The American Waterways Operators

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April 30, 2021

Ms. Bonnie Soriano
Chief, Freight Activity Branch
Transportation and Toxics Division
California Air Resources Board
1001 "I" Street
Sacramento, CA 95814

Re: AWO Comments Relating to Proposed Amendments to the Regulations to Reduce Emissions from Diesel Engines On Commercial Harbor Craft Operated Within California Waters and 24 Nautical Miles of the California Baseline

Dear Ms. Soriano:

On behalf of The American Waterways Operators (AWO), thank you for the opportunity to provide comments on the California Air Resources Board (CARB) proposed concepts for further reducing pollution from Commercial Harbor Craft (CHC). AWO is the national trade association for the tugboat, towboat, and barge industry. AWO's more than 300 member companies own and operate 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 supports family wage job and long-term career opportunities for more than 300,000 Americans. Our industry moves more than 760 million tons of critical cargo each year safely, securely, efficiently, and sustainably. CARB's CHC regulations are particularly significant given the importance of waterborne commerce to the state of California. California ranks third among the states in waterborne commerce by tonnage and fourth in economic impact, with more than $12.2 billion in annual economic activity driven by the domestic maritime transportation industry. Seven AWO member companies are headquartered in California, and many more operate tugboats, articulated tug-barge units (ATBs), tank barges, and deck barges on California waters.

AWO has engaged with CARB on the development of these rules for over three years, meeting numerous times in person, by teleconference and video conference, and attending various CARB workshops. Throughout this engagement AWO and its members have identified multiple concerns with the process, including:

- CARB's unwillingness to address and correct the acknowledged errors in its vessel population data that drastically overstate the towing vessel population operating in CARB waters. AWO has repeatedly demonstrated to CARB staff that the U.S. Coast Guard vessel database, the foundation of all CARB's vessel counts, has no information related to a vessel's utilization or operating location. Reliance on this database has led CARB to use a towing vessel count of 219 and assert that towing vessels are under-reporting emissions by 48%. Using accurate, real-time data sources, AWO has demonstrated that of the 219 vessels CARB identifies in the towing vessel population, only 142 towing vessels operated in the CARB airshed, consistent with the current reporting population. This refutes CARB's continued assertion, based on data the agency has admitted is inaccurate, that the towing vessel population is under-reporting by a factor of 48%. It defies logic and scientific rigor that CARB is continuing to promote a regulation based on an erroneous data set that has led to incorrect and invalid conclusions.

- The rule will have significant negative cost and operational implications for CHC operators, including AWO member towing vessel operators. CARB has not addressed concerns relating to the regulatory impacts to single boat and small-fleet vessel operators who are least-equipped to meet CARB's infeasible performance standards and implementation timelines.

- CARB has arbitrarily and capriciously included or exempted classes of vessels. For example, the draft CHC rule exempts commercial fishing vessels because of certain operating conditions while not extending exemptions to other vessels with identical operating conditions. Another example is the inclusion of large U.S. flagged tank barges moving petroleum products in coastwise trade in direct competition with self-propelled tank ships that are not covered by the draft CHC rule.

- The technical solutions offered by the rule are infeasible and overly prescriptive. They pick winners and losers in the commercial marketplace and fail to allow vessel operators to innovate and find creative solutions to achieve emission reduction targets. AWO supports CARB's goal of reducing emissions in California, but this rule would force operators down a technical path that is untested, unproven, and may not be the only avenue to achieve the desired emissions reductions.

AWO is disappointed that CARB did not incorporate the recommendations from either our April 30, 2020 or October 30, 2020 comment letters in response to previous draft regulatory proposals in the current proposal. AWO restates the concerns articulated in those letters and attaches them hereto as Appendices A and B.

CARB'S FLAWED PROCESS AND INFLEXIBLE POSTURE

AWO is deeply concerned that CARB continues to advance highly significant regulations during the global COVID-19 pandemic despite numerous requests from stakeholders to suspend the rulemaking. CARB received over a dozen requests, including from public transit authorities and the Chairman of the California Senate Transportation Committee, for suspension and extensions during the height of the pandemic but granted only a 30-day extension.

For this iteration of the draft rule and feedback process, CARB set April 16 as the comment deadline for a 113-page draft rule published on April 1. AWO was one of several organizations that requested an extension beyond the April 16 comment deadline. CARB responded to extension requests by granting an open-ended extension only to those entities that requested it and provided no notice of extension to other stakeholders. This communication is attached as Appendix C. Without public notice, other stakeholders are under the impression that April 16 is a hard deadline when it is not and the informal extension disadvantages stakeholders that are unaware that an extension is possible and available. If CARB can grant an indefinite extension to some stakeholders, why were all stakeholders not informed of this deadline extension? This process is inconsistent, inequitable, and contrary to CARB's stated interest in producing a sound rule that has effectively incorporated deliberate and reasoned feedback from the regulated community.

The CHC rulemaking process represents a dramatic failure of the essential partnership between regulators and the regulated community. The familiar charge has been repeatedly raised to CARB in both the California legislature and at stakeholder workshops: that CARB puts policies ahead of people. Throughout this process, CARB has been presented with both extensive, detailed information and anecdotal evidence that its policies are unsupported by solid data, will put companies out of business, and that the implementation timelines will force some vessel operators to decommission new equipment which already meet the best-achievable performance standard for air emissions. CARB's draft rulemaking provides small avenues of short-term relief to these CHC operators, but the bigger picture is that of an agency that continues to place policies ahead of people when better and less destructive regulatory paths are available.

CARB CONTINUES TO USE INACCURATE AND ARTIFICIALLY INFLATED COAST GUARD VESSEL POPULATION DATA

CARB's vessel population estimate is inaccurate and has been throughout this process. As the U.S. Coast Guard will attest, the database used by CARB to describe the population was designed to track the ownership and regulatory status of a vessel and does not provide any insight or information into where a vessel is operated. CARB's use of this database overstates the population of towing vessels, and likely other harbor craft categories as well, to reach the false conclusion that there is a significant number of vessels that are not reporting their engine hours to CARB.

CARB used the vessel's "Hailing Port State" in the Coast Guard database to determine whether a vessel is operated in California or not. This resulted in a count of 219 towing vessels. However, "Hailing Port" refers only to where the vessel is documented, not to where it is operated. Using data obtained from the two major Marine Exchange organizations in California, AWO demonstrated that of the 219 towing vessels counted by CARB, only 73 vessels showed evidence of having been operated in CARB-regulated waters during the previous two years. AWO also found evidence that 69 vessels with hailing ports outside of California operated in CARB waters, making the total towing vessel count 142 vessels. This is consistent with the current towing vessel population reporting to CARB. The following table shows the vessel counts by Hailing Port State that operate in California waters.

Towing Vessels Operating in California Waters
2018 thru 2019
By State of Registry

	# of Towing Vessels
Alaska	1
California	73
Delaware	7
Florida	2
Hawaii	1
Louisiana	3
Maryland	5
New York	1
Oregon	30
Washington	19
Total	142

The detailed data behind this table was shared with CARB in June of 2020. AWO members and staff worked with CARB to explain how the vessels were identified and how CARB could go about utilizing similar methods to clean up its data set. The data set was based on a

combination of AIS (Automatic Identification System) tracking and examination of regulated transit logs of arrivals and departures over a two-year period.

The most impactful and destructive result of this misuse of data is that CARB is incorrectly inflating the emissions of towing vessels by 48% based on its vessel count of 219. This is particularly egregious since CARB now knows this number to be inaccurate and understands how to obtain accurate vessel data.

During the CHC Workshop #4 held on March 16, 2021, CARB acknowledged that the agency is aware that its vessel counts do not accurately reflect the number of vessels operating in the applicable airshed. However, while acknowledging that they were aware of this crucial detail, CARB staff informed the attendees that they would not be revising their vessel count numbers in the draft regulation. Basing a regulation on data known to be inaccurate is unacceptable.

CARB has also used the Coast Guard database to identify other vessel populations. CARB includes a number of harbor craft that may not have any engines onboard and may or may not have been operated in California. Given that the towing vessel data was wildly inaccurate, there is a high likelihood that CARB has made similar errors with the other vessel populations. The inclusion of these vessels with no further investigation by CARB to determine if the vessels do have an engine onboard and that they are being operated in the CARB airshed further undermines public confidence in a deeply flawed regulatory process.

AWO's April 30, 2020 letter and letters submitted by AWO-member towing vessel operators empirically show the multitude of flaws in the U.S. Coast Guard data set. Nonetheless, CARB continues to use this data set, which includes vessels that:

- Cannot legally be operated because they are single-hulled tank vessels required by statute to be retired years ago.

- Cannot be legally operated because they do not meet federal Certificate of Documentation requirements.

- Can be shown to no longer operate in California.

- Only operated in California for brief periods or operated in California to temporarily cover for another vessel in California service.

AWO found that 69 of 229 towing vessels with California hailing ports in the Coast Guard data have expired Certificates of Documentation or did not operate in California. In its March 16 workshop, CARB staff claimed the estimate of 229 towing vessels corresponded with a review of AIS reporting and "confirmed that 229 or more tug vessels are active in California

for the past couple years." This is simply untrue. CARB must explain why it continues to rely on flawed Coast Guard data designed for a different purpose when readily available sources of vessel information exist to validate the agency's assumptions and show exactly which vessels are operating in California, where they operate, and for how long.

Importantly, CARB has not produced any scientific data that describes a correlation between harbor craft emissions and public health risk. Indeed, according to CARB, the basis for the proposed rulemaking will be communicated in its official regulatory package that is expected to be released for public comment in late September. AWO is troubled that the scientific justification for the rule will now likely be developed using inaccurate inputs. CARB's unwillingness to use real-time Marine Exchange data that is readily available to accurately identify vessels operating in the airshed appears designed to ensure that artificially inflated data informs the future study that will be the basis for the rulemaking.

As representatives of the most environmentally sustainable freight transportation mode, AWO members stand ready to work with CARB to develop practical and effective regulation based on science and facts. To that end AWO urges CARB to:

- Develop an accurate vessel population data set using available means of gathering real-time vessel operating information and emission profiles. This should be done for all vessel categories.

- Amend the study utilizing the corrected data set to determine the industry specific impact and need for regulation.

- Redraft the Proposed Regulations to reflect the conclusions of the new study.

Moving forward with regulation without correcting errors in the underlying data set will undermine the legitimacy of the regulatory process.

CARB'S PROPOSAL IS TECHNICALLY INFEASIBLE

In its April 30, 2020 letter, AWO submitted an Engineering Review Summary performed by Jensen Naval Architects on the Marine Engineers of the Cal Maritime Tier 4 Feasibility study with which CARB supports its assertion that the proposed regulations are feasible for CHC operators. The Cal Maritime study evaluated four DPF retrofit scenarios for a single ship assist and escort tug. The Jensen Review Summary also demonstrates the feasibility of DPF retrofit using a comparable large towing vessel. While the Cal Maritime study projects a $2.81 million per vessel cost, the Jensen study finds a larger cost impact – between $3.7 and $4.5 million – and makes some important points about the limitations of the Cal Maritime study:

- This study of one large and spacious ship assist and escort tug is not representative of the diverse towing vessel fleet.

- The Jensen Review Summary notes “the technical challenges of repowering with EPA Tier 4 engines could be significant and cost prohibitive for some ship assist and escort tugs.”

- The Jensen Review notes that size constraints on some tugs could entirely preclude the placement of aftertreatment systems required by CARB.

CARB’s proposal to combine Tier 3 or Tier 4 engines with DPF aftertreatment technology is unproven, unavailable, and technically infeasible. Size and weight constraints make re-powering and retrofit options impossible for many towing vessels, but even if a vessel had the necessary space to accommodate this technology, there is no available DPF aftertreatment product on the market. The absence of commercially available technology has limited the guidance that engine manufacturers can provide about potential paths to compliance. Additionally, the absence of compliant technology makes planning future capital investment impossible. No matter how carefully a CHC operator has planned out the service life and maintenance schedule of a given vessel, the impact of this proposed rule with its unknowable compliance price-tag cannot be accounted for.

CARB must acknowledge that there is no available technology that currently meets both the performance standards of the proposed regulation and the propulsion needs of the regulated population of towing vessels. CARB must provide realistic relief for vessels that cannot comply with its rules based on space or feasibility constraints. As the draft rule stands now, a vessel operator has no recourse other than to eventually retire a vessel that physically cannot install unproven and unavailable technology. The financial waste caused by this proposal is astonishing and raises the question of whether CARB is legally “taking” property from vessel operators by devaluing fully operational equipment that meets federal standards through state regulation. This is even more egregious since the proposed rules would most impact the CHC operators least equipped to weather such a financial blow. Larger CHC operators may be able to move towing vessels that cannot meet the CARB standards out of California and either build new vessels for California service or bundle retrofit projects to achieve greater economy of scale. For smaller CHC fleets or single-boat operators, the proposed CHC rules will be literally ruinous to their businesses. CARB has heard these concerns in several public meetings and has done nothing to address them.

CARB must consider providing vessel operators a feasible path to reducing stack emissions from CHCs. This path must include less prescriptive means of achieving emission reductions and longer-lasting exemptions for vessels that cannot feasibly retrofit.

CARB'S EXEMPTION OF 40% OF CALIFORNIA HARBOR CRAFT FROM CURRENT AND FUTURE REGULATIONS IS ARBITRARY AND CAPRICIOUS

CARB's decision to exempt about 1,570 commercial fishing vessels (approximately 40% of the total CHC population) from the rule is arbitrary and capricious. This decision places 100% of the emission reduction burden of the CHC rule on 60% of the vessel population.

CARB's rationale for excluding these vessels is that this sub-sector has:

- Small profit margins;
- Demonstrated lack of feasibility for Tier 4 repowers and retrofits;
- Competition with out of state and global markets; and,
- Tendency to conduct the majority of their operations far from the coast.

This rationale supports the exclusion of many included towing vessels that operate under conditions identical to the excluded commercial fishing vessels. More importantly, towing vessels that operate in coastwise interstate trade and do not perform ship-docking and escort services in California ports should not be considered CHC.

Ocean-going barges – either towed on a wire or rigidly connected through an ATB system – and their tugboats are directly analogous in their operation to commercial fishing vessels and share all four bases that led CARB to exempt commercial fishing vessels. AWO members can confidentially share with CARB financial data that demonstrates the small profit margins in the towing industry. AWO submitted information in April of 2020 showing that "repowering with EPA Tier 4 engines could be significant and cost prohibitive for some ship assist and escort tugs." Similar technical challenges exist for ocean-going tugs, barges, and ATBs. These vessels commonly operate in interstate commerce in competition with self-propelled vessels in out of state and global markets. Additionally, the tugboats and barges operating in these markets are required by law to be U.S.-flagged, -owned, -crewed, and -built. This rule would place U.S.-flagged towing vessels at a competitive disadvantage against self-propelled foreign-flagged vessels that are not covered by CARB's rule. Finally, AIS and Marine Exchange data reveals that these vessels conduct most of their operations far from the California coast, giving them a similar air emission profile in California as the exempted commercial fishing vessels.

CARB's decision to exempt 40% of CHC based on the exact conditions that apply to other non-exempt vessels is arbitrary and capricious and should be addressed prior to formal rulemaking.

THE SPECULATIVE AND NEGLIGIBLE HEALTH BENEFITS OF THE RULE CANNOT JUSTIFY THE $1.6 BILLION COST

CARB's justification for the proposed draft rule is unsupported by science as CARB has not released data connecting the alleged near-source cancer risk from CHC operation with actual CHC operation. CARB plans to provide this scientific justification when it releases its rulemaking package for 45 days of public comment. CARB's unwillingness to correct vessel population data the agency knows are inaccurate guarantees that this scientific justification will be erroneous and unethical.

CARB must support its claim that CHC operation results in 288 annual premature deaths in California. CARB's projects this rule to cost $1.6 billion, and it should justify its contention that those costs are commensurate with the proposed public health benefit. Additionally, CARB has not released any data that links CHC operation with increases in cancer rates. CARB estimates that 7200 total lives would be saved in California if PM emissions were reduced to "background" levels – by implication attributing 4% of total PM emissions to CHC. CARB's failure to provide scientific data that justifies this rule in a timely manner that allows for thorough public analysis is yet another unacceptable weakness in this badly flawed rulemaking process. Ethical and transparent government demands that stakeholders have sufficient opportunity to review and analyze the contribution of CHC to PM emissions in the airshed and the impact of these emissions on public health before being asked to spend $1.6 billion to address it.

AWO also believes that CARB's cost analysis has not fully accounted for the replacement costs of vessels that will be retired before the end of service life, the costs associated with the use of certain fuels, and the costs associated with bringing untested products to market. For example, R100 fuel, required under the draft regulation, must be shipped into California from Asia, negating some, if not all, of the emissions improvements promised by the new rule, and increasing costs to CHC operators. AWO members have projected vessel retrofit projects to be considerably more costly than projected by CARB. AWO members and other stakeholders have also cited the prohibitive costs of building replacement vessels to serve the California market, particularly given the challenging economic climate and thin profit margins.

This rulemaking process continues to be a serious concern for AWO and its members. The concerns that you will likely receive from other members of the regulated community as well should be taken as clear feedback that CARB needs to adopt a more collaborative approach to future iterations of this rulemaking. Meeting with stakeholders, listening to stakeholders, and then ignoring stakeholders' comments is not collaboration.

CARB needs an accurate inventory of CHC operating in its airshed and it needs to clearly describe a connection between the operation of CHC and public health risks. The regulatory measures proposed to mitigate those health risks must be commensurate with the problem and reasonably feasible for the regulated community to achieve.

In conclusion, beside developing truthful population counts and reliable cost estimates, CARB also needs to provide compliance paths for CHC operators that cannot feasibly retrofit and provide longer implementation timelines or financial incentives for CHCs with demonstrated feasibility issues. CARB must also address the inconsistency in the exemptions offered by the proposed rules.

This rulemaking represents a failure of collaboration between regulators and the regulated community. CARB's insistence on this path is hurting business and communities, inadvertently foreclosing better and more effective ways to reduce emissions air emissions throughout the state and inviting years of costly litigation. AWO urges CARB to adopt a more collaborative approach in advance of the 45-day formal rulemaking. Thoughtful and honest collaboration will benefit the state's economic and environmental health. AWO looks forward to discussing the topics outlined in this letter with the CARB staff.

Sincerely,

Charles Costanzo
General Counsel and Vice President – Pacific Region

Exhibit A

The American Waterways Operators

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Charles P. Costanzo
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April 30, 2020

Mr. David C. Quiros
Manager, Freight Technology Section
Transportation and Toxics Division
1001 "I" Street
Sacramento, CA 95814

Re: Proposed Concepts for Commercial Harbor Craft in California

Dear Mr. Quiros:

On behalf of The American Waterways Operators (AWO), thank you for the opportunity to respond to the California Air Resources Board (CARB) proposed concepts for further reducing pollution from Commercial Harbor Craft (CHC). AWO is the national trade association for the tugboat, towboat, and barge industry. AWO's more than 300 member companies own and operate 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 who safely, securely and efficiently move more than 760 million tons of cargo critical to the U.S. economy. The industry supports more than 300,000 jobs nationwide.

CARB's harbor craft regulations are particularly significant given the importance of waterborne commerce to the State of California. California ranks third among the states in waterborne commerce by tonnage and fourth in economic impact, with more than $12.2 billion annually in economic activity driven by the domestic maritime transportation industry. In California, the domestic maritime industry supports over 51,000 jobs and $3.6 billion annually in worker income. Seven AWO member companies are headquartered in California, and many more operate tugboats, tank barges, and deck barges on California waters. The industry enables the movement of tens of millions of tons of freight on California waterways, ensuring the state's essential role in global trade and significantly decreasing congestion on the state's highways and railroads while producing fewer air pollutants.

AWO members have a long history of collaboration with CARB on air quality initiatives and we are deeply committed to ongoing efforts to reduce air emissions and the carbon footprint of our operations. AWO is very concerned that CARB has not provided enough time for the regulated community to collaborate, engage on, and understand the complex and long-term implications and effects of the proposed concepts on the towing industry serving California. CARB has requested industry input throughout this process and has repeatedly highlighted the importance of strong industry-regulator dialogue for rule development. Now, with a global pandemic affecting livelihoods and schedules and in the face of repeated urgent requests from industry to delay the comment deadline on the proposed concepts, CARB has moved inexorably forward with a minimal extension on a critical review period for a major rulemaking proposal. In short, the 30-day extension is inadequate given the present circumstances surrounding industry's limited ability to respond and at odds with CARB's professed interest in regulator-industry dialogue. AWO values regulatory processes that allow for robust industry-agency dialogue, the safe and environmentally responsible operation of towing vessels, consideration of compliance costs and benefits, and protection of U.S. port competitiveness. CARB's process around these proposed concepts has neglected these important precepts.

CARB's Incentive-based Programs Have Proven Effective

The proposed concepts represent a significant change in policy direction from incentive-driven emission control programs to prescriptive and mandatory emission control programs. Harbor craft operators in California have long participated in mutually successful, incentive-based air quality programs through CARB and various Air Quality Management Districts, taken advantage of grant and finance plans to upgrade and improve engines, and achieved meaningful results for California air quality. Earlier iterations of progressively higher voluntary standards have led to successful technology innovations, well-managed industry costs, and substantive air quality improvements. The proposed concepts are a disappointing and dramatic departure from what has been a very successful regulator-industry partnership.

Several AWO member companies have worked extensively with CARB on incentive-based emission reduction strategies and have taken advantage of state funding programs to undertake substantial measures to reduce engine emissions. For example:

1. An operator of tugs and barges in both the Southern California and Bay Area markets took advantage of the Carl Moyer program, EPA DERA grants and Tiger grants partnering with Port Authorities. These funds, in conjunction with even more company capital was used to rebuild or repower over 20 engines upgrading from Tier 0 to Tier 1 or Tier 2. The funds were also used to convert a conventionally powered diesel tug to hybrid propulsion and construct a new hybrid propulsion tug. After spending tens of millions of dollars, the company has already had to replace many of these vessels due the current CHC rules, and will have to replace or modify all the vessels within 8 years,

including the brand new Tier 4 tug just delivered from the shipyard this year, if these concepts are adopted;

2. Another Bay Area towing vessel operator has more than a 20-year history of successful collaboration with the State of California, using Carl Moyer grants to replace over 40 engines. However, the proposed concepts would require this operator to replace or modify many of these engines for which the grant reporting period is still running; and,

3. Another national towing vessel operator collaborated with CARB, SCAQMD, and the BAAQMD to obtain Carl Moyer grants to repower and re-tier several vessels with kits to Tier 2 in 2011/2012 and is now in the process of upgrading many of these same vessels to Tier 3.

These examples demonstrate that the towing industry has been aggressively reducing air emissions both through collaboration with California regulators and on its own. This positive record of collaboration was achieved by developing a clear and shared understanding of our common goals. The proposed concepts, if enacted, threaten the collaboration built over many years and risk creating an adversarial and counterproductive situation driven by engineering feasibility concerns, prohibitive costs, and likely legal challenges. This is particularly disappointing since the concepts themselves and the implementation timeline are not justified by accurate data.

CARB Overstates CHC Air Emissions

AWO believes that CARB has relied on inaccurate information to justify the proposed regulatory concepts. Specifically, AWO sees no justification for upwardly scaling the CHC vessel population from the February 2019 reported figure of 1,928 vessels to align with U.S. Coast Guard data showing 3,698 vessels. This artificial inflation of California's vessel population is due to a flawed interpretation of Coast Guard data leading to an overstatement of air emissions from towing vessels in California.

The entire premise of the proposed concepts is that CHC are "the third-highest contributor to near-source cancer risk [at the Ports of Los Angeles and Long Beach] in 2016 and will contribute an even larger proportion in 2023 once emissions from ocean-going vessels and locomotives are further reduced." The proposed concepts and the attendant compliance schedules are derived from this flawed starting assumption. AWO strongly requests that: 1) CARB revise its vessel population count; 2) Revise the concepts and schedules to accurately reflect the lower cancer risk; and, 3) Revise the emission profile from CHC operation.

While our examination of the data was hampered by time and resource constraints due to our industry's response to the COVID-19 pandemic, CARB's unwillingness to extend the comment period, and a lack of transparency on how CARB used the Coast Guard dataset, we can safely conclude that there is no rationale for CARB's conclusion that our industry is

underreporting in any significant way. We find the following flaws in CARB's use of the dataset and the conclusions drawn from the data:

1. CARB is confusing "Hailing Port" with area of operation;

2. CARB is counting vessels that do not operate in California as "non-reporting" vessels;

3. CARB is counting vessels that are either not properly documented to operate or are no longer in commercial service because of their age or other regulatory requirements; and,

4. CARB failed to use readily available sources of vessel information to validate their assumptions.

All CHC vessels must maintain and provide extensive operational records pursuant to 17 California Code of Regulations (CCR) § 93118.5. But CARB is asserting that nearly half of the harbor craft in California do not comply with reporting requirements – i.e. 1,928 CHC operators report their operations to CARB while Coast Guard data reflects an additional 1,770 vessels with hailing ports from California. CARB's incorrect starting assumption is that "hailing port" is synonymous with operating area and that 1,770 vessels are not only not reporting but are operating with hours that are equivalent to the industry average per vessel. A vessel is not required to set their hailing port as the area they operate and is more often reflective of the owner's offices or corporate domicile.

As an example, one AWO member company reports seeing 60 vessels associated with its operation in the Coast Guard dataset, of which only 18 operate in California or regularly call on California ports. The remaining 42 vessels are either:

1. Operating in Alaska and have not been to California in possibly decades;

2. Operating in the Gulf of Mexico and, while they have the potential to call California, do not currently call California;

3. Operating only in Washington State;

4. Laid up (in Washington State) or sold; or,

5. Double counted in the Coast Guard data (two vessels are listed twice).

Towing vessels reporting to CARB have hailing ports in many states. This lack of rigor suggests that CARB is inflating the number of purported CHC vessels to demonstrate a greater risk to the airshed and to help justify the proposed concepts.

CARB's use of the Coast Guard dataset is also flawed because many vessels included in the dataset are not legally allowed to operate under current regulations. At least 37 of the tank barges in the list were built before 1983 – most likely with single hulls and legally prohibited from carrying oil in U.S. waters. These vessels likely do not operate in California or anywhere else. Other vessels in the dataset lack Certificates of Documentation (COD) and therefore cannot legally operate in U.S. waters. All told, from the data that AWO members had extraordinarily little time to review, at least 69 out of 217 towing vessels included in the Coast Guard's data have either expired CODs or work outside California. CARB concedes that 41 of the towing vessels included in its data have expired CODs but then appears to keep all 41 towing vessels in the dataset.

CARB has acknowledged its reliance on the Coast Guard data, but it is clear that CARB has not addressed any of these anomalies. Not including barges and tank vessels, CARB refers to 244 total towing sector vessels within California (13 ATBs, 73 ship assist/escort tugs, and 158 near-shore/ocean-going vessels). AWO sought to resolve this inconsistency by obtaining towing vessel population data from the Marine Exchange of Southern California and the San Francisco Marine Exchange, data clearinghouses for vessel activity throughout the state. This data included details on all tug escorts, assists, tank barge escort transit logs, and an AIS search for active towing vessels in San Francisco Bay, Los Angeles/Long Beach, San Diego, and Port Hueneme. This data showed that in the most recent two-year period a total of 142 vessels, classified as towing vessels by the Coast Guard, were active in CARB regulated waters. This includes 13 ATB units that call on these ports and more than 10 tug-barge units that called fewer than 10 times in the two years, likely leaving them well below the 300/80-hour low-operation reporting threshold. In addition to reexamining its vessel inventory, CARB should also disclose its exact methodology for determining its vessel inventory and explain its decision to augment that inventory with misinterpreted Coast Guard data.

CARB's Arbitrary and Capricious Application of Rules

CARB's mistaken reliance on inapplicable Coast Guard data to arrive at the 3,698 regulated vessel count is further compounded by its decision to refrain from applying portions of the proposed concepts to commercial fishing vessels and other vessels. Approximately 1570 vessels (40%) included in CARB's data set are listed as commercial fishing vessels, which are excluded from current and future in-use regulations. Therefore, CARB reasons that the remaining community of regulated CHC – 60% of the vessels included in the data set – must bear 100% of the regulatory burden of proposed emissions reductions. This selective application of the rules is unfair. Further, it necessitates a careful review of the policy decision to exempt 40% of the regulated vessel population from CARB's proposed concepts.

CARB's rationale for excluding fishing vessels from the so-called "in-use" concepts is based on "the small profit margins in the industry, demonstrated lack of feasibility for Tier 4 repowers and retrofits, competition with out of State and global markets, and tendency to conduct the majority of their operations far from the coast." These are identical prevailing

conditions for a significant portion of regulated vessels in the towing industry. Indeed, many, if not all, of the conditions that led CARB to exempt commercial fishing vessels and other ocean-going vessels from these proposed concepts are also true of a significant number of towing vessels.

ATBs Are Ocean-Going Vessels

Purpose built ocean-going tugs and their corresponding tank barges, which are rigidly connected as one unit (referred to as "ATBs"), commonly operate in interstate commerce in competition with U.S.- and foreign-flagged self-propelled tank vessels. While ocean-going tankers are entirely excluded from the proposed concepts, ATBs calling on the same petroleum terminals, carrying the same cargo, and conducting the same operations as self-propelled tank vessels would be regulated differently under CARB's proposed concepts. Due to the markets of operation, coupled with the fact that ATBs routinely spend the majority of their time outside of California in interstate and foreign commerce, CARB should consider ATBs as ocean-going vessels and, therefore, exclude ATBs from the proposed harbor craft rule.

CARB's Proposed Concepts May Violate the Federal Clean Air Act

Several of CARB's proposed concepts could, if enacted without express authorization from the U.S. Environmental Protection Agency (EPA), violate the federal Clean Air Act as they are "standards and other requirements relating to the control of emissions."[1] Although the federal Clean Air Act expressly preempts state regulation of emissions from many types of engines, it allows California to seek authorization from the EPA to adopt standards for certain nonroad engines and vehicles including harbor craft. Federal law limits the standards available to California without express authorization from EPA to "in-use standards." CARB characterizes certain elements of its proposed CHC concepts as "in-use" standards – which federal courts have determined apply to "use, operation, or movement" of regulated non-road vehicles. Examples of in-use standards include limitations on idling times, carpool lanes, and other use restrictions that control emissions. Despite this characterization, CARB's proposed concepts include clear emission performance standards that necessitate authorization from EPA.

CARB's proposed Concept 2 – which it characterizes as "More Stringent In-Use Requirements" – describes two clear emission performance standards, followed by an in-use standard as an alternate means of compliance: 1) the modification of a federally-compliant engine with specific filter equipment to meet an elevated California emission performance standard; 2) the use of "pre-approved" Alternate Complying Technology to meet an elevated California emission performance standard[2]; and 3) the imposition of low-use operational requirements. Both Options 1 and 2 outlined in Concept 2 are emission performance standards that specifically require specialized equipment above and beyond existing federal requirements to be installed aboard the vessel. CARB in its Proposed Concepts expressly acknowledges the establishment of an emission performance standard: "For vessels that choose to meet the

[1] Clean Air Act §209(e)(2)
[2] CARB provides no information on the pre-approval process for Alternate Complying Technologies.

performance standard with diesel engine repowers and retrofits, CARB is proposing the use of the cleanest available marine certified engines combined with verified retrofit DPFs." The proposed concept is not an "in-use" rule because it would regulate emissions and engines, not the fuel used. "Supplying a presumed mode of compliance does not alter the nature of the general requirement limiting emissions. Indeed, the Marine Vessels Rules do not impose an in-use fuel requirement because no particular fuel is required to be used at all."[3] Notwithstanding the questionable feasibility of retrofitting marine engines with DPFs, proposed Concept 2 cannot be construed as an "in-use requirement" and would necessitate authorization from EPA.

CARB's proposed Concept 3 – requiring new vessels to be designed with specific engine equipment meeting standards that are separate from those established by the federal EPA – is preempted by Clean Air Act §209(e)(1), which prohibits states from establishing requirements relating to the control of emissions from new non-road engines without authorization from EPA. The 2004 case of *EMA v. South Coast Air Quality Mgmt. District* is instructive. The U.S. Supreme Court took a broad view of what constitutes a "standard" under §209 of the Clean Air Act to include not just standards that manufacturers must meet, but also standards that consumers/purchasers are required to meet: "This interpretation is consistent with the use of 'standard' throughout Title II of the CAA (which governs emissions from moving sources) to denote requirements such as numerical emission levels with which vehicles or engines must comply, e.g., 42 U.S.C. § 7521(a)(3)(B)(ii), *or emission-control technology with which they must be equipped*, e.g., § 7521(a)(6)."[4]

Finally, CARB's proposed Concept 16 – requiring annual opacity testing – is a clear emission performance standard as it establishes a test to determine – however subjectively – a certain amount of a given pollutant. Even if this proposed concept were made less subjective through detailed standards for testing or made more applicable to CHC by updating existing CARB opacity testing rules, establishment of this concept in regulation would nevertheless require EPA authorization. As articulated by the court in *EMA*, "The Marine Vessel Rules plainly fit within the SCAQMD definition of 'standards' as a requirement that a 'vehicle or engine must not emit more than a certain amount of a given pollutant." This is the very essence of what opacity testing would measure. And, citing *Goldstene*, "In the end, Clean Air Act §209(e)(2) preempts the Marine Vessel Rules and requires California to obtain EPA authorization prior to enforcement because the Rules are 'emissions standard' that require that engines 'not emit more than a certain amount of a given pollutant."

Specific Suggestions from AWO

Despite AWO's fundamental concerns with the basis, timing, application, and legality of the proposed concepts, we nonetheless want to share specific concerns with the individual concepts themselves and suggest ways they can be better applied to regulated community of towing vessels.

[3] *PMSA v. Goldstene,* 517 F.3d 1108 (Ninth Cir. 2008).
[4] *EMA v. South Coast Air Quality Mgmt. District,* 124 S. Ct. 1756 (2004) (emphasis added).

Compliance Timelines

CARB's proposed compliance deadlines for engine repowering and engine modifications are too short. Even relatively simple engine modifications must be evaluated based on the vessel's stability, maneuverability, available space, and watertight integrity. As engine manufacturers obtain Tier certification for more engines, vessel manufacturers need more time to properly evaluate the engine options for certain operations and make changes to vessel designs to account for the new engine parameters and specifications.

AWO suggests the following improvements to the timeline:

1. Before enforcing new Tier 4 requirements, the agency should allow sufficient time (e.g. 1 year) for the industry to test the Tier 4 engines for towing applications.

2. Extend the proposed implementation dates to account for industry investments made to comply with existing regulations. Any currently compliant engine should be able to operate without modification for at least 20 years from its initial service date.

3. If an operator can prove that a required upgrade is not feasible and that such an upgrade would present a financial hardship to meet the compliance date, CARB should grant a reasonable extension.

4. Operators of multi-vessel fleets should be allowed to defer compliance in one-year increments indefinitely to avoid two vessel re-power projects in the same calendar year.

5. Vessel operators should be allowed to defer compliance until a vessel's next regulatory dry-docking in order to mitigate against shipyard congestion and cost.

6. New-build designs are often completed years in advance of vessel construction. The proposed concept could compel vessel operators to make costly and disruptive changes to engine plans during the design period. To avoid this situation, AWO recommends that CARB extend the new-build phase-in date to a minimum of five years after the effective date of the rule.

AWO appreciates CARB's consideration to allow compliance deadline extensions based on feasibility. However, because of the way CARB groups engine model years into single compliance years, compliance extensions are not likely to provide significant relief for operators with fleets that operate more than one "sister" vessel with engines from the same model year.

Technological Feasibility

The proposed concepts will not be feasible for certain towing vessels and will require operators to remove those vessels from California service. In some cases, relatively new and fully

compliant vessels would be barred from operation in California simply because the operators failed to anticipate the enactment of California's special Tier 4 requirements. This is particularly true of the proposed concept requiring Tier 4 engines with a Diesel Particulate Filter (DPF). Currently, there is little to no marine application of DPF, considerable size and engine space restrictions exist, and back pressure created by DPF on an engine exhaust system is intolerable for the safe operation of existing and known future engines. Many vessels currently have no manufacturer approved DPF available for engines, so industry cannot determine feasibility of DPF on marine vessels. CARB is proposing to require technology that is untested, unproven, and simply unavailable.

AWO suggests the following measures to address feasibility issues with DPF:

1. Delay the implementation date for any DPF rules by a minimum of five years after a compliant Tier 4 with DPF engine can be approved by the appropriate regulatory authority and is reasonably available; and

2. Vessels unable to install a Tier 4 engine and a DPF due to infeasibility will be considered in compliance if the vessel operates a Tier 3 engine with a DPF or a Tier 4 without a DPF.

CMA Tier 4 Feasibility Report Shortcomings

AWO retained Jensen Maritime Consultants ("Jensen") to provide an independent engineering review of Cal Maritime's "Evaluation of the Feasibility and Costs of Installing Tier 4 Engines and Retrofit Exhaust Aftertreatment on In-Use Commercial Harbor Craft." CARB relied on the Cal Maritime study to determine the feasibility of Tier 4 retrofits and to help justify the implementation and compliance schedule for the proposed concepts. The Cal Maritime study looked at four retrofit scenarios for an individual harbor tug to arrive at its conclusions while the Jensen review drew conclusions from a similar project performed for Crowley Maritime.

Jensen's review finds that the technical challenges of repowering a vessel with EPA Tier 4 engines could be significant and cost prohibitive for some ship assist and escort tugs. This is particularly true in the case where the engine room does not allow for overhead selective catalytic reduction (SCR) placement. Jensen's review identifies technical considerations for vessel repowers that were not included in the Cal Maritime study and suggests that the Cal Maritime study may have underestimated retrofit costs by nearly 37%. The Jensen review is attached hereto as Appendix 1.

It should also be noted that both the vessel in the Cal Maritime study and the vessel in the Jensen project are relatively large towing vessels with ample machinery space. Many other vessels performing similar functions do not afford the same space. Therefore, the Cal Maritime study, on which CARB relied for feasibility, is not representative of the feasibility for most towing vessels. For many comparable vessels in this category, not only is the cost of Tier 4 repower and DPF retrofit severely underestimated in the Cal Maritime study, but

general feasibility is questionable. AWO suggests that the proposed concept will necessitate more vessel replacements than CARB realizes.

Shore Power for At-Berth Vessels

CARB's proposal to require shore power for vessels at berth depends on the development of shoreside infrastructure beyond the control of vessel operators. Terminal and lay-berth facilities should equitably bear the burden of any proposals requiring specific shoreside infrastructure development. Many towing vessel companies use shore power at their home dock berths to limit generator use and to decrease idling time for main engines, but vessel operators without long-term leases and control over infrastructure may find it impossible to comply with this proposal.

The proposal also impacts customer berths, where the terminals may have to provide increased infrastructure. AWO is concerned that facilities may decide not to offer short-term lay-berths if they cannot comply with CARB's proposed infrastructure requirements. Limited berth space could force towing vessels to idle in harbor between jobs or burn more fuel to return to an electrified home dock. In this situation, the regulation would be responsible for increasing, not decreasing, air pollution.

Towing vessel operators struggle to find suitable mooring locations in California ports. While harbor craft moorage is essential to the port economy, most port operators would prefer to devote infrastructure resources to activities that generate higher revenue. The proposed concepts might reduce lay-berth availability if facility operators fail to provide to shore power to enable compliance with CARB's proposed shore power concept.

AWO also recommends the following actions to improve the shore power proposals:

1. The duration of the idle period should be extended from 15 minutes to 30 minutes.

2. CARB should explore incentive-based programs to encourage facilities to provide shore power infrastructure to regulated harbor craft.

Opacity Testing Requirements are Inappropriately Designed

Notwithstanding the above-referenced legal concerns, the opacity testing proposal is too subjective. Certain types of towing vessels have a highly variable duty cycle and their engines must be tuned to provide the power, maneuverability, and braking necessary to safely operate. CARB's proposed concept suggests testing during the transitional phase of a vessel's fuel map (i.e. accelerating or decelerating the engine), and not at steady state (i.e. at constant RPM under a consistent load), where the engines operate most efficiently. Tuning the engine to minimize smoke during the transitional phase could compromise engine integrity when the operator needs to ensure safe operation and maximum responsiveness.

To ensure the engines are tested in the manner that they are certified by the EPA, we offer the following recommendations:

1. Opacity testing of marine equipment should be done at steady state, either prior to or post acceleration/deceleration.

2. Testing should not be annual. Testing should be based on known risk factors such as equipment age and operational history. Opacity testing should occur once in the first years of vessel operation to set a baseline and then at reasonable periods thereafter (e.g. every 5 years).

3. Opacity testing should not be required for vessels qualifying under low-use operating requirements.

4. Consider allowing operators to perform annual engine opacity tests on their own equipment and adopt an oversight method to certify and spot-check results.

5. Towing vessel engines have different operational characteristics than other vessels addressed under similar CARB regulations. Also, different types of towing vessels operate differently from each other. CARB should consider the range of CHC engine types and duty cycles and modify the proposed concepts to meet specific operating conditions.

6. Opacity tests will be more difficult to perform on constant RPM engines such as generators and will provide fewer significant examples of standard operating condition for these engines. Opacity testing, as CARB proposes, may not be appropriate for constant RPM engines.

Compliance Costs are Unreasonable

The proposed concepts would create unreasonably high compliance costs and create waste by forcing operators to replace or retire relatively new, clean, and operable engines and vessels. In the towing vessel community's experience under the previous rule, transitioning a towing vessel from a Tier 0 or Tier 1 to a Tier 2 engine often required significant rebuilds or repowers. Because vessels often outlive the useful life of engines, compliance deadlines under the previous regulation could be effectively aligned with scheduled vessel rebuilds or repowers that would have taken place regardless of regulatory deadlines.

Under the proposed rule, too many towing vessels would not be allowed to outlive the useful life of their engines due to physical space constraints and installation restrictions for required equipment. In those cases, compliance with the proposed rule would require that vessels be retired or replaced when they would have otherwise had significantly greater operational lifespans. For some operators that perform work outside of California, vessel relocation is an option. For many California-only operators, however, the rule presents a significantly higher

financial burden by forcing them to replace vessels and engines long before it would make economic sense.

Under the proposed rule, CARB would render useless many towing vessels into which operators have already made significant air quality investments. Many of these recent investments were made with the understanding that CARB's current and forthcoming commercial harbor craft rules would allow vessels a far greater portion of their useful lives than the proposed rule currently allows. Tug and barge owners have, in good faith, designed and built vessels in compliance with international, federal, state, and local laws and regulations. CARB should not enact unnecessarily aggressive regulations that prevent vessel owners from recouping the cost of their significant investments.

Additionally, AWO is concerned that the proposed concepts frame the emissions by unit per engine or per vessel. The proposals fail to take into consideration emissions by unit per work performed. Given the added size and weight of Tier 4 compliant equipment, all other things being equal, vessels are likely to have reduced operating capacity. This lower capacity would create a need for additional vessels, operating in the same location and time period, in order to perform the same amount of work. Once again, the regulation could actually increase fuel use and air pollution.

The proposed rule would also cause an unprecedented short-term increase in demand for shipyard availability and equipment, much of which is not available in the market. The towing vessel community is concerned that California shipyards could not accommodate the waves of retrofits necessary to comply with the proposed concepts.

AWO disagrees with CARB's intent to assess the financial hardship of complying with a regulation based on a company's financial health. The effect of such a methodology would be to prop up companies that are struggling financially by allowing them to avoid regulation and gain an economic advantage over companies that are financially sound. Regulators should not be in the position of altering the competitive posture of companies, but rather strive to create an equitable regulatory regime. Financial hardship should be measured by the impact on an asset's ability to compete. For many operators, losing a single vessel has significant economic impact, either through lost revenue or through the cost of sourcing a temporary replacement tug. Also CARB should give special consideration when a vessel's design or configuration renders the required modification so expensive as to make the vessel unprofitable. CARB's projected compliance costs do not reflect the entire financial impact of the proposed concepts and AWO recommends that CARB more fully account for these costs.

To address cost concerns for towing vessels, AWO recommends the following:

1. Modification estimates, as verified by a to-be-determined third party or agency, which exceed a given cost/value ratio should be granted a compliance extension.

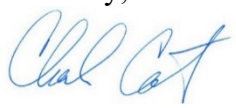
2. A vessel's initial in-service date should be the baseline to determine implementation dates for that engine, instead of engine model year, since engine year does not reflect

how long the engine has been operated or how long the owner has had to recoup the cost of investment.

CARB should also minimize the cost of the proposed rule's administration, including reducing the frequency of reporting and opacity testing. Any administration fees should be capped and based on fleet size and number of engines. AWO recommends $100 per year per engine, up to $400 per vessel, with a cap of $2,000 per company fleet.

AWO members are focused at this extraordinary time of global pandemic on keeping crews safe, protecting the environment, and facilitating essential California trade. We appreciate this opportunity to comment but strongly believe that more time to review this complex and costly proposal is needed. AWO urges CARB to further extend the comment period and stands ready to collaborate and dialogue with the agency. We would be pleased to answer any questions or provide further information.

Sincerely,



Charles. P. Costanzo
General Counsel & Vice President – Pacific Region

Appendix A
Jensen Naval Architects and Marine Engineers: Engineering Review Summary - Cal Maritime Tier 4 Feasibility Study

REVISIONS			
REV	DESCRIPTION	DATE	APPVD

PROJECT

Engineering Review - Cal Maritime Tier 4 Feasibility Study

CLIENT

The American Waterways Operators

TITLE

Engineering Review Summary

JENSEN
Naval Architects & Marine Engineers

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Seattle, Washington 98134-1030 Ph 206.284.1274
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EGR	CL	DATE	4-24-2020
CKD	CP/JP	DATE	4-24-2020
APP	CL	DATE	4-29-2020

DOC NO.	REV
203062-230-0	0

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Introduction

The American Waterways Operators (AWO) retained Jensen Maritime Consultants (Jensen) to provide an independent engineering review of Cal Maritime's "Evaluation of the Feasibility and Costs of Installing Tier 4 Engines and Retrofit Exhaust Aftertreatment on In-Use Commercial Harbor Craft", dated 30 September 2019, which was prepared for the California Air Resources Board (CARB) (Reference 1).

Reference 1 evaluated the feasibility of repowering thirteen different representative vessels with Environmental Protection Agency (EPA) Tier 4 marine engines. This engineering review focused on evaluating the technical feasibility and capital cost information for ship assist tugs only; particularly for the EPA Tier 4 main engine repower option. Specifically, the review focused on five areas impacted by repowering:

- Arrangement
- Mechanical
- Structure
- Electrical
- Weight/Stability
- Capital Cost

Operating costs and vessel replacement costs were not evaluated in this review.

In order to facilitate the review, Jensen's recent experience repowering ship assist and escort tugs with EPA Tier 4 engines was used.

Discussion

Cal Maritime Feasibility Study

Reference 1 evaluated the feasibility of four retrofit scenarios for a ship assist and escort tug. The study determined that retrofitting diesel particulate filters (DPF) and selective catalytic reduction (SCR) equipment to existing main engines was not feasible given the scope and constraints of the study. The study determined that repowering with EPA Tier 4 main engines was feasible with "minimal vessel modification".

In the repower option, the study used a representative ship assist and escort tug with the following attributes:

- LOA: 100'-0"
- Beam: 40'-0"
- Max Draft: 19'-6"
- Quantity of Main Engines: 2
- Total Installed Main Engine Power: 6,850 hp

The study identified the following impacts to accommodate the new engines in the representative vessel:

Arrangement

- The SCRs were located forward of the main engines in the engine room overhead.
- The study notes that there wasn't space available for a 2,000 gallon diesel exhaust fluid (DEF) tank in the engine room. The study does not identify a location for the DEF tank, but suggests there is a possible location in the Z-Drive room.

Structure

- No specific structural modifications were identified.

Mechanical

- The study assumes that new silencers will be needed for the main engines along with an overhaul of the exhaust system.
- Rerouting other mechanical systems in the engine room in way of the SCRs may be required.
- The study briefly mentions compressed air modifications.
- Engine room ventilation duct work rerouting to accommodate SCRs.

Electrical

- No significant impact to the electrical system was identified, but the study notes that minor integration of dosing equipment is required.

Weight/Stability

- The estimated weight additions are as follows:
    - New engines: 2 long tons (LT)
    - Additional equipment and structure: 13 LT
- The study notes that additional weight and stability calculations are required upon finalizing the DEF tank size and location.
- An increased vertical center of gravity (VCG) is possible due to the location of the SCRs and a possible weight reduction in the new main engines.

Capital Cost

- The average total capital cost for the repower is estimated to be $2,812,000.

Crowley Ship Assist and Escort Tug Case Study

In order to evaluate the information provided on the technical feasibility and capital cost for repowering a ship assist tug with EPA Tier 4 engines in Reference 1, it is useful to compare it against a project that is underway with the Crowley Maritime Corporation (Crowley). Crowley is currently underway with a project to repower an existing Tier 0 ship assist and escort tug with EPA Tier 4 engines. At this point the engineering is nearly complete and the project is scheduled for implementation in 2020. This project provides an excellent basis for comparison because the particulars of the tug are nearly identical to the representative tug used in Reference 1. The particulars of the Crowley tug are shown below:

- LOA: 100'-0"
- Beam: 40'-0"
- Depth: 22'-1"
- Quantity of Main Engines: 2
- Total Installed Main Engine Power: 6,800 hp

In reviewing the engineering package for the Crowley repower project, the following areas have been identified as requiring modification:

<u>Arrangement</u>

- The tug is fortunate to have the available space in the overhead of the engine room so the SCRs were located above the main engines as shown in Figure 1.

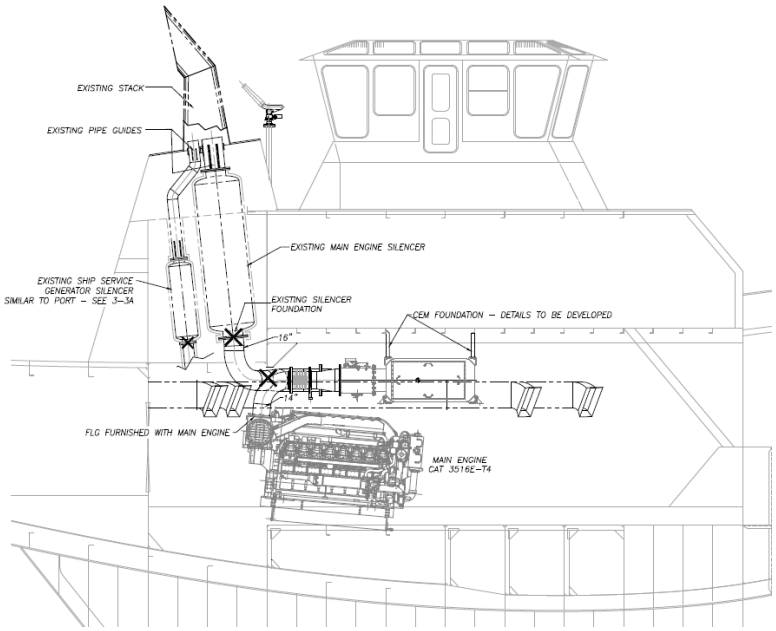

Figure 1: Crowley Tug SCR Arrangement

Structure

- The new Tier 4 engines have the same footprint and mounting configuration as the existing engines so modifications are not required to the engine foundation.
- The following equipment foundations are required:
  - Two (2) new DEF dosing units.
  - Two (2) new main engine exhaust aftertreatment CAT clean emissions modules (CEMs). Note that these are the SCRs.
  - One (1) new harbor generator silencer.
- Subdividing two existing ballast tanks to partially convert to DEF storage.
- Compartment and tank testing for DEF tanks

Mechanical

- Minor fuel oil modifications are required for the new engines and generators.
- New keel coolers for main engines and generators to replace existing raw water cooling system.
- Propulsion shaft bearing replacement and alignment.
- New exhaust piping between the main engines and silencers. The existing silencers will be retained as a cost saving measure. Possibility of installing new, slightly smaller silencers exist, but at additional cost for new equipment.
- Modifications to exhaust system piping for the generators.
- New DEF system including stainless steel transfer piping and DEF tank fill and vent piping. DEF tank insulation and heating.
- New compressed air piping, valves, and fitting for the dosing units.

Electrical

- Two new 129 kW generators to upgrade from Tier 0 engines to Tier 3 engines.
- Additional 2 kW electrical load for the dosing cabinets.
- New alarm and monitoring system for the main engines.
- Miscellaneous electrical requirements for power, control, and monitoring of dosing equipment and tank level indication.

Weight/Stability

- The new engines are the same weight as the existing engines.
- The estimated lightship increase from the repower is 4 LT.
- The vertical VCG is estimated to increase by .07 ft.

Capital Cost

- The total capital cost project budget range is 3.7M to 4.5M.

Conclusion

When comparing the results of Reference 1 with the Crowley project, as well as other EPA Tier 4 ship assist and escort tug designs in the Jensen Maritime portfolio, this engineering review finds that it is technically feasible for the representative tug to be repowered with EPA Tier 4 engines and associated aftertreatment equipment. There are multiple options for commercially available engines in the 3,500 hp range from which operators can evaluate and choose from. It is important to note that the technical challenges of repowering with EPA Tier 4 engines could be significant and cost prohibitive for some ship assist and escort tugs. This is particularly true in the case where the engine room overhead does not allow for SCR placement.

The scope of Reference 1 may not have allowed for detailed analysis of all aspects of a repower project. However, this review identified some technical considerations for repowering the representative tug that were not included in Reference 1, but should be discussed. The additional technical considerations are as follows:

Arrangement

As described above, the engine room of a ship assist and escort tug may not allow for the installation of SCRs in the overheard. In these cases, the SCRs may need to be located in the stacks which requires more extensive structural modifications and typically has an impact on the engine room ventilation fan arrangement. This can also create challenges in accessing the SCR for routine maintenance. Figure 2 shows an example of an SCR located in the stack. Note that this was excerpted from a new design.

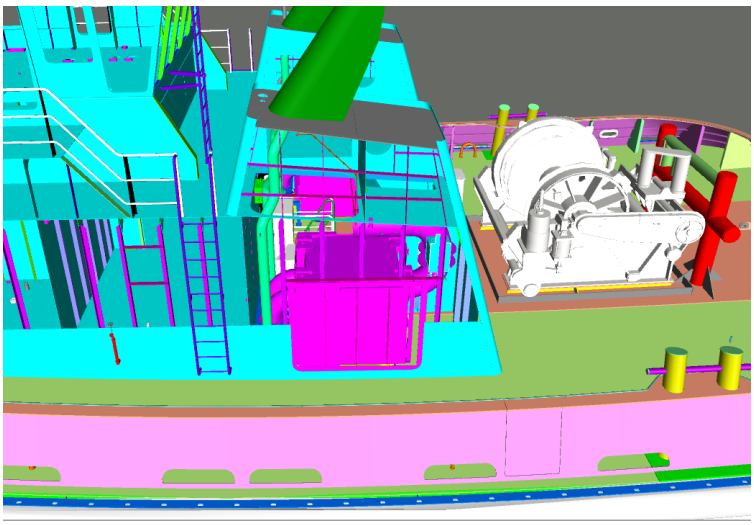

Figure 2: Example of SCR Located in the Stack

DEF Tank and Transfer System

Reference 1 assumes the use of an independent poly/rotomold DEF tank. Jensen has designed several new EPA Tier 4 ship assist tugs, as well an EPA Tier 4 repower project. Each of these projects have used independent stainless steel tanks with the exception of the repower project, which used integral steel tanks with a coating system. The volume of the DEF tank in Reference 1 is indicated as 2,000 gallons, which is smaller than the Jensen projects described above. For

example, new ship assist and escort designs using the 100 ft tug platform have a DEF capacity of approximately 5,800 gallons. Additionally, the Crowley repower project will have a DEF capacity of approximately 6,000 gallons. Since the amount of DEF carried aboard is dependent on the operators bunkering schedule, it is worth noting that some operators will need a DEF capacity greater than 2,000 gallons, which will create additional material and labor costs.

The study doesn't clearly state that DEF should not be kept in the engine room. DEF must be kept in a particular temperature range if reasonable shelf life is to be maintained, this typically precludes DEF storage in engine rooms or similar hot spaces without adequate measures to insulate the DEF tank. Ship owners will need to plan for alternate storage arrangements. The study correctly identifies the Z-Drive room as a viable location for the DEF tank(s). It is important to note that the American Bureau of Shipping's Guide for Exhaust Emission Abatement requires a minimum of six air changes per hour in areas where DEF tanks are located. Z-Drive rooms have ventilation systems sized to limit temperature rise in the space and typically meet the minimum air change requirement. However, if the tanks are located in the Z-Drive room consideration should be given to heating and insulating the DEF tanks if operation in cold climates is intended.

Main Engine Foundation Modifications

Reference 1 notes the repower option requires a different engine make and model. This will likely require some amount of engine foundation modifications; possibly including replacing the rider plates and modifying the foundation height to match the existing shaft line.

Auxiliary Equipment Foundations

Reference 1 doesn't explicitly identify the need for foundations for the engine aftertreatment equipment such as the dosing units and independent DEF tank.

Engine Room Ventilation

Reference 1 doesn't address the amount of engine room ventilation. The SCRs have significant ambient heat rejection which is particularly important when they're installed in the overhead of the engine room. Depending on the make and model of engine, the heat rejection from the SCRs can be 65% of the main engine or greater. This typically requires larger engine room ventilation supply fans; although in the Crowley example, engine room supply fans were not upgraded.

Propulsion Shafting and Z-Drives

Reference 1 does not include modifications to the propulsion shafting, Z-Drives, and propellers which assumes that the EPA Tier 4 replacement engines are approximately the same horsepower and RPM as the existing engines.

Capital Cost

The average total capital cost in Reference 1 is $2,812,000 for equipment and installation costs. The total capital cost budget for the Crowley reference project is $3,700,000 to $4,500,000. The Crowley project includes items that are not included in Reference 1, some of which are necessary for the repower and some of which are included as a matter of convenience. In order to have a more accurate comparison of capital costs, work items in the Crowley estimate not absolutely necessary to the repower were removed from the estimate. The work items, removed for this

comparison, are the new generators and associated exhaust systems and the new keel coolers. Removing these items lowers the Crowley capital cost budget to $3,300,000 to $4,100,000. Table 1 below summarizes the project capital costs.

Table 1: Capital Cost Comparison

	Cal Maritime Study	Crowley Reference Project
Low Estimated Capital Cost	$2,612,000	$3,300,000
High Estimated Capital Cost	$3,012,000	$4,100,000

As a general point of comparison, a previous study developed by Jensen (Reference 2) estimated that the cost to install a DEF system of approximately 4,500 gallons was $375,000 for labor and materials. This estimate assumed an independent stainless steel DEF tank at a west coast shipyard.

It's important to note that it was not the intent of this study is to cover every technical consideration or cost impact associated with repowering a ship assist and escort tug. Further study is required if additional factors are to be considered or more detail is required.

References

1) Cal Maritime "Evaluation of the Feasibility and Costs of Installing Tier 4 Engines and Retrofit Exhaust Aftertreatment on In-Use Commercial Harbor Craft" Prepared for CARB, 30 September 2019.
2) 193062-230-0_0, Tier 4 Engine Installation Study, Jensen Maritime Consultants, 2020.

Exhibit B

The American Waterways Operators

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Bainbridge Island, WA 98110

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Charles P. Costanzo
General Counsel & Vice President – Pacific Region

October 30, 2020

Mr. David C. Quiros
Manager, Freight Technology Section
Transportation and Toxics Division
1001 "I" Street
Sacramento, CA 95814

RE: Proposed Amendments to the Commercial Harbor Craft Regulation in California

Dear Mr. Quiros:

On behalf of The American Waterways Operators (AWO) members, thank you for the opportunity to respond to the California Air Resources Board (CARB) proposed amendments to the commercial harbor craft regulation. AWO is the national trade association for the tugboat, towboat, and barge industry. AWO's more than 300 member companies own and operate towing vessels on the U.S. inland and intracoastal waterways; the Atlantic, Pacific, and Gulf coasts; and the Great Lakes.

AWO considers CARB's harbor craft regulations to be particularly significant given the importance of waterborne commerce to the State of California. California ranks third among the states in waterborne commerce by tonnage and fourth in economic impact, with more than $12.2 billion in annual economic activity driven by the domestic maritime transportation industry. Seven AWO member companies are headquartered in California, and many more operate tugboats, articulated tug-barge units (ATBs), tank barges, and deck barges on California waters.

As outlined in AWO's April 30, 2020 comment letter, the proposed amendments will impose substantial costs on AWO members and create new compliance challenges for both harbor craft engine manufacturers and harbor craft operators. We would like to reassert the concerns articulated in our previous comments and reiterate our opposition to the proposed concepts and compliance schedules.

As a threshold concern, AWO believes that CARB's vessel inventory overstates the contribution of harbor craft to air pollution in California. CARB has acknowledged AWO's concerns with the vessel population counts and we are working with CARB staff to identify discrepancies in vessel counts. Based on these overestimations and corresponding lower

pollution loads attributable to towing vessels, AWO strongly recommends that compliance schedules and regulatory timelines for harbor craft performance standards be extended.

AWO also believes that the proposed concepts represent an unnecessary and unhelpful shift away from effective incentive-based programs and toward prescriptive mandates. This shift impairs industry flexibility and invites waste by encouraging the retirement or decommissioning of newer and federally compliant vessels long before the end of their life cycles while providing very little environmental benefit.

Finally, AWO objects to CARB's decision to exclude commercial fishing vessels and other vessels based on their operational profile and cost of compliance. The same conditions used to exclude fishing vessels and other vessels apply to towing vessels in coastwise trade that generally operate beyond the territorial sea boundary line. *If the goal is to regulate harbor craft, CARB should acknowledge the operational profile of all oceangoing vessels – including ATBs and oceangoing tugboats – and exempt them from this regulation for the same reasons that the rule exempts commercial fishing vessels.*

AWO members have a long history of collaboration and cooperation with CARB and constructive engagement in its initiatives. We remain deeply committed to protecting air quality in California and nationwide. AWO appreciates the consideration that CARB has given to several areas of this rule, specifically eliminating requirements for newly built near-zero emission harbor craft. AWO values regulatory processes that allow for robust industry-agency dialogue that takes into account the safe and environmentally responsible operation of towing vessels; consideration of compliance costs and benefits; and protection of U.S. port competitiveness. *AWO is concerned that CARB's process, so far, has neglected these important precepts.*

AWO looks forward to working with CARB to ensure that maritime transportation remains the most environmentally friendly mode of freight transportation -- enhancing California's trade economy and delivering cleaner air for all Californians.

Sincerely,

Charles Costanzo
General Counsel and Vice President – Pacific Region

Exhibit C

The American Waterways Operators

755 Winslow Way East
Suite 105B
Bainbridge Island, WA 98110

PHONE: 203.980.3051
EMAIL: ccostanzo@americanwaterways.com

Charles P. Costanzo
General Counsel & Vice President – Pacific Region

March 31, 2021

Mr. David C. Quiros
Manager, Freight Technology Section
Transportation and Toxics Division
California Air Resources Board
1001 "I" Street
Sacramento, CA 95814

Re: Request for 90-Day Extension for
Proposed Harbor Craft Concepts

Dear: Mr. Quiros:

I am writing to request a 90-day extension of the April 16, 2021 public comment deadline for the California Air Resources Board's (CARB) Draft Proposed Amendments to the Commercial Harbor Craft Regulation. According to a CARB workshop on March 16, 2021 these Proposed Amendments represent a total annualized cost of $1.6 billion over the next 17 years and impact over 3,000 working vessels in California. *The language of the Proposed Amendments is currently unavailable to the public.*

Additionally, the previous iteration of these Proposed Amendments was released in early 2020 at the inception of the Coronavirus pandemic. CARB received dozens of requests from stakeholders to suspend the rulemaking or to provide 90-day extensions for industry to review the 2020 Proposed Amendments based on the impacts of the global pandemic. CARB responded to those requests by providing an insufficient 30-day extension.

CARB has broken the bond of good policy processes between the regulated population and a state regulatory body by failing to provide the public with actionable regulatory language in a timely fashion and fixing a comment period before the regulation is released. The regulated and interested public will have no more than two weeks to read, digest, and provide a thoughtful response to this extensive regulation.

AWO hereby requests 90-day extension of time to obtain the Draft Proposed Amendments and develop substantive feedback on a regulatory proposal that likely represents the most dramatic and costly regulation in the history of domestic commercial maritime operations in California.

AWO seeks this extension to assess:

- The feasibility of emission control technologies to meet CARB's proposed requirements;
- The ability of vessel operators and shipyards to accommodate CARB's proposed requirements for retrofits and upgrades;
- CARB's jurisdiction over ocean-going vessels that are ostensibly covered by the proposed regulation but that operate primarily outside of California;
- The viability of in-use proposals and performance standards, including opacity testing and recordkeeping changes;
- The practicability of CARB's proposed compliance schedules;
- The accuracy of CARB's cost-benefit considerations in developing the Proposed Amendments;
- The availability and operational feasibility of certain emission-reducing technologies and fuels; and
- The commercial impacts from the Proposed Amendments to California communities and the West Coast of the United States; and
- Any additional unforeseeable impacts that we have no knowledge of because the regulatory language has not been released.

A 90-day extension of the public comment period on the Proposed Concepts would allow time for AWO, the regulated community, and citizens of California to develop feedback without interfering with CARB's formal rulemaking timeline – currently set for October 2021 – and proposed implementation timelines. Additionally, allowing AWO and other heavily-impacted stakeholders to submit public comments with greater clarity and comprehensiveness will provide CARB with the additional information needed to develop a regulation that increases air quality for the citizens of California in a meaningful and reasonable manner.

Sincerely,

Charles P. Costanzo
General Counsel & Vice President – Pacific Region

Charles Costanzo

From: Quiros, David@ARB <David.Quiros@arb.ca.gov>
Sent: Thursday, April 8, 2021 12:17 PM
To: Charles Costanzo
Cc: Lynn Muench; Soriano, Bonnie@ARB; Damiano, Andrew@ARB; Melgoza, Elizabeth@ARB; David Marron; Scott Merritt; Max Rosenberg
Subject: RE: CARB CHC Proposed Amendments - AWO Request for Comment Period Extension

Hi Charlie,

The soonest after 4/16 the better. We are not formally extending our request date for input beyond 4/16, but we are offering the same explanation to every other stakeholder requesting more time.

We can make procedural changes to the regulatory text as late as July 2021 (such as process or timelines for compliance extensions), but feedback received much later than around May 1 that would result in fundamental changes to the rule would likely not be part of the proposal that goes to our Board in November 2021. Feedback received much later than 4/16, or feedback on the formal proposed rule during the 45-day comment period could be considered in time for our 2nd hearing in 2022 where our Board would make a final decision on the amendments.

I recognize that feedback from AWO and the towing industry has not resulted in major changes to the draft proposal thus far, but we have been able to consider it. For example, Andrew spent considerable time evaluating the vessel population, and we have now increased the number of ATBs from 13 to 19 operating in the State. We also increased the idling limits from 15 to 30 minutes under certain circumstances based on data submitted by Max at Vane Brothers.

Let us know if you'd like to meet or discuss further – we look forward to hearing from you.

David

****
David C. Quiros, D.Env.
Manager, Freight Technology Section
Transportation and Toxics Division
California Air Resources Board
phone (telework): (916) 264-9378 | david.quiros@arb.ca.gov
****

From: Charles Costanzo <CCostanzo@americanwaterways.com>
Sent: Thursday, April 08, 2021 09:37
To: Quiros, David@ARB <David.Quiros@arb.ca.gov>
Cc: Lynn Muench <LMuench@americanwaterways.com>; Soriano, Bonnie@ARB <Bonnie.Soriano@arb.ca.gov>; Damiano, Andrew@ARB <andrew.damiano@arb.ca.gov>; Melgoza, Elizabeth@ARB <elizabeth.melgoza@arb.ca.gov>; David Marron <DMarron@americanwaterways.com>; Scott Merritt <scott@merrittws.com>; Max Rosenberg <mrosenberg@vanebrothers.com>
Subject: RE: CARB CHC Proposed Amendments - AWO Request for Comment Period Extension

Thanks, David. I appreciate the flexibility. It's in AWO's interests to ensure that our comments do, in fact, inform CARB's next steps. We have not had particularly great luck with that on previous attempts. Is there a deadline where our comments should be received to merit due consideration?

Additionally, is CARB planning to extend this degree of deadline flexibility to other stakeholders? I believe there is broadly held concern around the tightness of the April 16 deadline.

- Charlie

From: Quiros, David@ARB <David.Quiros@arb.ca.gov>
Sent: Monday, April 5, 2021 1:43 PM
To: Charles Costanzo <CCostanzo@americanwaterways.com>
Cc: Soriano, Bonnie@ARB <Bonnie.Soriano@arb.ca.gov>; Damiano, Andrew@ARB <andrew.damiano@arb.ca.gov>; Melgoza, Elizabeth@ARB <elizabeth.melgoza@arb.ca.gov>
Subject: RE: CARB CHC Proposed Amendments - AWO Request for Comment Period Extension

Hi Charlie,

Thank you for the request letter – you probably received our list serve notice that went out late last week announcing that revised draft regulatory language was posted on Thursday April 1, so I just wanted to make sure you were aware it is available now at this page.

We are also still in the informal stage of rulemaking – and similar to last year, are requesting input by a certain timeframe to inform next steps, but if 4/16/21 is not doable for AWO, you can provide us comments whenever you have them, including but not limited to the official 45-day comment period leading up to our November 2021 Board date.

You've raised a number of topics/categories in your letter, and we remain available to meet or review any materials available to provide. We look forward to hearing from you or your members in the near future.

David

****
David C. Quiros, D.Env.
Manager, Freight Technology Section
Transportation and Toxics Division
California Air Resources Board
phone (telework): (916) 264-9378 | david.quiros@arb.ca.gov
****

From: Charles Costanzo <CCostanzo@americanwaterways.com>
Sent: Wednesday, March 31, 2021 10:58
To: Quiros, David@ARB <David.Quiros@arb.ca.gov>
Subject: CARB CHC Proposed Amendments - AWO Request for Comment Period Extension

Hi David –

Attached please find a request for a comment period extension from AWO.

Thank you!

- Charlie

Charles P. Costanzo
General Counsel & Vice President – Pacific Region
The American Waterways Operators
755 Winslow Way East, Suite 105B
Bainbridge Island, WA 98110
www.americanwaterways.com
(203) 980-3051 (Mobile)