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RULE PROPOSALS

ENVIRONMENTAL PROTECTION

ENVIRONMENTAL REGULATION

41 N.J.R. 4156(a)

Proposed Amendments: N.J.A.C. 7:27-9.2

Proposed Repeal: N.J.A.C. 7:27-9.5

Air Quality Management

Sulfur in Fuels

Authorized by:	Mark N. Mauriello, Acting Commissioner, Department of Environmental Protection.
Authority:	N.J.S.A. 13:1B-3(e), 13:1D-9 and 26:2C-1 et seq.
Calendar Reference:	See Summary below for explanation of exception to calendar requirement.
DEP Docket Number:	14-09-10/676
Proposal Number:	PRN 2009-341.

A **public hearing** concerning this proposal and the proposed revision to the State Implementation Plan (SIP) will be held on:

Tuesday, January 5, 2010 at 10:00 A.M. at:

New Jersey Department of Environmental Protection

First Floor Hearing Room

401 East State Street

Trenton, New Jersey

Directions to the hearing room may be found at the Department's website, http://www.state.nj.us/dep/where.htm.

Submit written comments by **January 15, 2010** to:

Alice A. Previte, Esq.

Attn: DEP Docket No. 14-09-10/676

Office of Legal Affairs

New Jersey Department of Environmental Protection

401 East State Street, 4th Floor

PO Box 402

Trenton, New Jersey 08625-0402

Written comments may also be submitted at the public hearing. It is requested (but not required) that anyone submitting oral testimony at the public hearing provide a copy of any prepared text to the stenographer at the hearing.

The Department of Environmental Protection (Department) requests that commenters submit comments on disk or CD as well as on paper. Submittals on disk or CD must not be access-restricted (locked or read-only) in order to facilitate use by the Department of the electronically submitted comments. Microsoft Word 6.0 or above is preferred. Macintosh formats should not be used. Each comment should be identified by the applicable N.J.A.C. citation, with the commenter's name and affiliation following the comment.

This rule proposal can be viewed or downloaded from the Department's website at http://www.state.nj.us/dep/rules.

The agency proposal follows:

Summary

Since the Department has provided a 60-day comment period on this proposal, the proposal is exempted from the rulemaking calendar requirement pursuant to N.J.A.C. 1:30-3.3(a)5.

The Department is proposing to amend its rules at N.J.A.C. 7:27-9, Sulfur in Fuels, specifically N.J.A.C. 7:27-9.2, to lower, and thus make more stringent, the maximum sulfur content standard for fuel oil stored, offered for sale, sold, delivered, exchanged in trade for use, or used in New Jersey. Both the existing and the proposed amended standards are based on the grade of the fuel oil: numbers 1, 2, 4, 5 and 6 grade fuel oils. The Department is proposing new maximum sulfur content standards for all grades of fuel oil (except No. 5, No. 6 and heavier grades in Zones 3, 4 and 6, as discussed below), to take effect July 1, 2014. The Department is also proposing a second phase of more stringent maximum sulfur content standards for No. 2 and lighter grade fuel oil, to take effect July 1, 2016. In Zones 3, 4 and 6, the existing standards for No. 5, No. 6, and heavier grades of fuel oil already meet the standards agreed to by the members of the Mid-Atlantic / Northeast Visibility Union (MANE-VU), a regional planning organization that helps states in the Mid-Atlantic / Northeast U.S. develop and coordinate their Regional Haze State Implementation Plan. Accordingly, the Department does not propose new maximum sulfur content standards for those grades in Zones 3, 4 and 6.

The Department is also proposing to amend the maximum sulfur dioxide (SO_2) emissions standard for combustion of fuel oil that contains sulfur in excess of the sulfur content standard. The proposed new maximum SO_2 emissions standards, also effective July 1, 2014 and July 1, 2016, are more stringent for all grades of fuel oil in all zones, except No. 5, No. 6 and heavier grades in Zones 3, 4 and 6. In accordance with N.J.A.C. 7:27 9.1, “Zone 1” means Atlantic, Cape May, Cumberland, and Ocean Counties. “Zone 2” means Hunterdon, Sussex, and Warren Counties. “Zone 3” means Burlington, Camden, Gloucester, and Mercer Counties except those municipalities included in Zone 6. “Zone 4” means Bergen, Essex, Hudson, Middlesex, Monmouth, Morris, Passaic, Somerset, and Union Counties. “Zone 5” means Salem County. “Zone 6” means in Burlington County, the municipalities of Bass River Township, Shamong Township, Southampton Township, Tabernacle Township, Washington Township, Woodland Township, and in Camden County, Waterford Township. These zones were created when the

rule were first promulgated, to take into account the population, oil burning sources and resulting SO2 emission densities of the counties in the state. The existing rules allow for the use of higher sulfur fuels in zones where there were fewer sources of SO2 and where the ambient levels of SO2 were lower. Although the proposed amended rules will continue to reference the zones, the differences in sulfur limits among the zones will be much less because of the air quality need to reduce emissions of SO2 over larger areas to address long range transport of fine particles and regional haze.

The Department is proposing these amendments to help the State attain and maintain the Federal health-based National Ambient Air Quality Standards (NAAQS) for fine particles (particles smaller than 2.5 microns in diameter ($PM_{2.5}$)), SO_2 and ozone, and to reduce haze in New Jersey and the region. This proposed rulemaking is part of a regional effort to reduce regional haze and fine particles through the implementation of a low sulfur fuel strategy. New Jersey committed to propose this course of action as a member of MANE-VU. The MANE-VU membership includes Washington, D.C., Maryland, Delaware, Pennsylvania, New Jersey, New York, Connecticut, Rhode Island, Massachusetts, Vermont, New Hampshire and Maine, and two Native American tribes (the Penobscot Indian Nation and the St. Regis Mohawk Tribe).

New Jersey committed to propose these rules as part of its SIP proposal to demonstrate attainment of the fine particles NAAQS, dated June 16, 2008 (Fine Particles SIP). Accordingly, the proposed rules constitute a proposed amendment to the State's SIP.

Background

Fuel oil is a liquid or liquefiable petroleum product, burned for electricity or for the generation of heat or power, that is derived directly or indirectly from crude oil. Crude oil is a mixture of hydrocarbons that exists in natural underground reservoirs and is made into petroleum products through distillation at a refinery plant. Distillation physically separates the lighter and heavier hydrocarbon fractions of the crude oil mixture based on differences in their volatilities. The very light fractions (the lightest of the distillate fuels) become gasoline, kerosene and jet fuel. The proposed rules do not affect these very light fractions. The medium-to-light fractions become the middle distillate family of fuel oils, a general classification for refined petroleum products in the middle range of refinery distillation that includes distillate diesel and heating fuel

oils. The heavier fractions that remain after the lighter fractions are distilled away become residual fuel oils. Fuel oils are further distinguished by grade numbers: Nos. 1 and 2 are distillate oils, Nos. 5 and 6 are residual oils, and No. 4 can be either distillate oil or a mixture of distillate and residual oils.

The lighter fuel oils are more volatile and less viscous than the residual oils. They have negligible nitrogen and ash contents and usually contain less than 3,000 parts per million by (ppm) or 0.3 percent sulfur by weight before desulfurization. Distillate fuel oils are used mainly in domestic and small commercial applications, such as residential heating, on-road vehicles (mainly light and heavy duty trucks), non-road equipment used in construction, agriculture and industry, locomotives and marine vessels.

The residual fuel oils contain significant quantities of ash, nitrogen, and sulfur because they are produced from the residue remaining after the lighter fractions (gasoline, kerosene and distillate oils) have been removed from the crude oil. Residual oils contain up to, on average, approximately 25,000 ppm (2.5 percent by weight) sulfur, and are used mainly in utility, industrial, and large commercial applications. (AP-42, Fifth Edition, Section 1.3, Fuel Oil Combustion, United States Environmental Protection Agency, September 1998, http://www.epa.gov/ttn/chief/ap42/index.html)

New Jersey and other states regulate the sulfur content of fuel oil consistent with ASTM International's (ASTM) standard D396 for heating oil. ASTM D396 includes a maximum sulfur content of 5,000 ppm. In the 1970s, many states adopted their own heating oil sulfur requirements, including Connecticut (3,000 ppm), Maine (3,000 ppm in some regions), Massachusetts (3,000 ppm), New Hampshire (4,000 ppm), New Jersey (2,000 to 3,000 ppm, region-dependent), and New York (2,000 to 3,000 ppm, region-dependent).

The sulfur content in diesel fuel used by on-road vehicles is currently regulated by the first phase of an ultra-low sulfur fuel program (maximum sulfur content of 15 ppm) implemented by the United States Environmental Protection Agency (USEPA) in June of 2006 (40 CFR 80.50 and 80.52(a) and (b)). This Federal regulation requires 80 percent of on-road diesel to meet a maximum sulfur content of 15 ppm. The remaining 20 percent must be less than 500 ppm. In 2010, the phase-in will be complete, and all on-road diesel will have to meet the 15 ppm standard.

The USEPA also regulates the sulfur content of non-road diesel fuel. The USEPA implemented a low sulfur diesel program (maximum sulfur content of 500 ppm) in 2007 (40 CFR 80.510(b) and (c)) for non-road equipment used in construction, agriculture and industry and in locomotives and marine vessels. The Federal rules require ultra-low sulfur diesel fuel (15 ppm) by 2010 for non-road equipment and by 2012 for locomotives and marine vessels.

Residual fuel oil is also used to power oceangoing vessels, which have the largest marine diesel engines. Oceangoing vessels include, for example, container ships, bulk carriers, tankers and cruise ships, and do not include the generally smaller harbor craft such as ferries, fishing vessels and tug/tow boats.

The maximum allowable sulfur-by-weight specification for oceangoing vessel fuel oil is 45,000 ppm, under Annex IV of the International Convention for the Prevention of Pollution from Ships, adopted by the International Maritime Organization (IMO) member states on September, 1997. In October 2008, the IMO member states adopted new international standards for the oceangoing vessel fuel oil that established a maximum allowable sulfur-by-weight specification of 35,000 ppm, effective January 1, 2012, and a maximum allowable sulfur-by-weight specification of 5,000 ppm, effective January 1, 2020.

On March 27, 2009, the U.S. and Canada proposed to the IMO that it designate an Emission Control Area comprised of geographic regions of their coastal waters. In the proposed Emission Control Area, the oceangoing vessel fuel oil would have a maximum allowable sulfur-by-weight specification of 10,000 ppm, effective January 1, 2010, and a maximum allowable sulfur-by-weight specification of 1,000 ppm, effective January 1, 2015. (International Maritime Organization Adopts Program to Control Air Emissions from Oceangoing Vessels, EPA420-F-08-033, USEPA, October 2008)

As discussed below, reducing the sulfur content of fuel oil reduces SO_2 emissions.

Air Contaminant Emissions

Sulfur oxide emissions are generated during the combustion of fuel oil from the oxidation of sulfur contained in the fuel oil. The amount of uncontrolled sulfur oxide emissions is almost entirely dependent on the sulfur content of the fuel, and is not significantly affected by burner design or grade of fuel being fired. Distillate fuel oils (No. 2 and lighter) generate less sulfur

oxide emissions because they contain less sulfur than residual oils (No. 5 and 6). The majority of sulfur oxide emissions from conventional combustion systems are in the form of sulfur dioxide (SO_2). According to the USEPA, on average more than 95 percent of the sulfur in fuel oil is converted to SO_2, approximately one to five percent is further oxidized to sulfur trioxide (SO_3), and one to three percent is emitted as a direct particulate. (AP-42, Fifth Edition, Section 1.3, Fuel Oil Combustion, United States Environmental Protection Agency, September 1998) Hence, reducing the sulfur content of fuel also significantly reduces direct particulate emissions.

SO_2 contributes to the formation of fine particles in ambient air. SO_2 interacts with other gases and particles in the air to form sulfate particles. Both solid and condensable particulates form directly from fuel combustion in oil-fired heating systems. The solid particulates are emitted directly from the furnace and are composed of unburned carbon particulates and any ash residue in the fuel oil. The condensable particulates are vapors, including sulfate formed from SO_2 and SO_3 emissions, that condense into particulates when the exhaust gas cools, either in the furnace stack or after leaving the furnace venting system and mixing with cool ambient air.

Emissions of SO_2, fine particles, nitrogen oxides (NO_x) and carbon dioxide (CO_2) contribute to the formation of fine particles, ozone, regional haze, acid deposition, nitrification of water bodies, and accumulation of greenhouse gases in the atmosphere. (Low Sulfur Heating Oil in the Northeast States: An Overview of Benefits, Costs, and Implementation Issues, Northeast States for Coordinated Air Use Management (NESCAUM), December 2005) These pollutants are reduced when the sulfur content of fuel oil is lowered.

Sulfate is the dominant constituent of haze-forming particle pollution across the MANE-VU region. It alone accounts for anywhere from one-half to two-thirds of total fine particles mass on the 20 percent haziest days at locations within the MANE-VU region that the USEPA has designated as Class I areas. These are certain national parks and wilderness areas that Federal regulations seek to restore to natural, unpolluted levels. The Brigantine Wilderness Area of the Edwin B. Forsythe National Wildlife Refuge in New Jersey is one of the seven Class I sites in the MANE-VU region. Even in those areas not designated Class I, on the 20 percent haziest days sulfate generally accounts for the largest fraction (40 percent or more) of the total fine particles mass in the entire MANE-VU region. (Contributions to Regional Haze in the Northeast and Mid-Atlantic United States, Mid-Atlantic/Northeast Visibility Union (MANE-VU) Contribution Assessment, August 2006, (NESCAUM's 2006 MANE-VU Regional Haze

Contribution Assessment), http://www.nescaum.org/documents/contributions-to-regional-haze-in-the-northeast-and-mid-atlantic--united-states/)

Because of its dominant contribution to the creation of fine particles, sulfate is also an obvious target for reduction in efforts to reduce fine particles emissions. To reduce sulfate requires the reduction of its precursor pollutant, SO_2. Hence, USEPA, in its final implementation rule for fine particles at 40 CFR 51.1002(c)(1), required the evaluation of control measures for SO_2 in order to reduce fine particles emissions for those areas not in attainment of the annual fine particles National Ambient Air Quality Standards (NAAQS).

National Ambient Air Quality Standards (NAAQS)

The Federal Clean Air Act requires the USEPA to set NAAQS (40 CFR Part 50) for six common air pollutants (also known as criteria pollutants): fine particles, ground level ozone, carbon monoxide, sulfur oxides, nitrogen oxides and lead. These pollutants harm human health and the environment and cause property damage. The USEPA calls these pollutants "criteria" air pollutants because it regulates them by developing human health-based and/or environment-based criteria for setting permissible levels. Limits based on human health are called primary standards. The Clean Air Act also provides that USEPA can establish a second set of limits intended to prevent environmental and property damage, which are referred to as secondary standards.

The primary (health-based) and secondary (welfare-based) standards for fine particles are an annual standard of 15 micrograms per cubic meter ($\mu g/m^3$) and a 24-hour (daily) standard of 35 $\mu g/m^3$ (40 CFR 50.13). The primary (health-based) standard for SO_2 includes an annual standard of 0.030 parts per million (ppm) and a 24-hour standard of 0.140 ppm (40 CFR 50.4). The secondary (welfare-based) standard for SO_2 is 0.500 ppm over a three-hour period (40 CFR 50.5).

The USEPA is currently considering more stringent NAAQS for fine particulates and ozone because of known health effects below the current NAAQS. Both fine particles and ozone formation will be reduced as a result of the proposed rules.

Nonattainment of the NAAQS

When the USEPA establishes or revises a NAAQS, it designates each area of the country as either in attainment or in nonattainment with those NAAQS. States with areas designated as "nonattainment" for any criteria pollutant must develop State Implementation Plans (SIPs) that show how they will bring those areas into attainment of the standard by their designated attainment dates. Once an area meets its attainment date, it can be redesignated as "attainment." States must submit maintenance plans to the USEPA for these redesignated areas to ensure continued attainment in the areas. These redesignated areas are referred to as "maintenance areas."

Annual Fine Particulate NAAQS

On December 17, 2004, the USEPA finalized attainment/nonattainment designations for the annual fine particles standard, which became effective on April 5, 2005 (40 CFR 51.1000-1012). Thirteen of New Jersey's 21 counties were designated as nonattainment for the annual fine particles standard. These counties are associated with two multi-state fine particles nonattainment areas. Ten northern counties are part of the Northern New Jersey/New York/Connecticut (NNJ/NY/CT) nonattainment area and three southern counties are part of the Southern New Jersey/Philadelphia (SNJ/Phila) nonattainment area. New Jersey counties that are in the NNJ/NY/CT nonattainment area are Passaic, Bergen, Morris, Essex, Hudson, Union, Somerset, Middlesex, Monmouth and Mercer Counties. New Jersey counties that are in the SNJ/Phila nonattainment area are Burlington, Camden and Gloucester Counties.

On June 16, 2008, New Jersey submitted to USEPA its fine particles SIP, in accordance with the Federal final implementation rule for fine particles at 40 CFR 51.1000 through 51.1012. This SIP demonstrates how New Jersey will meet and maintain the 15 $\mu g/m^3$ annual fine particles standard by 2010. This SIP will also help the State meet other fine particles-related goals (reduced haze and air toxics) that complement the efforts to attain the annual fine particles NAAQS and further improve air quality in an effort to meet the daily fine particles standard of 35 $\mu g/m^3$.

Daily Fine Particulate NAAQS

As it does with the annual fine particles standard, the USEPA must designate areas that are in nonattainment of the daily fine particles standards. In accordance with 42 USC 7407(d)(1)(A) ((Section 107(d)(1)(A) of the Clean Air Act), for any new NAAQS, each state recommends to the USEPA areas of the state that should be designated as in nonattainment. Although fine particles concentration in New Jersey has improved since December 2004, the air quality in several areas of New Jersey does not meet the daily fine particles standard.

In December 18, 2007, New Jersey recommended to the USEPA that it apply the nonattainment boundaries designated for the annual fine particles standard to the daily fine particles standard, with the addition that Knowlton Township in Warren County be included in the Northampton-Lehigh County (PA) nonattainment area. In response to this request, then-Regional Administrator Steinberg of the USEPA Region 2 advised, in an August 14, 2008 letter, that the USEPA agreed with all of the Department's recommendations, except for the Knowlton Township request. The Department submitted additional justification for this request on September 17, 2008 and October 20, 2008. The USEPA has not finalized the designation for the 24-hour fine particles nonattainment in New Jersey.

Regional Haze

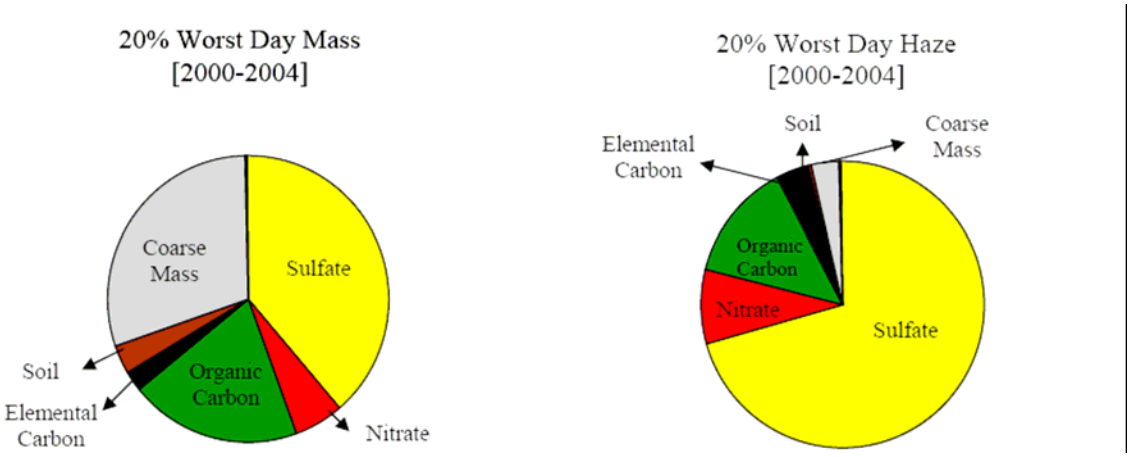
Fine particles are the major cause of visibility impairment in the U.S. Visibility impairment caused by the collection of air pollutants emitted by sources over a broad geographic area is known as regional haze. Some particles and gases can either absorb or scatter light, causing an effect known as "light extinction," resulting in haze. Very small or "fine" particles within the 2.5 micrometer size designation of fine particles ($PM_{2.5}$) are the most effective at scattering light and are of primary concern from a regional haze perspective. (Regional Haze and Visibility in the Northeast and Mid-Atlantic States, NESCAUM, January 31, 2001, (2001 NESCAUM Regional Haze Report), http://www.nescaum.org/topics/regional-haze/regional-haze-documents)

Monitoring data collected over the last decade at Federally protected Class I sites in the MANE-VU region show that fine particles concentrations, and resulting visibility impairment, are generally highest at those sites near industrial and highly populated areas of the region.

Monitoring data indicate that particle concentrations are lower, and visibility conditions are better, at the more northern Class I sites (such as Acadia and Moosehorn, both in Maine) where visibility on the 20 percent clearest days is close to natural, unpolluted conditions. By contrast, visibility at the more southern Class I Brigantine site in New Jersey is substantially impaired, even on the 20 percent clearest days. On the 20 percent haziest days, visibility is substantially impaired throughout the region. (2001 NESCAUM Regional Haze Report)

Sulfate is a significant factor in creating hazy conditions, since it is the dominant contributor to fine particles mass that causes these conditions in the Eastern U.S. Figure 2a below reflects sulfate as the largest contributor to fine particles mass at New Jersey's Class I Brigantine Wilderness Area from 2000 to 2004. Furthermore, the sulfate components of total fine particles mass have an even larger effect when considering the differential visibility impacts of different particle species. Sulfate typically accounts for over 70 percent of estimated particle-induced light extinction at northeastern and mid-Atlantic Class I sites. (NESCAUM's 2006 MANE-VU Regional Haze Contribution Assessment) Different fine particles will scatter light more or less effectively. Sulfate is highly hygroscopic (meaning it has a strong affinity for water), a characteristic that enhances its light-scattering efficiency. By comparison, the light-scattering contribution of organic carbon, which is non-hygroscopic, becomes smaller. Sulfate's relative contribution to total light-extinction is disproportionately larger than its relative contribution to total particle mass. (2001 NESCAUM Regional Haze Report) This is evident from a comparison of Figures 1a and 1b below. On the haziest 20 percent of days, sulfate accounts for approximately one-half to two thirds of total fine particles mass, but is responsible for 70 to 82 percent of estimated particle-induced light extinction at northeastern and mid-Atlantic Class I sites. (NESCAUM's 2006 MANE-VU Regional Haze Contribution Assessment)

Figures 1a and 1b: Role of Sulfate in Visibility Impairment at the Brigantine Wilderness Area (2000-2004)



(SIP for Regional Haze Proposal, September 5, 2008, NJDEP, http://www.state.nj.us/dep/baqp/2008%20Regional%20Haze/Regional%20Haze%20SIP%20-%20PROPOSAL.pdf)

To mitigate the visibility impairment that occurs from SO_2 emissions, MANE-VU states have committed to propose a coordinated course of action that includes the adoption and implementation of a low sulfur fuel strategy that focuses on reducing SO_2 emissions from stationary fuel combustion sources. (Statement of the Mid-Atlantic/Northeast Visibility Union (MANE-VU) Concerning a Course of Action Within MANE-VU Toward Assuring Reasonable Progress, June 20, 2007, (MANE-VU 2007 Statement), http://www.manevu.org/document.asp?fview=Formal%20Actions#)

The proposed amendments would implement this strategy in New Jersey in accordance with the USEPA's regional haze regulations, as discussed below.

Federal Regional Haze Regulations

In amendments to the Clean Air Act in 1977, Congress added Section 169A (42 U.S.C. §7491) setting forth the following national visibility goal: "Congress hereby declares as a national goal the prevention of any future, and the remedying of any existing, impairment of

visibility in mandatory Class I Federal areas which impairment results from man-made air pollution."

The USEPA addressed the problem of visibility impairment in two phases. The 1980 USEPA regulations (40 CFR 51.300-51.307) addressed what was termed "reasonably attributable" visibility impairment or "plume blight." Reasonably attributable visibility impairment is the result of emissions from one or a few sources that are generally located in close proximity to a specific Class I area. "Plume blight" describes a discrete or coherent plume of pollution moving across the horizon or across a scenic view.

When it amended the Clean Air Act in 1990, Congress added Section 169B (42 U.S.C. § 7492) to strengthen and reaffirm the national visibility goal. Section 169B(e) calls for the USEPA "to carry out the Administrator's regulatory responsibilities under [Section 169A], including criteria for measuring 'reasonable progress' toward the national goal." Congress also included in Section 169B authorization for further research and regular assessments of the progress made. In 1993, the National Academy of Sciences concluded that "current scientific knowledge is adequate and control technologies are available for taking regulatory action to improve and protect visibility."

The second phase of the USEPA's attempts to reduce visibility impairment in national parks and wilderness areas was the adoption of the Federal Regional Haze Rule in 1999. The Regional Haze Rule slightly modified 40 CFR 51.300 through 51.307, including the addition of definitions in 40 CFR 51.301, and added new 40 CFR 51.308 and 51.309 to address regional haze visibility impairment on a national level.

The goal of the Federal Regional Haze Rule is to improve visibility to natural background levels by the year 2064, in all Federally designated Class I areas (42 U.S.C. 7492). This goal is to be achieved by requiring all states to periodically conduct an analysis of available reasonable measures and implement these measures. The analysis and measures must be included in a SIP. States with Class I areas are further required to establish Reasonable Progress Goals for Class I areas within their borders, using the results of the analysis of reasonable measures as a way to demonstrate movement towards the national goal of the absence of all manmade pollution from national parks and wilderness areas by 2064. States are required to reassess the progress toward the 2064 goal in five- and 10-year increments, with the first progress assessment occurring in 2013, for the first milestone year 2018 (40 CFR 51.308(f) and (g)). The five-year reassessment

of progress is intended to keep the states on target to meet each 10-year goal established for the area.

State and Regional Efforts to Address Regional Haze

In response to the requirements of the USEPA Regional Haze Rule, New Jersey proposed its regional haze air quality protection plan on June 16, 2008. (SIP for Regional Haze Proposal, September 5, 2008) This first New Jersey regional haze air quality protection plan includes a reasonable progress goal to improve visibility levels by 2018, in accordance with design standards established by the USEPA Regional Haze Rule. The Department anticipates that it will achieve the goal through a combination of reasonable control measures for New Jersey, and similar controls of sulfate emissions from sources in the other states in the region.

The Department consulted with the other Regional Planning Organizations and the contributing members of MANE-VU regarding the reasonableness of the measures contained in the State's SIP. To address the impact on Federally protected Class I areas, MANE-VU members have agreed to pursue a coordinated course of action. The MANE-VU agreement is designed to ensure reasonable progress toward preventing any future impairment of visibility in Class I areas, and remedying any existing impairment of visibility in Class I areas. This includes pursuing the adoption and implementation of a low sulfur fuel strategy in the MANE-VU region. (MANE-VU 2007 Statement)

To meet its commitment to the MANE-VU agreement, New Jersey proposed a low sulfur fuel strategy in its June 18, 2008 Regional Haze SIP. This strategy is also included in New Jersey's June 16, 2008 Fine Particles Attainment Demonstration SIP to attain and maintain the fine particles NAAQS.

The MANE-VU agreement contains an effective date of 2012 for sulfur-in-fuel standards. In the within proposed rules, New Jersey proposes an effective date of 2014, in response to feedback from the fuel oil industry on the time required to lower the sulfur in fuel regionally and in consultation with the other MANE-VU states. Otherwise, the proposed sulfur-in-fuel limits are consistent with those contained in the MANE-VU low sulfur fuel oil strategy for the states in the inner zone, which includes New Jersey.

New Jersey's proposed limits are as follows: 500 ppm for No. 2 and lighter (distillate oil), 2,500 ppm for No. 4 (residual oil), and 3,000 ppm and 5,000 ppm for Nos. 5, 6 and heavier (residual oil), depending upon the zone. Measured as percentages, these maximum limits are 0.05 percent, 0.25 percent, 0.30 percent and 0.50 percent, respectively. The Department also proposes to further reduce the maximum sulfur content of No. 2 distillate oil in 2016 to 15 ppm (0.0015 percent).

In some counties and municipalities in New Jersey, the existing standards already meet the proposed MANE-VU limits for heavy oil (Nos. 5, 6 and heavier residual oil). That is, the maximum sulfur content standard for Nos. 5, 6 and heavier fuel oil is already 3,000 ppm for Zones 4 and 6, and 5,000 ppm for Zone 3. Existing N.J.A.C. 7:27-9 establishes maximum sulfur content standards and equivalent output-based performance standards for the six areas of New Jersey referred to as Zones 1 through 6, based on the level of SO_2 nonattainment of the zone at the time the rules were promulgated. To ensure maintenance of the SO_2 standard, the Department is proposing to retain the more stringent maximum sulfur content standard of 3,000 ppm for heavy oil in Zone 4 in the northern part of the State (Bergen, Essex, Hudson, Middlesex, Monmouth, Morris, Passaic, Somerset, and Union Counties), and in Zone 6, in the southern part of the State (the Townships of Bass River, Shamong, Southampton, Tabernacle, Washington and Woodland in Burlington County, and Waterford Township in Camden County). This is consistent with the MANE-VU limits for this grade of oil, which range from 3,000 to 5,000 ppm. Also, consistent with the proposed new maximum allowable sulfur-in-fuel standards, the Department proposes commensurate new maximum allowable SO_2 emissions standards for each grade of fuel oil.

Since 2004, the Department has participated in stakeholder meetings conducted by Northeast States for Coordinated Air Use Management (NESCAUM) and MANE-VU to solicit input from industrial and environmental advocates on how to effectively implement a regional low and ultra-low sulfur heating oil program. The major stakeholders included representatives from the heating oil industry, including oil-heat distributors, wholesalers and refiners, other states, NESCAUM, MANE-VU and the Ozone Transport Commission. The Department also met on a number of occasions with members of the New Jersey's regulated fuel oil community to generally discuss what would be required for New Jersey facilities to comply with the lower sulfur in fuel oil standards.

The proposed amendments are more fully described below.

7:27-9.2 Sulfur content standards

The proposed amendments at N.J.A.C. 7:27-9.2 include the addition of Tables 1B and 2B, to add new maximum allowable sulfur-in-fuel and maximum allowable SO_2 emission standards, effective July 1, 2014. The proposed new standards at Table 1B are given in parts per million by weight (ppm), rather than percent sulfur by weight, as the existing standards are described. As the maximum standards decrease to 15 ppm, expressing the standards as a percentage becomes somewhat awkward, inasmuch as 0.0015 percent is more difficult to conceptualize than 15 ppm. The conversion to parts per million by weight does not change the standard. Conversion from percent to parts per million requires multiplication by 10,000.

Accordingly, and for greater ease in comparing the existing standards to those that are proposed to be in effect in 2014 and 2016, the Department proposes to rename Table 1 as Table 1A and to convert the existing standards to their equivalents in parts per million. Thus, for example, the existing percent sulfur by weight standard for No. 2 and lighter fuel oil is 0.3 percent; expressed as parts per million by weight, this standard is 3,000 ppm.

These proposed new standards in Tables 1B and 2B are consistent with the MANE-VU emission management strategy for new standards for maximum allowable sulfur in fuel, which would reduce sulfur content in the inner zone states (including New Jersey).

Under the MANE-VU agreement on the proposed standards, phase one establishes limits of 0.05 percent sulfur by weight (500 ppm) for distillate oil (No. 2 and lighter); 0.25 percent sulfur by weight (2,500 ppm) for No. 4 residual oil; and between 0.3 and 0.5 percent sulfur by weight (3,000 to 5,000 ppm) for No. 6 residual oil. Under the MANE-VU strategy, these standards are to go into effect no later than 2012. The Department proposes additional time, until July 1, 2014, to achieve these standards to ensure sufficient time for production and distribution of lower sulfur fuel oil.

In addition, the MANE-VU strategy provides for a phase two reduction by 2016 for distillate oil (No. 2 and lighter) to 15 ppm. The proposed new standards for maximum allowable SO_2 emissions at N.J.A.C. 7:27-9.2 Table 2B represent, as do the existing standards, the

emissions level for each grade of fuel oil under combustion scenarios without add-on SO_2 air pollution control equipment. These values are generated by applying a USEPA SO_2 emission factor, based on the fuel oil grade, in addition to the fuel oil heating value (British Thermal Units (BTU)/gallons), to the sulfur concentration in ppm. An example of this calculation for No. 2 fuel oil with a sulfur by weight content of 0.0015 percent is as follows: 0.0015 percent sulfur by weight x 142 pounds SO_2 /1000 gallons fuel oil x 1000 gallons/137 Million BTUs = 0.00160 pounds SO_2/Million BTUs. The emission factor is taken from the USEPA AP-42 Compilation of Air Pollution Emission Factors, Volume I, External Combustion Sources, Chapter 1.3, Fuel Oil Combustion, September 1998.

The Department proposes renaming Table 2 as Table 2A and making the existing maximum allowable SO_2 emissions standards effective through June 30, 2014. Thereafter, the limits in proposed Table 2B would apply. As a clarification, the Department proposes restating "lbs/10^6" as "lbs per million" in the header for the existing table's emissions standards, and replacing the reference to "No. 2" with "No. 2 & lighter" in the left-most column of Table 2A. These standards apply not only to No. 2 grade fuel oil, but to lighter grades, as well. This is consistent with Table 1, which correctly refers to "No. 2 & lighter" grades of fuel oil. To further simplify all four tables, the Department proposes to replace "Zone 2 & Zone 5" and "Zones 4 & Zone 6" with "Zones 2 & 4" and "Zones 4 & 6," respectively, and to use these shorter labels in proposed new Tables 1B and 2B.

The Department recognizes that on July 1, 2014 and July 1, 2016, when the proposed new standards go into effect, facilities may have product in their tanks that complies with the previous standard, but not with the newly operative standard. In order to avoid a situation whereby persons (from refiners down to end-users, such as home heating oil consumers) could not sell, distribute, deliver or use fuel that complied with the standard in effect when it was stored, but does not comply with the operative standard, the Department proposes to amend N.J.A.C. 7:27-9.2(a) and (b) to include a "sell-through" provision, which allows the storage, sale, distribution, delivery or use of newly-noncompliant fuel that is already in tanks in New Jersey as of July 1, 2014 and July 1, 2016.

The Department proposes to update the cross references at N.J.A.C. 7:27-9.2(a) through (c), (d)6 and (f), and to delete cross references to N.J.A.C. 7:27-9.5, which is proposed to be repealed. The Department also proposes to replace the reference in N.J.A.C. 7:27-9(a) and (b) to

"a percentage" with "the applicable parts per million," and to make a similar amendment at N.J.A.C. 7:27-9.2(f). To correct a grammatical error, the Department proposes to replace "which" with "that" at N.J.A.C. 7:27-9.2(a) through (c) and (d)6.

The Department also proposes to correct a cross reference at N.J.A.C. 7:27-9.2(d)7 to the table in N.J.A.C. 7:27-18 containing threshold values for significant air quality impact levels. This table is codified at N.J.A.C. 7:27-18.4, not N.J.A.C. 7:27-18.3.

7:27-9.5 Incentive for conversion to coal or other solid fuel

To ease the transition to the then relatively new sulfur-in-fuel content standards, in 1982 the Department promulgated N.J.A.C. 7:27-9.5 to allow, under certain strictly controlled circumstances, the use of high-sulfur oil for no more than two or three years, where the Department has issued a permit for conversion to coal or other solid fuel. No entity has taken advantage of this provision. As a result of recently adopted amendments to rules governing sulfur in solid fuels (40 N.J.R. 4390(a), 41 N.J.R. 1752(a)), N.J.A.C. 7:27- 9.5 is now inconsistent with the performance standard of 0.150 pounds of SO_2 per million BTU at N.J.A.C. 7:27-10, Sulfur in Solid Fuels. There would be an environmental detriment were the Department to allow either such a conversion or the use of such non-compliant, high-sulfur fuel oil. Accordingly, the Department proposes to repeal N.J.A.C. 7:27-9.5.

Social Impact

The proposed amendments will have a positive social impact on the residents of New Jersey because of the reduced health and welfare impacts achieved from air pollution reduction.

The proposed amendments will primarily reduce emissions of SO_2, which is an air contaminant and a precursor in the formation of fine particles in ambient air and haze. Additionally, the proposed amendments will indirectly reduce emissions of nitrogen oxides, which are fine particles and ozone precursors, and indirectly reduce the direct emissions of fine particles.

The health effects associated with exposure to fine particles are significant, mainly due to the fact that particles of this size can easily reach into the deepest regions of the lungs. Significant health effects associated with fine particles exposure include:

- Premature mortality;
- Aggravation of respiratory and cardiovascular disease;
- Decreased lung function and difficulty breathing;
- Asthma attacks; and
- Serious cardiovascular problems, such as heart attacks and cardiac arrhythmia.

The USEPA estimated that attainment of the 1997 annual and daily fine particles standards nationally would prolong tens of thousands of lives each year and prevent hundreds of thousands of hospital admissions, doctor visits, absences from work and school, and respiratory illnesses in children. Individuals particularly sensitive to fine particles exposure include older adults, people with heart and lung disease, and children. The elderly have been shown to be particularly at risk for premature death from the effects of particulate matter. Health studies have shown that there is no clear threshold below which adverse effects are not experienced by at least certain segments of the population. Some individuals who are particularly sensitive to fine particles exposure may even be adversely affected by concentrations of fine particles below the revised 2006 annual and daily standards. (72 Fed. Reg. 20586-20587 (April 25, 2007), Clean Air Fine Particle Implementation Rule) The USEPA is currently reconsidering those standards based on recommendations of its Clean Air Scientific Advisory Committee (CASAC).

According to the most recent Federal and State estimates, 765,125 New Jersey residents have asthma. In 2004, asthma sufferers in New Jersey accounted for 15,679 hospitalizations, which represents approximately one out of every 50 hospitalizations. Of these asthma hospitalizations, 5,175, or about one-third, were children. There were 1,838 deaths due to asthma between 1989 and 2003 in New Jersey. The risk of death from asthma increases considerably with age, with the over-65 population having the highest rates. (Asthma in New Jersey Annual Update 2006. New Jersey Department of Health and Senior Services, August 2006, http://www.state.nj.us/health/fhs/asthma/documents/asthma_update2006.pdf)

SO_2 causes a wide variety of health and environmental impacts because of the way it reacts with other substances in the air. SO_2 reacts with other chemicals in the air to form fine

sulfate particles. When these are breathed, they gather in the lungs and are associated with increased respiratory symptoms and disease, difficulty in breathing, and premature death. Peak levels of SO_2 in the air can cause temporary breathing difficulty for people with asthma who are active outdoors. Longer-term exposures to high levels of SO_2 gas and particles cause respiratory illness and aggravate existing heart disease. (Sulfur Dioxide: Health and Environmental Impacts of SO_2/Six Common Pollutants/Air & Radiation/USEPA, http://www.epa.gov/oar/urbanair/so2/hlth1.html)

Increased ozone concentrations severely affect the quality of life for susceptible populations – children, the elderly, and asthmatics – and present health risks for everyone. Exposure to ozone for several hours at relatively low concentrations significantly reduces lung function and induces respiratory inflammation in normal, healthy people during exercise. This decrease in lung function is generally accompanied by symptoms such as chest pain, coughing, sneezing, and pulmonary congestion. (The Green Book Nonattainment Areas for Criteria Pollutants, United States Environmental Protection Agency, as updated August 17, 2007, http://www.epa.gov/oar/oaqps/greenbk/o3co.html#Ozone)

NO_x, as a precursor for both fine particles and ozone, will contribute to the health impacts associated with both fine particles and ozone. Ozone exposure can cause several health effects, including irritation of lungs. This can make the lungs more vulnerable to diseases such as pneumonia and bronchitis, increase incidents of asthma and susceptibility to respiratory infections, reduce lung function, reduce an individual's ability to exercise and aggravate chronic lung diseases.

The Department anticipates that there will be no social impact from the proposed repeal of N.J.A.C. 7:27-9.5, since there have not been, nor will there be, any entities that have or will avail themselves of the options offered by these outdated, and no longer applicable, incentives to convert to coal combustion.

Economic Impact

The Department anticipates that the overall economic impact of the proposed amendments will be a positive one.

The Department evaluated the availability and production cost of heating oil with sulfur-by-weight specifications of 500 ppm (low sulfur heating oil) in 2014 and 15 ppm (ultra-low sulfur heating oil) in 2016 for the northeast U.S. that corresponds to the MANE-VU Region. The Department based this analysis on currently available refinery studies conducted for the National Oil Heat Research Alliance (NORA) and American Petroleum Institute (API), Energy Information Agency (EIA) data, and a public health benefits study conducted by Northeast States for Coordinated Air Use Management (NESCAUM). The NORA Report concludes that as the demand for low and ultra-low sulfur fuel oil and heating oil increases, the sources of supply for low sulfur fuel oil and refining capacity will be reconfigured for greater low and ultra-low sulfur production capability. The API Report projects that sufficient supplies of low sulfur heating oil will be available to meet the demand that will be generated from the implementation of a low sulfur fuel standard in 2010 for New Jersey. The NESCAUM Report determined overall health care savings from the implementation of both low and ultra-low sulfur programs. (Public Health Benefits of Reducing Ground-level Ozone and Fine Particle Matter in the Northeast U.S., A Benefits Mapping and Analysis Program (BenMAP) Study, NESCAUM, January 15, 2008) The Department also conducted a cost-benefit analysis based on information from this report in addition to the NORA and API Reports and EIA data.

Additionally, the Department considered the study conducted by the New York State Energy Research and Development Authority (NYSERDA) and Brookhaven National Laboratories (Low sulfur Home Heating Oil Demonstration Project Summary Report, Energy Research Center, Inc., and Brookhaven National Laboratories, BNL-74956-2005-IR, June 2005 (NYSERDA Report)). The NYSERDA Report finds overall savings to consumers in terms of reduced heating equipment service and maintenance costs from using low sulfur heating oil.

The NORA Report

The NORA Report analyzes the availability of and the cost to produce low sulfur heating oil in 2012, and ultra-low sulfur heating oil in 2018, to supply the demands of the northeast U.S. market. The report analyzes availability of low sulfur heating oil as of 2012 because that was the targeted implementation date of the low sulfur heating oil program within the inner zone of the MANE-VU region (New Jersey, New York, Delaware and Pennsylvania, or portions thereof).

The targeted implementation date for the first phase of the program for the outer zone of the MANE-VU region was 2014. The entire MANE-VU region was targeted to require the use of ultra-low sulfur heating oil by 2018. The NORA Report focuses on the supply and demand of the northeast U.S. heating oil market, because this area corresponds to the entire MANE-VU region that will be affected by both the low and ultra-low sulfur programs**.**

The NORA Report indicates that there will be a major shift to ultra-low sulfur distillate by 2012 in the Atlantic Basin region, of which the eastern portion of the U.S. is a part. By 2012, approximately 76 percent of distillate in the Atlantic Basin region will be low or ultra-low sulfur, up from 48 percent in 2006. By 2018, 86 percent of Atlantic Basin distillate oil will be 50 ppm or less.

Similarly by 2018, 94 percent of the northeast U.S. distillate will be ultra-low sulfur according to the NORA report. Therefore, most suppliers will be marketing all or predominantly ultra-low sulfur distillate. This is mainly because the on-road and non-road diesel conversions to ultra-low sulfur were completed more than five years earlier and adequate notice of the heating oil market conversion to ultra-low sulfur distillate will be provided to suppliers. Hence, the NORA Report believes that supplying the additional ultra-low product will not place a significant strain on the northeast U.S. heating oil market. Based on this conclusion, the available supply in 2014 and 2016 will meet the demand of New Jersey.

The NORA Report points out the possibility that the availability of low sulfur fuel may be constrained at the beginning of 2012, because Federal mandates for non-road mobile sources to use ultra-low sulfur fuel oil in the U.S. will cause a rapid, short-term shift to ultra-low sulfur fuels. In consideration of this possibility, the Department proposes to implement the low sulfur fuel standard in 2014 instead of in 2012, to provide the refineries sufficient time to make modifications to increase distillate production to meet this demand.

According to the NORA Report, producing low sulfur distillate that meets the proposed 500 ppm standard will cost refineries 5.4 to 6.8 cents per gallon more than producing fuel exceeding the maximum 500 ppm sulfur standard (high sulfur distillate). This figure includes both capital and operating costs of control equipment. Producing 15 ppm-compliant sulfur distillate will cost as much as 8.9 cents per gallon more than producing high sulfur distillate. The cost to refineries that have existing desulfurization facilities that could be revamped for lower sulfur content operation could be as much as four cents per gallon lower.

The API Report

The API Report provides additional support for the feasibility of the low sulfur heating oil supply. It analyzes the availability and cost to produce low sulfur heating oil for 2010 in the U.S. The API Report utilized a proprietary refinery analysis model that accounted for the operations of each domestic refinery that manufactures distillate fuel oil. The API report found that even without any change to the allowable sulfur-by-weight specifications in heating oil the 2010 production of low sulfur heating oil in the eastern U.S. will reach 250 thousand barrels per day (tbd), as compared to 90 tbd for high sulfur heating oil, so that these fuels represent approximately 73 and 27 percent of the total distillate fuel oil production in the eastern U.S. for 2010, respectively. This closely corresponds to the nationwide relative production values for high and low sulfur heating oil in 2010, which the API reports as 423 tbd for low sulfur heating oil as compared to 155 tbd of high-sulfur heating oil.

Based on the API Report modeling results for 2010, assuming that these results will be similar in 2014, and given the adequate notice that will be provided to refiners, the Department anticipates that there will be enough supply to satisfy New Jersey's market for low sulfur heating oil.

NESCAUM Report

NESCAUM used a USEPA Environmental Benefits Modeling and Analysis Program (BENMAP) to estimate the economic benefit of avoided adverse health care episodes, such as hospital admissions and medical treatment, that result from SO_2 emission reductions achieved from the implementation of low and ultra-low sulfur standards in 2018, within the northeast U.S. The analysis showed that the eastern and midwest U.S. will achieve SO_2 emission reductions of 180,000 tons with an economic benefit in reduced health care costs of $3.63 billion, which corresponds to more than $20,000 of benefit per ton of SO_2 removed.

No. 2 Oil

The Department used information from the NORA, API, NESCAUM reports and EIA data to determine the costs and benefits of implementing the proposed low and ultra-low sulfur standards. As discussed above, the API report found that the 2010 production of low sulfur heating oil in the eastern U.S. will reach 250 tbd, as compared to 90 tbd for high sulfur heating oil, so that these fuels represent approximately 73 and 27 percent of the total distillate fuel oil production in the eastern U.S. for 2010. To determine the total amount of high-sulfur heating oil consumed in New Jersey in 2007, the Department applied the 27 percent high sulfur heating oil to total heating oil ratio determined from the API Report to the 316,134 thousand gallons per year (tgy) of total residential distillate oil consumed in New Jersey for 2007. (State Energy Data System, Table F4a: Distillate Fuel Oil Consumption Estimates by Sector, 2007, Energy Information Administration, February 13, 2009, http://www.eia.doe.gov/emeu/states/sep_fuel/html/pdf/fuel_use_df.pdf) This yields 85,356 tgy of high sulfur heating oil consumed in New Jersey for 2007. Although the data are from 2007, it is reasonable to assume that they should closely approximate heating oil demand in 2014 and also in 2016, which may well be lower than this amount. This is because heating oil consumption in the State has leveled off from a high of approximately 430,000 tgy in 2000 to approximately 300,000 tgy in 2006 and 2007. (State Energy Data System, Table 8: Residential Sector Energy Consumption Estimates, Selected Years, 1960-2006, New Jersey, http://www.eia.doe.gov/emeu/states/sep_use/res/use_res_nj.html) Also, energy efficiency improvement efforts should reduce fuel oil consumption.

New Jersey would achieve a SO_2 emission reduction of 1,030 tons per year (tpy) from the implementation of the low sulfur standard in 2014. This estimate is based on the application of USEPA's AP-42 SO_2 emission factor of 142 times S to the 85,356 tgy of high sulfur heating oil projected to be consumed in New Jersey in 2014. This emission factor is expressed in units of pounds of SO_2 per thousand gallons, and the S in the equation is the percent sulfur concentration by weight of the distillate fuel oil. (AP-42 Compilation of Air Pollution Emission Factors, Volume I, External Combustion Sources, Chapter 1.3, Fuel Oil Combustion, USEPA, September 1998) Since there are two different S values for New Jersey under the existing rule depending on the county (0.3 percent and 0.2 percent), the S value of 0.218 percent that the Department

used for the calculation is a weighted average based on estimated county population in 2007. Subtracting the SO_2 emission calculated from the 0.218 percent S value and the 0.05 percent low sulfur S value yields a reduction of SO_2 emissions of 1,030 tpy.

The cost to convert the projected 85,356 gallons of high sulfur heating oil to low sulfur heating oil is estimated to be $5.8 million. This is based on the application of the NORA cost estimate of 6.8 cents per gallon for converting high sulfur heating oil to low sulfur-heating-oil.

In addition to the 1,030 tpy of SO_2 emission reduction from the implementation of the proposed low sulfur rulemaking standard in 2014, the Department projects achieving SO_2 emission reduction of 294 tpy from implementation of the ultra-low sulfur standard in 2016. The Department used the same estimation methodology applied above, but with S representing a reduction of average sulfur-by-weight concentrations in the projected 316,134 tgy of low sulfur heating oil from 0.05 percent (500 ppm) to 0.0015 percent (15 ppm). (Final Regulatory Analysis: Control of Emissions from Nonroad Diesel Engines, EPA420-R-04-007, Table 7.1.6-10 Annual Distillate Fuel Demand and Sulfur Content: Final NRLM Rule: USEPA, May 2004 (Table 7.1.6-10), http://www.epa.gov/nonroad-diesel/2004fr/420r04007h.pdf)

The cost to convert 316,134 tgy of low sulfur heating oil to ultra-low sulfur heating oil is estimated to be $14.5 million, based on the NORA cost estimate of 4.6 cents per gallon to convert low sulfur heating oil to ultra-low sulfur heating oil. The Department added this amount to the $5.8 million estimated cost to implement the low sulfur standard to obtain an overall cost estimate of $20.3 million to implement both the proposed low and ultra-low sulfur standards for residential heating oil (No. 2 fuel oil). This corresponds to a cost of $15,332 per ton of SO_2 emission reductions, based on the total SO_2 emission reductions of 1,324 tpy achieved from the implementation of both the proposed low sulfur and ultra-low sulfur standards for residential heating oil.

No. 4 Oil

Currently, only one facility that is using No. 4 fuel oil in New Jersey, Accurate Forming in Hamburg, participates in the Department's Emission Statement Program. Lowering the allowable maximum sulfur content of No. 4 fuel oil to 0.25 percent (2,500 ppm) will reduce SO_2 emissions by approximately 1.4 tpy from burning 45 tgy of No. 4 fuel oil at this facility. This

estimate is based on a reduction in average sulfur content of 0.7 percent (7,000 ppm) to the allowable sulfur by weight specification of 0.25 percent (2,500 ppm) for 42 tgy of No. 4 fuel oil affected by the proposed change in sulfur specifications. The SO_2 emission factor, expressed in units of pounds of SO_2 per thousand gallons, is 150 X S. (USEPA AP-42 Compilation of Air Pollution Emission Factors, Volume I, External Combustion Sources, Chapter 1.3, Fuel Oil Combustion, September 1998)

In order to estimate the incremental cost of this affected fuel, the Department considered historical price data from the Division of Purchase and Property in the New Jersey Department of the Treasury. (http://www.nj.gov/cgi-bin/treasury/purchase/fuel/fuelsearch.pl?fueltype=oil46) Prices for No. 6 fuel oil are available for three specifications of sulfur-by-weight (0.3 percent, 0.5 percent, and 1.0 percent). Because information on more than one specification of No. 4 fuel oil is not available from the Treasury Department, the Department uses the historical average price difference on the available prices for No. 6 fuel oil.

The historical average price difference from August 30, 2004 to June 25, 2009 for No. 6 fuel oil with sulfur-by-weight contents between 0.3 and 1.0 percent was 8.86 cents per gallon. Using this estimated price difference, the total economic impact of the proposed 2014 standard for New Jersey consumers on the affected 42 tgy of No. 4 fuel oil will be approximately $3,721 per year. This corresponds to a cost estimate of $2,658 per ton of SO_2 removed.

No. 6 Oil

Lowering the allowable sulfur content of No. 6 fuel oil to 0.5 percent (5,000 ppm) would affect at least five New Jersey facilities and would reduce SO_2 emissions by approximately 219 tons per year. Based on the Emission Statement data, most of the 9.3 million gallons of No. 6 fuel oil is combusted by B.L. England Generating Station in Upper Township, Deepwater Generating Station in Pennsville, Ames Rubber in Hamburg, Anchor Glass in Salem, and BASF in Washington. The estimated sulfur reduction is based on a reduction in average sulfur content of 0.8 percent (8,000 ppm) to the allowable sulfur content of 0.5 percent (5,000 ppm) for the 9.3 million gallons per year of No. 6 fuel oil affected by the proposed change in sulfur specifications. The SO_2 emission factor, expressed in units of pounds of SO_2 per thousand gallons, is 157 times

S. (USEPA AP-42 Compilation of Air Pollution Emission Factors, Volume I, External Combustion Sources, Chapter 1.3, Fuel Oil Combustion, September 1998)

In order to estimate the incremental cost of the affected fuel, the Department considered historical price data from the Division of Purchase and Property in the New Jersey Department of the Treasury (http://www.state.nj.us/cgi-bin/treasury/purchase/fuel/fuelsearch.pl?fueltype=oil46) As discussed above, prices for No. 6 fuel oil are available for three specifications of sulfur by weight (0.3 percent, 0.5 percent, and 1.0 percent). The historical average price difference from August 30, 2004 to July 27, 2007 in No. 6 fuel oil with sulfur-by-weight contents between 0.5 and 1.0 percent was 5.05 cents per gallon. Using this estimated price difference, the total economic impact of the proposed 2014 standard for New Jersey consumers on the affected 9.3 million gallons per year of No. 6 fuel oil is $469,650 per year. This corresponds to $2,145 per ton SO_2 removed as a result of the proposed decrease in sulfur content in No. 6 oil.

Estimated Net Benefit

The total cost of the proposed decrease in sulfur content from No. 2 fuel oil, No. 4 oil, and No. 6 oil estimated to be $13,100 per ton of SO_2 removed. This estimate is based on combined costs of $20.8 million, divided by the SO_2 emissions removed of 1,585 tons per year that the Department anticipates will result from the proposed rules. The annual health-care benefit is estimated to be $32.0 million, which the Department calculated based on the NESCAUM health care benefit factor of $20,167 per ton of SO_2 removed for the 1,585 tons of SO_2 removed. The health benefit exceeds the compliance costs. Taking the difference between the benefits and costs, the Department estimates that the proposed standards for residential heating oil (No. 2 fuel oil) and No. 4 and 6 fuel oils rules will have a net benefit in health care savings of $11.2 million.

NYSERDA Report

NYSERDA and Brookhaven National Laboratories conducted a three-year demonstration project in which 1,000 homes switched from high to low sulfur heating oil. According to the

NYSERDA Report, consumers that switch to low sulfur heating oil save money, because low sulfur distillate fuel oil used in heating is cleaner-burning and results in a substantial reduction in heating equipment maintenance and service requirements, while at the same time reducing SO_2 emissions. The NYSERDA Report found that the use of the low sulfur heating oil reduced fouling of heating equipment, which meant that cleaning of the equipment was needed less frequently. The savings ranged from $22.00 to $40.00 per year, based on hourly labor costs of $56.00 to $100.00 per hour. These calculations were based on the cleaning interval increasing from 18 months for fuel with sulfur by weight of 0.25 percent (2,500 ppm) to 58 months for fuel with sulfur by weight of 0.05 percent. This savings would be equivalent to one to two percent of the roughly $2,000 cost of fuel oil per year per home.

The NYSERDA Report also estimated that fouling a furnace system with approximately 2,500 ppm fuel oil reduces efficiency by approximately two percent per year, and more than 50 percent of deposits are created by the sulfur in the fuel. Reducing sulfur content in distillate fuel oil to 0.05 percent (500 ppm) will increase efficiency by approximately one percent over the heating season, for a 0.5 percent average annual efficiency increase. In the case of a $2,000 per year heating bill, the efficiency savings would be approximately $20.00. Additionally, the use of low sulfur heating oil will extend furnace life and could reduce the cost of new oil furnaces, because of the ability to use lower-cost materials in their construction and more compact heat exchangers.

Economic Impact of Proposed Sulfur Standards

The economic benefit of reducing the negative impacts of high sulfur fuel on the environment, human health and damage to equipment outweighs the costs to implement the proposed rulemaking. The Department anticipates the increased cost to consumers as a result of the proposed low and ultra-low sulfur standards for heating oil (No. 2 oil) is two to four percent of recent home heating oil prices. The proposed standard for No. 4 fuel oil will affect few facilities in New Jersey, and cost a relatively low amount. The predominant use of the No. 6 fuel oil in New Jersey is by several electric generating units (EGUs). According to EIA data, the amount of No. 6 oil used by these EGUs is low in comparison to the entire fuel mix of all EGUs (less than one percent, nationally), so the increase in the cost of electricity for the consumer will

also be proportionately low. With an estimated net health benefit of $11.2 million, the cost of the proposed rules is more than offset by the benefits received.

Economic Impact of Proposed Repeal

The Department anticipates that there will be no economic impact from the proposed repeal of N.J.A.C. 7:27-9.5, since there have not been, nor will there be, any entities that have or will avail themselves of the options offered by these outdated, and no longer applicable, incentives to convert to coal combustion.

Environmental Impact

The proposed amendments will have a positive impact on the environment because emissions of SO_2, fine particles, nitrogen oxides, and carbon dioxide are reduced when the sulfur content of heating oil is lowered. These pollutants contribute to the formation of fine particles, ozone, and regional haze, acid deposition, nitrification of water bodies, and accumulation of greenhouse gases in the atmosphere. ("Low Sulfur Heating Oil in the Northeast States: An Overview of Benefits, Costs and Implementation Issues," NESCAUM, December 2005, http://www.nescaum.org/documents/report060101heatingoil.pdf)

As discussed in the Economic Impact above, the Department estimates that lowering the allowable sulfur-by-weight specification in high sulfur heating oil (No. 2) to 0.05 percent (500 ppm) will reduce SO_2 emissions by over 1,000 tons per year in New Jersey. A further reduction in the allowable sulfur-by-weight standard in low sulfur heating oil (No. 2) from 0.05 percent (500 ppm) to 0.0015 percent (15 ppm) will additionally reduce SO_2 emissions by about 300 tpy in New Jersey. Both of these reductions are discussed in the Economic Impact above. The Department estimates that lowering the allowable sulfur-by-weight standard of No. 4 fuel oil to 0.250 percent (2,500 ppm) in all zones, as is proposed, would affect at least one New Jersey facility and would reduce SO_2 emissions from this facility by over one tpy . Similarly, lowering the allowable sulfur-by-weight standard of No.6 fuel oil to 0.5 percent (5,000 ppm) would affect at least five New Jersey facilities and would reduce sulfur dioxide emissions by over 200 tpy.

A summary of the estimated emission reductions obtained from lowering the sulfur-by-weight concentrations in the typical grades of fuel oils used in heating is included in Tables B and C below.

Table B

Emission Reductions from Proposed Sulfur in Fuel Standards

Effective July 1, 2014

Typical Grades of Oil	**Existing Sulfur-in-Fuel Standards**	**Proposed Sulfur-in-Fuel Standards in 2014**	**SO_2 Emission Reductions in 2014 in tons per year (tpy)**
No. 2 & lighter	0.3 percent to 0.2 percent (3,000 to 2,000 ppm)	0.05 percent (500 ppm)	1,030
No. 4	0.7 percent (7,000 ppm)	0.25 percent (2,500 ppm)	1.4
No. 5, No. 6 & Heavier	2.0 percent to 0.3 percent (20,000 to 3,000 ppm)	0.5 percent (5,000 ppm)	219
Total emission reductions in 2014 from proposed new sulfur-in-fuel standards			1,250 tpy

Table C

Emission Reductions from Proposed Sulfur in Fuel Standards

Effective July 1, 2016

Typical Grades of Oil	**Proposed Sulfur-in-Fuel Standards in 2014**	**Proposed Sulfur-in-Fuel Standards in 2016**	**Sulfur Dioxide Emission Reductions in 2016 in tons per**

			year (tpy)
No. 2 & lighter	0.05 percent (500 ppm)	0.0015 percent (15 ppm)	294
Total additional emission reductions in 2016 from proposed new sulfur-in-fuel standards			294
Total emission reductions from proposed new sulfur-in-fuel standards in 2014 and 2016			1,544

Lowering the sulfur content of heating oil reduces particles emissions. Direct particle emissions from residential burners are reduced 80 percent from implementing a low sulfur heating oil standard, which reduces the level of sulfur in the heating oil by a similar amount. ("Low Sulfur Heating Oil in the Northeast States: An Overview of Benefits, Costs and Implementation Issues," NESCAUM, December 2005, http://www.nescaum.org /documents /report060101 heatingoil.pdf) This is because reducing SO_2 emissions by reducing sulfur in heating oil will also cause a similar reduction in fine particles emissions, as discussed in the Summary above. High sulfur heating oil contains significant quantities of ash; whereas, low sulfur heating oil has negligible ash content. (USEPA AP-42 Compilation of Air Pollution Emission Factors, Volume I, External Combustion Sources, Chapter 1.3, Fuel Oil Combustion, September 1998) A lower ash content in the low sulfur heating oil results in lower particle emissions when the heating oil is combusted.

Ozone damages the leaves of trees and other plants, degrading the aesthetic value of cities, national parks, and recreation areas. Ozone can also damage certain man-made materials, such as textile fibers, dyes, and paints. (USEPA Fact sheet on the New 8-Hour Ozone and Fine Particulate Matter (2.5 microns) Health Standards, July 1997)Lowering the sulfur content of fuel oil reduces the overall level of NO_x emissions, which are contributors to ozone and fine particles. This is because the processes that remove fuel-borne sulfur in the refinery also remove other impurities, including small amounts of nitrogen compounds in the fuel oil. This means that there are fewer "fuel-bound" nitrogen compounds in low sulfur fuel. Lower levels of nitrogen in low sulfur fuel may reduce nitrogen oxides emission levels by five to 10 percent. (Low Sulfur

Heating Oil: Evaluating the Impacts on Consumers, Consumer Energy Council of America, September 2003) Moreover, NO_x emission reductions will result in reductions in ozone and fine particles emissions because NO_x is a precursor pollutant for both ozone and fine particles formation.

Fine particles harm vegetation and ecosystems, contribute to the formation of acid rain, cause aesthetic damage to manmade structures, and damage sensitive forests and farm crops. (USEPA. Health and Environment, Particulate Matter, http://www.epa.gov/air/particlepollution/health.html) The primary fine particles that contribute to acid rain are the sulfates and nitrates formed from SO_2 and NO_x, which also react in the atmosphere to form acidic compounds. Consequently, reducing sulfur concentration in heating oil reduces acid rain by reducing the sulfate formed from SO_2.

Another immediate effect of reducing the sulfur content in fuel is a noticeable reduction in the levels of sulfate buildup on heating equipment. This reduces heating equipment fouling, which results in an increase in average furnace efficiency. (Low Sulfur Heating Oil: Evaluating the Impacts on Consumers, Consumer Energy Council of America, September 2003) This increase in efficiency reduces the amount of fuel necessary to operate the furnace, which reduces emissions of carbon dioxide (CO_2), a greenhouse gas that contributes to global warming. Global climate change includes effects on precipitation and sea level and temperature rises, all of which could have significant adverse effects on many ecological systems, as well as on human health and the economy. New Jersey, a coastal state, is particularly vulnerable to sea level rise.

The proposed amendments will have a positive environmental impact in New Jersey by reducing emissions of sulfur dioxide, fine particles, nitrogen oxides, and carbon dioxide, all of which have negative impacts on the environment as discussed above.

The Department anticipates that there will be no environmental impact from the proposed repeal of N.J.A.C. 7:27-9.5, since there have not been, nor will there be, any entities that have or will avail themselves of the options offered by these outdated, and no longer applicable, incentives to convert to coal combustion.

Federal Standards Statement

Executive Order No. 27(1994) and N.J.S.A. 52:14B-1 et seq. (P.L. 1995, c.65) require State agencies that adopt, readopt or amend State regulations that exceed any Federal standards or requirements to include in the rulemaking document a Federal standards analysis. No Federal law establishes standards or requirements regarding the contents of sulfur in the fuel oil regulated by N.J.A.C. 7:27-9. Although the Department's sulfur content standards for fuel oil are Federally enforceable as part of New Jersey's State Implementation Plan, the proposed amendments to N.J.A.C. 7:27-9 and proposed repeal of N.J.A.C. 7:27-9.5 are not promulgated under the authority of, or in order to implement, comply with or participate in any program established under Federal law or under a State statute that incorporates or refers to Federal law, Federal standards or Federal requirements. Moreover, there is no comparable Federal standard exceeded by this rulemaking and no Federal regulatory scheme that might be perceived to be duplicated or overlapped by this rulemaking. Accordingly, Executive Order No. 27(1994) and P.L. 1995, c.65 do not require a Federal standards analysis.

Jobs Impact

The Department anticipates that the proposed amendments may have some impact on employment in the State. However, the net impact should be neutral. Refineries, fuel storage facilities, fuel transporters and fuel distributors will likely modify their operations as necessary without the need to shut down operations and/or reduce their workforce.

The Hess refinery in Port Reading may be significantly impacted by the proposed amendments. This facility currently supplies higher sulfur distillate oil (sulfur by weight of 0.20 percent (2000 ppm) or less) for residential heating in New Jersey. Hess will have to find other markets for its high sulfur distillate oil before July 1, 2014, the effective date of the proposed sulfur specification of 500 ppm, or install additional desulfurization equipment to produce 500 and 15 ppm fuel oil by the 2014 and 2016 deadlines. Other refineries that supply heating oil to New Jersey and other MANE-VU states may also have to install additional desulfurization equipment. Installation of additional desulfurization equipment at New Jersey refineries would require the employment of construction workers.

Lower sulfur fuel oil may result in less required maintenance on oil furnaces and boilers. This may reduce the need for furnace maintenance technicians. Lower sulfur oil also enables the

production of lower cost and more efficient furnaces, which may encourage the replacement of older, less efficient furnaces, thereby increasing the need for furnace installers.

The potential changes for the oil heat industry are not expected to have an impact on overall employment. Without cleaner fuel, the oil heat industry may have difficulty competing with the natural gas heat industry. To the extent that the proposed amendments encourage the use of oil heat, they will contribute to the competitiveness and employment in the oil heat industry.

There will be no impact on jobs from the proposed repeal of N.J.A.C. 7:27-9.5, since there have not been, nor will there be, any entities that have or will avail themselves of the options offered by these outdated, and no longer applicable, incentives to convert to coal combustion.

Agricultural Industry Impact

The Department anticipates that the proposed amendments will have a positive impact on the State's agriculture industry. Sulfur dioxide contributes to acid rain and related crop and vegetation damage. A reduction of SO_2 will result in less crop damage. A reduction of SO_2 will also result in a reduction in emissions of precursors of sulfate particulate matter, which travel and deposit in soil and in water. According to the USEPA, these depositions can make lakes and streams acidic, change the nutrient balance in coastal waters and large river basins, deplete the nutrients in soil, damage sensitive forests and farm crops, and negatively affect the diversity of ecosystems. ("Particulate Matter – Health and Environment," United States Environmental Protection Agency. http://www.epa.gov/particles/health.html)

The proposed amendments will also reduce particulate matter accumulation on agricultural growth. This reduction in accumulation will have a positive impact by reducing interference with photosynthesis.

There will be no agricultural industry impact from the proposed repeal of N.J.A.C. 7:27-9.5, since there have not been, nor will there be, any entities that have or will avail themselves of the options offered by these outdated, and no longer applicable, incentives to convert to coal combustion.

Regulatory Flexibility Analysis

As required by the New Jersey Regulatory Flexibility Act, N.J.S.A. 52:14B-16 et seq., the Department has evaluated the reporting, recordkeeping and other compliance requirements that the proposed rulemaking would impose upon small businesses. The Regulatory Flexibility Act defines the term "small business" as "any business which is a resident in this State, independently owned and operated and not dominant in its field, and which employs fewer than 100 full-time employees." Based upon this definition, some small businesses, primarily fuel oil distributors, would be subject to the proposed amendments. Although small businesses would be subject to the compliance requirements of the proposed amendments, the Department has not proposed any new recordkeeping or reporting requirements, nor would any small business be required to retain a consultant or other professional in order to comply with the proposed amendments.

The cost of producing lower sulfur fuel oil will be borne by refineries, not small businesses. To meet the requirement of the proposed amendments, distributors would continue their current practice of ensuring that the fuel oil they are delivering meets the sulfur limits, without need for additional professionals. The Department has proposed at N.J.A.C. 7:27-9.2(b) to allow regulated entities to continue to use fuel oil that met the existing limits and is already in storage at the time the proposed new limit becomes operative. The reason for this provision is to allow regulated entities to use up their existing supply of fuel oil before receiving a new delivery of fuel oil that meets the new limits, without requiring them to remove and dispose of the old oil. This will mitigate the impact of the proposed amendments on small businesses, as well as large businesses.

New Jersey is under a Federal mandate, pursuant to the authority of the Clean Air Act, to meet the health-based NAAQS and improve visibility in Class I areas, which requires reducing air pollutant emissions. Failure to achieve these reductions subjects New Jersey to economic sanctions, which would adversely affect all businesses in the State, including small businesses. The Department has determined that to exempt small businesses from any requirements or to reduce any requirements would compromise the goals of the rules and the emission reductions needed to reach the attainment of the ozone and particulate matter standards.

The proposed repeal of N.J.A.C. 7:27-9.5 is not expected to impact any small businesses, since it is not expected to have an impact on any business in the State.

Smart Growth Impact

Executive Order No. 4 (2002) requires State agencies that adopt, amend or repeal State regulations to include in the rulemaking document a Smart Growth Impact statement that describes the impact of the proposed amendments on the achievement of smart growth and implementation of the State Development and Redevelopment Plan (State Plan).

The proposed rulemaking does not relate to the State's official land use and development policies in a way that would either encourage or discourage any development or redevelopment in this State contrary to the guiding principles of the State Plan. As a result, the Department does not expect this rulemaking to have an impact on the State's achievement of smart growth, or implementation of the State Plan.

Since the proposed amendments implement reductions of SO_2 emissions from the combustion of fuel oil, thereby helping to protect air quality, the proposed amendments support the State Plan’s goal of protecting the environment and preventing air pollution by implementing a strategy of reducing air pollution at the source.

Housing Affordability Impact Analysis

Pursuant to N.J.S.A. 52:14B-4, as amended effective July 17, 2008, by P.L. 2008, c. 46, the Department has evaluated the proposed rulemaking to determine the impact, if any, on the affordability of housing. Lowering sulfur in fuel oil is expected to enable the construction of lower cost and more efficient heaters, thereby, reducing both the installation and operating cost of oil heaters. However, the Department has determined that the proposed amendments will evoke no change in the overall average cost associated with housing in the State.

Smart Growth Development Impact Analysis

Pursuant to N.J.S.A. 52:14B-4, as amended effective July 17, 2008, by P.L. 2008, c. 46, the Department has evaluated the proposed rulemaking to determine its impact, if any, on smart growth development. The Department has determined that the proposed rulemaking will not impact housing production in Planning Areas 1 or 2, or within designated centers, under the State Development and Redevelopment Plan.

Full text of the proposal follows (additions indicated in boldface **thus**; deletions indicated in brackets **[**thus**]**):

7:27-9.2 Sulfur content standards

(a) No person shall store, offer for sale, sell, deliver or exchange in trade for use in New Jersey fuel **[**which**] that** contains sulfur in excess of **[**a percentage**] the applicable parts per million** by weight set forth in **[**Table 1**] Tables 1A and 1B** of this section, except as provided in (c), (d) and (e) below **[**, and N.J.A.C. 7:27-9.5**]**. **Fuel stored in New Jersey that met the applicable maximum sulfur content standard of Tables 1A or 1B of this section at the time the fuel was stored in New Jersey may be stored, offered for sale, sold, delivered or exchanged in trade for use in New Jersey after the effective date of the applicable standard in Table 1B.**

(b) No person shall use fuel **[**which**] that** contains sulfur in excess of **[**a percentage**] the applicable parts per million** by weight set forth in **[**Table 1**] Tables 1A and 1B** of this section, except as provided in (c), (d) and (e) below **[**, and N.J.A.C. 7:27-9.5**]**. **]**. **Fuel stored in New Jersey that met the applicable maximum sulfur content standard of Tables 1A or 1B of this section at the time it was stored in New Jersey may be used in New Jersey after the operative date of the applicable standard in 1B.**

TABLE 1**A**

MAXIMUM ALLOWABLE SULFUR IN FUEL **EFFECTIVE THROUGH JUNE 30, 2014**

Typical Grades of Fuel Oil	Classification by SSU Viscosity at 100° F	**[**Percent Sulfur**] Parts per Million** by Weight **(ppm)**

		Zone 1	**[**Zone**] Zones** 2 & **[**Zone**]** 5	Zone 3	**[**Zone**] Zones** 4 & **[**Zone**]** 6
No. 2 & lighter	Less than or equal to 45, including gases	**[**0.3%**]** **3,000**	**[**0.3%**]** **3,000**	**[**0.2%**]** **2,000**	**[**0.2%**]** **2,000**
No. 4	Greater than 45 but less than 145	**[**2.0%**]** **20,000**	**[**0.7%**]** **7,000**	**[**0.3%**]** **3,000**	**[**0.3%**]** **3,000**
No. 5, No. 6 & heavier	Equal to or greater than 145	**[**2.0%**]** **20,000**	**[**1.0%**]** **10,000**	**[**0.5%**]** **5,000**	**[**0.3%**]** **3,000**

TABLE 1B

MAXIMUM ALLOWABLE SULFUR IN FUEL

EFFECTIVE JULY 1, 2014 AND JULY 1, 2016

Parts per Million by Weight (ppm)

Typical Grades of Fuel Oil	**Classification by SSU Viscosity at 100°F**	**Zone 1**	**Zones 2 & 5**	**Zone 3**	**Zones 4 & 6**
No. 2 & lighter (effective July 1, 2014 through June 30, 2016)	**Less than or equal to 45, including gases**	**500**	**500**	**500**	**500**
No. 2 & lighter (effective July 1, 2016)	**Less than or equal to 45, including gases**	**15.0**	**15.0**	**15.0**	**15.0**

No. 4 (effective July 1, 2014)	**Greater than 45 but less than 145**	**2,500**	**2,500**	**2,500**	**2,500**
No. 5, No. 6 & heavier (effective July 1, 2014)	**Equal to or greater than 145**	**5,000**	**5,000**	**5,000**	**3,000**

(c) The provisions of (a) and (b) above shall not apply to fuels whose combustion carries sulfur dioxide emissions from any stack or chimney into the outdoor atmosphere **[**which**] that** are demonstrated to the Department as not exceeding, at any time, those quantities of sulfur dioxide expressed in pounds per 1,000,000 British Thermal Units (BTU) gross heat input, set forth in **[**Table 2**] Tables 2A and 2B** of this section.

TABLE 2**A**

MAXIMUM ALLOWABLE SULFUR DIOXIDE EMISSIONS

EFFECTIVE THROUGH JUNE 30, 2014

SO_2 Emissions **[** (lbs./10^6 **] lbs per million** BTU)

Typical Grades of Fuel Oil	Classification by SSU Viscosity at 100° F	Zone 1	**[**Zone**]** **Zones** 2 & **[**Zone**]** 5	Zone 3	**[**Zone**] Zones** 4 & **[**Zone**]** 6
No. 2 **& lighter**	Less than or equal to 45, including gases	0.32	0.32	0.21	0.21
No. 4	Greater than 45 but less than 145	2.10	0.74	0.32	0.32

No. 5, No. 6 & Heavier	Equal to or greater than 145	2.10	1.05	0.53	0.32

TABLE 2B

MAXIMUM ALLOWABLE SULFUR DIOXIDE EMISSIONS

EFFECTIVE JULY 1, 2014 AND JULY 1, 2016

		SO_2 Emissions (lbs per million BTU)			
Typical Grades of Fuel Oil	**Classification by SSU Viscosity at 100° F**	**Zone 1**	**Zones 2 & 5**	**Zone 3**	**Zones 4 & 6**
No. 2 & lighter (effective July 1, 2014 through June 30, 2016)	**Less than or equal to 45, including gases**	**0.0530**	**0.0530**	**0.0530**	**0.0530**
No. 2 & lighter (effective July 1, 2016)	**Less than or equal to 45, including gases**	**0.00160**	**0.00160**	**0.00160**	**0.00160**
No. 4 (effective July 1, 2014)	**Greater than 45 but less than 145**	**0.260**	**0.260**	**0.260**	**0.260**
No. 5, No. 6 & Heavier (effective July 1, 2014)	**Equal to or greater than 145**	**0.530**	**0.530**	**0.530**	**0.320**

(d) The provisions of (a) and (b) above shall not apply to fuels included in an alternative emission control plan based on a mathematical combination approved by the Department. Application for such approval shall be made to the Department in writing and must include:

1. Certification that all source operations to be included in the mathematical combination are under the control of, or operated by, one person; [and]

2. Certification that the total sulfur dioxide emissions from the mathematical combination during each 24-hour period will not exceed the quantity of sulfur dioxide expressed in pounds per million BTU gross heat input set forth in **[**Table 2**] Tables 2A and 2B** of this section; [and]

3. Certification that the total sulfur dioxide emissions from the mathematical combination during each 24-hour period will not exceed the total weight of sulfur dioxide that all the sources in the mathematical combination were allowed to emit at the time of applying; [and]

4. Identification of each fuel burning unit and stack to be included in the mathematical combination; [and]

5. Identification of the grades of fuel to be burned in each unit, the maximum sulfur content of each fuel to be burned in each unit, the maximum gross heat input rate for each unit, the higher heating value of each fuel, and the annual fuel use and operating hours per year for each unit; [and]

6. An application for a permit for any fuel burning unit **[**which**] that** must be altered or for any fuel burning unit in which fuel is to be burned having a sulfur content in excess of the applicable limits specified in **[**Table 1**] Tables 1A and 1B** of this section. The permit may be a preconstruction permit and certificate under N.J.A.C. 7:27-8, an operating permit under N.J.A.C. 7:27-22, or a facility-wide permit as defined at N.J.A.C. 7:1K-1.5; and

7. A demonstration by air quality simulation modeling acceptable to the Department, including aerodynamic downwash modeling, unless waived in accordance with the provisions of N.J.A.C. 7:27-9.4, that increases in air contaminants resulting from use of the alternative emission control plan will not cause any ambient air quality standard to be exceeded, or cause any allowable prevention of significant deterioration ambient air increment as established by the USEPA to be exceeded; and in areas where an ambient air

quality standard is already exceeded, will not cause an increase in ambient air concentrations greater than the threshold increases set forth in Table 1 of N.J.A.C. 7:27-18.**[**3**]4**; and

8. - 9. (No change.)

(e) (No change.)

(f) If the identified grade of fuel does not agree with the classification by viscosity set forth in **[**Table 1**] Tables 1A and 1B,** and [Table 2**] Tables 2A and 2B,** then the allowable **[**percent**] parts per million** sulfur by weight shall be determined by the viscosity classification.

[7:27-9.5 Incentive for conversion to coal or other solid fuel

(a) The Department may authorize a person to store, offer for sale, sell, deliver, exchange in trade or use fuel oils having a sulfur content in excess of the maximum allowable amounts set forth in Table 1 of N.J.A.C. 7:27-9.2 provided that:

1. The fuel burning unit in which the high-sulfur oil is used, or a unit of comparable capacity at the same facility, will burn coal or other solid fuel in accordance with a schedule approved by the Department; and

2. The high-sulfur oil will be burned for no longer than a period of two years if an existing fuel burning unit is converted from burning oil or gas, or three years if the conversion is accomplished by the installation of a new fuel burning unit; and

3. The applicant demonstrates by air quality simulation modeling or other methods acceptable to the Department that increases in the emissions of air contaminants resulting from the use of the high-sulfur oil will not cause any ambient air quality standard to be exceeded and in areas where an ambient air quality standard is already exceeded, will not cause an increase in ambient air concentrations greater than the threshold increases set forth in Table 1 of N.J.A.C. 7:27-18.3; and

4. The sulfur dioxide emissions from the burning of coal or other solid fuel will not exceed 0.3 pounds of sulfur dioxide per million BTU gross heat input; and

5. The applicant obtains a permit for the conversion to coal or other solid fuel. The permit may be a preconstruction permit and certificate under N.J.A.C. 7:27-8, an operating permit under N.J.A.C. 7:27-22, or a facility-wide permit as defined at N.J.A.C. 7:1K-1.5; and

6. The applicant agrees that if the conversion does not take place pursuant to (a)1 above, he will pay to the Department a sum of money no less than the difference between the cost of

the high-sulfur oil used pursuant to the provisions of this section and the cost of the same grade oil which would otherwise be required under the provisions of N.J.A.C. 7:27-9.2. Such payment shall be in addition to, and not in lieu of, any penalty which may be required pursuant to the New Jersey Air Pollution Control Act, N.J.S.A. 26:2C-1 et seq.; and

7. The applicant will furnish to the Department a written monthly report stating the quantity of high-sulfur oil used, the cost of such oil, and the cost of an equivalent quantity of the same grade oil which conforms to the provisions of N.J.A.C. 7:27-9.2; and

8. The applicant attests to his commitment to honor and comply with all of the provisions of this section and any other provisions the Department deems appropriate, by entering into a Consent Order, which shall so state, with the Department; and

9. Such Consent Order shall be subject to modification or revocation by the Department if the Department determines that the emissions from the burning of high-sulfur oil contribute to a contravention of any applicable ambient air quality standard, or significantly degrade ambient air quality, or that the applicant has failed to honor or comply with its provisions in part or in whole.**]**