

TABLE OF CONTENTS

PART I. PREFACE TO THE FINAL ENVIRONMENTAL IMPACT REPORT

PURPOSE	I-1
ORGANIZATION OF THE FINAL EIR	I-1
PROJECT DESCRIPTION.....	I-2
DECISION-MAKING PROCESS.....	I-3
PROJECT CEQA CHRONOLOGY	I-4

PART II. RESPONSES TO COMMENTS

COMMENT SET 17: JOHN-PAUL TIOSECO	II-270
COMMENT SET 18: TESORO REFINING & MARKETING COMPANY, LLC.....	II-271
COMMENT SET 19: EICHLEAY ENGINEERING.....	II-275
COMMENT SET 20: KATHLEEN PETRICCA	II-276
COMMENT SET 21: ANNA RIKKELMAN.....	II-277
COMMENT SET 22: GEORGE SMITH	II-278

PART III. REVISIONS TO THE DRAFT ENVIRONMENTAL IMPACT REPORT

EXECUTIVE SUMMARY	ES-1
INTRODUCTION	ES-1
PROJECT OBJECTIVE	ES-1
ORGANIZATION OF THE EIR.....	ES-3
PROPOSED PROJECT	ES-4
ALTERNATIVES TO THE PROPOSED PROJECT	ES-5
ENVIRONMENTAL IMPACTS AND MITIGATION.....	ES-6
COMPARISON OF PROPOSED PROJECT AND ALTERNATIVES	ES-16
KNOWN AREAS OF CONTROVERSY OR UNRESOLVED ISSUES	ES-17
1.0 INTRODUCTION.....	1-1
1.1 PROJECT LOCATION AND BACKGROUND	1-1
1.2 PROJECT OBJECTIVE	1-4
1.3 OVERVIEW OF THE ENVIRONMENTAL REVIEW PROCESS	1-4
1.4 USE OF THIS EIR.....	1-6
1.4.1 The CSLC's Role	1-6
1.4.2 Responsible and Coordinating Agencies/Permitting	1-6
1.4.3 Public Participation	1-8
1.5 PURPOSE AND SCOPE OF THE EIR.....	1-9
1.5.1 Baseline Conditions	1-9
1.5.2 Study Area Boundary.....	1-10
1.5.3 Impacts of Proposed Project and Summary of Alternatives Evaluated	1-11
1.5.4 Organization of the EIR	1-12
2.0 PROJECT DESCRIPTION	2-1
2.1 PROJECT OVERVIEW AND LEASE HISTORY	2-1
2.2 PROJECT LOCATION	2-3
2.2.1 Local Setting.....	2-3
2.2.2 Regional Setting	2-4
2.3 PROJECT COMPONENTS	2-6
2.3.1 Marine Oil Terminal Engineering and Maintenance Standards	2-6
2.3.2 Avon Terminal Loading/Unloading Area.....	2-9
2.3.3 Approachway.....	2-18

2.4 OPERATIONS.....	2-22
2.4.1 Ballast Water	2-22
2.4.2 Personnel and Communications	2-26
2.4.3 Security and Lighting	2-27
2.4.4 Preliminary Avon Terminal Inspection and Testing	2-28
2.4.5 Berthing	2-28
2.4.6 Mooring	2-29
2.4.7 Hoses	2-29
2.4.8 Pre-transfers.....	2-29
2.4.9 Transfers	2-30
2.4.10 Vessel Calls.....	2-31
2.4.11 Throughput Volumes	2-31
2.4.12 Shipping Routes	2-32
2.4.13 Waste Management.....	2-35
2.4.14 Operations Schedule	2-35
2.4.15 Inspection and Maintenance	2-38
2.4.16 Emergency Response	2-40
2.5 MOTEMS-RELATED RENOVATION.....	2-47
2.5.1 General Renovation Sequence.....	2-48
2.5.2 Typical Renovation Equipment	2-48
2.5.3 Renovation Schedule.....	2-50
2.5.4 Access and Staging Areas.....	2-51
2.5.5 Renovation Workforce	2-52
2.5.6 Renovation Waste Management.....	2-52
2.5.7 Renovation Power and Electricity	2-53
2.5.8 Vegetation Clearance and Clean Up.....	2-53
2.5.9 Equipment Refueling	2-53
2.5.10 Rights-of-Way.....	2-53
2.5.11 Pile Removal	2-54
2.5.12 Pile Installation	2-56
2.5.13 Avon Terminal Loading/Unloading Area Renovation.....	2-57
2.5.14 Approachway Renovation	2-61
3.0 ALTERNATIVES AND CUMULATIVE PROJECTS	3-1
3.1 SELECTION OF ALTERNATIVES	3-1
3.1.1 Alternatives and Screening Development	3-1
3.1.2 Alternatives Screening Method	3-2
3.2 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FULL CONSIDERATION.....	3-4
3.2.1 Consolidation Terminal	3-4
3.2.2 Deep-water Port Consolidation	3-5
3.2.3 Limitations of Avon Terminal for Emergency Product Transfer Use Only	3-5
3.2.4 Alternative Lease Term with Phase Out.....	3-6
3.2.5 Trucking-only Alternative	3-6
3.3 ALTERNATIVES EVALUATED IN THIS EIR	3-7
3.3.1 No Project.....	3-7
3.3.2 Restricted Lease Taking Avon Terminal Out of Service for Oil Transport.....	3-10
3.3.3 Environmentally Friendly Alternative (Summary)	3-10

3.4 CUMULATIVE RELATED PROJECTS	3-11
3.4.1 Boundary of Cumulative Projects Study Area	3-11
3.4.2 Description of Cumulative Projects	3-12
3.4.3 Regional Characteristics of Crude/Product in the San Francisco Bay and Along Coastal Shipping Lanes off Northern California	3-19
4.0 ENVIRONMENTAL IMPACT ANALYSIS	4-1
4.1 OPERATIONAL SAFETY/RISK OF ACCIDENTS.....	4.1-1
4.1.1 Environmental Setting.....	4.1-1
4.1.2 Regulatory Setting	4.1-17
4.1.3 Significance Criteria.....	4.1-17
4.1.4 Impact Analysis and Mitigation	4.1-18
4.1.5 Cumulative Impact Analysis.....	4.1-46
4.1.6 Summary of Findings.....	4.1-48
4.2 BIOLOGICAL RESOURCES	4.2-1
4.2.1 Environmental Setting.....	4.2-1
4.2.2 Regulatory Setting	4.2-33
4.2.3 Significance Criteria.....	4.2-33
4.2.4 Impact Analysis and Mitigation	4.2-34
4.2.5 Cumulative Impact Analysis.....	4.2-76
4.2.6 Summary of Findings.....	4.2-80
4.3 WATER QUALITY	4.3-1
4.3.1 Environmental Setting.....	4.3-1
4.3.2 Regulatory Setting	4.3-24
4.3.3 Significance Criteria.....	4.2-26
4.3.4 Impact Analysis	4.3-27
4.3.5 Cumulative Impact Analysis.....	4.3-53
4.3.6 Summary of Findings.....	4.3-56
4.4 AIR QUALITY	4.4-1
4.4.1 Environmental Setting.....	4.4-1
4.4.2 Regulatory Setting	4.4-8
4.4.3 Emissions Inventory.....	4.4-9
4.4.4 Significance Criteria.....	4.4-15
4.4.5 Impact Analysis and Mitigation	4.4-15
4.4.6 Cumulative Impact Analysis.....	4.4-21
4.4.7 Summary of Findings.....	4.4-22
4.5 GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE	4.5-1
4.5.1 Environmental Setting.....	4.5-1
4.5.2 Regulatory Setting	4.5-5
4.5.3 Greenhouse Gas Emissions Inventory.....	4.5-6
4.5.4 Significance Criteria.....	4.5-8
4.5.5 Impact Analysis and Mitigation	4.5-9
4.5.6 Cumulative Impact Analysis.....	4.5-12
4.5.7 Summary of Findings.....	4.5-13
4.6 GEOLOGY, SEDIMENTS, AND SEISMICITY	4.6-1
4.6.1 Environmental Setting.....	4.6-1
4.6.2 Regulatory Setting	4.6-9

4.6.3 Significance Criteria.....	4.6-10
4.6.4 Impact Analysis and Mitigation	4.6-10
4.6.5 Cumulative Impact Analysis.....	4.6-15
4.6.6 Summary of Findings.....	4.6-16
4.7 CULTURAL RESOURCES.....	4.7-1
4.7.1 Concepts and Terminology	4.7-1
4.7.2 Environmental Setting.....	4.7-2
4.7.3 Regulatory Setting	4.7-6
4.7.4 Significance Criteria.....	4.7-6
4.7.5 Impact Analysis and Mitigation	4.7-7
4.7.6 Cumulative Impact Analysis.....	4.7-8
4.7.7 Summary of Findings.....	4.7-9
4.8 LAND-BASED TRANSPORTATION.....	4.8-1
4.8.1 Concepts and Terminology	4.8-1
4.8.2 Environmental Setting.....	4.8-3
4.8.3 Regulatory Setting	4.8-4
4.8.4 Significance Criteria.....	4.8-5
4.8.5 Impact Analysis and Mitigation	4.8-6
4.8.6 Cumulative Impact Analysis.....	4.8-9
4.8.7 Summary of Findings.....	4.8-9
4.9 LAND USE AND RECREATION.....	4.9-1
4.9.1 Environmental Setting.....	4.9-1
4.9.2 Regulatory Setting	4.9-7
4.9.3 Significance Criteria.....	4.9-9
4.9.4 Impact Analysis and Mitigation	4.9-9
4.9.5 Cumulative Impact Analysis.....	4.9-17
4.9.6 Summary of Findings.....	4.9-17
4.10 NOISE	4.10-1
4.10.1 Concepts and Terminology	4.10-1
4.10.2 Environmental Setting.....	4.10-4
4.10.3 Regulatory Setting	4.10-6
4.10.4 Significance Criteria.....	4.10-8
4.10.5 Impact Analysis and Mitigation	4.10-8
4.10.6 Impact Analysis and Mitigation	4.10-12
4.10.7 Summary of Findings.....	4.10-12
4.11 VISUAL RESOURCES, LIGHT AND GLARE	4.11-1
4.11.1 Environmental Setting.....	4.11-1
4.11.2 Regulatory Setting	4.11-5
4.11.3 Significance Criteria.....	4.11-5
4.11.4 Impact Analysis and Mitigation	4.11-6
4.11.5 Cumulative Impact Analysis.....	4.11-14
4.11.6 Summary of Findings.....	4.11-14
5.0 OTHER REQUIRED CEQA SECTIONS	5-1
5.1 SIGNIFICANT ENVIRONMENTAL EFFECTS THAT CANNOT BE AVOIDED IF THE PROJECT IS IMPLEMENTED.....	5-1

Table of Contents

5.2 SIGNIFICANT IRREVERSIBLE CHANGES THAT WOULD BE CAUSED BY THE PROJECT SHOULD IT BE IMPLEMENTED.....	5-5
5.3 GROWTH-INDUCING IMPACT OF THE PROPOSED PROJECT.....	5-5
5.4 ENVIRONMENTALLY SUPERIOR ALTERNATIVE.....	5-6
6.0 COMMERCIAL AND SPORT FISHERIES.....	6-1
6.1 ENVIRONMENTAL SETTING	6-1
6.1.1 Methodology and Data Collection	6-1
6.1.2 Carquinez Strait/Suisun Bay Fisheries, West of the Legally Defined Delta	6-2
6.1.3 San Francisco and San Pablo Bay Fisheries	6-10
6.1.4 Outer Coast: Oregon Border to Mexico.....	6-12
6.2 REGULATORY SETTING	6-13
6.3 SIGNIFICANCE CRITERIA	6-14
6.4 IMPACT ANALYSIS AND MITIGATION	6-15
6.4.1 Proposed Project.....	6-15
6.4.2 Alternative 1: No Project	6-24
6.4.3 Alternative 2: Restricted Lease Taking Avon Terminal Out of Service for Oil Transport	6-25
6.5 CUMULATIVE IMPACT ANALYSIS.....	6-26
6.6 SUMMARY OF FINDINGS	6-27
7.0 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE.....	7-1
7.1 SOCIOECONOMIC EFFECTS	7-1
7.1.1 Analysis and Conditions	7-1
7.1.2 Regulatory Setting	7-3
7.1.3 Significance Criteria.....	7-3
7.1.4 Impact Analysis and Mitigation	7-3
7.1.5 Cumulative Project Analysis	7-6
7.2 ENVIRONMENTAL JUSTICE.....	7-7
7.2.1 Background	7-8
7.2.2 Setting	7-9
7.2.3 Policy Analysis and Conditions	7-11
7.2.4 Relationship to Alternatives	7-14
7.2.5 Cumulative Project Policy Analysis	7-17
8.0 MITIGATION MONITORING PROGRAM	8-1
8.1 MONITORING AUTHORITY.....	8-1
8.2 ENFORCEMENT RESPONSIBILITY.....	8-2
8.3 MITIGATION COMPLIANCE RESPONSIBILITY	8-2
8.4 GENERAL MONITORING PROCEDURES	8-2
8.5 MITIGATION MONITORING TABLES.....	8-3

9.0 LIST OF PREPARERS AND REFERENCES	9-1
9.1 ENVIRONMENTAL IMPACT REPORT PREPARERS.....	9-1
9.1.1 CSLC Staff	9-1
9.1.2 Professional Consultant Environmental Impact Report Contributors	9-1
9.2 REFERENCES.....	9-4

LIST OF APPENDICES

- Appendix A: EIR Distribution List, Notice Of Preparation (NOP), Index to Location where each NOP Comment is Addressed in the EIR, and Comments on the NOP
Appendix B: Spill Trajectory Modeling from Previous Projects at Nearby Locations
Appendix C: Biological Resources in the Project Study Area
Appendix D: Avon Marine Terminal Emissions Calculations Methodology
Appendix E: Native American Heritage Commission Correspondence
Appendix F: Fisheries
Appendix G: Osprey Nest Deterrence and Relocation Plan

LIST OF FIGURES

Figure ES-1: Project Vicinity.....	ES-2
Figure 1-1: Project Overview.....	1-2
Figure 2-1: Project Location	2-2
Figure 2-2: Existing and Proposed Avon Marine Oil Terminal	2-7
Figure 2-3: New Berth 1A.....	2-11
Figure 2-4: Approachway	2-19
Figure 2-5: Vessel Traffic System	2-33
Figure 2-6: Regulated Navigation Areas.....	2-34
Figure 2-7: Transit Route of Vessels	2-36
Figure 2-8: Lightering Area	2-37
Figure 4.1-1: San Francisco Bay Ferry Routes.....	4.1-5
Figure 4.1-2: San Francisco Bay Entrance Traffic Separation Scheme	4.1-7
Figure 4.1-3: Worldwide Spill Size Cumulative Distribution at Large Marine Terminals	4.1-21
Figure 4.2-1: Bayland Habitat.....	4.2-2
Figure 4.2-2: Marsh Zonation	4.2-8
Figure 4.2-3: Regional Biological Resources.....	4.2-15
Figure 4.2-4: Vegetation and Habitat.....	4.2-21
Figure 4.2-5: Salinity Stratification at Avon Terminal	4.2-22
Figure 4.2-6: Average Suspended Sediment Concentration at Benicia Bridge, 2003-2007 ..	4.2-23
Figure 4.2-7: Wetland Delineation	4.2-29
Figure 4.2-8: Typical Frequency Bands of Sounds Produced by Marine Organisms Compared with the Low-frequency Sounds Associated with Crude Oil Tankers.....	4.2-39
Figure 4.3-1: Surface Water Features	4.3-3
Figure 4.3-2: Water Quality Data Locations.....	4.3-13

Figure 4.6-1: Major Faults and Earthquake Epicenters.....	4.6-2
Figure 4.6-2: Regional Surface Geology	4.6-4
Figure 4.6-3: Seismic Hazards Map, USGS 2002	4.6-7
Figure 4.6-4: California Seismic Hazard Map, Caltrans 1996	4.6-8
Figure 4.9-1: Contra Costa County Land Use Designations	4.9-2
Figure 4.9-2: Recreational Uses.....	4.9-4
Figure 4.10-1: Noise Monitoring and Receptor Locations.....	4.10-5
Figure 6-1: Major Commercial Fisheries.....	6-8
Figure 6-2: Major Sport Fisheries	6-9

LIST OF TABLES

Table ES-1: Summary of Environmental Impacts and Mitigation Measures for the Proposed Project.....	ES-6
Table ES-2: Summary of Environmental Impacts for Proposed Project and Alternatives....	ES-18
Table 1-1: Proposed MOTEMS Renovations at the Avon Terminal	1-3
Table 1-2: Agencies with Potential Project Oversight	1-6
Table 2-1: Proposed MOTEMS Renovations at the Avon Terminal	2-9
Table 2-2: Existing and Proposed Avon Terminal Dock Pipelines	2-13
Table 2-3: Existing and Proposed Avon Terminal Dolphins	2-16
Table 2-4: Avon Terminal Vessel Calls	2-31
Table 2-5: Avon Terminal Throughput.....	2-32
Table 2-6: Avon Terminal Oil Spill Response Equipment	2-42
Table 2-7: Typical Renovation (Construction and Demolition) Equipment	2-49
Table 2-8: Renovation Schedule (Approximate)	2-51
Table 2-9: Proposed Piling Removals	2-54
Table 2-10: Proposed Piling Installations	2-56
Table 3-1: Summary of Alternative Screening Results	3-3
Table 3-2: Vessel Calls to Marine Oil Terminals in San Francisco Bay (2008 and 2013).....	3-20
Table 4-1: Major Federal and State Laws, Regulations, and Policies Potentially Applicable to the Project	4-6
Table 4.1-1: Inbound Vessel Traffic in San Francisco Bay (2012)	4.1-2
Table 4.1-2: Tank Vessel Traffic within San Francisco Bay	4.1-2
Table 4.1-3: Vessel Calls to San Francisco Bay Marine Oil Terminals (2008, 2013)	4.1-3
Table 4.1-4: Petroleum Product Transfers in San Francisco Bay (2012)	4.1-3
Table 4.1-5: MSRC Benicia/Martinez Spill Response Equipment	4.1-8
Table 4.1-6: Probability of Spill Greater than 100 Gallons, per Vessel Calling (by Vessel and Accident Type)	4.1-34
Table 4.1-7: Expected Number of Annual Spills from Vessels Calling at the Avon Terminal While Transiting the San Francisco Bay	4.1-34
Table 4.1-8: Spill Estimates for Pipelines with Diameters Greater than 16 Inches.....	4.1-44
Table 4.1-9: Expected Mean Time between Spills Inside and Outside the San Francisco Bay—All Tank Vessels	4.1-47
Table 4.1-10: Summary of Operational Safety Impacts and Mitigation Measures.....	4.1-48
Table 4.2-1: Biotic Communities of the San Francisco Bay Estuary	4.2-4

Table 4.2-2: Biological Impacts of 100,000-gallon Spill from a Martinez Terminal	4.2-44
Table 4.2-3: Ballast Water Treatment Performance Standards	4.2-47
Table 4.2-4: Total Discharge Volume (metric tons) by Port, Six-Month Period (2010b-2012a; a = January to June, b = July to December)	4.2-49
Table 4.2-5: Blooming Period for Special-status Plants	4.2-56
Table 4.2-6: Compensatory Mitigation for Salt Marsh Harvest Mouse Habitat	4.2-60
Table 4.2-7: Criteria for Noise-related Impacts to Fish and Marine Mammals	4.2-66
Table 4.2-8: Estimated Distances to Fish Sound Thresholds during Unattenuated Pile Driving	4.2-67
Table 4.2-9: Potential Impacts to Essential Fish Habitat from New and Replacement Overwater Structures	4.2-71
Table 4.2-10: Estimated Inputs of Total Copper to San Francisco Bay, 2000-2004	4.2-79
Table 4.2-11: Summary of Biological Resources Impacts and Mitigation Measures	4.2-80
Table 4.3-1: Selected Water Quality Objectives from the Basin Plan	4.3-4
Table 4.3-2: California Toxics Rule Toxic Materials Concentrations for Saltwater	4.3-5
Table 4.3-3: Sediment Effects Guideline Values	4.3-6
Table 4.3-4: Water Sampling Results from Suisun Bay	4.3-12
Table 4.3-5: Sediment Sampling Results from Suisun Bay	4.3-14
Table 4.3-6: Avon Marine Terminal Sediment Metal, Pesticide, PAH, and PCB Concentrations (milligrams per kilogram, dry weight)	4.3-15
Table 4.3-7: Beneficial Uses of Surface Waterbodies near the Project	4.3-17
Table 4.3-8: Groundwater Monitoring Results and Water Quality Parameters for Golden Eagle Refinery	4.3-20
Table 4.3-9: Production-based Mass Emission Limits and Technology-based Concentration Limits for Avon Terminal (EFF-001)	4.3-23
Table 4.3-10: Effluent Limitations for Toxic Substances for Avon Terminal	4.3-23
Table 4.3-11: Summary of Water Quality Impacts and Mitigation Measures	4.3-56
Table 4.4-1: Summary of Air Quality Monitoring at the Vallejo, Concord, and Martinez Monitoring Stations	4.4-7
Table 4.4-2: Emissions per OGV (pounds unless indicated)	4.4-11
Table 4.4-3: 2005 Baseline Year Compared with Anticipated Lease-period Annual Emissions (tons)	4.4-13
Table 4.4-4: Project MOTEMS renovation-related Emissions	4.4-14
Table 4.4-5: Summary of Air Quality Impacts and Mitigation Measures	4.4-22
Table 4.5-1: Global Warming Potential of Various Gases	4.5-2
Table 4.5-2: Summary of OGV GHG Emissions	4.5-7
Table 4.5-3: Annual Renovation GHG Emissions	4.5-8
Table 4.5-4: Summary of Air Quality Impacts and Mitigation Measures	4.5-13
Table 4.6-1: Known Active Faults in the Avon Terminal Vicinity	4.6-5
Table 4.6-2: Summary of Geology, Sediments, and Seismicity Impacts and Mitigation Measures	4.6-16
Table 4.7-1: Cultural Resources Previously Recorded within 1 Mile of the Project Site	4.7-4
Table 4.7-2: Summary of Cultural Resources Impacts and Mitigation Measures	4.7-9
Table 4.8-1: Daily Capacities for Major and Minor Arterials	4.8-2
Table 4.8-2: Summary of Levels of Service (LOS) for Intersections	4.8-2

Table of Contents

Table 4.8-3: Summary of Land-based Transportation Impacts and Mitigation Measures.....	4.8-9
Table 4.9-1: East Bay Regional Park District Parks near the Project Site	4.9-5
Table 4.9-2: Major Shoreline Recreational Areas, San Francisco and San Pablo Bays.....	4.9-6
Table 4.9-3: Summary of Land Use and Recreation Impacts and Mitigation Measures	4.9-18
Table 4.10-1: Typical A-weighted Sound Levels.....	4.10-3
Table 4.10-2: Noise Level/Land Use Compatibility	4.10-7
Table 4.10-3: Noise Levels from Typical Construction Equipment.....	4.10-9
Table 4.10-4: Standard Construction Equipment Aggregate Noise Emission Values	4.10-10
Table 4.10-5: Summary of Noise Impacts and Mitigation Measures	4.10-13
Table 4.11-1: Summary of Visual Resources Impacts and Mitigation Measures.....	4.11-14
Table 6-1: Summary of Commercial and Sport Fisheries Impacts and Mitigation Measures... Table 7-1: Demographic Characteristics for Contra Costa County, City of Martinez, and California	6-28 7-1
Table 7-2: Contra Costa County Employment by Industrial Sector	7-2
Table 7-3: Race Characteristics (2010)	7-10
Table 7-4: Hispanic Origin (2010).....	7-11
Table 7-5: Study Area Poverty Status (2012)	7-11
Table 8-1: Mitigation Monitoring – Operational Safety/Risk of Accidents	8-4
Table 8-2: Mitigation Monitoring – Biological Resources	8-9
Table 8-3: Mitigation Monitoring – Water Quality.....	8-33
Table 8-4: Mitigation Monitoring – Land Use and Recreation	8-37
Table 8-5: Mitigation Monitoring – Visual Resources, Light and Glare.....	8-38

LIST OF ABBREVIATIONS AND ACRONYMS

UNITS OF MEASUREMENT

°F	degrees Fahrenheit	L _{max}	maximum noise level
bpd	barrels per day	LT	long ton
bpy	barrels per year	mcy	million cubic yards
bph	barrels per hour	MGD	million gallons per day
cfs	cubic feet per second	mg/kg	milligrams per kilogram
cy	cubic yards	mg/L	milligrams per liter
dB	decibel	mm/yr	millimeters per year
dBA	decibel on A-weighted scale	MT	metric ton
dBRMS	decibel root mean square	Mw	moment magnitude
DWT	dead-weight ton	nm	nautical mile
ft ²	square foot	ppm	parts per million
g	gravitational force	ppt	parts per thousand
GPM	gallons per minute	µg/kg	micrograms per kilogram
knots	nautical miles per hour	µg/L	micrograms per liter
L _{dn}	day-night average noise level	µPa	micro Pascal
L _{eq}	equivalent continuous sound level		

OTHER ABBREVIATIONS AND ACRONYMS

ADT	average daily traffic
ASME	American Society of Mechanical Engineers
ATCMs	Air Toxic Control Measures
BAAQMD	Bay Area Air Quality Management District
BCDC	San Francisco Bay Conservation and Development Commission
BMP	Best Management Practice
BNSF	BNSF Railway Company
cal. A.D.	calibrated Anno Domini
cal. B.P.	calibrated Before Present
CalARP	California Accidental Release Prevention Program
Caltrans	California Department of Transportation
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CCC	California Coastal Commission
CDFG	California Department of Fish and Game (now CDFW)
CDFW	California Department of Fish and Wildlife
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CGS	California Geological Survey
CNEL	Community Noise Equivalent Level
CO _{2e}	CO ₂ equivalent

List of Abbreviations and Acronyms

CPUC	California Public Utilities Commission
CSLC	California State Lands Commission
CWA	Clean Water Act
CWP	Contra Costa Clean Water Program
DDT	dichlorodiphenyltrichloroethane
Delta	Sacramento-San Joaquin River Delta
DMMO	Dredged Material Management Office
DNF	dissolved nitrogen flotation
DWR	California Department of Water Resources
EFH	essential fish habitat
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
ER-L	Effects Range-Low
ER-M	Effects Range-Medium
ERT	Emergency Response Team
FCD	Contra Costa Flood Control and Water Conservation District
FCMA	Fishery Conservation and Management Act
FEMA	Federal Emergency Management Agency
FSP	Facility Security Plan
GAC	granular activated carbon
GHG	greenhouse gas
GWP	global warming potential
HAP	Hazardous Air Pollutant
HAPC	Habitat Area of Particular Concern
HFC	hydrofluorocarbon
IGS	inert gas system
IPCC	Intergovernmental Panel on Climate Change
LED	light-emitting diode
LOS	level of service
LTMS	Long-term Management Strategy
MBTA	Migratory Bird Treaty Act
MCLs	California maximum contaminant levels
MHHW	mean higher high water
MHW	mean high water
MLLW	mean lower low water
MLW	mean low water
MM(s)	Mitigation Measure(s)
MMTCO2e	million metric tons of CO ₂ equivalent emissions
MTCO2e	metric tons of CO ₂ equivalent emissions
MOTCO	Military Ocean Terminal Concord
MOTEMS	Marine Oil Terminal Engineering and Maintenance Standards
MOV	motor-operated valves
MSRC	Marine Spill Response Corporation
MTC	Metropolitan Transportation Commission

MTL	mean tide level
MVR	Marine Vapor Recovery
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NAS	nonindigenous aquatic species
NEP	National Estuary Program
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOP	Notice of Preparation
NPDES	National Pollutant Discharge Elimination System
NRDA	National Resource Damage Assessment
NWS Concord	Naval Weapons Station Concord
OGV	ocean-going vessel
OPA 90	Oil Pollution Act of 1990
OSPR	Office of Spill Prevention and Response
OSRO	Oil Spill Response Organization
PAHs	polycyclic aromatic hydrocarbons
PAWSA	USCG Ports and Waterways Safety Assessment
PCBs	polychlorinated biphenyls
PCEs	primary constituent elements
PCR	Pacific Coast Region
PED	Pre-construction Engineering and Design
PFMC	Pacific Fisheries Management Council
PGA	peak ground acceleration
PM ₁₀	inhalable fine particulate matter
PORTS	Physical Oceanographic Real Time System
PSV	pressure safety valves
PTS	permanent threshold shift
RMLPS	Richmond Marine-Link Pipeline System
RMP	Regional Monitoring Program
RNA(s)	Regulated Navigational Area(s)
RT	Radiographic Testing
SB	Senate Bill
SCH	State Clearinghouse
SFBE	San Francisco Bay Estuary
SFBRWQCB	San Francisco Bay Regional Water Quality Control Board
SFEI	San Francisco Estuary Institute
SFEP	San Francisco Estuary Partnership
SJV	San Joaquin Valley
SJvh	San Joaquin Valley Heavy
SSC	suspended-sediment concentration
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TACs	Toxic Air Contaminants

List of Abbreviations and Acronyms

TBT	tributyltin
TMDL	Total Maximum Daily Load
TOLs	Terminal Operating Limits
TPIC	Terminal Person-in-Charge
TSS	Traffic Separation Scheme
TTS	temporary threshold shift
UKC	under-keel clearance
USACE	U.S. Army Corps of Engineers
USCG	U.S. Coast Guard
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
V/C	volume/capacity ratio
VGP	Vessel General Permit
VOC	volatile organic compound
VPIC	Vessel Person-in-Charge
VTS	Vessel Traffic Service
WCATWC	West Coast/Alaska Tsunami Warning Center
WCD	worst-case discharge
WDR	RWQCB Waste Discharge Requirements
WETA	San Francisco Water Emergency Transit Authority
WQO	water quality objective
WWTP	Wastewater Treatment Plant

FREQUENTLY USED TERMS

Ballast/ballast water – heavy material placed in the hold of a ship to provide stability.

Barge – any vessel that carries oil in commercial quantities as cargo, but is not equipped with a means of self-propulsion.

Dolphin – a fixed, manmade structure that is not connected to shore and is used to berth vessels against (a berthing dolphin) or moor vessels to (a mooring dolphin).

Marine terminal or marine oil terminal – a facility, including a mobile transfer unit, other than a vessel, located on or adjacent to marine waters in California, used for transferring oil to or from tank vessels or barges. The term references all parts of the facility, including, but not limited to, structures, equipment and appurtenances thereto used or capable of being used to transfer oil to or from tank vessels or barges. A marine terminal includes all piping not integrally connected to a tank facility.

Oil – any kind of petroleum, liquid hydrocarbons, or petroleum products, or any fraction or residues there from, including, but not limited to, crude oil, bunker fuel, gasoline, diesel fuel, aviation fuel, oil sludge, oil refuse, oil mixed with waste, and liquid distillates from unprocessed natural gas.

Operator – when used in connection with vessels, marine terminals, pipelines, or facilities, means any person or entity which owns, has an ownership interest in, charters, leases, rents, operates, participates in the operation of or uses that vessel, terminal, pipeline, or facility. "Operator" does not include any entity that owns the land underlying the terminal or the terminal itself, where the entity is not involved in the operations of the terminal.

Spill or discharge – any release of oil into marine waters that is not authorized by any federal, State, or local government entity.

Terminal Person-in-Charge" or "TPIC" – an individual designated by the terminal operator as the person in charge of a particular oil transfer operation at a particular terminal.

Transfer – any movement of oil, including movements of bunker fuel, between the terminal and the vessel by means of pumping, gravitation, or displacement. The term "transfer" also includes those movements of oil to, from, or within any part of the terminal or vessel that are directly associated with the movement of oil or bunker fuel between the terminal and the vessel.

Vessel – every description of watercraft or other artificial contrivance used, or capable of being used, as a means of transportation on water, including, but not limited to, tank vessels and barges.

Vessel Person-in-Charge or "VPIC" – person in charge of a vessel's oil transfer operations.

PAGE INTENTIONALLY LEFT BLANK