsified asphalt contains no greater than eight percent VOC by volume and is used for mixed-in-place construction.

The proposed amendments, based on OTC guidance, would ban the use or application of cutback asphalt or emulsified asphalt from April 15 through October 15, unless the emulsified asphalt contains no greater than 0.1 percent VOC; or the emulsified asphalt produces no greater than 0.5 milliliter of oil distillate, in accordance with American Society for Testing and Materials (ASTM) Test Method D 244 or American Association of State Highway and Transportation Officials (AASHTO) Test Method T 59. For more details on this future rulemaking, see Appendix C2.

Asphalt Production: Asphalt is a material produced by mixing and heating bituminous substances with gravel, crushed rock or similar materials, and used as a coating or paving. Two types of plants produce asphalt: drum mix and batch mix. In a drum mix asphalt plant, the asphalt cement or other binder is added to the aggregate while the aggregate is in a rotary dryer. In a batch type asphalt plant the asphalt cement or other binder is mixed with the aggregate in equipment other than a rotary dryer. The dryer operation is the main source of pollution at asphalt manufacturing plants. New Jersey has 51 production plants with 70 dryers with rotary dryer burner capacities typically ranging from 40 MMBtu/hr, to as large as 150 MMBtu/hr that generally use natural gas, fuel oil and/or waste oil. The reaction of nitrogen and oxygen in the dryer creates NO_x emissions in the combustion zone. New Jersey's existing rules limits NO_x emissions from a drum mix or batch type asphalt plant to 200 parts per million by volume dry basis (ppmvd) at seven percent oxygen.

The NJDEP plans to propose amendments to its rules at N.J.A.C. 7:27-19.9 in order to lower NO_x emissions from asphalt production facilities. The proposed amendments, based on OTC guidance, would pursue control measures to achieve at least a 35% reduction of NO_x emissions from asphalt production plants from current levels, with the inclusion of emission limits based on type of fuel combusted and implementation of Best Management Practices (BMP) requirements. The OTC guidance is based on emission rates and percent reductions typically achieved from the installation of low NO_x burners (LNB) and flue gas recirculation (FGR) to reduce NO_x emissions from asphalt plants. A low NO_x burner reduces NO_x by controlling aspects of the combustion process. In flue gas recirculation, the flue gas is cooled and then used to assist in cooling the combustion temperature, which in turn reduces the NO_x generated. The implementation of Best Management Practices would allow for substantial reductions in fuel consumption and the corresponding products of combustion including NO_x. Best Management Practices include annual combustor tune-ups, effective stockpile management to reduce aggregate moisture content, lowering mix temperature, and other maintenance and operational best practices. For more details on this future rulemaking, see Appendix C3.

Glass Manufacturing: The glass manufacturing process requires that raw materials, such as sand, limestone, soda ash, and cullet (scrap and recycled glass), be fed into a furnace at temperatures between 2,700 degrees Fahrenheit to 3,100 degrees Fahrenheit. The raw materials then chemically react creating the molten material known as glass. The main product types are flat glass, container glass, pressed and blown glass, and fiberglass. New Jersey's seven manufacturing plants operate 25 glass manufacturing furnaces (GMFs), of which, one plant manufactures fiberglass and the other six manufacture container-type glass. There are no flat glass facilities operating in New Jersey at this time.

The reaction of nitrogen and oxygen in the furnace creates NO_x emissions. New Jersey's current NO_x emission limits for a glass manufacturing furnace used to produce a container-type glass is 5.5 pounds (lbs) NO_x per ton of pulled glass and 11 lbs NO_x per ton of pulled glass for specialty container glass.⁵¹ Pulled glass is the total output from the furnace and includes the glass produced, including the rejected glass. New Jersey's existing rule does not specify a NO_x emissions limit for a glass manufacturing furnace used to produce flat glass. The NJDEP would require any new flat glass applicant to include state of the art (SOTA) controls.

New Jersey plans to propose amendments its current glass manufacturing rules at N.J.A.C. 7:27-19.10. The proposed amendments, based on OTC guidance, would revise the NO_x emission rates to reduce emissions consistent with the installation of oxy-fuel firing at the time of the next furnace re-build. Although several alternative NO_x control technologies exist, including combustion modifications (low NO_x burners, oxy-fuel firing, oxygen-enriched air staging), process modifications (fuel switching, batch preheat,

⁵¹ "Specialty container glass" means clear or colored glass made of soda-lime recipe, which is produced to meet the specifications of any standard set forth by The United States Pharmacopeia or The National Formulary, and which is used for pharmaceutical, cosmetic or scientific purposes.

electric boost), and post combustion modifications (fuel reburn, SNCR, SCR), oxyfiring is considered the most effective because it not only reduces NO_x emissions by as much as 85 percent, but also reduces energy consumption, increases production rates by 10-15 percent, and improves glass quality by reducing defects. In addition, oxyfiring is demonstrated technology and has penetrated into all segments of the glass industry. Of New Jersey's 25 glass manufacturing furnaces, four are already equipped with oxy-fuel firing and nine are electric. For more details on this future rulemaking, see Appendix C2.

Certain Categories of ICI Boilers: Industrial/commercial/institutional (ICI) boilers combust fuel to produce heat and process steam for a variety of applications, including chemical, metals, paper, petroleum, and food production industries, and for space heating in office buildings, hotels, apartment buildings, hospitals, and universities. Industrial boilers are generally smaller than boilers in the electric power industry, and typically have heat inputs in the 10-250 MMBtu/hr range; however, industrial boilers can be as large as 1,000 MMBtu/hr or smaller than 1 MMBtu/hr. Most commercial and institutional boilers have a heat input less than 100 MMBtu/hr. In New Jersey, 70 percent of the population is smaller than 50 MMBtu/hr. For emission inventory purposes, emissions from ICI boilers are included in both the point and area source emission inventories. Generally, the point source emission inventory includes all ICI boilers at major facilities and lists individual boilers, along with their size and associated emissions. The area source inventory generally includes emissions from ICI boilers located at minor facilities and does not provide emissions by the size of boiler, as is done in the point source inventory. Instead, the emissions are calculated based on the fuel use not accounted for in the point source inventory.

Currently, New Jersey ICI boilers are regulated according to size, fuel and boiler type. New Jersey's existing NO_x rules generally apply only to ICI boilers at least 50 MMBtu/hr located at major sources (i.e., point sources). ICI boilers at minor sources (i.e., area sources) are not subject to the maximum allowable emission rates, but are required to adjust the combustion process annually in boilers as small as 5 MMBtu/hr, effective as of 2010.

New Jersey plans to propose amendments to its current ICI boiler rules at N.J.A.C. 7:27-19.7. The proposed amendments would revise the NO_x emission limits for both point and area source ICI boilers.

Under the proposed amendments, owners and operators of any ICI boilers as small as 25 MMBtu/hr would be required to achieve emission limits specified in the rules. For more details on this future rulemaking, see Appendix C2.

High Electrical Demand Days Program: In March 2007, following a year long process, six of the OTC states committed to pursue reductions in NO_x emissions from electrical generating units that primarily operate on high electrical demand days (HEDD) starting with the 2009 ozone season.⁵² On these high electric demand days, increased power generation is needed, usually on short notice. In Connecticut, Delaware, Maryland and Pennsylvania, boilers and turbines that primarily run to follow electrical load needs supply HEDD power generation. In New Jersey and New York, combustion turbines primarily supply HEDD power generation. The majority of the HEDD units in the six states are not controlled and produce significant NO_x emissions on HEDDs. For example, on a typical summer day (June 4, 2005), NO_x emissions for the six states for all Electric Generating Units (EGUs) were 551 tons per day (tpd). On a HEDD (July 26, 2005), NO_x emissions were 1,349 tpd. Most of this increase in emissions is due to power production from uncontrolled HEDD units.

As part of the HEDD initiative, New Jersey plans to reduce NO_x emissions by 19.8 tpd on these high electrical demand days. Specifically, power generators in New Jersey will be responsible for securing these reductions and will be required to submit a plan on how they will reduce NO_x. The generators will have flexibility in securing the 2009 reductions. New Jersey also plans to require that all HEDD units meet performance standards that reflect modern low NO_x technology by May 1, 2015.

4.3.1.3 MARAMA

The MARAMA states concentrated their efforts on identifying and analyzing emissions from all refinery processes to help states with refineries develop their SIPs for ozone, fine particles, and regional haze. The MARAMA Refinery Technical Oversight Committee (TOC), assisted by MACTEC Federal Programs, Inc., evaluated emissions and existing requirements for each type of source found at fourteen (14) petroleum refineries in the MARAMA area. Based on that preliminary review, the TOC selected catalytic and thermal cracking units, boilers and process heaters, flares, equipment leaks, wastewater treatment, storage tanks and sulfur recovery plants for further consideration.

MARAMA evaluated emissions, existing requirements, including recent Consent Decrees from 10 of the 14 identified refineries, available control technology options, and typical installation costs for each category. As a result of this study, MARAMA, assisted by MACTEC Federal Programs, Inc., developed three Model Rules for cracking units, flares and enhanced monitoring of equipment leaks at petroleum refineries. As part of this regional effort to attain the 8-hour ozone standard, the State of New Jersey expects to propose new rules based in part on MARAMA's model rules.⁵³

⁵² Memorandum of Understanding Among the States of the Ozone Transport Commission Concerning the Incorporation of High Electrical Demand Day Emission Reduction Strategies into Ozone Attainment State Implementation Planning. Ozone Transport Commission, March 2, 2007.

⁵³ The MARAMA model rules are posted at <http://www.marama.org> for public review.

A brief summary of all the MARAMA-identified control measures is included in the following subsections. For more information about the MARAMA control measure identification process, or the control measures identified for implementation through this process, please see Appendix C4.

MARAMA-Identified Beyond on the Way (BOTW) Measures:

Refineries - Fluid Catalytic Cracking Units (FCCUs): Catalytic cracking units convert middle distillate, gas oil and residuum into primarily gasoline, jet and diesel fuels by using a series of processing steps that literally “crack” large, heavy molecules into smaller, lighter ones. Heat and catalyst are used to convert the heavier oils to lighter products. With fluid catalytic cracking (FCC), a fluidized catalyst is used to optimize the cracking process. Fluid catalytic cracking unit systems are the most widely used cracking process in the MARAMA region and are among the largest air emission sources at the refinery. New Jersey has four gasoline-producing refineries with fluid catalytic cracking units. These refineries are major facilities with Title V Operating Permits, and all emit large quantities of criteria pollutants (SO₂, NO_x, VOCs, carbon monoxide and coarse particulate matter (PM₁₀)) as well as hazardous air pollutants (HAPs). New Jersey currently regulates emissions from fluid catalytic cracking units at N.J.A.C. 7:27-19.13.

MARAMA’s model rule for FCCUs, which will be the basis for New Jersey’s proposed regulatory amendments, includes emissions limits for particulate matter, SO₂, NO_x, and carbon monoxide. The MARAMA Technical Oversight Committee chose to use the most stringent limits based on recent Consent Decrees or rules in other jurisdictions. Feasible control technologies are summarized in Table 2-6 of their Final Report.

Refineries – Flares: Petroleum refinery flares are intended to be last-resort control devices used to safely dispose of flammable waste gases from emergency process upsets, as well as during start-up, shutdown and turnaround operations. The combustion of these gases can emit large quantities of NO_x, SO₂, and carbon monoxide into the atmosphere and are believed to be underestimated. New Jersey currently regulates emissions from refinery flares at N.J.A.C. 7:27-16.13.

MARAMA’s model rule for petroleum refinery flares, which will be the basis for New Jersey’s proposed regulatory amendments, includes the control measures designed to reduce NO_x, SO₂, VOC, and carbon monoxide emissions. Specifically, the model rule includes requirements for the owner/operators of refinery flares to operate and maintain a flare gas recovery system, and to eliminate the flaring of routinely generated refinery fuel gases. Other items included in MARAMA’s flare model rule include operational requirements, monitoring system requirements and guidelines for calculating flare emissions. Control technology options for flares are summarized in Table 4-5 of the Final Report.

Refineries - Fugitive Equipment Leaks: Equipment leaks are defined as emissions of VOC from pumps, compressors, pressure relief devices, sampling connection systems, open-ended or in-line valves, and instrumentation systems. Equipment leaks contribute

to plant-wide emissions of fugitive VOCs at petroleum refineries. Leak Detection and Repair (LDAR) programs can reduce these fugitive emissions. New Jersey currently regulates equipment leak emissions at N.J.A.C. 7:27-16.18.

MARAMA's model rule for equipment leaks, which will be the basis for New Jersey's proposed regulatory amendments, includes pursuing:

- the enhanced LDAR standards (i.e., standards based on program elements contained in recent Consent Decrees which are generally more stringent measures than existing the federal or State LDAR requirements); and,
- recordkeeping and reporting requirements.

Some of the recommended elements of the enhanced LDAR program include:

- written facility-wide LDAR procedures;
- training of assigned personnel;
- internal and third party audits;
- more stringent leak definitions;
- increased monitoring frequency;
- corrective action for "chronic leakers";
- electronic storing and reporting of data;
- additional Quality Assurance/Quality Control requirements; and,
- routine inspection of external floating roof storage tanks.

A summary of the available control technologies for fugitive equipment leaks can be found at Table 5-2 of the Final Report.⁵⁴

4.3.1.4 State Specific Efforts

In addition to New Jersey's participation in the regional control measure identification efforts, the State implemented its own outreach initiative, entitled "Reducing Air Pollution Together." "Reducing Air Pollution Together" was designed to gather control measure ideas and suggestions from the New Jersey public, regulated communities, and other interested parties. In addition, the NJDEP, as required by the Clean Air Act, completed its own internal RACT analysis, to identify viable controls for major stationary sources within the State. Both of these efforts, as well as the control measures identified from them, are discussed in greater detail below.

4.3.1.4.1 New Jersey Workgroup Efforts

The NJDEP began a collaborative effort to discuss the air quality challenges facing New Jersey by hosting a public workshop on June 29, 2005. This workshop served to initiate a dialogue between the NJDEP and interested and affected parties about reducing emissions in order to improve air quality in New Jersey. Over 200 persons representing various industries, environmental and civic groups attended. As a result of the "Reducing Air Pollution Together" workshop, the following six air quality workgroups were formed and collaborated over several months to develop recommendations on how to reduce air emissions from their specific source categories:

⁵⁴ *ibid*, page ES-5.

- Diesel Initiatives
- Gasoline Cars and Trucks
- Homes and Restaurants
- Non-Automobile Gasoline Engines
- Stationary Combustion Sources
- Volatile Organic Compounds from Industrial Processes and Consumer Products

The workgroups identified potential control measures to reduce NO_x, VOC, PM_{2.5}, and VOC emissions for possible inclusion in the State's upcoming SIP revisions. Through the cooperative efforts of the NJDEP, federal agencies, industry, consultants, environmental groups, and other members of the regulated community, the workgroups evaluated available emission inventories, technical information and field data to develop lists of potential air emission control strategies related to their topic area. The criteria used by the workgroups to prioritize control measures included technical feasibility, economic feasibility, environmental benefits, and implementation feasibility. The air quality workgroups compiled their recommendations into reports that were submitted to the NJDEP for further consideration on October 31, 2005. The workgroups presented a summary of their recommendations to the NJDEP's Air Quality Management Team on November 14, 2005. This event was another opportunity for the NJDEP staff and workgroup members to discuss the workgroup recommendations.

The NJDEP's workgroup leaders and facilitators met with the NJDEP's Air Quality Management team to review the over 200 workgroup recommendations and identify those control strategies with significant potential emissions reductions. After culling that list down to 60 potential control measures, the NJDEP then generated white papers⁵⁵ for each measure. These white papers were posted on the NJDEP's website for public review and comment. The NJDEP made revisions to individual white paper where appropriate, based on comment and/or additional information. In addition, the NJDEP invited the public, representatives from local businesses, industry and environmental groups, and others to a follow-up workshop to discuss potential emission reduction strategies on May 17, 2006. The purpose of that workshop was for the NJDEP to provide an update on efforts during the past year to address air quality challenges facing New Jersey and to share preliminary regulatory and nonregulatory plans to reduce air emissions. Following the May 17, 2006 workshop, the public was asked to provide feedback on the workshop, and on the 60 white papers drafted by the NJDEP and discussed at the workshop.⁵⁶

Many of the white paper measures are the same as those identified through the OTC and MARAMA effort, and the State's own RACT and Reasonably Available Control Measure (RACM) analyses, discussed in more detail in Section 4.3.1.4.3 and Chapter 7, respectively. The remainder of the measures identified will continue to be used as a

⁵⁵ A complete list of white papers, with links to the actual papers, can be found at www.nj.gov/dep/airworkgroups/docs/wp_summary_table_web.xls.

⁵⁶ Comments received on the white papers are posted at www.nj.gov/dep/airworkgroups/comments.html.

resource in the future, to help the State decide which strategies to include in its upcoming PM_{2.5} and regional haze SIP.

4.3.1.4.2 New Jersey Board of Public Utilities (BPU) Energy Master Plan Efforts

On October 3, 2006, Governor Jon S. Corzine announced the commencement of an interagency planning process that will culminate in an energy master plan, a long-term energy vision for the state that plans for the state's energy needs through 2020.⁵⁷ New Jersey is statutorily required to prepare an Energy Master Plan every 10 years and to update the plan every three years.⁵⁸ The most recent Energy Master Plan was published in 1991 and updated in 1995 in response to the introduction of wholesale competitive electricity markets in the region.⁵⁹

The Energy Master Plan will address three areas: security, safety, and reliability of prices of energy supply and services; economic impact of energy production, transportation, and end use; and environmental impact associated with the production of energy.⁶⁰ The main goal of the Energy Master Plan is to reduce projected energy use by 20% by 2020 and meet 20% of the State's electricity needs with Class 1 renewable energy sources by 2020.⁶¹ Other goals of the Energy Master Plan are described below:

Goal 1: Secure, Safe, and Reasonably Priced Energy Supplies and Services – To provide safe, secure, reasonably priced energy supplies and services to New Jersey's commercial, industrial, transportation, and residential customers, while reducing dependence on traditional fossil fuels and fossil fuel generation, decreasing electric and natural gas transmission congestion, utilizing efficiency and renewable resources to supplement the State's energy resources, proactively planning for in-state electricity generation retirements, and reducing the demand for energy.⁶²

Goal 2: Economic Growth and Development – To encourage and maintain economic growth prospects for the State by recognizing and fostering the multiple functions of energy in the economy.⁶³

Goal 3: Environmental Protection and Impact – To promote the achievement of Federal and State environmental requirements and objectives in an effective and low-

⁵⁷ State of New Jersey Office of the Governor. *Governor Corzine Announces Initial Phase of Energy Master Plan*. Available at <http://www.nj.gov/governor/news/news/approved/20061003.html>. October 3, 2006.

⁵⁸ N.J.S.A. 52:27F-14

⁵⁹ State of New Jersey Energy Master Plan. *Planning for New Jersey's Energy Future*. Available at: <http://www.nj.gov/emp/about/>.

⁶⁰ op. cit., note 49

⁶¹ State of New Jersey Energy Master Plan. *Energy Master Plan Goals*. Available at: <http://www.nj.gov/emp/about/goals.html>.

⁶² ibid.

⁶³ ibid.

cost manner and, where possible, provide market-based incentives to achieve those goals.⁶⁴

Public participation began October 2006, with a series of stakeholder meetings held throughout the state. That continued with the formation of External Working Groups for energy categories. More than 250 people have attended Energy Master Plan meetings, offered input and ideas, and joined the listserv. Opportunities for public comment will be available when the draft Energy Master Plan is released on or before July 10, 2007. Public hearings are tentatively scheduled for the week of September 10, 2007. The completed Energy Master Plan is expected to be released by Governor Corzine October, 2007.⁶⁵

4.3.1.4.3 Reasonably Available Control Technology (RACT)

On August 1, 2007, the State finalized its 8-hour ozone RACT plan as part of a SIP revision. A hearing to accept public comment on the SIP proposal was held on March 19, 2007. The 8-hour ozone RACT analysis was conducted pursuant to Clean Air Act 42 U.S.C. § 7502 for the primary ozone precursors (VOCs and NO_x). However, in so much as NO_x, and to a lesser extent VOCs, also contribute to the formation of PM_{2.5}, the identified control measures will also result in PM_{2.5} emission reductions and regional haze benefits. Hence, New Jersey also plans to use this RACT analysis to meet the PM_{2.5} RACT analysis for those precursors for some source categories. Also, in the cases where the RACT analysis identified control measures will also reduce direct PM_{2.5} or SO₂ emissions, New Jersey stipulated that we would claim these co-benefits as part of its PM_{2.5} attainment demonstration SIP due in April of 2008. The RACT analysis identified a number of source categories where emission requirements needed to be updated based on technological advances. Many of these identified source categories are the same as those identified through the OTC and MARAMA effort. This includes asphalt production, asphalt paving, adhesives and sealants, glass manufacturing, ICI boiler (both area and point), and refinery processes. The remainder of this section discusses those RACT measures additionally identified through the New Jersey RACT analysis. In its RACT SIP revision, New Jersey committed to propose rule changes to implement those control measures identified as “reasonable” by the analysis.

Petroleum Storage Tanks: Some petroleum and VOC products are stored in large storage tanks that are capped with floating roofs. Evaporative VOC emissions from floating roof tanks are the result of standing storage and working losses. Standing storage losses are evaporative losses through rim seals, deck fittings, and or deck seams. Floating roof storage tanks move vertically on slotted guide pole legs. VOCs escape from gaps at the juncture of the roof and legs. Working losses, including landing losses,⁶⁶ are due to changes in the stored liquid levels due to filling and draining operations. There are

⁶⁴ *ibid.*

⁶⁵ State of New Jersey Energy Master Plan. *Planning New Jersey's Energy Future - Energy Master Plan Calendar*. Available at: <http://www.nj.gov/emp/calendar/>.

⁶⁶ “Landing losses” refer to emissions that occur from floating-roof tanks whenever the tank is drained to a level where its roof rests on its deck legs (or other supports).

several control techniques now available to limit emissions due to standing storage and working losses including vapor recovery systems, retrofitting slotted guidepoles with covers or sleeves, retrofitting to domed roof, and lower landing heights.

New Jersey currently regulates petroleum storage tank emissions at N.J.A.C. 7:27-16.2. The NJDEP will amend its existing rules to control VOC emissions from petroleum and VOC storage tanks as follows:

- Cover external floating roof tanks;
- Implement measures to reduce VOC emissions emitted during degassing, cleaning, and landing operations, and from slotted guidepoles;
- Apply to existing tanks the new source performance standards (NSPS) for floating roof seal and deck fitting specifications; and tank preventive inspection and maintenance requirements.

USEPA Control Technique Guidelines (CTGs): The USEPA provides guidance regarding what level of control may be RACT for a given source through control technique guideline (CTG). The Clean Air Act provides that nonattainment areas must revise their ozone SIPs to include RACT for VOC-emitting sources covered by a CTG document, either by adopting regulations to implement the recommendations contained in the CTGs, or adopting its own equivalent RACT level. The CTGs and alternative control techniques (ACTs) for VOC were completed over a period from the late 1970s to mid-1990s and, with few exceptions, have not been updated. However, on October 5, 2006, the USEPA finalized four new CTGs covering five categories: flexible packaging printing materials, lithographic printing materials, letterpress printing materials, industrial cleaning solvents, and flat wood paneling coatings. The USEPA further provided that states should submit their SIP revisions addressing these revised CTGs within one year of the date that the CTGs are finalized (that is, October 5, 2007).

An investigation of these revised CTGs shows that New Jersey has sources in these categories, and that, with the exception of industrial cleaning solvents, the CTGs' recommended control levels are more stringent than New Jersey's current regulations. The NJDEP is working on proposed amendments to its existing regulations at N.J.A.C. 7:27-16.7, Surface Coating and Graphic Arts operations, to address the recommendations contained in the final CTGs for these four source categories.

Case-by-Case VOC and NO_x Limit Determinations (FSELS/AELs): Existing RACT rules set performance standards for many source categories. Large facilities with major sources where no previous NJDEP RACT limit has been established in the RACT Rules (N.J.A.C. 7:27-16 and N.J.A.C. 7:27-19), i.e., sources without performance standards, must apply to the NJDEP for a Facility-Specific Emission Limit (FSEL). When a performance standard exists and the source determines it is not reasonable, they apply to the NJDEP for an Alternative Emission Limit (AEL). FSELS and AELs are determined on a case-by-case basis.

Currently, New Jersey has about 40 of these case-by-case FSEL/AEL determinations for sources throughout the State. New Jersey's FSEL and AEL provisions for volatile

organic compounds are found at N.J.A.C. 7:27-16.17. New Jersey's FSEL and AEL provisions for oxides of nitrogen are found at N.J.A.C. 7:27-19.13. Also, a similar case-by-case technology review is being added for BART-affected equipment, whether or not there are currently specific RACT limits in the RACT rules for these emission units. This will ensure that sources subject to RACT will also comply with BART.

As part of its RACT analysis, the NJDEP reviewed all of its existing FSELs and AELs and found that many were approved as long ago as 1997. In many cases, control technologies have advanced sufficiently since that time, warranting the reevaluation of these case-by-case determinations. The NJDEP proposes to require all facilities with existing FSELs or AELs to either comply with the existing or revised RACT limits, where applicable, or demonstrate that a new FSEL/AEL is warranted. The NJDEP further proposes that the newly issued AELs will terminate after a certain number of years, requiring periodic re-evaluations and determinations, in an effort to keep these limits current until compliance with specific rule emission limits are achieved.

4.3.1.4.4 Additional State Measures

There are additional State measures that, while not identified specifically in any of the regional or state control measure initiatives, have been, or will be, implemented in time to provide quantitative emission reductions prior to the summer of 2009. The remainder of this section discusses these measures:

Diesel Idling: Since diesel engines are significant contributors of ozone and fine particulate precursors in the State of New Jersey, any efforts to control and reduce those emissions contribute to the State's attainment of those NAAQS. On September 18, 2006, the NJDEP proposed amendments to the existing diesel idling rules.⁶⁷ These rules address the allowable idling duration for diesel-powered motor vehicles, and exemptions to that maximum idling limit. The proposed changes reduce the allowable exemptions to a three-minute diesel idling standard. Currently, there are exemptions to the idling limit which allow qualified vehicles to idle for an unlimited length of time under certain conditions. The proposed revisions to the rule modify these exemptions to further limit idling in cold weather; limit the idling time for vehicles that transport people; clarify the idling rules regarding trucks waiting in line; clarify the type of vehicle which would be considered an "emergency motor vehicle", and the times which would be considered "an emergency situation"; eliminate the exemption for idling while a vehicle is in for repairs that do not require the engine to be engaged to complete; eliminate the exemption for idling while attaching or detaching a trailer, should it take longer than the allowed three consecutive minutes; and phase out the exemption for sleeper berths.

⁶⁷ Control and Prohibition of Air Pollution from Diesel-Powered Motor Vehicles
Air Administrative Procedures and Penalties Proposed Amendments: N.J.A.C. 7:27-14.1, 14.3, 7:27A-3.10(m)14. New Jersey Department of Environmental Protection. September 18, 2006.

Diesel Inspection and Maintenance: Like the diesel idling efforts, the NJDEP requirements for the inspection and maintenance (I/M) of diesel vehicles are designed to reduce the emissions from diesel engines, which are significant contributors to ozone and fine particulate precursors. The NJDEP is currently working to propose amendments to its existing diesel I/M rules to reduce the allowable smoke from heavy-duty diesel vehicles. Smoke opacity, which is used as a surrogate for particulate matter, is the degree to which a plume of smoke will obstruct transmission of visible light. Smoke opacity is used as an indicator for mal-maintenance.

Currently available technology allows diesel engines to emit smoke at rates much lower than the existing cutpoints, when operating in accordance with the manufacturers' specifications. Therefore, it is appropriate to revise the heavy-duty diesel vehicle inspection program standards to reflect the current diesel engine technology and ensure appropriate maintenance is performed. Although newer diesel-powered vehicles and equipment usually operate more cleanly and may contribute less to air quality problems than their predecessors, diesel-powered trucks and buses tend to remain in service for 20 years or more. Unless the excess emissions due to mal-maintenance or lack of repair are reduced, trucks and buses will continue to emit excess levels of exhaust particles and contribute to air pollution in the State for many years to come. Implementing stricter opacity cutpoints for diesel-powered vehicles will require appropriate maintenance and reduce emissions.

Municipal Waste Combustors: New Jersey has five resource recovery facilities (RRF) located in Essex, Union, Camden, Gloucester, and Warren Counties, respectively. There are 13 municipal waste combustors (MWC) at these five facilities. The NJDEP approved FSELs pursuant to N.J.A.C. 7:27-19.13 for each of these MWCs to meet the 1-hour ozone NAAQS, because these facilities qualified as major facilities (i.e., those facilities with the potential to emit more than 25 tons of NO_x per year containing a source operation that has the potential to emit greater than 10 tons per year) and the State did not establish specific RACT source requirements for MWCs. The USEPA has adopted Federal Plans for both large and small MWCs. New Jersey is the delegated state authorized to implement and enforce those plans, in accordance with Memoranda of Agreement (MOAs) between the State and the USEPA. The Federal standard for emissions of NO_x from MWCs, as reflected in the Federal rules dated May 10, 2006, and previous Federal plans, is 205 ppm.⁶⁸ Currently, all New Jersey MWCs are in compliance with the Federal standard.

As part of its RACT analysis, the NJDEP reviewed the Municipal Waste Combustor FSELs and determined that, when equipped with selective non-catalytic reduction (SNCR), NO_x controls are capable of more NO_x reductions than are currently being achieved. The RACT SIP eliminates the various MWC FSELs and sets a more stringent source category NO_x emission limit, which will result in further NO_x emission reductions.

⁶⁸ 70 Fed. Reg. 75348 (May 10, 2006).

Refineries - Process Heaters and Boilers: Process heaters and boilers operating at petroleum refineries emit large amounts of NO_x, carbon monoxide, SO₂, and PM emissions. Boilers are designed to generate steam for use throughout the refinery, while process heaters burn fuels to transfer heat directly to process materials. Boilers and process heaters are similar in that they are indirect combustion devices that burn fuels such as natural gas, fuel oil, and refinery fuel gas. New Jersey currently regulates NO_x emissions from indirect heat exchangers at N.J.A.C. 7:27-19.7.

Available control technologies for controlling NO_x emissions from these units include Ultra Low NO_x Burners (LNB) and Selective Catalytic Reduction (SCR). These control technologies have been successfully applied to both types of equipment achieving emission reductions up to 90 percent. Recent enforcement settlements required some refineries to reduce NO_x emissions to 0.04 lbs NO_x/MMBtu. The NJDEP is proposing new amendments that would established a new maximum allowable NO_x emission rate for boilers and process heaters combusting refinery fuel gas.

New Jersey Low Emission Vehicle Program: The NJDEP's Low Emission Vehicle (LEV) program (or Clean Car Program) rule was adopted on November 28, 2005, with an operative date of January 27, 2006.⁶⁹ The rule requires all new vehicles offered for sale in New Jersey to be California certified for emissions beginning January 1, 2009. This rule also establishes a zero emission vehicle (ZEV) sales requirement for New Jersey and requires that each auto manufacturer's sales fleet in New Jersey meet a declining fleet average non-methane organic gas (NMOG) emission standard.

The rule is designed, in part, to encourage auto manufacturers to offer the ultra-low emitting California certified models in New Jersey prior to the 2009 mandatory compliance start date. Auto manufacturers delivering such vehicles to New Jersey can earn ZEV credits that can be used by manufacturers to help transition into the mandatory requirements in 2009 and beyond. Currently, 36 models are certified to the Partial ZEV (PZEV) or Advanced Tech PZEV (ATPZEV) standard, which will generate such credits if sold in New Jersey. There are 23,493 vehicles that have either received or are currently receiving ZEV credits in New Jersey.

4.3.1.5 Federal

The federal government plans to implement measures that will provide quantitative emission reductions prior to the summer of 2009. The remainder of this section discusses these measures.

Small Offroad Engine Rule: On May 18, 2007, the USEPA proposed new rules that would set stricter standards for most lawn and garden equipment and small recreational watercraft.^{70,71} Specifically, the proposal would establish new exhaust emission

⁶⁹ 38 N.J.R. 497(b) (January 17, 2006).

⁷⁰ 72 Fed. Reg. 28098 (May 18, 2007).

⁷¹ For more information about the proposal, visit USEPA's websites at Lawn and Garden <http://www.epa.gov/otaq/equip-ld.htm> for lawn and garden equipment and <http://www.epa.gov/otaq/marinesi.htm> for gasoline boats and personal watercraft.

standards that manufacturers are expected to meet using catalytic converters in many types of small watercraft, lawn, and garden equipment. This proposed rule also includes fuel evaporative standards for all the types of equipment and watercraft covered in the rulemaking. The new standards would apply as early as 2011 for most lawn and garden equipment (under 25 horsepower) and 2009 for watercraft. Comments on the proposal are due to USEPA by August 3, 2007.

4.4 Conclusions on Control Measures

The control measures discussed in this section make up the core of the State's 8-hour ozone attainment demonstration, demonstration of Reasonably Further Progress (RFP) and contingency measures. The use of these measures in each of those demonstrations, as well as how the benefits from the implementation of those measures were calculated, is discussed in Chapters 5, 6 and 8, respectively. Many of the benefits were determined from the USEPA MOBILE6 model and the USEPA Nonroad model, while other benefits were calculated manually. Most of the control measure benefits (quantitatively) were included in the attainment modeling. Those that were not included in the attainment modeling are listed and discussed in Chapter 5.

There are a host of other measures that have been, or will be, implemented in and around New Jersey whose benefits cannot be accurately estimated or quantified. These measures are described in Section 5.4.5. The State knows that these measures, while not quantified, are providing a benefit to the air quality in New Jersey, as well as its upwind states,⁷² and provide further evidence that the State will attain the 8-hour ozone health standard by its attainment date of June 15, 2010.

Table 4.4 shows a summary of New Jersey's control measures and how they are being used to meet SIP requirements.

⁷² Please see Chapter 9 for a discussion of the impact of New Jersey control measures on upwind states.

Table 4.4: Ozone Control Measure Summary

Control Measures	Attainment 2009 modeling ⁷³	Control Measures Not Captured in the 2009 Regional Modeling	2008 RFP	2009 RFP	RFP (2008) Contingency	Attainment (2009) Contingency	2012 Modeling
Pre-2002 with benefits achieved Post-2002 – On the Books New Jersey							
NOx Budget Program (SIP Call)			X				
NSR		X					
Pre-2002 with benefits achieved Post-2002 – On the Books Federal							
Residential Woodstove NSPS	X		X	X			X
Onroad Vapor Recovery (beyond Stage II)	X		X	X			X
Tier 1 Vehicle Program	X		X	X			X
National Low Emission Vehicle Program (NLEV)	X		X	X			X
Tier 2 Vehicle Program/Low Sulfur Fuels	X		X	X	X		X
HDDV Defeat Device Settlement	X		X	X			X
HDDV Engine Standards	X		X	X	X		X
Nonroad Diesel Engines	X		X	X			X
Large Industrial Spark-Ignition Engines over 19 kilowatts	X		X	X			X
Recreational Vehicles (includes snowmobiles, off-highway motorcycles and all-terrain vehicles)	X		X	X			X
Diesel Marine Engines over 37 kilowatts	X		X	X			X
Phase 2 Standards for Small Spark-Ignition Handheld Engines at or below 19 kilowatts	X		X	X			X
Phase 2 Standards for New Nonroad Spark-Ignition Nonhandheld Engines at or below 19 kilowatts	X		X	X			X
Post-2002 – On the Books New Jersey Measures Done Through a Regional Effort							
Consumer Products 2005	X		X ^A	X	X		X
Architectural Coatings 2005	X		X ^A	X	X		X
Portable Fuel Containers 2005	X		X ^A	X	X		X
Mobile Equipment Repair and Refinishing	X		X	X			X
Solvent Cleaning	X		X	X			X
NO _x RACT Rule 2006 (includes distributed generation)	X		X	X			X
Post-2002 – On the Books New Jersey Only							

⁷³ These are the measures that are needed for attainment.

Control Measures	Attainment 2009 modeling ⁷³	Control Measures Not Captured in the 2009 Regional Modeling	2008 RFP	2009 RFP	RFP (2008) Contingency	Attainment (2009) Contingency	2012 Modeling
Stage I and Stage II (Gasoline Transfer Operations)	X		X	X	X		X
On-Board Diagnostics - I/M	X		X	X	X		X
New Jersey Heavy Duty Diesel Rules Including "Not-To-Exceed" (NTE) Requirements	X						X
Post-2002 – On the Books Federal							
USEPA MACT Standards (including Industrial Boiler/Process Heater MACT)	X			X			X
CAIR	X			X			X
Refinery Enforcement Initiative	X			X			X
Post-2002 – Beyond on the Way New Jersey Measures Done Through a Regional Effort							
Consumer Products 2009 Amendments	X			X			X
Portable Fuel Containers 2009 Amendments	X		X	X	X		X
Asphalt Paving	X			X			X
Adhesives and Sealants	X			X			X
Asphalt Production		X					X
Glass Manufacturing							X
Certain Categories of ICI Boilers	X ^B						X
Refinery Rules		X				X	
High Electric Demand Day Program		X					
Post-2002 - Beyond on the Way New Jersey Only							
Petroleum Storage Tank Measures		X				X	
USEPA CTGs (5 categories)		X					
Case by Case VOC & NO _x Emission Limit Determinations (FSELs/AELs)		X					
Municipal Waste Combustor Measures		X				X	
New Jersey Low Emission Vehicle (LEV) Program	X			X	X		X
Diesel Idling		X				X	
Diesel Inspection and Maintenance		X				X	
Post 2002 – Beyond on the Way Federal							
New Nonroad Engine Standards		X				X	
Additional 2009 Benefits⁷⁴							
Portable Fuel Containers - additional credit		X		X			
NO _x RACT Rule 2006 - additional credit		X		X			

⁷⁴ These measures are above and beyond what went into the modeling.

Control Measures	Attainment 2009 modeling⁷³	Control Measures Not Captured in the 2009 Regional Modeling	2008 RFP	2009 RFP	RFP (2008) Contingency	Attainment (2009) Contingency	2012 Modeling
Certain Categories of ICI Boilers - additional credit		X		X			
	A - Portion not included as contingency for 2008 RFP						
	B - Some Categories have 2009 compliance dates; remainder have 2012 compliance dates.						