The State of New Jersey
Department of Environmental Protection

State Implementation Plan (SIP) Revision for the Attainment and Maintenance of the Ozone National Ambient Air Quality Standards

for

Amendments to N.J.A.C. 7:27-16.3 Gasoline Transfer Operations, Phase I and II Vapor Recovery Systems

November 2017

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Acronyms and Abbreviations

CAA	Clean Air Act
CARB	California Air Resources Board
ECO	Enhanced Conventional
EVR	Enhanced Vapor Recovery
MOVES	Motor Vehicle Emissions Simulator
NAAQS	National Ambient Air Quality Standards
NJ	State of New Jersey
Department	New Jersey Department of Environmental Protection
NO_x	Nitrogen Oxides
ORVR	Onboard Refueling Vapor Recovery
OTR	Ozone Transport Region
SIP	State Implementation Plan
EPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound

I. Introduction

The New Jersey Department of Environmental Protection (Department) has adopted amendments at N.J.A.C. 7:27-16.3, Gasoline Transfer Operations, which sets forth the requirements and procedures for the control and prohibition of air pollution by volatile organic compounds (VOCs) at a gasoline dispensing facility. The Department is submitting the rule amendments to the United States Environmental Protection Agency (EPA) as a revision to New Jersey's State Implementation Plan (SIP) for the attainment and maintenance of the ozone National Ambient Air Quality Standards (NAAQS), including the requisite demonstration attached herein that the amendments comply with CAA Sections 110(ℓ), 184(b)(2) and 193.

The amendments to N.J.A.C. 7:27-16.3 remove the requirement to install Phase II (which the EPA refers to as "Stage II") vapor recovery systems at new gasoline dispensing facilities and require the decommissioning of existing Phase II vapor recovery systems that are not compatible with on-board refueling vapor recovery (ORVR) systems within three years. A facility may retain its existing Phase II vapor recovery system if the facility is operating a system that is compatible with ORVR, as long as it continues to maintain that system. The amendments include requirements and specifications for decommissioning and gasoline dispensing facility testing. Additionally, the Department is proposing requirements that the Phase I, tank breathing and refueling systems that remain after the decommissioning be upgraded for improved emission reductions.

The Department has conducted an analysis using the methodologies in EPA's guidance document, which provides equations and data that may be used by states to estimate the VOC emission impact of phasing out Phase II programs. This demonstration will show that the decommissioning of Phase II vapor recovery in New Jersey will meet the demonstration requirements set forth in EPA rules and guidance. Any upgrades will provide the state with emission reductions above those necessary for decommissioning, in support of the goal of attainment of the ozone NAAQS.

Federal and EPA documents use the terms Stage I and II, , while the California Air Resources Board (CARB) documents and certifications use the terms Phase I and II. Existing rule N.J.A.C. 7:27-16.3 does not use the terms Stage I or Stage II or Phase I or Phase II. The terms Phase I and Phase II are being added to the rule amendments for clarity in the regulations. The CARB terminology is being used because both the existing rule and the amendments rely upon CARB certifications. Hereafter in this document, the Department will refer only to Phase I and Phase II, rather than Stage I and Stage II, except when Stage I or Stage II is in the title of a document, a formula, or in a direct quote from a document.

A. Background

New Jersey adopted its first statewide Phase II vapor recovery rules in 1988 based on the California program. California started developing vapor recovery control rules and programs in 1975. The 1990 Clean Air Act (CAA), sections 182(b)(3), (c), (d), and (e) or 42 U.S.C. 7511a(b)(3), 7511a(c), 7511a(d) and 7511a(e), required Phase II gasoline vapor recovery systems as an emissions control measure in areas that were classified as "moderate", "serious," "severe," and "extreme" nonattainment with the ozone NAAQS (serious and above after 1994.) The majority of New Jersey was classified as severe at the time of the 1990 CAA amendments. The 1991 EPA Technical Guidance (EPA Technical Guidance – Stage II Vapor Recovery Systems for Control of Vehicle Refueling Emissions at Gasoline Dispensing Facilities, EPA-450/3-91-022a, November 1991) instructed states to require equipment that is CARB-certified,

or certified by the individual state using a test procedure that is equivalent to CARB's. New Jersey, as well as all other ozone nonattainment area states except Missouri, chose to rely on CARB certification, rather than establish its own certification program and testing requirements.

Vapor recovery systems are installed at gasoline dispensing facilities to control hydrocarbon emissions from gasoline vapors during the delivery and dispensing of gasoline. These systems are comprised of two phases, Phase I and Phase II. Phase I systems control the emissions of gasoline vapors during the transfer of gasoline from the tanker truck to the gasoline dispensing facility storage tank by returning the vapors back to the truck. Phase II systems are designed to capture gasoline vapors displaced from the vehicle fuel tank during refueling and transport those vapors through the nozzle and vapor return lines back to the storage tank. There are two types of Phase II systems, balance systems and vacuum assist systems. Balance systems return vapors to the storage tank based on displacement in a sealed system while vapor assist systems use a vacuum pump to transfer the vapors back to the storage tank.

The CAA required two types of controls for capturing gasoline vapor during vehicle refueling: Phase II vapor recovery systems, and ORVR systems. The purpose of ORVR is to collect gasoline refueling emissions from within the vehicle fuel tank. During refueling, a carbon canister in the vehicle captures the fuel tank vapors and later releases them to the engine for combustion. CAA Section 202(a)(6), 42 U.S.C. 7521(a)(6) requires EPA to develop standards for ORVR controls on light-duty vehicles and provides for the phase-in of the ORVR requirement. Section 202(a)(6) also provides that the Phase II requirement does not apply in moderate ozone nonattainment areas after EPA's promulgation of these ORVR standards, for areas not already required to have Phase II. On April 16, 1994, EPA promulgated regulations setting standards for and requiring the phase-in of ORVR controls on new vehicles. Installation of ORVR systems was phased in over the 1998 to 2006 vehicle model years. The Department estimates that approximately 90 percent of the New Jersey fleet will have ORVR by 2017.

Congress recognized that ORVR and Phase II would eventually become largely redundant technologies, and provided authority to the EPA to allow states to remove Phase II from their SIPs, at a time that is appropriate for each state, after the EPA finds that ORVR is in widespread use. The CAA provides that EPA may revise or waive the Phase II control requirements of section 182(b)(3) after EPA determines that ORVR control systems are in "widespread use" throughout the motor vehicle fleet. Effective May 16, 2012, the EPA waived the CAA Phase II requirements after determining that ORVR is in widespread use. In order to remove Phase II requirements, states are required to have an EPA-approved SIP revision in accordance with the demonstration requirements outlined in the widespread use rule (77 FR 28772, May 16, 2012) and EPA's 2012 Guidance (Guidance on Removing Stage II Gasoline Vapor Control Programs from State Implementation Plans and Assessing Comparable Measures, EPA-457/B12-001, August 07, 2012.)

CARB determined that when ORVR systems operate in conjunction with vacuum assist systems there is a potential for excess emissions due to "incompatibility" of the two systems. The ORVR system causes the Phase II vacuum pump to pump air rather than gasoline vapors back to the service station tank, which can lead to vapor growth, over-pressurization of the tank and potential excess emissions. If the system is over-pressurized, the pressure is typically released by the opening of the pressure/vacuum valve on the vent, or via fugitives due to leaks in the system (loose risers and fittings on top of the tank, hoses, nozzles and at the tank spill containment buckets).

As older vehicles without ORVR are retired and replaced with newer vehicles equipped with

ORVR systems, the need for Phase II controls lessens over time. The Department has estimated, based on the EPA 2012 guidance, that the Phase II vapor recovery system benefits become zero in New Jersey sometime between mid-2017 and mid-2021.

The Department is also requiring upgrades to the Phase I, tank breathing and refueling systems at gasoline dispensing facilities. Volatile organic compound emission reductions from the upgrade requirements will assist the State in its goal of attainment of the eight-hour ozone NAAQS (75 ppb and 70 ppb).

The Department is submitting the amendments to EPA as a revision to the New Jersey SIP, including the requisite demonstration that the amendments comply with CAA Sections 110(ℓ), 184(b)(2) and 193. Section 110(ℓ) prohibits EPA approval of a SIP revision that interferes with attainment of the NAAQS or other CAA applicable requirements. Section 184(b)(2) requires states in the Ozone Transport Region (such as New Jersey) to either implement Phase II or "comparable measures." Section 193 is meant to ensure air quality in nonattainment areas does not degrade after the revocation of a NAAQS (anti-backsliding).

II. Environmental Impact

The Department expects the rule amendments to have a positive environmental impact. The primary environmental benefit expected will be a reduction in the emissions of VOCs, which are precursor emissions that lead to the formation of ground level ozone. A reduction in VOCs will also lead to a reduction in fine particulates (PM2.5), hazardous air pollutants (HAPs), toxics (TXS) and carcinogens. Additional background on the health effects of these pollutants is discussed in the rule proposal. The amendments would also have beneficial impacts on soil and groundwater. The amendments would help prevent gasoline spills and leakage and, thereby, decrease soil and groundwater contamination by constituents of gasoline such as benzene, toluene, xylenes, ethylbenzene and ethanol.

It is anticipated that the amendments to no longer require Phase II vapor recovery at new installations and to allow/require the decommissioning of Phase II vapor recovery at existing gasoline dispensing facilities will not have a negative environmental impact and will in the future have a positive environmental impact by eliminating the emission reduction disbenefit from ORVR-incompatible vacuum assist vapor recovery systems and ORVR.

As the fleet is increasingly comprised of newer, ORVR-equipped vehicles, the emission reduction benefits from Phase II vapor recovery systems decrease, due to the incompatibility of vacuum assist vapor recovery systems and ORVR. EPA has determined that at some point the overall benefits from Phase II become zero due to the incompatibility issue. The Department has estimated, based on EPA's 2012 Guidance that the Statewide overall benefits from Phase II in New Jersey become zero sometime between mid-2017 and mid-2021. The Department has timed the required decommissioning of non-ORVR compatible systems to coincide with this time frame. Therefore, there is no emission impact on the area wide VOC inventory.

The Department anticipates that the upgrade requirements for Phase I, tank breathing and refueling systems will result in a positive environmental benefit. The Department estimates that the requirements for a CARB-certified Phase I Enhanced Vapor Recovery (EVR) system, including the CARB-certified pressure/vacuum valve and a dual-point vapor balance system for new gasoline dispensing facilities, will result in an emission reduction of approximately 5 tons per day (tpd) of VOCs. It is estimated that the requirements for dripless enhanced conventional (ECO) nozzles and low permeation hoses will result in an emission reduction of approximately

3.5 tpd of VOCs.

A. CAA Requirements

In accordance with the requirements outlined in the EPA widespread use rule (77 FR 28772, May 16, 2012) and EPA's 2012 Guidance, the Department must demonstrate that the rule amendments meet the following three sections of the CAA:

- Section 110(ℓ), Non-interference, for all States
- Section 184(b)(2), Comparable Measures, for OTR States
- CAA Section 193, General Saving Clause or Anti-backsliding, for States that installed controls before 1990 (NJ, NY, DC, VA, CA, MO)

Section 110(ℓ) prohibits EPA approval of a SIP revision that interferes with attainment of the NAAQS or other CAA applicable requirements. Section 184(b)(2) requires states in the Ozone Transport Region (such as New Jersey) to either implement Phase II or "comparable measures." Section 193 is meant to ensure air quality in NAAs does not degrade after the revocation of a NAAQS (anti-backsliding).

The Department has conducted an analysis using the methodologies in EPA's 2012 guidance document, which provides equations and data that may be used by states to estimate the VOC emission impact of phasing out Phase II programs. This analysis will show that the decommissioning of Phase II vapor recovery in New Jersey will meet the demonstration requirements set forth in the EPA rules and guidance. Any upgrades will provide the state with emission reductions above those necessary for decommissioning, in support of the goal of attainment of the ozone NAAQS.

i. CAA Section 110(ℓ), Non-Interference

Under CAA section 110(ℓ), the EPA cannot approve a SIP revision if it would interfere with attainment of the NAAQS, reasonable further progress toward attainment, or any other applicable requirement of the CAA.

"Each revision to an implementation plan submitted by a State under this Act shall be adopted by such State after reasonable notice and public hearing. The Administrator shall not approve a revision of a plan if the revision would interfere with any applicable requirement concerning attainment and reasonable further progress (as defined in section 171), or any other applicable requirement of this Act."

The EPA 2012 guidance states that states should explain how the SIP revision that modifies an existing SIP-approved Phase II control program does not interfere with attainment of all applicable ozone NAAQS, and any applicable reasonable further progress requirements. In evaluating whether a given SIP revision would interfere with attainment or maintenance, EPA notes in its Stage II 2012 guidance that it generally considers whether the SIP revision will allow for an increase in actual emissions over what is allowed under the existing EPA-approved SIP. An increase in emissions may be considered to be "backsliding," which is prohibited under Section 110(ℓ). However, EPA's 2012 guidance states a temporary increase in VOC emissions that diminishes rapidly over time as ORVR is phased-in may be consistent with CAA section 110(ℓ):

"A phase-out plan that would result in very small foregone emissions reductions in the near

term that continue to diminish rapidly over time as ORVR phase-in continues, may result in temporary increases that are too small to interfere with attainment or progress toward attainment. This may be particularly evident in areas that are already attaining the ozone NAAQS or where emissions and/or air quality projections already demonstrate that an area is likely to maintain the NAAQS into the future."

The emissions reduction benefit of maintaining Phase II vapor recovery equipment diminishes over time for two reasons: 1) each year a larger percentage of gasoline is dispensed to vehicles equipped with ORVR as the vehicles fleet turns over; and 2) incompatibility excess emissions, the increased emissions caused by the incompatibility of most vacuum-assist Phase II systems and ORVR.

Using the methodology presented in the EPA 2012 guidance to calculate the emissions impact of decommissioning the state's Phase II vapor recovery program, the Department calculated the Phase II incremental emissions control benefit (the "Increment") using EPA's Equation 1.

Key Equation for Assessing and Demonstrating Compliance with the Noninterference Provisions of CAA Section 110(ℓ) and the Comparable Measures Requirement of CAA Section 184(b)(2)

Overall Phase II-ORVR increment: The overall increment identifies the annual area-wide emission control gain from Phase II installations at gasoline dispensing facilities as ORVR technology phases in. Thus, it also indicates the emission reduction potential loss (in year i) from removing Phase II.

Increment Equation 1:

$Increment_i = (Q_{SII})(1-Q_{ORVRi})\ (\eta_{iuSII}) - (Q_{SIIva})(CF_i)$

$Increment_i$ = emission reduction potential loss from removing Stage II in year i
Q_{SII} = Fraction of gasoline throughput covered by Stage II
Q_{ORVRi} = Fraction of gasoline dispensed to ORVR-equipped vehicles in year i (MOVES outputs)
n_{iuSII} = Stage II control efficiency
Q_{SIIva} = Fraction of gasoline dispensed by vacuum assist Stage II systems
CF_i = Incompatibility Factor in year i = 0.07645 * VMT_{ORVRi}
VMT_{ORVRi} = Fraction of annual VMT traveled by ORVR-equipped vehicles in year i (MOVES outputs)
Equation automatically assumes ORVR efficiency of 98%

The incremental emissions impact is the difference between the refueling vapors that Phase II equipment captures from non-ORVR vehicles and incompatibility excess emissions. Under the current regulatory construct for ORVR, there is a small and declining number of non-ORVR equipped vehicles and thus a small level of future emission reductions achievable from Phase II. Due to the increasing vacuum assist incompatibility emissions, the net emission reduction will eventually go to zero or possibly become negative. If the value is greater than zero for the year under consideration, there is still a remaining emission reduction benefit for Phase II for the year relative to ORVR. If it is zero, there is no net difference in the inventory. If it is negative, this would indicate that removing Phase II would not increase the refueling emissions inventory because the higher efficiency from ORVR and the incompatibility emissions offset the increment due to non-ORVR vehicles being refueled at Phase II gasoline dispensing facilities.

The results of the Phase II emissions impact calculations are highly dependent on the assumed effectiveness of the Phase II vapor recovery systems. Phase II vapor recovery system performance tests indicate that Phase II systems readily develop leaks and other malfunctions. The control efficiency of Phase II vapor recovery equipment is dependent on the frequency of inspection. EPA's November 1991 Technical Guidance, Stage II Vapor Recovery Systems for Control of Vehicle Refueling Emissions at Gasoline Dispensing Facilities, estimated Phase II in-use efficiencies of 92 percent with semiannual inspections, 86 percent with annual inspections and 62 percent with minimal or less frequent state inspections. EPA's 2012 Guidance determined that this is not the case and states that "publicly available data suggests typical current values of Phase II efficiency is in the range of 60-75%. The Department used a Phase II effectiveness of 70 percent in its calculations.

The fraction of highway gasoline throughput covered by Phase II vapor recovery systems has been estimated by the Department to be 86 percent based on permitting data.

The in-use control efficiency for ORVR has been estimated by EPA to be 98 percent and is automatically built into the increment equation.

The fraction of highway gasoline throughput dispensed through vacuum-assist type Phase II vapor recovery systems in New Jersey is unknown. The Department estimated the throughput using permitting and enforcement data, existing EPA and CARB estimates for facility throughput distribution and an industry survey conducted in January 2014. Based on these data sources, the Department estimated the increment at a range of 29 to 71 percent gasoline throughput at vacuum assist facilities from 2014 to 2022. The results of the increment equation were plotted to determine the crossover year where the Phase II benefits become zero.

As outlined in the EPA 2012 guidance, the Department used the EPA MOVES model to estimate the fraction of gasoline dispensed to ORVR-equipped vehicles and the fraction of annual vehicle miles traveled by ORVR-equipped vehicles. The Department ran the model for the years 2014 and 2018, for 5 counties representing both urban and rural areas of NJ, in both of New Jersey's ozone nonattainment areas. The years in between 2014 and 2018 were interpolated and the years after 2018 were extrapolated.

The Department has estimated, based on these calculations, that the overall benefit of Phase II systems in New Jersey become zero sometime between mid-2017 and mid-2021. The rule amendments require decommissioning of ORVR-incompatible systems within this timeframe. Therefore, there will be no emission increase inconsistent with CAA section 110(ℓ) and the EPA 2012 Guidance. Increment equation calculations for the non-interference demonstration are included in Appendix A.

ii. CAA Section 184 (b)(2), Comparable Measures

For the Ozone Transport Region (OTR), which is comprised of twelve states in the northeastern U.S. and the District of Columbia, there are additional requirements in section 184(b)(2) of the CAA, 42 U.S.C. 7511c(b)(2) for:

1) EPA to "complete a study identifying control measures capable of achieving emission reductions comparable to those achievable through vehicle refueling controls contained in section 7511a (b)(3) of this title, and such measures or such vehicle refueling controls shall be implemented in accordance with the provisions of

this section" (referred to as "comparable measures"), and

2) OTR States to revise their State Implementation Plans (SIP) to require Phase II controls or comparable measures in OTR areas. The results of the comparable control measures study are provided in the EPA report titled “Stage II Comparability Study for the Northeast Ozone Transport Region, January 1995.” This requirement under section 184(b)(2) is not affected by any future widespread use determination under CAA section 202(a)(6) by the EPA.

All areas of the Northeast OTR, both attainment and nonattainment, are subject to the requirements of CAA section 184(b)(2), commonly referred to as the “comparable measures requirement.” Section 184(b)(2) directs these areas to adopt and implement either Phase II controls meeting the general requirements for Phase II gasoline vapor recovery programs under CAA section 182(b)(3), or “control measures capable of achieving emissions reductions comparable to those achievable” by Phase II.

As discussed in the EPA 2012 Guidance, for the purposes of addressing comparability under CAA section 184(b)(2), states only need to consider the reductions achievable by the minimum program required by CAA section 182(b)(3). The CAA does not require OTR states to implement measures that would achieve reductions “equivalent” to a Phase II control program; the CAA requires that the reductions be “comparable.” Now that ORVR is in widespread use in the motor vehicle fleet, the EPA believes it is appropriate for states to demonstrate that the comparable measures requirement is satisfied if phasing out a Phase II control program in a particular area is estimated to have no, or a *de minimis*, incremental loss of area-wide emissions control– i.e., when no alternative reductions are needed to achieve reductions comparable to those achievable in the area by the Phase II control program stipulated in CAA section 182(b)(3). As discussed in the guidance, EPA believes it is reasonable to conclude that the incremental emissions control that Phase II achieves beyond ORVR is *de minimis* if it is less than 10 percent of the area-wide emissions inventory associated with refueling highway motor vehicles.

As the fraction of total gasoline dispensed into ORVR-equipped vehicles continues each year to increase in relation to the fraction of total gasoline dispensed into non-ORVR vehicles, the incremental emission reduction benefit achieved by Phase II controls over ORVR controls declines. EPA has developed an equation States can use to determine the date by which the incremental control efficiency of Phase II is less than 10% of the refueling emissions inventory.

Equation 1 in EPA’s guidance, and shown above in the 110(ℓ) demonstration, calculates the overall increment, or the annual area-wide emissions control gain, from Phase II installations at gasoline dispensing facilities as ORVR technology phases in. It also indicates the emissions reduction potential loss from removing Phase II. EPA has determined that if the increment calculated using Equation 1 is less than 10 percent, then the comparable measures clause has been satisfied. The Department calculations are included in Appendix A.

As shown in the Appendix A, the increments calculated for New Jersey are less than 10% prior to July of 2014, therefore, removing the state’s Phase II vapor recovery program meets the comparable measures requirement under CAA section 184(b)(2).

iii. CAA Section 193, General Savings Clause, Anti-backsliding

Section 193 of the CAA prohibits modification of any control requirement in effect before November 15, 1990 in a current nonattainment area, unless modification "insures equivalent or greater emissions reductions." According to EPA's 2012 guidance,this means that, in areas currently designated nonattainment for ozone, any Phase II control program implemented under a SIP prior to November 15, 1990 could not be removed from the SIP until the ORVR control requirement (or some other requirement or set of requirements) is shown to achieve equal or greater emissions reductions compared to the emissions reductions attributable to Phase II vapor recovery. As discussed in the guidance, alternatively, States can show that removing the area's pre-1990 Phase II control program would have no impact on area-wide emissions reductions.

Using the methodology presented in the EPA 2012 guidance, the Department calculated compliance with CAA Section 193 using EPA's Equation 2.

Key Equation for Assessing and Demonstrating Compliance with CAA Section 193

Delta Equation 2:

$delta_i = (Q_{SII})(\eta_{iuSII}) - (Q_{SIIva})(CF_i) - (Q_{ORVRi})(\eta_{ORVR})$

$delta_i$ = Difference between Stage II efficiency and ORVR efficiency in year i
Q_{SII} = Fraction of gasoline throughput covered by Stage II
η_{iuSII} = Stage II control efficiency
Q_{SIIva} = Fraction of gasoline dispensed by vacuum assist Stage II systems
CF_i = Incompatibility Factor = 0.07645 * VMT_{ORVRi}
VMT_{ORVRi} = Fraction of annual VMT traveled by ORVR-equipped vehicles in year i (MOVES outputs)
Q_{ORVRi} = Fraction of gasoline dispensed to ORVR-equipped vehicles in year i (MOVES outputs)
n_{ORVR} = ORVR in-use control efficiency (EPA recommends 0.98)

The overall delta is the comparison between the net Phase II efficiency and the net ORVR efficiency with both technologies in place. The conclusion drawn from Equation 2 is dependent on the determined value of $delta_i$.

- If the value is greater than 0, there is still emission reduction benefits from Phase II
- If the value is 0, there is no net difference in the inventory
- If the value is less than 0, reductions from ORVR are greater than those from Phase II. This means removing Phase II would not increase the refueling emissions inventory.

Using EPA's Equation 2 above, the Department calculated delta for the state for the years 2014 through 2022. The value calculated in each year was negative, indicating that removing Phase II would not increase the statewide refueling emissions inventory. The calculations are included in Appendix A.

B. System Upgrades

CARB-certified Enhanced Conventional (ECO)/Dripless Nozzles

The amendments to N.J.A.C. 7:27-16.3 would require gasoline dispensing facilities to install CARB-certified ECO nozzles (dripless nozzles) at their dispensers as a part of the decommissioning of an existing Phase II system or at the time nozzles or hoses are replaced as part of maintenance. Dripless/ECO nozzles are estimated to provide a statewide VOC emission reduction of 3 tons per day or 1,095 tons per year (tons per day x 365), estimated as follows:

New Jersey Annual Gasoline Consumption (Motor Gasoline Consumption-Transportation-Energy Information Administration (EIA) 2014) = 4,081,308,000 gallons/year
Conventional Nozzle Specifications (EPA AP-42): 0.7 lb VOC/1000 gallons
CARB-certified ECO Nozzle Specifications (1): 0.12 lb VOC/1000 gallons

New Jersey estimated VOC reduction =
((4,081,308,000 gallons/year)/1000 gallons) x (0.7 -0.12 lb/1000 gallons)/2000lb/ton)/
365 days/year

= 3.2 tons per day VOC emission reduction

Actual emission reductions may be greater based on manufacturer's testing:

Actual ECO Nozzle Emissions (CARB test results): 0.003 lb VOC/1000 gallons

New Jersey estimated VOC reduction =
((4,081,308,000 gallons/year)/1000 gallons) x (0.7 -0.003 lb/1000 gallons)/2000lb/ton)/
365 days/year

= 3.9 tons per day VOC emission reduction

CARB-certified Low Permeation Hoses

The amendments to N.J.A.C. 7:27-16.3 would require gasoline dispensing facilities to install CARB-certified Low Permeation Hoses at their dispensers as a part of the decommissioning of an existing system or at the time nozzles or hoses are replaced as part of maintenance. Low permeation hoses are estimated to provide a statewide VOC emission reduction of 0.48 tons per day or 175 tons per year (tons per day x 365) estimated as follows:

Hose Emission Reductions from CARB Calculations (2): 1.68 gallons/year-hose
Gasoline Density: 6.3 lb/gallon
Hoses =9 dispensing stations per facility * 3,657 facilities: 32,913 hoses

New Jersey estimated VOC reduction =
1.68 gallons/year/hose x 6.3 lb/gallon x 32,913 hoses)/2000 lb/ton)/365 days/year

= 0.48 tons per day VOC emission reduction

CARB-certified Phase I EVR System

The amendments to N.J.A.C. 7:27-16.3 add the requirement for a CARB-certified Phase I EVR system for new installations or within seven years for existing facilities, with some modifications from the CARB requirement that add flexibility for owners and operators. The components of the system must be approved in a current CARB-certified Phase I EVR System Executive Order at the time of installation, but the components do not need to all be in the same Executive Order, which is a requirement in California. In addition, if an existing facility has already installed a single-point vapor balance system it does not need to install a dual-point system or rotatable adapters to satisfy the Phase I EVR system requirements. CARB-certified Phase I enhanced vapor recovery system pressure/vacuum valves are part of the CARB-certified Phase I EVR system. The Department is requiring that the valves be installed at existing facilities within 1 year.

The Department estimates implementing this measure would result in an estimated statewide VOC emission reduction of 5 tons per day or 1,825 tons per year (tons per day x 365) estimated as follows:

Massachusetts Estimated VOC Reductions (3) (4): 3.7 tons per summer day
Massachusetts Gasoline Consumption 2014 from EIA:
64,485,000 barrels = 2,708,370,000 gallons
New Jersey Gasoline Consumption 2014 from EIA: 97,174,000 barrels = 4,081,308,000 gallons

New Jersey estimated VOC reduction =
3.7 tons per summer day x (4,081,308,000 gallons/2,708,370,000 gallons)

= 5.5 tons per day VOC emission reduction

III. Conclusions

The Department has conducted an analysis in accordance with the CAA, EPA rules and EPA guidance. This analysis shows that the decommissioning of Phase II vapor recovery in New Jersey will meet the demonstration requirements set forth in the EPA rules and guidance. Any upgrades will provide the state with emission reductions above those necessary for decommissioning, in support of the goal of attainment of the ozone NAAQS.

References/Notes:

(1) CARB Certification Procedure CP-207 for Enhanced Conventional (ECO) Nozzles and Low Permeation Conventional Hoses for Use at Gasoline Dispensing Facilities, April 23, 2015.

(2) From conventional or vacuum assist hoses to new specification of 10.0 grams per square meter per day (g/m2/day) (Emissions from Phase II balance hoses are higher than vacuum assist.) Source: CARB Initial Statement of Reasons for Proposed Rulemaking, Public Hearing to Consider the Proposed Adoption of Amendments to Vapor Recovery Certification and Test Procedures for Underground and Aboveground Storage Tanks Used at Gasoline Dispensing Facilities Including Gasoline Dispensing Facility Hose Regulation, Appendix 5 Cost Effectiveness and Economic Impact, August 3, 2011.

(3) Air Program Support for Stage I and Stage II Programs in Massachusetts, Final Report, prepared for: Massachusetts Department of Environmental Protection, Prepared by: Eastern Research Group, Inc., de la Torre-Klausmeier Consulting, December 12, 2012.

(4) Massachusetts existing rules already required dual point systems and rotatable adapters, which NJ's existing rule does not.

Appendix A:
Increment, Comparable Measures and Delta Equation Calculations