Testimony of Paul D. Baldauf, P.E.

Assistant Commissioner

New Jersey Department of Environmental Protection

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Hearing on

Legislation Addressing New Source Review Permitting Reform

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Thank you, Chairman Shimkus, Ranking Member Tonko, and the members of the committee for the opportunity to testify today. My name is Paul Baldauf, and I am the Assistant Commissioner for Air Quality, Energy and Sustainability at the New Jersey Department of Environmental Protection.

I have over 30 years of engineering and management experience related to environmental protection. I would like to take the opportunity today to provide a State perspective to the regulatory challenges associated with our mission to protect and improve air quality. As we all understand, air pollution has no respect for state borders. Individual states with effective and robust regulatory programs have little influence to encourage upwind states to similarly control

their emissions. The Environmental Protection Agency must be the lead to ensure a level playing field with all entities held to the same emission standards. Any discussion of New Source Review (NSR) permitting reform must focus on emissions reduction. Amendments to the NSR process that have the potential to increase emissions cannot be tolerated, and these amendments will cause New Jersey to fall out of attainment for the National Ambient Air Quality Standards (NAAQS).

New Jersey is the most densely populated state in the nation with a long history of air quality challenges. New Jersey has made major improvements in air quality over the last two decades. Today New Jersey is attaining all the NAAQS except the 70 ppb Ozone NAAQS. About half of the air pollution responsible for causing ozone in New Jersey comes from outside of New Jersey. The NSR program and the cost-effective control technologies that exist to reduce emissions have been critical to the improvements of New Jersey's air quality. If the proposed changes are adopted, emissions from out of state sources are likely to increase not only for ozone but for other air pollutants including particulates and air toxics. Governor Murphy has set numerous ambitious climate change goals such as 100 percent clean energy by 2050. States will be unable to attain the air quality benefits from clean energy if upwind states continue their current levels of emissions.

Adverse health impacts can come from both short-term exposure and annual exposure to air pollution. PM-2.5 is a good example of a pollutant that has both a daily health standard and an annual standard. The existing NSR addresses both short term increases in air pollution and

annual increases in air pollution through technology evaluation (Best Available Control Technology) and air quality modeling to verify compliance with short term and annual NAAQS and the air quality modeling performed as part of an air quality evaluation.

Maintaining the current NSR program and its associated requirements to reduce emissions with plant upgrades will not only improve the ability of states to attain or maintain NAAQS, but will result in greater air toxics reductions. Co-benefit reductions are frequently called out in rulemaking as a secondary benefit. Annual emissions of mercury and hexavalent chromium, a known neurotoxin and a known carcinogen respectively, both of which are trace elements in coal, would also increase with associated ton per year increases of other pollutants. Mercury and hexavalent chromium are closely associated with coal power plants, and any increase, short term or long term, will have detrimental effects on the environment and public health. Other pollutants of concern include fuel burning products of incomplete combustion at older, less efficient operations; increase in usage and releases (tons per year increase) is not acceptable. These include known air toxics, such as formaldehyde, acrolein, and dioxin. Many of these pollutants are still above acceptable health levels in New Jersey.

The proposed amendments would fundamentally alter the NSR Program. Since its inception in 1977, NSR was designed to allow existing sources to delay upgrades to air pollution controls until the source was engaged in capital expenditures that would increase emissions from the facility. NSR applicability is determined by an annual increase in emissions, caused by a

modification that increases annual use or hourly emissions. At the time of modification, the source would upgrade controls to the best available at the time of review. Thus, as sources age and are modified, emissions from existing sources would be reduced over the life of the equipment.

The proposed amendments would alter when a source would be subject to NSR in two key ways. First, the proposed amendments would exempt sources when, "…*a change in the stationary source that reduces the amount of any pollutant emitted by the source per unit of output.*" Thus a project that increases the efficiency of a unit, regardless of whether the project also increases the annual emissions of the unit would be exempted from NSR and its associated emission reductions. While increasing efficiency may be desirable, the increases in emissions associated with the change should still be evaluated for their impacts.

An example of this concern is an electric generating unit that undergoes changes to increase its efficiency while also increasing the maximum heat input, or amount of fuel burned per hour, to increase electric output. This project would decrease the pounds of CO_2 and some other pollutants emitted per megawatt-hour, but would increase the megawatts generated. Without additional controls, such a project would result in both increased hourly and annual emissions of all its pollutants, including CO_2, criteria pollutants and air toxics, resulting from the increased fuel use. These increased emissions could likely result in adverse health impacts despite the increase in efficiency of the unit.

New Jersey has had several upgrades of gas turbine electric generating units to increase efficiency and electric output. One example is a project NJDEP approved in 2017 at the PSEG Fossil, LLC Bergen Generating Station in Ridgefield New Jersey. This project involved:

- Replacing compressor inlet guide vanes, compressor blades and compressor stator vanes.

- Replacement of existing turbine buckets, turbine nozzles, and shrouds in the hot gas path using parts with enhanced blade geometry design and coatings to withstand higher operating temperatures and pressures.

- An increase in firing temperature and compressor mass flow, which improved the overall gas turbine output and efficiency across the operating range.

To increase the firing temperature and compressor mass flow, it is necessary to increase the turbines hourly fuel use, otherwise known as heat input. In this case, the electric output was increased by approximately 6.3 percent, while the hourly fuel burned increased by 0.47 percent to 5.9 percent, depending on load and ambient temperature.

As stated before, increasing the fuel burned increases the emissions of all pollutants associated with the turbine, even though the emissions per megawatt-hour of those pollutants might

decrease. In this case, it was determined that there would be an increase in actual hourly and annual emissions despite an increase in efficiency.

Second, the proposal would eliminate the requirement to evaluate the project for increases in annual emissions. This could result in major sources expanding the annual capacity of a plant (increasing the number of hours it operates each year) without the inclusion of modern air pollution controls or the replacement of the older equipment with modern more efficient equipment and associated lower air pollution.

By removing the requirement to upgrade air pollution controls and evaluate the air quality impacts of the existing facility when annual emissions increase, sources could continue to keep operating at the same level of hourly emissions indefinitely even though cost effective technologies exist to reduce emissions, undermining the continuous emissions reductions achieved over the last 40 years. Without the required air quality evaluation, there would be no way of knowing if the existing source operation was having adverse impacts to the airshed, and a source's useful life could be extended indefinitely with no consideration for reducing air pollution leading to continued operation of old and inefficient equipment. These annual emission increases would negatively impact annual air quality standards including PM-2.5. States such as New Jersey would find it challenging to remain in attainment with the NAAQS if the NSR program eliminated the requirement to evaluate a project for increases in annual emissions.

NSR amendments, as proposed, could result in the extension of the life of older power plants, with modifications that result in small improvements to energy efficiency, while causing significant increases in annual emissions of air contaminants, including carbon dioxide, sulfur dioxide, nitrogen oxides, particulates, mercury and other hazardous air pollutants. That would be inconsistent with the Clean Air Act, which requires that sources install best available control technology, lowest achievable emission rate, and maximum achievable control technology, when modifying equipment facilities, including energy efficiency modifications that would increase emissions of applicable air contaminants.

Thank you again for the opportunity to appear today and convey New Jersey's perspective on the importance of the NSR program. I welcome any questions you may have.

Summary of Paul D. Baldauf's Testimony

New Jersey has made major improvements in air quality over the last two decades. Today New Jersey is attaining all the National Ambient Air Quality Standards (NAAQS) except the 70 ppb Ozone NAAQS. About half of the air pollution responsible for causing ozone in New Jersey comes from outside of New Jersey. The NSR program is a critical part of the reason New Jersey's air has continued to improve.

Adverse health impacts can come from both short-term exposures and annual exposures to air pollution. The existing NSR addresses both short term increases in air pollution and annual increases in air pollution through technology evaluation (Best Available Control Technology) and air quality modeling to verify compliance with short term and annual NAAQS and the air quality modeling performed as part of an air quality evaluation.

NSR amendments, as proposed, could result in the extension of the life of older power plants, with modifications that result in small improvements to energy efficiency, while causing significant increases in annual emissions of air contaminants, including carbon dioxide, sulfur dioxide, nitrogen oxides, particulates, mercury and other hazardous air pollutants. That would be inconsistent with the Clean Air Act, which requires that when sources modify equipment facilities install best available control technology, lowest achievable emission rate, and maximum achievable control technology, for modifications, including energy efficiency modifications that would increase emissions of applicable air contaminants.