

ATTACHMENT C

ANALYSES SUPPORTING THE "SECOND NOTICE OF PUBLIC AVAILABILITY OF MODIFIED TEXT AND AVAILABILITY OF ADDITIONAL DOCUMENTS AND INFORMATION"

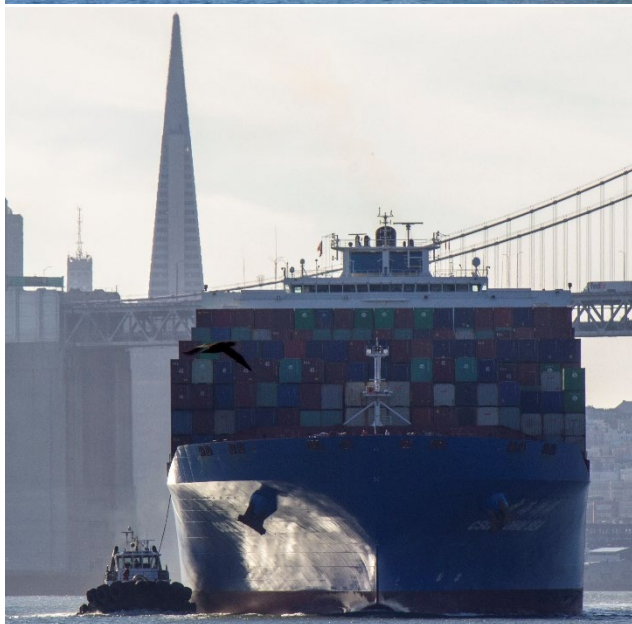
**THIS DOCUMENT PROVIDES UPDATES TO THE "NOTICE OF PUBLIC AVAILABILITY OF MODIFIED TEXT AND AVAILABILITY OF ADDITIONAL DOCUMENTS AND INFORMATION" POSTED MARCH 26, 2020 AND TO THE INITIAL STATEMENT OF REASONS: APPENDIX H: 2019 UPDATE TO INVENTORY FOR OCEAN-GOING VESSELS AT BERTH: METHODOLOGY AND RESULTS, POSTED OCTOBER 15, 2019.**

July 10, 2020

This is an attachment to the “Second Notice of Public Availability of Modified Text and Availability of Additional Documents and Information” (Second 15-Day Changes) posted July 10, 2020 related to the Proposed At Berth Regulation. This attachment is an update to the “Notice of Public Availability of Modified Text and Availability of Additional Documents and Information” posted March 26, 2020 (15-Day Changes) and Appendix H to the Initial Statement of Reasons (ISOR) supporting the Proposed Regulation released October 15, 2019 (ISOR Appendix H). The tables and figures included in this attachment reflect updates to the emissions estimates for the Second 15-Day Changes. The information provided in this attachment also updates the emissions inventory information presented in Chapters V in the ISOR.

# Updates to Appendix H: 2019 Update to Inventory for Ocean-Going Vessels At Berth

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Second 15-Day Changes, July 10, 2020

## **1. Overview of suggested Second 15-Day Changes to the Proposed Regulation that impact emissions inventory.**

On October 15, 2019, California Air Resources (CARB) staff posted the Notice of Public Hearing and Proposed Control Measure for Ocean-Going Vessels at Berth Staff Report: Initial Statement of Reasons (ISOR). The ISOR included the Proposed Regulation Order (October 15, 2019 version) and Appendix H-2019 Update to Inventory for Ocean-Going Vessels At Berth: Methodology and Results (Appendix H) that supports the October 15, 2019 version of the Proposed Regulation. On March 26, 2020, CARB staff posted proposed changes (15-Day Changes, dated March 26, 2020) to the Proposed Regulation. In response to feedback received from CARB's Board during the June 25, 2020 Board Meeting, public comments received during the formal comment period for the 15-Day Changes that began March 26, 2020 and ended May 1, 2020, and further CARB staff-level deliberations, CARB staff made both substantive and non-substantive changes to the Proposed Regulation language. The proposed changes are included in the Second 15-Day Changes package (dated July 10, 2020). This document, Attachment C to the proposed Second 15-Day Changes, provides updates to the 15-Day Changes and to the ISOR Appendix H.

The updates in the Second 15-Day Changes do not include any updates or changes to inventory inputs or methodology. Only tables and charts that include updates resulting from the Second 15-Day Changes have been provided and the table and chart numbers have been maintained from the ISOR Appendix H to provide easier comparison.

The proposed Second 15-Day Changes that affect emissions estimates include changes to the implementation dates for containers, refrigerated cargo (reefers), cruise vessels and roll on-roll off/auto carriers (ro-ros). The proposed 15-Day Changes implementation timeline is summarized in Updated Table 22.

Specifically, emissions control requirements for container, reefer and cruise vessels will begin January 1, 2023. In 2023, the control requirements will include all vessels that visit terminals in California that are above the low activity threshold as defined in the Proposed Regulation Text (Second 15-Day Changes). Terminal Incident Events are maintained at 15 percent in 2023 and 2024 and maintained at 5 percent in 2025 and later. Ro-ro vessel requirements begin January 1, 2025, with Terminal Incident Events maintained at 5 percent. Vessel Incident Events are maintained at 5 percent in 2023 and all years later, for all regulated vessel types.

**Updated Table 22 (Second 15-Day Changes, July 10, 2020):  
Implementation Timeline  
for the Proposed Regulation**

<b>2023</b>	<b>2025</b>	<b>2027</b>
Container, Reefer, and Cruise		
	Ro-ro	
	Tankers -POLA/POLB* Terminals	
		Tankers – Remaining Statewide Terminals

\* Port of Los Angeles (POLA), Port of Long Beach (POLB)

**2. Summary of Estimated Emissions Benefits of the Second 15-Day Changes**

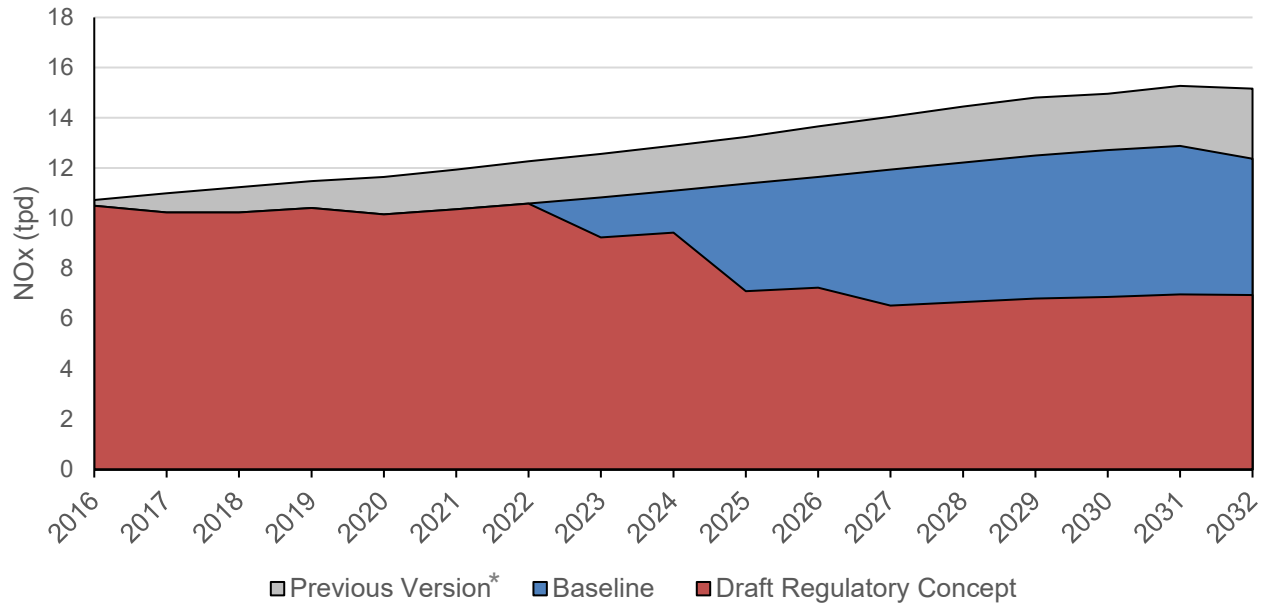
The following charts show the emissions estimates in tons per day (tpd) for the Second 15-Day Changes of the Proposed Regulation (identified as Draft Regulatory Concept) and the existing At Berth Regulation (identified as Baseline<sup>1</sup>). At Berth statewide emissions estimates for nitrogen oxides (NOx), particulate matter (PM) 2.5 and diesel PM (DPM) for the Second 15-Day Changes are provided in Updated Table 24a and for reactive organic gases (ROG) and greenhouse gas emissions (GHG) are provided in Updated Table 24b.

As shown in the Updated Figure 12, 2020, statewide NOx emissions from at berth vessels are reduced beginning in 2023 from container, cruise and refrigerated cargo vessels and beginning in 2025 from ro-ro vessels subject to the Proposed Regulation. Reductions also occur in 2025 and 2027 when implementation begins for tankers.

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<sup>1</sup> For inventory purposes, the Baseline refers to the emissions estimates without the Proposed Regulation control requirements and does not refer to a California Environmental Quality Act baseline.

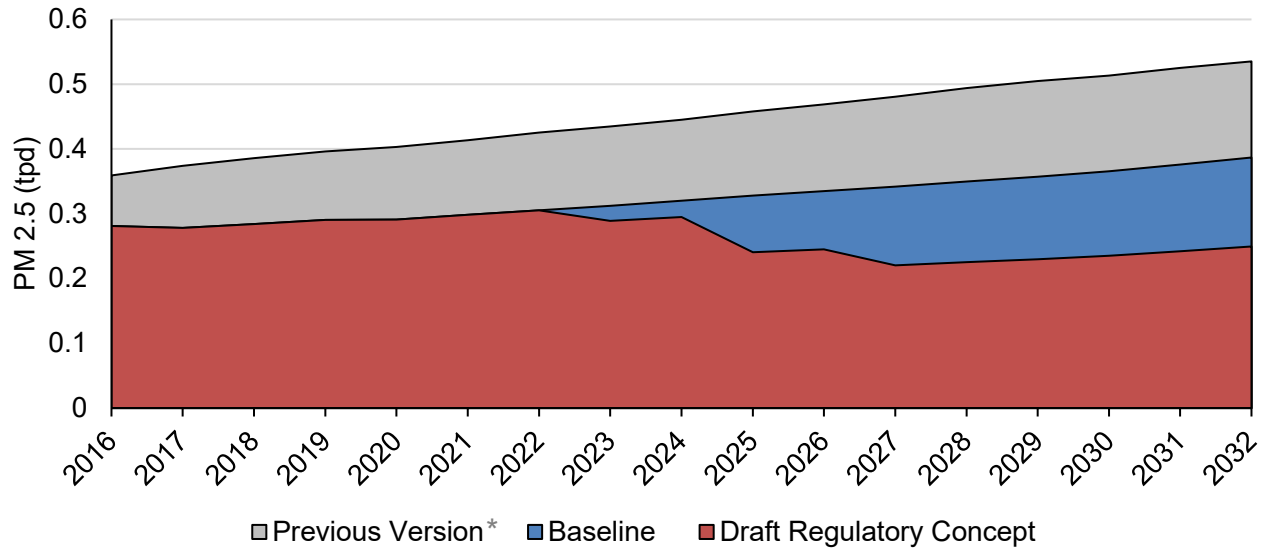
**Updated Figure 12 (Second 15-Day Changes, July 10, 2020): Statewide At Berth NOx Emissions**



\*\*For the figures in this document:  
 Previous Version refers to 2014 Emissions Inventory Baseline (as discussed in ISOR Appendix H),  
 Baseline refers to the Existing At Berth Regulation, and  
 Draft Regulatory Concept refers to the Proposed Regulation (Second 15-Day Changes, July 10, 2020 version).

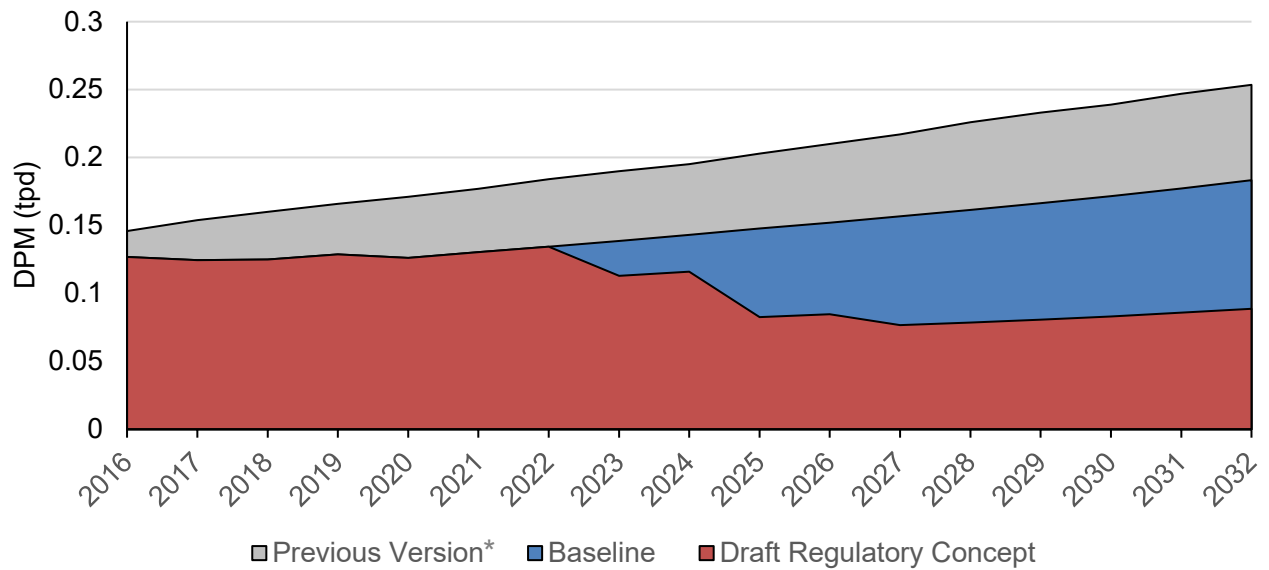
Similarly, statewide PM emissions from at berth vessels are shown for PM 2.5 in Updated Figure 13 and DPM in Updated Figure 14. The DPM emissions are those produced by diesel engines, and this excludes emissions from boilers.

**Updated Figure 13 (Second 15-Day Changes, July 10, 2020): Statewide At Berth PM 2.5 Emissions**



\*Previous Version refers to 2014 Emissions Inventory Baseline (as discussed in ISOR Appendix H)

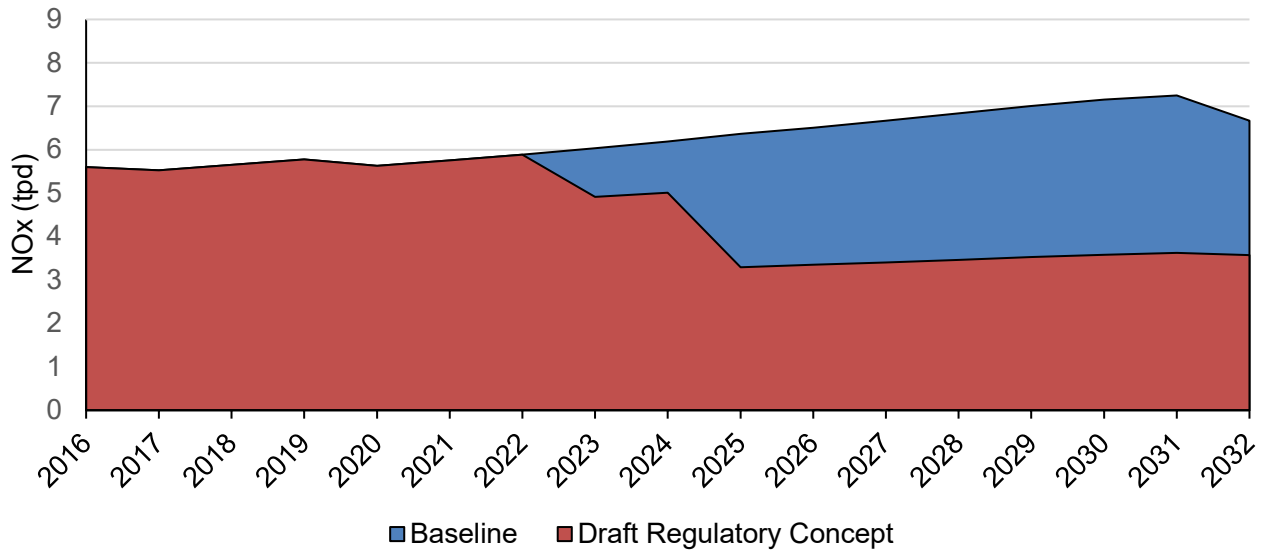
**Updated Figure 14 (Second 15-Day Changes, July 10, 2020): Statewide At Berth DPM Emissions**



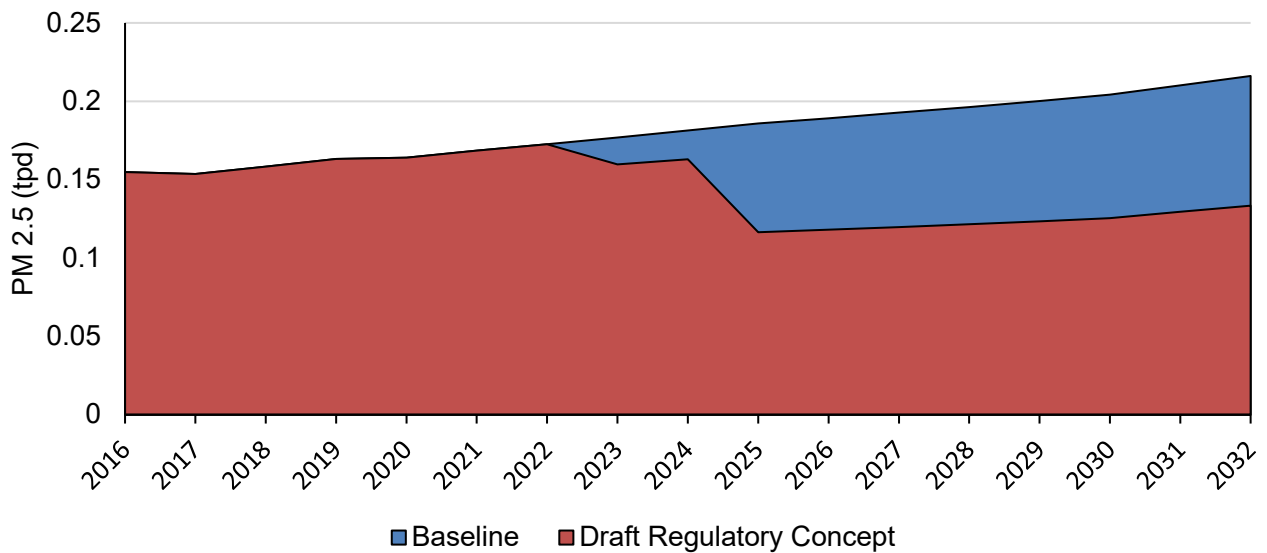
\*Previous Version refers to 2014 Emissions Inventory Baseline (as discussed in ISOR Appendix H)

Updated Figure 15, Updated Figure 16 and Updated Figure 17 show the NO<sub>x</sub>, PM 2.5 and DPM emissions, respectively, at POLA and POLB. Similarly, Updated Figure 18, Updated Figure 19 and Updated Figure 20 show the same information for the Port of Richmond Complex.

**Updated Figure 15 (Second 15-Day Changes, July 10, 2020): NOx Emissions Forecast at POLA and POLB**

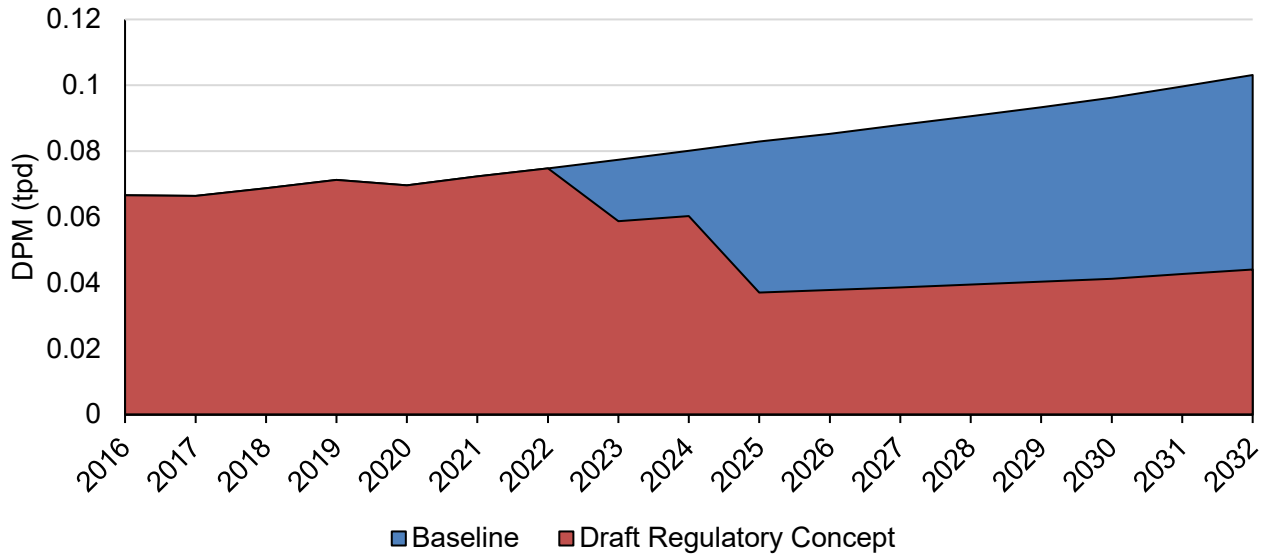


**Updated Figure 16 (Second 15-Day Changes, July 10, 2020): PM 2.5 Emission Forecast at POLA and POLB**

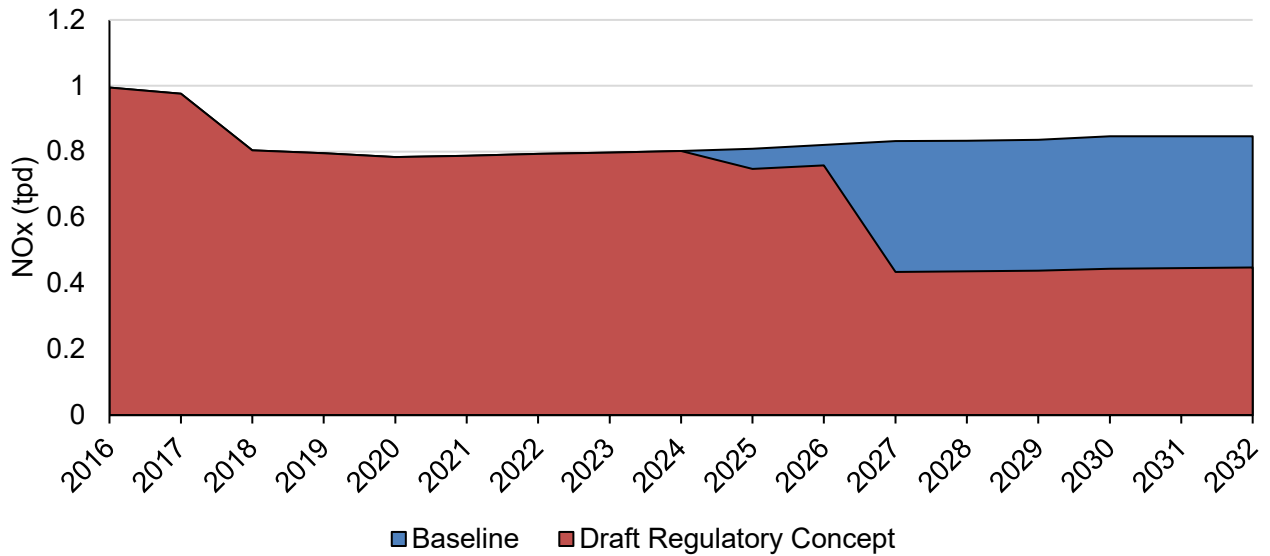




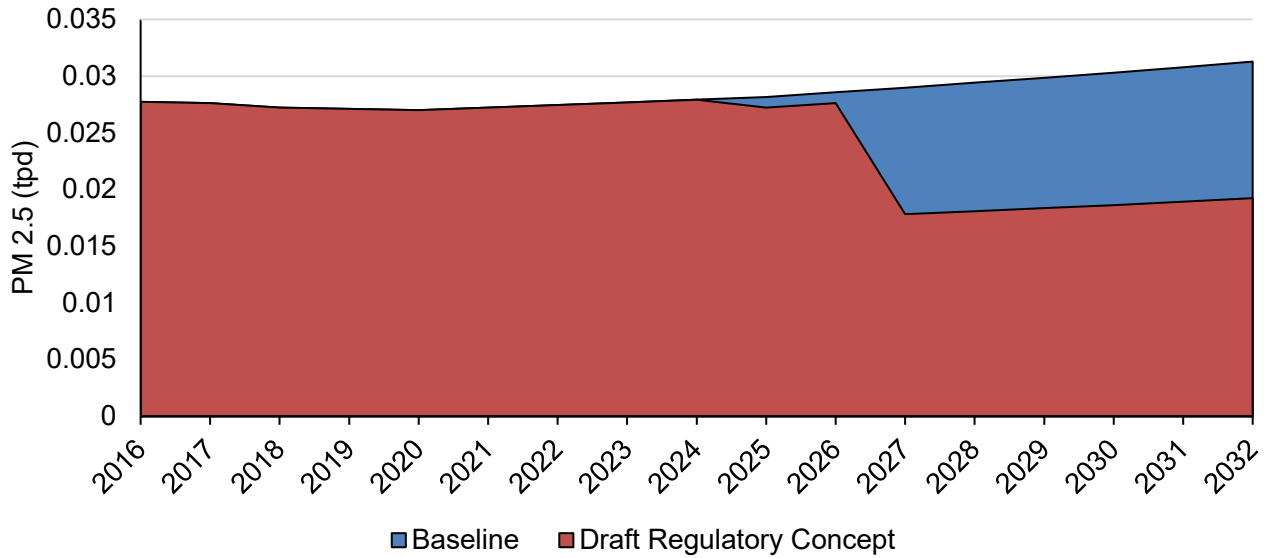
**Updated Figure 17 (Second 15-Day Changes, July 10, 2020): DPM Emission Forecast at POLA and POLB**



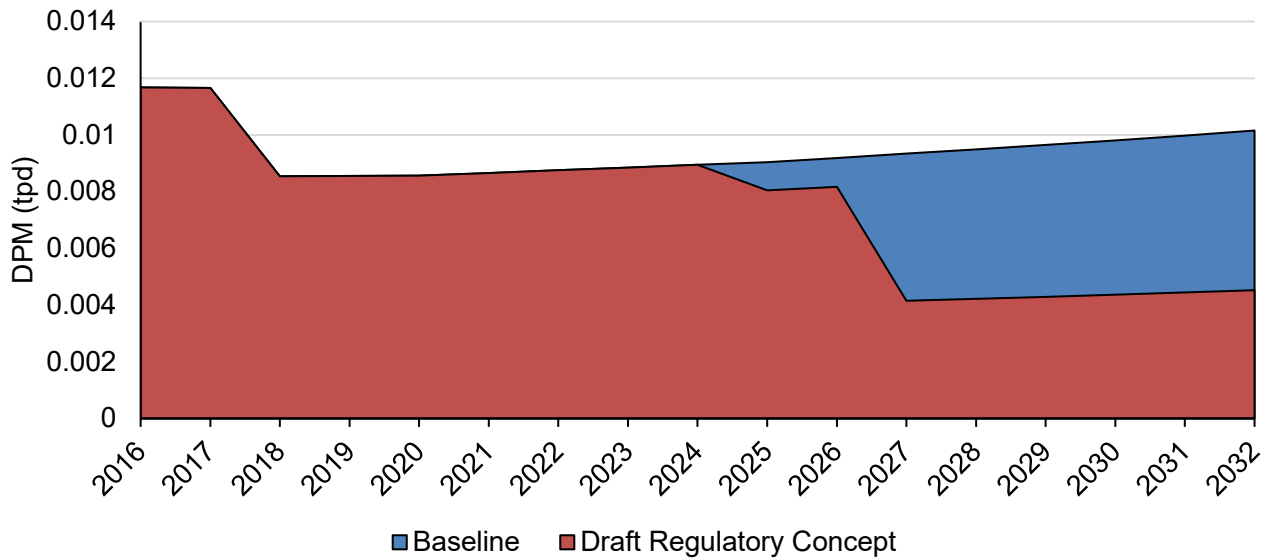
**Updated Figure 18 (Second 15-Day Changes, July 10, 2020): NOx Emission Forecast at the Port of Richmond Complex**



**Updated Figure 19 (Second 15-Day Changes, July 10, 2020): PM 2.5 Emission Forecast at the Port of Richmond Complex**



**Updated Figure 20 (Second 15-Day Changes, July 10, 2020): DPM Emission Forecast at the Port of Richmond Complex**



**Updated Table 24a (Second 15-Day Changes, July 10, 2020): Statewide NOx, PM 2.5 and DPM At Berth Emissions Estimates for the Draft Regulatory Concepts\***

Calendar Year	Statewide			Bay Area			South Coast			Richmond		
	NOx (tpd)	PM 2.5 (tpd)	DPM (tpd)	NOx (tpd)	PM 2.5 (tpd)	DPM (tpd)	NOx (tpd)	PM 2.5 (tpd)	DPM (tpd)	NOx (tpd)	PM 2.5 (tpd)	DPM (tpd)
2016	10.50	0.281	0.127	3.61	0.099	0.043	5.60	0.155	0.067	0.99	0.028	0.0117
2017	10.23	0.278	0.124	3.48	0.098	0.041	5.53	0.154	0.066	0.98	0.028	0.0117
2018	10.23	0.284	0.125	3.34	0.099	0.039	5.65	0.158	0.069	0.80	0.027	0.0085
2019	10.41	0.291	0.129	3.37	0.100	0.040	5.78	0.163	0.071	0.80	0.027	0.0086
2020	10.16	0.291	0.126	3.27	0.099	0.039	5.63	0.164	0.070	0.78	0.027	0.0086
2021	10.36	0.298	0.130	3.32	0.101	0.040	5.75	0.168	0.072	0.79	0.027	0.0087
2022	10.59	0.305	0.134	3.39	0.103	0.041	5.88	0.173	0.075	0.79	0.028	0.0088
2023	9.24	0.289	0.113	3.02	0.099	0.035	4.91	0.160	0.059	0.80	0.028	0.0088
2024	9.43	0.295	0.116	3.08	0.101	0.036	5.01	0.163	0.060	0.80	0.028	0.0089
2025	7.10	0.241	0.083	2.76	0.098	0.031	3.29	0.116	0.037	0.75	0.027	0.0080
2026	7.24	0.245	0.085	2.82	0.100	0.032	3.35	0.118	0.038	0.76	0.028	0.0082
2027	6.53	0.220	0.077	2.05	0.073	0.023	3.40	0.120	0.039	0.44	0.018	0.0042
2028	6.67	0.225	0.079	2.11	0.075	0.024	3.46	0.121	0.039	0.44	0.018	0.0042
2029	6.81	0.230	0.081	2.16	0.077	0.024	3.53	0.123	0.040	0.44	0.018	0.0043
2030	6.87	0.235	0.083	2.21	0.079	0.025	3.58	0.125	0.041	0.44	0.019	0.0044
2031	6.97	0.242	0.086	2.25	0.082	0.026	3.63	0.129	0.043	0.45	0.019	0.0044
2032	6.94	0.250	0.089	2.30	0.084	0.027	3.57	0.133	0.044	0.45	0.019	0.0045
2033	7.08	0.257	0.092	2.36	0.087	0.028	3.65	0.138	0.046	0.45	0.020	0.0046
2034	7.08	0.265	0.095	2.40	0.089	0.029	3.61	0.142	0.047	0.46	0.020	0.0047
2035	7.16	0.274	0.098	2.42	0.092	0.030	3.67	0.147	0.049	0.47	0.020	0.0048
2036	7.12	0.280	0.101	2.45	0.095	0.031	3.60	0.148	0.049	0.47	0.021	0.0049
2037	7.11	0.285	0.104	2.50	0.099	0.032	3.54	0.149	0.050	0.46	0.021	0.0050
2038	7.10	0.292	0.106	2.55	0.102	0.034	3.47	0.150	0.051	0.45	0.021	0.0051
2039	7.02	0.298	0.110	2.52	0.106	0.035	3.41	0.151	0.051	0.44	0.022	0.0052
2040	7.01	0.305	0.113	2.57	0.110	0.036	3.34	0.152	0.052	0.44	0.022	0.0053

\*Note that the baseline emissions are the same as provided in the ISOR Appendix H and the 15-Day Changes (March 26, 2020) emissions inventory and are not included in this document.

**Updated Table 24b (Second 15-Day Changes, July 10, 2020): Statewide ROG and GHG At Berth Emissions  
Estimates for the Draft Regulatory Concepts\***

Calendar Year	Statewide	
	ROG (tpd)	GHG (CO <sub>2</sub> eq)
2016	0.48	551,000
2017	0.47	546,000
2018	0.48	559,000
2019	0.49	571,000
2020	0.49	574,000
2021	0.50	588,000
2022	0.52	601,000
2023	0.46	582,000
2024	0.47	594,000
2025	0.36	604,000
2026	0.36	614,000
2027	0.33	635,000
2028	0.34	646,000
2029	0.34	658,000
2030	0.35	670,000
2031	0.36	687,000
2032	0.38	704,000
2033	0.39	722,000
2034	0.40	740,000
2035	0.41	760,000
2036	0.42	773,000
2037	0.43	787,000
2038	0.45	802,000
2039	0.46	817,000
2040	0.47	832,000

\*Note that the baseline emissions are the same as provided in the ISOR Appendix H and the 15-Day Changes (March 26, 2020) emissions inventory and are not included in this document.