

ATTACHMENT B

ANALYSES SUPPORTING THE PROPOSED 15-DAY CHANGES TO THE
PROPOSED REGULATION

**SUMMARY OF PROPOSED 15-DAY CHANGES AND IMPACTS ON COSTS:
CONTROL MEASURE FOR OCEAN-GOING VESSELS AT BERTH**

March 26, 2020

This attachment to the “Notice of Public Availability of Modified Text and Availability of Additional Documents and Information,” related to the Proposed At Berth Regulation is a summary of the 15-day changes and an update to the costs in the Initial Statement of Reasons (ISOR) Chapter IX supporting the Proposed Regulation released October 15, 2019.

SUMMARY OF PROPOSED 15-DAY CHANGES AND IMPACTS ON COSTS:

Summary of the 15-Day Changes

This addendum covers changes to the Proposed Regulation (15-day changes). The update does not include any changes to the cost or benefits methodologies. The 15-day changes primarily affect the implementation dates for tanker and ro-ro vessels, and includes the addition of an Innovative Concept provision.

The changes described below are changes made since the Initial Statement of Reasons (ISOR) was released on October 15, 2019. The changes collectively result in increased costs to industry and ports. The total net cost of the Proposed Regulation is estimated to increase to \$2.40 billion from \$2.19 billion in the ISOR for the period 2021 to 2032. The statewide valuation from avoided adverse health outcomes between 2021 to 2032 has increased to \$2.44 billion.

- 1) Updated implementation schedule. The updated proposed implementation timeline is summarized in Table 1. Specifically, emissions control requirements for tankers would begin in 2025 at the Ports of Los Angeles and Long Beach instead of 2027, with control requirements for the remainder of the tanker terminals statewide beginning in 2027 instead of 2029. Ro-ro vessel requirements begin in 2024 instead of 2025. The result of these changes is more emissions reductions in earlier years as more visits are controlled sooner. This change results in higher costs for vessel and terminal operators.

Table 1: Implementation Timeline for the Proposed Regulation

2021	2024	2025	2027
Container, Reefer, and Cruise			
	Ro-ro		
		Tankers - POLA/POLB Terminals	
			Tankers – Remaining Statewide Terminals

- 2) Updated terminal incident event (TIE) and vessel incident event (VIE) provisions. The percentage of TIEs and VIEs based on the updated implementation dates is shown in Table 2. There were no changes made to the percentage of TIEs and VIEs granted for each vessel fleet or terminal, only the years in which they would

occur. In addition, staff added a provision that would allow new or expanding terminals and vessel fleets to petition CARB for additional TIEs or VIEs based on their anticipated visits. CARB staff do not expect this provision to be used frequently, and it is speculative as to how often or how many fleets or terminals might use this provision. These changes have a minimal impact on total costs and savings to vessel and terminal operators.

Table 2: VIEs and TIEs by Vessel Category per Year under the Proposed Regulation

Category		2021 - 2023	2024	2025 - 2026	2027+
TIEs	All Terminals*	15%	15%	5%	5%
VIEs	Container/ Reefer	5%	5%	5%	5%
	Cruise	5%	5%	5%	5%
	Ro-ro	--	5%	5%	5%
	Tankers (POLA/POLB)	--	--	5%	5%
	Other Tankers	--	--	--	5%

*All terminals with control requirements.

- 3) Port and terminal plan submission dates. The due dates for the revised terminal and port plans for ro-ro and tanker terminals have been updated as a result of adjusting implementation dates in order to allow California Air Resources Board (CARB) staff sufficient time prior to implementation in order to review and assess the plans. The due dates for terminal and port plans were moved forward the same amount of time as the implementation dates to provide for consistency. This change has no impact on the total cost to terminal operators and ports, but the costs associated with port and terminal plans will be incurred in earlier years.
 - Ro-ro terminals: February 1, 2023;
 - LA/LB tanker terminals: February 1, 2024; and
 - All other tanker terminals: February 1, 2026.
- 4) Interim evaluation dates. CARB staff propose changing the date of the interim evaluation from July 1, 2023, to December 1, 2022, in response to advancing the implementation dates for ro-ro and tanker vessels. This change has no impact on CARB's staff costs.
- 5) Addition of Innovative Concept provision: This compliance option provides vessel and terminal operators or ports a way to incorporate an Innovative Concept to

meet the at berth emissions reductions requirements of the Proposed Regulation. The Innovative Concept would reduce oxides of nitrogen (NOx), particulate matter (PM) 2.5, and reactive organic gases (ROG) without increasing greenhouse gas (GHG) emissions from other sources in and around the port or marine terminal at equivalent (or greater) levels that would be achieved with reducing emissions from vessels at berth.

Western States Petroleum Association (WSPA), Pacific Merchant Shipping Association (PMSA) and some ports have indicated that Innovative Concept projects can achieve equivalent or greater emissions reductions in the impacted communities at a lower cost, compared to the cost of direct compliance. CARB received feedback from industry suggesting that alternative projects used to remediate at berth emissions can meet CARB's Carl Moyer cost effectiveness level of \$30,000 per weighed ton of at berth emissions.^{1,2} Therefore, to estimate the costs of the equivalent emissions reductions anticipated by using an Innovative Concept, staff used a cost effectiveness of \$30,000 per Carl Moyer weighted ton of emissions reductions. A Carl Moyer weighted ton is calculated using the formula as follows: $NOx + ROG + 20 * PM$.

Examples of Innovative Concept projects could include replacing old locomotives with zero-emissions electric locomotives or retrofitting tugboats with cleaner engines beyond what is required for existing Harbor Craft regulations. Although staff is proposing that an Innovative Concept provision can be re-applied for and used indefinitely (as long as it meets the standards set forth in the Proposed Regulation), staff assume a six-year period for use of an Innovative Concept in the cost analysis. Six years was chosen as a likely timeframe for use, as staff expect stricter regulations for freight vehicles and equipment to be in effect beyond that timeframe, which may restrict the amount of projects available to achieve emissions reductions that are equivalent or greater to those required by the Proposed Regulation.

CARB staff assumed the Innovative Concept provision would be used by six tanker terminals receiving less than 40 visits, as it is a less expensive option for terminals with lower ship visits. It will have a minimal impact on emissions reductions as an Innovative Concept project must reduce emissions that are equivalent (or greater) than would be achieved with reducing emissions from vessels at berth. This change will reduce costs to tanker terminal operators and ports compared to the costs for installing capture and control equipment and infrastructure at the six tanker terminals.

¹ Email from Thomas Jelenic to Bonnie Soriano and Angela Csondes titled "Calculation of Hourly Remediation Fund Value", dated January 15, 2020.

² Western States Petroleum Association (WSPA) handout titled "CARB At Berth Regulation Amendment Alternatives Potential Port, Maritime, OGV Emission Reduction Options" provided to CARB during a meeting with WSPA on March 4, 2020.

- 6) Updated emissions inventory. Updates to the 2019 CARB Ocean-Going Vessel (OGV) Emissions Inventory cover changes to the Proposed Regulation, and do not include any other changes to the inventory inputs or methodology. The Proposed Regulatory changes primarily affect the implementation dates for tanker and ro-ro vessels as shown in Table 1. Tables and charts detailing the emissions changes for NOx, PM2.5, and diesel PM emissions can be found in Attachment C of the 15-day package.
- 7) Remediation fund. The use of the remediation fund has been expanded to allow ports and CARB approved emission control strategy (CAECS) operators to use the provision. In the Initial Statement of Reasons (ISOR), it was assumed that costs related to construction projects or repairs, maintenance, and commissioning of equipment were borne by terminal operators. However, based on public comments received in response to the Proposed Regulation or the regulatory package it is often the ports that control these circumstances at many of the State's ports. Additionally, for CAECS operators, having the ability to use the remediation fund would give them compliance certainty when experiencing equipment issues or delays in connecting to a vessel. Based on staff analysis of CARB Enforcement data from 2017 documenting the reasons that vessels failed to control emissions, less than one percent of all emission control failures were related to CAECS. After accounting for vessel visits that would be eligible for an exemption or use a VIE, the remaining visits were nominal, therefore no costs are included for CAECS operators. The total remediation fund costs do not change but the expansion of the use of the remediation fund results in a decrease in costs to terminal operators as some of these costs are now assumed to be borne by the ports.
- 8) Connection time from "Ready to Work" determination. The Proposed Regulation adjusts the time allowed for connection to shore power or an alternative CAECS for vessels at berth from one hour after "Ready to Work" until two hours after "Ready to Work". This change is expected to have a minor impact to the emissions reductions compared to the connection time definition listed in the ISOR. This is based on past compliance data for the original At-Berth Regulation. Staff do not anticipate that a large portion of the vessel visits will require the entire two hours to connect to shore power or to an alternative CAECS. This change has no impact on costs.
- 9) Updated non-cancer mortality. Total costs for all entities is expected to be about \$2.4 billion through 2032, with a statewide valuation of avoided health impacts valued at \$2.44 billion from 250 fewer premature deaths, 78 fewer hospital admissions, and 126 fewer emergency room visits statewide. More information on the updates to the Health Analysis can be found in Attachment D of the 15-day package.
- 10) Regulation language clarifications and clean up. Staff made numerous changes to the Proposed Regulation language, both substantive and non-substantive. Most

substantive changes were made in response to feedback received from CARB's Board, public comments received during the formal comment period that began October 18, 2019, and ended December 9, 2019, and internal feedback from CARB legal and enforcement staff. Substantive changes to the Proposed Regulation include: the addition and clarification of definitions; new or revised language to improve clarity and ensure the regulation functions as staff intend; updates to reporting requirements and deadlines for both reporting and recordkeeping; the adjustment of implementation dates and terminal/port plan submittal dates in response to these changes; modifications to the vessel, terminal, and CAECS operator compliance checklists for better workability; expansion of additional compliance options for vessels, terminals, ports, and CAECS operators; more specific language addressing content of the interim evaluation language, with date adjustment based on changes to the implementation dates; and added language strengthening port responsibilities. Non-substantive changes include: grammar and spelling corrections, minor wording changes with some added abbreviations to help the document read easier, and also the re-numbering of numerous sections and subsections for clarity and consistency. All changes with impacts to costs have been described above.