



September 6, 2018
Oakland

&

September 17, 2018
San Pedro

Discussion Items

- I. New At Berth and At Anchor Regulatory Concepts
- II. Preliminary Assessment of Benefits and Costs
- III. Overview of Environmental Analysis
- IV. Next Steps





I. New At Berth and At Anchor Regulatory Concepts: Goals

- Address implementation issues of existing At-Berth Regulation
- Simplify requirements and increase enforceability
- Increase community health benefits
- Hold terminals and ports accountable for their roles to achieve reductions
- Meet March 2017 Board direction

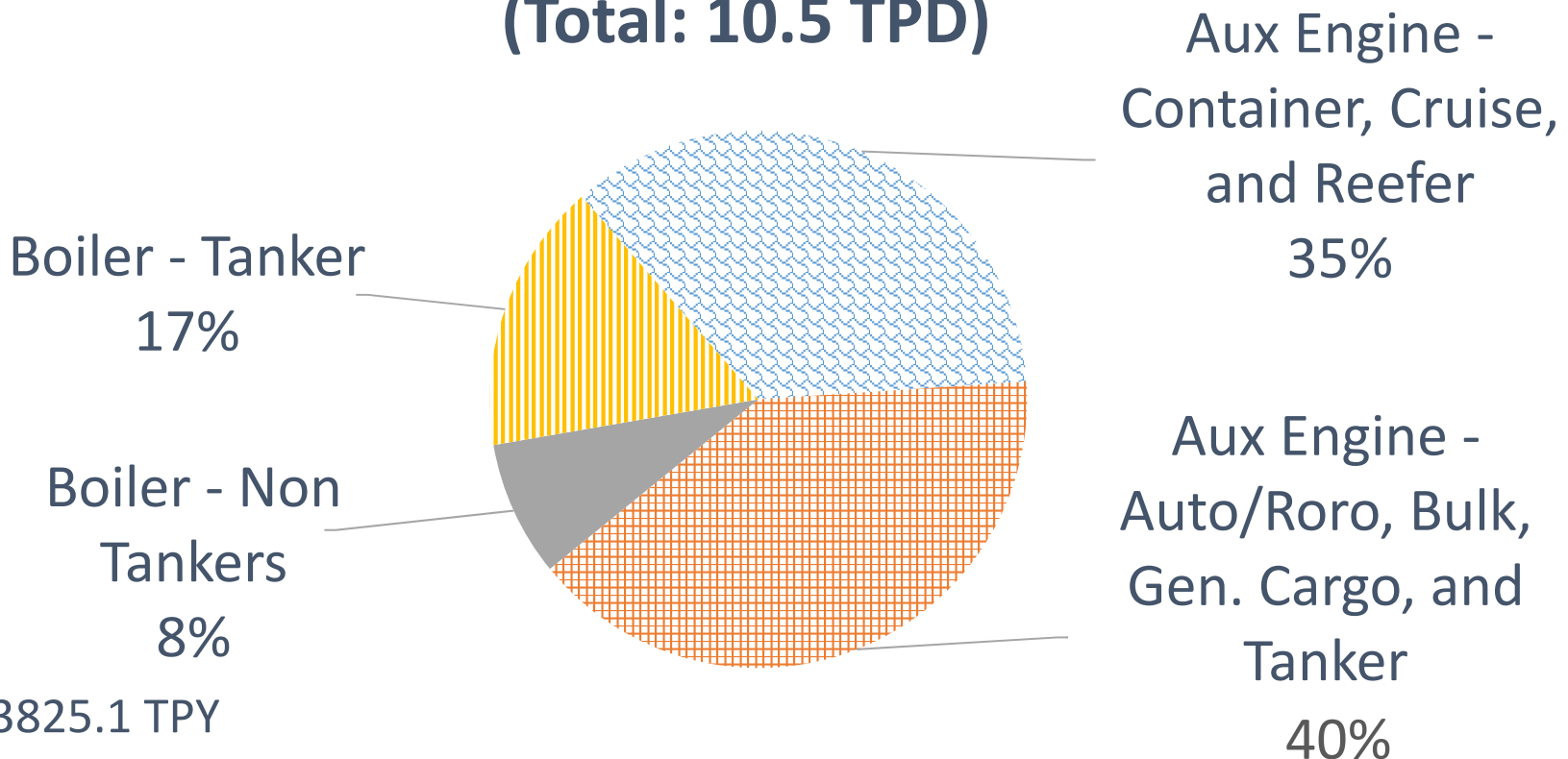


CARB Regulatory Authority

- HSC 39650 et seq. – directs CARB to regulate toxic air contaminants from non-vehicular sources to reduce public exposure/risk
- HSC 43013, 43018 – directs CARB to control criteria air pollutants from mobile sources to attain air quality standards
- AB/SB 32 - directs CARB to reduce greenhouse gases to specific levels to combat climate change

Need For Additional Reductions

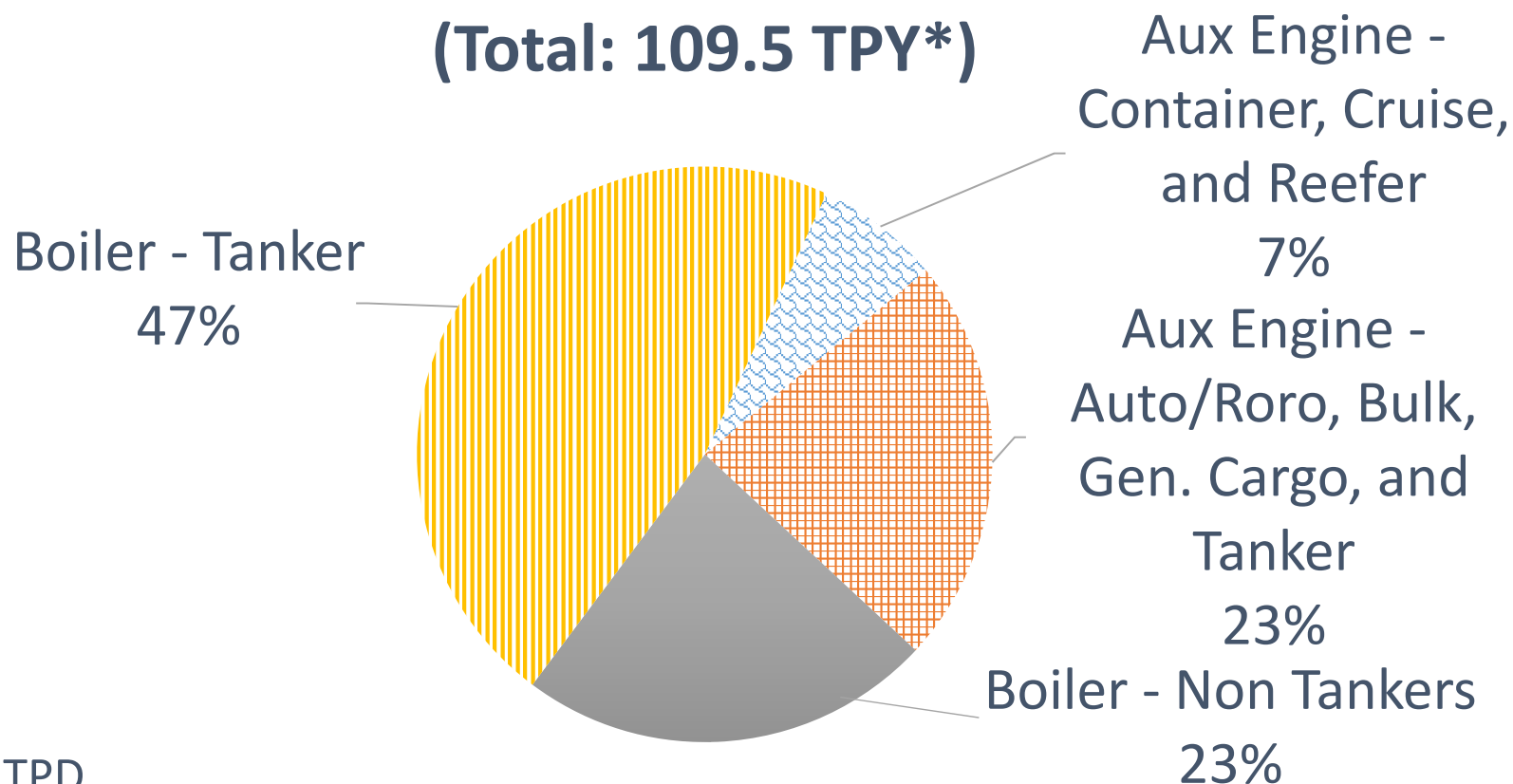
2021 Projected Statewide NOx Emissions At Berth - Existing Rule (Total: 10.5 TPD)



NOx = Oxides of Nitrogen, TPD = Tons Per Day, TPY = Tons Per Year
Source: CARB Emissions Inventory, 2018

Need For Additional Reductions (cont.)

2021 Projected Statewide PM_{2.5} Emissions At Berth - Existing Rule (Total: 109.5 TPY*)



*0.3 TPD

PM = Particulate Matter,

Source: CARB Emissions Inventory, 2018

Need For Additional Reductions (cont.)

2021 Projected Statewide CO₂ Emissions

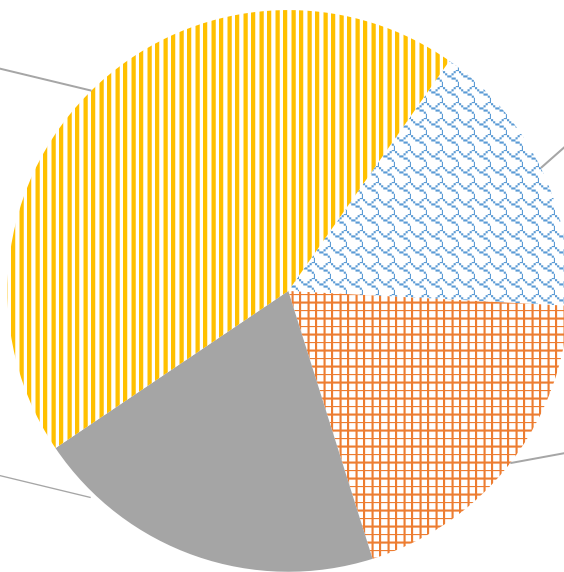
At Berth - Existing Rule
(Total: 700,000 MT/Year*)

Boiler - Tanker
44%

Boiler - Non
Tankers
21%

Aux Engine -
Container,
Cruise, and
Reefer
16%

Aux Engine -
Auto/Roro, Bulk,
Gen. Cargo, and
Tanker
19%



*1,900 MT/Day

MT/Year = Metric Tons Per Year
Source: CARB Emissions Inventory, 2018

Overview of Changes



<u>Existing Rule</u>	<u>Draft Concepts</u>
Vessel fleets	Vessel visits
Container, reefer and cruise	Additional vessel types
Implementation issues	Simplified requirements
Shore power or CARB approved alternative	Shore power or CARB approved alternative
Annual compliance reported	Clear, real time enforcement
Ports and terminals have limited responsibilities	Requirements for ports and terminals
Covers 6 named ports	Port and terminal thresholds
Reduces auxiliary engine emissions	Also reduces tanker boiler emissions



Potential Changes to Concepts in Response to Staff Analysis and Public Feedback

- Removal of bulk/general cargo vessel control requirements
- Evaluating changes to tanker phase-in (50%/80% control)
- Removal of low-use berth concept
- Updates to cost assumptions and cost estimates
- Assumptions re: capture & control utilization

Some (not all) of these are reflected in slides



Draft Regulatory Language

- Supersede existing At-Berth Regulation in 2021
- Responsibilities for vessel operators, marine terminals/complexes, and ports to reduce auxiliary engine and auxiliary boiler emissions
- Limited temporary exceptions for complications outside vessel's or terminal's direct control
- Requirements for reporting and record-keeping
- Pathway for shore power or alternative

Draft Implementation Timelines

Vessel category	Controls for 100% of visits*		
	2021	2025	2031
Container, Reefer, Cruise	 @80% ctrl		
Ro-Ro/Auto carrier	 @80% ctrl		
Tanker (<i>plus boilers for steam powered pumps</i>)		 @50% ctrl	 @80% ctrl

* *Above port and terminal thresholds*

- Does not include control requirements for bulk and general cargo vessels (still subject to opacity and reporting)



Draft Port and Terminal Thresholds

- Ports, marine terminal complexes (MTC), and terminals will have emission reduction obligations if they exceed both the port/MTC and terminal thresholds

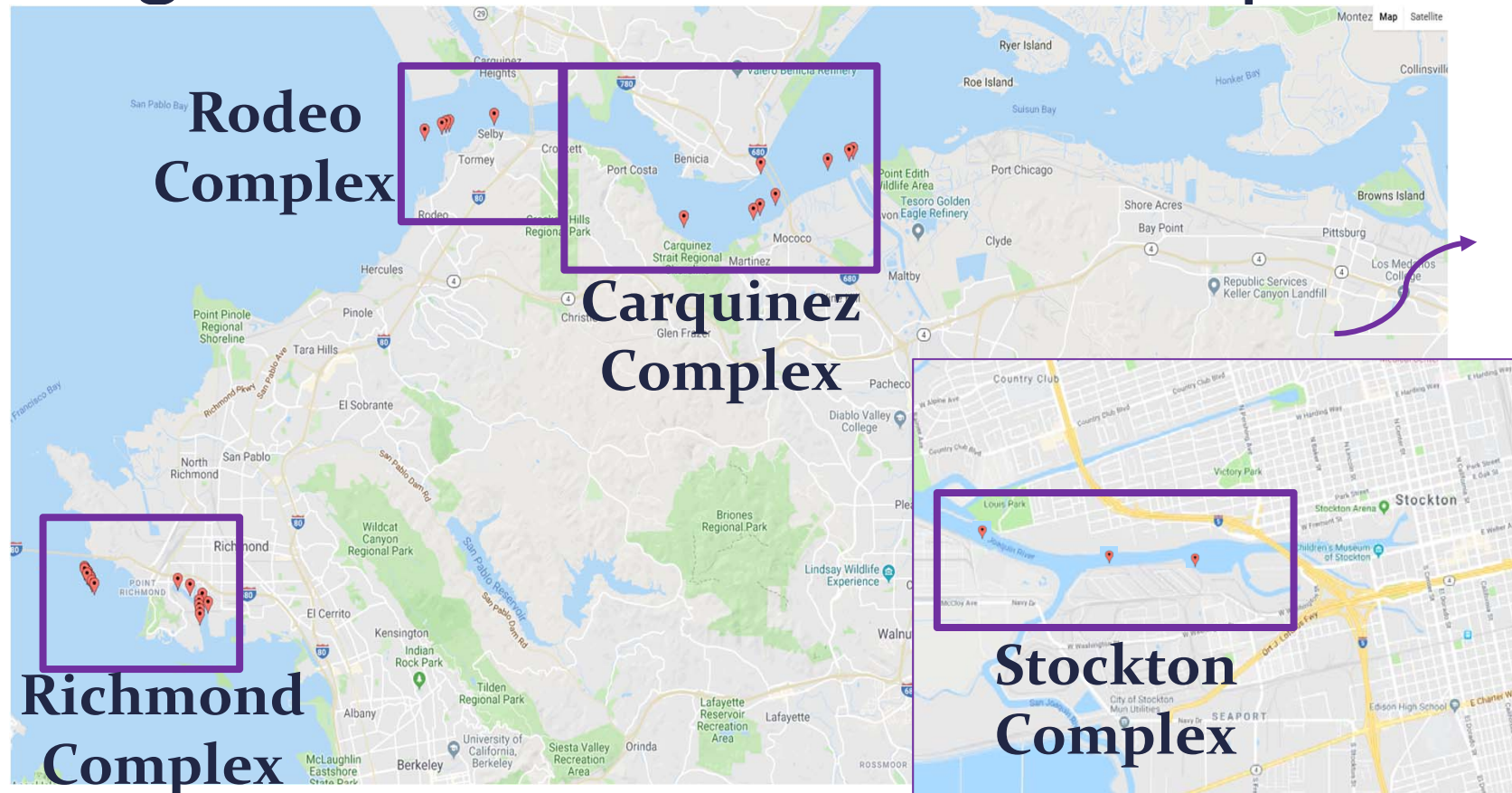
Vessel Type	Annual Port or MTC Threshold	Annual Terminal Threshold
Container & Reefer	50	25
Cruise	25	5
Liquid Bulk & Tankers	25	5
Auto Carrier/Ro-Ro	50	25

Draft California Ports and Marine Terminal Complexes Covered



All are in, or adjacent to, disadvantaged communities

Draft Northern California Preliminary Regional Marine Terminal Complexes



*Complexes made up of geographically close marine emissions sources that impact surrounding community



Draft Emission Reduction Requirements

- Use a CARB approved control strategy for each visit
- Shore power still the “gold standard”
 - High emissions reduction benefits for auxiliary engine emissions (diesel PM, NO_x, GHG)
 - Economical for frequent visitors
- Capture and Control system (80% control)
 - High to moderate emissions reduction benefits for auxiliary engines (diesel PM, NO_x), but potentially increases GHGs
 - Feasible option to capture tanker auxiliary boiler exhaust
 - Potentially more economical for infrequent visitors
- Future: onboard controls, cleaner vessels



Draft Vessel Owner/Operator Requirements

- Maintain opacity standards at berth and at anchor in California regulated waters
- Vessel must use a CARB approved emission control strategy
 - Unless exceptional situation occurs
- Vessel must advise terminal at least 72 hours prior to arrival if shore power berth is needed
 - If vessel is not shore power capable, an alternative control strategy must be confirmed with the terminal
- Follow checklist for compliance
- Record-keeping and reporting



Draft Terminal and Marine Terminal Complex Requirements

- Provide a CARB approved emissions control strategy for every regulated vessel visit
- Confirm shore power berth or alternative control system availability at least 48 hours prior to arrival
- Install and maintain any infrastructure or equipment necessary for compliance
 - Terminal lease with port may require port approval or participation in construction of new infrastructure
- Follow checklist for compliance
- Submit terminal plans to CARB

Draft Port Requirements

- Install infrastructure needed for compliance if terminal lease prevents terminal from doing so
- Submit port plans to CARB
- Provide annual Wharfinger data to CARB





Responsibilities

Terminal has....			
Vessel has....		Shore Power	No Shore Power
	Shore Power	Terminal plugs vessel into shore power or provides alternative control	Terminal provides alternative control
	No Shore Power	Vessel responsible for providing alt. control	Vessel & Terminal both responsible for providing alt. control
	On-Board Controls	Vessel	Vessel



Draft Alternative Emission Control Technology Operator Requirements

- Ensure alternative strategy has gone through CARB approval process
- Adhere to strategy specific checklist
- Control emissions for all of vessel's stay
 - Except for required connect/disconnect times
- Comply with all provisions of CARB Executive Order
- Maintain approved capture/control rates and conduct periodic emissions testing to verify performance
- Ensure appropriate labor and training are available for operation of alternative control technology



Compliance Exceptions

- Exceptions from certain compliance requirements may be granted for vessels and/or terminals for situations outside control of responsible party
- Exceptions may be limited in duration
- These situations may include:
 - Safety
 - Vessel/terminal side equipment failure or manufacturer delay
 - Research for testing of new alternative control technologies
 - Physical constraints (with U.S. Coast Guard confirmation)



Record-Keeping and Reporting Requirements



- Both vessel and terminal operators have record-keeping and reporting requirements
- Some record-keeping and reporting requirements may vary depending on emissions control strategy used
- Reporting includes:
 - General visit information
 - Additional visit information, such as:
 - Type of emissions control used
 - “Ready to Work” and “Pilot On Board” times
 - Connect and disconnect times
 - Documentation for exception utilized (if applicable)

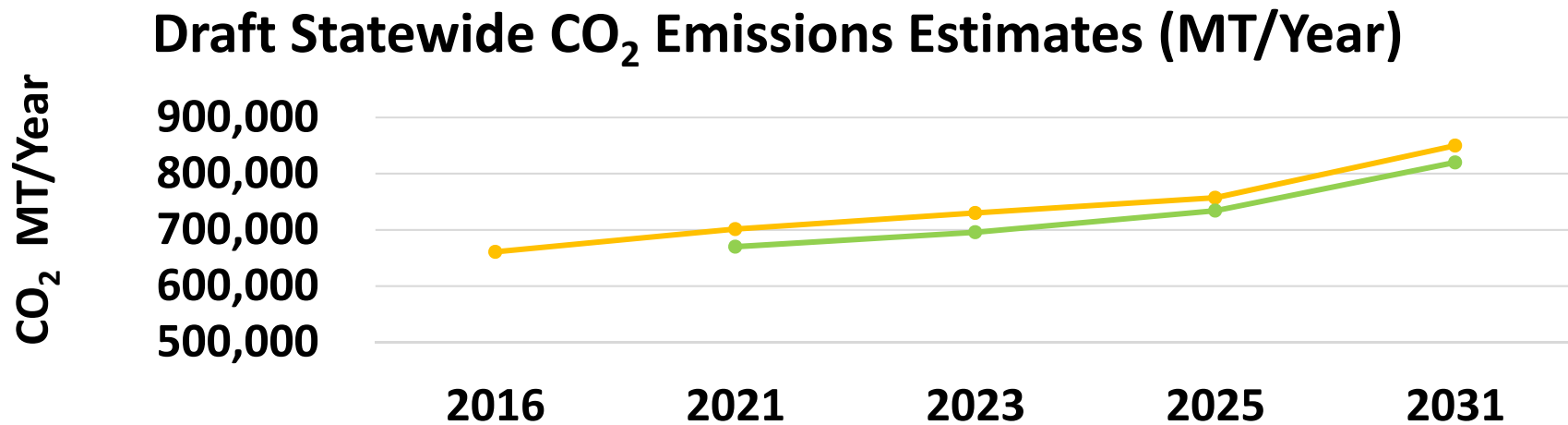
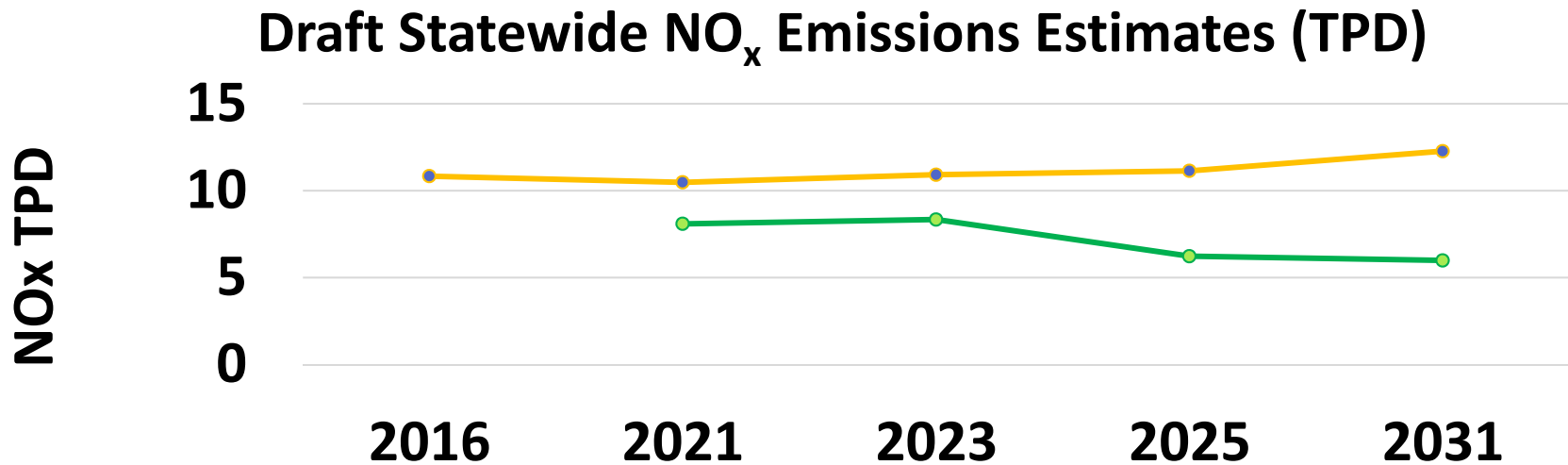


II. Preliminary Assessment of Benefits and Costs of Regulatory Concepts

Emissions Inventory Updates

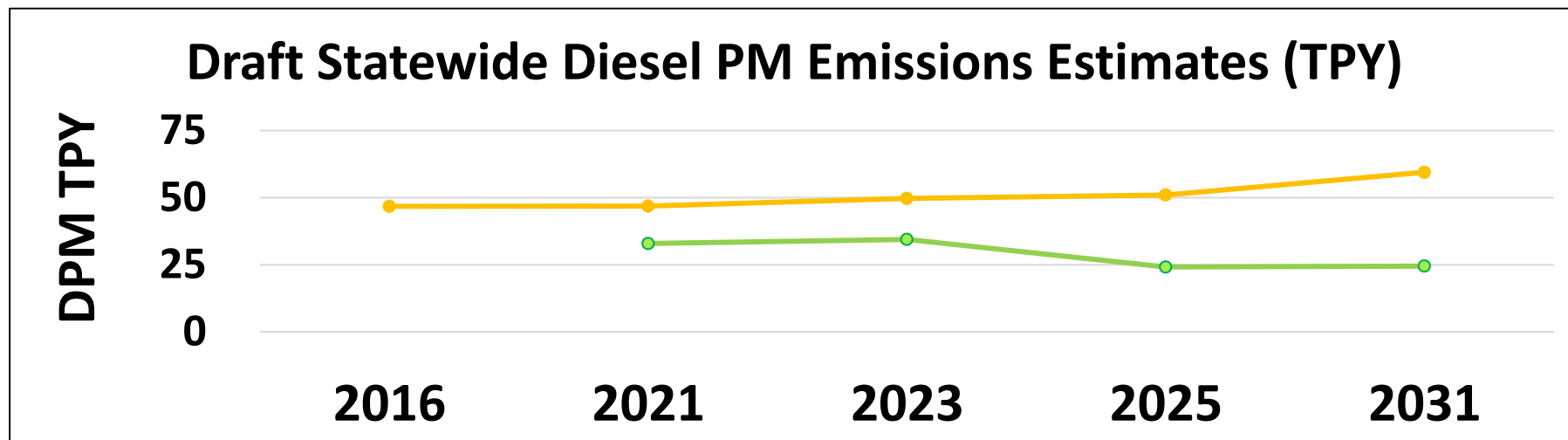
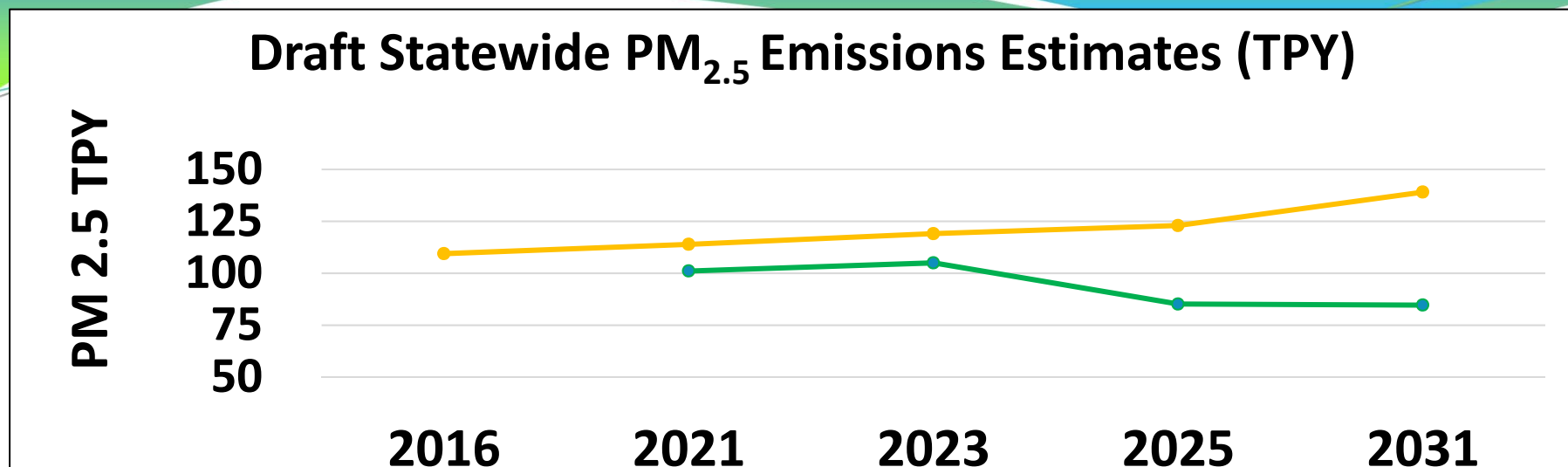


- Emission factors – Changes made to align with U.S. EPA and IMO emission factors
 - Reductions to boiler PM emission factors
 - No significant change to NOx, GHG emission factors
- Vessel stay time now includes South Coast Marine exchange data
 - Adds more geographic specificity to POLA and POLB
- New tanker size grouping
 - Incorporates Starcrest engine load changes
- Updated growth factors



Existing Rule Draft Concepts

- 2031 reductions w/concept: 6.7 TPD NO_x, 30,000 MT/Year CO₂



Existing Rule Draft Concepts

- 2031 reductions w/concept: 54 TPY PM_{2.5} , 35 TPY DPM



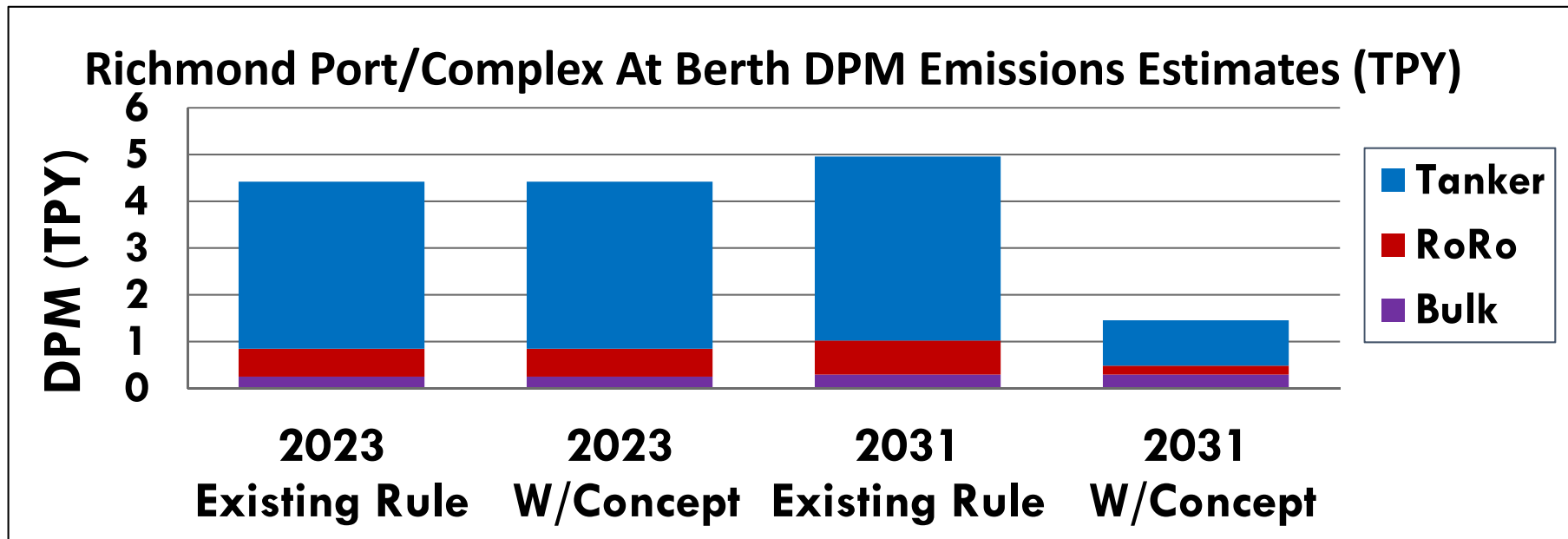
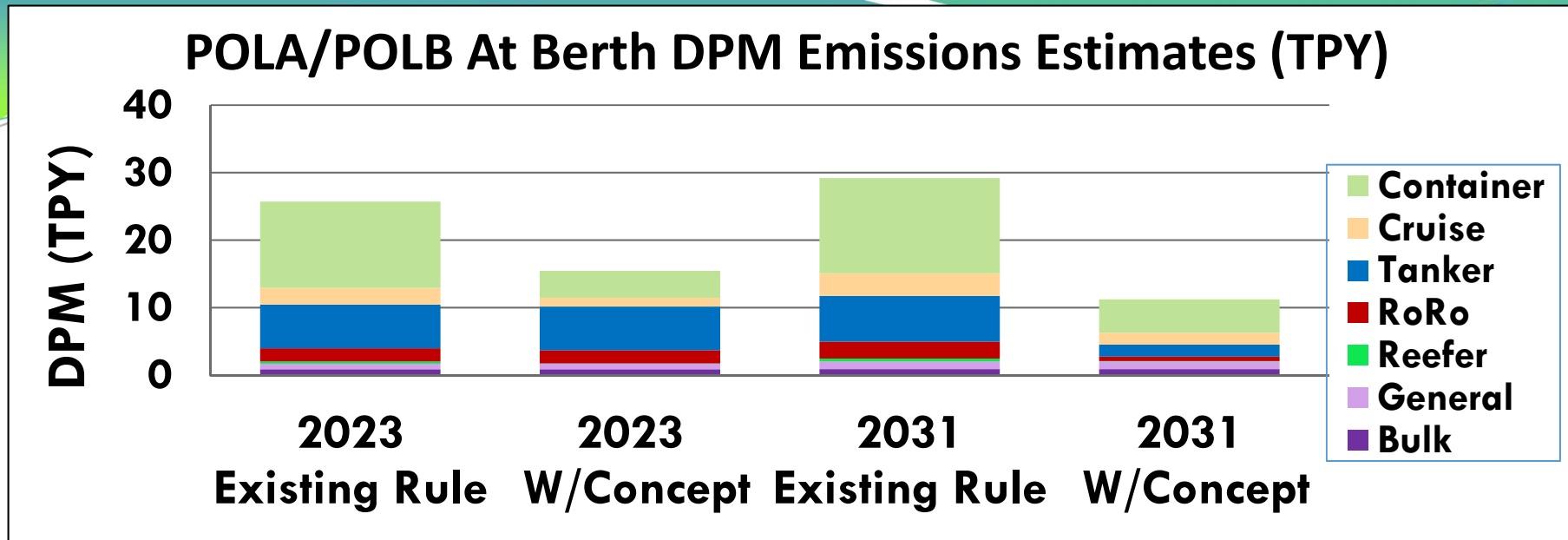
Health Impacts

Potential excess cancer risk

- Health risk assessments for POLA/POLB and Richmond Port/Complex
 - Maximum Exposed Individual Resident (MEIR) cancer risk (chances per million)
 - Population exposed to cancer risk levels
- Draft report for public comment in advance of formal rule proposal

Non-cancer effects

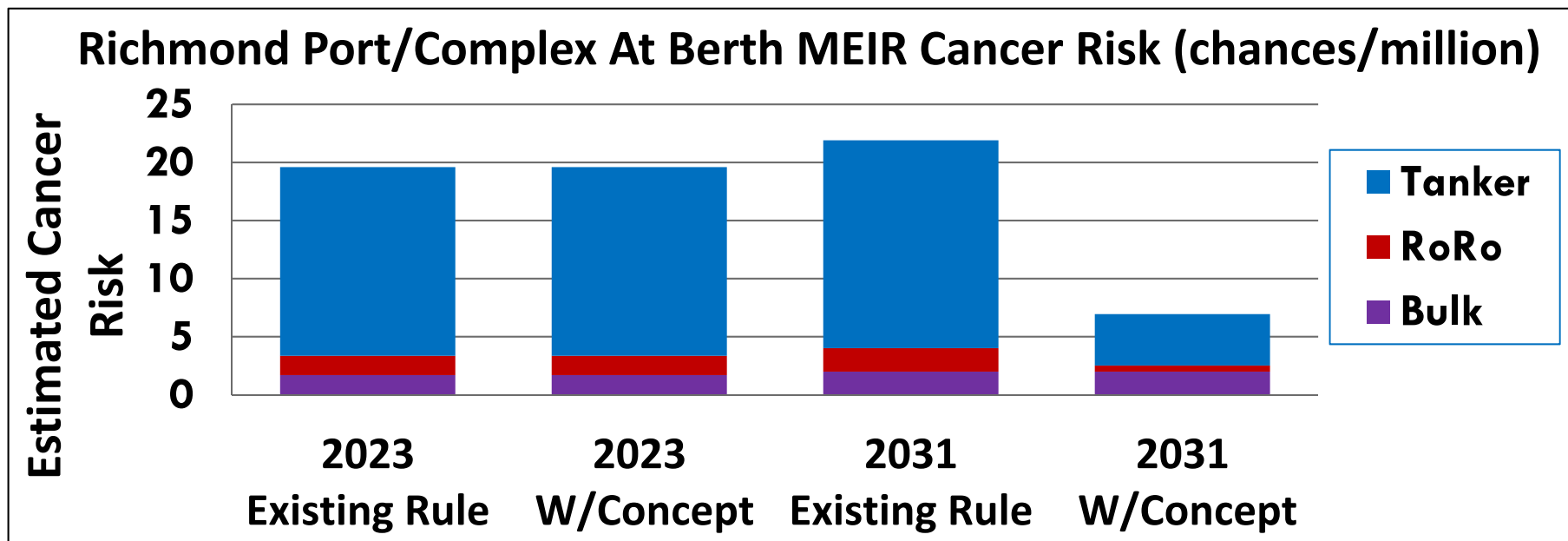
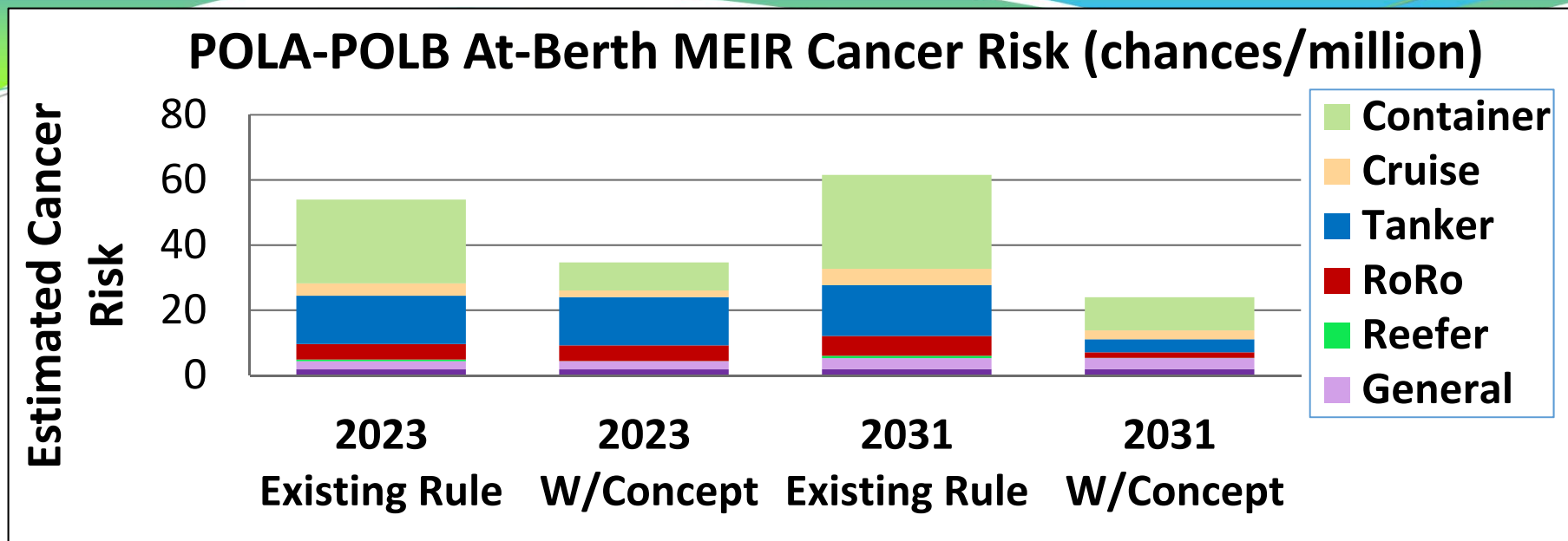
- Staff will estimate and monetize regional impacts



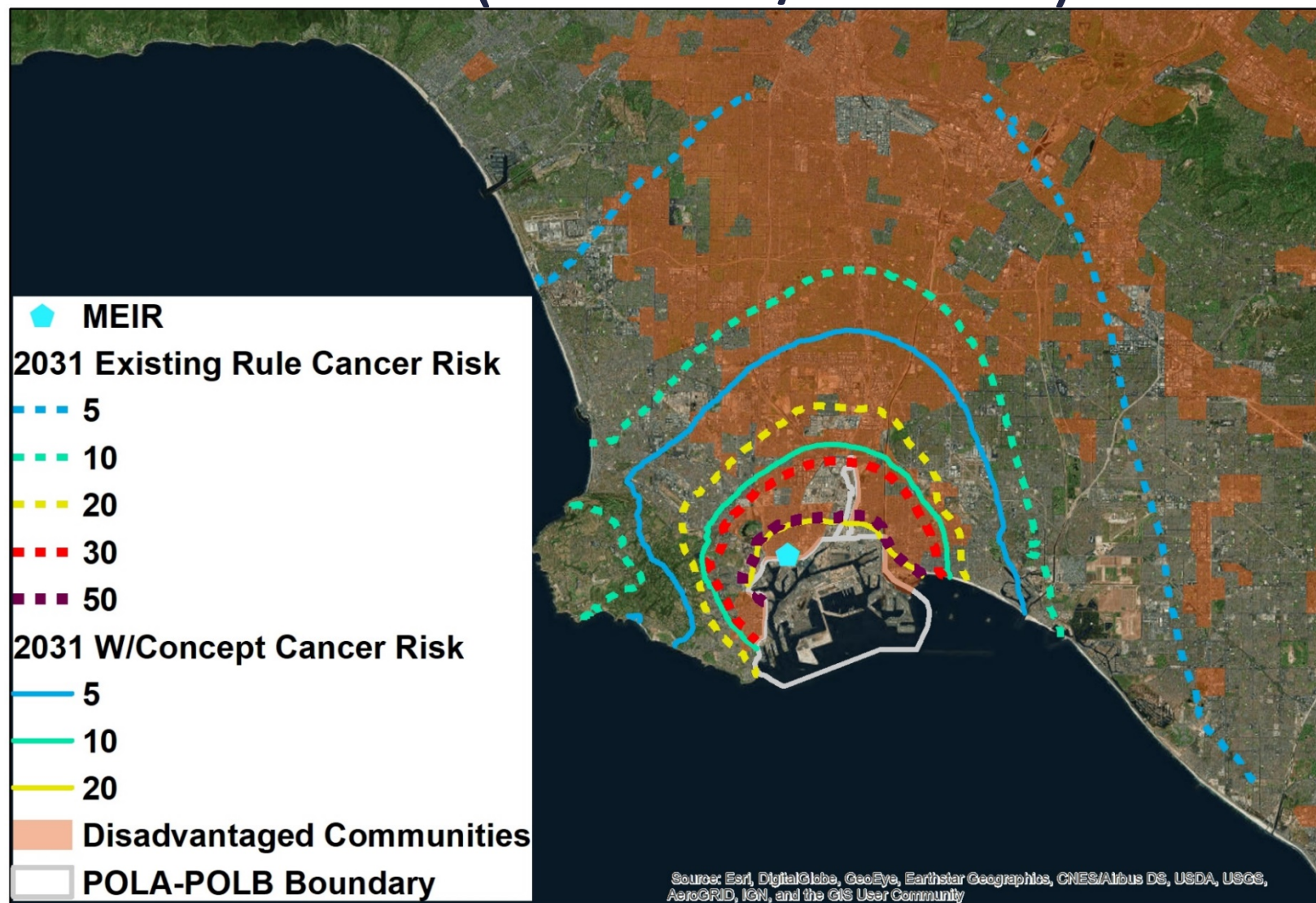


Existing Regulation Vs. Draft Concepts - 2031 Emissions by Ports

2031 Emission Reduction Percentage (Existing Rule vs. W/Concepts)									
Ports	Carquinez	Hueneme	Oakland	POLA- POLB	Richmond	Rodeo	San Diego	San Francisco	Stockton
DPM Emissions	65%	57%	57%	62%	71%	75%	52%	62%	17%
PM2.5 Emissions	57%	34%	25%	40%	42%	47%	29%	51%	8%
NOx Emissions	61%	50%	47%	53%	57%	60%	50%	58%	14%



2031 POLA-POLB: Vessels At Berth Cancer Risk (chances/million)



0 2.5 5 10 15 20 Kilometers



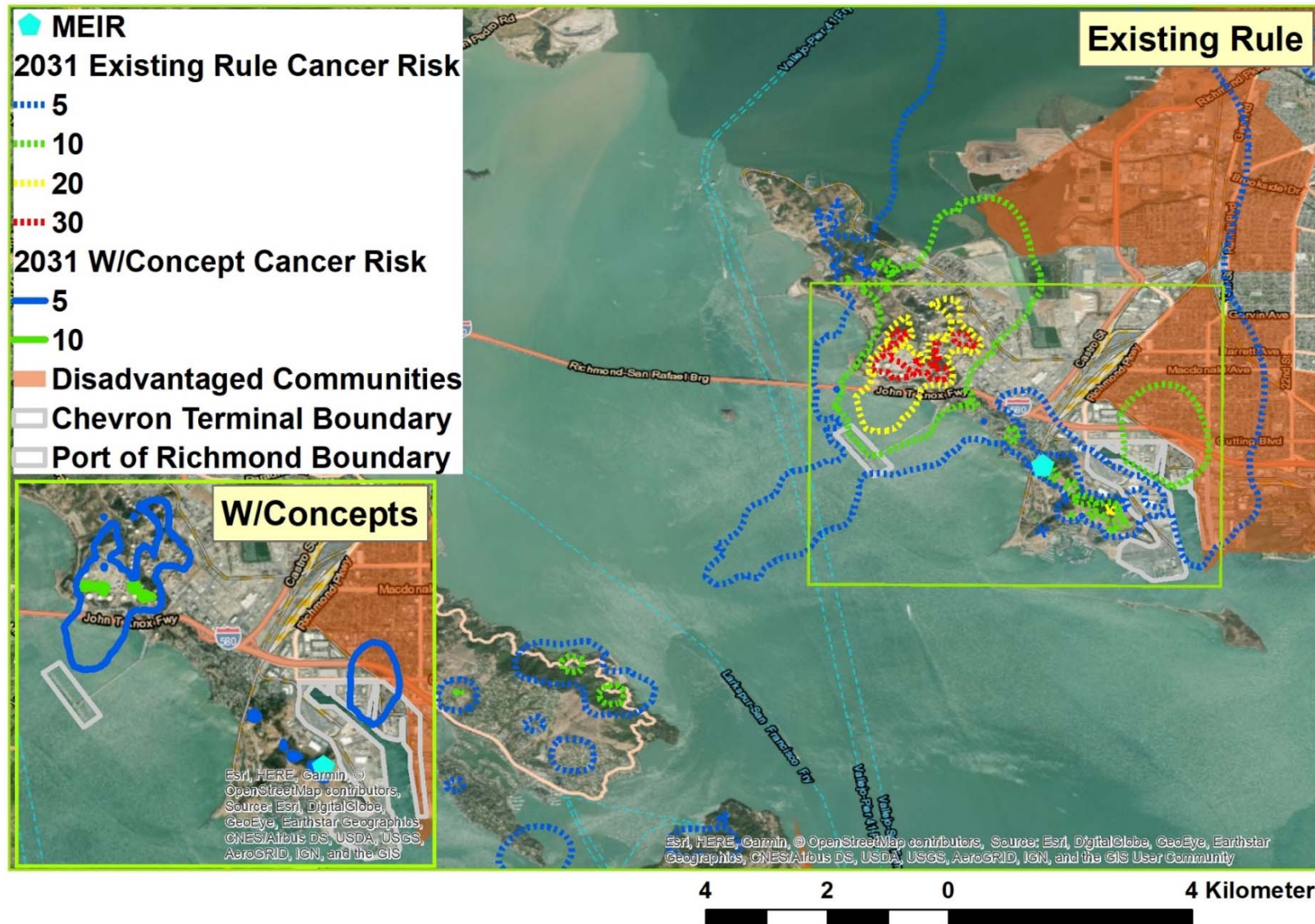
2031 POLA-POLB Vessels At Berth

Estimated Population Impacts

Population Impacted by Risk Levels (Number of People)		
	Total	
Risk Level	2031 Existing rule	2031 w/Concepts
Risk >50	46,100	0
Risk >30	242,800	0
Risk >20	464,600	39,500
Risk >10	1,166,900	327,600
Risk >5	3,201,800	795,500

- 91% reduction in population exposed to risk above 20 chances/million

2031 Richmond Port/Complex: Vessels At Berth Cancer Risk (chances/million)





2031 Richmond Port/Complex Vessels At Berth Estimated Population Impacts

Population Impacted by Risk Levels (Number of People)		
	Total	
Risk Level	2031 Existing rule	2031 w/concepts
Risk >50	0	0
Risk >30	0	0
Risk >20	80	0
Risk >10	3,100	0
Risk >5	35,780	750

- 98% reduction in population exposed to risk above 5 chances/million

Preliminary Cost Analysis

- Input from multiple sources
 - Surveys of vessel operators, terminals, ports
 - Utilities
 - Prop 1B grants
 - Equipment manufacturers
- Cost workgroup meetings
- Standardized Regulatory Impact Assessment (SRIA)
 - Required for all major regulations
 - Regulatory alternatives for analysis





Cost Estimate Updates

- Updating costs based on industry feedback and staff evaluation
 - Vessel visits for currently regulated entities in 2021 (80% to 100%)
 - Growth, fuel and electricity increases in cost
- Evaluating increased cost inputs
 - Hourly rates for tanker capture and control
 - Infrastructure estimates
- Cost estimates will increase (up to 100%)



Preliminary Annualized Statewide Costs

Annualized Statewide Cost Estimate Summary		
Vessel Type	Proposed Implementation Date	Annualized Cost at Full Implementation (2031)
Containers and Reefer Vessels	2021	\$7,537,200
Cruise Vessels	2021	\$3,737,100
Bulk and General Cargo Vessels	2025	\$29,541,500
Ro-Ro/Auto Vessels	2025	\$20,347,700
Product Tanker Vessels (80% control)	2031	\$32,782,000
Crude Tanker Vessels (80% control)	2031	\$23,639,000
Total Annualized Cost		\$117,584,500



III. Overview of Environmental Analysis

- Environmental Analysis (EA) to analyze potentially significant adverse impacts caused by reasonably foreseeable actions
- Meets requirements of CARB's certified program under the California Environmental Quality Act
- The CEQA Environmental Checklist (CEQA Guidelines Appendix G) is used to identify and evaluate potential indirect impacts
- The Draft EA will be appended to Staff Report



Environmental Analysis to Include

- Description of reasonably foreseeable actions taken in response to the proposal
- Programmatic level analysis of potential adverse impacts caused by reasonably foreseeable actions
- Beneficial impacts
- Feasible mitigation measures to reduce/avoid significant impacts
- Alternatives analysis

Input invited now on appropriate scope and content



IV. Next Steps

- Fall meetings with community groups
- Evaluation of public comments, new data
- Updated regulatory concepts and analyses
- Fall/Winter meetings on revised concepts
- Finance to release SRIA for comment
- Issue formal regulatory proposal with draft environmental analysis for comment 45 days prior to Board Hearing

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CARB At-Berth Website:

<https://www.arb.ca.gov/ports/shorepower/shorepower.htm>

