September 28, 2009

U.S. Environmental Protection Agency
Air Docket
Mail Code: 6102T
1200 Pennsylvania Ave., NW
Washington, DC 20460

Via electronic filing

Attention: Docket No.EPA-HQ-OAR-2007-0121—
74 Fed. Reg. 44442, August 28, 2009

Re: Comments on Proposed Large Marine Diesel Engine Rule

Dear Administrator Jackson:

The undersigned citizens' groups appreciate the opportunity to comment on EPA's proposed large marine diesel engine rule, entitled "Control of Emissions from New Marine Compression-Ignition Engines at or Above 30 Liters per Cylinder; Proposed Rule." We represent thousands of citizens throughout the Ohio Lake Erie Basin who are affected by and concerned about the continuing lack of any meaningful regulation of emissions from ocean-going shipping in U.S. ports and U.S. waters. As indicated below, in certain ports and other coastal areas, marine diesel engine emissions are responsible for a significant portion of local nitrogen oxides ("NOx"), sulfur oxides ("SOx") and particulate matter ("PM") emissions, thereby contributing to the already serious health and environmental effects of diesel exhaust, and exacerbating nonattainment problems in the areas that we serve.

Overview

We generally support EPA's proposal to establish—for the first time— enforceable limits on the sulfur content of fuel burned by large ("Category 3" or "C3") marine diesel engines used in ocean-going ships, and to tighten standards for NOx emissions from new C3 marine engines. EPA projects that its proposals—if applied to all C3 ships within the proposed US emission control area (the "ECA,"[1] will, by 2030, reduce NOx emissions from ocean-going ships by about 57% and reduce ship emissions of SOx by almost 95% and PM by about 85%.[2]

However, the vast majority of the public health and environmental benefit that these standards are capable of producing will be lost if the standards are only applied to domestic shipping. It is critical that EPA apply new standards to ALL ships—both US- and foreign-flagged—visiting US ports and operating in US waters (defined by the ECA). We also believe that EPA's proposal can be strengthened in several ways, particularly by promulgating:

- stringent standards to reduce directly emitted PM (including black carbon) from ships; and
- measures to reduce non-sulfur related emissions from existing C3 ships.

[1] As used herein, the term "ECA" is not used in the legal sense, but rather refers to the ***geographical area*** depicted in the US proposal to the International Maritime Organization (IMO Document MEPC 59/6/5, 27 March, 2009), whether or not that proposal is adopted.

[2] C3 Marine Engine NPR, 74 Fed. Reg. at 44460 [Table II-2].

We support EPA's proposed fuel sulfur standards, and its proposed NOx standards for new ships. However, we believe that EPA's proposal should be expanded as follows—

- EPA's proposed NOx standards should be applicable to all new ships travelling in US waters, regardless of the country in which the ship happens to be registered;
- EPA should set a firm and prompt date for proposal and promulgation of standards for directly emitted particulates from new ships; and
- EPA should explore additional approaches to reduce emissions of NOx and PM from the existing fleet of ships travelling in US waters.

In evaluating EPA's proposal, we note that Section 213(a) of the Clean Air Act requires the Agency to set emissions standards for non-road engines, including large marine engines, at levels that "shall achieve the greatest degree of emission reduction achievable through the application of technology which the Administrator determines will be achievable for the engines...."[3] Furthermore, those standards "shall take effect at the earliest possible date considering the lead time necessary to permit the development and application of the requisite technology...."[4] These standards clearly are required to be technology-forcing, not technology-following.

Reductions in NOx and SO2 is critical in ensuring compliance with National Ambient Air Quality Standards in our area. Ohio has four counties (Lorain, Lake, Cuyahoga, and Ashtabula (partial)) that are failing the particle pollution standard. Additionally, these counties will most likely fail the 2008 ozone standard of .075 parts per million when it takes effect in March of 2009. According to Ohio EPA emissions inventory, emissions from these four counties in regard to rail, marine, and air, produce 5,221.44 tons per year of NOx, 161.73 tons per year of particulate matter, and 647.17 tons per year of SO2. Additionally we know that according to the Port Authority of Cleveland, 16% of all engine calls are from C3 ships.

Pollution from ocean-going vessels not only fouls our air, but impacts our water ways. The nitrogen oxides that are emitted are stripped from the air during precipitation events and washed into our waterways contributing to algal blooms and deadening of the waterway. It also causes acid deposition, watershed eutrophication and nitrification, adverse impacts on vegetation and ecosystems, materials damage and soiling and regional haze. EPA described these effects in its proposal.[5]

Shipping and Marine Diesel Emissions

Air pollution from ships has historically been largely uncontrolled, with regulatory and advocacy focused on more visible land-based sources. However, shipping activity is increasing at a rapid pace,[6] and without stringent controls, shipping emissions are likely to become an even larger human

[3] 42 USC §7547(a).
[4] 42 USC §7547(b).
[5] ***See*** 73 Fed. Reg. at 44454-56; ***see also*** C3 Marine Engine ANPR, 72 Fed. Reg. at 69534-36.
[6] For example, according to statistics compiled by the American Association of Port Administrators, container traffic in US and Canadian ports almost doubled from 1993 to 2003. ***See:*** ***http://www.aapa-***

health and environmental problem in the coming years.

Diesel Emissions Endanger Public Health and Welfare and Must be Substantially Reduced

General Public Health Impacts

The health effects of diesel exhaust have been clearly documented by EPA[7] and others.[8] Diesel emissions contain a stew of over 40 different toxics including benzene, formaldehyde, acetaldehyde, 1,3-butadiene, acrolein and polyaromatic hydrocarbons. These compounds are known or suspected human or animal carcinogens, or have serious non-cancer health effects. Every one of these compounds has been listed by EPA as both an Urban Hazardous Air Pollutant ("HAP") for the Integrated Urban Air Toxics Strategy under Section 112(b) of the Clean Air Act,[9] and a Mobile Source Air Toxic under Section 202(l)(2) of the Act.[10]

The health impact from diesel pollution in these four counties is measurable. For example, Abt Associates, using EPA Science Advisory Board approved methods, has conducted a study for Clean Air Task Force that associated excess diesel exhaust particle exposure in the U.S. with an estimated 183

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ports.org/industryinfo/statistics.htm. In addition, the North American passenger cruise industry has grown an average of 8.4% over the last decade, and is expected to continue to grow, with port calls estimated to increase almost 4-fold from 2003 to 2010. ***See, e.g.***, http://www.aapa-ports.org/pdf/The%20Impact%20of%20FIS%20Facilities%20at%20Cruise%20Terminals.pdf.
One recent study has estimated the growth in global shipping emissions over the next several decades at 4.1% compounded annually. Corbett, J.J., Wang, C, Winebrake, J.J., and Green, E. "Allocation and Forecasting of Shipping Emissions," (January 11, 2007), prepared for the Clean Air Task Force and submitted to IMO as Document BLG11/INF.3, available on the Internet at: http://www.catf.us/projects/international_air_quality/shipping/air_pollution_standards_negotiation/ (hereinafter the "Corbett Global Emissions Inventory").
For North America, the projected emissions growth rate is even higher, at 5.9%. Corbett, J.J. and Wang, C., "Estimation, Validation and Forecasts of Regional Commercial Marine Vessel Inventories, Tasks 3 and 4: Forecast Inventories for 2010 and 2020: Final Report," University of Delaware (December 8, 2006), available of the Internet at http://www.arb.ca.gov/research/seca/jctask34.pdf (hereinafter the "Corbett North American Emissions Inventory").

[7] ***See, e.g.,*** U.S. EPA, National Center for Environmental Assessment, Office of Research and Development, Health Assessment Document for Diesel Engine Exhaust (2002), ***available at*** http://www.epa.gov/iris (Search for EPA/600/8-90/057F).

[8] National Institute for Occupational Safety and Health, "Carcinogenic Effects of Exposure to Diesel Exhaust," ***Current Intelligence Bulletin*** 50 (August 1988), ***available at*** http://www.cdc.gov/niosh/88116_50.html.
International Agency for Research on Cancer (IARC), ***Diesel and Gasoline Engine Exhausts and Some Nitroarenes.*** IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, no. 46 (Lyons: World Health Organization, 1989), pp. 41–185.
Health Effects Institute, ***Diesel Exhaust: A Critical Analysis of Emissions, Exposure and Health Effects*** (Cambridge, MA: Health Effects Institute, 1995), ***available at*** http://www.healtheffects.org/Pubs/diesum.htm.
International Programme on Chemical Safety, World Health Organization, "Diesel Fuel and Exhaust Emissions," ***Environmental Health Criteria*** 171 (1996).

[9] ***See*** 64 Fed. Reg. 38706, July 19, 1999.

[10] ***See*** 66 Fed. Reg. 17230, March 29, 2001.

annual early deaths, 231 heart attacks and 17,450 work loss days in this four county region.[11] Diesel particles are also associated with asthma, respiratory infections, chronic bronchitis and allergic sensitization.[12]

Additionally, there is new research by Corbertt and Winebrake which links ship emissions to early mortality. This peer-reviewed study is the first scientific analysis to demonstrate that international shipping emissions have significant global impacts on human health. The results revealed that the ***global cardiopulmonary and lung cancer mortality in 2002 from PM air pollution emitted by oceangoing ships was approximately 60,000 premature deaths per year.*** And this death toll is estimated to grow by 40% by 2012 along with a continued large increase in global trade and shipping traffic.
Diesel pollution also contributes to climate change through emissions of black carbon and NOx. The EPA should consider the benefits of reducing climate impacts in this rulemaking, along with other environmental and public health benefits commonly cited.

Black carbon, also known as soot, consists of microscopic light absorbing solid particles of incompletely combusted organic matter.[13] Black carbon particles absorb sunlight, they warm the air around them, decreasing the relative humidity of the air and thus the liquid water content of other particles suspended in the air.[14] The drying out of these other particles reduces *their* reflectivity, and as they absorb more sunlight the air warms even more.[15] Further, the water evaporated from such particles remains in the air as water vapor, which is itself a greenhouse gas.[16]

Black carbon may be responsible for 7 to 30 percent of the observed global warming.[17,18] In fact, approximately 66 percent of human-generating black carbon emissions come from the burning of

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[11] Abt Associates (2004), ***Diesel Emissions: Particulate Matter-Related Health Damage*** (Bethesda, MD), at p.6-2, available at: http://www.catf.us/projects/diesel/dieselhealth/20041216-REMSAD_No_Diesel_Report.pdf; ***see also,*** CATF (2005), ***An Analysis of Diesel Air Pollution and Public Health in America***, at p.7, available at: http://www.catf.us/publications/reports/Diesel_in_America_Technical_Paper.pdf. These studies used EPA estimated primary and secondary diesel emissions in 2010.

[12] ***See e.g.***, Brauer, M et al. (2002). Air pollution from traffic and the development of respiratory infections and asthmatic and allergic symptoms in children. American Journal of Respiratory and Critical Care Medicine, v. 166, p. 1092-1098.
Brown, J., and Frew, A. (2002). Diesel exhaust particles and respiratory allergy. European Respiratory Mon. v. 21, p. 180-192.

[13] See W. Chameides and M. Bergin, Soot Takes Center Stage, 297 SCIENCE 2214 (Sept. 27, 2002), (explaining that "BC is produced through incomplete combustion of biomass, coal, and diesel fuel").

[14] Id. at 6.

[15] Id.

[16] Id. at 7.

[17] Hansen, J., Mki. Sato, R. Ruedy, L. Nazarenko, A. Lacis, G.A. Schmidt, G. Russell, I. Aleinov, M. Bauer, S. Bauer, N. Bell, B. Cairns, V. Canuto, M. Chandler, Y. Cheng, A. Del Genio, G. Faluvegi, E. Fleming, A. Friend, T. Hall, C. Jackman, M. Kelley, N.Y. Kiang, D. Koch, J. Lean, J. Lerner, K. Lo, S. Menon, R.L. Miller, P. Minnis, T. Novakov, V. Oinas, Ja. Perlwitz, Ju. Perlwitz, D. Rind, A. Romanou, D. Shindell, P. Stone, S. Sun, N. Tausnev, D. Thresher, B. Wielicki, T. Wong, M. Yao, and S. Zhang, 2005: Efficacy of climate forcings. J. Geophys. Res., 110, D18104, doi:10.1029/2005JD005776.

[18] Ramanathan, ***supra***, note 64.

fossil fuels.[19] Marine engines account for a significant share of black carbon emissions. Ships emit between 50,000 tons and 132,000 tons of black carbon per year.[20]

NOx plays a role in climate change through two primary means: (1) nitrogen oxides react with other substances to form the greenhouse gas ozone, and (2) nitrous oxide is itself a highly potent and long-lived greenhouse gas. Moreover, nitrogen oxide pollution represents an additional burden on oceanic pH levels by lowering pH and increasing acidity.

Substantial Reductions in Marine Diesel Emissions are Technically Feasible and Must be Required

We support EPA's proposed requirement that marine fuel produced and sold for use by C3 ships operating within the US ECA and US internal waters (including the Great Lakes) have a maximum sulfur content of 1000 ppm (0.1%) by 2015,[21] with several important conditions—

1. EPA should adopt a fuel quality standard specifying the sale of distillate fuel for marine use in US waters;
2. while the measures proposed by EPA are appropriate for a "Tier 1" SOx standard effective in the 2015 time frame, we believe that additional control "tiers" containing more stringent sulfur limits should be imposed in the future as lower sulfur fuel becomes more widely available, allowing highly effective land-based PM control technologies to be applied to large marine diesel engines; and
3. EPA should propose within the next two years new PM standards for ships that would apply to directly emitted PM constituents other than sulfates, including black carbon; and
4. the standard must apply to ALL C3 ships traveling in the US ECA and internal waters—both foreign-flagged and US-flagged ships.

Sulfur in Fuel

Using a low sulfur fuel will reduce SOx emissions and PM emissions as well.[22]
We urge EPA to adopt minimum fuel quality requirements for all marine diesel fuel sold in the U.S. based on the characteristics of marine distillate fuel (marine gas oil or DMA) with a maximum sulfur content of 1,000 ppm. Although the Agency discussed the benefits of requiring a low sulfur distillate fuel in its ANPR, its latest proposal does not appear to require distillate fuel or contain any fuel quality standard other than a sulfur content limit.[23]

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[19] Reddy and Boucher, ***supra*** note 62, at 1.
[20] Bond et al., A technology-based global inventory of black and organic carbon emissions from combustion, J. Geophys. Res., Vol. 109, No. D14, 203, 2004, doi:10.1029/2003JD00369
[21] We also support the Agency's proposed standards for CO and HC, which are designed to prevent decreases in combustion efficiency that could result from NOx control. 74 Fed. Reg.at 44462.
[22] Id.
[23] C3 Marine ANPR, 72 Fed. Reg. at 69541-42; C3 Marine NPR, 74 Fed. Reg. at 44462-68.

Future Tier 2 SOx and PM Standards

While we support EPA's SOx standards in the future. Specifically, we urge EPA to commit now to conducting an additional rulemaking within the next two years that would establish emissions standards for directly emitted $PM_{2.5}$ (including black carbon), as well "Tier 2" sulfur in fuel standards, that approach in stringency the levels set by EPA in its recent highway heavy-duty engine rule and its non-road diesel rule, for effect in the 2015—2020 time frame. We note that while we support EPA's proposal to require measurement of PM emissions from ships, we do not believe that such a requirement should delay the promulgation of PM emissions standards.

We support the level of EPA's proposed Tier 3 standards, which represent a reduction from Tier 1 levels of about 80%.[24] Such reductions are achievable and cost-effective, as demonstrated by EPA's discussion in the C3 Marine Engine ANPR,[25] We also support EPA's proposal to apply the Tier 3 limits only within the entire US ECA and internal waters. We also believe it important to apply the Tier 3 NOx standard and the fuel sulfur standards to the same geographical areas. We urge EPA to apply the Tier 3 NOx standard to ALL ships—regardless of flag or registry—operating within the ECA.[26] *Because without* ***substantial NOx reductions from the existing fleet of C3 engines on a global fleet-wide NOx emissions will increase over the coming years as a result of low fleet turnover, combined with expected rapid fleet growth.***

In addition, we urge EPA to adopt a more substantial version of the International Maritime Organization's (IMO) NOx requirements for existing engines. The IMO standards are quite weak, cover only some ships, and do not achieve a level of NOx reductions that are attainable using modern NOx controls available today. We urge EPA to adopt requirements that simply require available control technology to be used on existing engines. Specifically, we urge EPA to require all C3 engines built prior to 2000 to comply with EPA's Tier 1 NOx limits, and for engines built after 2000 to comply with EPA's Tier 2 standards, provided that there is an approved remanufacture kit available for that engine meeting the applicable standard.

Marine Engine Standards Must Apply to All Ships Operating in U.S. Waters.

We strongly urge EPA to apply its marine diesel emission standards to all vessels operating in U.S. waters, regardless of the flag of registry of a particular ship.

With respect to the legal issues, we continue to think that EPA may permissibly interpret "new non-road engines" as including "imported non-road engines" and to include foreign-flagged ships operating in US waters as "imported" for Clean Air Act purposes.

EPA Must Apply C3 Standards to All Ships Operating Within the US ECA, including the Great Lakes

[24] We also support the Agency's proposed standards for CO and HC, which are designed to prevent decreases in combustion efficiency that could result from NOx controls. 74 Fed. Reg. at 44462.

[25] 72 Fed. Reg. at 69538-69541.

[26] The climate forcing effects of NOx and ozone, discussed earlier, also support application of Tier 3 NOx standards over the broadest possible area.

We strongly support EPA's proposal to apply emission limits to ships operating within the full extent of the geographic limits of the US ECA, including the internal waters of the United States—and particularly including the Great Lakes. This is necessary due to the impact that such emissions can have on the people and environment of US coastal and even inland areas. Shipping emissions can travel in the atmosphere significant distances once emitted, and in many places in the US, many shipping emissions likely travel the entire breadth of the ECA.[27] Also, emissions from Great Lakes shipping can travel into the heart of the Midwest, and must be controlled.

Conclusion

EPA's proposed C3 Marine Engine rule is a good step in the right direction. We support the "Tier 3" NOx standards and the "Tier 1" SOx standards. However, engines on all vessels—US- and foreign-flagged—operating within the ECA, must be covered. In addition, EPA must address NOx emissions from existing engines. Within the next two years, EPA should propose emissions standards for directly emitted $PM_{2.5}$. And finally, over the next decade, as instructed by Section 213(a)(3) of the Act, the Agency should move toward establishing a systems approach to regulating Category 3 marine diesel engines that contains limits similar to those applicable to land-based heavy duty diesel engines.

Respectfully submitted,

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[27] See note 12.