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October 21, 2019

The Honorable Andrew R. Wheeler  
Administrator  
U.S. Environmental Protection Agency  
1200 Pennsylvania Avenue, NW  
Washington, DC 20004

Re: Amendments Related to Marine  
Diesel Engine Emission Standards  
(Docket No. EPA-HQ-OAR-2018-  
0638)

Dear Mr. Wheeler:

The American Waterways Operators is the national trade association for the tugboat, towboat, and barge industry. AWO's more than 300 member companies own and operate barges and towing vessels on the U.S. inland and intracoastal waterways; the Atlantic, Pacific and Gulf coasts; and the Great Lakes. The tugboat, towboat and barge industry provides family-wage jobs and ladders of career opportunity for more than 50,000 Americans, including 38,000 positions as mariners on board our vessels who safely, securely and efficiently move more than 760 million tons of cargo critical to the U.S. economy.

Our industry is not only an integral part of the U.S. intermodal transportation system, but also the safest and most fuel-efficient, with the smallest carbon footprint, of any surface transportation mode. Therefore, regulations that do not adequately ensure the safe and environmentally responsible operation of all towing vessels and barges, that impose unnecessary costs on companies operating towing vessels and barges, or that result in the diversion of cargo to other modes of transportation harm not only the towing industry, but also the U.S. economy and environment.

Thank you for the opportunity to review and comment on the Environmental Protection Agency's proposal to amend its marine diesel engine emission standards. AWO respectfully requests that EPA amend the proposed rule to expand the definition of a vessel that may qualify for temporary relief from the Tier 4 standards in the first phase to include towing vessels. Consistent with the criteria outlined in the proposed rule, we recommend relief be limited to propulsion engines with maximum power output up to 1,400 kW (1,877 hp), and vessels with total nameplate propulsion power at or below 2,800 kW (3,754 hp) to accommodate vessels with multiple propulsion engines. Also consistent with the proposed rule, we recommend that EPA set model year 2022 as the implementation deadline for these engines and vessels.

### *Background*

EPA adopted Tier 4 standards for commercial marine diesel engines at or above 600 kW (805 hp) in 2008, which mandate reductions in the emissions of sulfur and nitrogen oxides (NO<sub>x</sub>). These standards phased in in 2017 for engines with rated power between 600-1,400 kW (805-1,877 hp). To achieve the required NO<sub>x</sub> reductions, these engines must incorporate selective catalytic reduction (SCR). EPA anticipated, as discussed in the proposed rule, that the nine years between the standards' adoption and implementation would "give engine manufacturers time to redesign and certify compliant engines, and...give boat builders time to redesign their vessels to accommodate Tier 4 engines."<sup>1</sup>

However, in early 2017, member companies began to contact AWO with reports that there were no certified Tier 4 engines below 1,400 kW (1,877 hp). AWO submitted comments to EPA in May 2017 recommending that the agency review and reevaluate the Tier 4 implementation timeline for engines below that power rating, in consultation with engine and vessel manufacturers and operators. AWO subsequently reiterated this recommendation in a meeting with EPA officials in November 2017.

Today, almost two years after making those recommendations, there is only one engine manufacturer that has certified Tier 4 engines below 1,400 kW (1,877 hp), as EPA acknowledges in its proposed rule.<sup>2</sup> Those engines became commercially available in 2018, one year after the Tier 4 standards took effect. In the meantime, EPA officials have acknowledged that the Tier 4 standards were implemented ahead of the wide availability of certified compliant engines from engine manufacturers. In December 2018, an EPA official from the Office of Transportation and Air Quality stated that "there are not very many engines certified for Tier 4 in the 600 kW to 1,400 kW sizes."<sup>3</sup>

Due to the delay in the delivery of Tier 4 engines, AWO is not aware of any towing vessel that has been built since 2017, or that is under construction, with Tier 4 engines less than 1,400 kW (1,877 hp). In addition, this delay has resulted in uncertainties that pose technical and economic challenges for towing vessel manufacturers, as well as operators seeking to purchase and planning to operate new towing vessels.

### *Technical Challenges*

#### Boatbuilding

In its proposed rule, EPA writes that it is proposing to limit relief to high-speed vessels because "vessels whose maximum speed is below the specified threshold do not have the same sensitivity to engine size and weight that should qualify them for relief from using Tier 4 engines."<sup>4</sup> Further, EPA proposes that relief "apply only to vessels classified as uninspected vessels by the U.S. Coast Guard," noting that towing vessels are inspected and writing,

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<sup>1</sup> 84 *Federal Register* 46911.

<sup>2</sup> *Ibid.*

<sup>3</sup> Parker, Barry. "Tier 4 engine regs get ahead of the technology." *WorkBoat*. 11 Dec. 2018.

<https://www.workboat.com/blogs/maritime-matters/tier-4-engine-regs-get-ahead-of-technology/>

<sup>4</sup> 84 *Federal Register* 46914.

“these ships are typically displacement vessels that operate low in the water and use very large propulsion engines that do not operate at high speeds. They are also typically custom-designed and built, meaning vessel manufacturers can and have been able to accommodate new-tier propulsion and auxiliary engines in new vessels in a timely manner. As a result, these vessels do not require the proposed adjusted implementation dates as they are currently being designed and built with compliant engines.”<sup>5</sup>

Although it is true that towing vessels with total propulsion power up to 2,800 kW (3,754 hp) are larger and operate at lower speeds than the vessels to which EPA is proposing to extend relief, most of the rest of EPA’s assumptions are not true of these vessels. In fact, these towing vessels are sensitive to engine size and weight, their manufacturers have not been able to accommodate Tier 4 engines in a timely manner, and they are not currently being designed and built with compliant engines.

Towing vessels with engines at or below 1,400 kW (1,877 hp) are smaller than their higher-powered counterparts. These smaller vessels are more sensitive than larger vessels to changes in weight distribution, which impacts vessel stability. Further, they have correspondingly small engine rooms in which there is virtually no space that is not already dedicated to machinery or walkways. As EPA writes in the proposed rule in reference to pilot boats, “the SCR emission control system takes up a significant amount of already limited space.”<sup>6</sup> As a result, substantial redesigns are required to accommodate Tier 4 technology.

As engine manufacturers certify new-tier engines, vessel manufacturers need time to evaluate those engine options and make changes to vessel designs to account for the new engine parameters and specifications. However, due to the lack of availability of certified Tier 4 engines at or below 1,400 kW, shipbuilders have had insufficient time to ascertain how to reliably, efficiently and safely redesign smaller towing vessels to accommodate them. The situation is similar to that faced by lobster boats, as described in the proposed rule:

“Lobster boat builders...need to prepare for more fundamental changes to vessel design to account for the room needed for additional emission control hardware...However, lobster boat builders are not able to make substantial progress in redesigning their vessels until they have certified or prototype Tier 4 engines available. Once those engines are available, the boat builders can undertake the anticipated effort to work out specific design needs for installing the Tier 4 engines...including any necessary sea trials.”<sup>7</sup>

In particular, because certified Tier 4 engines in this power rating range have become available only recently, and because the technology is largely untested in the operating environment, uncertainties about specific design needs persist. For example, SCR requires the injection of a reductant, typically anhydrous ammonia or urea, into the exhaust to convert the NO<sub>x</sub> into nitrogen and water vapor. This reductant is called diesel exhaust fluid, or DEF. A towing vessel with a Tier 4 engine that includes an SCR system must be designed around the engine and DEF tanks. However, it is unknown how much DEF these engines will consume, making the design and location of DEF tanks difficult. Making unsupported assumptions about the consumption rate and changing the design and weight distribution of the towing vessel accordingly could result in inefficiencies.

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<sup>5</sup> 84 *Federal Register* 46914.

<sup>6</sup> 84 *Federal Register* 46912.

<sup>7</sup> *Ibid.*

Due to these uncertainties, towing vessel operators that would otherwise be constructing new vessels to replace existing ones (which operate less efficient engines) are choosing to continue to operate or repower existing vessels. This has resulted in significant consequences for the shipbuilding economy. Notably, this chilling effect on investment in new towing vessels is occurring just as the tugboat, towboat and barge industry emerges from a multi-year downturn. The industry is making a comeback after several years of low rates, overcapacity and underutilization, reigniting an interest in the construction of new towing vessels – but construction of smaller towing vessels is not happening, due to the design challenges and operational concerns associated with Tier 4 engines.

### Support Infrastructure

Another technical challenge identified by AWO is particular to towing vessels, which are very transient relative to other classes of vessels. In our segment of the maritime industry, companies own and operate vessels that go where the customer asks them to, and frequently change areas of operation. Therefore, many towing vessels do not have ready access to a localized, shore-based support network, as other types of vessels do. Their operating area extends hundreds of miles, and their location any given day or week is far from predictable.

A hypothetical inland towboat equipped with two 745 kW (1,000 hp) Tier 4 engines, which is not returning to the same dock on a frequent basis, would have to either obtain DEF from a shoreside supplier, by taking it onboard from a bunker barge (also called midstreaming), or by carrying DEF tanks large enough to hold the necessary supply. However, each of these options is problematic. First, DEF is not available from suppliers, particularly on the inland waterways; second, DEF bunkering services do not currently exist; and third, as previously stated, it is difficult to design vessels to accommodate adequate DEF tanks when the available space on board the vessel is limited, the vessel is sensitive to changes in weight distribution, and the engines' DEF consumption rate is unknown.

Additionally, because of the limited application of this technology, there are too few towing vessel crewmembers or marine engine maintenance and repair service providers who are familiar with Tier 4 engines, can service them in the event of a malfunction, or can provide spare or replacement parts if needed. Even in the coastal sector, where larger and more powerful tugs with certified Tier 4 engines have been introduced, their operators report that the availability of Tier 4 engine parts is an ongoing issue.

### *Economic Challenges*

The implementation of Tier 4 standards for towing vessels is resulting in significant increases in the cost of their design and construction, far above and beyond those EPA projected in the economic analysis that accompanied EPA's 2008 final rule establishing the standards. These increases have an outsized impact on smaller towing vessels; the smaller the vessel, the higher the Tier 4 engine and associated design considerations increase total construction costs, and the lower the economies of scale to recover these costs. For example: For a new 72-foot inland towboat with a total propulsion power of 2,000 hp, there is a 20-25% increase in overall costs – three times the 7% increase in price that EPA estimated. This is a total increase of as much as

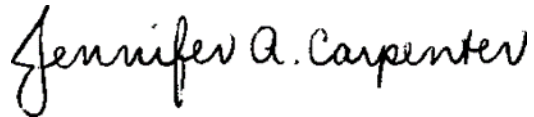
\$800,000 in the cost of a new towboat – again, three times the \$255,000 that EPA estimated in its assessment of market impacts.<sup>8</sup>

*Conclusion*

If EPA is acknowledging the challenges its Tier 4 standards are imposing on other segments of the maritime industry and adjusting its implementation timeline accordingly, AWO strongly believes that the agency should recognize and redress the similar challenges faced by smaller towing vessels as well. Therefore, AWO reiterates its requests that in its final rule, EPA expand the definition of a vessel that may qualify for temporary relief from the Tier 4 standards under Phase 1 through model year 2021 to include towing vessels, limited to propulsion engines with maximum power output up to 1,400 kW (1,877 hp), and total nameplate propulsion power at or below 2,800 kW (3,754 hp). This additional lead time will allow more time for engine manufacturers to certify additional engine models at or below 1,400 kW, and for vessel manufacturers to reconfigure vessel designs, create new tooling, perform sea trials, and start producing compliant towing vessels with certified Tier 4 engines.

Thank you again for the opportunity to comment on EPA's proposed rule. We would be pleased to answer any questions or provide further information as EPA sees fit.

Sincerely,

A handwritten signature in cursive script that reads "Jennifer A. Carpenter".

Jennifer A. Carpenter

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<sup>8</sup> 73 *Federal Register* 37162.