ENVIRONMENTAL PROTECTION

ENVIRONMENTAL REGULATION

DVISION OF AIR QUALITY

AIR QUALITY PERMITTING ELEMENT

Air Pollution Control

Operating Permits
Reclassification of CO_2 as an Air Contaminant

Proposed Amendments:	N.J.A.C. 7:27-8.1, 7:27-17.1, 7:27-19.1, 27-22.1
Authorized By:	Bradley M. Campbell, Commissioner, Department of Environmental Protection
Authority:	N.J.S.A. 26:2C, particularly 26:2C-8 and 26:2C-9.8; 13:1B-3; and 13:1D-9
Calendar Reference:	See summary below for explanation of exception to calendar requirement
DEP Docket Number:	21-04-09/476
Proposal Number:	PRN 2004-399

A **Public hearing** concerning this proposal will be held on:

November 22, 2004, at: 1:00 p.m.

New Jersey Department of Environmental Protection

401 E. State Street

Hearing Room--First Floor, East Wing

Trenton, NJ 08625

Directions to the hearing room maybe found at the Department's Web site address, http://www.state.nj.us/dep/where.htm

Submit written comments by close of business on December 17, 2004 to:

Alice A. Previte, Esq.

Attention: DEP Docket No. 21-04-09/476

New Jersey Department of Environmental Protection

Office of Legal Affairs

PO Box 402

Trenton, NJ 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. Submittal of a disk or CD is not a requirement. The Department prefers Microsoft Word 6.0 or above. 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.

Pursuant to N.J.S.A. 26:2C-8, these proposed new rules and amendments will be operative 60 days after adoption by the Commissioner.

The agency proposal follows:

Summary

The notice of proposal is excepted from rulemaking calendar requirement pursuant to N.J.A.C. 1:30-3.3(a)5, inasmuch as the Department has provided a 60-day comment period.

The New Jersey Department of Environmental Protection (Department) is proposing amendments to N.J.A.C. 7:27-8, Permits and Certificates for Minor Facilities; N.J.A.C. 7:27-17, Control and Prohibition of Air Pollution by Toxic Substances; N.J.A.C. 7:27-19, Control and Prohibition of Air Pollution from Oxides of Nitrogen; and N.J.A.C. 7:27-22, Operating Permits. These amendments would revise and clarify the definition of “distillates of air” at N.J.A.C. 7:27-8.1, 7:27-17.1 and 7:27-19.1, and define the term at

7:27-22.1, in conformance with commonly accepted scientific and chemical engineering understanding of the term and consistent with the definition of the term at N.J.A.C. 7:27-21, Emission Statements.

On January 23, 2003, the Department adopted regulations requiring large stationary sources to report emissions of the greenhouse gases carbon dioxide (CO_2) and methane (CH_4) (DEP Docket No. 03-02-01/149). These regulations revised the definition of distillates of air at N.J.A.C. 7:27-21.1 to remove CO_2 from the chemical species listed as distillates of air, thereby classifying CO_2 as an air contaminant at N.J.A.C. 7:27-21.

The proposed amendments would revise the definition of distillates of air at N.J.A.C. 7:27-8.1, 7:27-17.1, 7:27-19.1, and 7:27-22.1 as the following chemical species produced through the cryogenic fractional distillation of air: helium (He), nitrogen (N_2), oxygen (O_2), neon (Ne), argon (Ar), krypton (Kr), and xenon (Xe). This revision to the definition of distillates of air would have the consequence of classifying carbon dioxide (CO_2) as an air contaminant.

Background

Five of the six significant greenhouse gases as defined by the Intergovernmental Panel on Climate Change (IPCC) are already classified by default as air contaminants by the Department through categorical omission from the definition of distillates of air (CH_4, N_2O, HFCs, PFCs, SF_6). While correcting a significant technical inaccuracy in the

existing Department definition of distillates of air, the proposed amendments would also serve to harmonize the Department's definition of the bundle of six significant greenhouse gases, including CO_2, as air contaminants.

This clarification of the status of CO_2 is a regulatory prelude to anticipated future regulatory adoption of a Model Rule proposed through the Regional Greenhouse Gas Initiative (RGGI). At Governor McGreevey's initiative, New Jersey is participating through RGGI, along with eight other states in the Northeast and Mid-Atlantic (Connecticut, Delaware, Maine, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont), in the development of a regional CO_2 cap-and-trade program. Prior to regulating CO_2 as an air pollutant, the Department would need to make a formal determination and advise the public that regulating CO_2 is in the "best interest of human health, welfare, and the environment" as required by the Air Pollution Control Act (APCA), N.J.S.A. 26:2C-1 et seq. This proposed rule also serves as this formal determination and public advisory (See N.J.S.A. 26:2C-9.2i).

The statutory definition of air contaminant at N.J.S.A. 26:2C-2 defines an air contaminant as "any substance, other than water or distillates of air, present in the atmosphere as solid particles, liquid particles, vapors, or gases." Distillates of air is not defined at 26:2C-2. Since the term must be specified in order to define "air contaminant" at N.J.S.A. 26:2C-2, it is necessary for the Department, and the Department has the implicit authority to, specify the chemical species that comprise distillates of air.

The Department determined during the course of the Emission Statements rule-making (DEP Docket No. 03-02-01/149) that a reasonable interpretation of the legislative intent in excluding distillates of air from the definition of air contaminant was to exclude elements of air that are not normally regarded as contaminants, are not potentially hazardous or problematic, are not known to cause adverse environmental impacts, and are not generally addressed by air pollution control measures. This interpretation of legislative intent is consistent with N.J.A.C. 26:2C-9.2i, as discussed above, and acknowledges that as environmental conditions change and scientific evidence evolves, reclassification of gases and/or substances as air contaminants may be necessary.

This interpretation is consistent with the statutory definition of air pollution at N.J.S.A. 26:2C-2 and the Department's regulatory definition of "air pollution" at N.J.A.C. 7:27-5.1, which states that "'air pollution' means the presence in the outdoor atmosphere of one or more air contaminants in such quantities and duration as are, or tend to be, injurious to human health or welfare, animal or plant life or property, or would unreasonably interfere with the enjoyment of life or property throughout the State …."

The exclusion of CO_2 as an air contaminant is no longer valid, given the intent of the Department's definition of air contaminant throughout N.J.A.C. 7:27 and the definition of air pollution at N.J.A.C. 7:27-5.1, because scientific evidence has evolved to the point that adverse environmental and human health impacts due to increasing concentrations of CO_2 in the atmosphere are now clear.

The chemical species currently listed as distillates of air, and therefore excluded from consideration as air contaminants, evidently were selected because until the past decade the Department believed them to be environmentally benign and not subject to a significant change of concentration in the atmosphere. Over the past decade an overwhelming body of scientific evidence has emerged linking anthropogenic emissions of CO_2 to climate change and sea level rise. The projected climate impacts and related impacts on ecosystems and society related to increasing concentrations of CO_2 in the atmosphere due to anthropogenic emissions supports the conclusion that CO_2 should no longer be disregarded in the formation of environmental policy.

Formal Determination Regarding Regulation of Carbon Dioxide as an Air Contaminant

1. Legal Overview

Over the past decade an overwhelming body of scientific evidence has emerged linking anthropogenic emissions of CO_2 to climate change and sea level rise. The projected climate impacts and related impacts on the environment, ecosystems, and society due to increasing concentrations of CO_2 in the atmosphere from anthropogenic emissions clearly supports the conclusion that CO_2 emissions create significant adverse impacts on the State.

N.J.S.A. 26:2C-9.2i authorizes the Department to require reporting and evaluation of emissions information for any air contaminant; the proposed regulation herein would classify carbon dioxide as an air contaminant at N.J.A.C. 7:27. However, prior to requiring that such information be included on a permit or regulating any air contaminant

not regulated by the U.S. Environmental Protection Agency (EPA) pursuant to the federal Clean Air Act, 42 U.S.C. §§ 7401 et seq., N.J.S.A. 26:2C-9.2i requires the Department to first make a determination and advise the public of its conclusion that regulating such air contaminant is in the best interest of human health, welfare, and the environment.

2. Formal Determination and Justification

The Department determines, based on the evidence outlined herein, that regulating carbon dioxide (CO_2) as an air contaminant is in the best interest of human health, welfare, and the environment. This statement shall fulfill the Department's requirement to advise the public of its determination and justification for this determination, pursuant to N.J.S.A. 26:2C-9.2i.

The Department's determination is based on compelling scientific evidence of existing and projected adverse impacts due to climate change on the environment, ecosystems, wildlife, human health, and enjoyment of property in the State. The Department also bases this determination in part on the expected impacts of climate change on the formation of ground-level ozone. Increases in average temperature and related extreme heat events will increase the formation of ground-level ozone and further undermine the State's attempts to meet national ambient air quality standards (NAAQS) for NOx, with attendant increases in adverse human health and environmental impacts, as well as State compliance costs.

2.1 Global Impacts

According to the Intergovernmental Panel on Climate Change (IPCC), the atmospheric concentration of CO_2 has risen 31% since 1750, primarily due to anthropogenic emissions. By 2100, atmospheric concentrations of CO_2 are expected to reach 540-970 ppm (90% to 250% above the 1750 concentration of 280 ppm) (IPCC, *Third Assessment Report of Working Group I, Climate Change 2001: The Scientific Basis,* 2001).

This increase in greenhouse gas emissions is altering the climate and leading to rising sea levels. According to the IPCC, "Emissions of greenhouse gases and aerosols due to human activities continue to alter the atmosphere in ways that are expected to affect the climate" (IPCC, *Summary for Policy Makers: A Report of Working Group I of the Intergovernmental Panel on Climate Change,* 2001, p. 5). The IPCC reports that global average surface temperatures have risen by 0.6°C (1°F) during the 20th century and CO_2 emissions due to human activity are projected to further raise global temperatures by 1.4°C to 5.8°C (2.5°F to 10.4°F) over the period 1990 to 2100. Global average sea level rose by between 0.1 and 0.2 meters (4 and 8 inches) during the 20th century and the IPCC projects that global mean sea level will rise by an additional 0.09 to 0.88 meters (4 inches to 35 inches) over the period 1990 to 2100 (IPCC, *Third Assessment Report,* 2001). According to the IPPC, these trends are primarily due to increasing atmospheric greenhouse gas concentrations:

"In light of the new evidence and taking into account the remaining uncertainties, most of the observed warming over the last 50 years is likely to have been due to the increase in

greenhouse gas concentrations. Furthermore, it is very likely that the 20th century warming has contributed significantly to the observed sea level rise, through thermal expansion of sea water and widespread loss of land ice" (IPCC, *Summary for Policy Makers*, 2001, p. 10).

Future atmospheric CO_2 concentrations will be primarily tied to anthropogenic CO_2 emissions, according to the IPCC: "Emissions of CO_2 due to fossil fuel burning are virtually certain to be the dominant influence on the trends in atmospheric CO_2 concentration during the 21st century" (IPCC, *Summary for Policy Makers*, 2001, p. 12).

2.2 U.S. Impacts

In 2001, the Bush administration asked the National Research Council (NRC) to assess the IPCC findings. The NRC generally validated the IPCC findings and concluded that human-induced warming and sea level rise is expected to continue through the 21st century (National Research Council, *Climate Change Science: An Analysis of Some Key Questions*, National Academy of Sciences, 2001). Moreover, the NRC report reaffirmed that policy decisions made today will influence the extent of damage to human populations and ecosystems later in the century. The NRC report states:

- "The committee generally agrees with the assessment of human-caused climate change presented in the IPCC Working Group I (WG I) scientific report"

- "Greenhouse gases are accumulating in Earth's atmosphere as a result of human activities, causing surface air temperatures and subsurface ocean temperatures to rise."
- "Human-induced warming and associated sea level rises are expected to continue through the 21st century."

(NRC, *Climate Change Science, 2001*, p. 1)

The NRC report also outlined a number of adverse impacts from expected climate change:

- "Secondary effects are suggested by computer model simulations and basic physical reasoning. These include increases in rainfall rates and increased susceptibility of semi-arid regions to drought." (NRC, p. 1)
- "Increased rainfall rates could impact pollution run-off and flood control. With higher sea level, coastal regions could be subject to increased wind and flood damage even if tropical storms do not change in intensity. A significant warming also could have far reaching implications for ecosystems." (NRC, p. 4)
- "Global warming could well have serious adverse societal and ecological impacts by the end of this century, especially if globally-averaged temperature increases approach the upper end of the IPCC projections. Even in the more conservative scenarios, the models project temperatures and sea-levels that continue to increase well beyond the end of this century, suggesting that assessments that examine only

the next 100 years may well underestimate the magnitude of the eventual impacts." (NRC, p. 5)

In 2002, the U.S. State Department filed the *U.S. Climate Action Report*, the third formal U.S. national communication, as required as a signatory to the United Nations Framework Convention on Climate Change (UNFCCC) (U.S. Department of State, *U.S. Climate Action Report*, 2002). This report, the submission of which was coordinated by the U.S. EPA, represents the formal policy of the United States related to climate change. The *Report* states that "Greenhouse gases are accumulating in Earth's atmosphere as a result of human activities, causing global mean surface air temperature and subsurface ocean temperature to rise" (U.S. Department of State, *U.S. Climate Action Report*, 2002, p. 4). The *Report* also states that a continued increase in greenhouse gas emissions is projected to lead to significant temperature increases in the United States over the next century:

"Assuming continued growth in world greenhouse gas emissions, the primary climate models drawn upon for the analyses carried out in the U.S. National Assessment projected that temperatures in the contiguous United States will rise 3-5^{o}C (5-9^{o}F) on average during the 21st century." (U.S. Department of State, *U.S. Climate Action Report*, 2002, p. 89)

The *Report* also officially acknowledged a number of projected adverse impacts from climate change in the United States, including:

- Increases in both precipitation and evaporation, as well as more frequent occurrences of extreme wet and dry conditions (including increases in rainfall events considered "heavy" based on conditions in each region, which can lead to increased water pollution due to an increase in the intensity of runoff events)
- Increases in the heat index and in the frequency of heat waves, leading to increased discomfort and adverse human health impacts
- Compounding of other environmental stresses, such as air and water pollution, habitat fragmentation, wetland loss, coastal erosion, and reductions in fisheries
- Increase in damage to property and critical infrastructure, including buildings, roads, and power lines due to sea-level rise and storm surges in low-lying coastal areas
- Vulnerability of ecosystems and disappearance of some unique ecosystems, such as barrier islands
- Loss of goods and services supplied by some ecosystems, which may be costly or impossible to replace

(U.S. Department of State, *U.S. Climate Action Report*, pp. 82-112)

2.3 New Jersey-Specific Impacts

Climate change resulting from anthropogenic emissions of CO_2 and other greenhouse gases is expected to have significant negative impacts on New Jersey ecosystems, coastal property, air quality, and human health. As a result, CO_2 emissions can no longer be considered benign and would clearly meet the Department's definition of air pollution at N.J.A.C. 7:27-5.1.

Air Quality Impacts

Rising ambient temperatures will exacerbate the formation of ground-level ozone, which will further challenge New Jersey attempts to meet national ambient air quality standards for protection of human health and welfare. Climate change models predict a significant increase in the number of days above 90^{o}F, which will increase the frequency of high ozone days and enhance the secondary formation of PM 2.5 under these conditions (Kinney et al., *Climate Change and Public Health: Impact Assessment for the NYC Metropolitan Region*, 2000, p. 21). A preliminary analysis, conducted as part of the *U.S. National Assessment of the Potential Consequences of Climate Variability and Change*, projected a significant increase in annual average 8-hour daily maximum ozone concentrations in the Metro NYC region by 2030 and continued increases through 2100 (Kinney et al., *Climate Change and Public Health*, 2000, p. 25; U.S. Global Change Research Program, *Climate Change and a Global City: An Assessment of the Metropolitan East Coast Region*, 2000). The hot and humid conditions that are likely to exacerbate these air quality effects will also place significant stress on the region's electric power supply infrastructure. The analysis concludes that "climate change impacts should be included as one of the considerations in developing long-range strategies directed towards ground-level ozone mitigation in the MEC [Metropolitan East Coast] region" (Kinney et al., *Climate Change and Public Health*, 2000, p. 28).

Human Health Impacts

Rising temperatures will increase heat stress, especially for vulnerable urban populations, such as the elderly and urban poor. Climate models predict an increase in the number of

days per year with temperatures above 90^{o}F in the New York City metro area, with a potentially significant impact on human health due to heat stress (Kinney et al., *Climate Change and Public Health*, 2000). By the 2020s, climate change could result in an increase in summer heat-related mortality of 55% and a more than doubling in related mortality by the 2050s (New York Climate & Health Project, *Assessing Potential Public Health and Air Quality Impacts of Changing Climate and Land Use*, Columbia University, 2000).

Sea Level Rise Impacts

Sea level rise due to climate change is of significant concern to New Jersey. According to the 2002 *U.S. Climate Action Report*, New Jersey is especially vulnerable to significant impacts due to geologic subsidence, the topography of its coastline, current coastal erosion, and a high density of coastal development:

"[A]n increased rate of global sea level rise is likely to have the most dramatic impacts in regions where subsidence and erosion problems already exist. Estuaries, wetlands, and shorelines along the Atlantic and Gulf coasts are especially vulnerable. Impacts on fixed structures will intensify, even in the absence of an increase in storminess. However, because the slope of these areas is so gentle, even a small rise in sea level can produce a large inland shift of the shoreline. The rise will be particularly important if the frequency or intensity of storm surges or hurricanes increases." (U.S. Department of State, *U.S. Climate Action Report*, 2002, p. 103)

A sea level rise in line with median IPCC projections would threaten the majority of New Jersey's coastline. The effects of sea level rise will be exacerbated in New Jersey since relative sea level rise in New Jersey will be greater than the global average due to coastline subsidence. As an example, the mean sea level at Atlantic City rose by 0.3 meters during the period from 1920 to 2000, compared to a global average between 0.1 and 0.2 meters (Norbert P. Psuty, Rutgers University, personal communication, January 7, 2003). In addition to significant property losses, sea level rise will adversely impact coastal ecosystems and may threaten coastal fresh water supplies due to salt-water intrusion. (U.S. Global Change Research Program, *Metropolitan East Coast Assessment of Impacts of Potential Climate Variability and Change*, 2000; U.S. Global Change Research Program, *Mid-Atlantic Assessment of Impacts of Potential Climate Variability and Change*, 2000.)

Estimates of the cost of protecting threatened property and undeveloped coastlines in the Mid-Atlantic from sea level rise through 2100 are in excess of $20 billion (Titus et al., "Greenhouse Effect and Sea Level Rise: The Cost of Holding Back the Sea," *Coastal Management* 19 (1991): 171-204). Estimates of the cumulative cost of sand required to protect the New Jersey open coast through 2100 range from $900 million-$2.6 billion (0.5 meter sea level rise) to $1.7 billion-$4.3 billion (1.0 meter sea level rise); by comparison, the baseline cost absent additional sea level rise is projected at $158 million through 2100 (Titus et al., "Greenhouse Effect and Sea Level Rise," 1991). More recent data indicates that beach replenishment costs may significantly exceed these estimates. The Department has learned that actual replenishment costs exceeded $500 million

($2003) in the 1990 to 1999 period, and it estimates that replenishment costs could be even higher in the future (NJDEP analysis, based on data from Duke University Program for the Study of Developed Shorelines, 2004).

Protecting developed, sheltered shores in the Mid-Atlantic is projected to cost between $2 billion (0.5 meter sea level rise) and $5.1 billion (1.0 meter sea level rise) through 2100. Elevating threatened roads and structures in the Mid-Atlantic is projected to cost between $10.8 billion (0.5-meter sea level rise) and $21.6 billion (1.0-meter sea level rise) through 2100 (Titus et al., “Greenhouse Effect and Sea Level Rise,” 1991).

Systemic Impacts

Climate change is projected to have a significant adverse impact on coastal ecosystems and infrastructure in the Mid-Atlantic region and may compromise the services they provide:

- “Enhanced sea-level rise almost certainly will occur, with the potential for substantial damage to the coastal zone’s structures, wetlands and estuaries, and to water supplies because of salt water intrusion.”
- “The potential for a wetter regional climate, punctuated by droughts, suggests higher water supply management costs to protect the quality of both surface and ground water sources and to provide more storage capacity.”

- "The increased spring runoff and stream flow following fertilizer application will increase nutrient loads in and from agricultural watersheds. Coastal areas downstream of such areas will have greater risk of eutrophication."
- "The cost of protecting valued infrastructure or natural areas could be quite high."
- "[E]cosystem functioning and biodiversity are likely to experience mostly negative effects from climate change…In sum, the overall ecological impacts could be quite large, even though very uncertain …."

(*U.S. National Assessment of the Potential Consequences of Climate Variability and Change: Mid-Atlantic Region*, 2001, pp., iii, 22, 24, 27, and 33 respectively).

3. Summary

The evidence contained herein clearly meets a threshold of adverse impact consistent with the Department's regulatory definition of air pollution at N.J.A.C. 7:27-5.1 and the statutory definition of air pollution at N.J.S.A. 26:2C-2, which states:

"'Air pollution' means the presence in the outdoor atmosphere of one or more air contaminants in such quantities and duration as are, or tend to be, injurious to human health or welfare, animal or plant life, or property, or would unreasonably interfere with the enjoyment of life or property throughout the State and in those areas of the State as shall be affected thereby…."

Based on the evidence contained herein, the Department determines that it has the authority to regulate carbon dioxide as an air pollutant and that doing so is in the best interest of human health, welfare, and the environment in the State.

Clarifying Technical Inaccuracies

Current Department regulations at N.J.A.C. 7:27-8.1 and 7:27-19.1 define distillates of air as the following chemical species: helium (He), nitrogen (N_2), oxygen (O_2), neon (Ne), argon (Ar), krypton (Kr), xenon (Xe), and carbon dioxide (CO_2). N.J.A.C. 7:27-17.1 defines distillates of air as the chemical species listed above, except for krypton (Kr), which is omitted. The definition was revised in 2003 at N.J.A.C. 7:27-21.1, Emission Statements, as the following chemical species: helium (He), nitrogen (N_2), oxygen (O_2), neon (Ne), argon (Ar), krypton (Kr), and xenon (Xe).

The current Department definition of distillates of air does not conform to the complete set of chemical species in "standard atmosphere" as defined by the federal government (U.S. Committee on Extension of the Standard Atmosphere—COESA), or the components of "dry air" as defined by the International Union of Pure and Applied Chemistry (IUPAC) (*CRC Handbook of Chemistry and Physics*, 84th Edition, 2003; *IUPAC Glossary of Atmospheric Chemistry Terms*, 2000). The U.S. Standard Atmosphere consists of the following chemical species: nitrogen (N_2), 78.084%; oxygen (O_2), 20.9476%; argon (Ar), 0.934%; carbon dioxide (CO_2), 0.0314%; neon (Ne), 0.001818%; helium (He), 0.000524%; methane (CH_4), 0.0002%; krypton (Kr), 0.000114%; hydrogen (H_2), 0.00005%; and xenon (Xe), 0.0000087% (*CRC Handbook of*

Chemistry and Physics, 84th Edition, 2003). The IUPAC defines "dry air" as nitrogen (N_2), 78.084%; oxygen (O_2), 20.946%; argon (Ar), 0.934%; carbon dioxide (CO_2), 0.033%; neon (Ne), 0.0018%; helium (He), 0.000524%; methane (CH_4), 0.00016%; krypton (Kr), 0.000114%; hydrogen (H_2), 0.00005%; nitrous oxide (N_2O), 0.00003%; and xenon (Xe), 0.0000087% (*IUPAC Glossary of Atmospheric Chemistry Terms*, 2000). Current Department regulations defining distillates of air omit the chemical species hydrogen (H_2) and methane (CH_4) present in "standard atmosphere" and the chemical species hydrogen (H_2), methane (CH_4), and nitrous oxide (N_2O) present in "dry air."

Rather than defining distillates of air as representative of the full complement of naturally occurring components of air, the omission of certain naturally occurring chemical species demonstrates an attempt to use distillates of air as a proxy for components of air that were not considered to be potentially problematic, dangerous, or cause adverse environmental impacts, given the state of knowledge at the time. The intent of the current Department definition of distillates of air should not therefore be considered as equivalent to the naturally occurring chemical species of "standard atmosphere" or "dry air."

Distillates of air, based on common chemical engineering understanding of the term, refers to the commercial cryogenic fractional distillation of air for the production of industrial gases, primarily nitrogen and oxygen. Water vapor and carbon dioxide must be removed from air prior to cryogenic fractional distillation, since these substances freeze at low temperatures and would damage distillation plant components. These chemical compounds are separated out as solids through adsorption as the air is cooled during the

liquefaction process. Carbon dioxide, since it is considered an impurity that is removed prior to the cryogenic fractional distillation of liquid air, cannot be properly defined as a distillate of air.

The Department proposes to revise the current definition of distillates of air in N.J.A.C. 7:27 to conform to the accepted chemical engineering definition and to recognize that anthropogenic CO_2 emissions, and related climate change effects, have the potential to cause extreme damage to both the natural and built environment in New Jersey and create adverse human health impacts. This definition would limit distillates of air to the chemical species of air that are commercially produced through the cryogenic fractional distillation of air and limit these chemical species to those that are not currently considered potentially problematic from a human health, welfare, or environmental standpoint.

N.J.A.C. 7:27-8.1, 7:27-17.1, 7:27-19.1, 7:27-22.1 Definitions

The proposed amendments would revise the definition of the term "distillate of air" at N.J.A.C. 7:27-8.1, 7:27-17.1, and 7:27-19.1, and define the term at N.J.A.C. 7:27-22.1, to make it consistent with the definition of the same term found at N.J.A.C. 7:27-21.1. The proposed revised definition would remove carbon dioxide (CO_2) from the list of chemical species that are classified as distillates of air. The definition of "distillate of air" at N.J.A.C. 7:27-8.1, 7:27-17.1, 7:27-19.1, and 7:27-22.1 would include only the following chemical species: helium (He), nitrogen (N_2), oxygen (O_2), neon (Ne), argon (Ar), krypton (Kr), and xenon (Xe).

This change would have the effect of modifying the meaning of the term "air contaminant" at N.J.A.C. 7:27-8.1, 7:27-17.1, 7:27-19.1, and 7:27-22.1. Removing carbon dioxide from the list of chemical species that are defined as distillates of air would therefore have the consequence of classifying carbon dioxide as an air contaminant at N.J.A.C. 7:27-8.1, 7:27-17.1, 7:27-19.1, and 7:27-22.1.

Social Impact

The proposed amendments will have a positive social impact on the regulated community and the general public.

While the proposed amendments would not regulate emissions of CO_2, they would enable the Department to do so at a later date. Classification of CO_2 as an air contaminant in this proposed rulemaking would provide a clear market signal to regulated sources that CO_2 may be regulated at a future date and that CO_2 emission-intensive activities should be managed to minimize future economic and environmental risk accordingly.

To the extent that this market signal encourages regulated sources to voluntarily reduce emissions of CO_2, environmental benefits that improve the quality of life in New Jersey will be realized, including co-benefits achieved through the reduction of criteria air pollutants associated with reductions in CO_2 emissions.

Economic Impact

The Department expects the proposed amendments will have a positive economic impact. Since the proposed amendments would create no additional regulatory or reporting requirements for regulated entities, no economic burden will be created.

While the proposed amendments would not regulate emissions of CO_2, they would enable the Department to do so at a later date. Classification of CO_2 as an air contaminant may provide an additional incentive to encourage regulated sources to voluntarily engage in economic activities that also reduce CO_2 emissions, including energy efficiency improvements and production process improvements that improve relative economic competitiveness. A wide portfolio of economic project actions is available to reduce emissions of CO_2. To the extent that the possibility of future regulation of CO_2 provides a market signal, additional economic energy efficiency and other measures may be taken by regulated sources.

To the extent that voluntary early emission reduction actions are taken, the potential future economic costs to New Jersey from possible future national greenhouse gas emission reduction requirements will also be reduced.

Environmental Impact

The Department expects that the proposed amendments will have a positive environmental impact.

The chemical species currently listed as distillates of air evidently were selected because the Department originally believed them to be environmentally benign. Over the past decade an overwhelming body of scientific evidence has emerged linking anthropogenic emissions of CO_2 to climate change and sea level rise. The projected climate impacts and related impacts on ecosystems and society driven by increasing concentrations of CO_2 in the atmosphere due to anthropogenic emissions strongly supports the conclusion that CO_2 should no longer be disregarded in the formation of environmental policy.

While the proposed amendments would not regulate emissions of CO_2, they would enable the Department to do so at a future date. Classification of CO_2 as an air contaminant encourages regulated sources to voluntarily reduce emissions of CO_2. Therefore, environmental benefits will be realized, including co-benefits achieved through the reduction of criteria air pollutants associated with reductions in CO_2 emissions.

Federal Standards Analysis

Executive Order No. 27 (1994) and P.L. 1995, c. 65 (N.J.S.A. 52:14B-1 et seq.) require State agencies that adopt, readopt, or amend State rules that exceed any Federal standards or requirements to include in the rulemaking document a Federal standards analysis.

The Department has compared the proposed amendments to N.J.A.C. 7:27-8, 7:27-17, 7:27-19, and 7:27-22 to analogous Federal regulatory requirements. The proposed amendments to N.J.A.C. 7:27-8, 7:27-17, 7:27-19, and 7:27-22 are not being promulgated under the authority of or in order to implement or comply with any program under

Federal law, or under a State statute that incorporates or refers to Federal law, Federal standards, or Federal requirements.

Jobs Impact

The Department does not expect the proposed amendments to have any negative employment impact and expects that the proposed amendments may have a small positive impact on jobs, to the extent that regulated sources engage in voluntary early emission reduction projects that create jobs.

Agricultural Industry Impact

Pursuant to P.L. 1998, c. 48 (4:C1), the Department has evaluated this proposed rulemaking to determine the nature and extent of the impact of the proposed rule on the State's agricultural industry.

The proposed amendments should have no impact on the State's agricultural industry.

Regulatory Flexibility Analysis

Pursuant to P.L. 1986, c. 169 (N.J.S.A. 52:14B-16 et seq.), the Department has determined that the proposed amendments should have no impact on small businesses. The proposed amendments would create no new regulatory, reporting, or compliance requirement for small businesses.

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 rules on the achievement of smart growth and implementation of the State Development and Redevelopment Plan (State Plan). The amendments are to be implemented evenly Statewide and, therefore, do 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.

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

CHAPTER 27

AIR POLLUTION CONTROL

Subchapter 8. PERMITS AND CERTIFICATES FOR MINOR FACILITIES

7:27-8.1 Definitions

The following words and terms, when used in this subchapter, shall have the following meanings, unless the context clearly indicates otherwise.

…

"Distillates of air" means helium (He), nitrogen (N_2), oxygen (O_2), neon (Ne), argon (Ar), krypton (Kr), **and** xenon (Xe)**[**, and carbon dioxide (CO_2)**].**

…

Subchapter 17. CONTROL AND PROHIBITION OF AIR POLLUTION BY TOXIC SUBSTANCES

7:27-17.1 Definitions

The following words and terms, when used in this subchapter, shall have the following meanings, unless the context clearly indicates otherwise.

…

"Distillates of air" means helium (He), nitrogen (N_2), oxygen (O_2), neon (Ne), argon (Ar), **krypton (Kr**), **and** xenon (Xe)**[**, and carbon dioxide (CO_2)**].**

…

Subchapter 19. CONTROL AND PROHIBITION OF AIR POLLUTION FROM OXIDES OF NITROGEN

7:27-19.1 Definitions

The following words and terms, when used in this subchapter, shall have the following meanings, unless the context clearly indicates otherwise.

…

"Distillates of air" means helium (He), nitrogen (N_2), oxygen (O_2), neon (Ne), argon (Ar), krypton (Kr), **and** xenon (Xe)**[**, and carbon dioxide (CO_2)**].**

…

Subchapter 22. OPERATING PERMITS

7:27-22.1 Definitions

The following words and terms, when used in this subchapter, have the meanings given below unless the context clearly indicates otherwise.

…

"Distillates of air" means helium (He), nitrogen (N_2), oxygen (O_2), neon (Ne), argon (Ar), krypton (Kr), and xenon (Xe).

…

Based on consultation with staff, I hereby certify that the above statements, including the Federal Standards Analysis addressing the requirements of Executive Order No. 27 (1994), permits the public to understand accurately and plainly the purposes and expected consequences of this proposal. I hereby authorize this proposal.

Date:_____

_____

Bradley M. Campbell, Commissioner
Department of Environmental Protection