pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

February 20, 2020

Mr. Andrew R. Wheeler
Administrator
U.S. Environmental Protection Agency
Air and Radiation Docket
1200 Pennsylvania Ave, N.W.
Washington, DC 20460

Attn: Docket No. EPA-HQ-OAR-2019-0055

Re: Control of Air Pollution from New Motor Vehicles: Heavy Duty Engine Standards 85 FR 3306 (January 21, 2020).

Dear Administrator Wheeler:

The Pennsylvania Department of Environmental Protection (DEP) submits the following comments to the U.S. Environmental Protection Agency (EPA) in response to the advanced notice of proposed rulemaking (ANPRM) entitled *Control of Air Pollution from New Motor Vehicles: Heavy Duty Engine Standards* (Cleaner Trucks Initiative or CTI) published by the EPA on January 21, 2020 (85 FR 3306).

DEP thanks EPA for the opportunity to provide comment in advance of EPA's proposed rulemaking regarding the additional control of heavy-duty diesel and gasoline powered engines and vehicles. DEP is supportive of EPA's efforts to harness these additional reductions in air pollution from a sector that contributes a significant portion of Pennsylvania's air pollution statewide.

Pennsylvania needs reductions of nitrogen oxides (NO_x) and fine particulate matter ($PM_{2.5}$), in order to attain and maintain ozone and $PM_{2.5}$ National Ambient Air Quality Standards (NAAQS), particularly in the Commonwealth's most populated areas. Of the statewide highway vehicle emissions estimated by Pennsylvania for the 2017 National Emissions Inventory, 52 percent of NOx and 60 percent of $PM_{2.5}$ emissions were from heavy-duty diesel and gasoline powered vehicles. Between 2014 and 2017, vehicle miles travelled (VMT) on urban highways increased by over 4 percent with an over 12 percent increase on urban restricted roads. Additionally, these VMT increases were proportionally higher in the heavy-duty truck categories (a 5 percent increase over three years versus 1.4 percent for light-duty vehicles). While overall emissions from highway vehicles have decreased, the decreases have been proportionally less in urban areas, which tend to have the most air pollution.

Additionally, VMT from the heavy-duty sector is expected to increase as Pennsylvania trends above the U.S. average in growth in the Warehousing and Storage sector (2005 to 2016).[1] As

[1] Pennsylvania observed an 18.7 percent increase in the number of warehousing/storage establishments from 2005 to 2016 compared with 13.8 percent nationally. The number of Pennsylvanians employed in the sector increased by 60 percent in the same time period

this sector uses significant numbers of heavy-duty vehicles for the transportation of goods in commerce, an increase in VMT for these vehicles to service the additional capacity is expected.

In the ANPRM, EPA establishes "high-level" principles to guide the broader goal of "a holistic rethinking of emissions standards and compliance."[2] These principles include:

- A goal to reduce in-use emissions under a broad range of operating conditions,
- Consideration and enabling of effective technological solutions while carefully considering the cost impacts,
- Fair and effective enforcement provisions,
- Incentivization of early compliance and innovation,
- Insuring a coordinated 50-state program, and
- Active engagement with interested stakeholders.

Pennsylvania supports these principles and believes that any final revision of heavy-duty engine standards must meaningfully incorporate the above principles to ensure a successful and effective program both in Pennsylvania and nationwide.

As part of its comments on the ANPRM, DEP incorporates by reference the comment letter, including enclosures, concurrently submitted by the National Association of Clean Air Agencies (NACAA) to EPA on the ANPRM, for Docket No. EPA-HQ-OAR-2019-0055.[3] As a member of NACAA, DEP supports the collective comments of the state, territorial, district and municipal members. While the collective NACAA comments accurately reflect DEP's comments on those issues, DEP is providing EPA with additional comments and recommendations specific to EPA's request for comment in the ANPRM. These comments and recommendations are enumerated below.

1. Reducing the NOx Emission Standard: DEP supports the goal of reducing NO_x emissions from current in-use levels by at least 90 percent as soon as possible but no later than model year (MY) 2027. Currently available diesel engine technologies such as diesel particulate filters, diesel oxidation catalysts and selective catalytic reduction (SCR) systems combined with new engine designs and layouts currently being demonstrated show that these reductions are achievable within the MY 2027 timeframe.[4]

   EPA should evaluate new formulations of advanced SCR catalysts that improve performance (urea degradation) at temperatures below 200ºC including cold starts, sustained idle and low speed/light load operating modes. EPA should evaluate both passive and active thermal management strategies that enhance reductions of NO_x, volatile organic compounds (VOC) and $PM_{2.5}$ while minimizing potential increases of carbon dioxide (CO_2) emissions. Likewise, EPA should evaluate technologies such as variable valve actuation, late/early intake valve

compared to 43 percent nationally. Source: U.S Bureau of Census, County Business Patterns by Employee Size Class (2005-2016) for the Warehousing and Storage sector (NAICS code 493).

[2] 85 FR 3307

[3] Docket No. EPA-HQ-OAR-2019-0055, submitted February 20, 2020.

[4] Southwest Research Institute. "Update on Heavy-Duty Low NOX Demonstration Programs at SwRI". September 26, 2019; California Air Resources Board. "Evaluating Technologies and Methods to Lower Nitrogen Oxide Emissions from Heavy-Duty Vehicles". May 10, 2017.

closing and cylinder deactivation for increasing exhaust temperatures for better NO_x, VOC and $PM_{2.5}$ control without dramatically increasing CO_2 emissions.

DEP believes that improvements in reductions can be found through increasing the durability of aftertreatment devices and components as highlighted in the ANPRM. Specifically, EPA should evaluate how advances in onboard diagnostic (OBD) technology could be applied to enhance operations, monitoring and maintenance capabilities of heavy-duty diesel aftertreatment systems and how current and future "bolt-on" treatment technologies may use OBD technologies to inform operators and repair technicians as to the in-use efficacy of those systems across multiple duty cycles. DEP also supports the development of a practical OBD performance standard for heavy-duty vehicles that could allow EPA to include inspection maintenance performance standards in the EPA approved highway emissions model. This will allow states to include heavy-duty diesel vehicles in inspection and maintenance programs in state implementation plans which will help states meet the NAAQS.

2. Harmonization with California Standards: As Pennsylvania has adopted both California light and heavy-duty new highway vehicle standards under Section 177 of the Clean Air Act (42 U.S.C. § 7507), DEP supports a federal standard that harmonizes with current and developing heavy-duty standards enacted by the California Air Resources Board (CARB). EPA should ensure that both the stringency and the timing of its rule does not create a two-standard system that would conflict with EPA's stated principle of a 50-state harmonized program. To this end, DEP encourages that EPA work constructively with CARB to develop an equivalent harmonized standard to realize significant NO_x and $PM_{2.5}$ emission reductions in the heavy-duty truck sector.

3. Alternative Fuels and Fuel Quality: DEP supports the continued and increased use of compressed natural gas (CNG) as an alternative to diesel or gasoline fuels in Pennsylvania's heavy-duty vehicle fleet. However, EPA should consider a requirement for closed crankcases for CNG powered heavy-duty engines in order to reduce or eliminate methane "blow-by" from the crankcase that could contribute to increases in greenhouse gas (GHG) emissions while lowering NO_x, VOC and $PM_{2.5}$ emissions. EPA should evaluate incentives for deployment of CNG engines that are suitable for appropriate duty-cycles while not sacrificing direct or indirect GHG reductions. DEP also recommends that EPA should also evaluate, and address as part of its evaluation, the benefits of decreased diesel particulate (DPM) matter emissions from CNG engines in relation to reduced DPM acute and chronic human inhalation hazard and cancer risk.

   Regarding diesel fuel quality, DEP recommends that EPA consider limits for the concentrations of alkaline and alkali metals in both traditional diesel fuel and biodiesel blends at a level that will not hasten fouling of catalysts or otherwise impede the efficient operation of the engine and associated emissions control systems. Similarly, DEP encourages EPA to review the effects of the current diesel fuel water and sediment limit of 0.05 percent by volume (ASTM D975/D2709) and if this limit could be reduced to lessen the potential for wear and premature failure of injector systems due to corrosion.

   DEP supports EPA in investigating the potential of Dimethyl Ether (DME) as a diesel fuel alternative. EPA should be careful to evaluate the GHG life-cycle and criteria emissions

impacts of both national and regional DME production. EPA should consider production and transport of the natural gas feedstock (methane) as well as the final product. As Pennsylvania is the country's second largest producer of natural gas, the increased and widespread use of DME as an approved alternative fuel in the heavy-duty vehicle fleet could, in turn, introduce DME manufacturing into Pennsylvania that might increase emissions in manufacturing and transport that are not related to the combustion of the fuel in the engine.

4. Engine Labeling Considerations: DEP recommends that EPA address engine labeling inconsistencies between light, medium and heavy-duty vehicles. DEP believes that the CTI provides an opportunity to address the need for consistent emissions labeling requirements. This need was previously identified by EPA in both the Phase 1 and Phase 2 GHG emissions and fuel efficiency standards for medium- and heavy-duty engines and vehicles.[5] Consideration and potential resolution of this issue would be appropriate given EPA's desire to holistically rethink emissions standards and compliance.

   DEP recommends that EPA require heavy-duty engine manufacturers to provide sufficient information, either by print, electronically or both, to allow truck manufacturers and rebuilders to accurately represent the emissions and the associated control technology installed on the specific engine / chassis combination. EPA should continue to require a physical label on the vehicle that best describes the emissions profile of the vehicle across multiple parts of the duty cycle as this is a valuable tool for many consumers, especially when considering the purchase of a new engine or vehicle. EPA should also consider digital solutions for engine / vehicle certification and emissions information storage and retrieval that could be used by EPA and states to better assess actual emissions of vehicles in specific known fleets and assist with compliance and verification of the standards. Common availability of this information could also enhance the effectiveness of current and future diesel retrofit and rebuild incentive programs (e.g. the federal Diesel Emissions Reduction Act and Volkswagen settlement) by providing emissions certification data specific to vehicles throughout their useful life as opposed to only at initial new engine certification.

DEP thanks EPA for the opportunity to provide comment on this ANPRM for the Clean Trucks Initiative. Pennsylvania is supportive of EPA's efforts to move towards a program that would provide actual, significant emissions reductions for not only for our most populated areas that struggle with attaining and maintaining current NAAQS, but also areas where heavy-duty vehicles contribute significantly to ambient air pollution in which people live, work and recreate. A program that harmonizes with the current and developing California standards would allow Pennsylvania, and other states that have adopted CARB standards, to better meet their Clean Air Act NAAQS attainment and maintenance responsibilities through ensuring that out-of-state, non-CARB certified, heavy-duty vehicles doing commerce in Pennsylvania will provide the same emissions reduction benefits as CARB certified vehicles registered in Pennsylvania.

[5] 76 FR 57106, September 15, 2011; 81 FR 73478, October 25, 2016

Thank you for your consideration in this matter.

Sincerely,

Patrick McDonnell
Secretary

Enclosure