EXHIBIT C

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29 April 2020

California Air Resources Board
Attention: Clerk's Office
1001 I Street
Sacramento, CA 95814

California Air Resources Board,

On behalf of Crowley Maritime Corporation ("Crowley"), thank you for the opportunity to comment to California Air Resources Board ("CARB") regarding the Proposed Concepts for Commercial Harbor Craft in California ("Harbor Craft Concepts"). Crowley applauds CARB's leadership in the stewardship of California's air quality. In particular, Crowley appreciates CARB's recognition that the U.S. domestic maritime industry's fleet plays a substantial role supporting the economies of West Coast states and the livelihood of their citizens, including those of California.

Crowley owns and operates a diverse fleet of oceangoing vessels and harbor tugboats and offers a wide range of environmentally safe and reliable transportation options to meet many commercial and government customer requirements. Crowley maintains an extensive fleet of large petroleum Articulated Tug Barge Units ("ATBs") ranging in size from 20,000 deadweight tons ("DWT") to 45,800 DWT that safely and reliably carry petroleum in bulk throughout the U.S. East, Gulf and West Coasts, including Alaska, as well as international ports. Crowley ATBs regularly call California ports. Crowley companies also operate a fleet of harbor tugboats that dock, undock and escort ocean-going ships servicing the San Francisco Bay area, the Los Angeles-Long Beach area, and San Diego. Because of Crowley's extensive experience with vessel operations across a broad range of vessel types, many of which are covered in the Harbor Craft Concepts, we believe that Crowley is uniquely positioned to submit these comments to CARB.

Document Three of the Harbor Craft Concepts raises a series of questions related to costs and timelines for compliance with the proposed standard, alternative control technologies, compliance extensions, idling and shore power requirements, infrastructure, reporting, and fees. Crowley's comments on those topics are outlined below.

COMPLIANCE COSTS

Feasibility Study

The cost of compliance should include the cost of a feasibility study. A study assessing the technical feasibility of retrofitting or repowering a vessel would typically address the impact of proposed vessel modifications on three primary issues:

1. Arrangements - assessing space and volume constraints to determine if required net changes (removals and additions) fit reasonably within the vessel hull and/or superstructure boundaries and will comply with safety regulations, such as fire suppression and load line regulations.

2. Weights and Stability - conducting an upper level review of estimated net weight changes, structure and added equipment, against fixed vessel stability limits; and

3. Auxiliary Systems Capacity - establishing the capacity of engine room ventilation, generating plant, and main engine cooling to support added loads.

The budget for this kind of study would, on average, be approximately $10,000, representing 60-80 hours of engineering effort per vessel class. The Harbor Craft Concepts affect numerous classes of vessels. The outcome would be a report establishing the overall feasibility, usually dictated by firm weight and stability limits, with an overview of the required modification scope and rough order of magnitude of the modification cost for a vessel class.

Retrofit Costs

This table includes estimated costs for retrofitting Crowley owned or operated ATBs and harbor tugboats to meet the equipment standards outlined in the Harbor Craft Concepts.

	150,000 Barrel ATB Unit: Barge	150,000 Barrel ATB Unit: Tugboat	180,000 Barrel ATB Unit: Barge	180,000 Barrel ATB Unit: Tugboat	Harbor Tugboat
Engines and Attachments	$2,800,000	$3,950,000	$1,800,000	$4,350,000	$3,800,000
Engineering and Certification	$100,000	$100,000	$100,000	$100,000	$45,000
Installation	$400,000	$1,000,000	$200,000	$1,000,000	$1,000,000
Out of Service	$600,000	$600,000	$600,000	$600,000	$320,000
Per Vessel Cost	$3,900,000	$5,650,000	$2,700,000	$6,050,000	$5,165,000
Fleet Count	4	4	10	10	7
Fleet Cost	$15,600,000	$22,600,000	$27,000,000	$60,500,000	$36,155,000

Replacement Costs

Crowley estimates the replacement cost for current ATBs and tugboats at:

- $90MM for one 150,000 barrel ATB or $360MM to replace the existing 4-vessel fleet
- $105MM for one 180,000 barrel ATB or $1,050MM to replace the existing 10-vessel fleet
- $17MM for one harbor tugboat or $119MM to replace the existing 7-vessel fleet

General Comments on Cost

The initial phase of the Commercial Harbor Craft regulations issued in 2007, along with the 2010 amendments, included numerous requirements for operators to upgrade or replace existing equipment. CARB's existing Commercial Harbor Craft rule, therefore, which came into effect roughly a dozen years ago, caused operators to retrofit or acquire equipment that is typically amortized over a 20-year period and may last for 25 or 30 years. During those rulemakings, the cost reasonableness of making such investments was taken into consideration and a potential concern was raised to CARB that it was foreseeable that the "goal posts" might be shifted, i.e., new requirements might be proposed after operators incurred the costs of complying with the 2007 and 2010 requirements.. Now, the Commercial Harbor Craft

Concepts demonstrate that to this concern, raised over a decade ago, was indeed justified with respect to potential early retirement of vessels or equipment driven by implementation of future new rules.

TIMELINES

Feasibility Study

Conducting a study of the feasibility of retrofitting a vessel to meet the equipment standards outlined in the Harbor Craft Concepts (scope described above) would, we estimate, take two to three weeks.

Retrofit

Crowley estimates that a retrofit-repower of a 150,000-180,000 barrel ATB unit or of a harbor tugboat would take approximately forty days, assuming that all materials were staged and ready at a shipyard at the outset of the forty-day period.

Newbuild

Crowley estimates that it would take between two and three years, from the time that a decision is made, to build a new 150,000 or 180,000 barrel ATB until the keel is laid for that vessel, and an additional two years from keel laying to delivery of the vessel. For a harbor tugboat, Crowley estimates that it would take two years, from the time that a decision is made, to build a new vessel until delivery of the new vessel.

ALTERNATIVE TECHNOLOGIES

ATB

Because ATBs spend most of their operational lives outside of California harbors, shore power or emissions capture from the vessels while at berth are alternative technologies that could significantly reduce ATB emissions while in California.

Other alternative technologies, such as hybrid-electric systems or hydrogen fuel systems are not yet mature enough to meet the needs of ocean-going vessels, such as ATBs.

Harbor Tugboat

Diesel electric technologies are currently viable emissions reduction technologies for harbor tugboats. Other technologies, such as ammonia or hydrogen powered fuel cells or internal combustion engines, are not yet mature enough to meet the power needs of harbor tugboats.

EXTENSIONS

If a naval architect's analysis shows that Tier 3 or 4 engines are feasible for installation onboard a vessel but a retrofit diesel particulate filter (DPF) is not, we submit it is appropriate to grant an extension of the DPF requirement indefinitely. It is not reasonable to require equipment that is not feasible for use on a vessel, nor is it reasonable to require an operator to incur the cost of upgrading to a Tier 3 or 4 solution if the upgraded vessel will subsequently have a limited service life, because it cannot be retrofitted with a DPF.

Periodic equipment availability reviews could and should be conducted by CARB to assess when there are enough DPF retrofit models available to warrant sun-setting of any extensions.

SHORE POWER

Unequal Requirements for Vessels Conducting the Same Operations

It appears from the Harbor Craft Concepts that harbor craft would be required to be outfitted: (1) with shore power connections for auxiliary engines (except operation of direct-drive or other specialty auxiliary engines); **and** (2) to meet the Tier IV and diesel particulate filter requirements.

With respect to ATBs, it is not at all clear why an ATB would be subject to these dual requirements while other ocean-going tank ships – calling the same terminals and conducting the same operations – would only need to be outfitted for shore power or emissions capture.

Infrastructure Cost Allocation

The Harbor Craft Concepts appear to outline a framework whereby vessel operators would, in certain circumstances, be required to install shoreside infrastructure. The rationale CARB provides for this argument is as follows:

> *The installation and maintenance of such infrastructure can require investments that require cost recovery over a period of time that exceeds the length of lease terms. If the tenant with a particular vessel no longer visits the facility, it may result in stranded assets for the facility. There is a higher likelihood of stranded assets for harbor craft because technology is becoming commercialized, but is not yet standardized.*

It is not clear why CARB believes that it is preferable for vessel operators to bear the burden of shoreside infrastructure that cannot be used for its intended purpose over the full service life of that infrastructure.

If a vessel operator installs infrastructure at a facility and the lease expires before the service life of that equipment is over, then the vessel operator's assets – the shoreside infrastructure that the operator installed – may not be available to the operator. In this case, the operator will not even have access to the asset that it paid to design and install. Indeed, depending on the lease provisions, the operator may even be required to pay to remove the infrastructure at termination of the lease.

CARB has essentially outlined a model whereby a vessel operator could be bound to install infrastructure at a facility that the operator does not own, and to which the operator would not be guaranteed use for the infrastructure's service life.

Vessel operators will, in many cases, be required to install equipment on their own vessels to be able to use shoreside charging or other energy-supply infrastructure. It seems reasonable for the vessel operator to pay for what will be installed on the vessel and a facility operator to pay for what will be installed on a facility. In this model, risks are borne by both parties.

CARB proposes a process for installing infrastructure for harbor craft shore power or to support zero-emission vessels (such as hydrogen fueling and rapid charging infrastructure). This process will involve installation of equipment at shoreside facilities and, as such, will need to be developed in close coordination with the actual owner of those facilities. In most cases, the facility owner is not the vessel operator. The installation of equipment and infrastructure on a terminal will thus be a matter of commercial negotiation

between landlord and tenant which should not be subject to this regulation. If a riskier technology is installed on a terminal or berthing facility, it should be up to the landlord and the tenant to allocate the cost and risk and include commercial terms that address amortization and knockdown.

REPORTING

CARB asks for input on how, beside facility reporting, the agency can increase the percentage of vessels that are reporting to CARB as required.

It is not clear from the analyses CARB has presented in the proposed concepts that there is indeed a material reporting shortfall. It is not evident that the problem CARB attempts to identify with its facility reporting concept, is actually a problem.

FEES

If a fee were required, it seems practicable to charge vessel operators by vessel category, weighted by the presumed amount of time operating in California harbors. Those vessel categories that operate principally outside of California harbors, then, would bear less cost than vessels in categories that operate extensively inside California harbors.

Yours respectfully,
CROWLEY MARITIME CORPORATION

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Art Mead
Vice President & Chief Counsel
Government and Regulatory