FINAL
ENVIRONMENTAL IMPACT REPORT

STATE CLEARINGHOUSE NO 2007112108

CSLC EIR NO. 744

Vallejo

San Pablo Bay

FOR THE

Martinez

SHORE MARINE OIL TERMINAL LEASE PROJECT

San Francisco Bay

PREPARED BY

CALIFORNIA STATE LANDS COMMISSION

100 HOWE AVENUE, SUITE 100-SOUTH

SACRAMENTO, CALIFORNIA 95825-8202

JANUARY 2012

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TABLE OF CONTENTS

Section Page

LIST OF APPENDICES ..... **v**

LIST OF TABLES ..... **vi**

LIST OF FIGURES ..... **viii**

LIST OF ABBREVIATIONS/ACRONYMNS AND FREQUENTLY USED TERMS ..... **xi**

SECTION I. PREFACE TO FINAL ENVIRONMENTAL IMPACT REPORT **I-1**
PURPOSE I-1
PROJECT DESCRIPTION I-1
ORGANIZATION OF FINAL EIR I-2
DECISION-MAKING PROCESS I-2
PROJECT CEQA CHRONOLOGY I-4

SECTION II. RESPONSES TO COMMENTS **II-1**
COMMENT SET 1: Bay Conservation and Development Commission II-2
COMMENT SET 2: Shore Terminals LLC II-6
COMMENT SET 3: Shore Terminals LLC II-8

SECTION III. REVISIONS TO DRAFT EIR

EXECUTIVE SUMMARY **ES-1**
Project Objectives, Purpose and Need ES-1
Description of Proposed Project ES-1
Alternatives to Proposed Project ES-2
Environmental Impacts and Mitigation ES-3
Comparison of Proposed Project and Alternatives ES-8
Environmentally Superior Alternative ES-8
Known Areas of Controversy or Unresolved Issues ES-9

1.0 INTRODUCTION **1-1**
1.1 Project Objectives, Purpose and Need 1-1
1.2 Purpose and Scope of EIR 1-2
1.2.1 Organization of EIR 1-2
1.2.2 Study Area Boundary 1-3
1.2.3 Definition of Baseline and Future Conditions 1-5
1.3 Public Review and Comment 1-5
1.3.1 Scoping 1-5
1.3.2 Public Comment on the Draft EIR 1-6
1.4 Permits, Approvals, and Regulatory Requirements 1-7

2.0 PROJECT DESCRIPTION 2-1
2.1 Introduction 2-1
2.2 Project Background 2-1
2.2.1 Project History 2-1
2.2.2 CSLC Lease Boundary and Regulatory Boundary Areas 2-4
2.3 Proposed Project 2-5
2.3.1 Project Action 2-5
2.3.2 Physical Description of Marine Terminal 2-5
Topograph 2-5
Wharf 2-5
Wharf Pipelines 2-7
Drip, Oily Waste, and Ballast Discharge Facilities 2-8
Vapor Collection and Recovery Systems 2-10
Building, Personnel, and Communication Systems 2-11
Security 2-12
Storage and Transshipping Facilities (the Upland Facility/ Main Terminal) 2-12
2.3.3 Operational Procedures 2-14
Mooring and Berthing Procedures 2-14
Product Transfer Procedures 2-15
Maintenance 2-16
Pipeline Safety Controls 2-17
Fire Detection and Suppression 2-17
2.3.4 Volumes and Types of Materials Handled 2-18
Ship and Barges 2-18
Products 2-18
Dredging 2-19
2.3.5 Shipping Routes 2-19
2.3.6 Spill Response Capability 2-21
2.3.7 Measures Designed into Proposed Project to Avoid Potential Impacts 2-21

3.0 ALTERNATIVES AND CUMULATIVE PROJECTS 3-1
3.1 Factors Used in Selection of Alternatives 3-1
3.1.1 Alternatives Development and Screening Process 3-1
3.1.2 Alternatives Screening Methodology 3-2
3.1.3 Summary of Screening Results 3-3
3.2 Alternatives Eliminated from Full Evaluation 3-4
3.2.1 Facility Consolidation in Bay 3-4
3.2.2 Construct New Pipelines 3-4
3.2.3 Lease Options 3-5
3.3 Alternatives Evaluated in EIR 3-6
3.3.1 No Project Alternative 3-6
3.3.2 Limitations on Terminal Use 3-7
3.4 Comparison of Proposed Project and Alternatives 3-7
3.5 Cumulative Projects 3-8
3.5.1 Boundary of Cumulative Projects Study Area 3-8
3.5.2 Description of Cumulative Projects 3-11
3.5.3 Regional Characteristics of Marine Vessel Transportation in Bay and Along Coastal Shipping Lanes off Northern California 3-17

4.0 ENVIRONMENTAL ANALYSIS 4-1
Introduction to Environmental Analysis 4-1
Assessment Methodology 4-2
Environmental Baseline 4-2
Significance Criteria 4-2
Impact Analysis 4-3
Formulation of Mitigation Measures and Mitigation Monitoring Program 4-3
Impacts of Alternatives 4-4
Cumulative Projects Impact Analysis 4-4
4.1 Operational Safety/Risk of Accidents 4.1-1
4.1.1 Environmental Setting 4.1-1
4.1.2 Regulatory Setting 4.1-5
4.1.3 Significance Criteria 4.1-14
4.1.4 Impact Analysis and Mitigation 4.1-15
4.1.5 Impacts of Alternatives 4.1-35
4.1.6 Cumulative Projects Impact Analysis 4.1-36
4.2 Biological Resources 4.2-1
4.2.1 Environmental Setting 4.2-2
4.2.2 Regulatory Setting 4.2-35
4.2.3 Significance Criteria 4.2-49
4.2.4 Impact Analysis and Mitigation 4.2-51
4.2.5 Impacts of Alternatives 4.2-71
4.2.6 Cumulative Projects Impact Analysis 4.2-73
4.3 Commercial and Sport Fisheries 4.3-1
4.3.1 Environmental Setting 4.3-1
4.3.2 Regulatory Setting 4.3-20
4.3.3 Significance Criteria 4.3-22
4.3.4 Impact Analysis and Mitigation 4.3-23
4.3.5 Impacts of Alternatives 4.3-27
4.3.6 Cumulative Projects Impact Analysis 4.3-28
4.4 Hydrology and Water Quality 4.4-1
4.4.1 Environmental Setting 4.4-1
4.4.2 Regulatory Setting 4.4-5
4.4.3 Significance Criteria 4.4-16
4.4.4 Impact Analysis and Mitigation 4.4-17
4.4.5 Impacts of Alternatives 4.4-24
4.4.6 Cumulative Projects Impact Analysis 4.4-25
4.5 Land Use and Recreation 4.5-1
4.5.1 Environmental Setting 4.5-1
4.5.2 Regulatory Setting 4.5-13
4.5.3 Significance Criteria 4.5-18
4.5.4 Impact Analysis and Mitigation 4.5-18
4.5.5 Impacts of Alternatives 4.5-25
4.5.6 Cumulative Projects Impact Analysis 4.5-27
4.6 Air Quality 4.6-1
4.6.1 Environmental Setting 4.6-1
4.6.2 Regulatory Setting 4.6-9
4.6.3 Significance Criteria 4.6-15
4.6.4 Impact Analysis and Mitigation 4.6-16
4.6.5 Impacts of Alternatives 4.6-17
4.6.6 Cumulative Projects Impact Analysis 4.6-18

4.7 Noise 4.7-1
4.7.1 Environmental Setting....4.7-1
4.7.2 Regulatory Setting 4.7-8
4.7.3 Significance Criteria....4.7-10
4.7.4 Impact Analysis and Mitigation 4.7-10
4.7.5 Impacts of Alternatives 4.7-11
4.7.6 Cumulative Projects Impact Analysis....4.7-12
4.8 Traffic and Transportation 4.8-1
4.8.1 Environmental Setting....4.8-1
4.8.2 Regulatory Setting 4.8-4
4.8.3 Significance Criteria....4.8-5
4.8.4 Impact Analysis and Mitigation 4.8-5
4.8.5 Impacts of Alternatives 4.8-6
4.8.6 Cumulative Projects Impact Analysis....4.8-7
4.9 Visual Resources/Light and Glare....4.9-1
4.9.1 Environmental Setting....4.9-1
4.9.2 Regulatory Setting 4.9-10
4.9.3 Significance Criteria....4.9-12
4.9.4 Impact Analysis and Mitigation 4.9-12
4.9.5 Impacts of Alternatives 4.9-19
4.9.6 Cumulative Projects Impact Analysis....4.9-20
4.10 Cultural Resources....4.10-1
4.10.1 Environmental Setting....4.10-2
4.10.2 Regulatory Setting 4.10-7
4.10.3 Significance Criteria....4.10-12
4.10.4 Impact Analysis and Mitigation 4.10-13
4.10.5 Impacts of Alternatives 4.10-14
4.10.6 Cumulative Projects Impact Analysis....4.10-15
4.11 Geology, Soils, and Seismicity 4.11-1
4.11.1 Environmental Setting....4.11-1
4.11.2 Regulatory Setting 4.11-11
4.11.3 Significance Criteria....4.11-13
4.11.4 Impact Analysis and Mitigation 4.11-13
4.11.5 Impacts of Alternatives 4.11-18
4.11.6 Cumulative Projects Impact Analysis....4.11-18

5.0 SOCIOECONOMIC EFFECTS AND ENVIRONMENTAL JUSTICE 5-1
5.1 Socioeconomic Effects 5-1
5.1.1 Analysis and Conditions 5-1
5.1.2 Relationship to Alternatives 5-4
5.1.3 Cumulative Projects Analysis 5-7
5.2 Environmental Justice 5-8
5.2.1 Setting 5-10
5.2.2 Policy Analysis and Conditions 5-14
5.2.3 Relationship to Alternatives 5-16
5.2.4 Cumulative Projects Policy Analysis....5-20

6.0 OTHER REQUIRED CEQA SECTIONS AND ENVIRONMENTALLY SUPERIOR ALTERNATIVE 6-1
6.1 Introduction to Additional CEQA Requirements Discussed in this Section 6-1
6.2 Significant Environmental Effects of Proposed Project that Cannot Be Avoided and Cannot be Mitigated to Less Than Significant 6-1
6.3 Significant Environmental Effects of Proposed Project that Would Be Irreversible if the Proposed Project is Implemented 6-3
6.4 Growth-Inducing Impacts of the Proposed Project 6-4
6.5 Environmentally Superior Alternative 6-5

7.0 MITIGATION MONITORING PROGRAM 7-1
7.1 Monitoring Authority 7-1
7.2 Enforcement Responsibility 7-2
7.3 Mitigation Compliance Responsibility 7-2
7.4 General Monitoring Procedures 7-2
7.5 Mitigation Monitoring Table 7-3

8.0 REPORT PREPARATION SOURCES 8-1
8.1 EIR Preparers 8-1
8.2 EIR Information Consultations 8-3

9.0 REFERENCES 9-1

LIST OF APPENDICES (contained on CD inside back cover)

APPENDIX A DISTRIBUTION LIST A-1

APPENDIX B NOTICE OF PREPARATION (NOP) AND COMMENTS ON NOP B-1

APPENDIX C OIL SPILL MODELING ANALYSIS C-1
C.1 Coastal Engineering Analysis and Engineering Review C.1-1
C.2 Oil Spill Modeling Scenario Memo C.2-1

APPENDIX D BIOLOGICAL RESOURCES D-1
D.1 Regional Setting D.1-1
D.2 Tables D.2-1
D.3 Environmental Sensitivity Index Maps D.3-1

APPENDIX E 2005 MOT VESSEL ACTIVITY REPORT E-1

APPENDIX F AIR EMISSION CALCULATIONS F-1

APPENDIX G DISPERSANTS WHITE PAPER: OVERVIEW OF PROTOCOLS AND POTENTIAL EFFECTS G-1

LIST OF TABLES

ES-1 Summary of Environmental Impacts for the Proposed Project and Alternatives ES-10

2-1 Marine Vessel Product Transfers at the Shore MOT in 2007 2-18

2-2 Vessel Calls at the Shore MOT 1999 - 2008 2-20

3.1-1 Summary of Alternative Screening Results 3-4

3.3-1 Total Shore Upland Terminal In/Out Product Throughput for 2005-2008 3-7

3.5-1 Projects with the Potential to Cumulatively Affect Resources of Concern for the Shore Marine Oil Terminal Lease Project 3-12

3.5-2 Inbound Vessel Traffic in San Francisco Bay (2006) 3-17

3.5-3 Destination of Golden Gate Bridge Ship Traffic Arrivals 2008, including Shifts 3-18

3.5-4 Vessel Calls to Marine Terminals in the San Francisco Bay During 2008 3-19

3.5-5 Tanker Origin/Destination to/from San Francisco Bay and Distance Traveled from Coast 3-20

4.1-1 Inbound Vessel Traffic in San Francisco Bay (2006) 4.1-2

4.1-2 Spill Modeling Scenarios 4.1-17

4.1-3 Summary of Operational Safety/Risk of Accidents Impacts and Mitigation Measures 4.1-34

4.1-4 Spill Rates and Death Rates for Various Petroleum Transport Modes 4.1-35

4.2-1 Special-Status Species Considered in Evaluation of Project Site 4.2-15

4.2-2 Summary of Biological Resource Impacts and Mitigation Measures 4.2-71

4.3-1 Commercial Landings and Value of Major Species into San Francisco for the Years 2000 to 2007 ..... 4.3-3

4.3-2 Commercial Landings and Value of Major Species into Bodega Bay for the Years 2000 to 2007 ..... 4.3-6

4.3-3 Commercial Landings and Value of Major Species into Monterey Bay for the Years 2000 to 2007 ..... 4.3-7

4.3-4 San Francisco Bay Marine Inland Waters Recreational Fish Landings (pounds) for the Period 2004-2008 ..... 4.3-18

LIST OF TABLES (continued)

4.3-5 Recreational Fish Landings (pounds) from Central California Ocean Waters (San Luis Obispo to Mendocino) for the Period 2004-2008 ..... 4.3-21

4.3-6 Summary of Commercial and Sport Fisheries Impacts and Mitigation Measures 4.3-27

4.4-1 Summary of Hydrology and Water Quality Impacts and Mitigation Measures 4.4-24

4.5-1 Marina Facilities and Fishing Piers in the Project Area 4.5-8

4.5-2 Wildlife Refuges and Waterfront Parks and Beaches in the San Francisco Bay 4.5-12

4.5-3 Summary of Land Use and Recreation Impacts and Mitigation Measures 4.5-25

4.6-1 Study Area Air Quality Summary - 2006 through 2008 ..... 4.6-3

4.6-2 Attainment Status of Bay Area Air Basin 4.6-3

4.6-3 Estimated Baseline Emissions 4.6-8

4.6-4 State and Federal Criteria Air Pollutant Standards, Effects, and Sources 4.6-10

4.6-5 Existing Sources of Air Emissions at the Shore MOT 4.6-16

4.7-1 Human Response to Different Levels of Groundborne Vibration 4.7-5

4.7-2 Land Use Compatibility for Community Noise Environments, dBA 4.7-9

4.8-1 Daily Capacities for Major and Minor Arterials 4.8-2

4.8-2 LOS Interpretation 4.8-2

4.8-3 Traffic Volumes for San Pablo Avenue 4.8-3

4.9-1 Summary of Visual Resource/Light and Glare Impacts and Mitigation Measures 4.9-19

4.11-1 Principal Active Faults/Significant Seismic Sources 4.11-3

4.11-2 Historic Earthquakes that Affected the Proposed Project Site 4.11-5

4.11-3 Design Earthquake Motions 4.11-6

4.11-4 Peak Ground Acceleration and Spectral Accelerations Soil Class S_E (5% Damping) 4.11-6

4.11-5 Summary of Geology, Soils, and Seismicity Impacts and Mitigation Measures 4.11-17

5.1-1 Demographic Characteristics for Contra Costa County and the Rodeo-Crockett Local Area 5-1

LIST OF TABLES (continued)

5.1-2 Contra Costa County Employment by Industrial Sector 5-2

5.1-3 Employment in the Rodeo-Crockett Area by Industrial Sector 5-3

5.2-1 Racial Characteristics of Census Block Groups Located Within the Potential Impact Radius of the Proposed Project 5-13

5.2-2 Income Characteristics of Census Block Groups Located Within the Potential Impact Radius of the Proposed Project 5-13

6-1 Summary of Environmental Impacts for the Proposed Project and Alternatives 6-8

7-1 Mitigation Monitoring Program – Applicant Proposed Measures 7-5

7-2 Mitigation Monitoring Program – Operational Safety/Risk of Accidents 7-6

7-3 Mitigation Monitoring Program – Biological Resources 7-9

7-4 Mitigation Monitoring Program – Commercial and Sport Fisheries 7-12

7-5 Mitigation Monitoring Program – Hydrology and Water Quality 7-13

7-6 Mitigation Monitoring Program – Land Use and Recreation 7-14

7-7 Mitigation Monitoring Program – Visual Resources/Light and Glare 7-15

7-8 Mitigation Monitoring Program – Geology, Soils, and Seismicity 7-15

LIST OF FIGURES

1.2-1 Study Area 1-4

2-1 Project Location 2-2

2-2 Shore Selby MOT Area Detail 2-3

2-3 Shore Selby Wharf Layout Drawing 2-6

2-4 Shore Selby Whart Lighting 2-13

3.5-1 Location of Cumulative Projects 3-9

4.1-1 Scenario 1, Diesel Spill, 434 Barrels, Shore Terminal, summer 4.1-18

4.1-2 Scenario 2, Diesel Spill, 434 Barrels, Shore Terminal, winter 4.1-18

4.1-3 Scenario 5, Diesel Spill, 50 Barrels, Shore Terminal, summer 4.1-19

LIST OF FIGURES (continued)

4.1-4 Scenario 6, Diesel Spill, 50 Barrels, Shore Terminal, winter....4.1-19

4.1-5 Scenario 7, Diesel Spill, 20,000 Barrels, Richmond-San Rafael Bridge, summer 4.1-20

4.1-6 Scenario 8, Diesel Spill, 20,000 Barrels, Richmond-San Rafael Bridge, winter....4.1-20

4.1-7 Scenario 9, Diesel Spill, 20,000 Barrels, Golden Gate Bridge, summer 4.1-21

4.1-8 Scenario 10, Diesel Spill, 20,000 Barrels, Golden Gate Bridge, winter....4.1-21

4.1-9 Scenario 11, Gasoline Spill, 434 Barrels, Shore Terminal, summer 4.1-22

4.1-10 Scenario 12, Gasoline Spill, 434 Barrels, Shore Terminal, winter....4.1-22

4.1-11 Scenario 15, Gasoline Spill, 50 Barrels, Shore Terminal, summer 4.1-23

4.1-12 Scenario 16, Gasoline Spill, 50 Barrels, Shore Terminal, winter....4.1-23

4.1-13 Scenario 17, Gasoline Spill, 20,000 Barrels, Richmond-San Rafael Bridge, summer 4.1-24

4.1-14 Scenario 18, Gasoline Spill, 20,000 Barrels, Richmond-San Rafael Bridge, winter....4.1-24

4.1-15 Scenario 19, Gasoline Spill, 20,000 Barrels, Golden Gate Bridge, summer....4.1-25

4.1-16 Scenario 20, Gasoline Spill, 20,000 Barrels, Golden Gate Bridge, winter 4.1-25

4.2-1 Vegetation 4.2-4

4.2-2 Special-Status Communities 4.2-12

4.2-3 Special-Status Plants and Animals 4.2-28

4.3-1 Commercial Landings for Monterey, San Francisco, and Bodega Bay, by Weight, 2000-2007 ....4.3-15

4.3-2 Commercial Landings for Monterey, San Francisco, and Bodega Bay, by Market Value, 2000-2007 ....4.3-15

4.5-1 Land Use Designations 4.5-3

4.5-2 Zoning Districts 4.5-5

4.7-1 24-Hour Noise Measurement Data – Monday/Tuesday, June 22/23, 2009 ....4.7-7

4.7-2 24-Hour Noise Measurement Data – Tuesday/Wednesday, June 23/24, 2009....4.7-7

LIST OF FIGURES (continued)

4.9-1 Aerial View of the Shore Marine Oil Terminal 4.9-5

4.9-2 View of the Pipe Rack and Trestle, Looking Toward the Shore from the Marine Oil Terminal 4.9-5

4.9-3 View of the Shoreline to the East of the Marine Oil Terminal 4.9-6

4.9-4 View of the Shoreline to the West of the Marine Oil Terminal 4.9-6

4.9-5 View of Paved Bench on the Shoreline 4.9-7

4.9-6 View looking East from the Marine Oil Terminal 4.9-7

4.9-7 View of Fencing at the Entrance to the Wharf 4.9-8

LIST OF ABBREVIATIONS/ACRONYMS AND FREQUENTLY USED TERMS

UNITS OF MEASUREMENT

^{o}F	degrees Fahrenheit
bbl	barrel (= 42 gallons)
bph	barrels per hour
dB	decibel
dBA	decibel on A-weighted Scale
DWT	deadweight ton/deadweight tonnage
Hz	Hertz
km	kilometer
knot	nautical mile per hour
kV	kilovolt
lbs/day	pounds per day
L_{dn}	day-night average noise level
L_{eq}	equivalent continuous sound level
L_{max}	maximum noise level
m	meter
mm/yr	millimeters per year
nm	nautical mile
ppb	parts per billion
ppm	parts per million
psi	pounds per square inch
$\mu g/m^3$	micrograms per cubic meter
V	volt
VdB	vibration decibels

OTHER ABBREVIATIONS & ACRONYMS

A	A-2	General Agriculture
	AAS	Allision Avoidance System
	AB	Assembly Bill
	ABAG	Association of Bay Area Governments
	ACO	Airport Commercial
	ACOE	U.S. Army Corps of Engineers
	ADT	Average Daily Traffic
	AFS	American Fisheries Society
	AIS	Automatic Identification System
	Aka	Also Known As
	ANS	Alaskan North Slope
	APM	applicant proposed measure
	ARB	Air Resources Board (California)
	ASCE	American Society of Civil Engineers
B	BAAQMD	Bay Area Air Quality Management District
	BCDC	Bay Conservation and Development Commission
	BLM	Bureau of Land Management
	BTEX	benzene, toluene, ethyl benzene, and xylene
C	CAAQS	California Ambient Air Quality Standards
	Caltrans	California Department of Transportation
	CARB	California Air Resources Board
	CBC	California Building Code
	CCC	California Coastal Commission
	CCR	California Code of Regulations
	CCTA	Contra Costa Transportation Authority
	CDF	California Department of Forestry
	CDFG	California Department of Fish and Game
	CEC	California Energy Commission
	CeNCOOS	Central and Northern California Ocean Observing System
	CEQ	Council on Environmental Quality
	CEQA	California Environmental Quality Act
	CERES	California Environmental Resources Evaluation System
	CFGC	California Fish and Game Commission
	CFR	Code of Federal Regulations
	CGS	California Geological Survey
	CH_4	Methane
	CMC	Criteria Maximum Concentration
	CNDDB	California Natural Diversity Database
	CNEL	Community Noise Equivalent Level
	CNPS	California Native Plant Society
	CO	Carbon Monoxide
	CO_2	Carbon Dioxide
	CO_2e	Carbon dioxide equivalents
	COTP	Captain of the Port
	CPSA	Cumulative Projects Study Area

	CPUC	California Public Utilities Commission
	CRFS	California Recreational Fisheries Survey
	CSLC	California State Lands Commission
	CTR	California Toxics Rule
	CWA	Clean Water Act
	CWP	Contra Costa County Watershed Plan
D	DDT	dichloro-diphenyl-trichloroethane
	DNL	Day-Night Average Sound Level, also known as L_{dn}
	DOD	Department of Defense
	DOI	Department of the Interior
	DOT	U.S. Department of Transportation
	DPM	Diesel Particulate Matter
	DPS	Distinct population segment
	DTSC	Department of Toxic Substances Control
E	EBRPD	East Bay Regional Park District
	EFH	Essential Fish Habitat
	EIR	Environmental Impact Report
	EIS	Environmental Impact Statement
	ESA	Endangered Species Act
	ESI	Environmental Sensitivity Index
	ESU	Evolutionarily Significant Unit
F	FCMA	Fishery Conservation and Management Act
	FEMA	Federal Emergency Management Agency
	FHWA	Federal Highway Administration
	FMP	Fisheries Management Plan
	FMSA	Farallones Marine Sanctuary Association
	FRA	Federal Railroad Administration
	FSII	fuel system icing inhibitors
	FTA	Federal Traffic Administration
G	GGB	Golden Gate Bridge
	GHG	Greenhouse Gas
H	HAPs	hazardous air pollutants
	HAZOP	Hazard and Operability
	HFCs	Hydrofluorocarbons
	HI	Heavy Industrial
	HVDC	High Voltage Direct Current
I	I-80	Interstate 80
	IBC	International Building Code
	ID	Identification
	IEP	Interagency Ecological Program
	IGS	Inert Gas System
	IMO	International Maritime Organization
	IPCC	Intergovernmental Panel on Climate Change
L	LLC	Limited Liability Company
	LMD	Land Management Division (of California State Lands Commission)
	LOA	Length overall

	LOS	Level of Service
	LTMS	Long-Term Management Strategy
M	M	Magnitude
	MACT	maximum available control technology
	MARPOL	Marine Pollution
	MEI	Maximally Exposed Individual [health risk of 10 in one million]
	MEP	Maximum extent practicable
	MFD	Marine Facilities Division (of California State Lands Commission)
	MHHW	Mean Higher High Water
	MLMA	Marine Life Management Act
	MISA	Marine Invasive Species Act
	MLLW	Mean Lower Low Water
	MM	Mitigation Measure
	MMP	Mitigation Monitoring Program
	MMPA	Marine Mammal Protection Act
	MND	Mitigated Negative Declaration
	MOT	Marine Oil Terminal
	MOTEMS	Marine Oil Terminal Engineering and Maintenance Standards
	MOU	Memorandum of Understanding
	MOV	Motor Operated Valve
	MTC	Metropolitan Transportation Commission
N	N_2O	Nitrous oxide
	NAAQS	National Ambient Air Quality Standards
	NAS	Non-indigenous Aquatic Species
	NHPA	National Historic Preservation Act
	NISA	National Invasive Species Act
	NMFS	National Marine Fisheries Service
	NO_2	Nitrogen Dioxide
	NOAA	National Oceanic and Atmospheric Administration
	NOD	Notice of Determination
	NOP	Notice of Preparation
	NO_X	Nitrogen Oxides
	NPDES	National Pollutant Discharge Elimination System
	NPPA	California Native Plant Protection Act
	NPS	National Park Service
	NRC	National Response Corporation
	NRDC	Natural Resources Defense Council
	NWI	National Wetland Inventory
O	O_3	Ozone
	OCFM	Outdoor Central Fishing Magazine
	OCS	Outer Continental Shelf
	OEHHA	Office of Environmental Health Hazard Assessment
	OHP	California Office of Historic Preservation
	OPA 90	Oil Pollution Act of 1990
	OPR	Office of Planning and Research
	OS	Open Space

	OSC	On-Scene Coordinator
	OSFM	Office of the State Fire Marshall
	OSPR	Office of Spill Prevention and Response
	OSRO	Oil Spill Response Organization
	OSSM	On-Scene Spill Model
P	P-1	Planned Unit
	Pb	Lead
	PCBs	Polychlorinated Biphenyls
	PCR	Pacific Coast Region
	PFCs	Perfluorocarbons
	PFMC	Pacific Fishery Management Council
	PGA	Peak Ground Acceleration
	PHMSA	Pipeline and Hazardous Materials Safety Administration
	PM	Particulate Matter
	PM_{10}	Particulate Matter with diameter ≤ 10 micrometers (0.0004 inches)
	$PM_{2.5}$	Particulate Matter with diameter ≤ 2.5 micrometers (0.0001 inches)
	PMAO	PetroChemical Mutual Aid Organization
	POC	Pollutant of Concern
	PR	Parks and Recreation
	PRC	Public Resources Code
	PS	Public/Semi-Public
	PSMFC	Pacific States Marine Fisheries Commission
R	RCRA	Resource Conservation and Recovery Act
	RecFIN	Pacific Recreational Fishing Information Network
	RMP	Regional Monitoring Program
	RNA	Regulated Navigation Area
	ROG	Reactive Organic Gases
	RSR	Richmond-San Rafael
	RWCD	Reasonable Worst Case Discharge
	RWQCB	Regional Water Quality Control Board
S	SAV	submerged aquatic vegetation
	SB	Senate Bill
	SDC	Seismic Design Category
	SF_6	sulfur hexafluoride
	SFBRWQCB	San Francisco Bay Regional Water Quality Control Board
	SHPO	State Historic Preservation Officer
	SIOSC	State Interagency Oil Spill Committee
	SIP	State Implementation Plan
	SO_2	Sulfur Dioxide
	SOLAS	Safety of Life at Sea
	SOSLSTC	Shell Oil Spill Litigation Settlement Trustee Committee
	SO_X	Sulfur Oxides
	SPCC	Spill Prevention, Control, and Countermeasure
	SR	State Route
	SVP	Society for Vertebrate Paleontology
	SWRCB	State Water Resources Control Board

T	TACs	toxic air contaminants
	TAP	Trajectory Analysis Planner
	TBACT	toxic best available control technology
	TBT	Tributyltin
	TMDL	Total Maximum Daily Load
	TOL	Terminal Operating Limit
	TPIC	Terminal Person-in-Charge
	TRB	Transportation Research Board
	TSS	Traffic Separation Scheme
U	U	Unrestricted
	UBC	Uniform Building Code
	UCIPM	University of California Integrated Pest Management
	UPRR	Union Pacific Railroad
	USC	United States Code
	USCG	U.S. Coast Guard
	USDA	U.S. Department of Agriculture
	USEPA	U.S. Environmental Protection Agency
	USFWS	U.S. Fish and Wildlife Service
	USGS	U.S. Geological Survey
V	V/C	Volume to Capacity
	VCRS	vapor collection and recovery system
	VCS	Vapor Control System
	VGP	Vessel General Permit
	VPIC	Vessel Person-in-Charge
	VTS	Vessel Traffic Service
W	WA	Water
	WBWG	Western Bay Working Group
	WETA	Water Emergency Transit Authority
	WRCC	Western Regional Climate Center

FREQUENTLY USED TERMS RELATED TO MARINE TERMINALS

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 man-made structure that is not connected to shore and is used to berth vessels against (a berthing dolphin) or mooring vessels to (a mooring dolphin).

Marine terminal or Marine Oil Terminal (MOT) – 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. A tank facility means any one or combination of aboveground storage tanks, including any piping which is integral to the tank, which contains crude oil or its fractions and which is used by a single business entity at a single location or site.

Non-indigenous species – non-native species that threatens the diversity or abundance of native species or the ecological stability of infested waters, or commercial, agricultural, aquacultural, or recreational activities dependent on such waters.

Oil – any kind of petroleum, liquid hydrocarbons, or petroleum products or any fraction or residues therefrom, 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 which 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 which 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 and includes, but is not limited to, tank vessels and barges.

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

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California State Lands Commission

SECTION I – PREFACE

Final Environmental Impact Report for the Shore Marine Oil Terminal Lease Project, January 2012

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I. PREFACE TO FINAL ENVIRONMENTAL IMPACT REPORT

PURPOSE

This document is the Final Environmental Impact Report (EIR) for the Shore Marine Oil Terminal Lease Project (Project). The Final EIR has been prepared for consideration by the California State Lands Commission (CSLC), as the Lead Agency for this Project, pursuant to the California Environmental Quality Act (CEQA) (California Public Resources Code § 21000 *et seq*.) and in accordance with the State CEQA Guidelines (California Code of Regulations [CCR], Title 14, § 15000 *et seq*.).

This Final EIR, which is reproduced for convenience in one document, replaces and incorporates the entire January 2010 Draft EIR. It includes comments received during the 45-day public comment period, responses to those comments, and revisions to the text of the Draft EIR in response to comments received or for reasons that include: to include updated information; to refine discussions and resolve internal inconsistencies; and to make minor format changes. Some changes have resulted in a shifting of text from one page to another. Except for minor format changes, all revisions to the Draft EIR are shown as follows:

- Additions to the text of the Draft EIR are <u>underlined</u>; and
- Deletions from the text of the Draft EIR are shown as ~~strikeout.~~

The Final EIR may be viewed at the following repository locations and on the CSLC website (<u>www.slc.ca.gov/Division_Pages/DEPM/DEPM_Home_Page.html</u>):

Crockett Library 991 Loring Avenue Crockett, CA 94525 (510) 787-2345	CSLC, Marine Facilities Division 750 Alfred Noble Drive, Ste. 201 Hercules, CA 94547 (510) 741-4950	CSLC, Division of Environmental Planning and Management 100 Howe Avenue, Ste.100-South Sacramento, CA 95825 (916) 574-1889

PROJECT DESCRIPTION

The proposed Project involves Shore Terminals LLC (a NuStar Energy Company), hereafter referred to as Shore (aka NuStar or Selby), entering into a new 30-year lease of California sovereign land off the south shore of the Carquinez Strait, just west of the Carquinez Bridge in Contra Costa County, for the Shore Marine Oil Terminal (MOT) (see Final EIR Figure 2-1). The current lease (PRC 5735.1) has been considered by the CSLC to be in holdover since December 21, 2006 (i.e., the MOT is continuing to operate under the terms of its existing lease while a decision on a new lease is pending). A new 30-year lease, if granted, would allow Shore to continue current transfer operations of petroleum products from the wharf portion of its facility to its upland main terminal storage facility through December 21, 2036. Since Shore does not ship crude oil through its MOT, crude oil shipments are not part of the proposed Project. Shore also currently has no plans to expand the operations or equipment on the wharf or increase throughput capacity. Shore's upland main terminal operations are separate from wharf operations, and are not part of the proposed lease.

The MOT is located just north of the ConocoPhillips San Francisco Refinery in northwestern Contra Costa County just west of the Carquinez Bridge and the unincorporated town of Crockett. The MOT is a single-berth dock that can accommodate only one vessel at a time, with maximum vessel of up to 100,000 dead weight tons (DWT), maximum length of 831 feet, maximum beam of 145 feet and a minimum water depth at Mean Lower Low Water (MLLW) of 60 feet. The wharf deck consists of a concrete 32-foot-wide by 72-foot-long loading platform, supported by steel pipe piles. Two mooring dolphins and one breasting dolphin are located on both the east and west sides of the loading platform, and all dolphins are constructed with concrete decks supported by battered steel pipe piles. The wharf connects to land via a 260-foot-long concrete decked trestle with a 12-foot-wide access road and sidled with a 15-foot-wide pipe rack along the west side of the roadway. The trestle is also supported by steel pipe piles.

Shore is required to perform ongoing maintenance, repairs, replacements, seismic upgrades, and in some cases removal operations at the MOT to keep the Terminal's pipelines and associated facilities in compliance with current engineering and safety codes, including the Marine Oil Terminal Engineering and Maintenance Standards (MOTEMS), which are codified in the California Building Code, Chapter 31F – Marine Oil Terminals (24 CCR § 3101F *et seq*.). The Project includes implementing future maintenance and MOTEMS compliance activities as needed at the MOT through the year 2036.

ORGANIZATION OF FINAL EIR

Consistent with State CEQA Guidelines section 15132, the Final EIR consists of the following elements:

- Preface (Section I);
- Comments and Responses to Comments received on the Draft EIR, including a list of persons, organizations, and public agencies that commented on the Draft EIR (Section II); and
- Revisions to the Draft EIR and any other information added to the EIR by the CSLC as Lead Agency (Section III).

DECISION-MAKING PROCESS

The State CEQA Guidelines stipulate that an EIR must be prepared for any project that may have a significant impact on the environment. The CSLC has determined that: (1) the Shore Marine Oil Terminal Lease Project is a "project" as defined by the Guidelines; (2) the Project may have a significant adverse impact on the environment; and (3) an EIR is required. The CSLC will use this Final EIR as part of its approval process, including determining whether or not to issue a lease of State lands for continued operation of the Shore MOT. If the EIR is certified and the Project approved, the CSLC will set the conditions of the lease agreement and incorporate mitigation measures for Project implementation. The CSLC must certify that:

- The Final EIR has been completed in compliance with CEQA;

- The Final EIR was presented to the CSLC in a public meeting and the CSLC reviewed and considered the information contained in the Final EIR prior to considering the proposed Project; and
- The Final EIR reflects the CSLC's independent judgment and analysis (State CEQA Guidelines § 15090).

In conjunction with certification of the Final EIR, the CSLC must prepare one or more written findings of fact for each significant environmental impact identified in the document. These findings must either state that:

- The Project has been changed (including adoption of mitigation measures) to avoid or substantially reduce the magnitude of the impact;
- Changes to the Project are within another agency's jurisdiction and have been or should be adopted; or
- Specific considerations make mitigation measures or alternatives infeasible.

If any impacts identified in the EIR cannot be reduced to a level that is less than significant, the CSLC may issue a Statement of Overriding Considerations for Project approval if specific social, economic, or other factors justify the Project's unavoidable adverse environmental effects. If the CSLC approves a project for which a Final EIR has been prepared and certified, the CSLC will issue a Notice of Determination.

The CSLC's Marine Facilities Division staff is also responsible for ensuring that Shore is in compliance with the following requirements.

- CSLC Marine Terminal Oil Pipelines regulations (2 CCR § 2560 *et seq*.). The CCR section 2560(b) states in part that the purpose of the CSLC regulations is "to provide the best achievable protection of the public health and safety and of the environment by using the best achievable technology in providing for marine terminal oil pipeline integrity."
- MOTEMS (24 CCR § 3101F *et seq*.). The MOTEMS, which became effective on February 6, 2006, apply to all existing and new marine oil terminals in California, and include criteria for inspection, structural analysis and design, mooring and berthing, geotechnical considerations, and analysis and review of the fire, piping, mechanical, and electrical systems. MOTEMS require each marine oil terminal to conduct an audit to determine the level of compliance and an evaluation of the continuing fitness-for-purpose of the facility. The existing facilities, and any future maintenance, repair, fender system upgrades, seismic upgrades, and replacement activities, are currently subject to existing, or may be subject to new, permits, approvals, and regulatory requirements.
- California Marine Invasive Species Act (MISA). Vessels over 300 gross registered tons and capable of carrying ballast water must meet MISA ballast water management and reporting requirements and vessel biofouling management and reporting requirements.

Other agencies that have regulations or inspection requirements or that have granted existing, or may grant new, permits and approvals, include:

- Bay Area Air Quality Management District (BAAQMD);
- California Department of Fish and Game (CDFG), Office of Spill Prevention and Response (OSPR);
- Contra Costa County Public Works Department;
- San Francisco Bay Conservation and Development Commission (BCDC);
- San Francisco Bay Regional Water Quality Control Board (SFBRWQCB);
- State Fire Marshal;
- U.S. Army Corps of Engineers (ACOE); and
- U.S. Coast Guard (USCG).

Examples of permits and approvals that may be required include the BAAQMD's Major Facility Review Permit (air quality) for MOT facilities, and a USCG "Certificate of Adequacy" as an oily waste reception facility.

PROJECT CEQA CHRONOLOGY

The following is a brief chronology of the CEQA review process associated with the proposed Project (see also EIR Section 1.3, Public Review and Comment).

November 28, 2007. Notice of Preparation (NOP) published. (The environmental setting existing at the time the NOP is published normally constitutes the baseline physical conditions by which a Lead Agency determines whether an impact is significant [State CEQA Guidelines § 15125(a)].)

January 10, 2008. Two scoping meetings held in the city of Martinez, California.

January 25, 2010 – March 11, 2010. Draft EIR released for 45-day public review with comments accepted by mail, email, facsimile transmission, and in person at two public meetings. Three written comments were received, two during the public review period and one after the close of the public review period.

February 17, 2010. Public meetings on Draft EIR held at 3:30 and 5:30 p.m. At these meetings, the public and agencies had the opportunity to ask questions about, and present oral and/or written testimony on, the Draft EIR and its contents. No one provided comments at the public meetings.

March 2010 – December 2011. In preparing this Final EIR, the CSLC staff responded to all comments received, obtained additional information as needed to respond to comments, and revised the Draft EIR (see Final EIR Sections II and III). The CSLC hearing on the Final EIR and action on the proposed Project are tentatively scheduled for early 2012.

California State Lands Commission

SECTION II – RESPONSES TO COMMENTS

Final Environmental Impact Report for the Shore Marine Oil Terminal Lease Project, January 2012

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II. RESPONSES TO COMMENTS

Pursuant to State California Environmental Quality Act (CEQA) Guidelines section 15088, the California State Lands Commission (CSLC), as CEQA Lead Agency, is required to evaluate comments on environmental issues received from persons who reviewed the Draft Environmental Impact Report (EIR) prepared for the Shore Marine Oil Terminal Lease Project (Project) and to prepare a written response. The Lead Agency must respond to comments received during the noticed comment period and any extensions and may respond to late comments.

The State CEQA Guidelines further require the Lead Agency to describe in its written response the disposition of significant environmental issues raised (e.g., revisions to the proposed Project to mitigate anticipated impacts or objections). In particular, the major environmental issues raised when the Lead Agency's position varies from recommendations and objections raised in the comments must be addressed in detail giving reasons why any specific comments and suggestions were not accepted.

Three written comment sets were submitted on the Draft EIR. No oral comments were made at either of the two public meetings on the Draft EIR held on February 17, 2010. Each comment received is given a unique identification (ID) number (see Table II-1).

- Each commenter is given a unique comment code that refers to the agency, organization, or person submitting the comment.
- Individual comments are numbered in the margins of each comment letter and/or meeting transcript; correspondingly numbered responses follow each comment letter.

Section II contains both the original comment letters and the CSLC's Responses to Comments. In addition, Section III of this Final EIR contains revisions to the text of the Draft EIR that were made in response to comments received and to include new information that has come to light since publication of the Draft EIR in January 2010.

Table II-1 Commenters on Draft EIR and Comment Identification Numbers Used in this Final EIR

Category	Comment Set	Name of Commenter	Date of Comment	Comment ID
Agency	1	Linda Scourtis, Bay Conservation and Development Commission	3/10/2010	1-1 to 1-5
Applicant	2	Chad Edinger, Shore Terminals LLC	3/8/2010	2-1
	3	John Roller, Shore Terminals LLC	7/23/2010	3-1 to 3-14

COMMENT SET 1

Making San Francisco Bay Better

March 10, 2010

Mary Ann Hadden
California State Lands Commission
100 Howe Street, Suite 100-South
Sacramento, CA 95825

SUBJECT: Draft Environmental Impact Report for the Shore Marine Oil Terminal Lease Project; CSLC EIR No. 744; SCH#: 2007112108
BCDC Inquiry File # CC.RD.6614.4; BCDC Permit File No. 17-79

Dear Ms. Hadden:

Thank you for the opportunity to comment on the Draft Environmental Impact Report for the Shore Marine Terminal Lease Project (DEIR). Although the San Francisco Bay Conservation and Development Commission (Commission or BCDC) has not reviewed the document, the following are staff comments based on our review of the DEIR in the context of the Commission's authority under the McAteer-Petris Act (California Government Code Sections 66600 et seq.) and the federal Coastal Zone Management Act. The Commission's San Francisco Bay Plan ("Bay Plan") contains policies on Bay natural resources as well as policies on uses of the Bay and shoreline, including fill for water-related development and public access, and navigational safety and oil spill prevention. 1-1

The Commission also designates certain shoreline areas for uses that must be located on the waterfront, such as ports and other water-related industrial uses, to avoid potential filling of the Bay to accommodate water-related uses where the waterfront has been developed for uses not necessary to be at the water's edge. The Shore marine oil terminal represents a designated use and is located within a water-related industry priority use area as shown on Bay Plan Map 3. The proposed lease extension applies to an approximate 10-acre area of tide and submerged lands that include the terminal's wharf.

The DEIR studies potential impacts related to extending Shore's lease with the State Lands Commission (CSLC) for the wharf portion of the facility until 2036. As described in the DEIR, no expansion of marine terminal operations is expected to occur during this period, therefore the document assesses potential environmental impacts associated with continued operations, focusing on possible spills and their impacts to natural resources that could result during the transfer of petroleum products at the terminal. BCDC works closely with OSPR, the USCG, CSLC-MFD and other agencies to reduce the risk of petroleum spills in the Bay, and also in planning for response to spills that should occur, and is therefore pleased to see the DEIR present a number of mitigation measures to prevent spills at the terminal. The document also characterizes the on-site capability to respond to a spill up to 50 barrels, or 2100 gallons, as well as the required arrangement with a professional spill removal organization for a spill greater than 50 barrels, measures reflected in the required Oil Spill Response Plan for the terminal. 1-2

State of California • SAN FRANCISCO BAY CONSERVATION AND DEVELOPMENT COMMISSION • Arnold Schwarzenegger, Governor
50 California Street, Suite 2600 • San Francisco, California 94111 • (415) 352-3600 • Fax: (415) 352-3606 • info@bcdc.ca.gov • www.bcdc.ca.gov

Mary Ann Hadden
March 10, 2010
Page 2

A response to a comment made by staff on the NOP for the DEIR states the proposed project will not involve any action in the Bay or along the shoreline that would require a permit from the Commission, nor will it affect existing public access to the Bay and shoreline. If, however, in meeting the requirements of the Marine Oil Terminal Engineering and Maintenance Standards (MOTEMS), measures are proposed that could constitute development on the shoreline, or fill or dredging in the Bay, it would be advisable for Shore Terminals to contact our Chief of Permits, Bob Batha, at their earliest convenience. Developed by CSLC-MFD, MOTEMS criteria cover a number of areas, including seismic standards, which will further reduce the risk of spills into the Bay. **1-3**

In its discussion of potential effects of sea level rise to the wharf's mooring system, the DEIR states that based both on the historical record in the Bay and future estimates used by BCDC, the predicted rise in water levels over the lease period would not significantly affect terminal operations over the next 30 years, provided the same mooring conditions (vessel and environmental conditions) continue. The DEIR further states sea level rise will be assessed again at the time of the next lease extension request. It is important also to consider water level rise created by storm surge, El Nino events, high tide, etc., in concurrence with increasing eustatic sea level, the rate of which has been shown to increase significantly in the last approximately 15 year period over previous decades. **1-4**

Please note that the Commission's sea level scenarios referenced by the DEIR are consistent with the findings of the state Climate Action Team (CAT), initiated in response to Executive Order S-05-05 signed by Governor Schwarzenegger, which mandates the preparation of biennial science assessment reports on climate change impacts and adaptation options for California (www.climatechange.ca.gov/climate_action_team/reports/). Additionally, for your reference, we have included a copy of BCDC's map depicting shoreline areas vulnerable to sea level rise in the San Pablo Bay/Carquinez Strait area. **1-5**

If you should have any questions, please do not hesitate to contact me at 415.352-3644 or lindas@bcdc.ca.gov. Thank you again for the opportunity to review the DEIR for the proposed lease extension.

Sincerely,

Linda Scourtis

LINDA SCOURTIS
Coastal Planner

Enc.
BCDC File: Oil Spill Program Correspondence

San Francisco Bay
Conservation and Development Commission

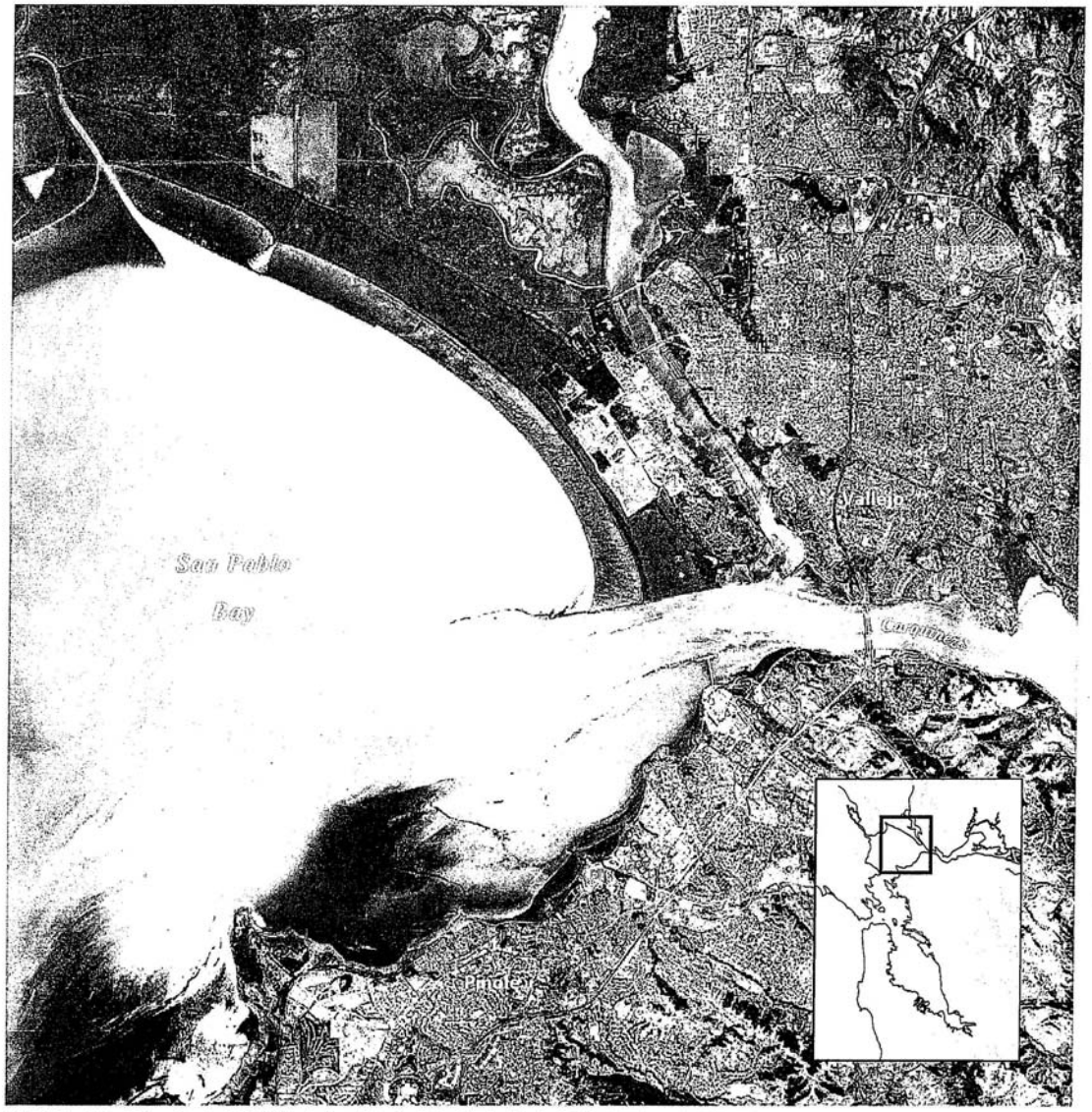
SHORELINE AREAS VULNERABLE TO SEA LEVEL RISE: SAN PABLO BAY/ CARQUINEZ STRAIT

Area vulnerable to an approximate 16 inch sea level rise

Area vulnerable to an approximate 55 inch sea level rise

0 1.5 3 MILES

NORTH



SOURCE: Inundation data from Knowles, 2008. Additional salt pond elevation data by Siegel and Bachand, 2002. Aerial imagery is NAIP 2005 data.

DISCLAIMER: Inundation data does not account for existing shoreline protection or wave activity. These maps are for informational purposes only. Users, by their use, agree to hold harmless and blameless the State of California and its representatives and its agents for any liability associated with its use in any form. The maps and data shall not be used to assess actual coastal hazards, insurance requirements, or property values or be used in lieu of Flood Insurance Rate Maps issued by the Federal Emergency Management Agency (FEMA).

RESPONSE TO COMMENT SET 1: BAY CONSERVATION AND DEVELOPMENT COMMISSION

1-1 The Bay Conservation and Development Commission's (BCDC's) authority and the purpose and policies of the San Francisco Bay Plan are acknowledged. The existing Shore Marine Oil Terminal (MOT) is a designated use, located within a water-related industry priority use area.

1-2 The comment accurately describes the proposed Project.

1-3 If Marine Oil Terminal Engineering and Maintenance Standards (MOTEMS) measures are subsequently identified which could constitute development on the shoreline or which could result in fill or dredging in the Bay, Shore will contact BCDC's Director of Permits.

1-4 Storm surge and sea level rise during the lease period combined with storm surge are potential concerns and are addressed in the Final Environmental Impact Report (EIR) in Section 4.11.1 on page 4.11-10. However, the amount of this potential increase in storm surge is unknown and not likely to be predictable. Shore's wharf operations already have in place procedures, in its existing Wharf Operations manual, to address berthing and transfer operations at the wharf during storm surge (as well as high wind and fast currents) conditions. Section 3103F.5.3.4 of the MOTEMS also requires that each MOT consider the predicted sea level rise over the remaining life of a terminal. Shore has and will continue to consider sea level rise in terminal assessments. Given that these existing procedures address these conditions of concern, no change in these procedures would be likely even with potential increases to storm surge, and correspondingly no change is needed to the Draft EIR.

1-5 The sea level scenarios described in the Draft EIR are consistent with the findings of the State Climate Action Team. The commenter included BCDC's map which depicts shoreline areas that may be vulnerable to sea level rise in the San Pablo Bay / Carquinez Strait area. The sea level scenarios described in the Draft EIR are also consistent with this map.

COMMENT SET 2

8 March 2010

Mary Ann Hadden
California State Lands Commission
100 Howe St, Suite 100-South
Sacramento, CA 95825

SUBJECT: Notice of Public Comment for Draft Environmental Report
For Marine Terminal Lease Extension to Shore Terminals LLC, a NuStar Energy, L.P. company; Document ID CSLC EIR #744; State Clearinghouse #2007112108

Dear Ms Hadden:

In regards to the DEIR for the Shore Terminals LLC lease renewal project, there had been verbal discussions between Shore and the Agency that the draft EIR would address in the cumulative projects section two other projects in the area. These would include 1) the pending site remediation project under development by the 'Selby Group' on the slag site, and 2) the ethanol rail relocation project currently under development by Shore Terminals. No mention is made of these in the cumulative project section. Has the DEIR found any potential impacts of these projects to be material or have they been deemed a negative declaration? Please don't hesitate to contact me with any questions or clarifications in regards to the intent of the comment. **2-1**

Thank you,

Chad Edinger
Shore Terminals LLC

RESPONSE TO COMMENT SET 2: SHORE TERMINALS LLC

2-1 The Draft Environmental Impact Report (EIR) does not identify either the pending site remediation project on the Selby slag site or the ethanol rail relocation currently under development (by Shore) in the cumulative project list and associated analysis. These projects were not included in the cumulative analysis list for the Draft EIR because they did not meet any of the criteria on page 3-11 of the Draft EIR at the time the Notice of Preparation (NOP) was published (November 28, 2007). The California State Lands Commission was not aware of any applications for these two proposed projects filed with any agency at the time of preparation of this document and, therefore, could not determine the level of review under the California Environmental Quality Act (CEQA) required for these projects, e.g., a Negative Declaration or EIR. From a cumulative impact perspective, the inclusion of these two projects into the environmental review of this lease project would not appear to introduce any new effect and it is unlikely that the new Shore lease would have any cumulatively significant impact on either of these two proposed projects. Such a determination would be speculative given the very limited amount of information available on these proposed projects.

Comment Set 3

NuStar Energy
2368 Maritime Dr.
Suite 275
Elk Grove, CA 95758

July 23, 2010

Sarah Mongano
California St. Lands Commission
100 Howe Ave,
Suite 100-South
Sacramento, CA 95825

California State Lands Commission

Subject: *Proposed Mitigation Monitoring Alternatives for the NuStar Selby Marine Terminal Lease Renewal EIR*

Dear Sarah;

NuStar Energy, L.P. (NuStar) would like to submit the following comments regarding the proposed Mitigation Monitoring Alternatives as part of the NuStar Selby Marine Terminal Lease Renewal Draft EIR dated January 2010.

OS-1 of Table 7-2 identifies a risk of accidental spill with the following three suggested mitigation measures:

- MM OS-1a - Installation of tension monitoring devices to avoid excessive tension or slack conditions that could result in spills,
- MM OS-1b - Installation of an Allision Avoidance System (AAS) to prevent damage to the wharf and/or vessel during docking operations, and
- MM OS-1c – Replacement of existing loading arms to limit spill volume in the event of loading arm break-away.

The draft EIR was completed in January 2010, prior to completion and submittal of NuStar's Initial Audit required under the California Code of Regulations, Title 24, Part 2, Chapter 31F, commonly known as the Marine Oil Terminal Engineering and Maintenance Standards (MOTEMS). That audit and mitigation actions taken and planned as a result of that audit mitigate the risk stated in OS-1 of Table 7-2, and duplicate the intent of the specific mitigations listed above. The MOTEMS Initial Audit has been prepared by Professional Engineers under the strict 3-1

July 23, 2010
Page 2

regulations of MOTEMS and reviewed by the Marine Facilities Division (MFD) of the California State Lands Commission (CSLC).

Because of the level of expertise expended on the MOTEMS audit, the regulations used, and the review by MFD, NuStar feels very strongly that the mitigations resulting from the MOTEMS audit that NuStar will implement provide an equal or better level of protection of the public health, safety, and environment than the mitigations recommended in the Draft EIR. 3-1 cont.

Specifically, Mitigations MM OS-1a and MM OS-1c attempt to address the concern of accidental spill due to break away of the vessel while moored to the dock. This particular scenario has already been studied by Halcrow on behalf of the terminal in a September 18, 2009 Fire Risk and Hazard Assessment, which is included in the MOTEMS Initial Audit. The primary safeguard to mitigate this risk was the establishment and implementation of Terminal Operating Limits (TOLs) for all vessels operating at the terminal. Mooring analyses were conducted for all vessel types likely to call on the facility to establish the maximum wind and current velocities that can be safely supported by the marine structures and vessel lines in accordance with MOTEMS. Both an anemometer and a current velocity meter have been installed at the site and the readouts from these devices are available for the terminal operator to monitor. If either the wind or current speeds approach the established limits of the terminal, the operator can immediately terminate transfer operations, immediately reducing the volume of petroleum product at risk of spill. The operator may also order disconnect of all transfer lines, practically eliminating the risk of spill due to vessel breakaway. Although the terminal is not considered a high risk for passing vessel effects by MOTEMS, operating procedures are in place to discontinue transfers if passing vessels come too close or pass too quickly past the terminal. NuStar and Halcrow believe that these procedures provide the most effective mitigation for addressing the risk of spill caused by vessel breakaway. 3-2 3-3

NuStar and Halcrow do not think the installation of tension monitoring devices as stated in Mitigation MM OS-1a provides more effective mitigation than active monitoring of environmental conditions. First, the maintenance of vessel lines and monitoring is the responsibility of the vessel captain. The terminal operator can communicate a concern to the captain, but it is the captain's discretion as to what action is taken. Thus, even knowing if the lines are nearing their load limits does not guarantee appropriate action. In addition, it must be recognized that even with this effort, not all the lines would be monitored as the uninstrumented bollards would still be in use. Only monitoring half the lines is not an effective safeguard for line breakage and is clearly an inferior mitigation to those already implemented and planned as a result of the MOTEMS audit. 3-4 3-5 3-6

Mitigation MM OS-1c also deals with the risk of vessel breakaway by replacing the loading arms. We do not believe replacing the existing loading arms with new arms for the sole purpose of addressing the risk of vessel breakaway is an effective mitigation. If properly maintained, the 3-7 3-8

July 23, 2010
Page 3

existing loading arms still have reasonable service life to safely operate. The existing loading arms are MOTEMS compliant. The existing envelope of loading arm reach and motion is well beyond the vessel movements (surge, sway, and change in draft) allowed by the TOLs. We believe that monitoring the TOLs so that the arms are operated within their operating envelopes, which is a mitigation resulting from the MOTEMS audit, clearly provides an equal or better level of protection as an unnecessary and premature replacement of the loading arms. 3-8 cont. 3-9 3-10

Mitigation MM OS-1b involves installation of allision avoidance equipment for berthing operations and other vessel monitoring equipment associated with tension monitoring already discussed above. Allision avoidance will not minimize the risk of spill associated with transfer operations as the vessel is not connected to the terminal during berthing. Allision avoidance is useful in protecting structures with relatively low berthing capacity. However, the Selby terminal is MOTEMS compliant for berthing operation as long as the TOLs are followed. There is no requirement of velocity monitoring for this terminal using the MOTEMS criteria. The other mitigations listed in MM OS-1b all require the installation of tension monitoring devices and do not provide any greater safety than the active monitoring of environmental conditions in conjunction with the MOTEMS-compliant TOLs. 3-11 3-12 3-13

In summary, we believe that risk OS-1 has been mitigated by the implementation of the MOTEMS audit mitigations, which has already been done under the review of the CSLC MFD, and those mitigations provide an equal or superior level of protection of the public health, safety, and environment than the mitigations recommended in the Draft EIR. As such, Mitigations MM OS-1a, MM OS-1b, and MM OS-1c are inappropriate and unnecessary and should be removed from the EIR. An appropriate Mitigation would be to comply with MOTEMS. 3-14

If you have any questions or concerns regarding the contents of this letter, please feel free to contact me directly.

Very truly yours,

John A. Roller

John A. Roller
Vice President & General Manager, West Operations

Cc
Chad Edinger
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RESPONSE TO COMMENT SET 3: SHORE TERMINALS LLC

3-1 The California State Lands Commission (CSLC), through its Marine Facilities Division (MFD), is the adopting and enforcing agency for the California Code of Regulations, Title 24, Part 2, Chapter 31F, commonly referred to as the Marine Oil Terminal Engineering and Maintenance Standards (MOTEMS), which became effective February 6, 2006. As stated in MOTEMS section 3101F.2:

> *"The purpose of this Code is to establish minimum engineering, inspection and maintenance criteria for MOTs in order to prevent oil spills and to protect public health, safety and the environment"* (emphasis added).

To achieve these objectives, MOTEMS requires routine audits and inspections of all marine oil terminals (MOTs) in California to be conducted by Professional Engineers where appropriate, and includes assessment of the integrity and adequacy of the following physical and operational conditions at the facility: structural, seismic, mooring, berthing, geotechnical, fire prevention/detection/ suppression, piping and pipelines, mechanical and electrical equipment, and electrical system.

The Shore MOTEMS Audit actions currently do not completely mitigate the risk of accidental product spill at this terminal, nor do they duplicate Mitigation Measures (MMs) OS-1a through 1d.

Shore is currently considered a MOTEMS "medium" risk terminal in accordance with the MOTEMS oil spill risk classification system (MOTEMS § 3104F.1.3). Shore submitted its MOTEMS Initial Audit in February 2010 as required. For existing MOTs, this risk classification is assessed as a function of the maximum vessel size, number of transfers per year per berthing system, and volume of exposed oil during transfer. However, extreme environmental conditions and history of past incidents are not accounted for in the MOTEMS risk classification.

In order to reduce its product spill risk classification from "high" to "medium", Shore installed four new motor-operated valves (MOVs) on its product pipelines onshore in 2008. Shore submitted documentation to justify reduced exposed product volumes below 1,200 barrels (bbls). These new MOVs may reduce the volume of product spilled into the water during an incident (dependent on operator response time), but they do not reduce the risk of accidental spills occurring.

Furthermore, Shore is working to implement Terminal Operating Limits based on its MOTEMS mooring and berthing assessments as required by the regulations, including installation of environmental monitoring equipment such as an anemometer and current meter.

However, monitoring Terminal Operating Limits alone will not provide *"equal or better level of protection of the public health, safety, and the environment"* than the addition of integrated monitoring systems and equipment as outlined in MMs OS-1a through OS-1d. Details of this justification are provided in CSLC's responses below.

Therefore, MOTEMS establish *"minimum engineering, inspection and maintenance criteria for MOTs in order to prevent oil spills and to protect public health, safety and the environment"* (emphasis added), and the Shore MOT has extreme environmental conditions and an accidental product spill history that are not fully addressed by the MOTEMS regulations.

3-2 The commenter is correct that the wind and current velocity and angle Terminal Operating Limits established for the MOT should be monitored, and if these limits are reached, the operator should immediately take the appropriate action of ceasing transfer operations, disconnecting the loading arms, and/or requiring the vessel to depart the terminal. However, the wind and current Terminal Operating Limits are established based on the results of the mooring analyses, which assume that the mooring lines are properly tended. This is not always the case, and without tension-monitoring devices, the terminal personnel may be unaware of an impending incident.

Furthermore, if severe wind and/or current conditions occur, it takes significantly more time for the operator to manually stop the transfer and disconnect the existing flanged loading arm(s) than it would to automatically activate the emergency release system on a new loading arm and instantaneously stop the transfer and quickly disconnect the arm. The latter option significantly reduces the risk of product spill and risk of injury to the operator.

3-3 Shore reported that consideration of passing vessel effects is not required for this facility, but Shore has adopted operating procedures. The 2010 MOTEMS Audit Terminal Operating Limits diagrams state: *"Stop operations if a vessel > 250 ft LOA (length overall) is within 300 ft offset of vessel at berth for ¼ mile up or downstream of facility."* CSLC staff does not believe that Shore can implement these procedures without instrumentation and procedures to monitor the distance, location, and characteristics of passing vessels.

This technology is available as part of an Allision Avoidance System (AAS) package. Furthermore, the CSLC staff believes that passing vessel effects were partially to blame for the February 20, 1997, incident that resulted in the tanker *Overseas Philadelphia* breaking its moorings and drifting away from the wharf.

3-4 Active monitoring of the Terminal Operating Limits and environmental conditions alone is not as effective as additionally monitoring mooring line tensions. In mooring analyses, the vessel mooring lines are modeled with pre-tensioning to represent safe line tending practices and remain equally tensioned throughout

the analysis. In reality, the pre-tension of each mooring line will constantly vary, and the only way to measure safe limits on these lines is through tension-monitoring devices. If mooring lines are not tended properly during mooring operations, an incident may occur in which the vessel's drifts (surge and sway) exceed their limits, mooring lines are overstressed or go slack, and ultimately, the vessel may break away. This is what occurred in 1997, when the *Overseas Philadelphia* mooring lines unzipped (or broke one at a time down the line due to overstressing and load transfer from the other lines) and the vessel broke away from the Shore Selby Terminal.

Simply monitoring the environmental conditions will not ensure proper line tending, or warn the terminal operator of improper line tending. While visible signs such as slack mooring lines or excessive vessel drift may indicate improper line tending, this is not always the case and the true tension in the line is important.

Ultimately, to moor a vessel and conduct product transfer operations safely, the terminal-to-vessel connections must be adequate. Two systems physically connect the vessel to the terminal, the loading arms and the mooring lines. While active monitoring of environmental conditions is very useful in anticipating if the environmental conditions are creating a severe operating situation, it does not account for mooring line tending.

3-5 The comment provides that the *"maintenance of vessel lines and monitoring is the responsibility of the vessel captain."* However, the safe operation of the MOT is Shore's responsibility, including the ability to stop product transfer operations at any time or turn a vessel away that is not found to comply with the terminal standards. If the terminal operator does not have tension-monitoring devices, then the operator is left uninformed of the line tensions and possible dangers at the wharf.

3-6 The commenter is correct in stating that: *"only monitoring half the lines is not an effective safeguard for line breakage."* While MM OS-1a does not specify the exact equipment required for successful completion, it is intended that best industry practices, and in this case best engineering practices, should be carried out in implementing mitigation measures. Therefore, CSLC staff expects that Shore would replace all bollards with quick-release mooring hook assemblies (see MM OS-1d) affixed with tension-monitoring devices to comply with MM OS-1a. In installing new mooring hooks at the terminal, MOTEMS regulations must be followed, including MOTEMS section 3103F.10.1 which states that: *"Only one mooring line shall be placed on each quick release hook."*

3-7 Marine loading arms with emergency release systems and quick-disconnect couplers are able to automatically stop product transfer, release the loading arms, and allow for safe isolation between the terminal and vessel with minimal

product spillage of approximately less than 1 gallon per line. This spillage is typically confined to the vessel's deck.

During the 1997 *Overseas Philadelphia* breakaway from the MOT, the two loading arms were ripped off of the wharf deck and approximately 10 barrels (approximately 42 gallons) of product were reported to have spilled into the water. Fortunately, no cargo transfer operations were in progress at the time of the accident, which limited the product spilled to the content of the loading arms. Emergency release systems would limit damage in a future incident such as this.

Therefore, new loading arms with emergency quick-release systems and quick-disconnect couplers in accordance with the MOTEMS are desirable technologies and a feasible mitigation measure to prevent significant product spillage and loading arm damage during excessive vessel drift or a vessel breakaway incident.

3-8 The existing loading arms may have service life remaining if properly maintained. However, "properly maintained" loading arms can fail and spill product if their operating envelope limits are exceeded.

3-9 The two existing loading arms at the wharf are reported to be MOTEMS compliant in their MOTEMS Audit. However, as emphasized previously, MOTEMS establishes only *"minimum engineering, inspection and maintenance criteria for MOTs in order to prevent oil spills and to protect public health, safety and the environment"* (emphasis added). These minimum standards are more lenient for existing MOTs, but MOTEMS section 3110F.2.2.1 Item #3 requires that: *"In high velocity current (> 1.5 knots) areas, all new marine loading arms shall be fitted with quick disconnect couplers and emergency quick release systems."* This technology provides safe disconnect and isolation between the shore and vessel with minimal spillage, and is a feasible mitigation measure.

3-10 The operating envelope of the existing loading arms is reported to be greater than the displacement limits permitted in the MOTEMS mooring analyses computed to create the Terminal Operating Limits. However, this claim cannot be verified by CSLC, as it must be assessed on a case-by-case basis for vessels calling at the terminal. The CSLC is aware that the MOT already approaches, if not reaches, these loading arm limits for large vessel transfers.

In the 2010 MOTEMS Audit, section 10 Checklist, Item 10.2.9 also states: *"The [marine loading] arms do not have automatic envelope limit sensors / overtravel alarms, but has graphic indicators on the counterweight arm wheel showing the wheel position that is associated with the envelope limits."* Since Shore's Wharf Operations Manual requires only one employee to be at the wharf during transfer operations, these graphical indicators may be difficult to monitor at all times, and concurrently with all other Terminal Operating Limits and operations. Again, the minimum standards are more lenient for existing MOTs, but MOTEMS section 3110F.2.2.1 Item #4 recognizes safer and more reliable technology by requiring

that for new loading arms: *"Out-of-limit, balance and the approach of out-of-limit alarms shall be located at or near the loading arm console."*

Therefore, following the Terminal Operating Limits established by the MOTEMS alone does not provide adequate safeguards against exceeding the loading arm operating limits. New loading arms including alarm systems are warranted, and is a feasible mitigation measure.

3-11 An AAS will not minimize the risk of spill during berthing due to rupture of the loading arm connections, because transfer operations do not take place until the vessel is moored. An AAS is primarily used to monitor and prevent damage to the MOT and vessel during berthing operations. However, when the AAS is set in drift mode after a vessel has berthed and may conduct transfer operations, components of an integrated AAS can be used to automatically monitor passing vessels and their effects on the moored vessel, vessel displacements (both surge and sway), and the environmental conditions established in the Terminal Operating Limits. Therefore, the full capabilities of an AAS should be utilized and integrated with the other monitoring equipment to ensure safe operations at the terminal and prevent product spills.

3-12 Velocity monitoring equipment may be required at the Shore Selby Terminal for MOTEMS compliance. MOTEMS section 3103F.6.7 provides guidelines for assessing the adequacy of a berthing system based on site conditions, terminal capacity, vessel characteristics, berthing velocities and angles, and states: *"Subject to Division approval, if an existing MOT can demonstrate lower velocities by velocity monitoring equipment, then such a velocity may be used."* Although the 2010 Shore Selby MOTEMS Initial Audit claims that velocity monitoring equipment is unnecessary if berthing operations are restricted when current velocities exceed 2.0 knots, Shore's analyses show that the berthing system is non-compliant in certain cases. Therefore, the Shore Selby Terminal may require velocity monitoring instrumentation to comply with the MOTEMS and to protect the wharf and vessel at reduced berthing velocities.

3-13 An integrated AAS and Tension-monitoring System provides greater safety during terminal operations than only monitoring environmental conditions in conjunction with MOTEMS-compliant Terminal Operating Limits. In addition to the greater safety provided by monitoring the mooring lines as discussed in Response 3-4, automated and alarmed monitoring systems significantly reduce the chance of accidents due to operator error in watching all of the Shore Selby Terminal Operating Limits. The terminal operator is not only responsible for the transfer operation procedures, but also for monitoring all of the Terminal Operating Limits, not just the environmental conditions. These Terminal Operating Limits, which include wind and current velocities and angles, vessel drift, vessel mooring line tension/slack, loading arm limits, and passing vessels, must be monitored concurrently at all times during transfer operations. All of the MOTEMS-compliant Terminal Operating Limits may not be effectively monitored by terminal personnel

without the aid of automated instrumentation and alarms. Furthermore, if an incident does occur, the data recorded from these systems can be analyzed to determine the cause of the incident and how to avoid it in the future.

3-14 See Response 3-1, above.

California State Lands Commission

SECTION III – REVISIONS TO DRAFT EIR

Final Environmental Impact Report for the Shore Marine Oil Terminal Lease Project, January 2012

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EXECUTIVE SUMMARY

The staff of the California State Lands Commission (CSLC) has prepared this Environmental Impact Report (EIR) for the Shore Marine Oil Terminal Lease Project (Project), as proposed by Shore Terminals LLC (a NuStar Energy Company), in accordance with the California Environmental Quality Act (CEQA). The CSLC is the Lead Agency for CEQA compliance in the preparation of this EIR. This EIR is meant to inform the public and permitting agencies about the potential adverse and beneficial environmental impacts of the proposed Project and its alternatives. Additionally, mitigation measures are recommended that would reduce any significant adverse impacts associated with the Project to the maximum extent possible and, where feasible, to a less-than-significant level.

PROJECT OBJECTIVES, PURPOSE AND NEED

Shore Terminals LLC (Shore, aka NuStar, or Selby) has identified the following objectives and purposes for the proposed Shore Marine Oil Terminal Lease Project:

- Provide product loading/unloading services for oil companies, distributors, and brokers in the San Francisco Bay, Sacramento, and Northern California region;
- Safely moor barge vessels and tank ships to transfer petroleum products to and from storage;
- Operate the Marine Oil Terminal (MOT) in a safe, efficient, environmentally sensitive, and cost-effective manner; and
- Remain a link in the logistic chain of associated refiners' inbound and outbound shipments on the west coast.

DESCRIPTION OF PROPOSED PROJECT

Shore proposes to continue operation of its ~~marine oil terminal (~~MOT~~)~~ located on the south shore of the Carquinez Strait, just west of the Carquinez Bridge in Contra Costa County, and seeks ~~California State Lands Commission (~~CSLC~~)~~ approval for a new 30-year lease of state-owned sovereign lands for the wharf portion of its facility. The current lease term ended December 21, 2006, and is in holdover status.[1]~~.~~ The new lease, if granted, would allow Shore to continue current transfer operations of petroleum

[1] Holdover status means that the MOT is continuing to operate under the terms of its existing lease while a decision on a new lease is pending. Shore's existing lease (PRC 5735.1) was issued to former owners, Wickland, in 1981 and assigned to Shore in 1998.

products from the wharf to its upland main terminal storage facility until 2036. Shore currently has no plans to expand either the operations or the equipment on the wharf. Shore's upland main terminal operations are separate from wharf operations, and are not part of the proposed lease. Since Shore does not ship crude oil through its MOT, crude oil shipments are also not part of the proposed Project.

The Shore MOT is also subject to the CSLC's Marine Oil Terminal Engineering and Maintenance Standards (MOTEMS), which are codified in the California Building Code, Chapter 31F – Marine Oil Terminals (California Code of Regulations [CCR], Title 24, § 3101F *et seq*.). The MOTEMS, which became effective on February 6, 2006, apply to all existing and new MOTs in California, and include criteria for inspection, structural analysis and design, mooring and berthing, geotechnical considerations, and analysis and review of the fire, piping, mechanical and electrical systems. The MOTEMS require that an audit be conducted for each MOT to determine the level of compliance and an evaluation of the continuing fitness-for-purpose of the facility. The existing facilities, and any future maintenance, repair, fender system upgrades, seismic upgrades, and replacement activities, are currently subject to existing, or may be subject to new, permits, approvals, and regulatory requirements. Shore submitted its MOTEMS Initial Audit to the CSLC in February 2010; subsequent Audits and Inspections will be required on a regularly scheduled basis.

ALTERNATIVES TO PROPOSED PROJECT

Alternatives to the proposed Project were selected based on the information received from Shore, the EIR study team, and the public and local jurisdictions during the EIR scoping period, which began on November 28, 2007, with the release by the CSLC of the Notice of Preparation (NOP) for this EIR. Potential alternatives were reviewed against a set of specific screening criteria as described in Section 3.0, Alternatives and Cumulative Projects. Alternatives were eliminated based on technical and regulatory infeasibility. Those alternatives that were found to be technically feasible and consistent with Shore's objectives were reviewed to determine if the alternative had the potential to reduce the significant environmental impacts of the proposed Project.

Two alternatives were evaluated in this EIR: the No Project Alternative and the Limitations on Terminal Use Alternative. Under the No Project Alternative, the upland terminal would continue to operate but product would no longer be delivered or shipped by marine vessel. According to Shore (2009), closing of the wharf would reduce the volume of products handled at the upland terminal substantially, by 40 percent of total volume handled. Some of this volume could be made up by increasing the volume of products transported to

and from the upland terminal via pipeline, tank truck, and/or railcar, but the existing capacity of those other transportation modes would fall far short of the volume needed to make up for the loss of marine vessel transportation with closure of the wharf. A substantial volume of petroleum products would therefore have to be diverted to other marine terminals in the region.

The Limitations on Terminal Use Alternative would place restrictions on the number, type, or size of marine vessels that would be allowed to call at the marine terminal, or restrictions on the type of product that could be loaded or unloaded.

ENVIRONMENTAL IMPACTS AND MITIGATION

The environmental impacts associated with the proposed Project are analyzed in this EIR using information provided by Shore, field investigations, comments received during scoping, literature searches, and contacts with Federal, tribal, State, and local agencies.

In the evaluation of each resource category and issue in the EIR, the environmental setting is described, followed by a discussion of the regulatory framework, identification of significance criteria or thresholds, identification of applicable Applicant Proposed Measures, and a description of potential environmental impacts and proposed mitigation, as needed. Within each issue area, each impact is described and classified as:

- **Class I** (significant adverse impact that remains significant after mitigation);
- **Class II** (significant adverse impact that can be eliminated or reduced below an issue's significance criteria);
- **Class III** (adverse impact that does not meet or exceed an issue's significance criteria); or
- **Class IV** (beneficial impact).

The State CEQA Guidelines section 15125(e) defines the environmental setting as "the physical environmental conditions in the vicinity of the Project, as they exist at the time the notice of preparation is published." The baseline condition for the proposed Project is the existing operations as of November 2007. The EIR also includes a program for reporting and monitoring the implementation of any mitigation measures identified to reduce potential Project-related significant impacts; a Mitigation Monitoring Program (MMP) is presented in EIR Section 7.0. Table ES-1 presents a summary of potential

impacts associated with the proposed Project and Project alternatives.[2] The following sections summarize the potentially significant impacts that would result due to the implementation of the proposed Project.

Operational Safety/Risk of Accidents

Spills of relatively low-volatility petroleum products (e.g., diesel and jet fuel) or large volumes of highly volatile products (e.g., gasoline) could reach the shore, potentially causing injury to members of the public (as stated above, Shore does not ship crude oil to or from its MOT). For spills of 50 barrels (2,100 gallons) or less, mitigation measures would lower the probability that a spill would occur and would reduce the consequence of a spill if it occurs to less than significant (Class II). The impacts to public health and safety associated with the potential consequences of a spill greater than 50 barrels would be significant and unavoidable (Class I). Cumulative impacts associated with spills of 50 barrels or less would be less than significant (Class II), whereas a spill greater than 50 barrels would be cumulatively significant and unavoidable (Class I).

Also, the potential for fires or explosions from loading of highly volatile products at the MOT would create a potentially significant impact to public health and safety. However, this impact can be reduced to less than significant (Class II) through the implementation of mitigation measures. Cumulative impacts to public health and safety from fires or explosions would also be less than significant (Class II).

Biological Resources

The introduction of non-native species into the Bay-Delta ecosystems can result in drastic, large-scale changes to the aquatic community. Approximately 100 species of non-indigenous ~~exotic~~ marine invertebrates have been introduced into San Francisco Bay over the past 130 years. ~~The principle~~ Principal mechanisms of introduction ~~has~~ have been biofouling, boring, and release of ballast-dwelling organisms. Introduced species include snails, shrimp, plankton, and crabs. In particular, the introduction of Asian clams -- *Corbula amurensis* and *Corbicula fluminea* -- has resulted in significant changes in native benthic infaunal communities in the western Delta and Sacramento and San Joaquin Rivers. The proposed Project would result in potential introduction of non-native species

[2] The original Table ES-1 in the Draft EIR has been deleted in its entirety from this Final EIR since it would needlessly duplicate the information in Section 7.0, Mitigation Monitoring Program. (This table summarized Project impacts and proposed mitigation measures, and was included in the Draft EIR so that the CSLC could submit a complete Executive Summary to the State Clearinghouse; however, information in Table ES-1 was repeated in Section 7.0.) Table ES-2 in the Draft EIR is now Table ES-1 in the Final EIR.

from ~~hull~~ vessel biofouling and ballast water discharge, even after application of mitigation measures. The potential for the introduction of a single non-native species from ~~hull~~ vessel biofouling and ballast water would be considered a significant impact (Class I).

The accidental release of refined petroleum products from the MOT has the potential to affect marine biota inhabiting or using Bay-Delta waters as well as all intertidal and subtidal habitats. Especially at risk are marine birds, marine mammals, intertidal and shallow subtidal communities, as well as special-status fish, bird, plant, and marine mammal species. The MOT has sufficient booms and deployment equipment on-site to contain small accidental releases that enter Bay-Delta waters. Depending on the time of year, spill volume, and tidal cycle, accidental releases of refined product could come into contact with both soft and hard substrate intertidal habitat in the Carquinez Strait and San Pablo Bay within hours of the release and before regional response capability could be on-site. Spill response measures that could be put in place quickly to prevent oiling of intertidal habitat or to recover and rehabilitate most at-risk taxa would reduce the overall impact to the Bay-Delta ecosystem (Class II). Large spills originating from tanker or barge incidents while in transit to the MOT would impact important and sensitive habitats with the San Francisco Bay-Delta, including critical fisheries habitat and protected species. Impacts would remain significant (Class I) even with implementation of the recommended mitigation measures. Cumulative impacts to biological resources associated with small and moderate spills of refined product at or near the MOT would be less than significant (Class II), whereas cumulative impacts from a major tanker or barge spill would be significant and unavoidable (Class I).

Commercial and Sport Fisheries

The accidental release of refined product from either the MOT or from product in-transit to or from the terminal has the potential to have a significant impact on the Bay-Delta, open coast ecosystems, and commercial or recreational fisheries. The severity of the impact is dependent on not only the material spilled and its toxicity to marine biota, but the volume of material released, the location of the release, the time of year the spill occurs, and the effectiveness of spill response and cleanup activities. The actual qualitative and quantitative effects, both direct and indirect, of an accidental release on either commercial or sport fishing in the Bay-Delta and open coast regions can be very localized for small spills or widespread for larger spills. Residual impacts following small and moderate spills of refined product at or near the MOT would be mitigated to less than significant (Class II). Residual impacts following a major tanker or barge spill would be significant and unavoidable (Class I). Cumulative impacts to commercial and

sport fisheries associated with small and moderate spills of refined product at or near the MOT would be less than significant (Class II), whereas cumulative impacts from a major tanker or barge spill would be significant and unavoidable (Class I).

Hydrology and Water Quality

Adverse water quality impacts could arise from organotin biocides in marine anti-fouling paints that may be used on vessels calling at the MOT. This impact would be mitigated to a less-than-significant level through the implementation of mitigation measures (Class II). Cumulative impacts to water quality from marine anti-fouling paint would not be cumulatively considerable and would thus be less than significant (Class II).

Discharge of ballast water that contains non-indigenous ~~exotic~~ or harmful microorganisms could impair several of the Bay-Delta's beneficial uses. Therefore discharge of segregated ballast water is determined to have a potentially significant impact to water quality (Class I). With currently feasible mitigation, which are informative measures only, this impact to water quality would remain significant (Class I). Although the MOT neither discharges nor handles any ballast water, and vessels that call at the MOT are required to comply with State provisions, compliance is not enough to ensure full mitigation of this potential impact. Therefore, the proposed Project's contribution to future introduction of viruses, toxic algae, or other harmful microorganisms to Bay-Delta waters would be cumulatively considerable, and significant cumulative impacts would occur (Class I) even with implementation of mitigation.

Land Use and Recreation

Release of relatively low-volatility petroleum products or large volumes of highly volatile products could disturb both sensitive shoreline lands and/or water and non-water recreation to the degree that the shoreline and recreational activity areas would be rendered temporarily unusable. The degree of disturbance would be determined by a multitude of factors, including spill size and location, the type of material spilled, prevailing winds and weather conditions, the sensitivity and vulnerability of the resource, response capability to the spill, and other factors. Potentially significant impacts on sensitive shoreline lands and/or water and non-water recreation could occur due to accidental spills of relatively low-volatility petroleum products or large accidental spills of highly volatile products. However, this impact can be reduced to less than significant (Class II) through the implementation of mitigation measures that would improve spill prevention and response capabilities and ensure that the potential impacts resulting from a spill are temporary and do not persist for an extended duration. Cumulative

impacts to sensitive shoreline lands and/or water and non-water recreation would also be less than significant (Class II).

Visual Resources/Light and Glare

Impacts resulting from a spill of petroleum products would have the potential to temporarily adversely alter or degrade the visual quality of Bay waters and the affected shoreline. The degree of impact would be determined by a multitude of factors, such as spill size, location, type of material spilled, wind conditions, currents, the vulnerability of the shoreline, and the effectiveness of early containment and cleanup efforts. In particular, degradation of visual resources could occur due to accidental spills of relatively low-volatility petroleum products or large accidental spills of highly volatile products. However, this impact can be reduced to less than significant (Class II) through the implementation of mitigation measures that would improve spill prevention and response capabilities and ensure that the potential impacts resulting from a spill are temporary and do not persist for an extended duration. Cumulative impacts to the visual quality of Bay waters and the affected shoreline would also be less than significant (Class II).

Geology, Soils, and Seismicity

Shore's MOTEMS Initial Audit indicated that two areas of potential pipeline failure exist at the MOT. The first could occur at the pipe connections to the loading arms on the wharf, and the second could occur at the point where the pipelines enter the shore embankment. Should either of these pipeline failures occur during product transfer at the wharf, a significant amount of petroleum product could be released into the environment. Although block valves are currently present onshore to limit pipeline flow in the unlikely event of the failure of the wharf's steel pipe pile foundations, the potential for a spill from the pipelines due to seismic conditions requires additional mitigation measures (Class II).

Summary of All Impacts

~~Table ES-1 presents a summary of~~ Section 4.0, Environmental Analysis, and Section 7.0, Mitigation Monitoring Program, identify all impacts and mitigation measures for the proposed Project. ~~This table is presented by environmental issue area.~~ Within each environmental issue area analyzed in Sections 4.1 through 4.11, each impact is described and classified, the recommended mitigation is listed where applicable, and the level of impact with mitigation is stated. ~~All significant adverse impacts that remain significant after mitigation (identified as Class I in this document) are presented first,~~

~~followed by Class II significant adverse impacts that can be eliminated or reduced below an issue's significance criteria.~~

COMPARISON OF PROPOSED PROJECT AND ALTERNATIVES

The State CEQA Guidelines (§ 15126.6(d)) require~~s~~ that an EIR include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed Project. A matrix displaying the major characteristics and significant environmental effects of each alternative may be used to summarize the comparison. Table ES-1~~2~~ provides a comparison of the proposed Project with each of the alternatives evaluated in this document, including the No Project Alternative.

ENVIRONMENTALLY SUPERIOR ALTERNATIVE

The State CEQA Guidelines ([§ 15126.6(d))] require that an EIR include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed Project. The State CEQA Guidelines (§ 15126.6(e)(2)]) further state, in part, that "*If the environmentally superior alternative is the "No Project" alternative*, the EIR shall also identify an environmentally superior alternative among the other alternatives." (Emphasis added.)~~.~~

Table ES-1~~2~~ summarizes the environmental impacts for the proposed Project and alternatives. In this case, the No Project Alternative would not simply eliminate all of the potential environmental effects of the proposed Project. In particular, a decision not to approve the lease would result in closure of the MOT but would have no effect on regional demand for the petroleum products currently handled by the MOT. The limited capacity of the existing pipelines and truck/rail loading facilities at Shore's upland terminal would be unable to accommodate the large volume of petroleum products currently shipped by marine vessel, so these products would have to be shipped in and out of other marine terminals in the region. This could result in similar regional impacts in all resource areas, depending upon the location of the other terminals. So while direct impacts of the proposed Project may be reduced or eliminated in the immediate vicinity of the MOT under the No Project Alternative, similar direct impacts would arise elsewhere in the region. Therefore, the No Project Alternative is not the environmentally superior alternative.

The determination of an environmentally superior alternative is difficult because of the many factors that must be balanced. In addition, although there would be minor differences of impacts between the proposed Project and the Limitations on Terminal

Use Alternative, they each would result in the same impact significance levels within each environmental resource area.

The Limitations on Terminal Use Alternative would result in lower risk of an accidental spill of petroleum products at the MOT, and therefore less risk of collateral impacts to operational safety, hydrology and water quality, biological resources, commercial and sport fisheries, recreation, and visual resources in the immediate vicinity of the proposed Project. However, that risk would merely be displaced to other terminals in the region since the regional demand for the petroleum products transferred at the MOT is expected to continue. Further, to the extent that the displaced product throughput from the MOT would result in increased truck and rail transportation – which have an inherently higher risk of accidental spills than marine vessel transportation – the potential environmental effects of the Limitations on Terminal Use Alternative may be greater than for the proposed Project.

In summary, both the No Project Alternative and the Limitations on Terminal Use Alternative would displace potentially significant impacts of the proposed Project to other locations within the region. The extent and exact location of these indirect impacts cannot be known because it is not possible to ascertain what volumes of which petroleum products would be displaced to any given terminal, or what the ultimate transportation mode or distance would be. For the proposed Project, the only significant unavoidable impacts would be associated with an accidental spill of a large volume of petroleum products, potential impacts to biological resources through the introduction of non-indigenous ~~invasive~~ species via either ~~hull~~ vessel biofouling or ballast water discharge from ships calling at the MOT, and potential impacts to water quality from viruses, toxic algae, or other harmful microorganisms that may be discharged in ballast water. The current regulatory requirements governing spill prevention and response, and the additional mitigation measures imposed in this EIR, would minimize as much as practical the risks of, and possible environmental effects from, a significant accidental spill from the proposed Project and with greater certainty than could be assured under either of the two alternatives. Therefore, the proposed Project is selected as the environmentally superior alternative.

KNOWN AREAS OF CONTROVERSY OR UNRESOLVED ISSUES

There are no known areas of controversy or unresolved issues for the proposed Project.

Table ES-1~~2~~. Summary of Environmental Impacts for Proposed Project and Alternatives

Impact Class
I = Significant adverse impact that remains significant after mitigation.
II = Significant adverse impact that can be eliminated or reduced below an issue's significance criteria.
III = Adverse impact that does not meet or exceed an issue's significance criteria.
IV = Beneficial impact. Impact numbers are not applicable (NA) to Class IV impacts.

Impact No.	Impact Summary	Proposed Project	No Project	Limitations on Terminal Use Alternative
Section 4.1 Operational Safety/Risk of Accidents				
OS-1	**Accidental spills of relatively low-volatility petroleum products or large accidental spills of highly volatile products.** Spills of relatively low-volatility petroleum products (e.g., diesel and jet fuel) or large volumes of highly volatile products (e.g., gasoline) could reach the shore, potentially causing injury to members of the public.	I	I	I
OS-2	**Potential for fires or explosion of gasoline, ethanol, or other blended product vapors during product transfer, or from other sources of ignition in areas where vapor could be present.** Potential impacts to public safety could occur from an explosion of gasoline, ethanol, or other blended product vapors due to an inadequately operating vapor control system.	II	II	II
Section 4.2 Biological Resources				
BIO-1	**Potential impacts to biological resources from the introduction of non-indigenous~~invasive~~ species from ~~hull~~ vessel biofouling.** The release of non-indigenous aquatic organisms attached to or associated with the wetted portions of a vessel or its appurtenances, including, but not limited to, sea chests, propellers, anchors, and associated chains (collectively called vessel biofouling), could impair estuarine habitat, fish migration, preservation of rare and endangered species, fish spawning, and wildlife habitat.	I	I	I

Impact No.	Impact Summary	Proposed Project	No Project	Limitations on Terminal Use Alternative
BIO-2	**Potential impacts to biological resources from the introduction of non-indigenous~~invasive~~ species from ballast water.** Discharge of ballast water that contains non-indigenous aquatic organisms could impair estuarine habitat, fish migration, preservation of rare and endangered species, fish spawning, and wildlife habitat.	I	I	I
BIO-3	**Potential impacts to biological resources from the accidental release of petroleum products.** The accidental release of refined petroleum products from the MOT has the potential to affect marine biota inhabiting or using Bay-Delta waters as well as all intertidal and subtidal habitats. Especially at risk are marine birds, marine mammals, intertidal and shallow subtidal communities, as well as special-status fish, bird, plant, and marine mammal species.	I	I	I
Section 4.3 Commercial and Sport Fisheries				
FSH-1	**Impacts to commercial and sport fishing as a result of accidental releases or spills.** Accidental releases or spills of refined hydrocarbon products shipped through the Shore MOT can impact the Bay-Delta, open coast ecosystems, and commercial or recreational fisheries.	I	I	I
Section 4.4 Hydrology and Water Quality				
HWQ-1	**Water quality impacts associated with ~~segregated~~ discharged ballast water.** Discharge of ballast water that contains non-native or harmful microorganisms could impair several of the study area's beneficial uses, including commercial and sport fishing, estuarine habitat, fish migration, preservation of rare and endangered species, water contact recreation, non-contact water recreation, fish spawning, and wildlife habitat. Therefore discharge of ballast water is determined to have a potentially significant impact to water quality.	I	I	I

Impact No.	Impact Summary	Proposed Project	No Project	Limitations on Terminal Use Alternative
HWQ-2	**Water quality impacts associated with marine anti-fouling paints.** Marine anti-fouling paints that include organotin biocides could have a significant adverse impact to water quality when leached or dislodged from vessels berthing at the MOT.	II	II	II
Section 4.5 Land Use and Recreation				
LUR-1	**Impacts on sensitive shoreline lands and/or water and non-water recreation due to a release of accidental spills of relatively low-volatility petroleum products or large accidental spills of highly volatile products.** Spills of relatively low-volatility petroleum products or large volumes of highly volatile products could result in a temporary disturbance to Bay waters used for recreation as well as recreational facilities and designated areas.	II	II	II
Section 4.9 Visual Resources/Light and Glare				
VIS-1	**Degradation of visual resources due to a release of accidental spills of relatively low-volatility petroleum products or large accidental spills of highly volatile products.** A spill of relatively low-volatility petroleum products or a large accidental spill of highly volatile products could adversely alter or degrade the existing visual character or quality of the MOT lease area and its surroundings, unusually contrast with or degrade the character of the viewshed, and/or temporarily result in a substantial adverse effect on a designated scenic area.	II	III	II
Section 4.11 Geology, Soils, and Seismicity				
GEO-1	**Accidental spills of petroleum products from damage to petroleum pipelines due to seismic events.** Spills of petroleum products could occur due to damage to transfer pipelines during a seismic event either at the loading arms or at the shore embankment.	II	III	II

1.0 INTRODUCTION

1.1 PROJECT OBJECTIVES, PURPOSE, AND NEED

Shore Terminals LLC (a NuStar Energy Company), hereafter referred to as Shore (aka NuStar or Selby), proposes to continue operation of its Marine Oil Terminal (MOT) located on the south shore of the Carquinez Strait, just west of the Carquinez Bridge in Contra Costa County. Shore seeks California State Lands Commission (CSLC) approval for a new 30-year lease of California sovereign lands for the wharf portion of its facility (the proposed Project). The current lease term ended December 21, 2006, and is in holdover status.[1] The new lease, if granted, would allow Shore to continue current transfer operations of petroleum products from the wharf to its upland main terminal storage facility until 2036. Shore does not own products transshipped through the facility, but simply warehouses products for its customers to store and transport to and from the site. Shore currently has no plans to expand the operations or equipment on the wharf. Shore's upland main terminal operations are separate from wharf operations, and are not part of the proposed lease. Since Shore does not ship crude oil through its MOT, crude oil shipments are also not part of the proposed Project.

The California Environmental Quality Act (CEQA) Guidelines (section 15126.6(a)[2] requires that a range of reasonable alternatives to the proposed Project must be described, analyzed, and feasibly attain most of the basic objectives of the Project. Therefore, in order to explain the need for the proposed Project, and to guide in development and evaluation of alternatives, Shore was asked to define its Project objectives, which follow:

- Provide product loading/unloading services for oil companies, distributors, and brokers in the San Francisco Bay, Sacramento, and Northern California region;
- Safely moor barge vessels and tank ships to transfer petroleum products to and from storage;
- Operate the Shore MOT in a safe, efficient, environmentally sensitive, and cost-effective manner; and
- Remain a link in the logistic chain of associated refiners' inbound and outbound shipments on the west coast.

[1] Holdover status means that the Shore MOT is continuing to operate under the terms of its existing lease while a decision on a new lease is pending. Shore's existing lease (PRC 5735.1) was issued to former owners, Wickland, in 1981 and assigned to Shore in 1998.

[2] The "State CEQA Guidelines" are found in Title 14 of the California Code of Regulations (CCR), commencing with section 15000.

1.2 PURPOSE AND SCOPE OF EIR

Section 15124(d) of the State CEQA Guidelines requires that an Environmental Impact Report (EIR) contain a statement within the project description briefly describing the intended uses of the EIR. The State CEQA Guidelines indicate that the EIR should identify the ways in which the Lead Agency and any responsible agencies would use this document in their approval or permitting processes. The following discussion summarizes the roles of the agencies and the intended uses of the EIR.

The CSLC is serving as the Lead Agency responsible for preparing the EIR. Shore has a State lease (PRC 5735.1) with respect to an existing single-vessel marine terminal wharf, offshore pipelines, and other improvements associated with the Shore MOT. The EIR will be used by the CSLC to exercise its jurisdictional responsibilities in making its decision whether or not to grant a new 30-year lease of State-owned sovereign lands to Shore.

Because the proposed Project would involve only the continuing operation of the MOT and no new development is proposed, approval for the project is not required from any other local, State, or Federal agency at this time. Over the 30-year duration of the new lease, it is likely that any existing operating permits currently held by Shore would require renewal; existing permits likely to require renewal are identified in Section 1.4 of this EIR.

1.2.1 Organization of EIR

This document is organized into the following ~~S~~sections:

- Section 1.0 – Introduction describes the Project's objectives, purpose, and need. It also describes the purpose and scope of the EIR, defines the Project baseline, and outlines what permits and approvals are required for the proposed Project;
- Section 2.0 – Project Description describes the proposed Project, its location, layout and facilities, and presents an overview of its operation;
- Section 3.0 – Alternatives and Cumulative Projects describes the alternatives to the proposed Project carried forward for analysis, the alternatives that were considered but eliminated from detailed evaluation, and identifies the cumulative projects that will be analyzed;
- Section 4.0 – Environmental Analysis describes existing environmental conditions, Project-specific impacts and mitigation measures, and the impact analysis of the alternatives. This section also evaluates the impacts of the cumulative projects;

- Section 5.0 – Socioeconomic Effects and Environmental Justice describes the consistency of the Project with local and State policy;

- Section 6.0 – Other Required CEQA Sections addresses other required CEQA elements;

- Section 7.0 – Mitigation Monitoring ~~Compliance, and Reporting~~ Program presents the Mitigation Monitoring ~~and Reporting~~ Program (MMP);

- Section 8.0 – Report Preparation Sources presents information on the qualifications of those who prepared the report;

- Section 9.0 – References lists reference materials used to prepare the report; and

- A ~~Section 10.0 –~~ List of Acronyms can be found following the Table of Contents ~~includes a list of acronyms used in the report~~; and

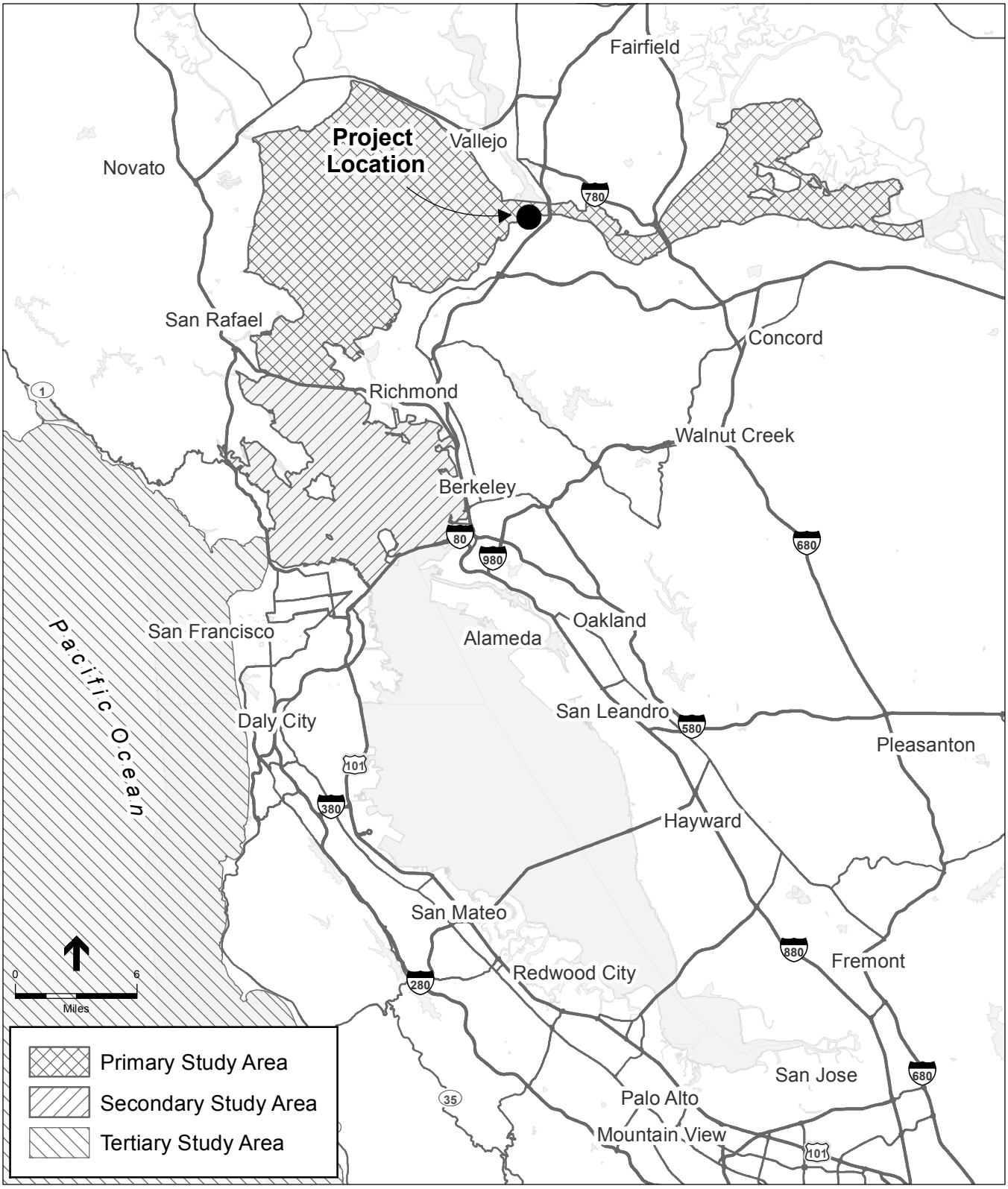
- Appendix A to this ~~Draft~~ EIR contains the mailing list of those receiving copies of the ~~Draft~~ EIR. Appendix B contains the Notice of Preparation (NOP) and copies of comments received on the NOP, ~~including~~ with the location in the Draft EIR where the comments are addressed. Other technical appendices are also included in this ~~Draft~~ EIR. All appendices are included in a compact disk (CD).

1.2.2 Study Area Boundary

Shore's upland main terminal operations are separate from wharf operations, and are not part of the proposed lease Project. The upland terminal operations are not under the jurisdiction of the CSLC, and are addressed in this EIR only as they pertain to wharf operations or to alternatives to the proposed Project.

The study area for this Project includes the San Francisco-San Pablo Bay region (the Bay or Bay Area), Carquinez Strait, Suisun Bay, and the outer coast of California. The study area has been further divided into three areas, with three levels of analysis as shown in Figure 1.2-1. The primary area, and the focus of the analyses, is the area with resources most likely to be affected by Shore MOT operations. This area is from the MOT east, past the Carquinez Bridge into the Carquinez Strait, and the Suisun Bay to Pittsburg; and from the MOT west, including San Pablo Bay south, to the Richmond-San Rafael Bridge.

The secondary study area, which is discussed in less detail, is San Francisco Bay from the Richmond-San Rafael Bridge south, and west to the Golden Gate Bridge. The third level of analysis was conducted for the outer coast, with information from applicable previous environmental documentation included herein, as appropriate.



SOURCE: ESRI 2008

Shore Marine Oil Terminal Lease Project EIR

Figure 1.2-1
Study Area

1.2.3 Definition of Baseline and Future Conditions

An EIR was prepared and certified by the CSLC in September 1979 before the original lease was issued to the former owner, Wickland, in 1981. Since the current lease term ended December 21, 2006, the new lease, if granted by the CSLC, would allow Shore to continue current operations until 2036.

With an existing, ongoing operation for which the applicant is seeking entitlements to continue activities (rather than to initiate new activities), both the Project and the baseline condition against which impacts are to be measured must be defined carefully to avoid confusion and to ensure that the environmental analysis properly focuses on the proposed changes that constitute the Project.

According to State CEQA Guidelines section 15125(a), an EIR must include a description of the "environmental setting" of a project. The environmental setting is defined as "the physical environmental conditions in the vicinity of the project, as they exist at the time the notice of preparation is published…. This environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant."

The NOP for this Project was issued on November 28, 2007 (see Appendix B), at which time the Shore MOT was in place and operational. Shore is now proposing to continue operating the MOT in the same manner, in the same location, and at a similar level of intensity as was occurring when the NOP was issued. Therefore, consistent with the State CEQA Guidelines section cited above, the baseline condition for the proposed Project includes the existing physical effects of MOT operations. Unless otherwise noted in the specific resource sections in ~~Chapter~~ Section 4.0, Environmental Analysis, the baseline year used in this EIR for the Shore MOT is 2007. This EIR examines the impact that continued Shore MOT operations would have on the existing environment over the proposed 30-year lease period.

1.3 PUBLIC REVIEW AND COMMENT

1.3.1 Scoping

The CSLC, as Lead Agency in accordance with the provisions of CEQA, determined that the proposed Project may result in potentially significant adverse environmental impacts, and therefore required preparation of this ~~Draft~~ EIR pursuant to and in accordance with CEQA (Public Resources Code, §~~section~~ 21000 *et seq*.), the State

CEQA Guidelines (CCR, Title 14, Chapter 3, §~~section~~ 15000 *et seq*.), and the CSLC's guidelines implementing CEQA.

On November 28, 2007, pursuant to CEQA section 21080.4 and the State CEQA Guidelines section 15082(a), the CSLC provided a ~~Notice of Preparation (~~NOP~~)~~ for the proposed Project to responsible and trustee agencies and to other interested parties. The NOP solicited both written and verbal comments on the EIR's scope during a 30-day comment period and provided information on a forthcoming public scoping meeting. The CSLC held a public and agency scoping meeting in Martinez, California, on January 10, 2008, to solicit verbal comments on the scope of the EIR; however, none were received. Written comments were received in response to the NOP from the following:

- Bay Conservation and Development Commission

A copy of the NOP and letters received, as well as an index of where such comments are addressed in the document, are included in Appendix B.

1.3.2 Public Comment on the Draft EIR

~~This~~ The Draft EIR for the proposed Project was released on January 25, 2010, and ~~is being~~ was circulated to local and State agencies and to interested individuals ~~who may wish~~ to review and comment on the report. In compliance with the State CEQA Guidelines, the CSLC provided a 45-day public review period on the Draft EIR from January 25, 2010, to March 11, 2010.

Specifically, on January 25, 2010, a Notice of Availability for the Draft EIR was sent to local, regional, Federal and State agencies, property owners and occupants adjacent to the proposed Project, and other interested parties. The Notice of Availability provided a summary of the Project and the public review and comment period, included information on how to access the Draft EIR, and listed the date, times, and location of two public meetings on the Draft EIR. Copies of the Draft EIR were also submitted to the State Clearinghouse for distribution to responsible and trustee agencies, and written copies and/or CDs were mailed to agencies, organizations, and others who requested a copy. Additional copies were available at the two noticed public meetings, which were held on February 17, 2010, at 3:30 p.m. and 5:30 p.m. At these meetings, the CSLC staff explained the CSLC's decision-making process, and the public and agencies had the opportunity to ask questions about the EIR and its contents and present oral and written testimony on the Draft EIR.

Written comments ~~may be~~ that were submitted to the CSLC during the 45-day public review period~~. Verbal and written comments on this Draft EIR will be accepted at a noticed public meeting (either noticed in this document or under separate cover). All comments received will be addressed in a~~ are presented and addressed in this Final EIR in Section II, Response to Comments. Three written comments were received by mail or email; no comments were submitted at the public meetings.~~ addendum document, which, together with this Draft EIR, will constitute the Final EIR for the proposed Project.~~

~~This Draft EIR identifies the environmental impacts of the proposed Project on the existing environment, indicates how those impacts will be mitigated or avoided, and identifies and evaluates alternatives to the proposed Project. This document is intended to provide the CSLC the information required to exercise its jurisdictional responsibilities with respect to the proposed Project, which would be considered at a separate noticed public meeting of the CSLC.~~

~~The CEQA requires that a Lead Agency shall neither approve nor implement a project as proposed unless the significant environmental impacts have been reduced to an acceptable level. An acceptable level is defined as eliminating, avoiding or substantially lessening significant environmental effects to below a level of significance. If the Lead Agency approves the project, even though significant impacts identified in the final EIR cannot be fully mitigated, the Lead Agency must state in writing the reasons for its action. Findings and a Statement of Overriding Considerations (SOC) must be included in the record of project approval and mentioned in the Notice of Determination (NOD).~~

1.4 PERMITS, APPROVALS, AND REGULATORY REQUIREMENTS

Because the proposed Project would involve obtaining a new lease from the CSLC and no new development is proposed, approval for the continued operation of the facility is not required from any other local, State, or Federal agency.

However, during the 30-year term of the lease, the MOT may require new or modified permits and approvals from the following reviewing authorities and regulatory agencies:

- Bay Area Air Quality Management District (BAAQMD) Major Facility Review Permit (air quality);
- CSLC Marine Facilities Division (MFD), United States Coast Guard (USCG), and State Fire Marshal inspection requirements;

- 2007 California Building Code (CBC), Parts 2 (Volumes 1 and 2) and Part 3, as subsequently amended (24 CCR § 3101F *et seq.*). Note that the "Marine Oil Terminal Engineering and Maintenance Standards" (MOTEMS) is now Chapter 31F of Part 2 of the CBC;

- CSLC and USCG regulations for an Oil Spill Response Plan and Operations Manual;

- USCG “Certificate of Adequacy” as an oily waste reception facility;

- California Department of Fish and Game (CDFG), Office of Oil Spill Prevention and Response (OSPR) regulations and guidelines for spill prevention, response planning, and response capability; and

- California Ballast Water Management for Control of Nonindigenous Species Act of 1999 and California Public Resources Code for ballast water management.

2.0 PROJECT DESCRIPTION

2.1 INTRODUCTION

This Environmental Impact Report (EIR) examines the environmental impacts associated with the continued operation of the Shore Marine Oil Terminal (MOT) under a proposed 30-year lease. Section 2.2, Project Background, presents an overview of the existing MOT structure, and Section 2.3, Proposed Project, describes the proposed Project (continuation of MOT operations involving shipping of petroleum products [not crude oil], with no expansion of operations or equipment on the wharf, until 2036). Alternatives considered in this EIR are presented in Section 3.1, Factors Used in Selection of Alternatives, and the cumulative projects considered for the analysis are presented in Section 3.5, Cumulative Projects.

2.2 PROJECT BACKGROUND

2.2.1 Project History

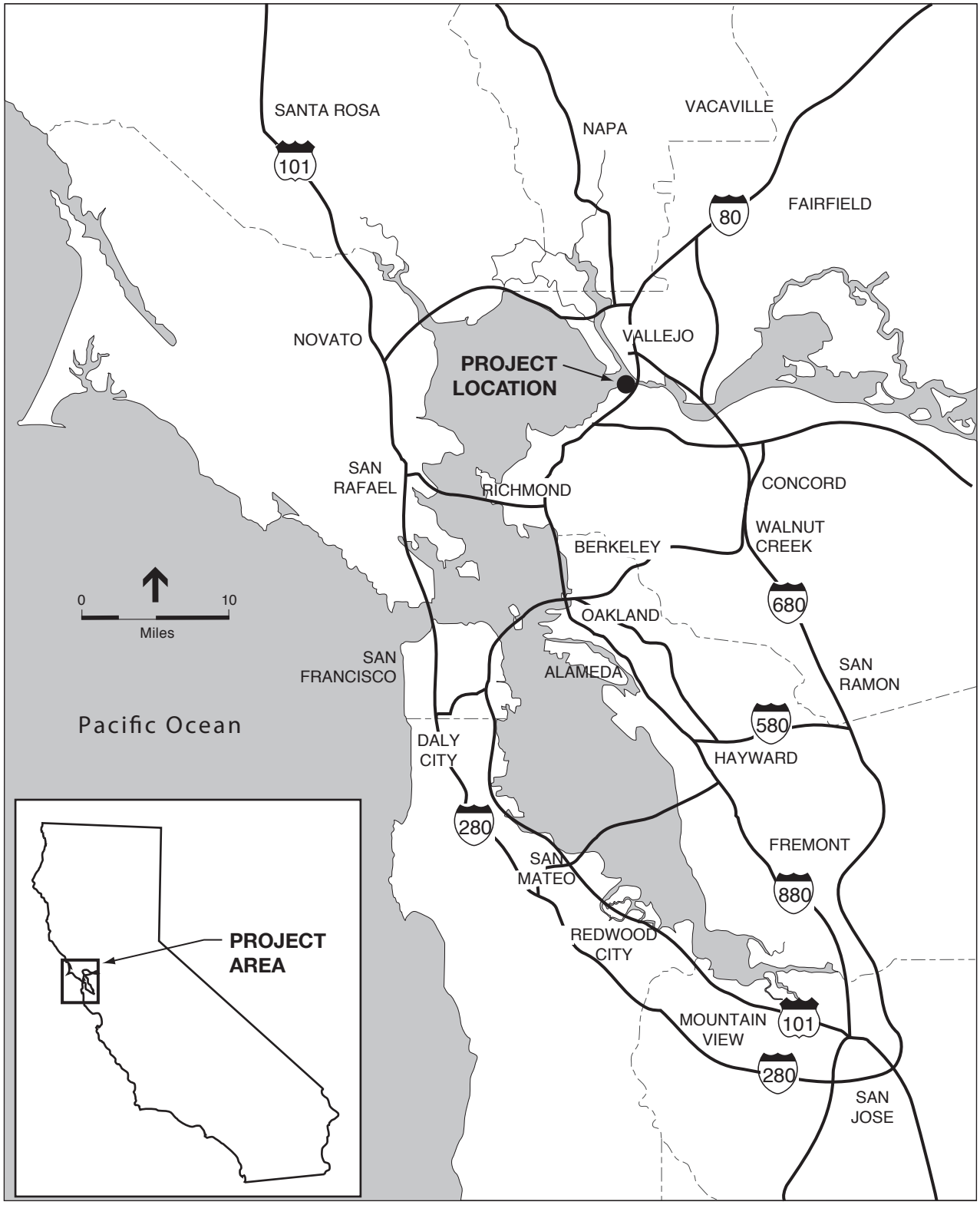
Shore Terminals LLC (Shore, aka NuStar, or Selby) is an independent, privately owned transshipper of petroleum products. Shore operates the marine terminal and storage facilities in an industrial area in the unincorporated portion of Contra Costa County between the cities of Crockett and Rodeo (see Figure 2-1). Approximately 0.9 mile southwest of the wharf facility, Shore owns approximately 50 acres on the south side of San Pablo Avenue occupied by the upland storage facilities (main terminal) as shown in Figure 2-2.

Lease History

The original lease (PRC 5735.1) was issued to former owner Wickland in 1981 for an initial term of 25 years with provisions for two optional renewals for one 20-year renewal. Wickland assigned its interest to Shore Terminals in September 1998, and Valero L.P. purchased Shore Terminals in July 2005. Shore has applied to the California State Lands Commission (CSLC) to exercise its option for a new 30-year lease. Since the current lease term ended in December 21, 2006, the new lease, if granted by the CSLC, would allow Shore to continue current operations until 2036.

Marine Oil Terminal Engineering and Maintenance Standards

The Marine Oil Terminal Engineering and Maintenance Standards (MOTEMS) became effective on February 6, 2006, and are now codified as the 2007 Title 24, California Code of Regulations (CCR), Part 2, California Building Code, Chapter 31F – Marine Oil



SOURCE: ESA

Shore Marine Oil Terminal Lease Project EIR

Figure 2-1
Project Location

0 2000
Feet

SOURCE: ESA

Shore Marine Oil Terminal Lease Project EIR

Figure 2-2
Shore Selby MOT Area Detail

Terminals (24 CCR § 3101F *et seq.*). These standards apply to all existing and new marine oil terminals in California, and include criteria for inspection, structural analysis and design, mooring and berthing, geotechnical considerations (a seismic and structural assessment, based on current seismic criteria), and analysis and review of the fire, piping, mechanical, and electrical systems. MOTEMS requires each MOT to conduct an audit to determine the level of compliance and an evaluation of the continuing fitness-for-purpose of the facility. Depending on the results, operators (such as Shore) must then determine what actions are required, and provide a schedule for implementation of deficiency corrections and/or rehabilitation.

The Shore MOT is subject to the MOTEMS and has recently completed ~~is currently undergoing~~ its required MOTEMS Initial Audit. This Initial Audit ~~shall be~~was submitted to the regulatory agency, the CSLC Marine Facilities Division (MFD), for review and approval ~~by~~ in February ~~6,~~ 2010. Subsequent MOTEMS Audits and Inspections will be required on a regularly scheduled basis. The MOTEMS Initial Audit~~, when finished, will identify~~ identified future actions that Shore is required to implement to comply with the code. As these future actions may include physical changes to the wharf and associated lease area, depending on the nature and extent of any such changes, additional discretionary review by the CSLC MFD and/or Land Management Division may be required. Such discretionary review may also trigger CEQA review of the future actions.

~~Although~~Prior to completion of the Shore MOTEMS Initial Audit~~ is not yet finished~~, ~~to date implementation of~~ MOTEMS has required some minor changes to the wharf. These are:

- 60-second actuators were installed in the Franklin valves in 2008;
- The 3-inch slop line was replaced;
- Cameras were installed at the wharf and are monitored via the Control Room 24 hours per day; and
- A sonar current meter with feed to the Control Room was installed.

These changes are considered in this EIR as part of the existing Shore operations.

2.2.2 CSLC Lease Boundary and Regulatory Boundary Areas

The MOT is located just north of the ConocoPhillips San Francisco Refinery in northwestern Contra Costa County, as shown on the vicinity map (Figure 2-1). The MOT lies just west of the Carquinez Bridge and the unincorporated town of Crockett at

the entrance to the Carquinez ~~Straight~~ Strait and across and to the south of the Vallejo ship channel. The MOT has been operating under a lease from the CSLC since 1981. The MOT occupies approximately 10.09 ± acres of sovereign tide and submerged public land leased from the CSLC. The lease boundary is shown on the Wharf Layout Drawing in Figure 2-3.

2.3 PROPOSED PROJECT

2.3.1 Project Action

Shore proposes to continue operation of its MOT located on the Carquinez Strait, and seeks CSLC approval for a new 30-year lease for the MOT portion of its facility. If the CSLC grants the lease, Shore would continue current operations at the terminal until 2036. Shore currently has no plans to expand its operations or the equipment on the MOT.

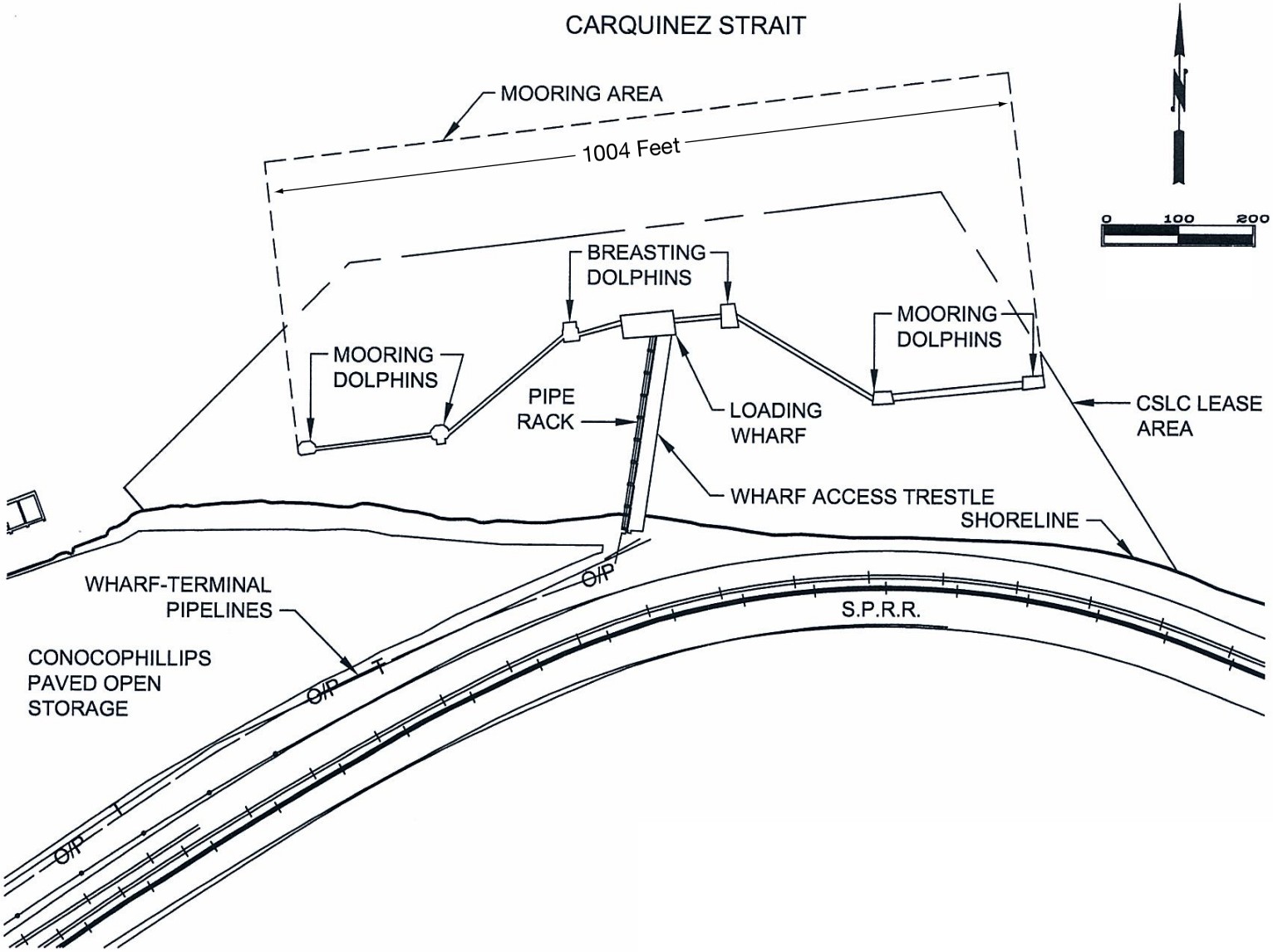
2.3.2 Physical Description of Marine Terminal

Topography

The Shore MOT lease area constitutes approximately 10.09 ± acres of sovereign tide and submerged public land in the Carquinez Strait. The adjacent land is characterized by a steeply sloping upland and shoreline. The upland hills range between 35 and 50 percent slopes, climbing 250 to 300 feet from the water's edge. The underwater slope is approximately 20 percent at the center of the wharf structure. The trestle connecting the wharf to the shoreline is at the very east end of a relatively flat, long and narrow filled bench stretching west between the steep hillside and water's edge. This paved bench is only about 150 feet wide at the trestle, with approximately 70 feet of that width occupied by the Union Pacific mainline railroad tracks. The bench, a former U.S. ~~United States~~ Environmental Protection Agency ~~(EPA)~~ Superfund site, provides an open storage laydown for the nearby ConocoPhillips Refinery.

Wharf

The Shore wharf is a single-berth dock that can accommodate only one vessel at a time, with maximum vessel displacement of up to 100,000 dead weight tons (DWT), maximum length of ~~850~~ 831 feet, and a maximum water depth at Mean Lower Low Water (MLLW) of ~~45~~ 60 feet, with the ~~no~~ maximum beam restricted~~ions~~ to 145.1 feet. The wharf deck consists of a concrete 32-foot-wide by 72-foot-long loading platform, supported by ~~pre-stressed concrete~~ steel pipe piles. The wharf connects to land via a 260-foot-long elevated trestle paved with a 12-foot-wide access road and sidled with a



SOURCE: Shore 2006

Shore Marine Oil Terminal Lease Project EIR

Figure 2-3

Shore Selby Wharf Layout Drawing

15-foot-wide pipe rack along the west side of the roadway. Because of the high-velocity current in this location, dredging has not been needed in over 20 years of MOT operation, and therefore, is not a part of this Project.

The Wharf Layout Drawing (Figure 2-3) shows that the total length of the wharf between the outermost mooring dolphins is approximately 0.19 mile. A single breasting dolphin and two mooring dolphins on each side of the loading platform secure moored vessels tightly to the wharf. One-hundred-ton bollards are mounted on the wharf and breasting dolphins, while 100-ton double manual quick-release hooks with electric capstans and slide plates are mounted on each of the mooring dolphins. The wharf and breasting dolphins carry the lateral loads from vessel mooring impacts, transferring energy through the fender system and preventing damage to the wharf structure. The spill-containment booms are housed in large bins on each end of the breasting dolphins.

The wharf is equipped with pumps, pipelines, electrical utilities, and other mechanical equipment for effectively transferring diverse cargo from vessels with varying configurations. The cargo pumps are located at the main terminal 0.9 mile from the wharf, and transfer all the vessel cargo loads.

Wharf Pipelines

On the wharf, two hydraulically operated, 12-inch-diameter loading/unloading arms provide “clean product” service (gasoline, diesel, etc.), with connections to upland tanks through two 12-inch-diameter steel pipelines. No crude oil is delivered to or transported through the MOT. The arms use individual 25-gallon-per-minute pumps to empty the piping before uncoupling from the ship. Per Title 33 Code of Federal Regulations (CFR) ~~§~~sections 156.170(c)(4) and f(1), the loading arms are required to be tested annually. Additionally, these loading arms are also tested at the frequencies, pressures, and other applicable provisions of Title 2 CCR, Article 5.5. The requirements of the above-mentioned Federal regulations complement the requirements of the State of California.

The pipelines are supported on a pipe rack that extends along the west side of the MOT access road and entirely over open water. The rack carries four 12-inch-diameter clean product lines, a 12-inch-diameter vapor recovery line, a 12-inch-diameter fire main, a 3-inch-diameter slop line, and necessary water and electrical connections for the wharf. All pipelines and conduits proceeding from the shoreline through the upland area to the main terminal are underground.

Drip, Oily Waste, and Ballast Discharge Facilities

A 6-inch-high curb surrounds the wharf deck and drains into a 3-barrel-capacity sump. The sump, normally empty, collects flushdown water and/or stormwater from rainfall, and also contains product in the event of a discharge. The sump pump automatically starts when water flows trigger an initial threshold level, and then pumps liquid contents into a 3-inch-diameter steel slop line that discharges to a slop tank at the upland main terminal. The Shore MOT technician visually inspects the sump daily.

The MOT has no facilities to collect or treat ballast water but is certified by the U.S. Coast Guard (USCG) as an oily waste reception facility (USCG 2004). Vessels are required to meet the Federal and State ballast water laws, regulations, and permits, including the conditions presented below.

Vessels bound for the MOT must comply with California Public Resources Code (PRC) sections 71200 to 71207 that specify ballast water and vessel biofouling reporting and management requirements. Ballast water management requirements differ, depending upon the location from which an arriving vessel originates. Several ballast water management practices for a vessel arriving from a California port or from a port or place outside the Pacific Coastal Region (PCR) are allowed.[1]

Ballast water management practices for vessels arriving from places outside the PCR (PRC § 71204.3) include at least one of the following:

(1) Exchanging the vessel's ballast water in mid-ocean waters more than 200 nautical miles (nm) from land and at least 2,000 meters (m) deep, before entering the coastal waters of the State;

(2) Retaining the ballast water on board the vessel;

(3) Discharging all ballast water at the same location where the ballast water originated, provided that the master, operator, or person in charge of the vessel can demonstrate that the ballast water to be discharged was not mixed with ballast water taken on in an area other than mid-ocean waters;

(4) Using an alternative, environmentally sound method of ballast water management that, before the vessel begins the voyage, has been approved by the CSLC or ~~Commission in consultation with~~ the USCG as being at least as effective as exchange, using mid-ocean waters, in removing or killing non-indigenous Aquatic Species (NAS);

[1] The ~~Pacific Coast Region (~~PCR~~)~~ means all coastal waters on the Pacific Coast of North America east of 154 degrees W longitude and north of 25 degrees N latitude, exclusive of the Gulf of California (PRC § 71200(k)).

(5) Discharging the ballast water to a CSLC-approved reception facility;

(6) Under extraordinary circumstances~~onditions~~, ~~conducting~~ performing a ballast water exchange within an area agreed to by the CSLC in consultation with the USCG at or before the time of the request.

Ballast water management practices for vessels arriving from places within the PCR (PRC §§ 71201.7 and 71204.5, 2 CCR § 2280 *et seq.*) include:

(1) Exchanging the vessel's ballast water in near-coastal waters more than 50 nm from land within the PCR, and at least 200 m deep, before entering the waters of the State, if that ballast water has been taken on in a port or place within the PCR;

(2) Retaining the ballast water on board the vessel;

(3) Using an alternative environmentally sound method of ballast water management that has been approved by the CSLC before the vessel begins the voyage, and that is at least as effective as ballast water exchange in removing or killing non-indigenous organisms~~NAS~~;

(4) Discharging ballast water to a CSLC-approved reception facility;

(5) Under extraordinary conditions, conducting a ballast water exchange within an area agreed to by the CSLC in consultation with the USCG at the time of the request.

In 2006, the CSLC was tasked with the preparation of regulations under PRC section 71205.3 that require vessels operating in waters of the State to meet ~~a final~~ performance standards for ballast water discharge~~ of zero detectable organisms by 2020~~. These regulations were adopted in 2007 (2 CCR § 2291 *et seq.*) ~~being developed and phased in during 2009 and 2010~~ and will be applied to vessels in a phased approach between 2010 and 2016. A final discharge standard of zero detectable living organisms for all organism size classes in ballast water discharge shall be implemented on January 1, 2020 for all vessel size classes~~2020~~.

Vessels are also required to minimize the uptake and the release of non-indigenous organisms ~~NAS~~ as follows (PRC § 71204):

(1) Avoid the discharge or uptake of ballast water in areas within or that may directly affect marine sanctuaries, marine preserves, marine parks, or coral reefs;

(2) Minimize or avoid uptake of ballast water in all of the following areas and circumstances:

(a) Areas known to have infestations or populations of harmful organisms and pathogens;

(b) Areas near a sewage outfall;

(c) Areas near dredging operations;

(d) Areas where tidal flushing is known to be poor, or times when a tidal stream is known to be more turbid;

(e) In darkness when bottom-dwelling organisms may rise up in the water column;

(f) Where propellers may stir up the sediment;

(3) Remove ~~hull~~ vessel biofouling organisms from hull, piping, propellers, sea chests, and other submerged portions of a vessel on a regular basis, and dispose of removed substances in accordance with local, State, and Federal laws, regulations, and permits;

(4) In-water cleaning of submerged portions of a vessel shall be conducted using best available technologies economically achievable, and designed to minimize the release of coating and biological materials, cleaning agents, and byproducts of the cleaning process into the surrounding waters. The cleaning shall be performed in accordance with local, State, and Federal laws, regulations, and permits.

Vapor Collection and Recovery Systems

The MOT is equipped with a carbon adsorption/absorption vapor collection and recovery system (VCRS) to collect and process the vapors displaced during vessel loading operations. Recovered vapors and hydrocarbon emissions are piped to the Adsorption-Absorption High Efficiency Hydrocarbon VCRS unit at the main terminal. A 10-inch-diameter vapor hose is used to collect the vapor from the ship's cargo compartments during product transfer. The hose is lifted into position with the ship's crane. The VCRS also recovers vapors from the storage tanks. The system, installed in 1982, complies with USCG Regulations 33 CFR 154 for VCRS operations and with Bay Area Air Quality Management District (BAAQMD) Regulation 8, Rule 44 (Organic Compounds, Marine Vessel Loading Terminals) that limits hydrocarbon emissions to the atmosphere from marine vessels.

The MOT operator panel is located in the MOT Control Room, and provides monitoring and control of the VCRS. Other panel indicators include startup/shutdown, audible and

visual alarms for high and low vapor pressures, seals, high-level MOT knockout pot[2] alarms, and VCRS shutdown.

Pressure control valves keep the pressure in the ship's storage compartment within 80 percent of the ship's pressure and vacuum relief settings. An alarm automatically activates if the compartment pressure exceeds 25 inches of water column. The VCRS shuts down and loading is stopped if the water column exceeds 30 inches.

Buildings, Personnel, and Communication Systems

An 8-foot by 12-foot MOT Control Room is located on the main wharf platform. This Control Room contains a telephone and two-way FM radio, first aid supplies, maintenance tools, flange gaskets, cleanup materials, 11 emergency life rings, and portable fire extinguishers. A step-down transformer (12 kilovolt [kV]/480 volt [V]) and circuit-breaker cabinet are located on the upland adjacent to the trestle.

A minimum of two personnel are required to be on duty during marine transfer operations as per the Selby Wharf Operations Manual (Shore 2008). Other personnel may be on the wharf for maintenance or to assist with operations only if required. The Terminal Person-In-Charge (TPIC) supervises all ship docking and cargo transfer operations. In addition, that person shall report emergencies and oil spills. The other technician is designated the Terminal Technician, whose duty is to handle all other operating requirements in the facility as well as control landside tankage and piping systems in support of a marine cargo transfer. In addition, Shore requires that at least one crewman be aboard every tank vessel at all times while it is moored at the berth. This person is the designated Vessel Person-In-Charge (VPIC).

A portable radio is placed aboard the berthed vessel for continuous communication between the VPIC and the TPIC. All radios must be intrinsically safe against explosion. If radio contact cannot be made with either the VPIC or TPIC, the party attempting to activate radio communications can signal the other using a canister air horn on the vessel or the emergency horn located in the MOT Control Room. If radio access is not made, the VPIC and TPIC are required to proceed to the gangway to implement voice exchange and/or hand signals until radio communication is restored. In addition, the telephone in the MOT Control Room provides a direct connection to the main terminal.

[2] A knockout pot, also called a vapor-liquid separator drum, is a vertical vessel into which a liquid and vapor mixture (or a flashing liquid) is fed and wherein the liquid is separated by gravity, falls to the bottom of the vessel, and is withdrawn.

Spill response equipment is stored in containment boxes on the elbow of the mooring dolphins on both sides of the wharf.

Security

Shore is required to comply with CSLC regulations (~~section 2430 of~~ 2 CCR §§ 2430-2445)~~Title 2, Division 3, Chapter 1, Article 5.1~~, that require~~ outlining~~ a physical security program for marine terminals. Only authorized personnel are allowed access to the MOT, accessible only through the ConocoPhillips upland property. Personnel entering the property must sign in with the main office and wear a facility badge. During the pre-transfer conference, vessels must provide a crew list to MOT operations personnel, which is then distributed to the main office. A vessel's personnel are cleared into the upland property and then to the outside of the property using this crew list. In addition, MOT operations and personnel receive notification from the main office when other people, such as vessel agents, electronics specialists, repairmen, etc., request entry to the MOT. Wharf operations personnel confirm with the ship if the people requesting entry are authorized for ship access prior to allowing them entry into the upland facility and the MOT.

Only Shore company vehicles and other vehicles pre-authorized by MOT personnel are allowed. Company vehicles are used for routine operations and maintenance activities. Pedestrians do not have access to the MOT.

Exterior lighting is provided at the MOT to allow for nighttime operations (see Figure 2-4). Lighting is provided between sunset and sunrise and during times of reduced visibility by permanent fixtures on photocell. Strobe lights (a USCG requirement) can be seen in all directions and have battery backup. All lights are on during night operations ~~regardless of~~ whether or not a vessel is present.

The MOT cannot be accessed from adjacent public shore areas. Physical security is controlled by fencing along the facility perimeter, which consists of a 7-foot fence with 1-foot concertina wire loops at the top of the wharf entry and 24-hour camera surveillance. Access by fishing or pleasure craft is prevented by fencing, the lack of ladders or other suitable climbing apparatus, and the MOT's elevation above the water (Shore 2009b).

Storage and Transshipping Facilities (the Upland Facility/Main Terminal)

Shore does not own products transshipped through this facility, but simply warehouses products for its customers to store and transport to and from the site. The primary service areas for this facility are the San Francisco Bay and Sacramento regions.

SOURCE: Shore 2008

Shore Marine Oil Terminal Lease Project EIR

Figure 2-4

Shore Selby Wharf Lighting

Facilities on the upland area between the MOT and the main terminal consist of the connecting pipelines and a railroad tank car loading/unloading area at a spur track along the Union Pacific Railroad mainline tracks. These facilities are located on property owned by ConocoPhillips and Union Pacific Railroad. The main terminal, which includes a truck loading rack, product storage tanks, the VCRS, and pumps, is located on property owned by Shore on the south side of San Pablo Avenue, approximately 0.9 mile southwest of the MOT. An 8-inch-diameter pipeline and a 12-inch-diameter pipeline connect the main terminal to the Kinder Morgan pipeline and the Kinder Morgan Richmond pipeline, respectively. Both pipelines ship gasoline and distillate products (diesel, JP-8, JP-5, jet fuel). The main terminal operates 24 hours per day, 365 days per year, and employs the terminal manager, a total of 13 technicians, and three office staff.

As currently operated, the facility receives and distributes petroleum products by pipeline, marine vessels, railroad tank cars, and trucks. During 2005 (the most recent year for which concurrent data on marine vessels at the wharf and rail/truck loadings at the upland terminal were available), 110 marine vessels visited the wharf while 2,435 railroad tank cars and 12,270 trucks loaded or unloaded product at the upland terminal.

2.3.3 Operational Procedures

Mooring and Berthing Procedures

The wharf can moor ships up to ~~850~~ 831 feet in length, with a maximum of 100,000 ~~dead weight tons (~~DWT~~)~~. Both port and starboard side mooring are acceptable. The MOT experiences strong ebb and flood currents and is considered to be a “high-current terminal.” The MOT is subject to prevailing winds, normally from the west, northwest, and east. Wave action is not significant at the MOT and tide ranges are from a maximum of 7.8 feet to a minimum low tide of -1.8 feet (Shore 2008). Ships are moored to allow for almost no drift (drift of more than ~~1.6~~2 feet away from or 3 feet along the dock requires that the ship be brought back into position). Depending on the ship or barge size, a minimum of 12 or 6 mooring lines are used, with a maximum of 16 and 10 lines, respectively. Ship crews are responsible for positioning the vessel and tensioning mooring lines and cables. High tidal current, velocities, and angles at the MOT result in the requirement that vessels be tightly breasted. In addition, MOTEMS requires Shore to follow specific mooring procedures including prescribed maximum mooring velocities and angles (Shore 2008). An anemometer mounted on the wharf with visual display in the Operations Control Room provides real-time wind restriction data monitored by the TPIC and vessel crew during cargo operations (Shore 2008). ~~The following table indicates the wind restrictions for cargo operations.~~

~~Vessel Mooring~~	~~Wind Velocity~~	~~Wind Direction~~	~~MOT Action~~
~~Starboard Side to Wharf~~	~~≥30 kts~~	~~160 – 200 degrees~~	~~Stop Transfer~~
	~~≥35 kts~~	~~160 – 200 degrees~~	~~Disconnect~~
	~~≥35 kts~~	~~150 – 230 degrees~~	~~Stop Transfer~~
	~~≥40 kts~~	~~160 – 200 degrees~~	~~Stop Transfer~~
~~Port Side to Wharf~~	~~≥35 kts~~	~~145 – 175 degrees~~	~~Stop Transfer~~
	~~≥40 kts~~	~~145 – 175 degrees~~	~~Disconnect~~
	~~≥40 kts~~	~~130 – 210 or 250 – 290 degrees~~	~~Stop Transfer~~

Once the vessel is moored, the vessel crew and TPIC inspect vessel mooring line tension no less than once per one-half hour. In the ~~unlikely~~ event that the vessel is allowed to drift off the dock more than 2 feet or along the dock more than 3 feet, the loading arms will be disconnected until the vessel is repositioned securely to the wharf. Passing vessels must also be monitored by the TPIC and vessel crew. Should a vessel over 250 feet in length be projected to pass within 300 feet of the MOT, transfer operations are shut down when the vessel is within one-quarter mile down (west) channel and may be resumed after the vessel is more than one-quarter mile up channel (Shore 2008).

Product Transfer Procedures

During product transfers, the Shore TPIC begins by coordinating the position of the vessel to maximize allowable movement by centering its manifold directly opposite the arm that would be used for transfer. Once the loading arm connections are on the ship and over a containment or drip pan, the vessel's personnel pull a blind flange off the loading arm connections. The vessel's personnel then bolt the arm to the ship's manifold, using a new gasket for each connection. As the transfer nears completion the loading rate is reduced. At completion of the transfer, the pumps are shut down with a remote shutdown switch, the dock valves are closed, and the VCRS is shut down by the TPIC. The loading arm vent ball valve is opened and the outboard end of the arm is allowed to drain to the ship. A stripping pump is used to empty the inboard end of the arm. Vessel personnel then disconnect and blind-off the loading arm while it is still on the vessel and over the vessel's drip pan. The blind flange is bolted and the Terminal Technician confirms that the gasket is in place. Confirmation between the TPIC and Terminal Technician is conducted to assure that all shore valves and tanks are closed. Finally, the loading arms are returned to stored positions on the MOT and then secured.

Maintenance

Shore performs routine maintenance on the wharf to ensure proper operation as well as meet regulatory obligations. These maintenance activities are as follows:

- Dock load arms are pressure-tested every three years per CSLC regulations and USCG regulations;
- Routine maintenance of lighting, bollards, life rings, etc. occurs ~~on an~~ as needed ~~basis~~;
- MOTEMS Audits and Inspections;
- Dock lines are hydrotested every five years per State Fire Marshal regulations;
- An atmospheric corrosion (ultrasonic thickness) survey is performed every three years with the most recent survey conducted in 2010~~7~~;
- Annual Inspections and Spot Inspections of the wharf are conducted in conjunction with the CSLC and USCG. All maintenance items or recommendations outlined in the inspections are completed; and
- Valves are inspected and cycled every six months for U.S. Department of Transportation (DOT) compliance.

In addition to these routine maintenance activities, some recent or planned maintenance activities at the wharf are:

- Dock ~~has~~ received MOTEMS underwater and structure inspection in 2008. Additional MOTEMS inspections[3] were ~~ill be~~ performed in 2009 for MOTEMS compliance, evaluating the wharf's geotechnical stability and electrical and fire equipment;
- The~~Replaced~~ 3-inch schedule 40 slop line was replaced in 2008 with 3-inch schedule 80 slop line for additional strength/thickness to prevent corrosion leaks;
- Dock rams were~~have been~~ serviced/replaced in 2007 and 2008;
- Hydraulic oil was scheduled to ~~will~~ be replaced with biodegradable oil in September 2009;~~ and~~

[3] Includes a seismic and structural assessment, based on current seismic criteria, a pipeline analysis and review of the piping system and all mechanical systems.

- Two of four dock fenders ~~are~~ were budgeted for replacement in 2010 per MOTEMS recommendations~~.~~[4]; and

- An audible/visual fire alarm pull box system is scheduled to be installed pending approval to install a new TPIC shack for operations at the foot of the wharf.

Pipeline Safety Controls

The design maximum operating pressure of the pipeline system and loading arms is 150 pounds per square inch (psi). Pressure gauges are installed at the MOT and dock pump manifold to monitor pipeline pressures. All receiving lines contain one-way check valves which prevent product backflow. Wharf piping is pressure relieved at the upland tank farm and governed by 150 psi pressure relief devices. The Shore cargo pipelines span a known earthquake fault area near the MOT. Shore uses Franklin fault block valves with the pipelines on either side of the known fault area.

Fire Detection and Suppression

The MOT is equipped with fire extinguishing equipment that can be activated in the event of a fire. Two permanently mounted fire monitors are installed on the wharf. These 500-gallon-per-minute monitors are fed by a pipeline connection to the fire water system at the MOT. This fire extinguishing system is started by pushing a red button in the wharf Control Room. ~~One~~Four portable 150-pound wheeled extinguishers, two portable 20-pound dry chemical, and two 15-pound carbon dioxide (CO_2) extinguishers are located on the wharf. There are no fire response vessels located near the MOT.

In general, the MOT fire equipment is designed for use by professional fire fighters, and the Crockett Fire Department is the designated first responder, although Shore employees would be available to assist as appropriate. Furthermore, Shore is a non-responding member of the PetroChemical Mutual Aid Organization (PMAO).[5] As such, employee training is limited to the use of fire extinguishers and procedures to assist professional fire fighters when they arrive on scene.

A stationary water system extends around the main terminal tank farm and to the MOT, with hydrants throughout. Communications during an emergency are handled using portable radios and telephones located at the MOT and main office.

[4] Suggested by MOTEMS contractor after initial underwater and abovewater survey performed in 2007/2008. Replacement budgeted for 2010 (Shore 2009b).

[5] The PMAO consists of ChevronTexaco, Valero, ConocoPhillips, Tesoro, Dow Chemical, NuStar (Shore), Shell Oil, and Rhodia, Inc. (non-responding member).

2.3.4 Volumes and Types of Materials Handled

Ships and Barges

In 2007, ~~approximately~~ 105 marine vessels were recorded visiting~~ed~~ the MOT; ~~approximately~~ 31~~7~~ of these vessels were barges and the other 74~~68~~ were tankers (Shore 2008).

Products

The following products are routinely loaded/unloaded at the MOT: gasoline, fuel oil (diesel, JP-5 and JP-8), and ethanol. Gasoline blendstocks[6] are also handled occasionally. Table 2-1 summarizes the total volume of product loading and unloading for marine vessels visiting the MOT in 2007.

Table 2-1. Marine Vessel Product Transfers at the Shore MOT in 2007

Product	Loaded (bbls)	Unloaded (bbls)
Gasoline	897,310	1,185,553
Fuel oil (diesel, JP-5, and JP-8)	4,404,554	3,003,454
Ethanol/other	767,825	743,386

Source: Shore 2008

The typical sources and destinations of these products are as follows:

JP-8 and JP-5: This product is a military specification distillate handled for the U.S. Government. It is received at the terminal by pipeline shipment from local refineries. It is also received by vessels under contract to the government, often from voyages originating in Washington State. These products are shipped from the terminal to vessels with military destinations. The product is also loaded into trucks for delivery to Department of Defense and Department of Homeland Security destinations.

Gasoline: This product is received by pipeline and vessel from local refineries, including ConocoPhillips. This product is shipped by pipeline and vessel to users such as local refineries and distributors.

Fuel Oil (Diesel): This product is received by pipeline and vessel from local refineries, including ConocoPhillips. It is shipped by pipeline and vessel to users such as local refineries and distributors.

[6] Gasoline blendstocks are all other motor gasoline blending components such as naphthas (e.g., straight-run gasoline, alkylate, reformate, toluene, xylene) used for blending or compounding into finished motor gasoline.

Ethanol: Ethanol is received by vessel and railcar. Ethanol is shipped by truck to local refineries and petroleum distribution facilities.

Miscellaneous: At times, miscellaneous products such as gasoline blendstocks may be stored at the main terminal. These products are received from local refineries by pipeline or vessel. These products are shipped to local refineries by pipeline or truck and are not transferred by marine vessels at the terminal.

Dredging

~~The need for m~~Maintenance dredging has not been required for the historical operation of the MOT, and dredging is considered unlikely during the term of the proposed new lease. The depth of water at the MOT and the strong current at this location effectively preclude the deposition of sediment. Therefore dredging activities ~~will~~ are not ~~be~~ included in the Project Description.

2.3.5 Shipping Routes

Shore is an independent, privately owned transshipper of petroleum products. Ships and barges which visit the Shore MOT arrive from or depart to locations all over the world. As an example, Appendix E provides the 2005 Vessel Activity Report[7] for the MOT. Table 2-2 shows the number of vessel calls at the MOT between 1999 and 2008, and includes both tankers and barges. As may be seen from Table 2-2, over this 10-year period vessel calls have ranged from a low of ~~77~~ 75 in 2008~~4~~ to a high of 137 in 2003. These data are consistent with the level of use originally contemplated in the EIR for the existing lease, which projected up to 185 vessel calls per year (Woodward-Clyde 1979).

In 1992, the Western States Petroleum Association, in agreement with the California Department of Fish and Game (CDFG), Office of Spill Prevention and Response (OSPR), and 10 oil shipping companies, adopted a voluntary agreement to maintain a minimum distance of 50 nautical miles offshore the mainland for loaded Alaskan North Slope (ANS) crude oil tankers transiting between Alaska and California, except when approaching from offshore into the Main (west) directed traffic area south of the Farallon Islands. This minimum distance does not apply to other crude oil tankers. However, Shore does not handle any crude oil, and its product tankers typically follow routes closer to shore at an average distance of approximately 15 to 20 nautical miles.

[7] 2005 is the most recent year available for this report that includes vessel destinations.

Table 2-2. Vessel Calls at the Shore MOT 1999 - 2008

Year	Total Tank Vessel Calls
1999	88
2000	93
2001	116
2002	105
2003	137
2004	77
2005	110
2006	135
2007	105
2008	75~~83~~
Ten-Year Average	**104~~5~~**

Source: Shore 2009a

The USCG has established vessel traffic lanes for north, south, and west approaches to San Francisco Bay. Each approach consists of a 1-mile-wide inbound lane, a 1-mile-wide outbound lane, and a 1-mile-wide separation zone. Approximately 16 miles west of the Golden Gate Bridge (GGB), these lanes enter a "Precautionary Area" where traffic is merged with eastbound traffic lanes through the Bar Channel toward San Francisco Bay.

Once inside the Precautionary Area, vessels must contact the San Francisco Vessel Traffic System on Yerba Buena Island. Vessels anchored in the San Francisco Bay pick up their pilots at anchorage. Vessels inbound from the sea embark pilots at the pilot boarding area, approximately 12 miles west of the GGB. Vessels shifting from another berth downstream embark their pilots at the berth. After picking up pilots, the vessels pass through Regulated Navigational Areas (RNAs) on their way to the Shore MOT. Vessels calling at the Shore MOT typically pass through the San Francisco Bay RNA, the North Ship Channel RNA, and the San Pablo Strait Channel RNA. RNAs organize traffic flow patterns to reduce vessel congestion where maneuvering room is limited; reduce meeting, crossing, and overtaking situations between large vessels in constricted channels; and limit vessel speed.

2.3.6 Spill Response Capability

Detection of leaks at the MOT is accomplished by visual means, by monitoring transfers for unexplained drops in pipeline pressure, and routine comparisons of volume shipped with the volume received during the loading or unloading process.

Shore currently contracts with the National Response Corporation (NRC) for spill response services. NRC is listed in the Oil Spill Response Plan as the oil spill response organization (OSRO) for onwater, onshore, and shallow water response. NRC equipment in the Bay Area includes 73 boats, 12.3 miles (64,900 feet) of boom, 20 skimmers, 80,615 barrels (bbls) of storage capacity, and other miscellaneous equipment. Their response time is less than two hours. While Shore relies on NRC for ~~their~~ its second level spill response, first level response is provided by trained terminal personnel. The MOT has 0.3 mile (1,600 feet) of 18-inch curtain containment boom (800 feet on each end) for immediate response.

Shore revised its Oil Spill Response Plan in December ~~of~~ 2000, and updated the ~~Manual~~ Plan in August 2005. Shore participates in the emergency response drills scheduled regularly with ~~Cal~~ OSPR and the USCG.

2.3.7 Measures Designed Into Proposed Project to Avoid Potential Impacts

The proposed Project is required to have available equipment to deploy to contain potential spills of product at the MOT (see Section 2.3.2 ~~above~~, Physical Description of Marine Terminal). In addition, to further mitigate potential spills, the proposed Project would incorporate the following applicant proposed measures (APMs):

APM-1 Powered containment boom reels ~~will be~~ were installed and became operational in November 2009.

APM-2 The seismic assessment reported in the 2010 MOTEMS Initial Audit of the NuStar Selby Marine Terminal identified that two of the four product lines serving the wharf have insufficient flexibility to accommodate the predicted seismic displacements of the wharf moving during an earthquake. To provide the necessary flexibility and prevent the potential for pipeline rupture and oil spill, a U-shaped expansion loop will be introduced into each of these two at-risk product lines. The new expansion loops will consist of 60 feet of new piping, inserted into the alignment of the existing P-4 and P-5 lines. The loops will be installed on the wharf, starting approximately 2 feet from the first set of existing 12-inch pipe elbows.

Lateral stops will also be added to the 2nd and 5th pile cap bents (counting from the wharf) to provide necessary lateral restraint for the upgraded system. This work is exclusively intended to address the seismic deficiencies reported in the 2010 MOTEMS Initial Audit. No increase in pipeline capacity or throughput is associated with this work.

3.0 ALTERNATIVES AND CUMULATIVE PROJECTS

3.1 FACTORS USED IN SELECTION OF ALTERNATIVES

3.1.1 Alternatives Development and Screening Process

One of the most important aspects of the environmental review process is the identification and assessment of reasonable alternatives that have the potential for avoiding or minimizing the impacts of a proposed project. In addition to mandating consideration of the No Project Alternative, the State California Environmental Quality Act (CEQA) Guidelines (sections 15126.6(c) and 15126.6(d)) emphasize the selection of a range of reasonable alternatives and an adequate assessment of these alternatives to allow for a comparative analysis for consideration by decision-makers.

The CEQA requires consideration of a range of reasonable alternatives to a proposed project or project location that: (1) could feasibly attain most of the basic project objectives; and (2) would avoid or substantially lessen any of the significant impacts of the proposed project. An alternative cannot be eliminated simply because it is more costly or if it could impede the attainment of all project objectives to some degree. However, the State CEQA Guidelines declare that an Environmental Impact Report (EIR) need not consider an alternative whose effects cannot be reasonably ascertained and whose implementation is remote or speculative. The CEQA requires that an EIR include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project.

The State CEQA Guidelines require~~s~~ the identification of an environmentally superior alternative. The determination of an environmentally superior alternative is based on the consideration of how the alternative fulfills the project objectives and how the alternative either reduces significant, unavoidable impacts or substantially reduces the impacts to the surrounding environment. The State CEQA Guidelines (section 15126.6(e)(2)) states, in part, that “If the environmentally superior alternative is the “No Project” alternative, the EIR would also identify an environmentally superior alternative among the other alternatives.”

This screening analysis does not focus on relative economic factors of the alternatives (as long as they are feasible) since the State CEQA Guidelines require consideration of alternatives capable of eliminating or reducing significant environmental effects even though they may “impede to some degree the attainment of ~~P~~project objectives or would

be more costly." Likewise, the question of market demand or ~~P~~project need is not considered.

3.1.2 Alternatives Screening Methodology

Alternatives to the proposed Project were selected based on the information received from Shore, the EIR study team, and the public and local jurisdictions during the EIR scoping period. The alternatives screening process consisted of three steps:

Step 1: Define the alternatives to allow comparative evaluation.

Step 2: Evaluate each alternative in consideration of one or~~f~~ more of the following criteria:

- The extent to which the alternative would accomplish most of the basic goals and objectives of the Project;
- The extent to which the alternative would avoid or lessen one or more of the identified significant environmental effects of the Project;
- The potential feasibility of the alternative, taking into account site suitability, economic viability, availability of infrastructure, General Plan consistency, and consistency with other applicable plans and regulatory limitations; and
- The requirement of the State CEQA Guidelines to consider a "no project" alternative and to identify, under specific criteria, an "environmentally superior" alternative in addition to the "no project" alternative (State CEQA Guidelines, §~~section~~ 15126.6(e)).

Step 3: Determine suitability of the proposed alternative for full analysis in the EIR. If the alternative is unsuitable, eliminate it from further consideration with appropriate justification.

Feasible alternatives that did not clearly offer the potential to reduce significant environmental impacts and infeasible alternatives were removed from further analysis. In the final phase of the screening analysis, the environmental advantages and disadvantages of the remaining alternatives were carefully weighed with respect to potential for overall environmental advantage, technical feasibility, and consistency with Project and public objectives.

If an alternative clearly does not provide any environmental advantages as compared to the proposed Project, it is eliminated from further consideration. At the screening stage, it is not possible to evaluate potential impacts of the alternatives or the proposed Project

with absolute certainty. However, it is possible to identify elements of the proposed Project that are likely to be the sources of impact. A preliminary assessment of potential significant effects of the proposed Project resulted in identification of the following impacts:

- Operational Safety/Risk of Accidents;
- Biological Resources;
- Commercial and Sports Fisheries;
- Water Quality;
- Land Use/Recreation (oil spill impacts);
- Air Quality (including greenhouse gases);
- Noise;
- Visual Resources (oil spill impacts); and
- Geological Resources (structural integrity of the wharf).

For the screening analysis, the technical and regulatory feasibility of various potential alternatives ~~were~~ was assessed at a general level. The assessment of feasibility was approached using reverse reason; that is, an attempt was made to identify anything about the alternative that would be infeasible on a technical or regulatory basis. The CEQA does not require elimination of a potential alternative based on cost of construction and operation/maintenance. For the proposed Project, the primary technical and regulatory issues that could make an alternative infeasible relate to:

- Engineering feasibility and feasibility of implementation;
- Availability of space in roads and railroad or utility corridors and the likelihood of obtaining a right-of-way easement from these owners; and
- The likelihood of obtaining right-of-way easements on private lands.

3.1.3 Summary of Screening Results

Potential alternatives were reviewed against the above criteria. A number of alternatives were eliminated based on feasibility or their inability to meet the basic project objectives (see Section 1.1, Project Objectives, Purpose, and Need). Those alternatives that were found to be technically feasible and consistent with Shore's objectives were reviewed to

determine if the alternative had the potential to reduce the environmental impacts of the proposed Project.

Table 3.1-1 represents the evaluation and selection of potential alternatives to be addressed in the EIR. Those listed in the first column have been eliminated from further consideration (see rationale in Section 3.2, Alternatives Eliminated from Full Evaluation), and those in the second column are described in Section 3.3, Alternatives Evaluated in EIR, and are evaluated in detail in Section 4.0, Environmental Analysis.

Table 3.1-1. Summary of Alternative Screening Results

Alternatives Eliminated from Consideration	Alternatives Evaluated in this EIR
Facility Consolidation in Bay	No Project
Construct New Pipelines	Limitations on Terminal Use
Lease Options	

3.2 ALTERNATIVES ELIMINATED FROM FULL EVALUATION

3.2.1 Facility Consolidation in Bay

Consolidation of marine terminal operations at another presently existing facility was examined. The most likely candidate for consolidation in the Bay is the Chevron Long Wharf, given its central location in the Bay and its size. However, the Chevron Long Wharf is already operating at capacity and substantial modifications to its pipeline infrastructure would be required to transform that wharf into a facility that could accommodate additional marine tanker and barge traffic (CSLC 2007). In addition, integrating a multi-party transshipment operation with a refinery-owned and operated marine terminal would likely encounter substantial legal challenges under Federal Trade Commission regulations intended to prevent business monopolies. Given these technical and legal feasibility issues, this alternative was eliminated from further consideration in this EIR.

3.2.2 Construct New Pipelines

As described in Table 2-1 in Section 2.0, Project Description, a total of approximately 11 million barrels of petroleum products were transferred to or from marine vessels at the Shore MOT in 2007. Under this alternative, the Shore MOT would cease operations and new pipelines would have to be constructed to transfer these petroleum products from and to the wide variety of sources and destinations, respectively, currently served by marine vessels. Design and construction of such an extensive pipeline system

would require a complex technical and regulatory process. Further, it is unlikely that right-of-way acquisition would be feasible for the many miles of public and private lands that would have to be crossed by such a pipeline network. Accordingly, this alternative was eliminated from further consideration.

3.2.3 Lease Options

Alternative Lease Option 1

Two alternative lease options were considered. The first would involve granting of a short-term lease to Shore during which Shore would phase out its operation of the MOT. Because demand for the types of petroleum products transshipped through the Shore MOT is unlikely to diminish substantially in the near term, such a phase-out lease would require Shore to replace its marine vessel loading and unloading with other means of product conveyance. The phase-out lease would therefore serve only to extend the time during which the other conveyance alternatives considered in this document, including the No Project Alternative, would have to be developed. Because this would not meet the basic Project objective of continuing to operate the Shore MOT as a link in the inbound and outbound logistics chain on the west coast,[1] a short-term lease is not considered further in this document.

Alternative Lease Option 2

The second alternative lease option would involve the California State Lands Commission (CSLC) granting a lease to another marine terminal operator. This would be an option if Shore and the CSLC were unable to agree on terms of a new 30-year lease. However, Shore would continue to own the MOT infrastructure and the upland terminal as well as the pipelines between the MOT and the upland terminal. It is reasonable to assume that Shore would continue to operate the upland terminal using truck and rail transportation for product conveyance in addition to the existing 8-inch-diameter Kinder Morgan pipeline and 12-inch-diameter Kinder Morgan Richmond pipeline. This would effectively isolate the MOT, making it very difficult for a new MOT operator to negotiate storage and throughput capacity with Shore in order to transship products through the MOT. In addition to the question of feasibility, this alternative would not result in any lessened environmental impacts as compared to the proposed Project. Therefore, this alternative was eliminated from further consideration.

[1] The movement (logistics chain) of petroleum products along the west coast is currently provided by a variety of conveyance methods, including truck, rail, pipeline, barge, and tanker. This diversity of conveyance methods provides a certain amount of redundancy in the event that a particular method is interrupted by unforeseen circumstances.

3.3 ALTERNATIVES EVALUATED IN EIR

3.3.1 No Project Alternative

Under the No Project Alternative, ~~new lease~~ the CSLC would not ~~be~~ grant~~ed~~ a new lease to Shore and the existing wharf would be subsequently decommissioned with its components reused, abandoned in place, removed, or a combination thereof. The decommissioning of the Shore wharf would be governed by an Abandonment and Restoration Plan, and would include, but not be limited to, the following actions:

- Magnetic survey of seafloor;
- Abandonment and/or removal all wharf components above and below the seafloor, including pilings and pipelines;
- Site Cleanup Verification using such means as side scan sonar, remotely operated vehicles, and video; and
- Phase 1 Site Assessment (and more detailed Assessment if needed). Based on the results, a Site Closure Plan would be prepared for approval by appropriate agencies.

Under the No Project Alternative, the upland terminal would continue to operate but product would no longer be delivered or shipped by marine vessel. Table 3.3-1 summarizes the total product throughput by transportation mode at the Shore upland terminal for 2005 though 2008. For the baseline year 2007, these data show that 41 percent of the total throughput at the upland terminal either came in or was shipped out by marine vessel; pipeline transportation accounted for 40 percent of the total; and truck and rail transportation combined accounted for 19 percent of the total. A similar distribution is shown for the other three years presented in the table.

According to Shore (2009), closing of the wharf would reduce the volume of products handled at the upland terminal substantially, by approximately 40 percent of total volume handled. Outbound capacity on the 8-inch Concord pipeline is limited by Kinder Morgan to 12,000 ~~thousand~~ barrels per day (4,380,000 ~~thousand~~ barrels per year) at the Shore terminal, so there is little capacity remaining in the Concord pipeline to make up for the loss of marine vessel transportation. There are currently no inbound truck offloading facilities (only outbound loading), while there are no outbound rail loading facilities (only inbound offloading) at the upland terminal. Further, the inbound rail facility is near maximum capacity due to railroad operation service levels. Given these

Table 3.3-1. Total Shore Upland Terminal In/Out Product Throughput for 2005-2008 (thousand barrels and percent of total)

Year	Transportation Mode				
	Marine Vessels	Rail	Truck	Pipeline	Total
2005	9,239 *36%*	1,655 *7%*	2,332 *9%*	12,344 *48%*	25,570 *100%*
2006	11,212 *42%*	1,510 *6%*	2,765 *10%*	11,152 *42%*	26,639 *100%*
2007	11,468 *41%*	2,522 *9%*	2,889 *10%*	11,098 *40%*	27,977 *100%*
2008	8,069 *39%*	2,894 *14%*	2,827 *13%*	6,995 *34%*	20,785 *100%*

Source: Shore 2009

constraints on the existing modes of product transport, very little of the lost capacity could be made up by increasing these other modes of transportation; therefore, the total product throughput at the upland terminal would likely decrease by up to 40 percent under the No Project ~~a~~Alternative. Because it can be expected that demand for these products would continue with or without the proposed Project, the No Project Alternative may therefore result in diversion of some product shipments to other marine terminals, with a corresponding increase in outbound rail car and/or truck transportation to final destinations not served by existing pipelines from those other marine terminals.

The No Project Alternative would also require Shore to terminate its contract with the Defense Fuel Supply Center, which is currently in year ~~five~~ seven of a ~~fifteen~~ 15-year contract. This contract relies on inbound pipelines to the Shore upland terminal and loading of 90 percent of these receipts to U.S. Naval vessels via the MOT for delivery to additional Defense Fuel Supply Center distribution centers.

3.3.2 Limitations on Terminal Use

Under the Limitations on Terminal Use Alternative, a new lease would be granted to Shore but with restrictions on the number, type, or size of marine vessels that would be allowed to call at the marine terminal, or restrictions on the type of product that could be loaded or unloaded.

3.4 COMPARISON OF PROPOSED PROJECT AND ALTERNATIVES

The State CEQA Guidelines (§~~Section~~ 15126.6(d)) require~~s~~ that an EIR include sufficient information about each alternative to allow meaningful evaluation, analysis, and

comparison with the proposed Project. The State CEQA Guidelines section 15126.6(e)(2) further state, in part, that “If the environmentally superior alternative is the “No Project” alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives.”

Table ES-1 in the Executive Summary provides a comparison of the proposed Project with each of the alternatives. All of the alternatives, including the No Project Alternative, are evaluated in Section 4.0, Environmental Analysis.

3.5 CUMULATIVE PROJECTS

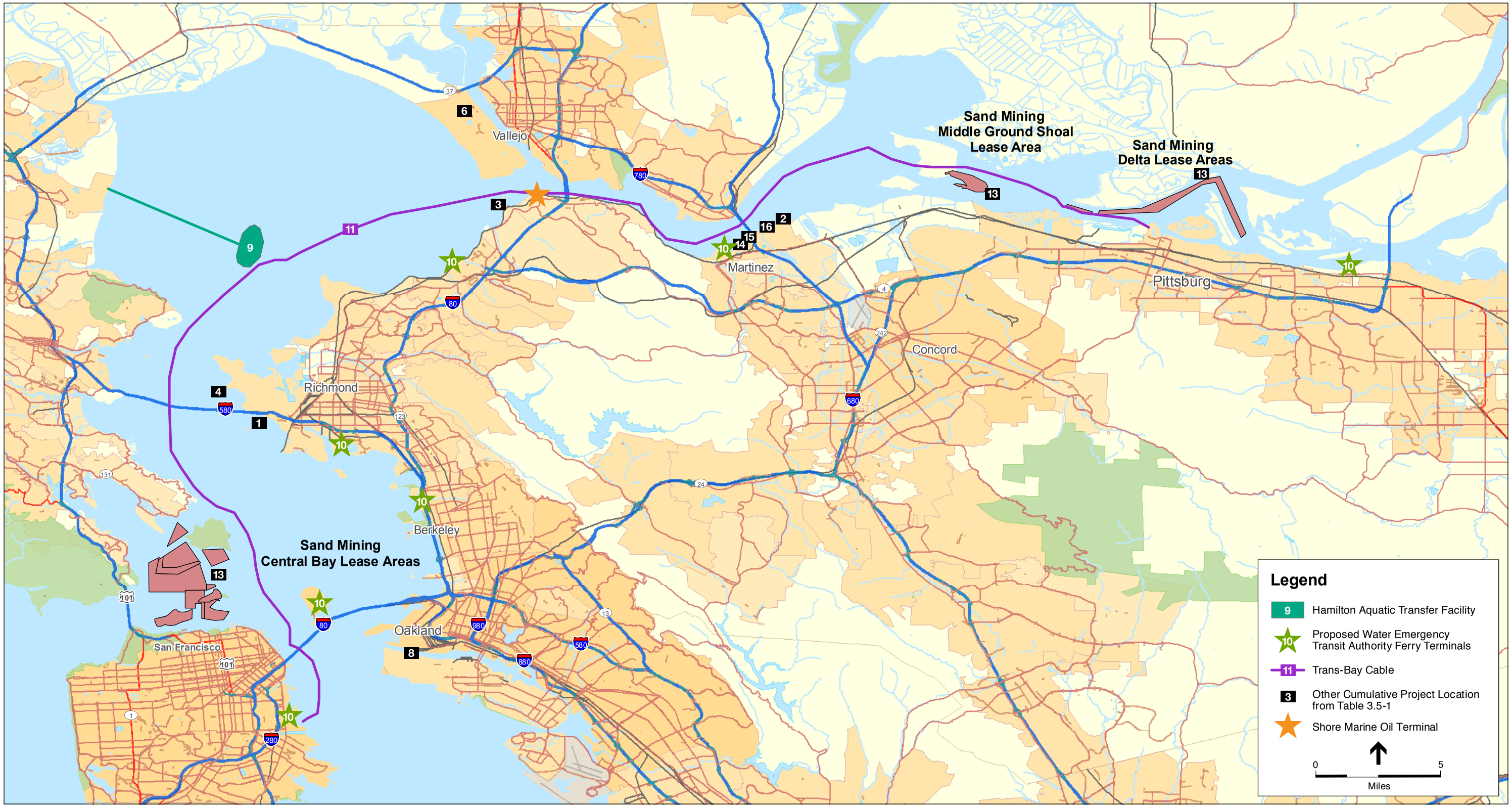
This discussion provides a listing and map identifying other related future projects near the location of the proposed Project and alternatives.

Section 15130 of the State CEQA Guidelines requires that an EIR discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable, as defined in section 15065(c). Where a lead agency is examining a project with an incremental effect that is not "cumulatively considerable," a lead agency need not consider that effect significant, but shall briefly describe its basis for concluding that the incremental effect is not cumulatively considerable. As defined in ~~S~~section 15355 of the State CEQA Guidelines, a cumulative impact consists of an impact which is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts. An EIR should not discuss impacts which do not result in part from the project evaluated in the EIR.

3.5.1 Boundary of Cumulative Projects Study Area

The Cumulative Projects Study Area is defined as the San Francisco-San Pablo Bay region (the Bay or Bay Area), Carquinez Strait, Suisun Bay, and the outer coast of California as shown in Figure 3.5-1. This is the area within which the proposed Project’s impacts could combine with impacts from other projects and be cumulatively considerable. Cumulative projects within this area are separated into the following components and are described in Section 3.5.2, Description of Cumulative Projects:

- Foreseeable projects in the general vicinity of the Shore MOT; and
- Projects in or near the shipping lanes, utilized by other carriers, not only for petroleum products but also for transport of other goods and materials within the Carquinez Strait, San Pablo Bay, and San Francisco Bay.



SOURCE: ESA 2009; ESRI 2008

Shore Marine Oil Terminal Lease Project EIR

Figure 3.5-1

Location of Cumulative Projects

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Most vessel traffic in the Cumulative Projects Study Area is not the responsibility of Shore. However, vessels en_route to or departing from the Shore MOT could have an accidental spill or release of fuel or product in the Bay or outer coast. A general overview of cumulative impacts is presented in Section 4.0, ~~Existing~~ Environmental ~~and Impact~~ Analysis, within each environmental discipline. Cumulative impacts on the coastal area from San Francisco Bay north to the Oregon/California border and south to Santa Cruz were previously addressed in the Shore Terminals, LLC, Martinez Marine Terminal Lease Consideration EIR (CSLC 2004), and for consideration of a new lease for the Unocal (now ConocoPhillips) Marine Terminal (CSLC 1994), and Chevron Long Wharf (CSLC 2007). Cumulative impacts relevant to tanker traffic on the shipping lanes from San Francisco Bay south to southern California were previously addressed in the GTC Gaviota Marine Terminal Project Final Supplemental EIR/EIS (Aspen Environmental Group 1992). The identification and analyses of cumulative outer coast impacts possible from outer coast shipping discussed by these documents, though dated, are still relevant, and, in the discussion of impacts associated with the Shore MOT, comparable and current for this analysis. A description of the regional characteristics of transport in the Bay Area and outer coast is presented in Section 3.5.3, Regional Characteristics of Marine Vessel Transportation in Bay and Along Coastal Shipping Lanes off Northern California.

3.5.2 Description of Cumulative Projects

Consistent with ~~the~~ State CEQA Guidelines requirements (§ 15355), projects considered in this analysis that potentially contribute to cumulative impacts for the Shore MOT are those that are within the defined study area and include:

- Projects that are currently under construction;
- Approved projects that have not yet been constructed;
- Projects requiring an agency approval for an application that has been received at the time the Notice of Preparation was released;
- Projects that have been budgeted, planned, or included as a later phase of a previously approved project; and
- Probable future projects that are determined to be reasonably foreseeable for other reasons.

Table 3.5-1 identifies and describes the specific projects considered in the cumulative scenario, and the locations of these projects are illustrated on Figure 3.5-1.

Table 3.5-1. Projects with the Potential to Cumulatively Affect Resources of Concern for the Shore Marine Oil Terminal Lease Project

Location on Map (Figure 3.5-1)	Project	Description	Location	Status/Schedule
1	Lease Consideration for the Existing Chevron Richmond Long Wharf Marine Terminal	Proposed 30-year lease of approximately 68 acres of California sovereign lands would allow Chevron USA, Inc. to continue its marine oil terminal operations for vessel transfers of crude oil and petroleum products. The terminal enables transfers to upland storage and refinery facilities approximately 1 mile west of the city of Richmond, south of the Richmond-San Rafael Bridge and Castro Point, northwest of Point Richmond, and north of the Richmond Harbor Entrance, in Contra Costa County.	Richmond, CA	Notice of~~O~~ Determination filed February 2009
2	Shore Terminal LLC Martinez Marine Terminal 20-year Lease Consideration	Proposed new 20-year lease of 5.04 acres of California sovereign lands would allow Shore Terminals, LLC, to continue its marine oil terminal operations for vessel transfers of crude oil and petroleum products. The terminal enables transfers to on-land storage facilities approximately 2 miles east of the City of Martinez, south shore of Carquinez Strait, and approximately 1 mile east of the Benicia Bridge.	Martinez, CA	Notice of Determination (NOD) filed August 2005
3	Coscol (Pacific Refining) Decommisioning and Pipeline Abandonment Project	Removal of the former Pacific Refining Marine Terminal and onshore vault. Abandonment of approximately 7,000 feet of underwater pipeline.	Rodeo and Hercules, CA	Mitigated Negative Declaration (MND) adopted June 2009; project was completed in summer 2010
4	Point Molate Reuse Project	Project evaluates the potential for significant environmental effects of U.S. Navy disposal of Pt. Molate Fueling Depot and three proposed community reuse alternatives.	Richmond, CA	Draft EIR/Environmental Impact Statement (EIS) filed 2002

Table 3.5-1. Projects with the Potential to Cumulatively Affect Resources of Concern for the Shore Marine Oil Terminal Lease Project (cont.)

Location on Map (Figure 3.5-1)	Project	Description	Location	Status/Schedule
5 [Note: due to the disperse geography of this project, it cannot be illustrated on Figure 3.5-1]	San Francisco Bay Area Water Trail Plan	The San Francisco Bay Area Water Trail Plan (Plan) provides recommendations and guidance for a network of landing/launching sites at various locations on the margins of San Francisco Bay and its tributaries for non-motorized small boats. Water Trail access is being considered for at least 112 locations in the counties of Alameda, Santa Clara, San Mateo, San Francisco, Napa, Sonoma, Solano, Marin, and Contra Costa. The Plan would result in improvements at some or all of the 112 locations, as well as other unidentified sites. The plan would also redirect existing use of San Francisco Bay by non-motorized small boats.	San Francisco Bay	EIR filed June 2008
6	Mare Island Reuse Project	WESTON Solutions, Inc. and the city of Vallejo propose to use seven existing disposal ponds on Mare Island for the disposal of material dredged from projects throughout the Bay Area. The ponds would be operated as a commercial facility available for the disposal of dredged material by various public and private projects.	Vallejo, CA	EIR filed July 2005
7 [Note: due to the disperse geography of this project, it cannot be illustrated on Figure 3.5-1]	Long-Term Management Strategy (LTMS) for the Placement of Dredged Material in the San Francisco Bay	Interagency strategy and plan for ongoing dredging, including maintenance dredging of federally designated navigation channels, in San Francisco Bay, San Pablo Bay, and Suisun Bay, and dredge materials disposal in San Francisco Bay, Pacific Ocean, and upland disposal sites for beneficial use.	Locations throughout the San Francisco Bay, San Pablo Bay, Carquinez Strait, and the Delta	Strategy and Plan in effect. - Final EIR/EIS was completed in December 1998. - Record of Decision was signed on 16 July 1999. - LTMS Management Plan was completed in August 2000 and adopted by Bay Conservation and Development Commission (BCDC) in December 2000.

Table 3.5-1. Projects with the Potential to Cumulatively Affect Resources of Concern for the Shore Marine Oil Terminal Lease Project (cont.)

Location on Map (Figure 3.5-1)	Project	Description	Location	Status/Schedule
8	Oakland Harbor Navigation Improvement (-50 Foot) Project	The –50 Foot Project supports deep draft navigation improvements at the Port of Oakland. Project components include widening and deepening of the Harbor Entrance, Outer and Inner Harbor channels, and two turning basins to –50 feet Mean Lower Low Water (MLLW) as well as local business and utility relocations.	Oakland Harbor	Project being implemented. Final EIR/EIS completed in 1998 by U.S. Army Corps of Engineers (ACOE) and Port of Oakland.
9	Hamilton Wetlands Restoration Project Dredged Material Aquatic Transfer Facility	Evaluation of alternative approaches to deliver dredged material to the Hamilton Wetlands Restoration Project in Marin County; Federal lead agency is ACOE; State lead agency is California State Coastal Conservancy.	San Pablo Bay, in vicinity of existing in-Bay dredged material disposal site SF-10	Draft EIR/EIS was published in October 2008
10	San Francisco Water Emergency Transit Authority (WETA) Ferry System Expansion	WETA priorities are to create and adopt an Emergency Water Transportation System Management Plan for the Bay Area on or before July 1, 2009; create and adopt, on or before July 1, 2009, a transition plan to facilitate the transfer of existing public transportation ferry services within the Bay Area region to WETA while ensuring continuity in the programs, services, and activities of existing public transportation ferry services; and to continue to deliver the 2003 Ferry Implementation and Operations Plan with a focus on building and operating a comprehensive and environmentally friendly public water transit system of ferries, feeder buses, and terminals to increase regional mobility in the Bay Area.	San Francisco Bay, San Pablo Bay, and Suisun Bay	Ferry Implementation and Operations Plan adopted in 2003 by WETA's predecessor (Water Transit Authority), and based on Final Program EIR~~Environmental Impact Report~~ for the Expansion of Ferry Transit Service in the San Francisco Bay Area. Prepared for the Water Transit Authority, completed in 2003. http://www.watertransit.org/newsInformation/eir.aspx#download)

Table 3.5-1. Projects with the Potential to Cumulatively Affect Resources of Concern for the Shore Marine Oil Terminal Lease Project (cont.)

Location on Map (Figure 3.5-1)	Project	Description	Location	Status/Schedule
11	Trans-Bay Cable	The Trans-Bay Cable Project would involve the installation of a submarine High Voltage Direct Current (HVDC) transmission cable and associated onshore facilities that would transmit electrical power and provide a dedicated connection between the East Bay near Pittsburg and the electrical transmission and distribution facilities serving the northern San Francisco peninsula. Includes 53 miles of submarine and buried onshore HVDC cable installed beneath Suisun Bay, the Carquinez Strait, San Pablo Bay, and San Francisco Bay to a proposed converter station in San Francisco. Project scheduled to become operational in 2009, with an operational life of at least 40 years.	City of Pittsburg, Suisun Bay, Carquinez Strait, San Pablo Bay, San Francisco Bay, City of San Francisco	Final EIR certified by ~~C~~city of Pittsburg in 2006 http://www.ci.pittsburg.ca.us/pittsburg/pdf/tbc_feir/urs%20tbc%20feir/index.html
12 [Note: due to the disperse geography of this project, it cannot be illustrated on Figure 3.5-1]	Long-Term Management Strategy (LTMS) for Delta Sediments	The Delta ~~Long Term Management Strategy (~~LTMS~~)~~ is a multi-agency cooperative planning effort to coordinate, plan, and implement beneficial reuse of sediments in the Sacramento and San Joaquin River Delta.	Sacramento and San Joaquin River Delta	Plan is under development
13	Hanson Sand Mining Project	Hanson Marine Operations and Jerico Products, Inc./Morris Tug & Barge have submitted an application to the CSLC for the renewal of mineral extraction leases for an additional 10-year period to enable the continuation of dredge mining of construction-grade sand from certain delineated areas of Central San Francisco Bay and the western Sacramento–San Joaquin Delta.	Certain delineated areas of Central San Francisco Bay and the western Sacramento–San Joaquin Delta	Notice of Preparation (NOP) filed July 2007; ~~d~~Draft EIR ~~in-process~~filed in October 2011

Table 3.5-1. Projects with the Potential to Cumulatively Affect Resources of Concern for the Shore Marine Oil Terminal Lease Project (cont.)

Location on Map (Figure 3.5-1)	Project	Description	Location	Status/Schedule
14	Shell Martinez Marine Oil Terminal	Shell Oil Products US (Shell), ~~is seeking~~ received approval from the ~~California State Lands Commission (~~CSLC~~)~~ for a new 30-year lease to continue current transfer operations at its crude oil and petroleum product marine terminal.	Approximately 0.6 mile west of the Benicia-Martinez Bridge on the south side of the Carquinez Strait	~~NOP filed~~NOD filed June~~ly~~ 2011~~04~~
15	AMORCO Marine Oil Terminal	Tesoro is seeking approval for a new lease for its existing AMORCO MOT. It is currently unknown whether this proposed project would require any substantial changes to the existing terminal.	The nearest end of the wharf is about 600 feet west of the Benicia-Martinez Bridge	An application has been filed with CSLC. The NOP has not yet been issued for the project
16	Avon Marine Oil Terminal	Tesoro is seeking approval for a new lease for its existing Avon MOT. This project would require substantial maintenance work to be performed on the existing terminal.	The nearest end of the wharf is about 1.5 miles east of the Benicia-Martinez Bridge	An application has been filed with State Lands. The NOP has not yet been issued for the project

3.5.3 Regional Characteristics of Marine Vessel Transportation in Bay and Along Coastal Shipping Lanes off Northern California

Many types of marine vessels call at terminals in the San Francisco Bay Area, including passenger vessels, cargo vessels, tankers, tow/tug vessels, dry cargo barges, and tank barges. Several sources track vessel transits into the Bay. These sources are generally limited to inbound/arrival information from outside to inside the Bay and do not include vessel transit information for transits originating in the Bay.

Table 3.5-2 presents information on inbound vessel transits only through the Golden Gate Bridge (GGB) during 2006 (~~Corps~~ ACOE 2006),[2] which is the most recent year of data available and is generally representative of the baseline conditions for the proposed Project. The number of outbound transits would essentially be the same. With the exception of San Francisco Harbor, these numbers do not reflect vessel traffic transits originating in the Bay. Excluding San Francisco Harbor, 40,890 vessels called at terminals in the San Francisco Bay Area in 2006. Of these, 3,639 vessels transited the Carquinez Strait, which includes the general area of the Shore MOT.

Table 3.5-2. Inbound Vessel Traffic in San Francisco Bay (2006)

Location	Type of Vessel					Total Number of Vessels
	Passenger & Cargo	Tanker	Tow or Tug	Dry Cargo Barge	Tank Barge	
San Francisco Bay Entrance	2,810	804	352	9	410	4,385
San Francisco Harbor	38,825[1]	1	426	218	68	39,538[1]
Redwood City Harbor	40	-	130	24	5	199
Oakland Harbor	9,134	5	1,719	217	435	11,510
Richmond Harbor	133	428	4,754	256	1,587	7,158
San Pablo Bay and Mare Island Strait	10,053	465	1,588	708	472	13,286
Carquinez Strait	465	446	1,776	538	414	3,639
Totals	**22,635**[2]	**2,149**	**10,745**	**1,970**	**3,391**	**40,890**[2]

[1]Number of passenger and cargo vessels in Harbor reflects vessel traffic generated within the Bay, thus numbers shown exceed the number of vessels at the San Francisco Bay Entrance.
[2]Total excludes San Francisco Harbor passenger and cargo.

Source: ACOE 2006. Waterborne Commerce of the United States Calendar Year 2006 Part 4 Waterways and Harbors Pacific Coast, Alaska, and Hawaii.

[2] Although 2007 is the baseline year for the proposed Project, 2006 was the most current year of data available to the EIR authors and is presented here to show typical values for the waterway.

The Marine Exchange of the San Francisco Bay Region also tracks ship movements. Over a 20-year period (1989 to 2008), the overall number of GGB ship traffic arrivals has remained fairly constant, ranging from a low of 2,897 arrivals in 1997 to a high of 3,671 arrivals in 1991. In 2007, the baseline year for the proposed Project, the number of GGB vessel arrivals was 3,518. The mix of foreign flagged to U.S. vessels has been increasing over the years, and in 2007 was approximately 18 percent U.S. and 82 percent foreign flagged (Marine Exchange 2008).

Table 3.5-3 summarizes the marine vessel arrivals at Bay Area ports in 2008, including "shifts" (shifts included in Table 3.5-3 are those vessels that had movements from one part of the Bay to another). Total vessel arrivals at local ports have remained fairly constant over the past 4-year period (2004 to 2008), in the range of approximately 5,000 to 6,000 arrivals per year (Marine Exchange 2008), so these data are considered representative of the baseline conditions for the proposed Project. Of six anchorages located in the Bay, Anchorage 9, located south of the Bay Bridge between San Francisco and Oakland, had the majority of arrivals at 928 of the total 1,106 arrivals.

Table 3.5-3. ~~Golden Gate Ship Traffic~~ Destination of Golden Gate Bridge Ship Traffic Arrivals 2008, Including Shifts

Destination	Total
Anchorages (6)	1,106
Oakland	1,938
North Bay Area	817
Antioch	8
Benicia	317
Crockett Sugar	26
Martinez	282
Pittsburg	65
Rodeo	119
Redwood City	54
Richmond	722
Sacramento	55
San Francisco	126
Stockton	166
Total	**5,801**

Source: Marine Exchange 2008

The CSLC Marine Facilities Division in Hercules also tracks ship and barge calls to those marine terminals for which they have jurisdiction. Table 3.5-4 presents those numbers for 2008.

Table 3.5-4. Vessel Calls to Marine Terminals in the San Francisco Bay During 2008

Marine Terminal	Tankers	Barges	Total
Shell Oil, Martinez	67	130	197
G.P. Resources	3	60	63
Tesoro Amorco	82	3	85
Tesoro Avon	30	80	110
ConocoPhillips, Rodeo	77	179	256
Plains Products, Martinez	87	119	206
Shore, Crockett (Selby)	34	24	58
Chevron Long Wharf, Richmond	410	370	780
BP West Coast, Richmond	22	8	30
Plains Products, Richmond	10	333	343
BP Lubricants	0	12	12
Kinder Morgan, Richmond	5	0	5
IMTT, Richmond	5	443	532[1]
ConocoPhillips, Richmond	0	177	177
Valero, Benicia	134	22	156
Total All Terminals	**966**	**1,960**	**3,010**

[1]Total includes 84 tugs not included in the vessels or barges categories
Source: CSLC Marine Facilites Division 2009

Vessels entering and leaving the GGB entrance to San Francisco Bay do so through the Traffic Separation Scheme, which consists of a circular Precautionary Area with three traffic lanes (northern, main or western, and southern) exiting from the Precautionary Area. A detailed description of the regulated navigation areas is presented in Section 4.1, ~~in the~~ Operational Safety/Risk of Accidents, in the baseline conditions discussion.

Table 3.5-5 presents information on tanker origins and destinations and travel distances offshore of the California coastline when calling at terminals in the San Francisco Bay. This data is based on a USCG and National Oceanic and Atmospheric Administration (NOAA) special report to Congress and confirmed by recent data from the Marine Exchange. Vessels carrying crude are separated from vessels carrying products because product carriers sometimes transit closer to shore.

Table 3.5-5. Tanker Origin/Destination to/from San Francisco Bay and Distance Traveled from Coast

Origin	Destination	Typical Distance From Coast (Miles)
Alaska	SF Bay	50+
Canada	SF Bay	25+
Oregon and Washington	SF Bay	25+
Asia and Hawaii	SF Bay	NA
Los Angeles	SF Bay	25+
Mexico, Panama, and South America	SF Bay	10+
SF Bay	Oregon and Washington	25+
SF Bay	Humboldt Bay	25+
SF Bay	Asia and Hawaii	NA
SF Bay	Port San Luis	10+
SF Bay	Los Angeles	50+ ANS crude 25+ other crude and products
SF Bay	Mexico, Panama, and South America	25+

Sources: USCG and NOAA, undated. Report to Congress on Regulating Vessel Traffic in the Monterey Bay National Marine Sanctuary as Required by Public Laws 102-368 and 102-587. Marine Exchange of the San Francisco Bay Region 2002.

Imported cargo and associated vessel calls are expected to triple from 1995 to 2020 (~~Corps~~ ACOE et al. 1998). Numbers taken from the Seaport Plan (BCDC and MTC 2003) show a projected increase of total waterborne cargo[3] more than doubling from approximately 18 million metric tons in 2002 to 41 million metric tons in 2020. The number of vessels is difficult to estimate, as in the future, larger vessels will carry greater quantities of cargo than at present.

[3] The projected estimates reflect general cargo ports and terminals; liquid bulk commodities handled at proprietary terminals (including Shore) are not included in the projections.

4.0 ENVIRONMENTAL ANALYSIS

INTRODUCTION TO ENVIRONMENTAL ANALYSIS

Section 4.0 examines the potential environmental impacts of the proposed Shore Marine Oil Terminal (MOT) Lease Project and Project alternatives. This section includes analyses of the environmental issue areas listed below:

4.1 OPERATIONAL SAFETY/RISK OF ACCIDENTS
4.2 BIOLOGICAL RESOURCES
4.3 COMMERCIAL AND SPORT FISHERIES
4.4 HYDROLOGY AND WATER QUALITY
4.5 LAND USE AND RECREATION
4.6 AIR QUALITY
4.7 NOISE
4.8 TRAFFIC AND TRANSPORTATION
4.9 VISUAL RESOURCES/LIGHT AND GLARE
4.10 CULTURAL RESOURCES
4.11 GEOLOGY, SOILS, AND SEISMICITY

Each environmental issue area analyzed in this document provides background information and describes the environmental setting (baseline conditions) to help the reader understand the conditions that would cause an impact to occur. In addition, each section describes how an impact is determined to be “significant” or “less than significant.” Finally, the individual sections recommend mitigation measures (MMs) to reduce significant impacts. Throughout this ~~S~~section~~—4~~, both impacts and the corresponding MMs are identified by a bold letter-number designation (e.g., Impact **BIO-1** and **MM BIO-1a**).

Based on an initial review and analysis, it is likely that the proposed Project would have a less-than-significant impact, or no impact, on the environmental issue areas identified below. The primary reasons for these determinations are as follows:

- Agricultural Resources. The proposed Project would not involve any new construction or expansion of existing operations, so there would be no changes to the existing environment that could result in the conversion of farmland to non-agricultural use or conflict with existing zoning for agricultural use or Williamson Act contract.

- Mineral Resources. The proposed Project would not result in any change to the existing footprint of the MOT, so there would be no impact on the availability of regionally or locally important mineral resources.

- Population and Housing. The proposed Project would not change existing operations, so there would be no construction or operation workforce growth that could have an adverse effect on population and housing.

- Public Services. The proposed Project would not result in any change to existing operations and would not add any new workforce, so there would be no changes to the existing level of demand for public services.

- Utilities and Service Systems. The proposed Project would not result in any change to existing operations and would not add any new workforce, so there would be no changes to the existing level of demand for utilities and service systems.

ASSESSMENT METHODOLOGY

Environmental Baseline

The analysis of each issue area begins with an examination of the existing physical setting (baseline conditions) that may be affected by the proposed Project as determined pursuant to section 15125(a) of the California Environmental Quality Act (CEQA) Guidelines ~~that may be affected by the proposed Project~~. The effects of the proposed Project are defined as changes to the environmental setting that are attributable to Project components or operation.

Unless otherwise noted in the specific resource sections which follow, ~~the baseline year used in this EIR for the Shore MOT is 2007.~~ for the purposes of this analysis, the baseline conditions against which impacts are analyzed are those conditions existing as of the publication of the proposed Project's Notice of Preparation (NOP), November 28, 2007. The year 2007 provided the most recent and complete set of data to the EIR authors and also coincides with the filing date (November 28, 2007) of the ~~Notice of Preparation (~~NOP~~)~~ for this EIR.

Significance Criteria

Significance criteria are identified for each environmental issue area. The significance criteria serve as benchmarks for determining if a component action will result in a significant adverse environmental impact when evaluated against the baseline. According to the State CEQA Guidelines section 15382, a significant effect on the environment means "… a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project."

Impact Analysis

Impacts are classified as:

- **Class I** (significant adverse impact that remains significant after mitigation);
- **Class II** (significant adverse impact that can be eliminated or reduced below an issue's significance criteria);
- **Class III** (adverse impact that does not meet or exceed an issue's significance criteria); or
- **Class IV** (beneficial impact).

A determination will be made, based on the analysis of any impact within each affected environmental issue area and compliance with any recommended mitigation measure(s), of the level of impact remaining in comparison to the pertinent significance criteria. If the impact remains significant, at or above the significance criteria, it is deemed to be Class I. If a "significant adverse impact" is reduced, based on compliance with mitigation, to a level below the pertinent significance criteria, it is determined to no longer have a significant effect on the environment; i.e., to be "less than significant" (Class II). If an action creates an adverse impact above the baseline condition, but such impact does not meet or exceed the pertinent significance criteria, it is determined to be adverse, but less than significant (Class III). An action that provides an improvement to an environmental issue area in comparison to the baseline information is recognized as a beneficial impact (Class IV).

Formulation of Mitigation Measures and Mitigation Monitoring Program

When significant impacts are identified, feasible mitigation measures are formulated to eliminate or reduce the intensity of the impacts and focus on the protection of sensitive resources. The effectiveness of a mitigation measure is subsequently determined by evaluating the impact remaining after its application. Those impacts meeting or exceeding the impact significance criteria after mitigation are considered residual impacts that remain significant (Class I). Implementation of more than one mitigation measure may be needed to reduce an impact below a level of significance. The mitigation measures recommended in this document are identified in the impact sections and presented in a Mitigation Monitoring Program (MMP). The MMP is provided in Section 7.0, Mitigation Monitoring Program.

If any mitigation measures become incorporated as part of a project's design, they are no longer considered mitigation measures under CEQA. If they eliminate or reduce a

potentially significant impact to a level below the significance criteria, they eliminate the potential for that significant impact since the "measure" is now a component of the action. Such measures incorporated into the project design have the same status as any “applicant proposed measures.” The CSLC’s practice is to include all measures to eliminate or reduce the environmental impacts of a proposed project, whether applicant proposed or recommended mitigation, in the MMP.

Impacts of Alternatives

Section 3.0, Alternatives and Cumulative Projects, provides a list, description, and map that identify alternatives to the proposed Project. Each issue area in Section 4.0, Environmental Analysis, presents the impact analysis for each alternative scenario. A summary of the collective impacts of each alternative in comparison with the impacts of the proposed Project is included within the Executive Summary.

Cumulative Projects Impact Analysis

Each issue area in Section 4.0, Environmental Analysis, presents the cumulative impact scenario, the focus of which is to identify the potential impacts of the proposed Project that might not be significant when considered alone, but that might contribute to a significant impact when viewed in conjunction with the other projects.

4.1 OPERATIONAL SAFETY/RISK OF ACCIDENTS

This section describes the existing environment that may impact operational safety of the ~~terminal~~ Shore Marine Oil Terminal (MOT), or that may be affected by an accident associated with the operation of the MOT, including transportation of petroleum products to and from the terminal. The MOT operated by Shore Terminals LLC (a NuStar Energy Company), hereafter referred to as Shore, is primarily located along the coastal area of the Carquinez Strait, a narrow channel that separates San Pablo Bay from Suisun Bay. Included in this section are: a~~A~~ summary of the existing vessel traffic levels at the terminal and at other marine terminals within the San Francisco Bay Area (Bay Area); ~~is described, as well as~~ a summary of the historical casualties involving tank vessels and marine terminals within the Bay Area;~~. This is followed by~~ a description of measures that are in place to allow the safe movement of marine vessels within the Bay and the ability to respond to emergency situations; a~~. A~~ summary of laws and regulations designed to maximize safety and to minimize potential risks from the facilities; an analysis of ~~is described. The~~ potential ~~for~~ impacts associated with the proposed Project; ~~are also described~~ and the mitigation measures recommended to reduce significant adverse impacts ~~are identified~~.

4.1.1 Environmental Setting

Vessel Traffic

Bay Area

Many types of marine vessels call at terminals in the Bay Area, including passenger vessels, cargo vessels, tankers, tow/tug vessels, dry cargo barges, and tank barges. Table 4.1-1 presents information on vessel visits to the Bay Area during 2006 (U.S. Army Corps of Engineers [ACOE] 2006), which is the most recent year of data available and is generally representative of the baseline conditions for the proposed Project.[1] The numbers in the table represent inbound transits, and numbers for outbound transits are approximately the same. A vessel that visits multiple terminals is counted at each terminal. With the exception of San Francisco Harbor, these numbers do not reflect vessel traffic transits originating in San Francisco Bay (the Bay). Excluding San Francisco Harbor, 40,890 vessels called at terminals in the Bay Area in 2006. Of

[1] As discussed in Section 3.5.3, Regional Characteristics of Marine Vessel Transportation in Bay and Along Coastal Shipping Lanes off Northern California, The Marine Exchange of the San Francisco Bay Region also tracks ship movements. Over a 20-year period (1989 to 2008), the overall number of Golden Gate Bridge ship traffic arrivals has remained fairly constant.

Table 4.1-1. Inbound Vessel Traffic in San Francisco Bay (2006)

Location	Type of Vessel					Total Number of Vessels
	Passenger & Cargo	Tanker	Tow or Tug	Dry Cargo Barge	Tank Barge	
San Francisco Bay Entrance	2,810	804	352	9	410	4,385
San Francisco Harbor	38,825[a]	1	426	218	68	39,538[a]
Redwood City Harbor	40	-	130	24	5	199
Oakland Harbor	9,134	5	1,719	217	435	11,510
Richmond Harbor	133	428	4,754	256	1,587	7,158
San Pablo Bay and Mare Island Strait	10,053	465	1,588	708	472	13,286
Carquinez Strait	465	446	1,776	538	414	3,639
Totals	**22,635**[b]	**2,149**	**10,745**	**1,970**	**3,391**	**40,890**[b]

[a] Number of passenger and cargo vessels in Harbor reflects vessel traffic generated within the Bay; thus numbers shown exceed the number of vessels at the San Francisco Bay Entrance.
[b] Total excludes San Francisco Harbor passenger and cargo.
Source: ACOE 2006

these, 3,639 vessels transited the Carquinez Strait, which includes the general area of the Shore MOT.

Shore Terminal

The number of tanker and barge visits to the MOT for the period from January 1999 through December 2008 ~~are~~ is presented in Table 2-2 in Section 2.0, Project Description. During this 10-year period, the maximum number of vessel calls occurred in 2003, when the maximum number (137) was about 30 percent greater than the average (105). In the baseline year 2007, there were 105 vessel calls.

Spill Response Capability

Marine terminals and all vessels calling at marine terminals are required to have spill response plans and a certain level of initial response capability. However, it is not economically feasible or practical for terminals or vessels to have their own equipment to respond to more than minor spills. Terminal operators usually rely on outside contractors with capability to handle larger spill events.

The MOT maintains spill response resources that are sufficient to handle the most probable small discharge (50 barrels) within 1 hour of the detection of a spill; the response program includes mitigation and recovery equipment and materials, trained personnel, and facilities. The Shore Oil Spill Response Plan states that the MOT has 800 feet of containment boom at the dock's west end and 800 feet at the dock's east end, one on-water skimmer, and two boxes of adsorbent pads/booms, which would be sufficient to handle smaller spills.

Containment, recovery, and shoreline cleanup for larger spills are provided by the contracted Oil Spill Removal Organization (OSRO). The contract OSRO for the MOT is the National Response Corporation (NRC), and they can be onsite within 2 hours. ~~National Response Corporation~~NRC equipment in the Bay Area includes 73 boats, 12.3 miles (64,900 feet) of boom, 20 skimmers, 80,615 barrel (bbl) storage capacity, and other miscellaneous equipment.~~ is capable of providing 54,561 barrels/day derated recovery capacity and 85,000 feet of boom within 54 hours.~~ A detailed breakdown of the OSRO response services is presented in Appendix C of the Oil Spill Response Plan for the MOT (Shore 2003). Rehabilitation of oiled wildlife is coordinated through the activation of the California Oiled Wildlife Network.

Containment booms would not be deployed in response to gasoline spills, because of the fire hazard. Containment booms also would not be deployed in response to spills of materials that are highly soluble in water, such as ethanol or de-icing solution, miscible materials that have been handled by the terminal. An accidental spill of these products would rapidly mix and disperse in the waters of the Bay. Consequently, the containment booms would be used to contain spills of the remainder of products handled at the MOT mostly consisting of fuel oils (diesel, JP-5, and JP-8).

Accidents and Spills within the Bay

The California State Lands Commission (CSLC) has been tracking spills from marine terminals since 1992. Spills usually vary from 1 gallon to 1,092 gallons~~; 1,092 gallons equals approximately~~ (26 barrels). Terminals were the responsible party for approximately 59 percent of the spills, while vessels were responsible for the remaining 41 percent. In addition, several major vessel incidents have occurred over the past 30 years.

U.S. Environmental Protection Agency (USEPA) rules require that terminals maintain a historical record of oil spills~~ from their terminal~~. Oil spills that have occurred at the Shore MOT into the Bay are reported below:

1. April 12, 1994, 10 barrels of diesel fuel were released into Carquinez Strait because of a failure of a pipeline relief valve system, resulting in overflow of the slop storage tank.~~;~~

2. February 20, 1997, 10 barrels of jet fuel were spilled into Carquinez Strait when the *Overseas Philadelphia* suddenly pulled away from the wharf and mooring lines parted during transfer. ~~and t~~Two marine loading arms and piping were damaged.~~;~~ The vessel's motor needed to be deployed to prevent the ship from drifting away.

3. In 2006, 1 pint of product was released into Carquinez Strait from a leaking loading arm.

CSLC staff investigated the *Overseas Philadelphia* incident at the MOT extensively in the months following the incident. The vessel broke free of the wharf and drifted away after the mooring lines parted. While no one single factor has been determined to be the root cause of the incident, CSLC staff believe that a combination of strong currents, weakened mooring lines, and possibly the wake from a passing ship were responsible for the parting of the mooring lines and subsequent breaking of the transfer lines. Fortunately, transfer operations were not in progress and the resulting spill of jet fuel was limited to the residual amount in the loading arms. The CSLC investigation also reported on two 'near miss' incidents at the MOT in the previous year (1996), where in both cases (5/9/96 and 6/3/96) vessels had drifted away from the MOT by distances of 6 to 12 feet, putting strain on the transfer arms and in one case breaking a mooring line. Following the CSLC investigation, changes were made to mooring procedures (Wickland 1997). These changes included requirements that mooring lines be in suitable condition, line requirements were increased, and mooring requirements were revised with respect to wind speed, wind direction, and current flow. These requirements have continued to evolve since the incident, and the most current version of these requirements is in the Selby Wharf Operations Manual (Shore 2008).

Major Vessel Incidents Inside and Outside of the Bay

In 1971, a collision of the *Oregon Standard* and the *Arizona Standard* occurred in heavy fog under the Golden Gate Bridge (GGB), resulting in a spill of approximately 27,600 barrels of heavy fuel oil. Spilled oil impacted the outer coast as far north as Point Reyes and to the south near San Gregorio Beach in San Mateo County.

In 1984, the chemical tanker *Puerto Rican* experienced an explosion in a void space surrounding a cargo tank. The explosion occurred while the vessel was in open waters about 8 miles west of the ~~Golden Gate Bridge~~GGB. The accident resulted in injury to

crew members and the release of over 30,000 barrels of lubricating oil and fuel oil, impacting the Farallon Islands, Point Reyes, and Bodega Bay.

In November 2007, a container ship, the *Cosco Busan*, struck the Bay Bridge and released almost 1,400 barrels of fuel oil into the water. Oil contamination occurred on the waterfront in the Bay, and several beaches in San Francisco and in Marin County were closed because of oil contamination. On-water and shoreline cleanup activities were undertaken, and many oiled and closed beaches have since been cleaned up and have reopened.

As a result of the 2007 spill, State legislation was passed in September 2008 that is geared to improve oil spill preparedness and to improve response measures. Some of the passed legislation deals with preparedness, and other legislation assigns responsibility for cleanup in the event of a spill.

Bay Area Vessel Traffic Control Systems

A Traffic Separation Scheme (TSS) was established by the U.S. Coast Guard (USCG) off the entrance to the Bay. It includes three directed traffic areas, each with one-way inbound and outbound traffic lanes, defined separation zones, a precautionary area, and a pilot boat cruising area. Within the Bay, the USCG has established seven Regulated Navigation Areas (RNAs). The RNAs organize traffic flow patterns to reduce vessel congestion where maneuvering room is limited. The RNAs are geared to minimize meeting, crossing, and overtaking situations between large vessels in constricted channels and under limited vessel speed. All larger vessels operating in the RNAs are required to follow certain navigation rules that limit vessel speed and require vessel engines to be ready for immediate operation under control conditions. Vessel traffic is monitored by the USCG at the Vessel Traffic Service (VTS) at Yerba Buena Island.

4.1.2 Regulatory Setting

Many laws and regulations are currently in place that regulate marine terminals, vessels calling at marine terminals, and emergency response/contingency planning. Enforcing or executing these laws and regulations is the responsibilities of various international, Federal, State, and local agencies. The responsible agencies are summarized below.

International Maritime Organization (IMO)

The agency governing the movement of goods at sea is the IMO. This is done through a series of international protocols. Individual countries must approve and adopt these protocols before they become effective. The International Convention for the Prevention of Pollution from Ships (Marine Pollution [MARPOL] 73/78 and amendments) governs the movement of oil, and it specifies tanker construction standards and equipment requirements. Regulation 26 of Annex I of MARPOL 73/78 requires that every tanker of 150 gross tons and above shall carry on board a shipboard oil pollution emergency plan approved by IMO. The U.S. implemented MARPOL 73/78 with passage of the Act of 1980 to Prevent Pollution from Ships. The IMO (IMO 1992) has issued "Guidelines for the Development of Shipboard Oil Pollution Emergency Plans" to assist tanker owners in preparing plans that comply with the regulations and to assist governments in developing and enacting domestic laws that enforce the cited regulations.

In 1990, the USEPA passed the Oil Pollution Act (OPA 90) and California passed the Lempert-Keene-Seastrand Oil Spill Prevention and Response Act (California Senate Bill [SB] 2040) to meet IMO requirements. The ~~Traffic Separation Schemes (~~TSS~~s)~~, must be approved by the IMO, and they have been approved for entrances to the Bay and Santa Barbara Channel.

The IMO adopted an amendment to the International Convention for Safety of Life at Sea (SOLAS) with provisions entitled "Special Measures to Enhance Maritime Safety," which became effective in 1996. These provisions allow for operational testing during port State examinations to ensure that masters and crews for both U.S. and international vessels are familiar with essential shipboard procedures relating to ship safety. The USCG ~~Marine Safety Office~~ conducts these port State examinations as part of ~~their~~ its vessel inspection program.

Federal Agencies

There are a number of Federal laws that regulate marine terminals and vessels. These laws address operational standards and spill prevention and cleanup. Regulations for implementing these laws are contained primarily in Title 33 (Navigation and Navigable Waters), Title 40 (Protection of Environment), and Title 46 (Shipping) of the Code of Federal Regulations (CFR).

OPA 90, as identified above, was enacted to expand prevention and preparedness activities, improve response capabilities, ensure that shippers and oil companies pay the costs of spills that occur, and establish an expanded research and development program. The act also established a one billion dollar Oil Spill Liability Trust Fund, funded by a tax on crude oil received at refineries. A Memorandum of Understanding (MOU) was established to divide areas of responsibility. The USCG is responsible for tank vessels and marine terminals, the USEPA for tank farms, and the Department of Transportation (DOT) Pipeline and Hazardous Materials Safety Administration (PHMSA) for pipelines through the offices of the California Office of the State Fire Marshal ~~for pipelines~~. Each of these agencies has developed regulations for ~~their~~ its area of responsibility.

All facilities and vessels that have the potential to release oil into navigable waters are required by OPA 90 to have up-to-date oil spill response plans and to have submitted them to the appropriate Federal agency for review and approval. Of particular importance in OPA 90 is the requirement for facilities and vessels to demonstrate that they have sufficient response equipment under contract to respond to and clean up a worst-case spill. Other key laws addressing oil pollution include:

- Federal Water Pollution Control Act of 1972;
- Clean Water Act of 1977;
- Water Quality Act of 1987;
- Act of 1980 to Prevent Pollution from Ships;
- Resource Conservation and Recovery Act (RCRA) of 1978;
- Hazardous and Solid Waste Act of 1984; and
- Refuse Act of 1899.

Responsibilities for implementing and enforcing the Federal regulations addressing terminals, vessels, and pollution control fall to a number of agencies, as described in the following sections.

United States Coast Guard (USCG)

The USCG, through Title 33 (Navigation and Navigable Waters) and Title 46 (Shipping) of the CFR, is the Federal agency responsible for vessel inspection, marine terminal operations safety, coordination of Federal responses to marine emergencies, enforcement of marine pollution statutes, marine safety (navigation aids, etc.), and operation of the National Response Center for spill response. It is the lead agency for

offshore spill response. The USCG implemented a revised vessel-boarding program in 1994 designed to identify and eliminate substandard ships from U.S. waters. The program pursues this goal by systematically targeting the relative risk of vessels and increasing the boarding frequency on high-risk (potentially substandard) vessels. Each vessel's relative risk is determined through the use of a matrix that factors in the vessel's flag, owner, operator, classification society, vessel particulars, and violation history. Vessels are assigned a boarding priority from I to IV, with priority I vessels being the potentially highest risk. The USCG is also responsible for reviewing marine terminal Operations Manuals and issuing Letters of Adequacy upon approval. While the CSLC cooperates and coordinates with the USCG on Operations Manuals review and terminal inspections, the USCG does in fact conduct ~~their~~ its own review and inspection program, in accordance with mandates under 33 CFR § 154 and the USCG Marine Safety Manual, Volume~~.~~ VII. The USCG issued regulations under OPA 90 addressing requirements for response plans for tank vessels, offshore facilities, and onshore facilities that could reasonably expect to spill oil into navigable waterways.

Because studies have shown that the use of double-hull vessels will decrease the probability of releases when tank vessels are involved in accidents, the USCG issued regulations addressing double-hull requirements for tank vessels. The regulations establish a timeline for eliminating single-hull vessels from operating in the navigable waters or the Exclusive Economic Zone of the United States after January 1, 2010, and double-bottom or double-sided vessels by January 1, 2015. Only vessels equipped with a double hull, or with an approved double containment system, will be allowed to operate after those times. The phase-out timeline is a function of vessel size, age, and whether it is equipped with a single hull, double bottom, or double sides. The phase out began in 1995 with 40-year-old or older vessels equipped with single hulls between 5,000 and 30,000 gross tons, 28-year or older vessels equipped with single hulls over 30,000 gross tons, and 33-year or older vessels equipped with double bottoms or sides over 30,000 gross tons. All new tankers delivered after 1993 must be double hulled. Double-bottom or double-sided vessels can essentially operate 5 years longer than single-hull vessels.

United States Environmental Protection Agency (USEPA)

The USEPA is responsible for the National Contingency Plan and acts as the lead agency in response to an onshore spill. The USEPA also serves as co-chair of the Regional Response Team, which is a team of agencies established to provide assistance and guidance to the on-scene coordinator (OSC) during the response to a

spill. The USEPA also regulates disposal of recovered oil and is responsible for developing regulations for Spill Prevention, Control, and Countermeasures (SPCC) Plans. SPCC Plans are required for nontransportation-related onshore and offshore facilities that have the potential to spill oil into waters of the United States or adjoining shorelines. Shore has a current SPCC Plan (Shore 2003).

Department of Commerce through the National Oceanic and Atmospheric Administration (NOAA)

The NOAA provides scientific support for response and contingency planning, including assessment of the hazards that may be involved. The movement and dispersion of oil and hazardous substances ~~is~~ are evaluated through trajectory modeling, and information on the sensitivity of coastal environments to oil and hazardous substances is reported. NOAA provides expertise on living marine resources and their habitats, including endangered species, marine mammals, and National Marine Sanctuary ecosystems. It also provides information on meteorological, hydrological, and oceanographic conditions for marine, coastal, and inland waters, and tide and circulation data for coastal waters. The NOAA, through its various offices, provides expertise during spills in a number of areas, including the following:

- U.S. National Marine Fisheries Service (NMFS) – Anadromous fish; managed marine fish and marine mammals.

Department of the Interior (DOI)

The DOI, through its various offices, provides expertise during spills in a number of areas, including the following:

- U.S. Fish and Wildlife Service (USFWS) – Wildlife, including endangered and threatened species, and migratory birds; waters and wetlands; and contaminants affecting habitat resources; and
- U.S. Geological Survey (USGS) – Geology, hydrology (groundwater and surface water), and natural hazards.

Department of Defense (DOD)

The DOD, through the ~~U.S. Army Corps of Engineers (~~ACOE~~)~~, is responsible for reviewing all aspects of a project and/or spill response activities that could affect navigation. The ACOE has specialized equipment and personnel for maintaining navigation channels, removing navigation obstructions, and accomplishing structural repairs.

State Agencies

California State Lands Commission (CSLC)

Chapter 1248 of the Statutes of 1990 (SB 2040), the Lempert-Keene-Seastrand Oil Spill Prevention and Response Act, established a comprehensive approach for the prevention of and response to oil spills. The CSLC Marine Facilities Division (MFD) is responsible for governing marine terminals. Through ~~two~~ California Code of Regulations (CCR) sections 2300 through 2571, the MFD established a comprehensive program to minimize and prevent spills from occurring at marine terminals, and to minimize the impact of a spill should one occur. These regulations established a comprehensive inspection-monitoring plan whereby the CSLC inspectors monitor transfer operations on a continuing basis.

The CSLC's marine terminal regulations are similar to, but more comprehensive than, Federal regulations in the area of establishing exchange of information between the terminal and vessels, information that must be contained in the Declaration of Inspection, requirements for transfer operations, and information that must be contained in the Operations Manual. All marine terminals are required to submit updated Operations Manuals to the CSLC for review and approval.

The CSLC regulations ~~also~~ require that ~~prior to the commencement of transfer of a persistent oil that does not readily evaporate, such as crude oil[2], diesel oil or jet fuel, a boom shall be deployed to contain any oil that might be released.~~ all onshore ~~M~~marine terminals, except those "subject to high-velocity currents," deploy boom to enclose the water surface surrounding the vessel (if loading) or the vessel's entire inboard length at the waterline (if discharging) and either of the following: (1) the entire dock; or (2) portions of the dock where oil may spill into the water, prior to transfer operations. An "onshore marine terminal subject to high-velocity currents" is defined as an onshore terminal at which the maximum current velocities are 1.5 knots (nautical miles per hour) or greater for the majority of the days in the calendar year. ~~where it may be difficult or ineffective to pre-deploy a boom, are required to provide sufficient boom, trained personnel, and equipment so that at least 600 feet of boom can be deployed for containment within 30 minutes. It should be noted that t~~The Shore MOT fits into this category ~~is subject to high velocity currents~~.

This conditional exemption from the pre-booming requirement is based upon the lack of effectiveness of a boom in containing oil at higher current velocities, as well as the

~~[2] The Shore MOT does not handle crude oil.~~

considerable difficulty and expense which is encountered in deploying boom under these conditions. When water is moving at speeds higher than 1.5 knots, oil on the surface is entrained under (and, dependent upon wind, sometimes overtops) containment boom, reducing the effectiveness of oil containment. Deployment of boom in open water and against the current is highly labor-intensive and creates very real personnel hazards. Additionally, there is constant difficulty in providing a stand-off (a gap between the side of the vessel and the boom, so that oil does not merely flow over the boom), which adds to the effort and expense.

Instead, under CCR section 2395(c)(4), onshore marine terminals subject to high-velocity currents must provide sufficient boom appropriate to the conditions at the terminal, trained personnel, and equipment maintained in a standby condition at the berth for the duration of the entire transfer operation, so that a length of at least 600 feet of boom can be deployed within 30 minutes of a spill. Shore maintains 1,600 feet of boom on the MOT (800 feet at the west end and 800 feet at the east end) that can be deployed within 30 minutes.

A requirement that each marine oil terminal operator must implement a marine oil terminal security program is contained in 2 CCR section 2430~~ of CCR Title 2, Division 3, Chapter 1, and Article 5.1~~. At a minimum, each security program must:

- Provide for the safety and security of persons, property, and equipment on the terminal and along the dockside of vessels moored at the terminal;
- Prevent and deter the carrying of any weapon, incendiary, or explosive on or about any person inside the terminal, including within his or her personal articles;
- Prevent and deter the introduction of any weapon, incendiary, or explosive in stores or carried by persons onto the terminal or to the dockside of vessels moored at the terminal; and
- Prevent or deter unauthorized access to the terminal and to the dockside of vessels moored at the terminal.

The MFD has also issued regulations on the following:

- Marine Terminal Personnel Training and Certification; and
- ~~Structural Requirements for Vapor Control Systems at Marine Terminals; and~~
- Marine Oil Terminal Pipelines.

In addition, MFD enforces the ~~has initiated~~ Marine Oil Terminal Engineering and Maintenance Standards (MOTEMS) (24 CCR § 3101F *et seq.*), which are designed to

develop comprehensive engineering standards for performing analysis, design, and inspection/maintenance of marine oil terminals. These ~~new~~ standards apply to both new and existing terminals, and they define criteria in the following areas:

- Audit and Inspection (both above and below the water line);
- Structural Loading;
- Seismic Analysis and Performance Based Structural Design;
- Mooring and Berthing Analysis and Design;
- Geotechnical Hazards and Foundations;
- Structural Analysis and Design of Components;
- Fire Prevention, Detection, and Suppression;
- Piping and Pipelines; and
- Electrical and Mechanical Equipment.

All marine terminals in the State ~~will be~~are required to comply with ~~follow~~ the criteria defined in each of these issue areas. ~~It is expected that these standards, which are the first in the U.S., will form the basis for similar standards developed for other State, Federal, and international agencies. The seismic performance standards of MOTEMS are now established in the seismic guidelines for ports, as established by the World Association for Waterborne Transport Infrastructure.~~

California Department of Fish and Game (CDFG)

The Office of Spill Prevention and Response (OSPR) was created within the CDFG to adopt and implement regulations and guidelines for spill prevention, response planning, and response capability. Final regulations regarding oil spill contingency plans for vessels and marine facilities were issued in November 1993, and last updated in October 2002. These regulations are similar to, but more comprehensive than, the Federal regulations. The regulations require that tank vessels, barges, and marine facilities develop and submit their comprehensive oil spill response plans to OSPR for review and approval.

OSPR's regulations require that marine facilities and vessels be able to demonstrate that they have the necessary response capability on hand or under contract to respond to specified spill sizes, including a worst-case spill. The regulations also require that a risk and hazard analysis be conducted on each facility. This analysis must be conducted in accordance with procedures identified by the American Institute of Chemical Engineers ~~(AIChE)~~.

~~Senate Bill (~~SB~~)~~ 2040 established financial responsibility requirements and required that Applications for Certificate of Financial Responsibility be submitted to OSPR. California's requirement for financial responsibility is in excess of the Federal requirements.

SB 2040 also requires the OSPR to develop a State Oil Spill Contingency Plan. In addition, each major harbor was directed to develop a Harbor Safety Plan addressing navigational safety, including tug escort for tankers. The Harbor Safety Committee of the San Francisco Bay Region issued its Harbor Safety Plan in 1992, and has issued annual updates since that time. The plan contains several recommendations to improve safety. One recommendation, first implemented in May 1993 through OSPR issuance of the then interim regulations (now permanent), requires that all tank vessels carrying more than 5,000 tons of oil have available a standby tug or be escorted by one or more tugs when transiting through certain zones. For example, tug escorts are required while tankers are transiting from the mouth of the Bay to the MOT.

California Coastal Commission (CCC) / San Francisco Bay Conservation and Development Commission (BCDC)

The CCC and the ~~San Francisco Bay Conservation and Development Commission (~~BCDC~~)~~ have oil spill statutory authority under the following two statutes: the California Coastal Act of 1976 and the Lempert-Keene-Seastrand Oil Spill Prevention and Response Act of 1990. The CCC jurisdiction includes all of California's coastal shoreline, including ports and harbors, except for the Bay, which falls under the jurisdiction of the BCDC. The CCC's responsibilities include:

- Review of coastal development projects related to energy and oil infrastructure for compliance with the Coastal Act and consistency with the Coastal Zone Management Act;
- Attendance at statewide and committee and subcommittee meetings with the regional Harbor Safety Committee on issues such as dispersants, sensitive sites, Area Contingency Plan updates, and oiled wildlife operations;
- Review of regulations for oil spill prevention and response, and providing input to ensure the regulations' consistency with Coastal Act regulations and policies;
- Review of oil spill contingency plans for marine facilities located in the coastal zone/Bay Area, and oil spill response plans for facilities located on the outer continental shelf;
- Participation in the State Interagency Oil Spill Committee (SIOSC), in the SIOSC Review Subcommittee, and in the Oil Spill Technical Advisory Committee meetings and assignments;

- Participation in studies that will improve oil spill prevention, response, and habitat restoration;
- Participation in oil spill drills; and
- Participation in the development of planning materials for oiled wildlife rehabilitation facilities.

California Office of the State Fire Marshal (OSFM)

The ~~Office of the State Fire Marshal (~~OSFM~~)~~ regulates the safety of approximately 5,500 miles of intrastate hazardous-liquid transportation pipelines and acts as an agent of the federal Office of Pipeline Safety concerning the inspection of more than 2,000 miles of interstate pipelines. Pipeline Safety staff inspect, test, and investigate to ensure compliance with all Federal and State pipeline safety laws and regulations. All spills, ruptures, fires, or similar incidents are responded to immediately; all such accidents are investigated for cause. Hazardous-liquid pipelines are also periodically tested for integrity using procedures approved by the OSFM.

4.1.3 Significance Criteria

An operational safety or risk of accidents impact is considered significant if any of the following apply:

- The existing facility does not conform to its oil spill contingency plans or other plans that are in effect; or if current or future operations may not be consistent with Federal, State, or local regulations. Note: conformance with regulations does not necessarily mean that there are not significant impacts;
- There is a potential for fires, explosions, releases of flammable or toxic materials, or other accidents from the MOT or from vessels that could cause injury or death to members of the public;
- The Project is located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5 and, as a result, would create a significant hazard to the public or the environment; or
- Existing and proposed emergency response capabilities are not adequate to effectively mitigate spills and other accident conditions, such that a level of concern would be reached at shoreline environments.

The Project site is not on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5 (the Cortese list), so this significance criterion is not discussed further in this Environmental Impact Report (EIR) (No Impact).

4.1.4 Impact Analysis and Mitigation

The public safety impacts from the continued operation of the MOT and potential accidents from tankers and barges that would call at the MOT were analyzed. This analysis considers accidents that could occur, including fires and explosions of highly volatile product, such as gasoline, and potential spills of petroleum products. Potential spills at the MOT and in transit were considered in this analysis.

Detailed modeling of spill scenarios was not conducted in the analysis. Instead, statistical data that summarize the spill modeling results already included within the NOAA Trajectory Analysis Planner II (TAPII) software for the Bay (NOAA 2000) were~~as~~ utilized. The TAPII software consists of a database comprising spill modeling results for various materials, time periods, volumes, and physical conditions. The TAPII system database is generated using a large set of individual spill trajectory modeling runs performed with NOAA's "On-Scene Spill Model (OSSM)." Each run consists of a randomly chosen start time with its corresponding wind/tide/current conditions and a spill location of interest; then spill trajectories are calculated with subsequent calculation of spill volumes that accumulate within each segmented shoreline impact area (shoreline zone) over a 5-day run period (Barker 2009). The results obtained from the TAPII system for the Shore MOT scenarios ~~include probabilities of spill volumes within the shoreline zones resulting from a spill of a certain material and volume at the terminal~~ show probabilities that various spill volumes could reach segmented shoreline areas if a spill of a certain material and volume were to occur. The spills that were analyzed are described below.

Spill Scenarios

The number of spill scenarios that could occur is based on the spill planning volumes described in the Oil Spill Response Plan for the MOT. These spills are derived from the design specifications of the MOT, including the amount of product available to be released and the potential for accidents to occur. The scenarios range from fairly minor incidents to catastrophic spills, and they include products that are expected to be handled during the license renewal period. In the past 5 years, the products that have been transferred at the MOT include diesel fuel, jet fuel, ethanol, gasoline, and gasoline feed stocks such as naphtha and reformate. There have also been small quantities of specialty products transferred at the terminal, such as fuel system icing inhibitors (FSII), which are water-soluble glycol ethers. The chosen spill scenarios consider products commonly transported and the most hazardous product in terms of fire and/or explosion

potential that is commonly transferred at the MOT (i.e., diesel fuel and gasoline, respectively).

The Shore Terminal Oil Spill Response Plan identified a Reasonable Worst-Case Discharge (RWCD), based on the operating parameters of the MOT. The RWCD scenario assumes a rupture of a pipeline. With a pipeline pumping rate of 10,000 barrels per hour (bph) and a 2-minute release before discovery and shutdown (assumes 1 minute for human response and 1 minute for shut-down valves to engage), 434 barrels could be released over the 2-minute period. This scenario (No. 1) assumes that an accidental spill of diesel fuel would occur during summer months, and Scenario No. 2 assumes that the spill would occur during the winter months.

Scenario Nos. 3 and 4 cover the Maximum Most Probable Discharge of diesel fuel at the MOT during summer and winter months, respectively, as defined in the Shore Terminal Oil Spill Response Plan. These scenarios are based on the USEPA definition that the Maximum Most Probable Discharge is 857 barrels, or 10 percent of the capacity of the single largest aboveground storage tank, whichever is less. However, because this definition focuses on aboveground storage tanks onshore, the discharge amount had to be changed for the MOT. Therefore, the 10 percent value was applied to the quantity identified in Scenario Nos. 1 and 2 (i.e., 434 barrels). Thus, the USEPA Maximum Most Probable Discharge (10 percent of 434 barrels) would be 44 barrels. Per regulatory guidance, these scenarios were rounded to 50 barrels. As Scenario Nos. 5 and 6, described below, already address this spill volume, Scenario Nos. 3 and 4 were eliminated.

The average most probable discharge is based on the USEPA and USCG definitions as less than or equal to 50 barrels, not to exceed the worst-case discharge. Thus, Scenario Nos. 5 and 6 assume 50-barrel discharges of diesel fuel at or near the MOT for summer and winter months, respectively.

Scenario Nos. 7 and 8 assume larger spills of up to 20,000 barrels during summer and winter, respectively, that would occur from a tanker or barge collision in the Bay near the Richmond-San Rafael (RSR) Bridge. Scenario Nos. 9 and 10 include worst-case spills of 20,000 barrels during summer and winter, respectively, near the ~~Golden Gate (GG) Bridge~~GGB.

In addition to diesel spill scenarios, spill scenarios were developed for gasoline, which is the most hazardous product commonly transported because of its flammability. Scenario Nos. 11 through 20 are gasoline spill scenarios corresponding to the same

quantities and locations as the diesel spill scenarios described above. The spill scenarios that were considered are summarized in Table 4.1-2.

Table 4.1-2. Spill Modeling Scenarios

Scenario	Material	Location	Season	Volume (barrel)
1	Diesel	MOT	Summer	434
2	Diesel	MOT	Winter	434
5	Diesel	MOT	Summer	50
6	Diesel	MOT	Winter	50
7	Diesel	RSR Bridge	Summer	20,000
8	Diesel	RSR Bridge	Winter	20,000
9	Diesel	GGB	Summer	20,000
10	Diesel	GGB	Winter	20,000
11	Gasoline	MOT	Summer	434
12	Gasoline	MOT	Winter	434
15	Gasoline	MOT	Summer	50
16	Gasoline	MOT	Winter	50
17	Gasoline	RSR Bridge	Summer	20,000
18	Gasoline	RSR Bridge	Winter	20,000
19	Gasoline	GGB	Summer	20,000
20	Gasoline	GGB	Winter	20,000

Designation of winter and summer time periods is important mainly because of typically larger tidal ranges in the winter. The results of the TAPII runs are presented in Figures 4.1-1 through 4.1-16 and are summarized in this section; a detailed report is given in Appendix C.

Assuming that a 434-barrel spill of diesel fuel would occur at the MOT (Scenario Nos. 1 and 2), the maximum probabilities that the spill would reach each shoreline zone are shown in Figures 4.1-1 and 4.1-2, respectively. The figures show that the probabilities of exceeding the levels of concern[3] range from 75 percent to 100 percent along the shorelines at distances ranging from 1.8 miles west of the spill to 4.9 miles east of the spill. Whereas, lower probabilities of 25 percent to 50 percent of exceeding the level of concern can extend as far as 9 miles along the shore from the spill site.

[3] The level of concern is the amount of oil that can cause temporary loss of use and minor fouling. The NOAA defines the level of concern to be 1,000 gallons per square nautical mile. For modeling purposes, this is equivalent to 8.37 barrels in a shoreline sector of a modeling domain, which is 0.47 square miles.

Figure 4.1-1. Scenario 1, Diesel Spill, 434 Barrels, Shore Terminal, summer

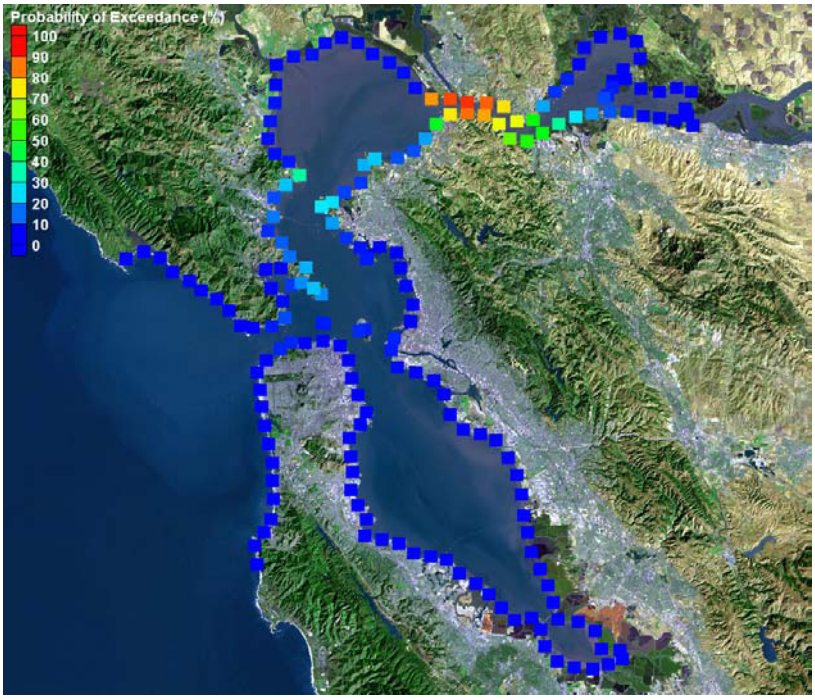

Figure 4.1-2. Scenario 2, Diesel Spill, 434 Barrels, Shore Terminal, winter

SOURCE: Coast & Harbor Engineering 2009

Figure 4.1-3. Scenario 5, Diesel Spill, 50 Barrels, Shore Terminal, summer

Figure 4.1-4. Scenario 6, Diesel Spill, 50 Barrels, Shore Terminal, winter

SOURCE: Coast & Harbor Engineering 2009

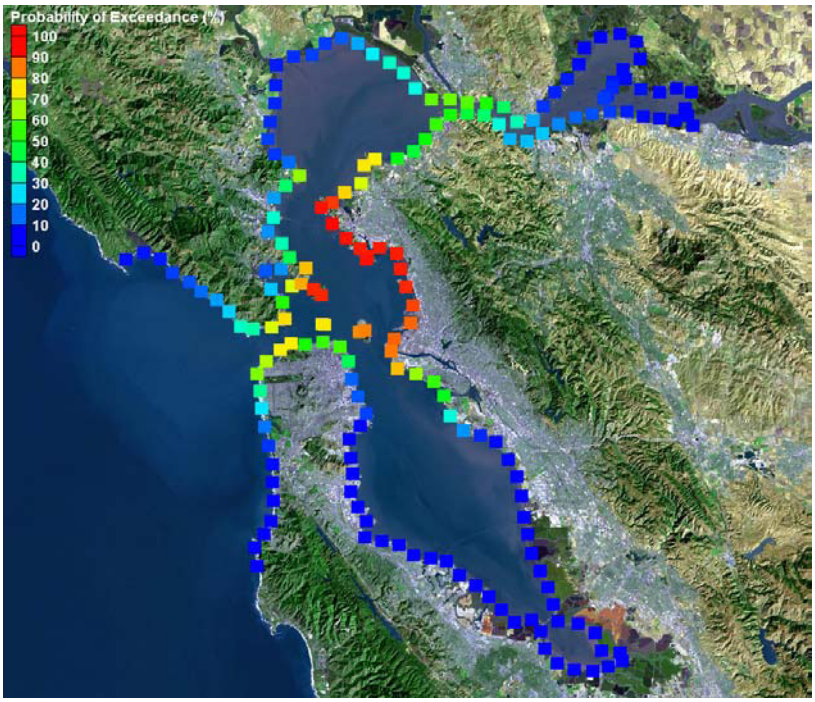

Figure 4.1-5. Scenario 7, Diesel Spill, 20,000 Barrels, Richmond-San Rafael Bridge, summer

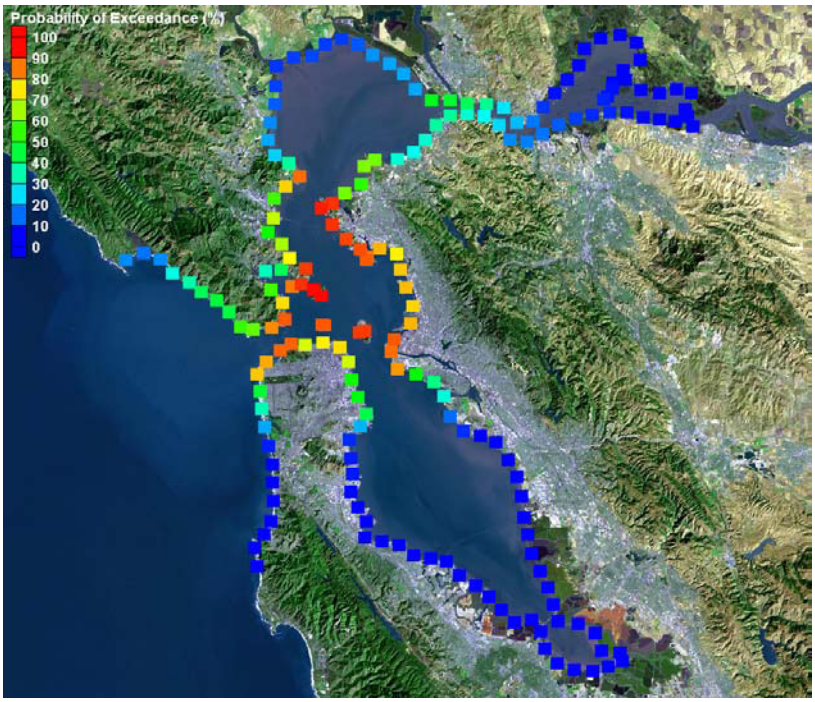

Figure 4.1-6. Scenario 8, Diesel Spill, 20,000 Barrels, Richmond-San Rafael Bridge, winter

SOURCE: Coast & Harbor Engineering 2009

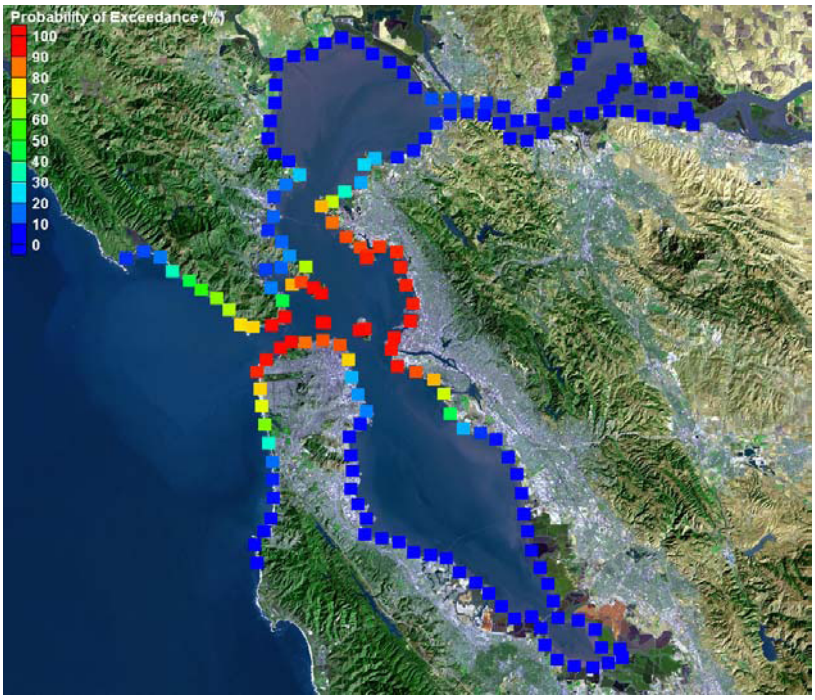

Figure 4.1-7. Scenario 9, Diesel Spill, 20,000 Barrels, Golden Gate Bridge, summer

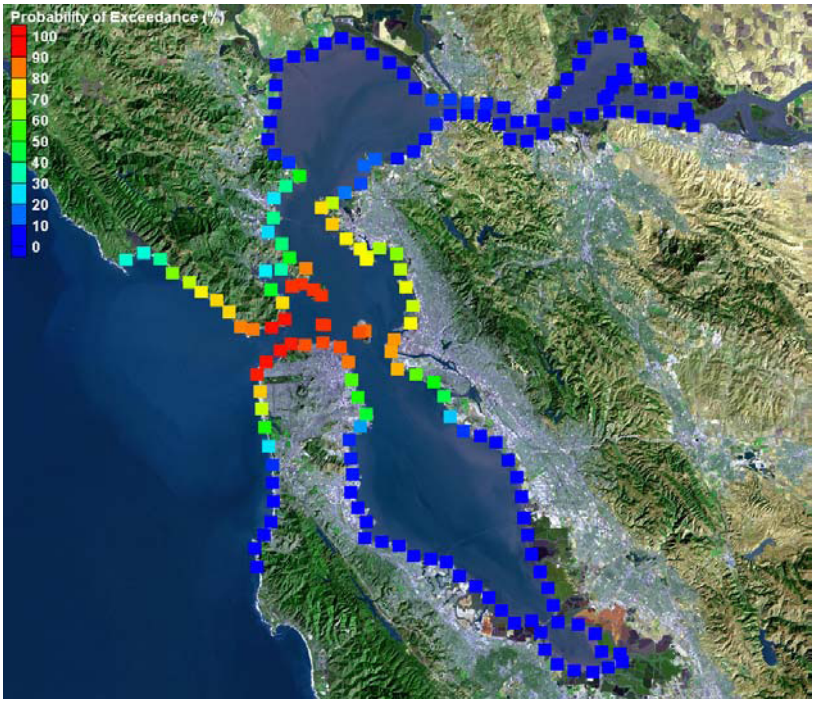

Figure 4.1-8. Scenario 10, Diesel Spill, 20,000 Barrels, Golden Gate Bridge, winter

SOURCE: Coast & Harbor Engineering 2009

Figure 4.1-9. Scenario 11, Gasoline Spill, 434 Barrels, Shore Terminal, summer

Figure 4.1-10. Scenario 12, Gasoline Spill, 434 Barrels, Shore Terminal, winter

SOURCE: Coast & Harbor Engineering 2009

Figure 4.1-11. Scenario 15, Gasoline Spill, 50 Barrels, Shore Terminal, summer

Figure 4.1-12. Scenario 16, Gasoline Spill, 50 Barrels, Shore Terminal, winter

SOURCE: Coast & Harbor Engineering 2009

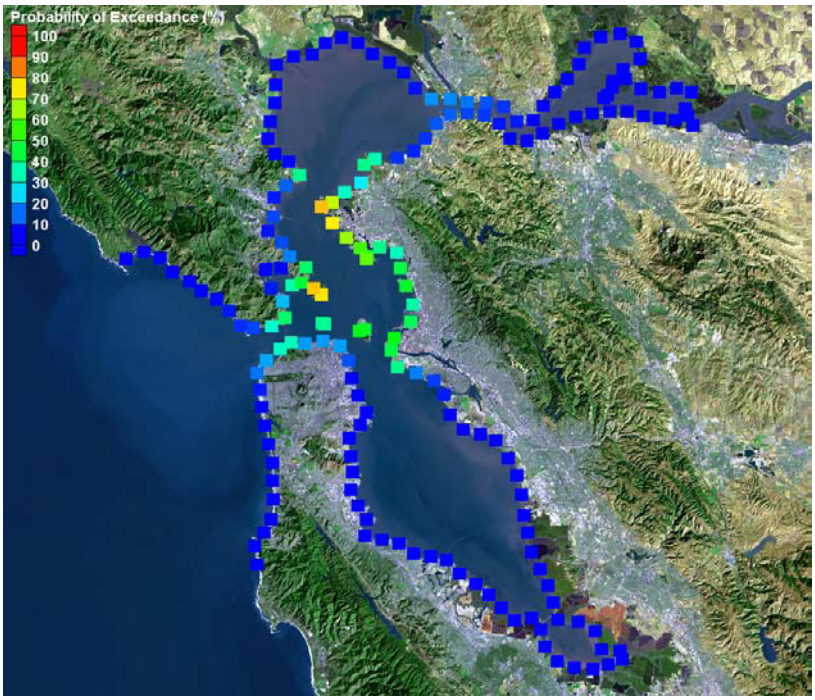

Figure 4.1-13. Scenario 17, Gasoline Spill, 20,000 Barrels, Richmond-San Rafael Bridge, summer

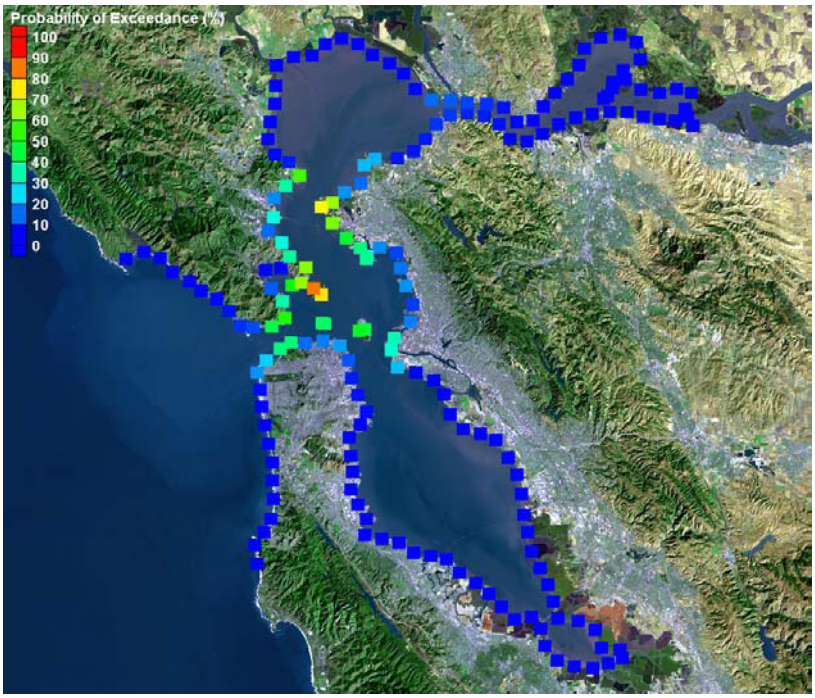

Figure 4.1-14. Scenario 18, Gasoline Spill, 20,000 Barrels, Richmond-San Rafael Bridge, winter

SOURCE: Coast & Harbor Engineering 2009

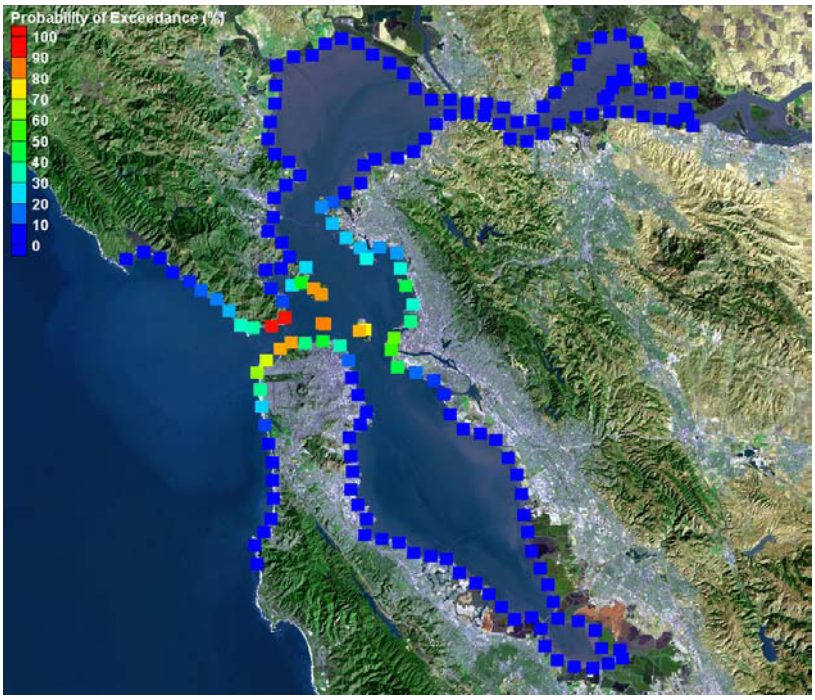

Figure 4.1-15. Scenario 19, Gasoline Spill, 20,000 Barrels, Golden Gate Bridge, summer

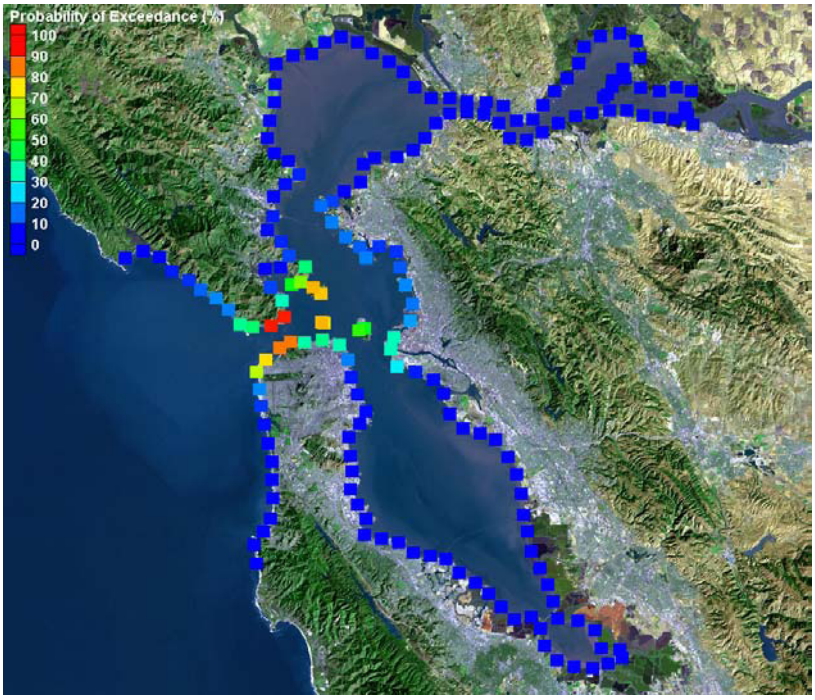

Figure 4.1-16. Scenario 20, Gasoline Spill, 20,000 Barrels, Golden Gate Bridge, winter

SOURCE: Coast & Harbor Engineering 2009

For Scenario Nos. 5 and 6, which represent 50-barrel diesel spills at the MOT, Figures 4.1-3 and 4.1-4 show that the highest probability (90 percent) that the spill would reach the shore would occur on the north side of the Carquinez Strait. Probabilities exceeding 50 percent are located up to 4.9 miles east of the MOT and 25 percent probabilities would extend 1.2 miles west of the MOT.

For the assumption of a larger spill (i.e., 20,000 barrels of diesel) from a vessel collision near the ~~Richmond-San Rafael~~RSR Bridge (Scenario Nos. 7 and 8), Figures 4.1-5 and 4.1-6 show that there would be high probabilities that the spill would reach the shorelines from Point Pinole to Alameda and from Tiburon to the ~~Golden Gate Bridge~~GGB. High probabilities that the spill would reach the shorelines of Treasure Island, Angel Island, and Alcatraz Island are also illustrated in the figures.

Scenario Nos. 9 and 10 (Figures 4.1-7 and 4.1-8), which represent a potential spill volume of 20,000 barrels of diesel near the ~~Golden Gate Bridge~~GGB, show high probabilities that the spill would reach the shoreline from Point San Pablo to Alameda and from Tiburon to the Bay Bridge, including Treasure Island, Angel Island, and Alcatraz Island. Probabilities exceeding 25 percent that the spill would reach a shoreline can be found as far away as Point Pinole and down the Bay to Oakland Airport.

Because of the high evaporation rate of gasoline, gasoline spills of similar volume to the diesel fuel spill scenarios would result in much smaller impacted shoreline areas. Scenario Nos. 11 and 12, which cover 434 barrels of gasoline spilled at the MOT area, are shown in Figures 4.1-9 and 4.1-10. These figures show that there would be a high probability (i.e., more than 90 percent) that the spill would reach the shoreline at the north side of Carquinez Bridge. Probabilities exceeding 50 percent that the spill would reach the shore occur along shorelines up to 4.9 miles east of the MOT, and much lower probabilities occur west of the MOT.

For Scenario Nos. 15 and 16, ~~that~~ which represent spill volumes of 50 barrels of gasoline, Figures 4.1-11 and 4.1-12 show that the probabilities that the spills would reach the shoreline would be much lower. For Scenario Nos. 17 through 20, which represent spill volumes of 20,000 barrels of gasoline at two different locations, a much larger shoreline would probably be affected before the product would eventually evaporate (see Figures 4.1-13 through 4.1-16).

For products handled by the MOT that are soluble in water, such as ethanol or de-icing solution, an accidental spill of the product would rapidly mix in the water column and would be diluted by the large volume of water in the Bay.

Accidental Small (50 Barrels or Less) Spills of Highly Volatile Products

Products, such as gasoline, are highly volatile and flammable and could cause adverse impacts if ignited, resulting in a flammable vapor cloud. Since the product is highly volatile and flammable, the Oil Spill Response Plan states that, given the potential for ignition by engines operating near the spill, no attempt should be made to clean up the spill and no engine equipment should be operated near the spill to prevent ignition. The TAPII results show that, for a small spill of gasoline (i.e., 50 barrels or less), the product would evaporate quickly and would not persist to shoreline environments. This response method is acceptable to the USCG. Potential impacts to public safety from a spill of gasoline can be adverse but less than significant (Class III) since the product would evaporate quickly from the water surface.

Impact OS-1: Accidental Spills of Relatively Low-Volatility Petroleum Products or Large Accidental Spills of Highly Volatile Products

Spills of relatively low-volatility petroleum products (e.g., diesel and jet fuel) or large volumes of highly volatile products (e.g., gasoline) could reach the shore, potentially causing injury to members of the public. (Class I, or Class II, depending on the size and complexity of the spill)

In addition to the probabilities that certain spills could reach the shoreline, another factor affecting the impact is the probability that a release would ~~actually~~ occur. Such a probability is derived from statistics of the historical record of past spills. Cutter Information Corporation published information on spills of 238 barrels or greater in the Bay Area from 1978 to 1988, and indicated that the probability of a spill at marine terminals of this magnitude was about 2.7×10^{-4} per vessel call (Cutter 1989). Using this statistic, the probability of a spill at the MOT has been estimated based on the number of port calls at the MOT. A record of port calls for the MOT over the past 10 years indicates that, on average, there were about ~~105~~ 104 visits per year, and the greatest number of annual visits over that period was 137 calls in 2003 (see Table 2-2 in Section 2.0, Project Description). Assuming that the highest number of calls (i.e., 137) would occur in the future, the expected mean time between spills of about 238 barrels would be approximately 27 years at the Shore MOT.

For spills greater than 1,000 barrels, statistics are used for worldwide tanker visits, and the increased safety record of the Bay Area is factored into those statistics. Based on these assumptions, the estimated probability was estimated to be 3.8×10^{-5} per port call (Aspen 1992). Using this probability and applying the highest number of annual visits to the MOT in the past 10 years (137), the expected mean time between spills greater than 1,000 barrels would be approximately 190 years.

The probability for occurrence of spills up to 50 barrels is greater than for the larger spills discussed above. There have been three spills that have occurred at the MOT in the past 15 years, each of which were 10 barrels or less. The spill cleanup and response plan that is described under Section 4.1.1, Environmental Setting, indicates that the MOT has the necessary resources to handle spills of 50 barrels or less, per USCG requirements. Thus, spills of 50 barrels or less would be contained and cleaned up. Shore's conformance with its existing spill cleanup and response plan, together with implementation of mitigation measures MM OS-1a through MM OS-1d~~c~~, described below, would reduce these potentially significant impacts to less than significant (Class II).

Regarding spills of more than 50 barrels, Section 4.1.1, Environmental Setting, describes the steps that are taken to minimize impacts, which include seeking additional help by contacting the OSRO for the Shore Terminal, ~~National Response Corporation (~~NRC~~)~~. The NRC can be onsite within 2 hours and has the capability of recovering ~~up to~~ approximately 54,000 barrels per day. However, even though the probability of a moderate spill of 238 barrels is low (once over the 30-year term of the lease), and the probability for a larger spill is even lower, the TAPII results show that such events could pose a threat to human health through interaction with the spilled material, which would be a significant impact (Class I).

Mitigation Measures for Impact OS-1:

MM OS-1a. Install Tension-Monitoring Devices. Shore shall ~~I~~install and maintain tension-monitoring devices to monitor all mooring lines and environmental loads and avoid excessive tension or slack conditions that could result in damage to the terminal structure and/or equipment and/or vessel mooring line failures that could result in spills. Line tensions and environmental data shall be integrated, recorded, and relayed to the Control Room system, Terminal operator(s), and vessel operator(s). This system shall ~~also~~ include, but not be limited to, quick-release hooks only (with load cells), site-specific anemometer(s), and visual and audible alarms that

can support preset limits and shall be able to record and store monitoring data. Shore shall document procedures and training for systems use and communications between the Terminal and vessel operator(s). Routine inspection, testing and maintenance of all equipment and systems in accordance with manufacturer's recommendations and necessity are required to ensure safety and reliability, to the satisfaction of California State Lands Commission (CSLC) staff. This system shall be implemented within two years of certification of this Environmental Impact Report or sooner if required for Marine Oil Terminal Engineering and Maintenance Standards ~~MOTEMS~~ compliance. Shore may install alternate technology that provides an equivalent level of protection, as reviewed by CSLC staff and only if approved by the CSLC at a publicly noticed meeting.

MM OS-1b. Install an Allision Avoidance System. Shore shall ~~I~~install and maintain an Allision Avoidance System (AAS) at the Shore Marine Oil Terminal (MOT) to prevent damage to the wharf and/or vessel during docking operations. The AAS shall also be used and alarmed to monitor vessel drift (both surge and sway) during all mooring operations, and shall be equipped with an Automatic Identification System (AIS) receiver to capture passing vessel parameters. This system shall be integrated with the tension-monitoring system such that all data collected are ~~is~~ available in the Control Room and to the Operator(s) at all times and to vessel operator(s) during berthing operations, and shall be able to record and store monitoring data. Prior to implementing this measure, Shore shall consult with the San Francisco Bar Pilots, the U.S. Coast Guard, and the staff of the California State Lands Commission (CSLC) and provide information that would allow the CSLC to determine, on the basis of such consultations and information regarding the nature, extent, and adequacy of the existing berthing system, the most appropriate application and timing of an AAS at the MOT. This system shall be implemented within two years of certification of this~~e~~ Environmental Impact Report~~EIR~~ or sooner if required for Marine Oil Terminal Engineering and Maintenance Standards ~~MOTEMS~~ compliance. Shore shall document procedures and training for systems use and communications between the Terminal and vessel operator(s). Routine inspection, testing, and maintenance of all equipment and systems in accordance with manufacturer's recommendations and necessity are required to ensure safety and reliability, to the satisfaction of CSLC staff. Shore may install alternate

technology that provides an equivalent level of protection, as reviewed by CSLC staff and only if approved by the CSLC at a publicly noticed meeting.

MM OS-1c. **Replace Existing Loading Arms.** Shore shall replace the existing loading arms on the Shore Marine Oil Terminal~~MOT~~ with loading arms that have quick-connect/disconnect couplers and emergency quick-release systems, consistent with Marine Oil Terminal Engineering and Maintenance Standards ~~MOTEMS S~~sections 3110F.2, 3110F.2.2.1, 3110F.8 and all other applicable regulations, within two years of certification of this Environmental Impact Report~~EIR~~. Shore may install alternate technology that provides an equivalent level of protection, as reviewed by California State Lands Commission (CSLC) staff and only if approved by the CSLC at a publicly noticed meeting.

MM OS-1d. **Install Remote Release System.** Shore shall install and maintain mooring quick-release devices that shall be able to be activated within 60 seconds. These devices shall be capable of being engaged by electric/push button release mechanism and by integrated remotely operated release system. Shore shall document procedures and training for systems use and communications between Terminal and vessel operator(s). Routine inspection, testing, and maintenance of all equipment and systems in accordance with manufacturer's recommendations and necessity are required to ensure safety and reliability, to the satisfaction of California State Lands Commission (CSLC) staff. Shore may install alternate technology that provides an equivalent level of protection, as reviewed by CSLC staff and only if approved by the CSLC at a publicly noticed meeting.

Rationale for Mitigation

MM OS-1a: The Shore Terminal is located in a high velocity current area in the Carquinez Strait and currently has no mechanisms to monitor mooring line tending and integrated environmental conditions. Monitoring moored vessel line strains and environmental conditions enables informed and controlled transfer operations to continue in harsh weather conditions, high velocity current conditions, and/or other conditions where excessive tension or slack in the mooring lines could result in failure of mooring lines and/or significant movement of the vessel resulting in damage to the

Shore Terminal and/or vessel. (Tension-monitoring systems are unable to directly monitor vessel movements; this is addressed in MM OS-1b.)

Devices able to continuously monitor moored vessel line strains and to alarm at preset limits can warn operators of the development of dangerous mooring situations, allowing time to take corrective action and minimize the potential for the parting of mooring lines, which can quickly escalate to the breaking of loading arm connections, the breakaway of a vessel, and/or other unsafe mooring conditions that could ultimately lead to a petroleum product spill. Backed up by an alarm system, real time data monitoring and control room information would provide the Terminal Person-In-Charge (TPIC) with immediate knowledge of whether safe operating limits of the moorings are being exceeded. Mooring adjustments can be made to reduce the risk of damage and accidental conditions.

MM OS-1b: Located in a high velocity current area, the Shore Terminal is subject to "unfavorable" site conditions in accordance with the MOTEMS § 3103F.6.7. However, Shore's current practice is to only berth vessels in "favorable" conditions. At present, the docking system relies on the pilot's judgment to determine the vessel's approach speed and angle. Allision Avoidance Systems (AASs) would monitor an approaching vessel's speed, approach angle, and distance from the dock to keep the potential impact velocity within the maximum elastic allowable limits of the fender/structural system, and thus help to prevent damage to the Shore Terminal and/or vessel due to vessel impact that could lead to a spill. Monitoring these factors would ensure that all vessels can safely berth at the terminal and comply with the minimum standards required in the MOTEMS. Furthermore, monitoring passing vessels and moored vessel movements ensures that all vessels can remain securely moored at the terminal and comply with the minimum standards required in the MOTEMS. Excessive surge or sway of vessels (motion parallel or perpendicular to the wharf, respectively) and/or passing vessel forces may result in sudden shifts/redistribution of mooring forces through the mooring lines, which can quickly escalate to the failure of mooring lines, breaking of loading arm connections, the breakaway of a vessel, and/or other unsafe mooring conditions that could ultimately lead to a spill.

MM OS-1c: During the 1997 *Overseas Philadelphia* incident at the MOT, the loading arms were ripped from the wharf when the vessel rapidly pulled away from the MOT following the breaking of two mooring lines. The loading arm connection failed and was the source of a spill. Fortunately, although the valves on the loading arms were open, no active transfer operation was in progress at the time of the incident. Through the

quick actions of the terminal operator, who saw the incident and manually closed the valves, the spill was limited to the standing contents of the loading arm (about 10 barrels [420 gallons]). Quick-connect/disconnect couplers and emergency quick-release systems for near instantaneous disconnect of the loading arms from the vessel would reduce the amount of a spill to less than 1 gallon with or without human intervention.

MM OS-1d: The Shore Terminal currently has no mechanisms that would allow the quick release of mooring lines in the event of an emergency. In the event of a fire, tsunami, explosion or other emergency, quick release of the mooring lines within 60 seconds would allow the vessel to quickly leave the Shore Terminal which could help prevent damage to the Shore Terminal and vessel and avoid and/or minimize spills. These measures may also help isolate an emergency situation, such as a fire or explosion, from spreading between the Terminal and vessel, thereby reducing spill potential. By providing mooring release devices capable of being engaged by a locally initiated electric/push button release system and by a remotely operated release mechanism, Shore would have several different options to cover emergency situations.

The *Overseas Philadelphia* incident may have potentially been caused by or partially caused by a combination of the high-velocity currents at the MOT and the potential wake effects from a passing vessel.[4] The MOT is not aligned with either the ebb or flood current, which increases the force on moored vessels, causing them to drift in and out from the berth when vessels are passing. In addition, the wharf is located in the Carquinez Strait and is subject to high-velocity currents, increasing the probability of this type of event. If the MOT had had a tension-monitoring system, an AAS, and a remote release system at the time of the incident, operators would potentially have had advanced notice of the strain on the mooring lines and been alarmed to take (and capable of taking) action as the vessel began to move away from the MOT.[5] The systems proposed in MM OS-1a, OS-1b, and OS-1d would provide critical information and capabilities to the MOT operator that would help identify and facilitate timely response to conditions that led to the *Overseas Philadelphia* incident, thereby reducing the likelihood of spills into the Bay during loading or unloading operations.

[4] The CSLC and ship owner investigations following the incident were indeterminate as to one single factor causing this incident and point to a combination of factors including weak mooring lines, strong current, and possible wake effects from a passing ship.

[5] As is discussed in Section 4.1.1 above, in the year previous to the *Overseas Philadelphia* incident (1996), two near misses occurred where vessels moored at the MOT drifted between 6 to 12 feet from the wharf, putting strain on the loading arms.

The combination of these mitigation measures would lower the probability that a spill would occur and would reduce the consequence of an oil spill if it occurs to less than significant for spills of 50 barrels or less.

Residual Impacts

The impacts to public health and safety associated with the potential consequences of a spill greater than 50 barrels would remain significant and unavoidable (Class I).

Impact OS-2: Potential for Fires or Explosion of Gasoline, Ethanol, or Other Blended Product Vapors During Product Transfer, or From Other Sources of Ignition in Areas Where Vapor Could Be Present

Potential impacts to public safety could occur from an explosion of gasoline, ethanol, or other blended product vapors due to an inadequately operating vapor control system. (Class II)

Fires and explosions at the MOT involving vessels and/or the MOT are possible. Vessels loading or unloading products with low flash points are required to have properly operating inert gas systems (IGS) in which an inert gas is generated and injected into the cargo tanks to displace oxygen. The Vessel-Person-In-Charge (VPIC) is required to verify that the tanks are inerted and that the IGS is working properly before transfer operations can commence. In addition, the Vapor Control System (VCS) at the terminal must be working properly to prevent fires and explosions. The Wharf Operations Manual describes the VCS for the MOT, and it includes a Hazard and Operability (HAZOP) Study of Terminal Operations. The HAZOP is a systematic review of the safety systems related to the MOT. It identifies possible accidents that could occur and determines if the safety systems designed into the operations would prevent or minimize accidents.

An evaluation of the HAZOP and the system drawings contained in the Wharf Operations Manual was conducted as part of the review of the proposed Project (Katin Engineering 2009). In summary, the evaluation indicates that the HAZOP is inadequate for the proposed new lease going forward. It is likely that some of the MOT equipment related to safety may have been replaced since the HAZOP was prepared about 30 years ago. Additionally, because of its age, the equipment that has not been replaced may need to be evaluated further. The Katin Engineering evaluation also noted that several of the drawings contained in the Wharf Operations Manual are incomplete and do not show sufficient details of the system to effectively evaluate the HAZOP that was previously carried out. Therefore, it is recommended that a new HAZOP Study be prepared to ensure that the MOT can operate safely going forward with a new lease for the next 30 years, and to ensure that adequate safety measures

are in place to prevent significant impacts from occurring. This new HAZOP should identify all sources of vapor and not be limited to just the VCS. It should also identify all sources of ignition in areas where vapor could be present. The prevention of vapor being ignited by heat, electric static sparks, and other sources would reduce the exposure to risks but not eliminate it completely. The new HAZOP should also make recommendations on improvements that should be made to ensure continuing safety.

Mitigation Measure for Impact OS-2:

MM OS-2. Prepare ~~and Implement~~ a New Hazard and Operability (HAZOP) Study. Within 90 days of project approval and Environmental Impact Report certification, Shore shall prepare for California State Lands Commission~~CSLC~~ and U.S. Coast Guard approval a new ~~Hazard and Operability (~~HAZOP Study for all Shore Marine Oil Terminal~~MOT~~ operations including all sources of vapor and ignition, and identify steps needed to eliminate the identified possible accidents.

Rationale for Mitigation

This mitigation measure will ensure that the safety systems are working properly and that safe operations procedures are followed during routine operations. The impacts would be reduced to less than significant.

Impact and Mitigation Summary

Table 4.1-3 presents a summary of operational safety/risk of accident impacts that would be associated with the proposed Project and the corresponding recommended mitigation measures.

Table 4.1-3. Summary of Operational Safety/Risk of Accidents Impacts and Mitigation Measures

Impacts	Mitigation Measures
OS-1: Accidental Spills of Relatively Low-Volatility Petroleum Products or Large Accidental Spills of Highly Volatile Products	**MM OS-1a.** Install Tension-Monitoring Devices **MM OS-1b.** Install an Allision Avoidance System **MM OS-1c.** Replace Existing Loading Arms **MM OS-1d.** Install Remote Release System
OS-2: Potential for Fires or Explosion of Gasoline Vapors During Product Transfer, or From Other Sources of Ignition in Areas Where Vapor Could Be Present	**MM OS-2:** Prepare ~~and implement~~ a ~~n~~New Hazard and Operability (HAZOP) Study

4.1.5 Impacts of Alternatives

No Project Alternative

Under the No Project ~~a~~Alternative, a new lease would not be granted and the existing MOT would be abandoned, reused, removed, or some combination of these three options. The Shore upland terminal would remain in operation, but product would not be shipped in or out by marine vessel. Closing the MOT would reduce the volume of products handled at the upland terminal by as much as 40 percent. Product could be shipped by marine vessel through other marine terminals in the area, or by pipeline, rail, or truck. If product were shipped through other marine terminals, the overall probability of a spill in the Bay Area would be similar to the proposed Project but would depend on the location(s) of the other terminal(s) and vessel traffic conditions near the other terminal(s) as compared to the Shore MOT.

From a risk standpoint, alternative modes of transport for petroleum products are dependent on two main issues: (1) the accidental spill rate by mode, and (2) the number of deaths associated with accidents for each mode of transportation.

Table 4.1-4 compares both the spill rates per billion-ton miles of petroleum product transported and the deaths per billion-ton miles of petroleum transported for the various modes. The table shows that the spill rates for rail tankers, for marine tankers, and for trucks are much higher than for pipelines, while truck transportation has by far the highest spill rate. The death rates for both rail and truck are the highest, mainly because collisions can be violent, leading to fire and explosion near communities. Therefore, because of the seriousness of accidents for rail and truck transport, marine and pipeline transportation is preferable over rail and truck. So, to the extent that the No Project Alternative would increase truck and rail transportation, risks to public health and safety would be greater than for the proposed Project.

Table 4.1-4. Spill Rates and Death Rates for Various Petroleum Transport Modes

Mode	Spills/ Billion-Ton Miles	Deaths/ Billion-Ton Miles
Pipeline	0.5	0.01
Tanker	9.4	0.31
Rail Tanker	7.8	2.5
Truck	44.6	10.9

Source: EIP Associates 1992

Limitations on Terminal Use Alternative

Under the Limitations on Terminal Use Alternative, Shore would ~~not~~ be granted a new lease ~~but~~ with restrictions on the number, type, or size of marine vessels that would be allowed to call at the marine terminal, or restrictions on the type of product that could be loaded or unloaded. Therefore, this alternative would result in fewer tanker/barge visits and would reduce the probability of an accident from occurring compared to the proposed Project. However, should an accident or spill occur, impacts to public health and safety would be essentially the same as for the proposed Project.

4.1.6 Cumulative Projects Impact Analysis

Routine operations of the proposed Project would not result in any impacts to public health and safety, and so would not contribute to cumulative safety impacts. However, the proposed Project, as well as several cumulative projects listed in Table 3.5-1, each has a risk of an accidental spill of petroleum products.

Compliance with existing USCG regulations ensures adequate response capability to manage spills up to 50 barrels in size before impacts to public health and safety reach significant levels. Further, it is unlikely that multiple concurrent small spills could occur in the Bay such that existing response capabilities would be unable to respond effectively. Because the MOT has the necessary resources to handle spills of 50 barrels or less, spills of 50 barrels or less would be contained and cleaned up. The proposed Project's contribution to cumulative safety impacts from spills up to 50 barrels would not be cumulatively considerable (Class II).

Based on historical perspective (see Impact OS-1, discussed above), the probability of a spill from marine vessel traffic in the Bay is ~~very~~ low (less than three spills per 10,000 vessel calls), so the likelihood of multiple large accidental spills occurring simultaneously and affecting public health and safety is ~~extremely~~ slim. Furthermore, over the past 20 years (1989 to 2008), the overall number of ~~Golden Gate Bridge~~GGB ship traffic arrivals has remained fairly constant, ranging from a low of 2,897 arrivals in 1997 to a high of 3,671 arrivals in 1991 (see Section 3.5.3, Regional Characteristics of Marine Vessel Transportation in Bay and Along Coastal Shipping Lanes off Northern California). Because the nature of the cumulative projects shown in Table 3.5-1 is not unlike that of past projects in the Bay over the past 20 years, and total vessel traffic has remained fairly steady over that time, it follows that the cumulative projects would not be expected to have a material effect on total marine vessel traffic and, therefore, no material effect on the cumulative risk of an accidental spill of petroleum products in the

Bay. However, a single spill greater than 50 barrels could pose a threat to human health through interaction with the spilled material. Because the proposed Project has an individual impact from large spills that is significant and unavoidable, the proposed Project's contribution to the cumulative impact is cumulatively considerable (Class I).

None of the cumulative projects would be located within sufficient proximity to the Shore MOT such that they could contribute any cumulative effect from fires or explosion during product transfer. Implementation of ~~m~~Mitigation ~~m~~Measure OS-2 would ensure that the proposed Project's contribution to public health and safety risk from fire and explosion would not be cumulatively considerable.

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4.2 BIOLOGICAL RESOURCES

This ~~S~~section identifies the existing biological resources at the Shore Marine Oil Terminal (MOT) site in Contra Costa County, and for the greater San Francisco Bay-Delta and open coastal region between Pigeon Point and Point Arena. It also identifies Federal, State, and local regulations pertaining to biological resources within the region, and describes Project impacts to those biological resources and mitigation measures to reduce potentially significant impacts to less than significant.

Information used in the preparation of this section was obtained from: regional biological and ecological habitat reports (NOAA 2007, USFWS 1989); recent San Francisco Bay Region CEQA documents (Chambers 2007); long-term regional studies such as the Regional Monitoring Program for Water Quality in San Francisco Bay-Delta; California Department of Fish and Game's (CDFG) San Francisco Bay Study (CDFG 2000-2007); the Interagency Ecological Program (IEP) for the San Francisco Bay-Delta; and other resources such as the California Natural Diversity Database (CNDDB) (CDFG 2008), California Native Plant Society Electronic Inventory (CNPS 2008), U.S. Fish and Wildlife Service (USFWS 2008), the National Wetlands Inventory (USFWS 2009), and standard biological literature. The information provided below is a summary of what is presented in these documents, which should be consulted for additional detail.

In order to develop a preliminary characterization of biological resources at the site, previous biological resource studies of the Project area were reviewed as well as existing plans such as the San Francisco Bay Plan (San Francisco Bay Conservation and Development Commission [BCDC] 2008, 2011) and the Contra Costa County General Plan (Contra Costa County 2005). Previous involvement in intertidal and subtidal scientific assessments of the former Selby Smelting operations located adjacent to the MOT, combined with a site visit on December 10, 2008, when a terrestrial field survey was conducted of the Project area, provided first-hand information and verification of existing data on marine and terrestrial biota, habitats, and presence of sensitive areas such as wetlands located in the vicinity of the Project site. For the purposes of this analysis, the baseline conditions against which impacts are analyzed are those conditions existing as of the publication of the proposed Project's Notice of Preparation (NOP), November 28, 2007.

4.2.1 Environmental Setting

Regional Setting

The Bay Area-Delta Bioregion, in which the Project site occurs, extends from the Pacific Coast to the Sacramento Valley and San Joaquin Valley Bioregions to the northeast and southeast (CERES 2005). ~~There is a~~ A wide variety of habitat and vegetation types exist in the bioregion, including redwood forests, northern coastal scrub, mixed hardwoods, valley oaks, eucalyptus, manzanita, and saltwater and freshwater wetlands. The region is drained by rivers including the Russian, Gualala, Napa, Petaluma, and Alameda and Putah Creeks. These watersheds are used by listed anadromous fish and a variety of threatened and endangered wildlife and plants, including California red-legged frog (*Rana draytonii*), California clapper rail (*Rallus longirostris obsoletus*) and black rail (*Laterallus jamaicensis coturniculus*), salt marsh harvest mouse (*Reithrodontomys raviventris*), and Alameda whipsnake (*Masticophis lateralis euryxanthus*). The freshwater supply suffers from the conflicting demands of providing two-thirds of the State's drinking water, irrigating farmland, as well as sustaining fish and wildlife habitat. This has had a profound effect on the species dependent on freshwater inputs to the estuary (San Francisco Bay and Sacramento Delta). Development in the Bay area has also had a significant impact on wetlands around the Bay-Delta. Salt and tidal marshes that historically surrounded the Bay have been reduced to 5 percent of their former extent (USGS 1996).

The climate is considered Mediterranean with moist, cool winters and hot, dry summers. The high diversity of vegetation and wildlife found in Contra Costa County, reflective of the region as a whole, is a result of its range of soil, topographic, and micro-climatic conditions.

The San Francisco Bay-Delta is the second largest estuary in the United States (NOAA 2007) and is composed of multiple aquatic habitats and biological communities. It encompasses 479 square miles (1,241 square kilometers), including shallow mudflats (NOAA 2007). Typically, San Francisco Bay (the Bay) is divided into four main basins: South Bay, Central Bay, San Pablo or North Bay, and Suisun Bay. The described boundary between South Bay and Central Bay often varies depending on the study or report. For the purposes of this document, South Bay is defined as that area of the Bay south of the Oakland Bay Bridge. Central Bay stretches between the Oakland Bay Bridge and the Richmond-San Rafael Bridge and connects to the Pacific Ocean through the Golden Gate Bridge (GGB). North Bay/San Pablo Bay stretches between the Richmond-San Rafael Bridge and the Carquinez Bridge. The most northern and upstream basin is Suisun Bay, which transforms quickly into the diked wetlands of

Suisun Marsh and the west Delta. Suisun Bay lies east of Carquinez Strait to the westerly point where the Sacramento and San Joaquin Rivers combine at the Sacramento Delta, providing the main source of fresh water into San Francisco Bay. Along with this freshwater input, sediments are also transported into the Bay primarily by the Sacramento and San Joaquin Rivers, but also by the Yolo Bypass, Mokelumne River, Calaveras River, Cosumnes River, and several other smaller tributaries (NOAA 2007). Both the Napa and Petaluma Rivers flow into San Pablo Bay.

Biological Communities

Due to the historic land use for ore smelting, the onshore area adjacent to the Project site supports a very low diversity of vegetation communities. Vegetation and wildlife habitat have been highly disturbed on the vast majority of land in the vicinity of the Project site. Biological communities in the Project area are open water (pelagic), soft sediment (benthic), subtidal and intertidal, hard bottom (benthic), subtidal and intertidal, ruderal, and developed/barren habitat types. In the vicinity of the Project site are coastal scrub, eucalyptus, and non-native grasslands. The vegetation communities are described below, and those that are dominated by naturally occurring native species are based on the classification presented in *A Manual of California Vegetation* (Sawyer and Keeler-Wolf 1995). Vegetation types and wildlife habitats were identified using both records (CNDDB 2009, CDF 2005, NWI 2009) and field observations. Vegetation and habitat types occurring in the vicinity of the proposed Project site are illustrated in Figure 4.2-1. For a detailed description of the biological communities in the vicinity of the Project site, including the San Francisco Bay, North Central Coast, and Farallon Islands, please see Appendix D.1.

Project Site - Upland

<u>Ruderal</u>

This habitat type is found in highly disturbed areas, and is characterized by an abundance of non-native, herbaceous species. Near the Project site, these areas are dominated by: black mustard (*Brassica nigra*), yellow star thistle (*Centaurea solstitialis*), lupine (*Lupinus sp.*), fennel (*Foeniculum vulgare*), pampas grass (*Cortaderia selloana*), iceplant (*Carpobrotus edulis*), and Himalayan blackberry (*Rubus discolor*). Ruderal vegetation is found surrounding the paved area, along the shoreline riprap, and on the edge of the railway trestle. Ruderal areas can provide habitat for wildlife similar to that of annual grassland; however in this instance, the areal extent is so restricted that it is unlikely to support even a few individuals other than transients. Wildlife may be limited

SOURCE: CDF 2005

Shore Marine Oil Terminal Lease Project EIR

Figure 4.2-1

Vegetation

to visitation by birds such as lesser goldfinch (*Carduelis psaltria*), house finch (*Carpodacus mexicanus*), white-crowned sparrows (*Zonotrichia leucophrys*), and gulls (*Larus* spp.).

Developed/Barren

In the Project area, these areas are covered by asphalt, riprap, and the wharf area. These areas are essentially barren, lacking significant biological diversity.

Project Site - Marine

The predominant habitat types in the San Francisco Bay-Delta include open water (pelagic), soft sediment subtidal and intertidal, and hard bottom subtidal and intertidal environments (NOAA 2007). The open water (pelagic) environment is the predominant habitat of the Bay and includes the area between the water surface and the seafloor. The physical conditions of the open water environment are constantly changing with tidal flow and season. Each of the main basins is heavily influenced by ocean water brought into the Bay by the daily tidal cycle, and by freshwater flow from the many rivers and tributaries that flow to the Pacific Ocean through the Bay-Delta. Differences between the phytoplankton and zooplankton communities in North Bay, Central Bay, and South Bay are primarily influenced by the distance from the GGB (source of ocean water) and freshwater inputs to the Bay (NOAA 2007). The water column provides habitat for plants (phytoplankton), invertebrates (zooplankton), fishes, birds, and marine mammals. The pelagic community is composed of phytoplankton (floating microscopic plants), zooplankton (floating and limited swimming animals), and nekton (swimming) organisms.

Soft bottom (benthic) habitats of the estuary floor include mud/silt/clay, sand, pebble/cobble, and shell mix. Exposure to wave and current action, temperature, salinity, and light penetration determine the composition and distribution of organisms within the sediments. Most surveys and other information sources indicate unconsolidated sediments are present throughout the Bay-Delta and are the most common substrate type in San Francisco Bay (NOAA 2007).

Hard bottom (benthic) habitat in San Francisco Bay consists of natural and artificial surfaces. Natural substrates include boulders, rock face outcrops, and low-relief rock. Artificial hard substrate includes vessel structures, pilings, riprap, and pipelines. Pilings, riprap, and pipelines can be found in every region of the San Francisco Bay-Delta. Hard substrate provides habitat for an assemblage of marine algae, invertebrates, and fishes. Natural substrates provide surface area for algae and diatoms and foraging

areas for birds and marine mammals. Boulders and rock face outcrops provide substrate for fish rearing, spawning, and growth.

San Pablo Bay (North Bay) - Open Water (Pelagic) Habitat

Plants and Phytoplankton

The phytoplankton community in San Pablo Bay is dominated by diatoms followed by dinoflagellates and cryptophores (NOAA 2007). Most of the phytoplankton species in San Francisco Bay can tolerate broad ranges of salinity and temperature (NOAA 2007), and as a result can be found in the North, South, and Central Bays. Similarly, the freshwater species, *Skeletonema potamos*, is carried into the Bay with the freshwater flows from the Delta and can be found in San Pablo Bay (NOAA 2007). Because of the flow of ocean water from Central Bay into San Pablo Bay, the red algae, *Polysiphonia denudata*, can occasionally be observed floating in the water (NOAA 2007). The kelps, *Laminaria* spp. and *Egregia* spp., are found in addition to other species such as *Ahnfeltiopisis* ssp. (formerly *Gymnogongrus*) and *Halymenia* spp. that are common on the outer exposed rocky coast.

Zooplankton

The zooplankton community in San Pablo Bay consists of small invertebrate organisms that spend all or a portion of their life cycle in the water column. These include microzooplankton (tintinnids, rotifers, and copepod nauplii), larger copepods (small crustaceans), cladocerans (small crustaceans or water fleas), and the larvae of benthic and pelagic invertebrate animals and fish (meroplankton). Zooplankton species typically change seasonally, with a few species present throughout the year. Several species introduced in the 1980s have changed the zooplankton community's dominant taxa. Bay meroplankton is dominated by the northern anchovy (*Engraulis mordax*), longfin smelt (*Spirinchus thaleichtys*), Pacific herring (*Clupea pallasi*), plainfin midshipman (*Porichthys notatus*), the ctenophore *Pleruobranchia bachei*, the isopod *Syndotea laticauda*, the shrimps *Palaemon macrodactylus*, *Crangon franciscorum* and *C. nigricauda*, the mysid *Neomysis kadiakensis*, and the medusa *Polyorchis* spp. (NOAA 2007).

Fish

The fish community inhabiting the water column in San Pablo Bay is dominated by northern anchovy, which accounts for 90 percent of the fish taxa collected by the CDFG (2000 through 2007). Pacific herring, American shad (*Alosa sapidissima*), jack smelt (*Atherinopsis californiensis*), longfin smelt, and striped bass (*Morone saxatilis*) account

for 9 percent of the population (CDFG 2000 through 2007). Other common taxa that account individually for less than 0.1 percent of the community include Chinook salmon (*Onchorhynchus tshawytscha*), topsmelt (*Atherinops affinis*), shiner perch (*Cymatogaster aggregata*), white croaker (*Genyonemus lineatus*), plainfin midshipman, threadfin shad (*Dorosoma petenense*), and walleye surfperch (*Hyperprosopon argenteum*) (CDFG 2000 through 2007). Another 32 species are present in very small abundances in North Bay (see Appendix D.2 Table 1), including the protected delta smelt (*Hypomeseus transpacificus*).

Chinook salmon and delta smelt are both Federal and State listed special-status fish species, with winter-run Chinook salmon listed as endangered and spring-run Chinook salmon listed as threatened. Delta smelt were ~~recently~~ changed from threatened to endangered by the State of California on March 5, 2009 (CCR § 670.5 Title 14) ~~(SF Chronicle 2009)~~. The USFWS is in the process of listing delta smelt as endangered under the Endangered Species Act (ESA). Longfin smelt have also been recently listed as threatened by the State of California (CCR § 670.5 Title 14~~SF Chronicle 2009~~). Northern anchovy are also protected under the Coastal Pelagic Fishes Management Plan (Olberding 2008). Finally, the Project area is located within the established migration corridor for adult steelhead (*Onchorhynchus mykiss irideus*) and smolts, a State and Federal protected species. Both the main shipping channel and adjacent shallows are used by steelhead for migration and foraging (NOAA 2009). Although CDFG data (CDFG 2000 through 2007) do not indicate that steelhead are ~~present~~ resident in the Project area in any significant numbers, individuals can be expected to be present during migration times. Similarly, Chinook salmon is another State and Federal protected species, and San Pablo Bay is identified as an essential fish habitat for migration and foraging (NOAA 2009).

Mammals

Seven species of marine mammals use the pelagic water column habitat in San Francisco Bay for migrating and foraging (NOAA 2007). Marine mammals frequently observed in San Pablo Bay include harbor seals (*Phoca vitulina*), California sea lions (*Zalophus californianus*), and the harbor porpoise (*Phocoena phocoena*). California gray whales (*Eschrichtius robustus*) occasionally swim into San Francisco and San Pablo Bays on their annual migrations between Mexico and Alaska (NOAA 2007). Harbor seals and California sea lions feed primarily on fish within San Francisco Bay, including schooling northern anchovy and Pacific herring, but also feed on migratory Pacific eels, lamprey, salmonids, and mysid shrimp and other invertebrates within the water column (NOAA 2007). All of these mammal species are protected

under the Federal Marine Mammal Protection Act. There are no major haul-outs or rookeries in North Bay for any marine mammals, but individuals may still use various structures.

Birds

Dominant marine birds inhabiting or utilizing San Pablo Bay and the Project area include cormorants (*Phalacrocorax* spp.), the pigeon guillemot (*Cepphus columba*), the herring gull (*Larus argentatus*), and the mew gull (*L. canus*) (NOAA 2007). The California brown pelican (*Pelecanus occidentalis californicus*) can also frequent San Pablo Bay, and osprey (*Pandion haliaetus*) are known to inhabit the Project area (NOAA 2007).

San Pablo Bay - Soft Sediment (Benthic) Habitat

Marine biota expected to be present in the deep water channel adjacent to the MOT are similar to that described above for main channels in San Pablo Bay with one major distinction. Because of the high currents present in the waters adjacent to the MOT (Shore 2008), the instability of bottom sediments and reduced organic content result in reduced species diversity and abundance ~~than may be present elsewhere in~~ compared to other areas of North San Francisco Bay. Likewise, propeller wash from tankers and tug boats act in a similar manner as high currents, keeping bottom sediments in a constant state of disturbance. It also winnows away finer sediment particles (e.g., fine sand, silts, and clays) and organic matter, resulting in a seafloor consisting of coarser sediments and exposed rock habitat.

Plants and Phytoplankton

Several types of aquatic vegetation can also be found in the North Bay, including the green alga *Ulva/Enteromorpha* spp. on shallow mudflats and eelgrass (*Zostera marina*) (Merkel & Assoc. 2005). The largest eelgrass bed in San Francisco Bay is located between Point San Pablo and Point Pinole and covers more than 1,500 acres (Merkel & Assoc. 2004). Major eelgrass beds continue down the east side of North Bay along Point Molate to Point Richmond. Smaller beds are located at Point San Quentin and Point San Pedro (Merkel & Assoc. 2004). Submerged aquatic vegetation (SAV) and eelgrass beds in particular are important habitats within San Francisco Bay because they stabilize sediments, help clarify water through sediment trapping, cycle nutrients, and oxygenate water (Merkel & Assoc. 2005).

The SAV in San Francisco Bay has been poorly studied and very little is known about its distribution and abundance. However, there are four main types of SAV communities known to inhabit the Bay: surfgrass, eelgrass, widgeon grass, and sago pondweed (NOAA 2007). Each species of SAV has varying physical requirements and is found in distinct parts of the Bay. All four SAV species provide primary productivity and decrease erosion by dampening wave action, preventing sediment resuspension, increasing sedimentation, providing attachment for sessile organisms, and providing a resource area for invertebrates, fishes, birds, and marine mammals. Most species of plants and algae need coarse particles such as pebbles or shells to become established in soft bottom habitats, otherwise they are removed by water motion such as tidal and wind currents as well as storm action.

Eelgrass beds also provide habitat to an abundant array of invertebrates, fish, and birds. Eelgrass is a nursery habitat for most of the anadromous fish found in San Francisco Bay, including Chinook salmon, as well as sturgeon, striped bass, and smelt. Pacific herring use eelgrass beds to deposit their eggs during spawning (Merkel & Assoc. 2005). Likewise, many of the waterfowl present in the Bay, including species such as the black brant (*Branta bernicla nigricans*), use eelgrass beds for foraging ~~such as black brant (*Branta bernicla nigricans*)~~ (Merkel & Assoc. 2005).

Invertebrates

The benthic animal community of North Bay and the Delta has been significantly affected by the introduction of ~~exotic~~non-native species. Most importantly, the establishment of two ~~invasive~~non-indigenous clams, *Corbula amurensis* and *Corbicula fluminea,* has drastically changed the benthic communities in San Pablo Bay, Suisun Bay, and the Delta (NOAA 2007). In addition, the high water filtering rate of *C. amurensis* has been identified as a possible factor responsible for decreased plankton biomass in the Delta and North Bay (Thompson 1999, Kimmerer 2006). Marine biota expected to be present in the deep water channel adjacent to the MOT are similar to that described above for main channels in San Pablo Bay with one major distinction. Because of the high currents present in the waters adjacent to the MOT (Shore 2008), the instability of bottom sediments and reduced organic content result in reduced species diversity and abundance ~~than may be present elsewhere in~~ compared to other areas of North San Francisco Bay. Likewise, propeller wash from tankers and tug boats acts in a similar manner as high currents, keeping bottom sediments in a constant state of disturbance. It also winnows away finer sediment particles (e.g., fine sand, silts, and clays) and organic matter, resulting in a seafloor consisting of coarser sediments and exposed rock habitat.

Large motile invertebrates common in San Pablo Bay include Dungeness crab (*Cancer magister*), blackspotted shrimp (*Crangon nigromaculata*), a gastropod snail (*Ilyanassa obsoleta*), the American spider crab (*Pyromaia tuberculata*), and the nudibranch (*Sakuraeolis enoisimensis*) (NOAA 2007). Dungeness crab use San Francisco Bay, as they do all estuaries along the north Pacific Coast, as an area for juvenile growth and development prior to returning to the ocean as sexually mature adults (Tasto 1979, Pauley et al. 1989).

Fish

More than 54 fish taxa have been observed inhabiting or utilizing the benthic habitat of San Pablo Bay between 2000 and 2007 (CDFG 2000 through 2007). This fish community is characterized by the bay goby (*Lepidogobius Lepidus*), plainfin midshipman, English sole (*Parophrys vetulus*), longfin smelt, Pacific staghorn sculpin (*Leptococottus armatus*), speckled sanddab (*Citharichthys stigmaeus*), yellowfin goby (*Acanthogobius flavimanus*), Shokihaze goby (*Tridentiger barbatus*), white croaker (*Genyonomus lineatus*), cheekspot goby (*Ilypnus gilberti*), shiner surfperch (*Cymatogaster aggregata*), starry flounder (*Platichthys stellatus*), striped bass, bay pipefish (*Syngnathus leptorhynchus*), Pacific herring, California halibut (*Paralichthys californicus*), California tonguefish (*Symphurus atricaudus*), and sand sole (*Psettichthys melanostictus*) (see Appendix D.2 Table 2).

Several of the groundfish listed above, such as English sole and starry flounder, as well as other occasional inhabitants such as sand sole (*Psettichthys melanostictus*) and big skate (*Raja binoculata*), are covered by the Pacific Groundfish Management Plan, which identifies San Francisco Bay-Delta as essential fish habitat for these species (Olberding 2008). Finally, the North American green sturgeon (*Acipenser medirostris ayres*) is known to inhabit the waters and bottom (benthic) habitat of San Pablo Bay (CDFG 2000 through 2007). CDFG data (see Appendix D.2, Table 2) do not indicate that green sturgeon are present in the general Project area in any significant numbers, but they do migrate past the Project site on their regular migration from the upper reaches of the Sacramento River to the Pacific Ocean.

San Pablo Bay - Hard Bottom (Benthic) Habitat

Invertebrates

Depending on the location of the hard substrate and its proximity to freshwater flow, San Pablo Bay can support several different communities of sessile invertebrates. In areas with lower salinity, the mussel *Mytilus trossulus/galloprovincialis* and the barnacle

Amphibalanus improvisus are frequently observed (NOAA 2007). In the higher salinity regions of San Pablo Bay, the sessile invertebrate taxa are typically more diverse than what is observed in lower salinity regions. This is the result of the more favorable salinity conditions enabling more marine species to establish and thrive (NOAA 2007). The pilings of the MOT provide hard substrate for many of the sessile marine organisms identified above. Taxa that can be expected to be present include several species of barnacles, bryozoans, hydrozoans, mussels, oysters, occasional sponges, and green algae. Site visits revealed that the rocky subtidal slag substrate is predominantly covered with several species of hydroids and barnacles. The rocky intertidal regions of San Pablo Bay and at the MOT contain many of the same taxa as observed in the subtidal areas, depending on the frequency and duration of exposure to air during low tides. Site visits to the former Shelby Smelting site, near the MOT, revealed that the intertidal area is very small with less than a few feet of rocky beach and a steep bluff. Both the beach and bluff are composed of slag. Green filamentous algae (*Ulva/Enteromorpha*), several species of barnacles (*Balanus* spp., *Amphibalanus* spp.), and hydroid turf were the predominant taxa during site visits.

Sensitive Natural Communities

Sensitive communities in the Project area include those that are especially diverse, regionally uncommon, designated by CDFG, or are otherwise covered by State, Federal, or local regulations. The CNDDB~~)~~ tracks the status of sensitive natural communities throughout California. It identifies an area of northern coastal salt marsh in the Mare Island 7.5-minute quadrangle (see Figure 4.2-2) approximately 1 mile from the Project area. Northern coastal salt marshes are highly productive communities comprised of herbaceous or partially woody, salt- and water-tolerant plants. Species such as native *Spartina* and *Salicornia* form moderate to dense cover up to 1 meter tall. The plant species form horizontal transition zones from most salt tolerant at the lower elevations to least salt tolerant at higher elevations. Wildlife in northern coastal salt marshes is generally active in summer but dormant in winter. These salt marshes are found in hydric soils subject to regular tidal inundation by salt water and are usually located in sheltered edges of bays, lagoons, and estuaries (Holland 1986), corresponding to the Saltgrass series in the *Manual of California Vegetation* (CNPS 1997).

Other wetlands are present in the Project vicinity (see Figure 4.2-2). These freshwater and estuarine wetlands are sensitive to habitat alteration and changes in water quality, but would not be directly impacted by the Project.

SOURCE: CNDDB 2009; NOAA 2005; NWI 2009

Shore Marine Oil Terminal Lease Project EIR

Figure 4.2-2

Special-Status Communities

Designated Critical Habitat

The USFWS and the National Marine Fisheries Service (NMFS)[1] designate critical habitat with the purpose of contributing to the conservation of threatened and endangered species and the ecosystems upon which they depend. The designation of an area as critical habitat provides additional protection to habitat only when there is a Federal nexus with regard to some aspect of the Project, for example, when a Federal agency is implementing or issuing a permit for a Project. Critical habitat protection is only relevant when other statutory or regulatory protections, policies, or other factors relevant to agency decision-making would not prevent the destruction or adverse modification of habitat. Designation of critical habitat triggers the prohibition of destruction or adverse modification of that habitat, but it does not require specific actions to restore or improve habitat.

The MOT site is found within the designated critical habitat for the California Central Valley and Central California Coast Chinook salmon ~~California Central Valley and Central California Coast~~ Evolutionarily Significant Units (ESUs). Also, the NMFS is in the process of designating critical habitat for the green sturgeon, which may include San Pablo Bay (McGowan and Josselyn 2008). San Pablo Bay is also essential fish habitat for Chinook salmon, steelhead trout, and green sturgeon. Essential fish habitat includes all habitat types that contain the waters and substrates necessary for fish spawning, breeding, or growth, as defined in the Magnuson-Stevens Fishery Conservation and Management Act.

Special-Status Species

A number of species known to occur in the Project vicinity are protected pursuant to Federal and/or State of California endangered species laws, or have been designated as Species of Special Concern by the CDFG. In addition, section 15380(b) of the State CEQA Guidelines provides a definition of rare, endangered, or threatened species that are not included in any listing. Species recognized under these terms are collectively referred to as "special-status species." For the purposes of this Environmental Impact Report (EIR), special-status species include:

- Plant and wildlife species listed as rare, threatened, or endangered under the Federal or State endangered species acts;
- Species that are candidates for listing under either Federal or State law;

[1] Subsequently renamed NOAA Fisheries, the agency continues to be referred to, and refers to itself, as NMFS or NOAA Fisheries; it is referred to herein as NMFS.

- Species formerly designated by the USFWS as Species of Concern or designated by CDFG as Species of Special Concern;
- Species protected by the Federal Migratory Bird Treaty Act (16 ~~U.S.C.~~USC § 703 711); and/or
- Species such as candidate species that may be considered rare or endangered pursuant to section 15380(b) of the State CEQA Guidelines.

Table 4.2-1 provides a comprehensive list of the special-status species that have been documented or have potential to occur in suitable habitat within the general Project area. Other databases and informational tools used to determine whether special-status species have the potential to occur in the vicinity of the Project include:

- The USFWS Official List of Federal Endangered and Threatened Species (USFWS 2008);
- The California Native Plant Society nine-quad search for rare and endangered plants;
- The CDFG Wildlife Habitat Relationships database search; and
- Specimen information from the Consortium of California Herbaria and the Jepson Online Interchange (http://ucjeps.berkeley.edu/interchange.html).

Based on review of the biological literature of the region, previous EIRs, surveys in the Project vicinity, and an evaluation of the habitat conditions of the proposed Project site, many of these species were eliminated from further evaluation because (1) the Project site or the immediate area does not provide suitable habitat, or (2) the known range for a particular species is outside of the Project site and/or the immediate area.

The special-status species list presented in Table 4.2-1 includes species for which potential habitat (i.e., general habitat types) occurs on or in the vicinity of the Project site. Species for which generally suitable habitat occurs but that were nonetheless determined to have low potential to occur in the Project area are also listed in Table 4.2-1. This table also provides the rationale for each potential-to-occur determination. Species observed or with a moderate to high potential-to-occur in the Project area are discussed in further detail below. The CNDDB (CDFG 2008) records for the Project vicinity are shown in Figure 4.2-3.

- ~~California least tern~~
- ~~California brown pelican~~
- ~~Chinook (Sacramento River winter-run, Central Valley spring-run, and Central Valley fall/late-fall run ESUs)~~

Table 4.2-1. Special-Status Species Considered in Evaluation of Project Site

Common Name *Scientific Name*	Listing Status USFWS/ CDFG/other[a]	General Habitat	Potential for Species Occurrence Within Project Site	Period of Identification
Species Listed or Proposed for Listing				
Animals				
Invertebrates				
California freshwater shrimp *Syncaris pacifica*	FE/CE	Endemic to Marin, Napa, and Sonoma. Found in low-elevation, low-gradient streams with moderate to heavy riparian cover.	**Low**. Suitable habitat is not present at the Project site.	Year-round
Myrtle's silverspot *Speyeria zerene myrtleae*	FE/--	Foggy, coastal dunes/hills of Point Reyes peninsula. Larval food plant thought to be *Viola adunca*.	**Low.** Suitable habitat is not present at the Project site.	June-September
Vernal pool fairy shrimp *Branchinecta lynchi*	FT/--	Endemic to grasslands of the Central Valley, Central and South Coast mountains. Found in astatic rain-filled pools.	**Low.** Suitable habitat is not present at the Project site.	Winter
Fish				
Chinook – Central Valley spring-run *Onchorhynchus tshawytscha*	FT/CT	Chinook salmon that spawn in the Sacramento-San Joaquin River system. Majority of adults enter fresh water in March-September. Adults stay in fresh water through the summer, spawning between mid-August and early October. Juveniles migrate to salt water, or stay in fresh water and migrate later.	**Moderate.** Suitable habitat and documented occurrences onsite.	Year-round
Chinook – Sacramento River winter-run *Onchorhynchus tshawytscha*	FE/CE	Chinook salmon that spawn in the Sacramento-San Joaquin River system. Majority of adults pass under Golden Gate Bridge Nov-May, enter Sacramento River Dec-Aug. Spawn mid-April-Aug. Young emigrate downstream July through March, entering Delta Sep-June.	**Moderate.** Suitable habitat and documented occurrences onsite.	Year-round
Delta smelt *Hypomesus transpacificus*	FT/CE	Occurs in the Sacramento-San Joaquin Delta. Found seasonally in Suisun Bay, Carquinez Strait, and San Pablo Bay.	**High.** Suitable habitat and documented occurrences onsite.	Variable

Table 4.2-1. Special-Status Species Considered in Evaluation of Project Site (cont.)

Common Name *Scientific Name*	Listing Status USFWS/ CDFG/other[a]	General Habitat	Potential for Species Occurrence Within Project Site	Period of Identification
Green sturgeon *Acipenser medirostris*	FT,SC/CSC	Found in nearshore waters from Mexico to the Bering Sea. Adults migrate into fresh water to spawn in February. Juveniles stay in estuaries or fresh water for 1-4 years before migrating out to sea.	**High.** Suitable habitat and documented occurrences onsite.	Year-round
Longfin smelt *Spirinchus thaleichthys*	FP/CT	Found in open water in estuaries, from salty to fresh water. They are typically found in the middle to deep parts of the water column.	**High.** Suitable habitat and documented occurrences onsite.	Late spring-fall
Steelhead – Central California Coast ESU *Oncorhynchus mykiss irideus*	FT/--	Found from Russian River south to Soquel Creek and (not including) Pajaro River. Also found in San Francisco and San Pablo Bay.	**High.** Suitable habitat and documented occurrences onsite.	Year-round
Steelhead – California Central Valley ESU *Oncorhynchus mykiss irideus*	FT/--	Found in the Sacramento and San Joaquin watersheds including San Francisco and San Pablo Bays	**High.** Suitable habitat and documented occurrences occur onsite.	Year-round
Reptiles				
Alameda whipsnake *Masicophis lateralis euryxanthus*	FT/CT	Valley-foothill hardwood habitat, open areas in canyons, rocky hillsides, chaparral scrublands, open woodlands, pond edges, stream courses.	**Low.** Suitable habitat is not present at the Project site.	Year-round
Birds				
Bald eagle *Haliaeetus leucocephalus*	Delisted/CE, CFP/BEPA	Colonies found on marine, estuarine, or lagoon shores or salt ponds, nests on sandy/gravelly substrate near water.	**Low-Medium.** Suitable nesting habitat is not present at the Project site, but may forage onsite.	Year-round
California black rail *Laterallus jamaicensis coturniculus*	--/CT,CFP	Salt marshes along large bays, also freshwater marshes.	**Low.** Suitable habitat is not present at the Project site.	Year-round
California brown pelican *Pelecanus occidentalis californicus*	FE/CE,CFP	Colonial nester on large interior lakes.	**High.** Known to rest on and forage around terminal.	June-November

Table 4.2-1. Special-Status Species Considered in Evaluation of Project Site (cont.)

Common Name *Scientific Name*	Listing Status USFWS/ CDFG/other[a]	General Habitat	Potential for Species Occurrence Within Project Site	Period of Identification
California clapper rail *Rallus longirostrus obsoletus*	FE/CE,CFP	Salt water and brackish marshes, tidal sloughs.	**Low.** Suitable habitat is not present at the Project site.	Year-round
California least tern *Sternula antillarum browni*	FE/CE,CFP	Found on sea coasts, beaches, bays, estuaries, lagoons, lakes, and rivers. Rests on beaches, mudflats, salt pond dikes.	**Medium.** Forages in open water, may roost on the terminal.	April-November
Peregrine falcon *Falco peregrinus anatum*	Delisted/CE, CFP	Forages in marshes and grasslands; nesting habitat includes high, protected cliffs and ledges near water.	**Low-Medium.** Suitable nesting habitat is not present at the Project site, but may forage onsite.	Year-round
Swainson's hawk *Buteo swainsoni*	--/CT	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and farms/ranches. Requires adjacent suitable foraging habitat with rodent populations.	**Low.** Suitable habitat is not present at the Project site.	Year-round
Western snowy plover *Charadrius alexandrius nivosus*	FT/CSC	Sandy coastal beaches, salt pans, sites with coastal dredged spoils, dry salt ponds, salt pond levees, and gravel bars. Nests in sandy substrate and forages in sandy marine and estuarine bodies.	**Low.** Suitable habitat is not present at the Project site.	Year-round
White-tailed kite *Elanus leucurus*	--/CFP	Rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland.	**Low.** Suitable habitat is not present at the Project site.	Year-round
Mammals				
Salt marsh harvest mouse *Reithrodontomys raviventris*	FE/CE,CFP	Saline emergent wetlands, especially pickleweed, of San Francisco Bay and tributaries.	**Low.** Suitable habitat is not present at the Project site.	Year-round
Plants				
California seablite *Suaeda californica*	FE/--/List 1B.1	Coastal salt marshes and swamps.	**Not present.** Suitable habitat is not present at the Project site.	July-October

Table 4.2-1. Special-Status Species Considered in Evaluation of Project Site (cont.)

Common Name *Scientific Name*	Listing Status USFWS/ CDFG/other[a]	General Habitat	Potential for Species Occurrence Within Project Site	Period of Identification
Contra Costa goldfields *Lasthenia conjugens*	FE/--/List 1B.1	Cismontane woodland, alkaline playas, valley and foothill grassland, mesic vernal pools.	**Not present.** Suitable habitat is not present at the Project site.	March-June
Marin western flax *Hesperolinon congestum*	FT/CT/List 1B.1	Serpentinite chaparral and valley and foothill grasslands.	**Not present.** Suitable habitat is not present at the Project site.	April-July.
Mason's lilaeopsis *Lilaeopsis masonii*	--/CR/List 1B.1	Brackish or freshwater marshes and swamps, riparian scrub.	**Not present.** Suitable habitat is not present at the Project site.	April-November
Pallid Manzanita *Arctostaphylos pallida*	FT/CE/List 1B.1	Broadleafed upland forest, closed-cone coniferous forest, chaparral, cismontane woodland, coastal scrub. Found in silicaceous shale, sandy, or gravelly soil.	**Low.** Suitable habitat is not present at the Project site.	December-March
Santa Cruz tarplant *Holocarpha macradenia*	FT/CE/List 1B.1	Coastal prairie, coastal scrub, valley and foothill grassland. Often found in clay or sandy soil.	**Low.** Suitable habitat is not present at the Project site.	June-October
Sebastopol meadowfoam *Limnanthes vinculans*	FE/--/List 1B.1	Meadows and seeps, valley and foothill grasslands, vernal pools.	**Low.** Suitable habitat is not present at the Project site.	April-May
Soft bird's beak *Cordylanthus mollis ssp. mollis*	FE/CR/List 1B.2	Coastal salt marshes and swamps.	**Not present.** Suitable habitat is not present at the Project site	July-November
Sonoma sunshine *Blennosperma bakeri*	FE/CE/List 1B.1	Found in mesic valley and foothill grasslands and vernal pools around Laguna de Santa Rosa and Sonoma.	**Low.** Suitable habitat is not present at the Project site.	March-May
Tiburon jewel-flower *Streptanthus niger*	FE/CE/List 1B.1	Serpentinite valley and foothill grasslands in the Tiburon peninsula.	**Not present.** Suitable habitat is not present at the Project site.	May-June
Tiburon mariposa-lily *Calochortus tiburonensis*	FT/CT/List 1B.1	Serpentinite valley and foothill grasslands.	**Not present.** Suitable habitat is not present at the Project site.	March-June

Table 4.2-1. Special-Status Species Considered in Evaluation of Project Site (cont.)

Common Name *Scientific Name*	Listing Status USFWS/ CDFG/other[a]	General Habitat	Potential for Species Occurrence Within Project Site	Period of Identification
Tiburon paintbrush *Castilleja affinis ssp. neglecta*	FE/CT/List 1B.2	Serpentinite valley and foothill grasslands.	**Not present.** Suitable habitat is not present at the Project site.	April-June
Two-fork clover *Trifolium amoenum*	FE/--/List 1B.1	Coastal bluff scrub, valley and foothill grasslands (sometimes serpentinite).	**Low.** Suitable habitat is not present at the Project site.	April-June
White-rayed pentachaeta *Pentachaeta bellidiflora*	FE/CE/List 1B.1	Cismontane woodland, valley and foothill grasslands (often serpentinite).	**Low.** Suitable habitat is not present at the Project site.	March-May
Other Special-Status Species				
Animals				
Invertebrates				
Blennosperma vernal pool andrenid bee *Andrena blennospermatis*	--/*	Specialist on vernal pool blennosperma, nests in uplands around vernal pools.	**Low.** Suitable habitat is not found at the site.	Unknown
Bridges' coast range shoulderband *Helminthoglypta nickliniana bridgesi*	--/*	Inhabits open hillsides of Alameda and Contra Costa Counties. Tends to colonize under tall grasses and weeds.	**Low.** Suitable habitat is not present at the Project site.	Unknown
California brackish water snail *Tryonia imitator*	--/*	Coastal lagoons, estuaries and salt marshes, from Sonoma County south to San Diego County.	**Low.** Suitable habitat is not present at the Project site.	Year-round
Lee's micro-blind harvestman *Microcina leei*	--/*	Xeric habitats in the San Francisco Bay regions. Found beneath sandstone rocks in open oak grassland.	**Low.** Suitable habitat is not present at the Project site.	Unknown
Monarch butterfly *Danaus plexippus*	--/* Wintering sites only	Winter roosts located in wind-protected tree groves (eucalyptus, Monterey pine, cypress) with nectar and water sources nearby.	**Low.** Suitable habitat is not present at the Project site.	Fall through Spring
Opler's longhorn moth *Adela oplerella*	FSC/--	Generally on serpentine grassland, larvae feed on *Platystemon californicus.*	**Low.** Suitable habitat and larval host plant likely absent.	Winter-spring

Table 4.2-1. Special-Status Species Considered in Evaluation of Project Site (cont.)

Common Name *Scientific Name*	Listing Status USFWS/ CDFG/other[a]	General Habitat	Potential for Species Occurrence Within Project Site	Period of Identification
San Francisco lacewing *Nothochrysa californica*	FSC/--	Grasslands and a variety of habitats.	**Low.** Suitable habitat is not present at the Project site.	Unknown
Tiburon micro-blind harvestman *Microcina tiburona*	--/*	Open hilly grassland and habitat in areas with serpentine bedrock. Found on the undersides of serpentine rocks near permanent springs.	**Low.** Suitable habitat is not present at the Project site.	Unknown
Fish				
Chinook – Central Valley fall/late-fall run *Onchorhynchus tshawytscha*	SC/CSC	Chinook that enter the Sacramento and San Joaquin Rivers from June through December, spawning from October through December, with a peak in November.	**Moderate.** Suitable habitat and documented occurrences onsite.	Year-round
Reptiles				
Northwestern pond turtle *Actinemys marmorata marmorata*	--/CSC	Permanent (or nearly) water in a wide range of habitats. Requires basking sites.	**Low.** Suitable habitat is not present at the Project site.	February-November
Western pond turtle *Actinemys marmorata*	FSC/CSC	Freshwater ponds and slow streams edged with sandy soils for laying eggs.	**Low.** Suitable habitat is not present at the Project site.	Year–round
Birds				
Alameda song sparrow *Melospiza melodia pusillula*	--/CSC	Salt marshes of southern San Francisco Bay.	**Low.** Suitable habitat is not present at the Project site.	Year-round
Black-crowned night heron *Nycticorax nycticorax*	--/* (rookery)	Colonial nester, usually in trees, occasionally in tule patches. Located adjacent to foraging habitat (lake margins, mud-bordered bays, marshy spots).	**Low.** Suitable nesting habitat is not present at the Project site.	Year-round
Burrowing owl *Athene cunicularia*	FSC/CSC	Open, dry annual/perennial grasslands, deserts, scrublands with low-growing vegetation.	**Low.** Suitable habitat is not present at the Project site.	Year-round

Table 4.2-1. Special-Status Species Considered in Evaluation of Project Site (cont.)

Common Name *Scientific Name*	Listing Status USFWS/ CDFG/other[a]	General Habitat	Potential for Species Occurrence Within Project Site	Period of Identification
Cackling (Aleutian Canada) goose *Branta hutchinsii leucopareia*	Delisted/* (wintering sites)	Winters on lakes and inland prairies. Forages on pasture or grain.	**Low.** Suitable habitat is not present at the Project site.	Year-round
Caspian tern *Sterna caspia*	--/* (nesting)	Nests on sandy or gravely beaches and shell banks in small colonies along coast. Also found in inland freshwater lakes and marshes, brackish or salt waters of estuaries and bays.	**Medium.** May forage in the water around wharf.	April-September
Cooper's hawk *Accipiter cooperii*	--/3503.5	Nests in conifers or deciduous stands near riparian areas; also nests in urban areas near riparian corridors.	**Low-Medium.** Suitable nesting habitat is not present at the Project site, but forage habitat may be found at the site.	March–August (some year-round)
Double-crested cormorant *Phalacrocorax auritus*	--/* (rookery)	Colonial nester on coastal cliffs, offshore islands, along lake margins of the interior. Nests along coast in islets, on ground with sloping surface or in tall trees.	**High.** Known to forage around terminal.	Year-round
Ferruginous hawk *Buteo regalis*	--/3503.5	Open grasslands, sagebrush flats, desert scrub, low foothills, fringes of pinyon-juniper habitats.	**Low.** Suitable habitat is not present at the Project site.	September-April
Golden eagle *Aquila chrysaetos*	--/3503.5, CFP/BEPA	Rolling foothills, mountain areas, sage-juniper flats, and desert.	**Low.** May hunt on site, but prefers undeveloped areas.	Year-round
Great blue heron *Ardea herodias*	--/* (rookery sites)	Colonial nester in tall trees, cliff-sides, and sequestered spots near foraging habitat: marshes, lake margins, tideflats, rivers, streams, wet meadows.	**Low.** Suitable habitat is not present at the Project site.	Year-round
Great egret *Ardea alba*	--/* (rookery sites)	Colonial nester in large trees near marshes, tidal flats, irrigated pastures, and river and lake margins.	**Low.** Suitable habitat is not present at the Project site.	Year-round
Northern harrier *Circus cyaneus*	--/CSC, 3503.5	Coastal salt and freshwater marsh, nests and forages in grasslands.	**Low.** Suitable habitat is not present at the Project site.	Year-round

Table 4.2-1. Special-Status Species Considered in Evaluation of Project Site (cont.)

Common Name *Scientific Name*	Listing Status USFWS/ CDFG/other[a]	General Habitat	Potential for Species Occurrence Within Project Site	Period of Identification
Osprey *Pandion haliaetus*	--/3503.5	Ocean shore, bays, freshwater lakes, and larger streams. Nests in tree-tops within 15 miles of fish.	**High.** Suitable nesting and foraging habitat found on site.	May-September
Salt-marsh common yellowthroat *Geothlypis trichas sinuosa*	FSC/CSC	Riparian woodland/swamp, salt, brackish, freshwater marsh, and occasionally upland habitat.	**Low.** Forage habitat may be available on site, however, wetlands are extremely limited and mostly seasonal.	Year-round
San Pablo song sparrow *Melospiza melodia samuelis*	FSC/--	Tidal sloughs in *Salicornia* marshes along north side of San Francisco and San Pablo Bays. Nests in *Grindelia*.	**Low.** Suitable habitat is not present at the Project site.	Year-round
Short-eared owl *Asio flammeus*	--/CSC, 3503.5	Fresh and saltwater swamps, lowland meadows, irrigated alfalfa fields. Requires tule/tall grass for nesting, daytime seclusion. Nests on dry ground in depression concealed in vegetation.	**Low.** Suitable habitat is not present at the Project site.	September-April
Snowy egret *Egretta thula*	FSC/* (rookeries)	Colonial nester in protected beds of dense tules. Rookery sites close to foraging areas: marshes, tidal flats, streams, wet meadows, and borders of lakes.	**Low.** Suitable habitat is not present at the Project site.	March-November
Tricolored blackbird *Agelaius tricolor*	FSC/CSC	Requires open water, protected nesting substrate, and foraging area with insect prey.	**Low.** Suitable habitat is not present at the Project site.	Year-round
Yellow-headed blackbird *Xanthocephalus xanthocephalus*	--/CSC	Freshwater emergent wetlands with dense vegetation and deep water, often in border of lakes and ponds.	**Low.** Suitable habitat is not present at the Project site.	Spring-Fall
Mammals				
American badger *Taxidea taxus*	--/CSC	Found in drier open stages of shrub, forest, and herbaceous habitats with friable soils.	**Low.** Suitable habitat is not present at the Project site.	Year-round

Table 4.2-1. Special-Status Species Considered in Evaluation of Project Site (cont.)

Common Name *Scientific Name*	Listing Status USFWS/ CDFG/other[a]	General Habitat	Potential for Species Occurrence Within Project Site	Period of Identification
Berkeley kangaroo rat *Dipodomys heermanni berkeleyensis*	FSC/--	Open grassy hilltops and open spaces in chaparral and blue oak/foothill pine woodlands.	**Low.** Suitable habitat is not present at the Project site.	Year-round
Big free-tailed bat *Nyctinomops macrotis*	--/CSC	Low-lying arid areas, needs high cliffs or rocky outcrops for roosting sites.	**Low.** Suitable habitat is not present at the Project site.	Year-round nocturnal
California sea lion *Zalophus californicus californianus*	--/--/MMPA	Shallow coastal and estuarine waters in the eastern north Pacific Ocean. In California, hauls out on marina docks, jetties, and buoys.	**Medium.** May forage in the vicinity of the terminal. May rest on dock or buoys.	Year-round
Hoary bat *Lasiurus cinereus*	--/WBWGM	A relatively common, solitary species that occurs throughout California, wintering along the coast and in southern California, and breeding in areas inland and north of the winter range. Prefers open habitats or habitat mosaics, with trees for cover and open areas or habitat edges for feeding. Prefers to roost in dense foliage of medium to large trees.	**Low.** Suitable habitat is not present at the Project site.	Fall-Spring
Pacific harbor seal *Phoca vitulina*	--/--/MMPA	Temperate coastal habitats; use rocks, reefs, beaches, and ice for haul-out and pupping.	**Medium.** May forage in the vicinity of the terminal. May rest on dock or buoys.	Year-round
Pallid bat *Antrozous pallidus*	FSC/CSC	Grasslands, scrub, woodlands, mixed conifer forests, common in open, dry habitats with rocky areas for roosting. Day roosts include hollow trees, buildings, caves, crevices, and mines.	**Low.** Site provides suitable foraging habitat and solitary males may roost in onsite trees, but is generally unsuitable for roosting colonies.	Year-round nocturnal
Salt-marsh wandering shrew *Sorex vagrans halicoetes*	FSC/CSC	Salt marshes of the south arm of San Francisco Bay.	**Low.** Suitable habitat is not present at the Project site.	Year-round

Table 4.2-1. Special-Status Species Considered in Evaluation of Project Site (cont.)

Common Name *Scientific Name*	Listing Status USFWS/ CDFG/other[a]	General Habitat	Potential for Species Occurrence Within Project Site	Period of Identification
San Pablo vole *Microtus californicus sanpabloensis*	--/CSC	Salt marshes of San Pablo Creek, south shore of San Pablo Bay. Burrows in soft soil, feeds on grasses, sedges and herbs.	**Low.** Suitable habitat is not present at the Project site.	Year-round
Silver-haired bat *Lasionycteris noctivagans*	--/-- /WBWGM	Coastal and montane forests, roosts in hollow trees under bark, abandoned woodpecker holes, rarely under rocks. Needs water source.	**Low.** Suitable habitat is not present at the Project site.	Year-round
Suisun shrew *Sorex ornatus sinuosus*	--/CSC	Tidal marshes on north shores of San Pablo and Suisun Bays. Needs dense, low cover and driftweed for nesting and foraging.	**Low.** Suitable habitat is not present at the Project site.	Year-round
Plants				
Alkali milk-vetch *Astragalus tener* var. *tener*	--/--/List 1B.2	Alkali playa, valley and foothill grassland, vernal pools.	**Low.** Marginally suitable habitat found on site. Seasonal wetlands such as vernal pools and alkali playas are not found on site.	March-June
Bent-flowered fiddleneck *Amsinckia lunaris*	--/--/List 1B.2	Coastal bluff scrub, cismontane woodland, valley and foothill grassland.	**Low.** Suitable habitat is not present at the Project site.	March-June
Big tarplant *Blepharizonia plumosa*	--/--/List 1B.1	Valley and foothill grasslands.	**Low.** Suitable habitat is not present at the Project site.	July-October
Big-scale balsamroot *Balsamorhiza macrolepis* var. *macrolepis*	--/--/List 1B.2	Valley and foothill grassland (sometimes serpentine), cismontane woodland, chaparral.	**Low.** Suitable habitat is not present at the Project site.	March-June
Chaparral ragwort *Senecia aphanactis*	--/--/List 1B.1	Valley and foothill grassland.	**Low.** Suitable habitat is not present at the Project site.	July-October
Coastal bluff morning-glory *Calystegia pupurata* ssp. *saxicola*	--/--/List 1B.2	Coastal dunes, coastal scrub, north coast coniferous forest.	**Low.** Suitable habitat is not present at the Project site.	May-September

Table 4.2-1. Special-Status Species Considered in Evaluation of Project Site (cont.)

Common Name *Scientific Name*	Listing Status USFWS/ CDFG/other[a]	General Habitat	Potential for Species Occurrence Within Project Site	Period of Identification
Congdon's tarplant *Centromadia parryi* ssp. *congdonii*	--/--/List 1B.2	Valley and foothill grassland (alkaline).	**Low.** Suitable habitat is not present at the Project site.	May- October
Delta tule pea *Lathrus jepsonii* var. *jepsonii*	--/'—List 1B.2	Freshwater and brackish marshes and swamps.	**Low.** Suitable habitat is not present at the Project site.	May-July
Diablo helianthella *Helianthella castanea*	--/--/List 1B.2	Broadleaved upland forest, chaparral, cismontane woodland, coastal scrub, riparian woodland, valley and foothill grassland.	**Low.** Suitable habitat is not present at the Project site.	March-June
Dwarf downingia *Downingia pusilla*	--/--/2.2	Mesic valley and foothill grasslands, vernal pools.	**Low.** Suitable habitat is not present at the Project site.	March-May
Franciscan thistle *Cirsium andrewsii*	--/--/1B.2	Broadleaf upland forest, coastal bluff scrub, coastal prairie, and coastal scrub. Mesic sites, sometimes serpentinite.	**Low.** Suitable habitat is not present at the Project site.	March-July
Fragrant fritillary *Fritillaria liliacea*	FSC/--/List 1B.2	Coastal prairie and scrub, valley and foothill grasslands, often on serpentine soils.	**Low.** Suitable habitat is not present at the Project site.	February–April
Hairless popcorn-flower *Plagiobothrys glaber*	--/--/List 1A	Alkaline meadows and seeps, coastal salt marshes and swamps.	**Low.** Presumed extinct.	March-May
Legenere *Legenere limosa*	--/--/List 1B.1	Vernal pools	**Low.** Suitable habitat is not present at the Project site.	April-June
Loma Prieta hoita *Hoita strobilina*	--/--/List 1B.1	Chaparral, cismontane woodland, riparian woodland (usually serpentine, mesic).	**Low.** Suitable habitat is not present at the Project site.	May-July
Marin knotweed *Polygonum marinense*	--/--/List 3.1	Coastal salt or brackish marshes and swamps.	**Low.** Suitable habitat is not present at the Project site.	May-August
Mount Diablo fairy-lantern *Calochortus pulchellus*	--/--/List 1B.2	Chaparral, cismontane woodland, riparian woodland, valley and foothill grassland.	**Low.** Suitable habitat is not present at the Project site.	April-June

Table 4.2-1. Special-Status Species Considered in Evaluation of Project Site (cont.)

Common Name *Scientific Name*	Listing Status USFWS/ CDFG/other[a]	General Habitat	Potential for Species Occurrence Within Project Site	Period of Identification
Mount Tamalpais manzanita *Artostaphylos hookeri* ssp. *palustris*	--/--/1B.2	Openings and edges of broadleaf upland forest, chaparral, and north coast coniferous forest.	**Low.** Suitable habitat is not present at the Project site.	November-April
Oregon meconella *Meconella oregana*	--/--/List 1B.1	Coastal prairie, coastal scrub.	**Low.** Suitable habitat is not present at the Project site.	March-April
Pappose tarplant *Centromadia parryi* ssp. *parryi*	--/--/List 1B.2	Chaparral, coastal prairie, meadows and seeps, coastal salt marshes and swamps, vernally mesic valley, and foothill grasslands. Often on alkaline soil.	**Low.** Suitable habitat is not present at the Project site.	May-November
Point Reyes bird's-beak *Cordylanthus maritimus* ssp. *palustris*	--/--/1B.2	Coastal salt marshes and swamps.	**Low.** Suitable habitat is not present at the Project site.	June-October
Robust monardella *Monardella villosa* ssp. *globosa*	--/--/List 1B.2	Openings in broadleaved upland forest, chaparral, cismontane woodland, valley and foothill grassland, 200-600 meters in elevation.	**Low.** Suitable habitat is not present at the Project site.	June-July
Saline clover *Trifolium depauperatum* var. *hydrophilum*	--/--/List 1B.2	Marshes and swamps, mesic, alkaline valley and foothill grasslands, vernal pools.	**Low.** Suitable habitat is not present at the Project site.	April-June
San Joaquin spearscale *Atriplex joaquiniana*	--/--/List 1B.2	Chenopod scrub, meadows and seeps, playas, alkaline valley, and foothill grasslands.	**Low.** Marginally suitable habitat found on site. Not detected during appropriately timed survey (ESA 2008).	April-October
Western leatherwood *Dirca occidentalis*	--/--/List 1B.2	Occurs in mesic situations in a variety of habitats, including riparian woodland and forest, north coast and closed-cone coniferous forests, chaparral, broadleaf upland forest, and cismontane woodland.	**Low.** Suitable habitat is not present at the Project site.	January–March
Suisun Marsh aster *Symphyotrichum lentum*	--/--/List 1B.2	Brackish and freshwater marshes and swamps.	**Low.** Suitable habitat is not present at the Project site.	May-November

Table 4.2-1. Special-Status Species Considered in Evaluation of Project Site (cont.)

Common Name *Scientific Name*	Listing Status USFWS/ CDFG/other[a]	General Habitat	Potential for Species Occurrence Within Project Site	Period of Identification
Tiburon buckwheat *Eriogonum luteolum* var. *caninum*	--/--/List 1B.2	Chaparral, cismontane woodland, coastal prairie, valley and foothill grassland. On serpentinite, sandy to gravelly soil.	**Low.** Suitable habitat is not present at the Project site.	May-September

Status Codes:

Federal (U.S. Fish and Wildlife Service [USFWS]):
FE = Listed as Endangered (in danger of extinction) by the Federal government.
FT = Listed as Threatened (likely to become Endangered within the foreseeable future) by the Federal government.
FP = Proposed for Listing as Endangered or Threatened.
FC = Candidate to become a proposed species.
FSC = Former Federal Species of Concern. The USFWS no longer lists Species of Concern but recommends that species considered to be at potential risk by a number of organizations and agencies be addressed during Project environmental review.
SC= NMFS Species of Concern.

State (California Department of Fish and Game [CDFG]):
CE = Listed as Endangered by the State of California.
CT = Listed as Threatened by the State of California.
CR = Listed as Rare by the State of California (plants only).
CSC = California Species of Special Concern.
CFP = California Fully Protected.
3503.5 = Protection for nesting species of *Falconiformes* (hawks) and *Strigiformes* (owls).
*Special animal—listed on CDFG's Special Animals List.

Other
BEPA = Bald Eagle Protection Act of 1940.

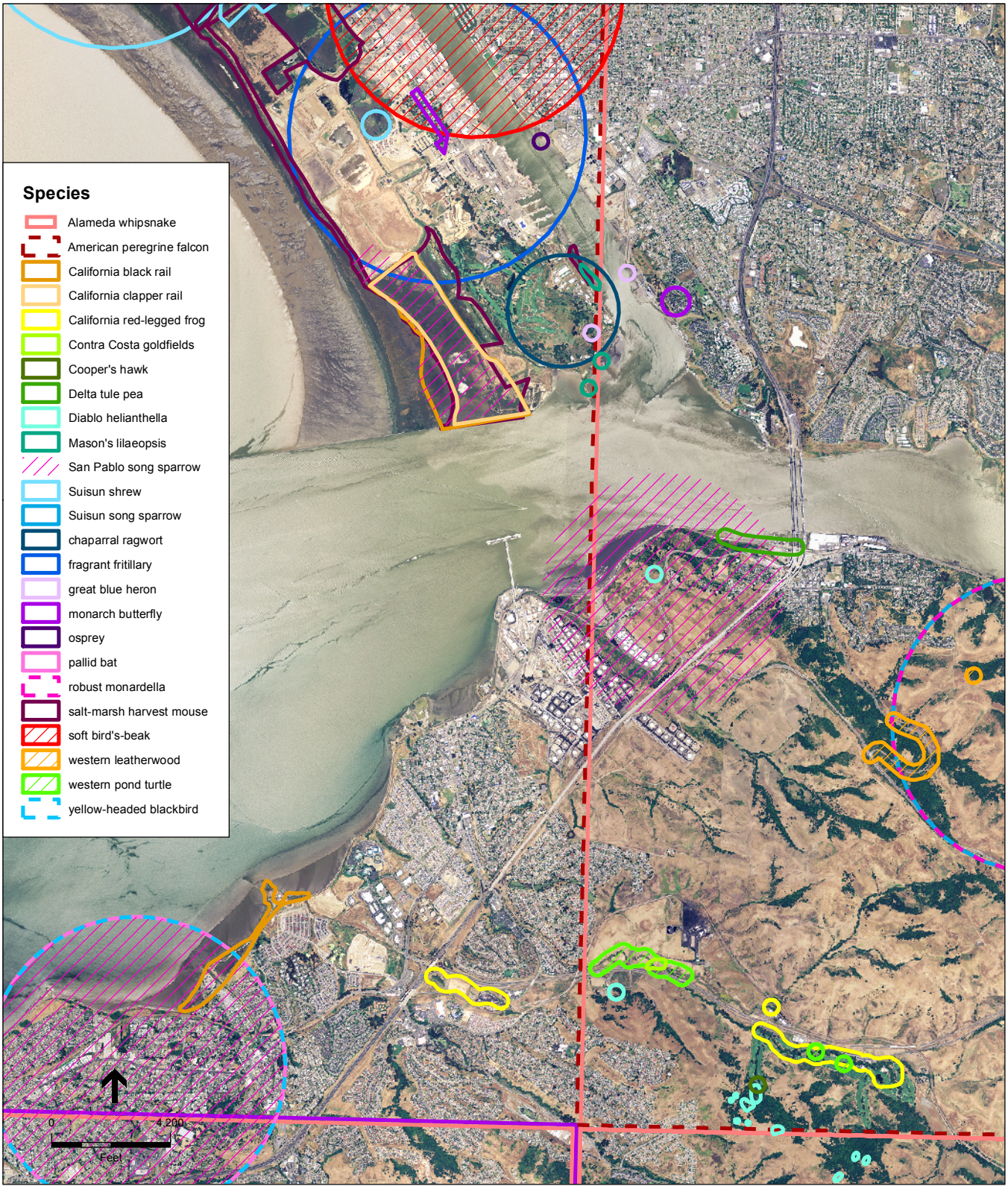
California Native Plant Society (CNPS):
List 1A=Plants presumed extinct in California.
List 1B=Plants rare, Threatened, or Endangered in California and elsewhere.
List 2= Plants rare, Threatened, or Endangered in California but more common elsewhere.

An extension reflecting the level of threat to each species is appended to each rarity category as follows:
.1 – Seriously endangered in California.
.2 – Fairly endangered in California.
.3 – Not very endangered in California.

National Marine Fisheries Service (NMFS):
MMPA = Marine Mammal Protection Act.

Western Bay Working Group (WBWG):
WBWGH = High priority; Species that are imperiled or at a high risk of imperilment.
WBWGM = Medium priority; Species that warrant a closer evaluation due to potential imperilment.
WBWGL = Low priority; Species are stable based on supporting data.

Sources: CDFG 2008; CNPS 2008; USFWS 2008.



SOURCE: CNDDB 2008

Shore Marine Oil Terminal Lease Project EIR

Figure 4.2-3

Special-status Plants and Animals

- ~~Double-crested cormorant~~
- ~~Osprey~~
- ~~California sea lion~~
- ~~Pacific harbor seal~~
- ~~Delta smelt~~
- ~~Steelhead (California Central Valley and Central California Coast ESUs)~~
- ~~Longfin smelt~~
- ~~Green sturgeon~~

Of the special-status plants and animals presented in Table 4.2-1 above, only the following animal species, which were determined to have a moderate to high potential to occur within the vicinity of Project site, were fully considered in the impact analysis:

California least tern (Sternula antillarum)

The California least tern is a State and federally listed endangered species and a Fully Protected species in California. They nest in the ground in abandoned salt ponds and along estuarine shores. They have been known to nest on dredge-spoil islands as well as next to airport runways and industrial ports. The migratory least tern is known to breed in San Francisco Bay between April and August, but not in the vicinity of the MOT. They are, however, known to forage in the area and may roost on the structure.

*California brown pelican (*Pelecanus occidentalis californicus*)*

The California brown pelican is a subspecies that is found on the Pacific Coast from California to Mexico. They are listed by the State and Federal governments as endangered, and are also Fully Protected in California. They are found in coastal salt water, beaches, bays, marshes, and the open ocean. Breeding takes place between March and August along the southern California coast, from the Channel Islands to Baja California (Zeiner et al. 1990). They migrate north from June to November. Brown pelicans feed on fish in both shallow and deep waters, using structures such as breakwaters, pilings, and salt pond dikes as roosts. They are common in Central and San Pablo Bay, and are known to rest and forage around the MOT. However, their primary foraging areas are in the central and western parts of San Francisco Bay.

*Double-crested cormorant (*Phalacrocorax auritus*)*

Double-crested cormorants are protected under section 3503 of ~~CD~~Fish and Game Code. They are year-long residents of California and are common in San Pablo Bay. They rest and roost on offshore rocks, islands, steep cliffs, dead branches of trees, wharfs, jetties, transmission lines, bridges, and marine terminals. Double-crested cormorants are colonial breeders and have established large colonies on both the Bay and Richmond-San Rafael Bridges. They feed in open water and may use the MOT as

a perch. Double-crested cormorants were observed at the Project site during a February 2, 2006, survey conducted by May and Associates Inc. (Shore 2008).

*Osprey (*Pandion haliaetus*)*

Osprey are protected under section 3503.5 of the ~~CD~~Fish and Game Code. They feed on fish and nest within 1 mile of the water (Airola and Shubert 1981). They spend the summer throughout California and tend to spend winter in Central and South America, but some stay in San Francisco Bay year-round. They have been observed nesting in the nearby ConocoPhillips Marine Terminal using the light tower as a regular perch. Osprey establish nests from mid-March to early April, migrating south in October.

*Pacific harbor seal (*Phoca vitulina*)*

The Pacific harbor seal is protected by the Marine Mammal Protection Act (MMPA). It is a common resident marine mammal along the West Coast. They prefer to stay close to shore in subtidal and intertidal habitats such as bays, estuaries, and occasionally venture into rivers. Groupings of various sizes can haul out on rocks, mudflats, and sandy/cobble coves (Zeiner et al. 1990). In general, the same haul out sites are used over many years (Kopec and Harvey 1995). Pacific harbor seals in the Bay feed on yellowfin goby, northern anchovy, Pacific herring, staghorn sculpin, plainfin midshipman, and white croaker (Harvey and Torok 1994). They may forage in the vicinity of the MOT.

*California sea lion (*Zalophus californianus*)*

Like the harbor seal, the California sea lion is protected by the MMPA. A common, abundant marine mammal, they are found along the West Coast. They breed in Southern California and the Channel Islands after which they migrate up the Pacific Coast to the Bay. They haul out on offshore rocks, and may forage in the vicinity of the MOT.

Delta smelt (Hypomeseus transpacificus~~Acipenser medirostris~~*)*

Delta smelt, a federally threatened (recently nominated as endangered) and State endangered species, is a small slender-bodied fish native to the Sacramento-San Joaquin Estuary that is able to tolerate a wide salinity range. The fish live in schools and primarily feed on planktonic crustaceans, small insect larvae, and mysid shrimp (Moyle 2002). This species, which has a one-year life span, lives primarily along the freshwater edge of the saltwater-freshwater interface of the Sacramento-San Joaquin Delta. Prior to spawning, Delta smelt migrate upstream from the brackish-

water habitat to river channels and tidally influenced backwater sloughs to spawn. Migration and spawning occur between December and June (Moyle 2002). The species has been collected in large quantities in Suisun and San Pablo Bays. The Delta smelt has no commercial or recreational value, but is considered a key indicator species of the environmental health of the Delta. In 2006 and 2007, the Delta smelt population in the Delta dropped to record low levels prompting additional measures by Federal and State agencies to protect it. CDFG Interagency Ecological Program Data (2000 through 2007) indicate that Delta smelt are present in the Project area but in very low numbers.

*Longfin smelt (*Spirinchus thaleichthys*)*

Longfin smelt, a California threatened species (and proposed for listing under the Federal ESA), is a small schooling fish that inhabits the freshwater section of the lower Delta. It has been observed from south San Francisco Bay to the Delta, with the bulk of the San Francisco Bay population occupying the region between the Carquinez Strait and the Delta (McAllister 1963; Miller and Lea 1972). They have been collected in large numbers in Montezuma Slough, Suisun Bay, and near the Pittsburg and Contra Costa power plants. In the fall, adults from San Francisco and San Pablo Bays migrate to fresher water in the Delta to spawn. The spawning habits of longfin smelt are similar to the Delta smelt and both species are known to school together. Larval stages are known to inhabit Suisun Bay and move south within the Bay-Delta as they grow larger in April and May (Ganssle 1966). The larvae are pelagic and found in the upper layers of the water column. CDFG Interagency Ecological Program Data (2000 through 2007) indicate that longfin smelt is one of the dominant species comprising the pelagic and demersal fish populations in the region of San Pablo Bay adjacent to the Project area.

*Green sturgeon (*Acipenser medirostris*)*

This anadromous fish is the most widely distributed member of the sturgeon family and the most marine-oriented. It is a Federal endangered species, a ~~National Marine Fisheries Service~~NMFS Species of Concern, and a California Species of Special Concern. Green sturgeon are found in nearshore waters, ranging from Mexico to the Bering Sea, and are common occupants of bays and estuaries along the western coast of the United States (Moyle et al. 1995). Adults in the San Joaquin Delta are reported to feed on benthic invertebrates including shrimp, amphipods, and occasionally small fish (Moyle et al. 1995), while juveniles have been reported to feed on opossum shrimp and amphipods. Adult green sturgeon migrate into fresh water beginning in late February with spawning occurring in March through July, with peak activity in April and June. After spawning, juveniles remain in fresh and estuarine waters for 1 to 4 years and then

begin to migrate out to sea (Moyle et al. 1995). The upper Sacramento River has been identified as the only known spawning habitat for green sturgeon in the southern distinct population segment (DPS). Although green sturgeon are caught and observed in the lower San Joaquin River, no spawning is known to occur within the river. CDFG Interagency Ecological Program data (2000 through 2007) indicate that green sturgeon are not frequent or significant inhabitants of the area of San Pablo Bay where the Project is located; however, they do occur within the shallows and use the navigation channel to migrate between the ocean and the Sacramento River.

*Sacramento River winter-run, Central Valley spring-run, and Central Valley fall/late fall-run Chinook salmon (*Oncorhynchus tshawytscha*)*

The population of Chinook salmon, also known as king salmon, in San Francisco Bay-Delta comprises three distinct races: winter-run, spring-run, and fall/late fall-run. These races are distinguished by the seasonal differences in adult upstream migration, spawning, and juvenile downstream migration. Chinook salmon are anadromous fish, spending ~~three~~ two to five years at sea before returning to freshwater to spawn. These fish pass through San Pablo Bay waters to reach their upstream spawning grounds. In addition, juvenile salmon migrate through the Bay to the Pacific Ocean.

Sacramento River winter-run Chinook salmon, listed as both State and federally endangered, migrate through San Francisco Bay from December through July with a peak in March (Moyle 2002). Spawning is confined to the mainstream Sacramento River and occurs from mid-April through August (Moyle 2002). Juveniles emerge between July and October, and are resident in their natal stream for 5 to 10 months followed by an indeterminate residency period in estuarine habitats (Moyle 2002).

The State and federally threatened Central Valley spring-run Chinook salmon migrate to the Sacramento River from March to September, with a peak spawning period between late August and October (Moyle 2002). Juvenile salmon emerge between November and March, and are resident in streams for a period of 3 to 15 months before migrating to downstream habitats (Moyle 2002).

The Central Valley fall/late fall-run Chinook salmon is a Species of Concern (NMFS), and a California Species of Special Concern. These salmon enter the Sacramento and San Joaquin Rivers from June through December, spawning from October through December, with a peak in November.

Adult and juvenile (smolts) winter-run, spring-run, and fall-run Chinook salmon are known to occur in San Pablo Bay and in the waters adjacent to the Project area during migrations to and from upstream spawning habitat. Although principally found in the main channels, they can use adjacent shallows for foraging. CDFG data (CDFG 2000 through 2007) suggest that Chinook salmon, although present, do not comprise a significant portion of the fish community near the Project area, representing less than 1 percent of the population since 2000.

*Central Valley and Central California coast steelhead trout (*Onchorynchus mykiss*)*

Steelhead from the Central California Coast and California Central Valley ESUs are listed as threatened under the Federal ESA. Steelhead possess the ability to spawn repeatedly, returning to the Pacific Ocean after spawning in fresh water. Juvenile steelhead may spend up to 4 years residing in fresh water prior to migrating to the ocean as smelts. Steelhead smolts enter San Pablo Bay during outmigration between November and May. Most Sacramento River steelhead migrate out towards the ocean in spring and early summer, transiting through the Project area. CDFG Interagency Ecological Program Data (2000 through 2007) suggest that steelhead trout can be expected to be present in the Project area in very small numbers.

~~Invasive~~Non-indigenous and Non-Native Species

Terrestrial

The terrestrial habitat is dominated by non-native species, many of which are considered invasive. The following ~~invasive~~non-indigenous and non-native species were identified at the Project site. Pampas grass (*Cortaderia selloana*) is native to South America and has become highly invasive throughout coastal California. It colonizes roadsides, cutbanks, dunes, coastal bluffs, rock outcrops, landslides, and logging areas (NPS 2001). Ice plant (*Carpobrotus edulis*), a succulent from South Africa, was introduced to California in the early 20th century to stabilize soil along railroad tracks. It establishes along highways and on sand dunes where it eliminates native species. Himalayan blackberry (*Rubus discolor*) forms dense thickets along riparian areas and disturbed sites such as stream channels and ditch banks. It shades out native vegetation and obstructs wildlife movement. Black mustard (*Brassica nigra*) was introduced from Europe and is now found just about everywhere in the United States. It produces chemicals that reduce germination of native plants. Yellow-star thistle (*Centaurea solstitialis*) is native to Eurasia, but was introduced around 1850 by way of South America (UCIPM 2007). It is common on roadsides, rangeland, wildlands,

hay fields, pastures, and waste areas. Fennel can invade grassland and scrub communities and exclude native vegetation. *Eucalyptus globulus* (Tasmanian blue gum) is also non-native. They can inhibit growth of native plants with the thick layer of leaf and bark litter that forms underneath (Cal-IPC 2006).

Aquatic

~~New~~ Non-native species of estuarine and marine animals are often inadvertently or intentionally introduced into California waters ~~regularly~~. ~~Often referred to as introduced, non-indigenous, alien, non-native, or exotic species, most pose little or no threat to native ecosystems or biological communities. However, a few~~ Some have the potential to severely disrupt local ecosystems, fisheries, and human infrastructure (Ray 2005). ~~California has the largest number of known introduced estuarine and marine animals. I~~t has been reported that over 200 taxa have been introduced to the San Francisco Bay-Delta, which has been described as the most invaded estuary in North America (Ray 2005). Appendix D.2 Table 9 lists known ~~invasive~~non-indigenous marine and estuarine species that inhabit San Francisco Bay-Delta waters.

~~Introduced~~ Non-native species now dominate all benthic communities within the Bay-Delta. Known ~~invasive~~non-native species appear to be dominated by polychaete worms, mollusks, and crustaceans, but this may be more reflective of the ease of identification and detection than their actual representativeness. Of the known ~~invasive~~non-native species in California waters, 54 species of mollusks, 47 species of polychaetes, and 36 species of amphipods have been reported (Ray 2005).

Invaded habitats tend to have low natural diversity, relatively simple food webs, and a history of recent natural or anthropogenic disturbance (Ray 2005). Estuaries and sheltered coastal areas appear to be among the most invaded aquatic habitats as a result of being naturally disturbed, low-diversity systems with historic centers of anthropogenic disturbance from shipping, industrial development, and urbanization (Ray 2005).

~~Invasive~~Non-native organisms are introduced by a variety of methods, the most prevalent being shipping, of which the ~~largest single~~two major sources (or sub-vectors) of introduction are ~~is in~~ ballast water and biofouling~~. Other methods of introduction include fouling organisms that have attached themselves to~~ of ship hulls, navigation buoys, anchors and anchor chains~~,~~. Other methods of introduction include ~~recovered~~ flotsam, ~~from "live" rock~~rocks and plants from the aquarium trade, the accidental release of animals from packing materials, aquaculture, ~~by restaurants serving live seafood,~~ and

the live bait industry (Ray 2005). Finally, many ~~invasive~~non-native species have been deliberately introduced into California waters for recreational or commercial purposes, such as striped bass, channel and white catfish, and giant Pacific oysters (*Crassostrea gigas*).

A few of the most damaging in the San Francisco Bay-Delta include the Chinese mitten crab (*Eriocheir sinesis*), the European green crab (*Carcinus maenas*), the Asian clam (*Corbula amurensis*), and the isopod (*Sphaeroma quoyanun*). The Chinese mitten crab is found throughout the Bay-Delta and is displacing native intertidal crabs. The Asian clam *Corbula* has completely changed the subtidal benthic infaunal community in the western Delta and because of its voracious feeding on bacterioplankton, phytoplankton, and copepod larvae, it has significantly reduced the phytoplankton community in the North Bay and western Delta, resulting in reduced zooplankton and fish abundances and distributions (Ray 2005, Kimmerer 2006, Thompson and Parchaso 2003). It is one of the contributing factors to population declines in the Delta and longfin smelt populations in the Bay-Delta (AFS 2007).

4.2.2 Regulatory Setting

This subsection briefly describes Federal, State, and local laws, regulations, permits, and policies pertaining to biological resources and wetlands as they apply to the proposed Project.

Federal

Regulation of Waters of the United States, Including Wetlands

The U.S. Army Corps of Engineers (ACOE) and the U.S. Environmental Protection Agency (USEPA) regulate the discharge of dredged or fill material into waters of the United States, including wetlands, under sections 404 and 401 of the Clean Water Act. Projects that would result in the placement of dredged or fill material into waters of the United States require a section 404 permit from the ACOE. Some classes of fill activities may be authorized under General or Nationwide Permits if specific conditions are met. Nationwide Permits do not authorize activities that are likely to jeopardize the existence of a threatened or endangered species listed or proposed for listing under the Federal ESA. In addition to conditions outlined under each Nationwide Permit, project-specific conditions can be required by the ACOE as part of the section 404 permitting process. When a project's activities do not meet the conditions for a Nationwide Permit, an Individual Permit may be issued.

Section 401 of the Clean Water Act requires that applicants obtain an ACOE permit to obtain State certification that the activity associated with the permit will comply with applicable State effluent limitations and water quality standards. In California, water quality certification, or a waiver, must be obtained from the Regional Water Quality Control Board, for both Individual and Nationwide Permits.

The ACOE also regulates activities in navigable waters under section 10 of the Rivers and Harbors Act. The construction of structures, such as tidegates, bridges, or piers, or work that could interfere with navigation, including dredging or stream channelization, may require a section 10 permit, in addition to a section 404 permit if the activity involves the discharge of fill.

Finally, the Federal government also supports a policy of minimizing "the destruction, loss, or degradation of wetlands." Executive Order 11990 (May 24 1977) requires that each Federal agency take action to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands.

The term "waters of the United States," as defined in the Code of Federal Regulations (33 CFR ~~section~~ § 328.3[a]; 40 CFR ~~section~~ § 230.3[s]), refers to:

(a) All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;

(b) All interstate waters including interstate wetlands;

(c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation, or destruction of which could affect interstate or foreign commerce including any such waters:

- Which are or could be used by interstate or foreign travelers for recreational or other purposes; or
- From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
- Which are used or could be used for industrial purposes by industries in interstate commerce;

(d) All impoundments of waters otherwise defined as waters of the United States under the definition;

(e) Tributaries of waters identified in paragraphs (1) through (4);

(f) Territorial seas;

(g) Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (1) through (6).

(h) Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other Federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with USEPA (33 CFR § 328.3[a][8]).

Wetlands are ecologically productive habitats that support a rich variety of both plant and animal life. The importance of wetlands has increased due to their value as recharge areas, as filters for water supplies, and due to their widespread filling and destruction to enable urban and agricultural development. In a jurisdictional sense, there are two commonly used definitions of a wetland, one definition adopted by the ACOE and a separate definition, originally developed by USFWS, which has been adopted by the agencies in the State of California that have regulatory authority over wetlands. Both definitions are presented below.

Federal Wetland Definition

Wetlands are a subset of "waters of the United States" and receive protection under section 404 of the Clean Water Act. Wetlands are defined as those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetland determination under the Federal wetland definition adopted by the ACOE requires the presence of three factors: (1) wetland hydrology; (2) plants adapted to wet conditions; and (3) soils that are routinely wet or flooded (33 CFR ~~section~~ § 328.3(b)).

Clean Water Act Regulation of Vessel Discharges

Clean Water Act regulation of vessel discharges occurs through the Vessel General Permit (VGP) for Discharges Incidental to the Normal Operation of Vessels. Under the VGP, all vessels greater than 300 gross registered tons, or with a ballast water capacity greater than 8 cubic meters, must submit a Notice of Intent with the USEPA in order to receive permit coverage. Vessels greater than 79 feet but less than 300 tons receive automatic permit coverage. The VGP covers 26 discharges from vessels including ballast water, deck runoff, hull husbandry discharges, graywater, and firemain systems. The VGP does not relieve vessel owners/operators (permittees) of the responsibility of complying with applicable state laws and/or regulations. Many states, including

California, with authority to implement the CWA, have added specific provisions for vessel discharges in state waters to the USEPA's general permit through the CWA Section 401 certification process.

Federal Endangered Species Act

The USFWS, which has jurisdiction over plants, wildlife, and resident fish, and NMFS, which has jurisdiction over anadromous fish, marine fish, and marine mammals, oversee the Federal ESA. Section 7 of the ESA mandates that all Federal agencies consult with the USFWS and NMFS to ensure that Federal agency actions do not jeopardize the continued existence of a listed species or destroy or adversely modify critical habitat for listed species. Federal agencies are required to consult with the USFWS and NMFS if they determine a "may effect" situation will occur in association with a project. The Federal ESA prohibits the "take" of any fish or wildlife species listed as threatened or endangered, including the destruction of habitat that could hinder species recovery.

Under section 9 of the Federal ESA, the take prohibition applies only to wildlife and fish species. However, section 9 does prohibit the removal, possession, damage, or destruction of any endangered plant from Federal land. Section 9 also prohibits acts to remove, cut, dig up, damage, or destroy an endangered plant species in non-Federal areas in knowing violation of any State law or in the course of criminal trespass. Candidate species and species that are proposed or under petition for listing receive no protection under section 9 of the Federal ESA.

Section 10 of the Federal ESA requires the issuance of an "incidental take" permit before any public or private action may be taken that would potentially harm, harass, injure, kill, capture, collect, or otherwise hurt any individual of an endangered or threatened species. The permit requires preparation and implementation of a habitat conservation plan that would offset the take of individuals that may occur, incidental to implementation of the project, by providing for the overall preservation of the affected species through specific mitigation measures.

Federal Migratory Bird Treaty Act

The Federal Migratory Bird Treaty Act (16 USC, § 703, Supplement I, 1989) prohibits killing, possessing, or trading in migratory birds, except in accordance with regulations prescribed by the Secretary of the Interior. This act encompasses whole birds, parts of birds, and bird nests and eggs.

Marine Mammal Protection Act

The Marine Mammal Protection Act of 1972 (16 USC § 1371) prohibits the taking (including harassment, disturbance, capture, and death) of any marine mammals except as set forth in the ~~act~~ MMPA. An incidental harassment permit under section 101(a)(5)(D) can be issued for activities other than commercial fishing that may impact only small numbers of marine mammals. This covers activities that do not occur longer than one year and only have a negligible impact on the species.

Magnuson-Stevens Fishery Management and Conservation Act

The Magnuson-Stevens Act, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-297), established requirements for Essential Fish Habitat (EFH) descriptions in Federal Fisheries Management Plans (FMPs) and requires Federal agencies to consult with NMFS on activities that may adversely affect EFH. The Magnuson-Stevens Act requires all Fishery Management Councils to amend their FMPs to describe and identify EFH for each managed fishery. The Pacific Fisheries Management Council currently manages four major fisheries, of which the salmon, pelagic fish, and groundfish fisheries are pertinent to the proposed Project.

The Magnuson-Stevens Act also requires consultation for all Federal agency actions that may adversely affect EFH (i.e., direct versus indirect effects); it does not distinguish between actions in EFH and actions outside EFH. Any reasonable attempt to encourage the conservation of EFH must take into account actions that occur outside of EFH, such as upstream and upslope activities that may have an adverse effect on EFH. Therefore, EFH consultation with NMFS is required by Federal agencies undertaking, permitting, or funding activities that may adversely affect EFH, regardless of the activity's location. Under section 305(b)(4) of the Magnuson-Stevens Act, NMFS is required to provide EFH conservation and enhancement recommendations to Federal and State agencies for actions that adversely affect EFH. However, State agencies and private parties are not required to consult with NMFS unless State or private actions require a Federal permit or receive Federal funding. Although the concept of EFH is similar to that of critical habitat under the Federal ESA, measures recommended to protect EFH by NMFS are advisory, not directory.

~~The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-297), established requirements for essential fish habitat descriptions in Federal Fisheries Management Plans (FMPs) and require Federal agencies to consult with the~~

~~National Marine Fisheries Service (NMFS) on activities that may adversely affect essential fish habitat. The Magnuson-Stevens Act requires all fishery management councils to amend their FMPs to describe and identify essential fish habitat for each managed fishery. The Pacific Fisheries Management Council currently manages four major fisheries, of which three are pertinent to the proposed Project. These include Salmon, Coastal Pelagic Species, and Groundfish.~~

~~The Act also requires consultation for all Federal agency actions that may adversely affect essential fish habitat (i.e., direct versus indirect effects); it does not distinguish between actions in essential fish habitat and actions outside essential fish habitat. Any reasonable attempt to encourage the conservation of essential fish habitat must take into account actions that occur outside of essential fish habitat, such as upstream and upslope activities that may have an adverse effect on essential fish habitat. Therefore, essential fish habitat consultation with NMFS is required by Federal agencies undertaking, permitting, or funding activities that may adversely affect essential fish habitat, regardless of the activity's location. Under section 305(b)(4) of the Magnuson-Stevens Act, NMFS is required to provide essential fish habitat conservation and enhancement recommendations to Federal and State agencies for actions that adversely affect essential fish habitat. However, State agencies and private parties are not required to consult with NMFS unless State or private actions require a Federal permit or receive Federal funding. Although the concept of essential fish habitat is similar to that of critical habitat under the FESA, measures recommended to protect essential fish habitat by NMFS are advisory, not proscriptive.~~

~~The NMFS strongly encourages efforts to streamline essential fish habitat consultation and other Federal consultation processes. Essential fish habitat consultation can be consolidated, where appropriate, with interagency consultation, coordination and environmental review procedures required by other statutes such as the National Environmental Policy Act (NEPA), Fish and Wildlife Coordination Act, Clean Water Act, FESA, and Federal Power Act. Essential fish habitat consultation requirements can be satisfied using existing review procedures if they provide NMFS timely notification of actions that may adversely affect essential fish habitat and the notification meets requirements for essential fish habitat assessments (i.e., a description of the proposed action, an analysis of the effects, and the Federal agency's views regarding the effects of the action on essential fish habitat and proposed mitigation, if applicable).~~

U.S. Coast Guard

Under the National Invasive Species Act (NISA) of 1996, the ~~U.S. Coast Guard (~~USCG~~)~~ initially established national voluntary ballast water guidelines. The USCG published regulations on June 14, 2004, establishing a national ballast water management program with mandatory requirements for all vessels equipped with ballast water tanks that enter or operate in U.S. waters. The regulations carry mandatory reporting requirements to aid in the USCG's responsibility, under the NISA, to determine patterns of ballast water movement. The regulations also require ships to maintain and implement vessel-specific ballast water management plans. In 2009, the USCG proposed regulations that would establish performance standards for living organisms in ships' ballast water discharged in U.S. waters. As of July 2011, the final regulation had not yet been released.

State

California Environmental Quality Act

The intent of the CEQA, under which this EIR has been prepared, is to maintain "high-quality ecological systems and the general welfare of the people of the State." It is the policy of the State to "prevent the elimination of fish or wildlife species due to man's activities, ensure that fish and wildlife populations do not drop below self-perpetuating levels, and preserve for future generations representations of all plant and animal communities and examples of the major periods of California history." The CEQA forbids public agencies to approve Projects that will harm the environment until and unless the agency has adopted all feasible mitigation for that harm (Public Resources~~.~~ Code (PRC) ~~section~~ §§ 21002, 21081, subdivision a.).

The CEQA requires consultation with CDFG on any project an agency initiates that is not statutorily or categorically exempt from CEQA. The State CEQA Guidelines (§ 15065a) indicate that impacts to State- and federally listed rare, threatened, or endangered plants or animals are significant. Under section 15380 of the State CEQA Guidelines, impacts to other species that meet certain criteria (i.e., it can be shown that the species' survival in the wild is in jeopardy or it is at risk of becoming endangered in the near future), but are not officially listed, may also be considered significant by the Lead Agency, depending on the applicability of other laws (e.g., Migratory Bird Treaty Act) and the discretion of the agency. For example, CDFG interprets Lists 1A, 1B, and 2 of the California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California to consist of plants that, in a majority of cases, would qualify for

listing as rare, threatened, or endangered. However, the determination of whether an impact is significant is a function of the Lead Agency, absent the protection of other laws. Projects subject to CEQA review must specifically address potential impacts to listed species and provide mitigation measures if the impact is significant.

California Endangered Species Act

California implemented its own Endangered Species Act in 1984; subsequent amendments took effect in 1998. The ~~State act~~ California Endangered Species Act prohibits the take of endangered and threatened species; however, habitat destruction is not included in the State's definition of take[2]. Section 2090 of California Endangered Species Act requires State agencies to comply with endangered species protection and recovery and to promote conservation of these species. The CDFG administers the act and authorizes take through section 2081 agreements (except for designated "Fully Protected species").

Regarding rare plant species, the California Endangered Species Act defers to the California Native Plant Protection Act of 1977, which prohibits importing of rare and endangered plants into California, taking of rare and endangered plants, and selling of rare and endangered plants. State-listed plants are protected mainly in cases where State agencies are involved in ~~Projects~~ projects under CEQA. In this case, plants listed as rare under the California Native Plant Protection Act are not protected under the California Endangered Species Act but can be protected under CEQA.

State CEQA Guidelines Section 15380

Although threatened and endangered species are protected by specific Federal and State statutes, State CEQA Guidelines section 15380(b) provides that a species not listed on the Federal or State list of protected species may be considered rare or endangered if the species can be shown to meet certain specified criteria. These criteria have been modeled after the definition in the Federal ESA and the section of the California Fish and Game Code dealing with rare or endangered plants or animals. This section was included in the State CEQA Guidelines primarily to deal with situations in which a public agency is reviewing a Project that may have a significant effect on, for example, a "candidate species" that has not yet been listed by either the USFWS or CDFG. Thus, CEQA provides an agency with the ability to protect a species from a

[2] "Take" is defined specifically in the Fish and Game Code to mean "hunt, pursue, catch, capture, or kill," or an attempt to do any such act.

project's potential impacts until the respective government agencies have an opportunity to designate the species as protected, if warranted.

California Native Plant Protection Act

State listing of plant species began in 1977 with the passage of the California Native Plant Protection Act (NPPA), which directed CDFG to carry out the legislature's intent to "preserve, protect, and enhance endangered plants in this State." The NPPA gave the California Fish and Game Commission the power to designate native plants as endangered or rare and to require permits for collecting, transporting, or selling such plants. The California Endangered Species Act expanded upon the original NPPA and enhanced legal protection for plants. The California Endangered Specifies Act established threatened and endangered species categories, and grandfathered all rare animals—but not rare plants—into the act as threatened species. Thus, there are three listing categories for plants in California: rare, threatened, and endangered.

California Fish and Game Code

Under section 3503 of the California Fish and Game Code, it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto. Section 3503.5 of the California Fish and Game Code prohibits take, possession, or destruction of any birds in the orders *Falconiformes* (hawks) or *Strigiformes* (owls), or of their nests and eggs.

Fish and Game Code sections 3511 (birds), 4700 (mammals), 5050 (reptiles and amphibians), and 5515 (fish), allow the designation of a species as Fully Protected. This is a greater level of protection than is afforded by the California Endangered Species Act, since such a designation means the listed species cannot be taken at any time.

Special-Status Natural Communities

Special-status natural communities are identified as such by CDFG's Natural Heritage Division and include those that are naturally rare and those whose extent has been greatly diminished through changes in land use. The CNDDB tracks 135 such natural communities in the same way that it tracks occurrences of special-status species: information is maintained on each site in terms of its location, extent, habitat quality, level of disturbance, and current protection measures. CDFG is mandated to seek the long-term perpetuation of the areas in which these communities occur. While there is no statewide law that requires protection of all special-status natural communities,

CEQA requires consideration of the potential impacts of a project to biological resources of statewide or regional significance.

State Policies and Regulations Regarding Waters of the U.S. and Wetlands

State regulation of activities in waters and wetlands resides primarily with the CDFG and the State Water Resources Control Board (SWRCB). In addition, the California Coastal Commission has review authority for wetland permits within its planning jurisdiction. CDFG provides comment on ACOE permit actions under the Fish and Wildlife Coordination Act. CDFG is also authorized under the California Fish and Game Code, sections 1600-1616, to enter into a Streambed Alteration Agreement with applicants and develop mitigation measures when a proposed project would obstruct the flow or alter the bed, channel, or bank of a river or stream in which there is a fish or wildlife resource, including intermittent and ephemeral streams. The SWRCB, acting through the nine Regional Water Quality Control Boards, must certify that an ACOE permit action meets State water quality objectives (~~section~~ § 401, Clean Water Act).

CDFG has adopted the USFWS definition of wetlands (Cowardin et al. 1979). The Federal definition of wetlands requires three wetland identification parameters to be met, whereas the USFWS definition can be satisfied under some circumstances with the presence of only one parameter. Thus, identification of wetlands by CDFG consists of the union of all areas that are periodically inundated or saturated, or in which at least seasonal dominance by hydrophytes may be documented, or in which hydric soils are present. The CDFG does not normally assert jurisdiction over wetlands unless they are subject to Streambed Alteration Agreements (California Fish and Game Code ~~sections~~ §§ 1600-1616) or they support State-listed endangered species.

California State Lands Commission

The California State Lands Commission (CSLC) administers state-owned sovereign lands, which includes the beds of all naturally navigable waterways, such as major rivers, streams and lakes, and tide and submerged lands below the mean high tide line. The CSLC issues Land Use Leases or Permits for use of State lands that are determined to be consistent with the public trust values for fisheries, navigation, public access, recreation, wildlife habitat, and open space.

Shipping operations that involve vessels of 300 gross tons or larger, being of either United States or foreign registry, and ~~carrying, or~~ capable of carrying~~,~~ ballast water into the coastal waters of the State, ~~after operating outside of the coastal waters of the state~~

are subject to the Marine Invasive Species Act (MISA) (~~Public Resources Code Sections~~ PRC §§ 71200 through 71271), which revised and expanded the California Ballast Water Management for Control of Nonindigenous Species Act of 1999 (Assembly Bill [AB] 703).

Ballast water management practices for vessels arriving from places outside the Pacific Coast Region (PCR) (see PRC § 71204.3) include:

(1) Exchanging the vessel's ballast water in mid-ocean waters, before entering the coastal waters of the State;

(2) Retaining the ballast water on board the vessel;

(3) Discharging the ballast water at the same location where the ballast water originated, provided that the master, operator, or person in charge of the vessel can demonstrate that the ballast water to be discharged was not mixed with ballast water taken on in an area other than mid-ocean waters;

(4) Using an alternative, environmentally sound method of ballast water management that, before the vessel begins the voyage, has been approved by the Commission in consultation with the USCG as being at least as effective as exchange, using mid-ocean waters, in removing or killing non-indigenous aquatic species (NAS);

(5) Discharging ballast water to a CSLC-approved reception facility;

(6) Under extraordinary conditions, conducting a ballast water exchange within an area agreed to by the CSLC in consultation with the USCG at the time of the request.

Ballast water management practices for vessels arriving from places within the PCR (PRC §§ 71201.7 and 71204.5, 2 CCR § 2280 *et seq*.) include:

(1) Exchanging the vessel's ballast water in near-coastal waters, before entering the waters of the State, if that ballast water has been taken on in a port or place within the PCR;

(2) Retaining the ballast water on board the vessel;

(3) Using an alternative environmentally sound method of ballast water management that has been approved by the CSLC before the vessel begins the voyage, and that is at least as effective as ballast water exchange in removing or killing NAS;

(4) Discharging ballast water to a CSLC-approved reception facility;

(5) Under extraordinary conditions, conducting a ballast water exchange within an area agreed to by the CSLC in consultation with the USCG at the time of the request.

In 2006, the CSLC was tasked with the preparation of regulations that require vessels operating in waters of the State to meet performance standards for ballast water discharge (see PRC § 71205.3). These regulations were adopted in 2007 (2 CCR § 2291 *et seq*.). California's performance standards will be progressively implemented between January 1, 2010, and January 1, 2016. The specific date of compliance depends on the vessel's year of construction and ballast water capacity.

MISA ~~is administered by the CSLC and imposes specific requirements on~~also requires the master, owner, operator, or person in charge of a covered vessel, to adopt specified best management practices to minimize the uptake and release of non-indigenous species, by discharging only minimal amounts of ballast water ~~that are~~ essential for the vessel's operation while in State waters~~;~~, and minimize the discharge and uptake of ballast water in areas within, or that may directly affect, marine sanctuaries, marine preserves, marine parks, or coral reefs~~,~~. Additionally, the master, owner, operator, or person in charge should minimize or avoid uptake of ballast: (1) within waters known to have infestations or populations of non-indigenous organisms and pathogens, (2) near a sewage outfall, or known or reported areas with the presence of toxic algal blooms, (3) where tidal flushing is known to be poor or in turbid waters, (4) in darkness when bottom-dwelling organisms may rise up in the water column, and (5) where sediments have been disturbed, such as near dredging operations or where propellers may have recently stirred up the sediment fouling organisms from the hull, piping, and tanks on a regular basis.

Biofouling organisms are to be controlled on the vessel's wetted surface areas, including ballast tanks. Vessels must remove biofouling organisms from their wetted surfaces on a regular basis (approximately every 5 years) in order to reduce the likelihood of the introduction of species (PRC § 71204(f)).). ~~both in ballast tanks and from the hull by cleaning ballast tanks regularly in mid-ocean waters, or under controlled arrangements in port or in dry dock, to remove fouling organisms and sediments, and to dispose of those organisms and sediments in accordance with local, state, and federal law; by rinsing~~ Vessels must also rinse anchors and anchor chains when retrieving the anchor to remove organisms and sediments at their place of origin~~; the removal and proper disposal of hull fouling organisms from hull, piping, propellers, sea chests, and other submerged portions of a vessel, on a regular basis~~.

All vessels are required to complete and submit a Ballast Water Reporting Form, an annual Hull Husbandry Reporting Form, maintain a vessel-specific ballast water management plan and ballast tank log book, remit the necessary fee to the Board of Equalization, and submit to compliance verification inspections. Vessels that discharge ballast treated by a ballast water treatment system into California waters must additionally file treatment technology reporting forms. ~~The act additionally requires the master, owner, operator, agent, or person in charge of a covered vessel~~Special exceptions to compliance with MISA are provided for vessels of the armed forces and vessels of "innocent passage," as defined in PRC ~~S~~section 71202.

The Marine Facilities Division (MFD) of the CSLC administers the State's Marine Invasive Species Program. The CSLC vessel Inspection Program consists of field offices located in both Northern and Southern California and implements a monitoring program to ensure compliance. All vessels are required to submit to compliance inspections, which include sample collection of ballast water and sediment, examination of documents, and any additional appropriate inquiries as needed. ~~The Act~~MISA specifies that field inspection of ballast water and sediments be conducted from at least 25 percent of arriving vessels, with enforcement administered through the imposition of administrative civil and criminal penalties.

Regional Water Quality Control Board

The Federal Clean Water Act requires that the discharge of dredged or fill material into waters of the United States does not violate State water quality standards. Applicants for section 404 or section 10 permits must obtain a certification from the State.

Pursuant to the Porter-Cologne Act, each of California's nine regional boards must prepare and periodically update basin plans that set forth water quality standards for surface and groundwater, as well as actions to control nonpoint and point sources of pollution to achieve and maintain these standards. Basin plans offer an opportunity to achieve wetlands protection based on water quality standards. Water quality for the area including the MOT is under the jurisdiction of the San Francisco Regional Water Quality Control Board (RWQCB).

Water Quality Control Plan for the San Francisco Region (Basin Plan)

The applicable basin plan is the San Francisco Bay Basin Water Quality Control Plan (Basin Plan), last revised in 1995. The RWQCB is responsible for developing and implementing the Basin Plan, which documents approaches to implementing State and Federal policies in the context of actual water quality conditions.

The RWQCB's other activities include permitting of waste discharges, and implementing monitoring programs of pollutant effects. For more information about the State and Regional Board regulations and permits that affect the proposed Project, see Section 4.4, Hydrology and Water Quality.

Local

San Francisco Bay Plan/McAteer-Petris Act

The McAteer-Petris Act of 1965 established the Bay Conservation and Development Commission (BCDC) and authorized the agency to prepare an enforceable plan to analyze, plan, regulate, and otherwise guide the future protection and use of San Francisco Bay and its shoreline. BCDC implements the San Francisco Bay Plan and regulates filling and dredging in the Bay, its sloughs and marshes, and certain creeks and their tributaries. BCDC jurisdiction includes the waters of the Bay as well as a shoreline band that extends inland 100 feet from the high tide line. Any fill, excavation of material, or substantial change in use within BCDC jurisdiction requires a permit from BCDC.

BCDC completed and adopted the San Francisco Bay Plan in 1968 and submitted it to the California legislature and Governor in January 1969. The Bay Plan has been amended periodically since then, most recently in October 2011 (BCDC 2011). The resource protection policies of the Bay Plan that are relevant to the Project include those that identify fish, wildlife, and aquatic organisms in the Bay, water quality, and habitats including tidal marshes, tidal flats, and subtidal areas. The Bay Plan also presents 11 mitigation policies that cover the full lifespan of a project, from the initial project design to monitoring and management of mitigation areas. These general policies include avoiding and minimizing impacts on Bay natural resources through project design; the siting of compensatory mitigation areas; the amount and type of required compensatory mitigation; the need for management and monitoring of mitigation areas; coordination with local, State, and Federal agencies that have jurisdiction over protected resources; the use of alternatives; and guidance on the use of mitigation banks and fee-based mitigation.~~The Bay Conservation and Development Commission (BCDC) is authorized by the McAteer-Petris Act to analyze, plan, and regulate San Francisco Bay and its shoreline. The BCDC implements the San Francisco Bay Plan and regulates filling and dredging in the bay, its sloughs and marshes, and certain creeks and their tributaries. The BCDC jurisdiction includes the waters of the bay as well as a shoreline band that extends inland 100 feet from the high~~

~~tide line. Any fill, excavation of material, or substantial change in use within BCDC jurisdiction requires a permit from BCDC.~~

Contra Costa County General Plan

The Contra Costa County General Plan (2005) sets forth a number of natural resource policies ~~in the County's General Plan (2005)~~ that may be pertinent to the activities in the proposed Project vicinity. In particular, the general plan designated Significant Ecological Areas throughout the county and a number of policies that relate to them. A number of these areas occur in general proximity to the proposed Project area (see ~~proposed Project~~ Section 4.2.1, Environmental Setting above). The goals and policies related to biological resources are summarized as follows:

- To protect ecologically significant lands, wetlands, plant, and wildlife habitats;
- To protect rare, threatened, and endangered species of fish, wildlife, and plants, significant plant communities, and other resources which stand out as unique;
- To attempt to achieve a significant net increase in wetland values and functions within the county; and
- To encourage the preservation and restoration of the natural characteristics of the San Francisco Bay/Delta estuary and adjacent lands.

4.2.3 Significance Criteria

Criteria outlined in the State CEQA Guidelines were used to determine the level of significance of identified impacts on biological resources. Appendix G of the State CEQA Guidelines (as revised) indicates that a Project would have a significant effect on the environment if it would:

1. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS;
2. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the CDFG or USFWS;
3. Have a substantial adverse effect on federally protected wetlands as defined by ~~S~~section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;

4. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;

5. Fundamentally conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or

6. Fundamentally conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or State habitat conservation plan.

The following sections of the State CEQA Guidelines, which expand and define some of the terms used in the criteria presented above, were also considered when using the criteria to determine impact significance:

- State CEQA Guidelines ~~S~~section 15065 directs Lead Agencies to find that a Project may have a significant effect on the environment if it has the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish and wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or wildlife community, substantially reduce the number or restrict the range of an endangered, rare, or threatened species, or eliminate important examples of the major periods of California history or prehistory.

- State CEQA Guidelines ~~S~~section 15380 further provides that a plant or wildlife species, even if not on one of the official lists, may be treated as “rare or endangered” if, for example, it is likely to become endangered in the foreseeable future.

- State CEQA Guidelines ~~S~~section 15382 identifies a significant effect on the environment as a “… substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the Project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance.”

Significance criteria have also been developed by the CSLC specific to this Project. An impact on biological resources will be considered significant if any of the following apply:

- A substantial adverse effect occurs on the population of a threatened, endangered, or candidate species or its habitat;

- A significant loss occurs in the functional habitat value of: a sensitive biological habitat, including salt water, fresh water, or brackish marsh; marine mammal haul-out or breeding area; eelgrass; river mouth; coastal lagoons or estuaries; seabird rookery; or Area of Special Biological Significance;

- ~~Introduce~~ A new, ~~invasive~~non-indigenous wildlife or aquatic species is introduced to an area;

- The Project would ~~C~~create a potential health hazard or involve the use, production, or disposal of materials in a manner that would be expected to pose a hazard to wildlife or fish populations in the ~~p~~Project area; or

- The Project would ~~S~~substantially interfere with the movement or range of migratory birds and other wildlife, or the movement, range, or spawning of any resident or anadromous fish.

4.2.4 Impact Analysis and Mitigation

Shading of Bay-Delta Waters

Increased shading of Bay-Delta waters by the MOT could result in decreased phytoplankton production, reducing the available forage for special-status fish species such as Delta and longfin smelt, northern anchovy, and Pacific herring. It would also indirectly affect higher food chain predators such as steelhead and Chinook salmon. The MOT naturally shades the water column immediately under and adjacent to the dock. This shading reduces the amount of sunlight penetrating the water column and the amount of light energy available to phytoplankton ~~that are~~ present in the shaded waters. In comparison to baseline conditions, there are no proposed changes in areal extent of the MOT. Therefore, no reduction in plankton productivity is anticipated from the proposed Project (No Impact).

Displacement of Marine Biota

Although the Project is located along the main migratory route for Chinook salmon, steelhead trout, and green sturgeon, the small size of the tankers and barges that call on the MOT requires less water depth than what is present in the San Francisco Bay navigation channels. This allows sufficient water and area for these taxa to swim unmolested. The subtidal habitat adjacent to the MOT is characterized as unstable, current-swept, coarse sand sediment with slag debris. As a result it is expected to support a low-diversity, low-abundance infaunal community, which provides little foraging for these species. No changes in daily operations or the number or type of vessels using the MOT are proposed by the Applicant. Therefore, in comparison to baseline conditions, there would not be any new or increased displacement of any special-status species including Chinook salmon, steelhead trout, or green sturgeon (No Impact).

Noise Disturbances to Marine Biota

Noise generated by MOT operations, as well as vessel transits through the Bay, have the potential to startle or disturb fish, marine birds, and mammals. This disturbance, although present, is not expected to increase with the proposed Project in comparison to baseline conditions (see Section 4.7, Noise). The MOT has functioned in its current capacity for more than 20 years and is immediately adjacent to the ConocoPhillips MOT. As a result, marine birds and mammals that frequent the area are assumed to have acclimated to the routine MOT operations and activities, as well as the transit of tankers and barges through the San Francisco Bay-Delta. Therefore, in comparison to baseline conditions, there would not be any new or increased impacts from noise (No Impact).

Sediment Disturbance to Benthic Habitat Adjacent to the MOT

Typically, vessels maneuvering during docking operations involve repeated high-velocity thrusts from the ships' screw or bow thrusters. The resultant propeller wash disturbs bottom sediments and associated biological organisms and communities. This loss of habitat and biota could result in reduced availability of forage for Bay-Delta mobile megabenthic invertebrates such as Dungeness crabs and fish, marine birds, marine mammals, and special-status species. The subtidal habitat adjacent to the MOT is characterized as unstable, current-swept, coarse sand sediment with slag debris. As a result, it is expected to support a low-diversity, low-abundance infaunal community, which provides little foraging for these species. Disturbance of seafloor sediments from propeller wash is expected to be no greater than the natural daily tidal-induced disturbance in the area, which can generate currents in excess of 2 knots. Further, no changes in daily operations or the number or type of vessels using the MOT are proposed by the Applicant. Therefore, in comparison to baseline conditions, there would not be new or increased impacts due to sediment disturbance (No Impact).

Potential Impacts to Riparian Habitat, Wetlands, and Sensitive Natural Communities

Several specific native vegetative communities within California (as distinct from the organisms they support) have been identified as rare and/or sensitive. These natural communities are of special significance because the present rate of loss indicates that acreage reductions or habitat degradation could threaten the viability of dependent plant and wildlife species. The CNDDB identifies northern coastal salt marsh habitat approximately 1 mile northwest of the Project area on Mare Island (see Figure 4.2-2). These marshes provide food, cover, nesting, and roosting habitat for a range of species

including endemics such as the clapper rail, black rail, and salt marsh harvest mouse. Also outside the Project site, but hydrologically connected, are other estuarine and freshwater wetlands (see Figure 4.2-2). No changes in daily operations or the number or type of vessels using the MOT are proposed by the Applicant. Therefore, in comparison to baseline conditions, there would not be any new or increased impacts to riparian habitat, wetlands, or sensitive natural communities (No Impact).

Potential Impacts of Nighttime Lighting on Special-status Fish Species

Use of bright lights in support of nighttime operations can affect the normal behavioral patterns of special-status fish species as well as increase natural predation on these species by other fish and birds. However, no changes in daily operations, lighting at the terminal, or the number or type of vessels using the MOT are proposed by the Applicant. Therefore, in comparison to baseline conditions, there would not be new or increased impacts due to nighttime lighting (No Impact).

Potential Impacts to Marine Biota and Special-status Species Due to the Introduction of Toxic Materials into Bay-Delta Waters from Routine Operations

The presence of hydrocarbon-based fluids and solids in or on equipment poses the potential for the accidental release of these materials into Bay waters where they could have a significant impact to Bay-Delta ecosystems and special-status species of fish, birds, and marine mammals either directly or through impacts to critical habitat for these species. Operational actions by Shore to minimize the potential for hazardous materials to be released to the Bay-Delta from MOT operations include use of sufficient secondary containment for all anticipated MOT drips and small releases, and routine and repeated worker training on spill and release prevention and the importance of protecting Bay-Delta waters and biota from exposure to toxic materials. There are no changes to daily MOT operations proposed by the Applicant; therefore, in comparison to baseline conditions, there would not be any new or increased impacts due to the introduction of toxic materials into Bay-Delta waters from routine operations (No Impact).

Potential Impacts to Marine Mammals

Sea lions and Pacific harbor seals are common visitors to San Pablo Bay, although no rookeries or defined haul-outs are known in San Pablo Bay (NOAA 2007). They are not known to use the Shore wharf or adjacent intertidal areas, but may swim nearby. Other large marine mammals such as the gray whale are also known to swim into the Bay. MOT traffic may interfere with the movement of these mammals as well as potentially cause collisions. The frequency and severity of ship collisions with marine mammals

are not well known due to failures to report collisions, delayed death post-impact, inability to find carcasses after impacts, as well as difficulties in conclusively assigning causes of death. However, no changes in daily operations or the number or type of vessels using the MOT are proposed by the Applicant. Therefore, there would not be any change in comparison to baseline conditions with regard to impacts to marine mammals (No Impact).

Potential Impacts to Special-Status Birds and Their Habitat

Many bird species nest, roost, and forage in the vicinity of the MOT and may use it for roosting or perching. California brown pelican, double-crested cormorant, California least tern, bank swallows (*Hirundo rustica*), cliff swallows (*Petrochelidon pyrrhonota*), western gull, and rock dove (*Columba livea*) may nest or forage on or around the terminal. Osprey have also been observed at the MOT perching on the light fixtures. However, there are no operational or structural changes proposed with the new lease. Any nesting or foraging birds are assumed to have acclimated to the current conditions at the wharf. With no proposed changes in daily operations or the number or type of vessels using the MOT, there would not be new or increased impacts to special-status birds in comparison to baseline conditions (No Impact).

Impact BIO-1: Potential Impacts to Biological Resources from the Introduction of ~~invasive~~Non-indigenous Species from ~~Hull~~ Vessel Bio~~F~~fouling

The release of non-indigenous aquatic organisms attached to or associated with the ~~submerged~~ wetted portions of a vessel or its appurtenances, including, but not limited to, sea chests, propellers, anchors, and associated chains (collectively called ~~hull~~ vessel biofouling), could impair estuarine habitat, fish migration, ~~and~~ preservation of rare and endangered species, fish spawning, and wildlife habitat. (Class I)

The introduction of non-native species into the Bay-Delta ecosystems can result in drastic, large-scale changes to the aquatic community. Approximately 100 species of ~~exotic~~ non-native marine invertebrates have been introduced into San Francisco Bay over the past 130 years. The principal mechanisms of introduction ~~has~~ have been biofouling, boring, and release of ballast-dwelling organisms. Introduced species include snails, shrimp, plankton, and crabs. The introduction of Asian clams -- *Corbula amurensis* and *Corbicula fluminea* -- has resulted in significant changes in native benthic infaunal communities in the western Delta and Sacramento and San Joaquin Rivers. *Corbula amurensis*, because of its voracious consumption of plankton, has also altered natural phytoplankton cycles and species in the western Delta and is one of the suspected causes of fish population declines in key Delta species such as Delta and

longfin smelt (AFS 2007). Its presence has also been attributed to the reduction of northern anchovy populations in the western Delta (Kimmerer 2006).

The potential introduction of non-native species from ~~hull~~ vessel biofouling exists. The best control for introducing non-native species from ~~hull~~ vessel biofouling is to minimize ~~hull~~ vessel biofouling through regular ship maintenance, use of anti-fouling paints, frequent hull inspections, and overall ship maintenance. Despite vessel operators' best efforts, the potential for the introduction of non-native species from ~~hull~~ vessel biofouling and ballast water still exists and the introduction of a single species would be considered a significant impact.

Mitigation Measures for Impact BIO-1:

MM BIO-1. Compliance with the California Marine Invasive Species Act. Beginning as of the date of certification of this Environmental Impact Report's Mitigation Monitoring Program~~ and continuing until the date of implementation of the regulations described in Public Resources Code (PRC) S~~section 71204.6, Shore shall advise owners, operators, and shipping agents representing vessels calling at the Marine Oil Terminal (MOT) about the California Marine Invasive Species Act~~ (MISA)~~ and associated regulations, and shall ensure that the vessel is in compliance with Public Resources Code sections 71204(e) and 71204(f) and California Code of Regulations, Title 2, Division 3, Chapter 1, Article 4.8~~Shore shall ensure that the Master (Captain) or authorized representative of vessels intending to call at the MOT certify that their vessel is in compliance with PRC Section 71204(f)(2) and California Code of Regulations, Title 2, Division 3, Chapter 1, Article 4.8, Section 2298~~.

Rationale for Mitigation

Implementation of an effective anti-fouling program, including use of anti-fouling hull coatings, regular ~~hull~~ vessel inspections, and additional cleaning of ~~hull~~ vessel surfaces that have limited anti-fouling coating, are critical to the prevention of non-native species introduction to the Bay-Delta. Strict compliance with California ~~Public Resources Code~~PRC sections 71203 to 71207 by vessels using the MOT will significantly reduce the potential for the introduction of non-native species to Bay-Delta waters. However, the possibility of introduction of non-native species from ~~hull~~ vessel biofouling still remains even with strict adherence to State regulations and permits. Impacts would remain significant (Class I) even with implementation of the recommended mitigation measures.

Impact BIO-2: Potential Impacts to Biological Resources from the Introduction of ~~invasive~~Non-indigenous Species from Ballast Water

Discharge of ballast water that contains non-indigenous aquatic organisms could impair estuarine habitat, fish migration, preservation of rare and endangered species, fish spawning, and wildlife habitat. (Class I)

The introduction of non-native species into the Bay-Delta ecosystems can result in drastic, large-scale changes to the aquatic community. Approximately 100 species of ~~exotic~~ non-native marine invertebrates have been introduced into San Francisco Bay over the past 130 years. The principal mechanisms of introduction ~~has~~ have been biofouling, boring, and release of ballast-dwelling organisms. Introduced species include snails, shrimp, plankton, and crabs. The introduction of Asian clams -- *Corbula amurensis* and *Corbicula fluminea* -- has resulted in significant changes in native benthic infaunal communities in the western Delta and Sacramento and San Joaquin Rivers. *Corbula amurensis*, because of its voracious consumption of plankton, has also altered natural phytoplankton cycles and species in the western Delta and is one of the suspected causes of fish population declines in key Delta species such as Delta and longfin smelt (AFS 2007). Its presence has also been attributed to the reduction of northern anchovy populations in the western Delta (Kimmerer 2006).

Mitigation Measures for Impact BIO-2:

Shore has indicated that it does not receive non-segregated ballast water at the MOT, so the handling of non-segregated ballast water at the MOT is unlikely. Regardless, mitigation measures are still required to address such an event should it occur. In addition to the mitigation measure presented below, implementation of Mitigation Measure BIO-1 would also reduce impacts to biological resources from the introduction of ~~invasive~~non-indigenous species from ballast water.

MM BIO-2. Ballast Water Management ~~Questionnaire~~. Following the adoption of the Mitigation Monitoring Program for the proposed Project, Shore shall advise both agents and representatives of shipping companies having control over vessels that have informed Shore of plans to call at the Marine Oil Terminal (MOT) about the California Marine Invasive Species Act and associated implementing regulations. Shore shall ensure that all vessels submit required reporting forms, as applicable for each vessel, to the California State Lands Commission Marine Facilities Division, including but not limited to, the Ballast Water Reporting Form, the Hull Husbandry Reporting Form, the Ballast Water Treatment Technology Reporting Form, and/or the Ballast

Water Treatment Supplemental Reporting Form prior to the vessel's entry into San Francisco Bay or in the alternative, at least 24 hours prior to the vessel's arrival at the MOT. Shore shall not discharge any non-segregated ballast water received at the MOT to San Francisco Bay. If Shore needs to unload non-segregated ballast water, it shall be unloaded into a tanker truck or other suitable waste handling vehicle and disposed of at an appropriate facility. All vessels calling at the MOT must also have removed biofouling organisms from their wetted surfaces on a regular basis.~~Beginning as of the date of certification of this EIR's Mitigation Monitoring Program and continuing until the date of implementation of the regulations described in Public Resources Code, Section 71204.6, Shore shall inform vessel owner, operator, and shipping agents representing vessels calling on the MOT about the MISA and ensure that the vessel is in compliance with the MISA and associated regulations. The MOT shall ensure that a questionnaire, developed in conjunction with the California State Lands Commission (CSLC) MISP staff and containing the following questions, is provided to the vessel operator:~~

~~Does the vessel intend to discharge ballast water in San Francisco Bay, the Carquinez Strait or any other location(s) in a Bay waterway on it transit to Shore Marine Oil Terminal?~~

~~Does the vessel intend to discharge ballast water at the Shore Marine Oil Terminal?~~

~~Which of the following means specified in the California MISA or Title 2, Division 3, Chapter 1, Article 4.6, has the vessel operator used or intends to use on the current voyage to manage the vessel's ballast water: a mid-ocean exchange (as defined in Section 71200(g)); a near-coastal exchange (as defined in Section 71202(b)); or retain all ballast water on board?~~

~~Shore shall ensure that the questionnaire be completed on behalf of the vessel, by its Captain or authorized representative, and provided to the CSLC's Marine Facilities Division's Northern California Field and Sacramento Offices, either electronically or by facsimile, prior to the vessel's entry into San Francisco Bay, or in the alternative, at least 24 hours prior to the vessel's arrival at the MOT.~~

Rationale for Mitigation

This measure ~~would~~ provides ~~an interim~~ a tracking mechanism to monitor the management of ballast water in California waters and to track ~~until~~ the implementation of Article 4.7 Performance Standards for the Discharge of Ballast ~~w~~Water for Vessels Operating in California Waters. Strict compliance with the MISA and associated regulations, including California's performance standards for the discharge of ballast waters, by vessels using the MOT will significantly reduce the potential for the introduction of non-native species to Bay-Delta waters. However, the possibility of introduction of non-native species from ballast water discharge still remains even with strict adherence to State regulations and permits. As such, even with the implementation of the recommended mitigation measure ~~As this measure would only be informative, even together with implementation of~~ MM BIO-1, impacts would remain significant (Class I).

Impact BIO-3: Potential Impacts to Biological Resources from the Accidental Release of Petroleum Products

The accidental release of refined petroleum products from the MOT has the potential to affect marine biota inhabiting or using Bay-Delta waters as well as all intertidal and subtidal habitats. Especially at risk are marine birds, marine mammals, intertidal and shallow subtidal communities, as well as special-status fish, bird, plant, and marine mammal species. (Class I)

The impact of a hydrocarbon product spill is a function of the chemical composition of the spilled hydrocarbon mixture, the manner that marine and estuarine organisms are exposed, toxicity of the product to the biota, and its concentrations and residence time in the environment. The more toxic hydrocarbons are composed of one or more aromatic rings. The one-ring aromatic hydrocarbons are most acutely toxic, generally through narcosis effects in animals, but rapidly disappear from the aquatic environment. The two- to five-ring aromatic hydrocarbons persist longer and are associated with longer-term effects, often after being metabolized (Neff et al. 1976; Rice et al. 1977).

As a consequence of differing behaviors of these classes of toxic compounds, impacts of petroleum hydrocarbon spills can conveniently be viewed as occurring in two phases. The first phase is an acute phase where the spilled material disperses from its source, retaining the full complement of molecular types, and a slick is usually present. The concentrations of volatile hydrocarbons (i.e., gasoline phase) are highest in the water and air, and they begin to rapidly decrease. The second phase is a chronic phase, where there are no slicks and the volatile hydrocarbons have disappeared or are greatly

reduced in concentrations, and the effects of the remaining, less volatile hydrocarbons dominate, typically resulting in impacts that are longer lasting.

Scientifically, more is known about acute phase impacts, especially from volatile hydrocarbons dissolved in water (Geyer et al. 1980). These are typically referred to as BTEX, which is the abbreviation for benzene, toluene, ethyl benzene, and xylene. Gasoline is composed of approximately 40 percent BTEX, and can cause death to a large variety of aquatic organisms.

These data indicate a range of acutely toxic concentrations generally from the very low parts per million (ppm) concentrations for the most sensitive organisms to hundreds of ppm for resistant organisms (Neff et al. 1976; Rice et al. 1977). Table 10 (see Appendix D.2) presents toxicity data for the refined products and additives transported to and from the MOT, the toxic constituents of these products, and reported toxicity levels for these constituents. The reasons for the differences in toxic response by different aquatic organisms are not fully known, but presumably result from differences in organism morphology, physiology, and biochemistry.

Reduction of hydrocarbons in water is due to the combined effects of evaporation, dilution, degradation due to the effects of sunlight, and microbial degradation. The toxicity of the water phase rapidly diminishes in the wake of a spill as these processes occur. The main exception to this generality is if petroleum becomes stranded in a sponge-like shoreline, e.g., with intertidal, thick vegetative material. In this situation, petroleum can slowly be released into the immediate area, resulting in potentially harmful water concentrations in confined regions.

Combined with model outputs that predict concentrations by area and time, acute lethal toxicity data can help define the acute effects that would occur in the first few days after a spill. In general, such impacts are often limited, as sufficient water concentrations are only reached very briefly and of limited areal extent after most spills (Spies 1983). However, spill impacts are as individual as the circumstances of any particular spill itself, and large spills with thick slicks are typically more threatening to pelagic organisms than small or moderate spills.

What must also be considered in the acute phase of a spill is direct petroleum contact with biota. The intersection of surface slicks with seabirds, marine ducks, neustons (organisms that float on the top of water or live right under the surface), and intertidal communities may generate a greater threat than dissolved hydrocarbons. Birds depend on the insulating properties of their feathers to maintain body temperatures, and direct

contact with petroleum can compress plumage and compromise insulation. While attempting to clean their feathers, birds will ingest hydrocarbons, resulting in gastrointestinal upsets, dehydration, and starvation. In addition, their ability to fly can also be affected if feathers become too matted with petroleum, as might occur with diesel. Large numbers of sea birds have succumbed to spills along the Pacific Coast in the past, including spills in San Francisco Bay, apparently due to compromised feathers and insulation (Page et al. 1990).

Because petroleum floats on water and expands to form slicks that move in accordance with the tide and wind, shoreline habitats would be impacted by most small spills and by all large spills within estuarine and most coastal environments. Acute effects on a wide variety of intertidal organisms are common in petroleum spills where substantial slicks form on shorelines (Spies 1983). Soft-bodied invertebrates (e.g., polychaete worms, starfish, crabs, anemones, bryozoans, hydroids, and tunicates) are very vulnerable to direct contact; small crustaceans, such as amphipods, are particularly susceptible. Barnacles and mussels, because they can close up and not pump water or feed for a substantial number of hours, can resist short-term toxic effects better than most organisms. However, other invertebrates and intertidal fish can be killed within hours if there is a substantial quantity of spilled chemical in the intertidal zone (Rice et al. 1977).

The long-term effects of petroleum in various benthic habitats are directly related to the persistence of petroleum in those environments. The energy from tides and waves in the intertidal zone forces petroleum into spaces between rocks and cobbles, sand, mud, and vegetative material, where it can persist for years. The persistence of petroleum hydrocarbons associated with sediments is a function of the chemical composition of the hydrocarbon mixture in a habitat, as well as the water energy, oxygen supply, nutrient supply at the surface of the remaining oil, and the surface area-to-volume relationships of the solid or liquid phase of the hydrocarbons. Because of the above considerations, hydrocarbon mixtures are most persistent where they are trapped with little water energy, lack a supply of oxygen and nutrients, and there is a large surface area-to-volume ratio. The lower concentration limits that result in long-term toxic effects are in the lower parts per billion (ppb) in water for the most sensitive organisms, which are three orders of magnitude lower than for acute exposures (Capuzzo 1983).

The most vulnerable estuarine and marine environments are those that occur at the oil-water interface. Effects on open water organisms are generally acute and short lived, while penetrations of low-energy intertidal habitats make long-term persistence a distinct possibility, depending on the particular circumstances of the spill. At greatest

risk are intertidal marshes, mudflats where the product is worked into the sediments (e.g., during a storm), mussel beds, and any aquatic vegetation with extensive roots or holdfasts that product can penetrate.

The two types of hydrocarbon spills modeled for this impact assessment, gasoline and diesel, have different fates and effects on open water habitat and associated biota. The primary focus of this assessment is the products being transported by the Project Applicant and not the fuel oil used by the tanker or tug/barge. Fuel oil spills have occurred in the past in San Francisco Bay; e.g., the *Cosco Busan* spill in November 2007 at the Bay Bridge that spilled 54,000 gallons of fuel oil (Lemkau et al. 2008).

Compared to crude oil and bunker fuel, gasoline dissolves further in water, disperses quicker, and evaporates faster; however, its high content of benzene and aromatic compounds (i.e., BTEX) make it more acutely toxic on a concentration basis. The effects of a small spill of gasoline in the aquatic environment would be limited both spatially and temporally, due to the shorter exposure period. Diesel has more polycyclic aromatic hydrocarbons, which cause it to evaporate slower, persist longer in slicks, and present longer exposures to organisms. Diesel, especially diesel mixtures with high aromatic contents, is one of the most toxic petroleum hydrocarbon mixtures or products in the environment (Neff 1983). Consequently, this discussion on potential spill impacts to marine biota from refined petroleum products concentrates on the more environmentally serious spills of diesel fuel.

Effects of Spills on Open Water (Pelagic) Habitat and Associated Biota

As mentioned above, the greatest impact to marine biota from an oil spill occurs at the oil-water interface. In the open water pelagic environment, this is typically at or near the sea surface. This means that seabirds, marine mammals, and fish species that typically swim very near the sea surface or in the shallows of the Bay-Delta are potentially the most at-risk individuals.

Seabirds, especially diving species such as grebes, scoters, cormorants, murres, pigeon guillemots, puffins, and other species that spend considerable time on the surface of the water, would be at greatest risk from petroleum slicks. Plunge divers, such as pelicans and gulls, would also be at risk to the degree they spend time on the water's surface. The most recent large petroleum spill in San Francisco Bay, the Cosco Busan in November 2007, was 58,000 gallons of fuel oil and killed many birds. Two thousand carcasses were recovered, representing 57 bird species. The most numerous victims of the spill were 300 surf scoters and 200 western grebes (*Aechmophorus*

occidentalis). Most of the other species well represented in the carcass count were also diving birds, including: common murres (*Uria aalage*), Clark's grebes (*Aechmophorus clarkii*), Brant's cormorants (*Phalacrocorax penincillatus*), greater scaups (*Aythya marila*), and eared grebes (*Podiceps nigricolus*) (Lemkau et al. 2008).

Marine mammals that spend much of their time at the ocean surface, such as harbor seals, sea lions, whales, and dolphins, are also at risk from direct contact with gasoline or diesel slicks, or breathing fumes just above the slick. The most common marine mammals in the area of a potential spill in San Francisco Bay are harbor seals and California sea lions (NOAA 2007), which regularly occur in San Francisco Bay and along the outer open Central California coast (BLM 1981). These species are not as susceptible to spills as sea birds, as they have a layer of blubber for insulation, rather than relying solely on external plumage to keep them warm. However, they are not immune to hydrocarbon toxicity from fumes or ingestion. Direct oiling of the fur and skin of harbor seals and sea lions can sicken them if they swim through a slick. In the case of a diesel spill, "oiling" of a harbor seal's coat might persist for a matter of days. Some hydrocarbons can be expected to be absorbed through the skin, but the exact amount is controlled by many factors, including the amount of oiling that occurs. Several hundred harbor seals were likely killed as a result of the 1989 Exxon Valdez oil spill in Alaska (Frost et al. 1994), but there were more than 100,000 sea birds killed. Harbor seals in the area of the heavy slick behaved in a lethargic manner, and such behavior could have made them more susceptible to predators, or possibly drowning in the case of extreme exposures. A diesel spill in Central or San Pablo Bays would be expected to have a deleterious influence on both harbor seals and sea lions.

Whales and dolphins are not very common in the Bay, but a slick of diesel that left the Bay might under some conditions affect a few individuals in the Gulf of the Farallones. It is thought that following the Exxon Valdez oil spill, two pods of killer whales (*Orcinus orca*) lost some individuals as a result of breathing in the fumes from the slick. However, the evidence for this is circumstantial (Matkin et al. 1994). Gray whales (*Eschrichtius robustus*) regularly pass through the slicks from natural oil seeps in the Santa Barbara Channel on their migrations between calving grounds in coastal lagoons in Mexico and their feeding grounds in the far North Pacific Ocean, and there is no indication that this is harmful to them.

Pelagic fish would be minimally exposed to the released hydrocarbons from a spill, but the potential severity of their exposure is dependent on the concentration of the hydrocarbons they encounter and the length of time they are exposed. Those pelagic

fish species that predominantly inhabit the mid-regions of the water column, such as Chinook salmon, steelhead, American shad, etc., would be expected to have the lowest exposure and potential impact. More severe hydrocarbon exposure can be expected to occur where there are heavier slicks and limited water circulation. The younger juvenile life stages of some fish, such as Pacific herring, northern anchovy, Pacific sardines, and Delta and longfin smelt, are more susceptible to spills than adults because they regularly swim near the water surface where they could be exposed to relatively high concentrations of hydrocarbons from the slick itself, as well as any hydrocarbons in the surface microlayer. Even after the slicks have dissipated, in the case of diesel, the surface microlayer would continue to have elevated concentrations of hydrocarbons (Payne et al. 1983). The petroleum-enriched, surface microlayer could come from the slow release of shore-stranded diesel when the tide and wind favor this process. In addition, petroleum hydrocarbons trapped in the surface microlayer are susceptible to chemical oxidation from sunlight (Payne et al. 1983), which can render them more reactive, and therefore more toxic than the parent compound.

One extensive review of scientific research from the 1970s and 1980s on the biological effects of hydrocarbon spills (Capuzzo 1983) showed the range of sub-lethal effects for petroleum to marine organisms, as follows:

- 3 to 10 ppb: Decreased larval fish viability, antennae function in crabs, and decreased photosynthesis in algae;
- 10 to 300 ppb: Abnormalities in egg development, reduced larval heartbeat in fish, and suppression of flagellate motility; and
- 200 to 800 ppb: Effects on juvenile fish and lobsters, larval crustaceans, and larval fish.

In some circumstances, long exposures to aromatic hydrocarbons in the ppb range has been shown to result in subtle damage that compromises fish survival (Heintz et al. 1999, 2000) and is not evident in more conventional acute and chronic toxicological testing (Moles et al. 1979; Moles and Rice 1983).

The effects of petroleum on phytoplankton, zooplankton, and nekton are often assumed to be less than significant due to the limited exposure times under most spill conditions in open water, especially from small spills (Spies 1983). However, there is scientific evidence that suggests that in large petroleum spills, such as the 1978 Amoco Cadiz spill on the Brittany Coast, in which millions of gallons of crude oil were released to the marine environment, effects on zooplankton can occur (Spies 1983).

Again, the potential risk from gasoline spills may be higher than crude oils within a very confined area, but probably not measurable on a larger scale due to dilution, turbulent mixing, and the large inherent variability in plankton distributions. The greatest risk to plankton from either diesel or gasoline would be expected to occur in calm or still water environments in which mixing and dissolution are minimized and exposure to higher hydrocarbon concentrations for longer periods of time could occur.

Effect of Spills on Soft and Hard Substrate Intertidal Habitat and Associated Biota

The greatest environmental impact to intertidal habitats would be expected to occur where petroleum slicks come ashore. The larger and thicker the slick, the more hydrocarbon material there is to spread over a larger surface area of the shoreline, and the more marine organisms that would come into contact with the spilled material. As with open water exposure, intertidal areas that are characterized as having lower kinetic energy (i.e., wave action) have the greatest impact potential due to limited mixing, dilution, evaporation, and increased exposure time.

There are a range of potential outcomes for petroleum contamination from a large spill with thick slicks in intertidal areas, ranging from no measurable impact to severe impact. Recovery of intertidal areas is typically much slower than for open water or subtidal habitats, often requiring months to decades. The recovery period depends on the amount of oiling that occurs, the biological community affected, and the persistence of the spilled hydrocarbons to remain in the habitat after soaking into driftwood, peat-like sediments, soft silts and clays, decaying algae, etc. (Duncan and Hooten 1996, Highsmith et al.1996, Stekholl et al. 1996).

Many well established intertidal communities, especially those in hard substrate areas, are typically dominated by long-lived organisms that take years to become established. These communities can be expected to require many years to recover to pre-disturbance conditions. In many cases where an impact would be significant, the communities would have to go through a succession of stages, with a variety of organisms, to return to their original state.

On natural rock or riprap shorelines, crustaceans (e.g., crab, shrimp, barnacles, amphipods, and isopods), polychaete worms, and mollusks (especially limpets, snails and burrowing or nestling bivalves) are susceptible to the toxic, narcotic effects of gasoline, or the long-term effects of aromatic compounds in diesel. Damage would likely last as long as significant quantities of sequestered petroleum would be present.

On pilings, common along the San Francisco Bay-Delta shoreline, biota attached to the vertical surfaces would be the most at-risk communities. These communities have the greatest potential to be exposed and reexposed to spilled gasoline or diesel during daily tidal cycles. They would be continually exposed to low-level concentrations from hydrocarbons that have been absorbed by the wood or concrete pilings themselves.

As discussed previously, gasoline would be expected to evaporate quickly and not pose a severe threat to organisms on the pilings, except where high concentrations would be expected to occur in the immediate area of the release. If a refined hydrocarbon product spill would occur in the north central Bay in late winter during the time periods when Pacific herring (*Clupea pallasi*) are spawning, then impacts to herring spawning and larval development would be anticipated since Pacific herring frequently spawn on pilings and riprap. Eelgrass beds can also be at risk since they occur in the shallower regions of the Bay-Delta and are partially exposed during most low tides. Eelgrass beds are a critical spawning substrate and habitat for Pacific herring (Merkel 2008).

Diesel and gasoline floating on the water surface could come into direct contact with herring eggs. Herring eggs exposed to hydrocarbon spills can develop significant morphological abnormalities at low exposure petroleum hydrocarbon concentrations (above 10 ppb) (Carls et al. 1999). Exposure of adult herring in the laboratory to similarly low concentrations of weathered petroleum resulted in increased expression of hemorrhagic septicemia virus (Carls et al. 1999). Although these are results with low concentrations of weathered crude oil, and diesel has a different composition, the possibility of low-level effects on developing larvae and expression of pathogens in adults should not be ruled out.

Invertebrates on the pilings, such as barnacles, mussels, small crustaceans, hydroids, and bryozoans, would also be affected by direct contact with a diesel or gasoline spill. Diesel and gasoline are not expected to adhere to pilings for very long once the hydrocarbon slick has passed. Therefore, exposures would likely be short-lived unless there is a very large spill or limited water movement in the vicinity of the pilings. It can also be anticipated that daily tidal washing of the area with cleaner water after the spill would continue to dilute and remove any residual hydrocarbons. Recovery would likely be more rapid on pilings than along riprap and natural rocky intertidal habitat because of less exposure during low tides and relatively rapid recruitment from the plankton. Typically, large bivalves such as mussels and oysters are able to survive small and moderate-sized spills since they are naturally conditioned to closing their shells tightly to

avoid desiccation during low tide periods, which would also limit exposure to hydrocarbons.

In tidal mudflats and salt marshes, like the intertidal areas discussed above, biological impacts would be the direct result of the physical exposure, concentrations, and the length of time they are exposed. Salt marshes and tidal wetlands, in particular, are at greatest risk from petroleum spills since any spilled hydrocarbons that come into contact with the wetland would have the potential to soak into the peat and silt substrate, allowing the hydrocarbons to remain unaltered for years. This condition could lead to a long-term chronic exposure of associated biota to the spilled hydrocarbons.

Two past oil spills into tidal marshlands provide some insight into the effects of hydrocarbons on marsh habitat and associated biota. The first was in April 1988, at the Shell Refinery in Martinez, California, when 400,000 gallons of crude oil leaked from a storage tank into the McNabney Marsh (SOSLSTC 1990 through 2001). The leaked oil flowed into the marsh to a depth of about 4 inches and then into the Carquinez Strait, where it was subsequently carried west into San Pablo Bay and east into Suisun Bay, on successive tides. Damage to the marsh was extensive from the oil and the cleanup operations that ensued. Without immediate cleanup, the oil would have remained in relatively high concentrations within the tidal marsh for years. Recovery of a marsh ecosystem is a long-term process typically requiring years for small spills and decades for larger spills as a result of the massive death of the marsh vegetation itself, which is the foundation of the ecosystem (SOSLSTC 1990 through 2001).

Another well-studied spill into tidal marshlands occurred in 1969 when No. 2 fuel oil leaked into Buzzard's Bay, Massachusetts, during a storm. Oil slicks floated into Wild Harbor and the fuel oil was worked into marsh sediments to a depth of more than 10 centimeters. There was an immediate mortality of invertebrates and fishes from the acute toxicity of the oil (Hampson and Sanders 1969). However, because the fuel oil was buried in an anoxic environment in the marsh sediments, its decomposition was slowed appreciably (Sanders et al. 1980), with detectable effects on burrowing invertebrates, such as fiddler crabs, for many years (Teal et al. 1992).

Although neither of these cases exactly fits the profile of a potential gasoline, jet fuel, diesel, or other refined product spill in San Francisco Bay-Delta, they do provide important insight into habitats that are particularly vulnerable and warrant added protection and consideration during spill response activities.

There is extensive intertidal soft bottom habitat in San Francisco Bay whose flora and fauna could be damaged by a spill, most seriously by diesel. A large spill of diesel originating in the vicinity of the wharf or at one of the trans-bay bridges would most likely intersect some soft bottom intertidal habitat because of the strong tidal current in these areas. The most damaging situation would be for a thick slick to reach the shore during a receding tide and have direct contact with intertidal invertebrates during one or more tidal cycles. This would likely result in the death of a portion of the intertidal infaunal and epifaunal communities, including polychaetes, bivalves, amphipods, isopods, and crabs.

Effect of Spills on Soft and Hard Substrate Subtidal Habitat and Associated Biota

Potential impacts to subtidal benthic habitats from refined hydrocarbons would be much more limited than what typically occurs from crude oil or bunker fuel spills. As discussed above, contact with the spilled oil is necessary for acute impact, and consistent exposure to elevated concentrations for prolonged time periods is necessary for chronic effects to occur (Neff 1977). There are limited pathways for petroleum to reach subtidal habitats, unlike crude oil and bunker fuel, which are more viscous and quickly mix with suspended sediments and sink to the seafloor. Diesel, aviation fuel, and gasoline typically remain on the sea surface as they slowly degrade, evaporate, and dilute into the water column. Refined hydrocarbons could slowly dissolve from the slick and reach the shallow subtidal habitat. The exposure in this case would likely be to rather low concentrations, probably not exceeding several ppb in deeper waters (Spies 1983). However, in shallow water under an extensive slick and with limited wind and wave action, considerably higher concentrations of hundreds of ppb would be possible (Spies 1983). These concentrations would be high enough to affect sensitive organisms if the exposures last long enough.

Another route of exposure would be the association of petroleum hydrocarbons with suspended particulate matter in the water, whereby the particulate matter would subsequently settle out of the water to contaminate subtidal benthic habitat. In the case of a diesel spill in the Bay-Delta, this process would likely contribute significantly to the contamination of benthic habitat. However, in areas of abundant suspended solids, like San Francisco Bay-Delta, the dilution over so many small particles would be expected to result in very low concentrations. Dilution would be expected to be greater with small spills than in the case of a large spill. In past spills, the subtidal benthos has been shown to be affected by this second route of contamination, with crustaceans and some genera of amphipods being the most affected (Spies 1983). A third mechanism of contamination reaching the subtidal benthos would be by erosion and resuspension of oiled intertidal

material that ultimately settles in subtidal areas of the Bay-Delta. Even in the massive Exxon Valdez spill in Prince William Sound, concentrations of petroleum hydrocarbons in subtidal sediments never reached concentrations greater than 0.5 ppm (Rice et al. 2007). This would be a concentration that would affect only very sensitive marine organisms, whereas the majority of organisms in the subtidal community would be unaffected.

Potential Impact to San Francisco Bay-Delta Marine Habitat from Spills

As presented in the biological characterization discussion above, the San Francisco Bay-Delta contains open water pelagic habitats, subtidal soft and hard substrate, and intertidal soft and hard substrate in all of its regions. Depending on the source of the spill, the hydrocarbon product, and the path of the release, many of the habitats and associated biota would be potentially impacted as discussed above. To determine where within the Bay-Delta accidental releases of refined petroleum products would be expected to go and what potentially sensitive habitats could be affected, 20 spill modeling scenarios were conducted as presented in Section 4.1, Operational Safety/Risk of Accidents. Based on these spill model trajectories, an analysis of NOAA Environmental Sensitivity Index (ESI) atlas maps for San Francisco Bay-Delta and the nearshore central California coast was made. Table 11 of Appendix D.2 lists the spill model scenarios, projected areas of the Bay-Delta or open coast that could be affected, the NOAA ESI atlas map number for potential spill impact areas (see Appendix D.3), the species of concern located within the spill impact areas, and special-status species that may be present.

The NOAA ESI atlas maps and Trajectory Analysis Planner (TAP) spill model primarily focus on shoreline (intertidal), marsh/wetland, and subtidal impacts from hydrocarbon spills. As indicated in the discussion above, the potential impacts to open water pelagic habitat and biological communities are limited. However, all of the spills modeled for the MOT operations would travel along Bay-Delta or open ocean waters, and as such, would have the potential for some impact to open water biota. Affected biota include marine birds, marine mammals, and near-surface swimming fish (e.g., Delta and longfin smelt, threadfin shad, Pacific herring, northern anchovy, and Pacific sardines).

As presented in Section 4.1, Operational Safety/Risk of Accidents, the average most probable (i.e., 50 barrels) and maximum most probable (i.e., 434 barrels) spills for the products shipped through the MOT were modeled. The projected trajectories indicate that the most probable areas of the Bay-Delta to be impacted by these releases would be the shoreline and open water areas immediately adjacent to the Project site and immediately across the Carquinez Strait. Daily tidal flow would be expected to potentially spread the releases slightly east and west of the Project site. As indicated in

Appendix D.2 Table 11, the Bay-Delta habitats that predominate in this region consist of open water, sand and gravel beaches, shallow subtidal flats, artificial shore armoring, riprap, docks, and piers. The taxa most at risk include diving and wading birds and intertidal communities.

Modeling results for potential tanker or barge collisions at or near either the Richmond-San Rafael or Golden Gate Bridges indicate that the accidental release of large volumes of diesel would have the potential to affect larger areas of Central and San Pablo Bay compared to a similar-sized release of gasoline. A serious tanker collision near the GGB would also be anticipated to affect portions of the open coast immediately north and south of the Bay entrance. Major tanker or barge spills of 20,000 barrels of refined petroleum products would have the potential to significantly affect all habitat types and associated biota present in the Bay-Delta.

Mitigation Measures for Impact BIO-3:

In addition to the Biological Resources mitigation measures presented below, implementation of Mitigation Measures OS-1a through OS-1d~~1c~~ (see Section 4.1, Operational Safety/Risk of Accidents) would reduce impacts to biological resources.

MM BIO-3a. **Rescue and Rehabilitation.** Shore shall ensure that procedures are in place to bring bird rescue and rehabilitators to the site as soon after the accidental release occurred to rescue birds following a release event that is not immediately contained at the Shore terminal. This includes having contractual arrangements in place as part of Shore's Spill Prevention Control and Countermeasure plan so that bird rescue personnel and equipment can be on-site within hours of the onset of an accidental release. Contact info for a bird rescue center (such as the International Bird Rescue Research Center listed below) shall be kept onsite and notified in the event of an accidental release greater than 10 barrels.

International Bird Rescue Research Center
Northern California
San Francisco Oiled Wildlife Care and Education Center
4369 Cordelia Rd.
Fairfield, CA 94534
Main line: (707) 207-0380
Fax: (707)207-0395
Wildlife hospital: (707) 207-0380 ext. 110

MM BIO-3b. **Develop Cleanup Procedures.** Shore shall develop procedures for the cleanup of any sensitive biological areas contacted by released hydrocarbon products from the operations of the terminal, including transportation within the Bay-Delta, in consultation with biologists from California Department of Fish and Game and the National Marine Fisheries Service to avoid damage from cleanup activities.

MM BIO-3c. **Conduct Post-Spill Studies.** If Marine Oil Terminal related damage occurs to Bay-Delta marine habitats or biological resources, any loss or impact shall be documented as soon as possible after a serious accidental spill or release. Shore's spill response plans shall be updated within ~~6~~ six months of the execution of the lease to provide guidance to spill response managers so that qualified resources can be on-site as soon as possible after initial impact to enable post-spill studies to begin immediately.

Rationale for Mitigation

Mitigation Measure BIO-3a would increase immediate spill response capability and promote potentially critical actions that would be within Shore's on-site capability to implement and execute to reduce potential spill effects to Bay-Delta ecosystems. Mitigation Measure BIO-3b would ensure that effective consultation occurs with CDFG and NMFS to prevent damage to sensitive or potentially at-risk Bay-Delta habitats and associated biota, including special-status species, during cleanup activities. Mitigation Measure BIO-3c would ensure that Shore would take the necessary steps in developing effective spill response planning so that qualified scientific personnel could be placed on-site in a timely manner to effectively document spill impacts, recovery, and ultimately the need or justification for compensation to private or governmental entities. Both Mitigation Measures BIO-3b and BIO-3c would provide for the meaningful collection of information for the continued evaluation of the effectiveness of impact prevention, cleanup actions, and appropriate methods of cleanup and data collection.

Residual Impacts

Large spills originating from tanker or barge incidents while in transit to the MOT would impact important and sensitive habitats with the San Francisco Bay-Delta, including critical fisheries habitat and protected species. Impacts would remain significant (Class I) even with implementation of the recommended mitigation measures.

Impact and Mitigation Summary

Table 4.2-2 presents a summary of biological resource impacts that would be associated with the proposed Project and corresponding recommended mitigation measures.

Table 4.2-2. Summary of Biological Resource Impacts and Mitigation Measures

Impacts	Mitigation Measures
BIO-1: Potential Impacts to Biological Resources from the Introduction of ~~invasive~~Non-indigenous Species from ~~Hull~~ Vessel Bio~~F~~fouling	**MM BIO-1.** Compliance with the California Marine Invasive Species Act
BIO-2: Potential Impacts to Biological Resources from the Introduction of ~~invasive~~Non-indigenous Species from Ballast Water	**MM BIO-1.** Compliance with the California Marine Invasive Species Act **MM BIO-2.** Ballast Water Management ~~Questionnaire~~
BIO-3: Potential Impacts to Biological Resources from the Accidental Release of Petroleum Products	**MM OS-1a.** Install Tension-Monitoring Devices **MM OS-1b.** Install an Allision Avoidance System **MM OS-1c.** Replace Existing Loading Arms **MM OS-1d.** Install Remote Release System **MM BIO-3a.** Rescue and Rehabilitation **MM BIO-3b.** Develop Cleanup Procedures **MM BIO-3c.** Conduct Post-Spill Studies

4.2.5 Impacts of Alternatives

No Project Alternative

Under the No Project Alternative, a new lease would not be granted to Shore and the existing MOT would be subsequently decommissioned with its components reused, abandoned in place, removed, or a combination thereof. The long-term operational impacts of the MOT on biological resources would not occur. However, the impacts of the MOT would be largely transferred to other nearby marine terminals.

The decommissioning of the wharf would be governed by an Abandonment and Restoration Plan. The methods by which the MOT would be removed or abandoned would be the subject of a separate application to the CSLC and subject to appropriate environmental review. The upland terminal would continue to operate but petroleum products would not be shipped by barge or marine vessel. Petroleum products would be transported by barge or marine vessel through other Bay Area marine terminals, via existing onshore pipelines, and/or via rail and/or truck transportation. Any future product transportation alternative would be the subject of a subsequent application to the CSLC and other agencies having jurisdiction, depending on the proposed Project.

Once the decommissioning would be complete, the transit of petroleum products would be transferred to other marine terminal locations or to other modes of transportation. Impacts to biological resources from boat traffic, sediment disturbance generated by boat propellers and bow thrusters, introduction of ~~exotic~~ non-native organisms in ballast water discharges and by ~~hull~~ vessel biofouling, and introduction of toxins used as anti-fouling agents on tankers would be transferred to other marine terminals. The impact of spills on biological resources would depend on the location of the terminal and would be subject to permit conditions or environmental reviews specific to that location, but would generally be expected to be similar to that described here for the proposed Project.

The upland terminal may continue to operate, receiving petroleum products by rail or truck. With the additional traffic servicing the upland terminal, there may be a greater impact to wildlife with increased vehicle collisions. Impacts due to increases in air pollution associated with rail and truck transport are discussed in Section 4.6, Air Quality. With existing rail and roadway access to the terminal, additional infrastructure may not be required. If, given traffic analyses, additional transportation infrastructure is required, then there may be additional impacts to biological resources. Depending on the exact location of the new roads or tracks, this may result in the loss of habitat, impacts to riparian areas and wetlands, and additional impacts to migratory birds. These impacts would need to be addressed in the CEQA document pertaining to the road and rail extensions.

Limitations on Terminal Use Alternative

Under the Limitations on Terminal Use Alternative, Shore's lease would be subject to restrictions on the number, type, or size of marine vessels that would be allowed to call at the wharf, or restrictions on the type of product that could be loaded or unloaded.

Under this alternative, the severity of potential impacts to biological resources would be reduced in the vicinity of the Project. The potential for release of toxic chemicals and ~~invasive~~non-indigenous species from ballast water would be reduced due to the fewer ships that would call at the MOT. However, due to the continued use of the MOT (albeit at a lower capacity), the potential for significant impacts would remain generally the same as for the proposed Project.

In addition, unless local demand for these products is significantly reduced, the gasoline, diesel, jet fuel, and other refined products currently shipped through the MOT would be transported through other Bay-Delta marine terminals and/or railroad and truck terminals with similar or greater projected impacts to Bay-Delta marine habitats

and associated biota, depending on the transportation mode, facility location, design and operation. Depending on when lease or use permits are due for renewal for these other potential sources of transport, the potential for increased risk and impact to Bay-Delta marine habitats and associated biota could occur due to a delay in implementation of environmental mitigation actions required for the proposed Project.

While the severity of the impacts under this alternative would be reduced in comparison to the proposed Project, potentially significant impacts would continue to exist. This alternative would require the same mitigation measures to ensure that potential impacts are less than significant.

4.2.6 Cumulative Projects Impact Analysis

The geographic context for analysis of cumulative impacts to biological resources includes sites within, adjacent to, and in the general vicinity of the Project site: collectively called the Cumulative Projects Study Area (CPSA). This analysis evaluates whether the impacts of the proposed Project, together with the impacts of other projects in the CPSA (see Section 3.5.1, Boundary of Cumulative Projects Study Area), would result in a "cumulatively considerable" impact on special-status species, wetlands and other waters of the U.S., or other biological resources protected by Federal, State, or local regulations or policies (based on the significance criteria and thresholds presented earlier). Impacts to biological resources that are not individually significant may become significant when considered with other impacts in the region. As defined in ~~S~~section 15355 of the State CEQA Guidelines, a cumulative impact consists of an impact that is created as a result of the combination of the proposed Project together with other projects causing related impacts. This analysis then considers whether the incremental contribution of the MOT Project to this cumulative impact would be considerable. Both conditions must apply in order for a Project's cumulative effects to rise to the level of significance.

Where it has been determined that there would be no changes in the proposed Project from baseline (see Impact Analysis and Mitigation, above), no discussion of cumulative impacts is required due to the lack of potential for any incremental contribution to be cumulatively considerable.

~~Invasive~~Non-indigenous Species from Ballast Water and ~~Hull~~ Vessel Bio~~F~~fouling

The California Ballast Water Management for Control of Non-indigenous Species Act of 1999, as revised and reauthorized by the Marine Invasive Species Act of 2003, and

California ~~Public Resources Code~~PRC sections 71200~~3~~ to 71271~~07~~ specify required ballast water and vessel biofouling management practices. These laws and associated regulations were developed to prevent future introduction of ~~invasive~~ non-indigenous species to Bay-Delta waters. Prior to the introduction of these management practices, however, a considerable number of ~~invasive~~non-indigenous species have been introduced into the Bay-Delta waters, resulting in a cumulatively significant impact. The following projects have the potential to affect the introduction of ~~invasive~~non-indigenous species through ballast water and/or ~~hull~~ vessel biofouling: Chevron Long-Wharf, Oakland Harbor Deepening, and Shell Martinez Lease Renewal. Each of these projects involves ships transiting through the San Francisco Bay-Delta and could potentially introduce non-native species. Although marine vessels that call at the MOT are required to comply with State provisions, compliance is not enough to ensure full mitigation of this potential impact and so the proposed Project's contribution to future introduction of ~~invasive~~ non-indigenous species to Bay-Delta waters would be cumulatively considerable. Significant cumulative impacts would occur (Class I) even with implementation of MM BIO-1 and MM BIO-2.

Accidental Release of Petroleum Products

The accidental release of refined hydrocarbon products into Bay-Delta waters, either from the MOT or from vessels transporting material through the MOT, would potentially affect a wide range of marine and terrestrial biological resources, in contrast to the limited effects of regular operations. The following projects have the potential to ~~affect the introduction of invasive species through~~ contribute to the accidental release of petroleum products: Chevron Long-Wharf, Oakland Harbor Deepening, and Shell Martinez Lease Renewal. These projects involve the transiting of petroleum products through the San Francisco Bay-Delta and therefore carry the potential for a fuel spill.

Implementation of the biological resources and operational safety mitigation measures identified in this EIR would collectively aid in the prevention and cleanup of accidental hydrocarbon releases from occurring in Bay-Delta waters and affecting Bay-Delta ecosystems. Although the potential contribution of the MOT operations to these cumulative risks and impacts is low, the mitigation measures required of continuing operations would aid in reducing that risk and the potential impact to Bay-Delta biological resources if a spill incident occurs.

In the event of a substantial release of refined hydrocarbon products, including but not limited to diesel fuel, gasoline, and jet fuel, into Bay-Delta waters, the biota composing regional marine and terrestrial ecosystems would have a residual impact after spill

response and cleanup have occurred. Therefore, the proposed Project would be cumulatively considerable and significant cumulative impacts would occur (Class I) even with implementation of all mitigation measures for Impact BIO-3.

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4.3 COMMERCIAL AND SPORT FISHERIES

This section addresses potential impacts to commercial and sport fisheries associated with the proposed Project and alternatives. For the purposes of this analysis, the baseline conditions against which impacts are analyzed are those conditions existing as of the publication of the proposed Project's Notice of Preparation (NOP), November 28, 2007.

4.3.1 Environmental Setting

Many important commercial and recreational fish species are known to spend a portion of their life history within the San Francisco Bay Estuary (the Estuary). Some reside predominantly as adults in the ocean waters beyond the Golden Gate Bridge (GGB), but spend their juvenile phase or a portion of their adult life stage within the Estuary itself, such as Dungeness crab (*Cancer magister*), Chinook salmon (*Oncorhynchus tshawytscha*), steelhead (*Oncorhynchus mykiss*), or sturgeon (*Accipenser* spp.). Others spend their entire life outside of the GGB, but may be impacted by anthropogenic activities occurring within the Estuary's watershed, which was the case during the temporary suspension of all fishing activities for human consumption following the *Cosco Busan* oil spill (OEHHA 2007). Still others spend their entire life within the Estuary proper (e.g., bay shrimp (*Crangon franciscorum*) and striped bass (*Morone saxatilis*)). For the purposes of this analysis, the environmental setting area encompasses all of San Francisco Bay and the West Delta (Suisun Bay and Suisun Marsh), and the North Central Coast between Monterey Bay and Bodega Bay.

The California Department of Fish and Game (CDFG) tracks and reports commercial fish landing and catch value data in several ways. One report used for this analysis provides catch and landing statistics compiled from self-reporting by commercial fisherman within the established fishing blocks in which their catch was harvested. A second report tracks commercial catch by regional fish landing areas along the coast, such as San Francisco, Los Angeles, Humboldt Bay, etc. Landing data for these regional landing centers represent fish and invertebrates caught and sold in many smaller ports within that region; for example, Monterey includes fish landed at Monterey, Moss Landing, and Santa Cruz. The principal ports within the North Central Coast of California where commercial fish landing and value information is available include San Francisco Bay, Monterey Bay, and Bodega Bay. Because of potential problems with erroneous reporting of catch block data, this document relied on regional port landing information and personal knowledge of the Bay and North Central Coast fisheries.

Although there are a few fisheries that only occur within the Bay itself, such as bay shrimp and brine shrimp (*Artemia* spp.), the majority of commercial fishing associated with the North Central Coast fisheries occurs along the coast. As a result, commercial boats located in Bodega Bay or Monterey Bay will frequently fish off of San Francisco. Similarly, San Francisco Bay-based vessels will frequently work north to Bodega Bay and down into Monterey Bay, and farther. To have an understanding of commercial fishing activities along the North Central Coast, it is necessary to assess data from all three of these regional reporting centers. Presented below are the current catch and landing data for the three regional landing centers and information that is known on important commercial and recreational fisheries, both inside and outside of the GGB.

Commercial Fisheries

For commercial fishery landings along the outer coast, port landing data were compiled as reported by the CDFG for Monterey Bay, San Francisco Bay, and Bodega Bay. For inland marine landings specific to San Francisco Bay, only San Francisco landing data were used. It should be noted that commercial fishing is a constantly changing endeavor. Although many species of fish or invertebrates (e.g., Chinook salmon, Dungeness crab, sablefish (*Anaplopoma fimbria*), Pacific herring (*Clupea pallasi*)), may be commercially caught on an annual basis, other fisheries, such as rock cod (*Lotella rhacina*), northern anchovy (*Engraulis mordax*), urchin, etc., may only be commercially caught for a few years in a given region as a result of short-term environmental conditions, market shifts, or population declines in one species that prompt harvesting of a less desirable species.

Below are descriptions of some of the major commercial fisheries for San Francisco Bay, Bodega Bay, and Monterey Bay, accompanied by Tables 4.3-1 through 4.3-3, which describe the commercial landings and value of the major species in San Francisco Bay, Bodega Bay, and Monterey Bay, respectively.

Inland Fishing, San Francisco Bay

CDFG commercial ocean fishing landing data for San Francisco were compiled for the period 2000 through 2007. This dataset reported landings, in pounds, for important commercial fisheries that spend at least part of their lifespan within San Francisco Bay. These fisheries, including Pacific herring, Bay shrimp, Dungeness crab, northern anchovy, and brine shrimp, are described below.

Table 4.3-1. Commercial Landings and Value of Major Species into San Francisco for the Years 2000 to 2007

Species	2000	2001	2002	2003	2004	2005	2006	2007
Northern Anchovy	256,796 lbs $63,435	17,767 lbs $4,374	37,856 lbs $9,466		14 lbs $28	29 lbs $29	155,400 lbs $4,662	
Croaker (unspecified)					47,805 lbs $53,618			
White croaker	39,297 lbs $38,045	45,344 lbs $40,690	57,011 lbs $51,648	43,260 lbs $41,883				
Starry flounder				45,881 lbs $23,390		63,664 lbs $38,854	51,526 lbs $32,995	
California halibut	284,528 lbs $745,212	263,883 lbs $704,331	330,141 lbs $834,475	401,319 lbs $1,033,568	534,265 lbs $1,287,684	616,000 lbs $1,587,465	398,189 lbs $1,237,409	145,803 lbs $527,454
Pacific herring-roe on kelp	189,225 lbs $43,603	53,720 lbs $390,882	90,661 lbs $621,647	132,410 lbs $449,193				
Pacific herring roe	7,276,197 lbs $2,153,337	5,254,998 lbs $2,403,183	6,773,657 lbs $1,629,144	3,802,826 lbs $920,662	2,974,318 lbs $703,678	289,481 lbs $61,969	1,490,853 lbs $416,239	576,210 lbs $108,741
Pacific herring	13 lbs $16				77,040 lbs $24,068			
Lingcod		22,050 lbs $32,926		20,014 lbs $32,323	18,378 lbs $29,176	17,756 lbs $32,427	23,778 lbs $41,873	23,404 lbs $37,942
Bank rockfish			52,776 lbs $28,577					25,458 lbs $36,403
Brown rockfish								5,505 $34,865
Chilipepper rockfish	369,687 lbs $263,888	288,814 lbs $196,971	103,251 lbs $64,131					40,065 lbs $27,909
Gopher rockfish								3,420 $26,569

Table 4.3-1. Commercial Landings and Value of Major Species into San Francisco for the Years 2000 to 2007 (cont.)

Species	2000	2001	2002	2003	2004	2005	2006	2007
Rockfish (group bolina)	56,671 lbs $237,054	29,511 lbs $123,601	13,282 lbs $59,825			5,058 lbs $29,272	5,662 lbs $36,186	
Rockfish (group slope)			58,899 lbs $28,074		112,159 lbs $56,111			
Quillback rockfish	6,990 lbs $29,658	6,679 lbs $28,711						
Widow rockfish	192,901 lbs $107,634	56,781 lbs $38,036						
Sablefish	382,453 lbs $541,028	300,158 lbs $353,390	272,675 lbs $303,709	319,000 lbs $379,482	415,238 lbs $486,456	266,860 lbs $339,872	303,228 lbs $460,962	331,915 lbs $450,104
Chinook salmon	1,952,945 lbs $4,070,959	862,139 lbs $1,742,774	1,834,474 lbs $2,725,100	793,058 lbs $1,507,847	2,662,206 lbs $7,784,061	1,647,569 lbs $4,533,263	208,504 lbs $1,118,208	405,781 lbs $2,187,117
Sanddab	1,429,456 lbs $494,888	1,291,832 lbs $487,050	539,622 lbs $213,845	412,652 lbs $206,391	352,003 lbs $132,742	118,331 lbs $60,088	144,778 lbs $64,882	240,062 lbs $101,718
Pacific sardine			378,730 lbs $31,940		815,938 lbs $34,386	681,196 lbs $27,258		
White seabass								8,239 lbs $31,769
Dover sole	629,696 lbs $187,777	402,526 lbs $123,051	626,063 lbs $219,811	604,200 lbs $219,915	796,983 lbs $284,258	345,884 lbs $125,236	216,737 lbs $81,310	691,391 lbs $270,352
English sole	171,871 lbs $64,851	148,213 lbs $62,055	77,245 lbs $30,964	78,908 lbs $31,288	83,230 lbs $30,219		80,967 lbs $32,410	78,753 lbs $32,489
Petrale sole	192,325 lbs $257,040	230,384 lbs $296,558	129,024 lbs $142,464	197,810 lbs $227,714	211,161 lbs $230,428	264,692 lbs $302,224	449,746 lbs $475,420	558,127 lbs $598,036
Rex sole					64,388 lbs $26,543			

Table 4.3-1. Commercial Landings and Value of Major Species into San Francisco for the Years 2000 to 2007 (cont.)

Species	2000	2001	2002	2003	2004	2005	2006	2007
Sand sole	76,288 lbs $63,488	103,746 lbs $75,896	66,186 lbs $54,706	52,512 lbs $44,806	38,551 lbs $33,002	38,695 lbs $32,821		
Surfperch (unspecified)		8,431 lbs $25,659	17,556 lbs $40,581	17,444 lbs $39,149	22,983 lbs $57,797	11,145 lbs $35,342		
Swordfish		19,067 lbs $66,816		503,714 lbs $1,227,290	124,759 lbs $226,730			
Longspine thornyhead	95,464 $79,707	49,536 lbs $42,800	141,967 lbs $129,684	84,273 lbs $71,997	224,626 lbs $158,233	99,663 lbs $59,866	45,669 lbs $27,729	110,262 lbs $59,739
Shortspine thornyhead	43,940 lbs $40,848		45,344 lbs $51,071	35,301 lbs $39,189	63,603 lbs $68,730	44,620 lbs $50,938	21,274 lbs $33,455	57,193 lbs $58,917
Albacore tuna	97,587 lbs $108,258	104,851 lbs $116,455	51,001 lbs $89,315	30,835 lbs $46,539	54,433 lbs $70,191	24,498 lbs $36,073	22,606 lbs $43,086	57,435 lbs $55,560
Dungeness crab	794,394 lbs $2,082,849	1,108,433 lbs $2,958,364	2,933,302 lbs $6,000,538	3,400,467 lbs $5,933,176	4,042,902 lbs $7,283,912	3,668,533 lbs $6,693,840	3,773,768 lbs $7,553,057	1,493,123 lbs $4,127,528
Rock crab (unspecified)	39,844 lbs $44,030	38,520 lbs $48,157	29,282 lbs $50,218		22,946 lbs $71,322	13,400 lbs $23,604		
Spot prawn	45,401 lbs $362,627	52,544 lbs $439,595	37,886 lbs $276,177					
Bay shrimp	82,816 lbs $264,245	94,077 lbs $294,693 lbs	70,798 lbs $217,319	85,284 lbs $302,046	66,424 lbs $252,276	52,055 lbs $199,567	38,457 lbs $159,745	50,114 lbs $225,505
Brine shrimp	890,703 lbs $8,829	863,716 lbs $8,679	710,954 lbs $8,219	522,207 lbs $10,323	843,388 lbs $8,355	459,974 lbs $5,985	278,027 lbs $2,372	299,409 lbs $2,994
Squid			1,906,089 lbs $214,582	6,189,821 lbs $1,547,264	362,568 lbs $90,713			

Source: CDFG 2009

Table 4.3-2. Commercial Landings and Value of Major Species into Bodega Bay for the Years 2000 to 2007

Species	2000	2001	2002	2003	2004	2005	2006	2007
Cabezon	7,958 lbs $34,577							
California halibut	15,076 lbs $41,818	9,026 lbs $27,329	14,082 lbs $38,137	25,287 lbs $67,510	20,726 lbs $58,742	16,547 lbs $50,602		6,777 lbs $30,453
Pacific herring roe	321,394 lbs $126,881	318,103 lbs $117,698	476,524 lbs $152,721	179,736 lbs $56,010	509,863 lbs $163,372			
Chilipepper rockfish	82,590 lbs $66,291	58,331 lbs $40,240						
Widow rockfish	66,588 lbs $43,197							
Sablefish	142,123 lbs $141,869		36,687 lbs $39,451	56,567 lbs $71,956			20,713 lbs $25,298	
Chinook salmon	548,460 lbs $1,369,956		787,444 lbs $1,179,330	1,483,985 lbs $2,749,237	939,830 lbs $2,653,739	574,765 lbs $1,695,567	447,915 lbs $2,190,759	463,509 lbs $2,177,207
Dover sole	328,761 lbs $109,104	68,812 lbs $23,023	170,699 lbs $62,301	171,638 lbs $62,677				
Petrale sole	78,980 lbs $72,037	44,879 lbs $51,250	64,664 lbs $58,671	58,027 lbs $56,319				123,532 lbs $132,351
Longspine thornyhead	65,508 lbs $50,519		44,893 lbs $25,465	56,985 lbs $27,722				
Albacore tuna	79,497 lbs $85,428	344,129 lbs $287,330	106,774 lbs $84,744	36,650 lbs $48,966	57,987 lbs $47,611		25,275 lbs $43,443	
Dungeness crab	489,077 lbs $1,261,144	407,842 lbs $1,160,749	1,209,215 lbs $2,367,604	1,377,988 lbs $2,316,752	1,901,232 lbs $3,199,157	1,275,122 lbs $2,198,045	1,739,764 lbs $3,331,286	1,177,992 lbs $3,084,286
Spot Prawn	4,751 lbs $39,806	9,617 lbs $83,316	14,606 lbs $124,530					
Red sea urchin	670,470 lbs $565,832	428,570 lbs $317,098	948,273 lbs $535,244	157,515 lbs $71,970				

Source: CDFG 2009

Table 4.3-3. Commercial Landings and Value of Major Species into Monterey Bay for the Years 2000 to 2007

Species	2000	2001	2002	2003	2004	2005	2006	2007
Northern Anchovy	15,000,791 lbs $750,128	25,706,123 lbs $569,140	5,929,263 lbs $255,108	1,555,834 lbs $81,964	8,577,584 lbs $290,592	13,651,387 lbs $379,185	16,831,064 lbs $564,258	16,985,051 lbs $848,900
Butterfish Pacific pompano			43,008 lbs $41,243					
Cabezon	23,851 lbs $107,954	16,713 lbs $74,849	13,545 lbs $50,330	5,827 lbs $26,656	13,194 lbs $63,027	5,644 lbs $30,813	5,744 lbs $39,252	4,829 lbs $32,005
Starry flounder					20,699 lbs $31,423	15,517 lbs $26,306		
Grenadier	222,928 lbs $38,348	234,592 lbs $35,141	236,636 lbs $37,379	225,411 lbs $49,000	198,568 lbs $38,119	187,020 lbs $41,080	91,268 lbs $20,114	127,512 lbs $30,713
Hagfish								260,272 lbs $184,672
California halibut	46,238 lbs $104,048	45,830 lbs $112,062	84,135 lbs $205,129	52,313 lbs $133,185	100,618 lbs $289,563	67,992 lbs $221,253	70,868 lbs $233,128	8,032 lbs $28,345
Pacific herring								741,483 lbs $34,538
Lingcod					26,245 lbs $37,375			
Jack mackerel							310,177 lbs $30,127	367,634 lbs $36,168
Pacific mackerel					1,079,949 lbs $52,691			
Bank rockfish	41,274 lbs $28,253						43,409 lbs $33,126	
Black & Yellow rockfish	10,688 lbs $54,643	6,827 lbs $38,352	6,222 lbs $29,722		4,808 lbs $27,204	3,830 lbs $26,753	3,800 lbs $28,993	5,294 lbs $38,521
Blackgill rockfish	41,891 lbs $44,093	40,414 lbs $36,020		95,744 lbs $91,260	29,078 lbs $28,162		33,403 lbs $26,196	

Table 4.3-3. Commercial Landings and Value of Major Species into Monterey Bay for the Years 2000 to 2007 (cont.)

Species	2000	2001	2002	2003	2004	2005	2006	2007
Brown rockfish		8,042 lbs $44,507						
Chilipepper rockfish	140,036 lbs $93,267	153,015 lbs $91,236	75,504 lbs $43,061					
Gopher rockfish	12,835 lbs $59,596	21,906 lbs $105,766	17,206 lbs $78,412					5,359 lbs $35,793
Grass rockfish	5,268 lbs $32,989	3,847 lbs $25,143				3,154 $27,441	4,113 lbs $36,405	3,969 lbs $37,160
Rockfish (group gopher)	7,972 lbs $33,742							
Rockfish (group rosefish)				188,119 lbs $50,072	126,422 lbs $42,092	102,009 lbs $33,064	192,020 lbs $55,066	
Rockfish (group slope)		63,594 lbs $40,423	35,750 lbs $25,094				27,045 lbs $24,100	
Widow rockfish	77,882 lbs $47,361							
Sablefish	709,963 lbs $943,786	570,765 lbs $699,211	526,019 lbs $600,037	673,999 lbs $790,973	508,517 lbs $525,987	581,208 lbs $637,907	545,553 lbs $677,566	384,833 lbs $578,359
Chinook salmon	1,723,751 lbs $3,072,307	370,907 lbs $718,427	695,203 lbs $1,017,888	475,610 lbs $842,956	760,631 lbs $2,198,188	927,047 lbs $2,919,252	73,967 lbs $449,759	147,434 lbs $830,135
Sanddab	93,889 lbs $25,081	90,452 lbs $36,119	205,537 lbs $62,373	640,612 lbs $193,431	159,143 lbs $72,067	132,965 lbs $82,635		
Pacific sardine	25,059,731 lbs $969,047	15,658,063 lbs $1,434,123	29,998,833 lbs $1,289,283	17,432,494 lbs $667,100	34,047,402 lbs $1,193,567	17,899,896 lbs $568,386	39,045,718 lbs $1,642,783	76,623,389 lbs $3,190,479
White seabass	24,475 lbs $46,312	54,692 lbs $115,716	23,333 lbs $46,604					

Table 4.3-3. Commercial Landings and Value of Major Species into Monterey Bay for the Years 2000 to 2007 (cont.)

Species	2000	2001	2002	2003	2004	2005	2006	2007
Dover sole	1,095,224 lbs $346,658	924,238 lbs $296,954	878,152 lbs $285,270	1,000,780 lbs $322,641	579,811 lbs $208,322	386,809 lbs $119,488	428,810 lbs $128,809	51,359 lbs $17,399
English sole		92,013 lbs $34,667	55,805 lbs $20,927					
Petrale sole	93,564 lbs $105,685	124,796 lbs $127,446	73,752 lbs $73,220	53,386 lbs $47,622	119,309 lbs $131,284	251,358 lbs $260,134	188,435 lbs $207,612	119,779 lbs $145,391
Swordfish	29,347 lbs $108,061	6,521 lbs $19,137		15,242 lbs $41,740	7,705 lbs $24,880	46,620 lbs $156,910	37,044 lbs $103,845	69,711 lbs $226,925
Longspine thornyhead	357,695 lbs $397,826	223,682 lbs $243,191	341,463 lbs $373,922	295,520 lbs $366,372	122,191 lbs $147,674	112,953 lbs $108,681	161,074 lbs $149,167	80,536 lbs $91,739
Shortspine thornyhead	92,058 lbs $102,528	77,472 lbs $93,275	104,431 lbs $130,974	111,500 lbs $171,692	75,511 lbs $210,243	70,687 lbs $175,309	90,081 lbs $228,450	51,102 lbs $170,746
Albacore tuna	757,921 lbs $688,719	1,366,732 lbs $1,053,981	923,384 lbs $616,683	473,375 lbs $327,193	394,923 lbs $326,067	146,868 lbs $140,717	58,560 lbs $64,667	236,767 lbs $211,822
Bluefin tuna		95,707 lbs $101,242						
Dungeness crab	28,187 lbs $86,194	24,260 lbs $76,009	107,446 lbs $260,325	163,020 lbs $341,753	169,041 lbs $320,610	302,656 lbs $609,245	165,650 lbs $384,235	139,252 lbs $436,324
Spot prawn	37,513 lbs $345,959	48,389 lbs $473,359	81,880 lbs $768,816	58,236 lbs $586,299	47,804 lbs $519,893	44,975 lbs $529,053	61,833 lbs $781,146	39,485 lbs $499,013
Ocean shrimp (pink)	65,788 lbs $39,513							
Squid	15,708,698 lbs $1,881,726	17,078,248 lbs $1,773,494	55,263,371 lbs $6,787,256	30,691,176 lbs $7,920,422	12,219,049 lbs $2,852,367	4,224,691 lbs $985,507	1,122,817 lbs $254,041	71,222 lbs $7,659

Source: CDFG 2009

Pacific Herring (Whole Herring, Herring Roe, and Herring Roe on Kelp)

The Pacific herring population and the size of the fishery are dependent on oceanic and conditions in the Bay. Therefore, population sizes can be expected to fluctuate from year to year. According to CDFG, these fluctuations appear to be linked to El Niño events (Chambers 2007). Reported increases in eelgrass (*Zostera marina*) bed acreage in Central Bay (Merkel & Associates 2004) could also assist spawning and population growth. In addition, Pacific herring landings have varied greatly over the past century with fluctuating market demand that has shifted between its use for fishmeal, human consumption, bait, and pet food. In 1973, the market came into its most recent configuration in primarily supplying roe (fish eggs) for Japanese consumption. Since then, herring in San Francisco Bay have been harvested primarily for roe, with only small amounts of whole herring marketed for other purposes (CDFG 2008).

The roe fishery in California is limited to the four largest herring spawning areas which include San Francisco Bay, Tomales Bay, Humboldt Bay, and Crescent City Harbor. San Francisco Bay has the largest spawning population of herring and produces more than 90 percent of the State's annual herring catch (CDFG 2008).

Pacific herring landed in San Francisco Bay are currently marketed in one of three forms: whole fish, sac-roe, and roe on kelp. Landing data for the period of 2000 through 2007 are shown in Table 4.3-1, with herring roe making up the vast majority of the market. Whole herring fish have only been reported as landed twice within the past eight years, with one of the years reported as only 13 pounds (see Table 4.3-1). Significant landings and sales of whole herring only occurred in 2004, when 73,040 pounds were landed and valued at $24,068.

The herring sac-roe fishery is managed through a limited entry system first implemented during the 1973 to 1974 season when 17 permits were issued. During the 1990s, the number of herring permits peaked at over 450, with over 120 vessels participating. Vessels participating in the fishery have subsequently declined, and in the 2006 through 2007 season, permit renewals fell to 250, with only 25 actually participating (CDFG 2008).

Beginning with the 1984 to 1985 season, a sac-roe permittee received a permit on an experimental basis, to harvest roe on kelp using fronds of giant kelp (*Macrocystis* spp.) suspended from unenclosed floating rafts. The kelp is brought into the Bay from the coast. The end product is also marketed to the Japanese food industry. There are

11 roe-on-kelp permits available for the fishery in San Francisco Bay, which are available to permittees willing to trade their sac-roe permits for roe-on-kelp permits (CDFG 2008).

This heavily managed fishery is closely monitored and controlled so that, barring catastrophic events, it can be expected to continue fluctuating with annual oceanographic conditions and market demand.

Bay Shrimp

The bay shrimp is the dominant shrimp in most Pacific Coast estuaries, and the largest and most abundant large shrimp in San Francisco Bay. Bay shrimp are primarily found in lower South Bay and from North Bay to Suisun and Honker Bays. Juveniles migrate upstream to rear in shallow brackish water for several months. Maturing shrimp migrate downstream to cooler, higher salinity areas for reproduction. Abundance of bay shrimp has been directly linked to freshwater outflow from the Delta (IEP 2008). Abundance indices calculated from trawling (conducted by the Interagency Ecological Program) reached a decade high in 2006, associated with high spring outflow that year (IEP 2008).

Beam trawls are used to harvest shrimp only in San Francisco Bay waters east of the GGB and in San Pablo Bay. The trawl may be towed by motorized vessels but may not be retrieved by mechanical devices. Any fish, other than shrimp, caught in the trawl must be returned immediately to the water.

The Bay shrimp fishery between 2000 and 2007 averaged 67,500 pounds per year, with a range of approximately 38,000 to 94,000 pounds per year (see Table 4.3-1). The commercial value of these landings has ranged between $159,745 and $302,046 (see Table 4.3-1). At present, this fishery is market driven. Since the product is used almost exclusively for angler bait, the market demand is not expected to change significantly in the foreseeable future.

Dungeness Crab ~~(*Cancer magister*)~~

Although Dungeness crabs are not commercially harvested within San Francisco Bay, the Bay and Estuary play a key role in the growth and development of juvenile crabs (CDFG 2004). Most rearing of juvenile crabs within the region takes place in nearshore coastal waters, but estuaries such as Humboldt Bay and San Francisco Bay provide important nursery areas for the young (CDFG 2004). These juveniles return to adjacent coastal waters when they mature (Pauley et al. 1989). Crabs nurtured within the Bay are larger than cohorts who remained in the ocean. They also represent a larger

percentage of harvested crabs inhabiting coastal waters off the shore of San Francisco (Pauley et al. 1989).

Dungeness crabs are landed as far south as Santa Barbara, and northward to Crescent City. Eureka, San Francisco, and Bodega Bay report the largest landings in the State (CDFG 2009). The central California fishery encompasses a 400-square-mile area, including the Gulf of the Farallones and waters north to the Russian River. During the 1950s, the Dungeness crab fleet consisted of 200 to 250 boats. Many boats left the fleet as the fishery began to decline in the 1960s. Currently, the fleet consists of about 190 vessels (CDFG 2004).

The commercial Dungeness fishery is managed on the basis of the crab sex, season, and size; only male crabs may be retained in the commercial fishery. The central California season opens November 15 and continues through June 30. The fishery also imposes a minimum size restriction of 6.25 inches across the widest part of the carapace.[1]

CDFG estimates that in most years 80 to 90 percent of all available legal-sized male crabs are captured. However, recent studies have shown that essentially all molting females receive attention from males in northern California, suggesting that the Dungeness population is not limited by this capture (CDFG 2004). Dungeness crab populations appear to fluctuate in regular, multi-year cycles with total pounds landed reflecting this cycle.

Between 2000 and 2007, Dungeness crab has been the highest value harvested commercial species in both the San Francisco and Bodega Bay ports (see Tables 4.3-1 and 4.3-2). These two port centers combined averaged 3.9 million pounds of crab over the eight years with an average landing value of $7.7 million. Monterey Bay accounted for an average additional 137 thousand pounds landed over the same period, with an average landing value of $314,000 (see Table 4.3-3). As mentioned above, Dungeness crab populations undergo periodic cycles. In 2007, the reported landing for crab at San Francisco dropped from 3.8 million pounds in 2006 to 1.5 million pounds in 2007 (see Table 4.3-1). The 2008 to 2009 season, although still underway, has early reports of very low landings (LA Times 2009). These low adult population numbers are consistent with reported CDFG Bay index estimates of juvenile data abundance for 2005 and 2006 (IEP 2008). However, juvenile abundance index estimates for 2007 (IEP 2008) show slightly increased numbers, which is supportive of improved harvests beginning with the 2009 to 2010 season. Dungeness crab populations and harvests will

[1] Protective covering over the back of the first body section.

likely continue to fluctuate on a multi-year cycle. Increasing ocean water temperatures could result in a shift in the population northward, since adults and juveniles prefer colder temperature waters (Pauley et al. 1989).

Northern Anchovy

Northern anchovy are harvested in San Francisco Bay for use as both live and frozen bait for sport fisherman. Primarily, northern anchovy are harvested in central San Francisco Bay using a purse seine type net. Like the Bay shrimp fishery, harvests are market driven by demand by sport fisherman. As illustrated in Table 4.3-1, northern anchovy landings in San Francisco Bay ports has fluctuated greatly between 2000 and 2007, with a high of 256,796 pounds landed in 2000, and virtually no reported landings in 2003, 2004, 2005, or 2007. In comparison, landings of northern anchovy in Monterey Bay ports over the same period have ranged between 1 million and 25 million pounds per year, with landing values ranging between $81,964 and $848,900 (see Table 4.3-3).

Brine Shrimp

Brine shrimp are small crustaceans that grow in very saline waters and are used primarily as food for tropical fish. Brine shrimp are typically sold as live, frozen or freeze dried, or as egg cysts. The two principal areas in the United States where brine shrimp are harvested are the Great Salt Lake in Utah and San Francisco Bay. In San Francisco Bay, they are raised and harvested exclusively in the salt ponds of South Bay. As the number of salt ponds changes over time, the total volume of brine shrimp harvested can be expected to change proportionally. Although annual brine shrimp landings between 2000 and 2007 ranged between 278,027 and 890,703 pounds, averaging 608,547 pounds per year, the commercial value of this species is very small, ranging between $2,372 and $10,323 per year since 2000.

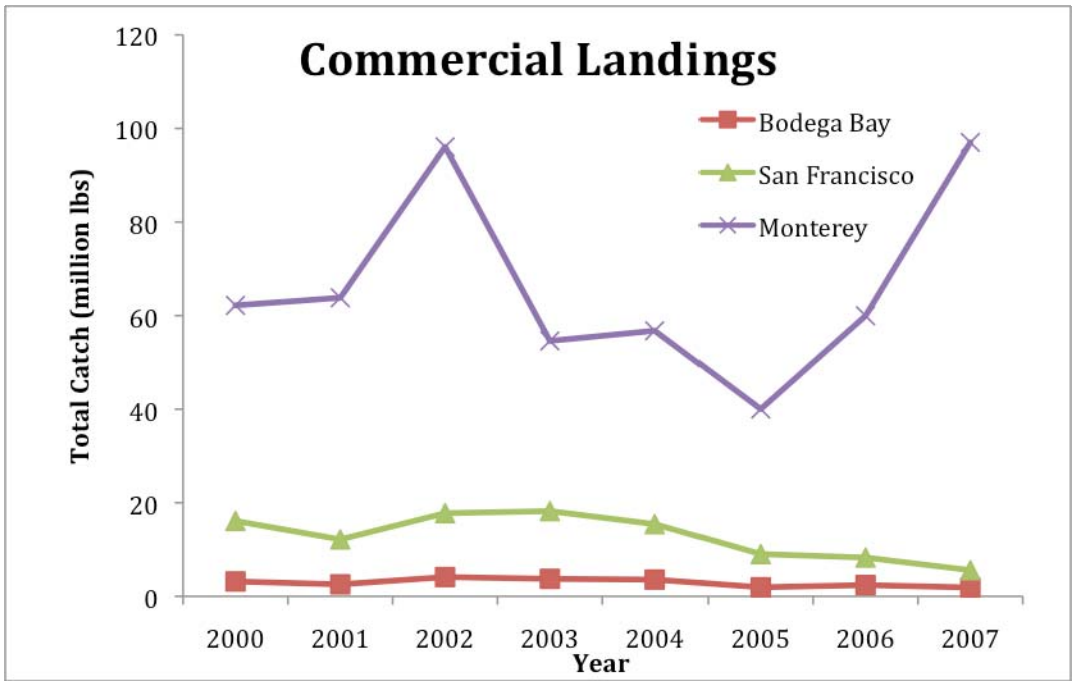
Coastal and Ocean Fishing, Monterey to Bodega

Tables 4.3-1 through 4.3-3 include the key species that are commercially harvested along the North Central Coast, both by landing weight and value, for the period 2000 through 2007. Approximately 48 species of fish and invertebrates are listed. The top ocean fisheries for the region over this time period, by value, include Dungeness crab; Chinook salmon; albacore tuna (*Thunnus alalunga*); squid; Pacific sardines (*Sardinops sagax*); swordfish (*Xiphias gladius*); California halibut (*Paralichthys californicus*); sablefish (black cod); sanddab; Dover sole, English sole, rex sole, sand sole, and petrale sole (*Microstomus pacificus*, *Parophrys vetulus, Errex zachirus, Psettichthys melanostictus*, and *Eopsetta jordani*); longspine and shortspine thornyhead (*Sebastolobus altivelis* and

S. alascanus); and spot prawn (*Pandalus platyceros*). Dungeness crab and Chinook salmon are the dominant fisheries for Bodega Bay (see Table 4.3-2) landings, whereas Monterey Bay is dominated by Pacific sardines, Chinook salmon, squid, sablefish, spot prawns, sole, and longspine and shortspine thornyhead (see Table 4.3-3). San Francisco landings are dominated by Dungeness crab, Chinook salmon, sablefish, California halibut, sanddab, and sole (see Table 4.3-1).

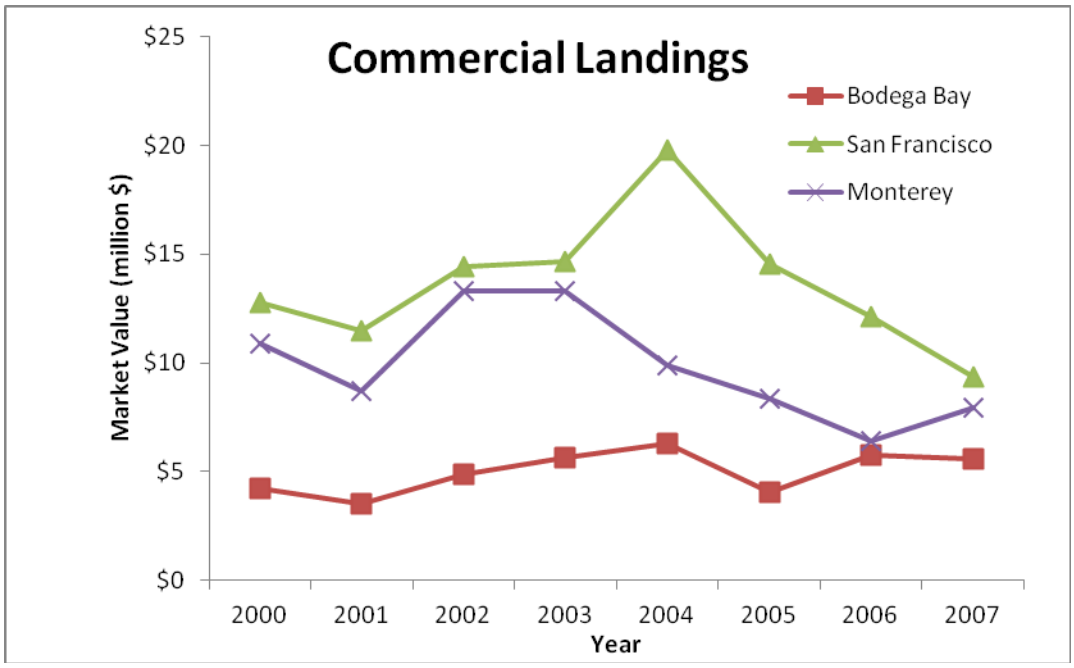
Trends in commercial fishery landings for Monterey, San Francisco, and Bodega Bays for the period 2000 through 2007 are also illustrated in Figures 4.3-1 and 4.3-2. Although the total pounds landed has remained fairly consistent for both Bodega Bay and San Francisco, it has fluctuated more widely for Monterey. Even though total landed pounds have remained fairly constant for San Francisco and Bodega, the value of those landings has fluctuated, reflecting shifts in the fish species landed as well as their market value. For example, rockfish harvests can be expected to continue to be closely regulated, with shifts in target species continuing to occur, until the fishery itself recovers from past overfishing. Groundfish (flatfish such as sole, halibut, sanddab) harvests can be expected to focus on key species like Pacific halibut and shift slightly as the fish populations periodically move along the coast, both north and south, in response to shifting oceanographic conditions. Likewise, Dungeness crab and Pacific herring populations and harvests will cycle in accordance with ocean temperature shifts, as well as increased or decreased freshwater flow through the Delta and San Francisco Bay. All commercially harvested fish and invertebrate populations will be affected by the occurrence of catastrophic events such as the *Cosco Busan* oil spill in 2007 and other natural and anthropogenic influences.

Finally, Chinook salmon ~~(*Oncorhynchus tshawytscha*)~~ is expected to remain a key commercially harvested taxa along the North Central Coast but should be expected to continue to be plagued with harvest limits and closures, as occurred in 2007 and 2008. In April 2008, the Pacific Fishery Management Council (PFMC), the National Marine Fisheries Service (NMFS), and the California Fish and Game Commission (CFCG) adopted a complete closure of the ocean salmon commercial and sport fisheries in California during 2008 (through April 30, 2009). On April 15, the ~~California Fish and Game Commission~~CFCG voted unanimously to prohibit commercial and recreational salmon fishing in oceanic State waters, which extend 3 miles off the coast. The Federal ban approved by the PFMC applies to U.S. waters extending from 3 miles to 200 miles off the coasts of California and Oregon. The ~~Commission~~ CFCG took the unprecedented action because runs of fall-run Sacramento Chinook salmon are experiencing a sharp decline over multiple years.



Source: CDFG ~~Commercial Landing Data,~~ 2009

Figure 4.3-1
Commercial Landings for Monterey, San Francisco, and Bodega Bay, by Weight, 2000-2007



Source: CDFG ~~Commercial Landing Data,~~ 2009

Figure 4.3-2
Commercial Landings for Monterey, San Francisco, and Bodega Bay, by Market Value, 2000-2007

These decreases in the salmon population have been attributed to water diversions to California water aqueducts, loss of spawning habitat, restricted migratory movement because of stream obstructions and dams, and other water related problems (e.g., water quality, temperature, etc.) including unfavorable ocean conditions. These factors have combined to cause reductions in the number of spawning native Chinook salmon (NRDC 2008, NOAA 1998, PFMC 2008).

Aquaculture and Ocean Mariculture

Throughout the State, commercial marine aquaculture facilities predominantly raise abalone, oysters, clams, scallops, seaweed, and mussels. Inland based hatcheries and aquaculture farms raise trout, steelhead, salmon, tilapia, catfish, crayfish, striped bass, sturgeon, and other fish species for market sale and stock replenishment (NOAA 2007). No mariculture operations currently exist within San Francisco Bay, but both Drakes and Tomales Bays in Marin County support major oyster farms (Chambers 2007). These farms are particularly vulnerable to oil spills and closures due to contaminated water.

Recreational Fisheries

For recreational fishing catch data, information from the Pacific States Marine Fisheries Commission (PSMFC) as reported through the Pacific Recreational Fishing Information Network (RecFIN) from the years 2004 to 2008, was reviewed (RecFIN 2009). This period coincides with the initiation of the California Recreational Fisheries Survey (CRFS), a collaborative effort of CDFG and PSMFC with funding from State and Federal sources.

Through RecFIN, data can be analyzed in a variety of manners. For this report, whole catch that was available for review by CRFS interviewers (RecFIN Type A), as well as catch that was not available for review, but was voluntarily reported by anglers (i.e., those caught and released (Type B1) and those caught but not released (Type B2)), were included in this review. These data are limited in that they rely upon a limited number of CRFS interviewers to generate Type A results and unknown representativeness of voluntary reports (Type B), but as the only consistent, ongoing database recording recreational fishing activity, it can be considered an indicator of recreational fishing catch.

Sport fishing occurs in all regions of the San Francisco Estuary and coastal and ocean areas beyond, and is conducted via multiple trip types, including by shore, pier, small

craft, and charter boat. It should be noted that there is an interim advisory issued by the California Office of Environmental Health Hazard Assessment (OEHHA) in effect for sport fish caught in San Francisco Bay and Delta due to elevated concentrations of mercury, polychlorinated biphenyls (PCBs), and other pollutants of concern (OEHHA 2009). The advisory recommends limits on the amount of fish that may be consumed by characteristics of both the fish caught and the potential consumer. This advisory, however, does not impact consumption of all popular sport fish in the area. For example, the advisory does not apply to salmon caught in the estuary or sport fish caught in the ocean. This advisory has been widely distributed, in multiple languages, and yet it is unknown how this outreach has affected fishing effort and consumption patterns.

Inland Sport Fishing, San Francisco Bay

Recreational fish catch data as reported by RecFIN for the marine inland waters of San Francisco Bay during the period 2004 to 2008 are presented in Table 4.3-4. These numbers are subject to the caveats discussed previously, but do provide an indicator of the breakdown of fish caught by sport fishers over this period.

In addition to well-publicized declines in some of the sensitive species inhabiting the San Francisco Estuary, estimated populations of some of the more popular sport fish have declined in recent decades. Descriptions of trends for a few select sport fish are detailed below.

Northern Anchovy

The northern anchovy is the most abundant fish in the lower estuary and an important prey species for many fishes and seabirds. The 2007 abundance index for northern anchovy was the second highest since 2001, but it remained below the 1980 through 2007 study period average; fish densities, as estimated from CDFG trawling efforts, were highest within the Central Bay, followed by South and San Pablo Bays (IEP 2008).

Jacksmelt

Abundance indices for the jacksmelt (*Atherinopsis californiensis*) peaked in 1985 and experienced a full decade of relatively low abundance in the 1990s. Jacksmelt abundance indices have rebounded somewhat and were at their highest level since 1985 in 2007 (IEP 2008).

Table 4.3-4. San Francisco Bay Marine Inland Waters Recreational Fish Landings (pounds) for the Period 2004-2008

Species	2004	2005	2006	2007	2008	Avg	% of total
Jacksmelt	16,908	20,053	20,795	8,641	17,003	16,680	26%
Northern Anchovy	12,257	4,538	18,142	5,199	7,702	9,568	15%
Striped Bass	6,679	10,373	3,480	3,508	2,796	5,367	8%
Shiner Perch	3,077	6,996	7,224	5,179	1,747	4,845	7%
Leopard Shark	3,806	4,181	5,233	2,700	1,737	3,532	5%
California Halibut	693	533	2,470	2,987	6,845	2,705	4%
Bat Ray	1,716	1,894	2,572	3,110	2,378	2,334	4%
White Croaker	5,196	2,504	1,100	770	1,335	2,181	3%
Silverside Family	0	297	9,200	910	401	2,162	3%
Topsmelt	472	7,527	865	712	240	1,963	3%
UnID'ed, Surfperch Family	3,484	2,273	1,654	1,409	331	1,830	3%
Pacific Sanddab	1,355	3,788	2,221	512	5	1,576	2%
Pacific Staghorn Sculpin	1,810	1,229	1,505	396	1,990	1,386	2%
Pacific Herring	185	1,473	2,760	2,167	55	1,328	2%
Walleye Surfperch	1,272	1,199	1,594	418	545	1,006	2%
Unidentified (Sharks)	686	444	1,210	1,485	1,106	986	2%
Black Perch	896	1,018	1,043	947	302	841	1%

Note: Species listed composed >1% of voluntary reported landings.
Source: RecFIN 2009.

Striped Bass

Striped bass are anadromous fish that were first introduced to the San Francisco Estuary over a century ago. The estimated population of legal-size fish in the San Francisco Estuary has declined from nearly 4.5 million in the early 1960s to approximately 1.0 million at the time of the last official estimate by the CDFG (IEP 2008).

Surfperch

All of the surfperches common to the San Francisco Bay Estuary underwent declines in their estimated abundance in the 1980s (IEP 2008). These declines prompted the CDFG to adopt a closed season for all surfperches except for shiner perch (*Cymatogaster aggregata*) from April 1 to July 31 in San Francisco and San Pablo Bays, as well as adopting new bag limits for shiner perch. The shiner perch abundance index

in 2007 was significantly higher than in 2006, but still only approximately one-third of the average since 1980 (IEP 2008).

Chinook Salmon

The recreational fishery for salmon has been very unstable for the last few years as a result of watershed and Bay-Delta habitat degradation. Sport salmon fishing has been closed in San Francisco Bay and Delta and offshore in both 2007 and 2008. Water diversion to California water aqueducts, dams, and other obstructions, along with many other water related problems (e.g., water quality, temperature, etc.), are considered to be at the root of the salmon problem (NRDC 2008, PFMC 2008).

Each April, the PFMC and the ~~Fish and Game Commission (~~CFGC~~)~~ adopt ocean salmon regulations that are in effect from May to the following April. Decisions were in part based upon the information in the PFMC Preseason Report II, 2008. The 2008 season opener for Fort Bragg was determined at the April 2007 PFMC and CFGC meetings. Some salmon were landed during ocean salmon sport fishery at the beginning of the year in February and March for Fort Bragg and other areas. In April 2008, the PFMC, the NMFS, and the CFGC adopted a complete closure of the ocean salmon commercial and sport fisheries in California during 2008 (through April 30, 2009). On April 15, the CFGC voted unanimously to prohibit commercial and recreational salmon fishing in State waters, which extend 3 miles off the coast. The Federal ban, approved by the PFMC, applies to U.S. waters extending from 3 miles to 200 miles off the coasts of California and Oregon. The CFGC took the unprecedented action because runs of fall-run Sacramento Chinook salmon were experiencing a sharp decline over multiple years.

A limited river salmon season was considered by the CFGC; only the Sacramento River from Knight's Landing to the Red Bluff Diversion Dam was allowed to remain open from November~~.~~ 1 to December~~.~~ 31. The 2008 recreational salmon fishing closures in the Central Valley went into effect July 3, 2008, to protect Sacramento River fall Chinook salmon. No Chinook are allowed to be kept anywhere on the Sacramento and San Joaquin Rivers or any of their tributaries, including the American and Feather Rivers. The only exception is from November 1 to December 31 in the Sacramento River between the Red Bluff Diversion Dam and Knight's Landing for a one-salmon bag and possession limit. While catch-and-release fishing for salmon is not prohibited, the salmon regulations were purposely structured as a zero-salmon bag limit to keep fishing open for other non-salmon species.

California Halibut

Sport landings of California halibut have been steadily increasing since 2005. Significant increases in the number of fish caught by sport fishermen in 2007 and 2008 were a direct result of the closure on sport fishing for salmon in the Bay. Adjacent coastal concerns about overfishing the resource have resulted in the CDFG reviewing the status of the fishery waters (SF Chronicle 2008, OCFM 2008). The CDFG initiated a survey of halibut and other fisheries (Hare and Clark 2008) that indicate that areas along the Oregon and California coasts have younger, increasing halibut catches. Halibut migrate long distances from shallow summer feeding grounds to deeper winter spawning grounds. Female halibut mature at around 12 years, while males mature at around 8 years. Adult fish tend to remain in the same area year after year, except for their migration to deepwater spawning grounds. The oldest halibut on record was 55 years old. Currently, the sport halibut season is open from May 1 to October 31, 7 days a week.

Coastal and Ocean Sport Fishing, Monterey to Bodega, CA

The predominant species collected by sport fishermen in ocean waters outside of San Francisco Bay and to the immediate north and south are various species of rockfish, anchovy, jacksmelt, sanddabs, lingcod, and perches. Most sport fishing, whether from shore, commercial sport fishing boats, or private boats, predominantly occurs within 3 miles of shore. Recreational fish catch data as reported by RecFIN for the central California ocean waters between San Luis Obispo to Mendocino during the period of 2004 to 2008 are presented in Table 4.3-5.

4.3.2 Regulatory Setting

State and Federal regulations governing commercial and sport fishing activities, as well as marine aquaculture operations, occur within the following two broad categories: resource protection, and management and regulatory control of human activity and development. Both State and Federal agencies have legislative jurisdiction within each category that can be either exclusive or complementary. The following section provides a brief overview of key legislation and agency responsibilities concerning commercial and sport fisheries, as well as ocean mariculture.

Federal

Salmon, groundfish, and pelagic fish species are managed under individual fisheries management plans (FMP) authorized under the Federal Fishery Conservation and

Table 4.3-5. Recreational Fish Landings (pounds) from Central California Ocean Waters (San Luis Obispo to Mendocino) for the Period 2004-2008

Common Name	2004	2005	2006	2007	2008	Avg.	% Total
Blue Rockfish	15,078	10,570	36,141	13,378	11,950	17,424	11.8%
Northern Anchovy	28,690	4,187	36,414	14,916	2,297	17,301	11.8%
Jacksmelt	17,120	6,736	13,869	10,306	18,418	13,290	9.0%
Rockfish Genus (Unidentified)	4,731	5,650	16,247	6,170	3,866	7,333	5.0%
Surfperch Family (Unidentified)	17,178	3,939	7,040	3,607	2,837	6,920	4.7%
Black Rockfish	5,938	7,041	9,590	4,187	6,089	6,569	4.5%
Barred Surfperch	13,285	2,841	3,021	4,283	6,183	5,923	4.0%
Chub (Pacific) Mackerel	651	1,751	14,001	5,904	5,361	5,534	3.8%
Shiner Perch	10,961	4,310	4,705	3,717	169	4,772	3.2%
White Croaker	10,671	4,086	4,141	2,872	974	4,549	3.1%
Lingcod	4,158	5,955	8,155	2,614	1,852	4,547	3.1%
Gopher Rockfish	2,025	4,102	6,251	3,956	5,861	4,439	3.0%
Walleye Surfperch	9,854	1,616	5,767	2,702	1,931	4,374	3.0%
Pacific Sanddab	3,217	1,530	6,317	3,791	5,286	4,028	2.7%
Olive Rockfish	3,232	3,465	3,955	3,662	3,738	3,611	2.5%
Yellowtail Rockfish	2,011	872	2,702	7,122	3,053	3,152	2.1%
Chinook Salmon	0	8,699	4,492	1,580	23	2,959	2.0%
Pacific Sardine	6,049	769	1,764	2,276	3,379	2,847	1.9%
Surf Smelt	294	9,554	1,814	9	806	2,495	1.7%
Redtail Surfperch	1,025	3,285	1,471	1,258	1,213	1,650	1.1%
Striped Seaperch	966	1,618	448	2,602	1,814	1,490	1.0%
Pacific Staghorn Sculpin	1,124	561	1,117	1,910	2,416	1,425	1.0%

Note: Species listed composed >1% of voluntary reported landings.
Source: RecFIN 2009

Management Act (FCMA), the Sustainable Fisheries Act, and the American Fisheries Act. The PFMC, a regional entity with representatives from the fishing industry, the public, and State and Federal biological resource management agencies, imposes seasonal, geographic, and gear limitations to maintain healthy fisheries populations and prevent overfishing. ~~NOAA~~ NMFS is responsible for protecting special-status species under the Endangered Species Act (ESA). Additionally, the US Fish and Wildlife Service (USFWS), the U.S. Army Corps of Engineers, and the U.S. Environmental Protection Agency have regulatory authority to manage development and ensure the protection of aquatic resources.

State and Local

Within California, most of the legislative authority over fisheries management is enacted within the Marine Life Management Act (MLMA). This law directs CDFG and ~~the Fish and Game Commission~~ CFGC to issue sport and commercial harvesting licenses, as well as licenses for aquaculture operations. CDFG, through the CFGC, is the State's lead biological resource agency and is responsible for enforcement of the State endangered species regulations and the protection and management of all State biological resources. CDFG, through the Oil Spill Prevention and Response Act (OSPR), is responsible for the State's spill response capability.

In addition to the regulations administered by CDFG, marine mariculture facilities and operations are also required to comply with the land use and leasing regulations of the California State Lands Commission (CSLC) as they apply to the use of State tide and submerged lands and water. Water quality management and the permitting of discharges into State waters are administered by the California Regional Water Quality Control Board under the Porter-Cologne Act and the Federal Clean Water Act. Depending on the siting of the mariculture operation, either the California Coastal Commission or the San Francisco Bay Conservation and Development Commission has responsibility for coastal and shoreline development (under both State and Federal regulations). In addition, local counties and cities have planning, land use, construction, and operations regulations and authority for commercial activities within their geographic jurisdictions.

4.3.3 Significance Criteria

An impact to commercial and sport fisheries would be considered significant if:

- Project activities temporarily reduce any fishery in the vicinity by 10 percent or more during a season, or reduce any fishery by 5 percent or more for more than one season;
- Project activities affect kelp and aquaculture harvest areas by 5 percent or more; or
- Harvesting time is lost due to harbor closures, impacts on living marine resources and habitat, and equipment or vessel loss, damage, or subsequent replacement.

4.3.4 Impact Analysis and Mitigation

Impacts to Aquaculture or Commercial and Recreational Sport Fishing from Routine Operations at the Shore Marine Oil Terminal

The ~~shore~~ Shore Marine Oil Terminal (MOT) is not located in an area of the Bay-Delta where any current commercial fishing occurs. Also, at present, no kelp harvesting or aquaculture is conducted within the Bay-Delta, nor is any projected to occur in the foreseeable future. As mentioned previously, recreational sport fishing can occur at any location within the Bay-Delta, but as a result of the ~~Shore~~ MOT's location adjacent to the main Western Delta navigation channel, combined with high surface currents at the MOT~~Terminal~~, the Project ~~Site~~ area is not considered a significant recreational sport fishing location. Routine Project operations are considered part of baseline conditions, and would not be expected to result in any temporary reduction of commercial or recreational sport fishing, result in lost harvesting time because of harbor closures, ~~or~~ damage~~s to~~ equipment or vessels, or cause ~~sufficient~~ impacts on living marine resources or habitat that would have an ~~a~~effect on either commercial or recreational sport fishing or aquaculture (No Impact).

Space Use and Navigational Conflicts Between Transiting Tankers and Barges and Commercial Fishermen

Although no commercial fishing occurs in the immediate vicinity of the ~~Shore~~ MOT in San Pablo Bay, vessels in transit between the Project site and the Pacific Ocean transit through active Pacific herring, northern anchovy, and California bay shrimp fishing areas. The proposed Project would not result in any increases in vessel trips to and from the MOT, so no additional navigational conflicts are anticipated over those that may have occurred in past years and are part of baseline conditions. All tankers and barges are restricted to existing navigation channels through the Bay and are required to cooperate with the U. S. Coast Guard (USCG) Vessel Traffic Plan for San Francisco Bay. They are restricted to the navigation channel while transiting the Bay. Commercial fishing boats, primarily trawlers, are able to avoid any large vessels located within the shipping channel (No Impact).

Space Use Conflicts with Recreational and Sport Fishing Activities

Sport fishing navigational or space use conflicts between recreational anglers (operating from either commercial party boats or private vessels) and the tankers and barges transiting to/from the MOT are expected to be minimal. Recreational fishing for starry flounder (*Platichthys stellatus*), cabezon (*Scorpaenichthyes marmoratus*), shark,

salmon, rockfish, sturgeon, halibut, striped bass, and anchovy occurs from shore and both anchored and drifting boats, depending on the targeted fish species. Since no additional vessel trips are proposed by Shore, no additional conflicts with recreational fishermen are expected over what may have occurred it the past and are part of baseline conditions. In addition, most recreational fishing in the Bay is targeted within the shallower areas of the Bay and not within the shipping lanes. As with commercial fishing boats, tankers and barges are restricted to the shipping lanes. As a result, recreational fishermen are expected to be able to avoid any tankers or barges (No Impact).

Contamination to Bay-Delta Waters from Vessel Hull Anti-fouling Paint

Anti-fouling paint from tankers and barges using the MOT may contribute to the contaminant loading of Bay-Delta waters and sediments. The amount of contaminant material originating from vessels using the MOT is assumed to be relatively small and lower than other known sources of similar contaminants to the Bay, such as the Ports of Oakland and San Francisco and the nearby mothballed merchant marine fleet. The San Francisco Bay-Delta is not listed as impaired for any of the contaminants known to be contained in currently used anti-fouling paint. As a result, any contaminants that might originate from the continued use of the MOT are not expected to affect fish species targeted by commercial or recreational fishermen (No Impact).

Impact FSH-1: Impacts to Commercial and Recreational Fishing as a Result of Accidental Releases or Spills

Accidental releases or spills of refined hydrocarbon products shipped through the MOT can impact the Bay-Delta, open coast ecosystems, and commercial or recreational fisheries. (Class I and II)

The accidental release of refined product from either the MOT or from product in-transit to or from the terminal has the potential to have a significant impact on the Bay-Delta, open coast ecosystems, and commercial or recreational fisheries. The severity of the impact is dependent on not only the material spilled and its toxicity to marine biota, but the volume of material released, the location of the release, the time of year the spill occurs, and the effectiveness of spill response and cleanup activities.

Although no active commercial fisheries occur in the immediate vicinity of the MOT, in eastern San Pablo Bay, the area is important foraging and migration habitat for fish and invertebrate taxa that have either commercial or sport fishing importance, including

Chinook salmon, sturgeon, Dungeness crab, California Bay shrimp, striped bass, Pacific herring, northern anchovy, and Pacific sardines, to mention just a few.

The actual qualitative and quantitative ~~a~~effects, both direct and indirect, of an accidental release on either commercial or sport fishing in the Bay-Delta and open coast regions can be very localized for small spills or widespread for larger spills. Small spills might result in the temporary closure of harbors and marinas and/or short-term displacement or halting of fishing, while cleanup activities are underway. Larger spills could result in delays or closures of fishing seasons, as occurred in 2007 following the *Cosco Busan* spill when the Dungeness crab season opening offshore Central California was delayed (FMSA 2007).

In addition, as illustrated in the Trajectory Analysis Planner (TAP) spill model trajectories for a 20,000-barrel diesel spill at or near the GGB (see Section 4.1, Operational Safety/Risk of Accidents, Figures 4.1-7 and 4.1-8), bivalve mariculture operations in Drakes Bay could be affected. Effects on bivalve mariculture could range from ~~and at minimum,~~ temporary~~ily~~ ~~restricted from~~ restrictions on selling shellfish, to ~~having~~ substantial mortality in ~~their~~ cultured bivalves.

Small (i.e., less than 50 barrels) and moderate (i.e., less than 434 barrels) spills from the terminal are expected to have limited effect on fish taxa of commercial or recreational sport importance. The principal impacts are anticipated to be restricted access to portions of the Bay-Delta during cleanup activities and possible temporary closures of marinas. In the event that released spill material is allowed to enter any of the marinas near the MOT, then the use of those boats for recreational fishing might be further restricted while they are cleaned.

Larger tanker or barge source releases have the potential to impact larger regions of the Bay-Delta. The two modeled scenarios indicate that most of Central Bay and part of the open coast adjacent to the GGB could be affected. Eelgrass (*Zostera spp.*) beds in Central Bay and the southern portion of North Bay are critical habitat for Pacific herring spawning, as are other submerged vegetation, pier pilings, etc. in this area of the Bay-Delta, which would all be significantly impacted. Pacific herring, anchovy, and Bay shrimp trawling also occur in Central Bay and North Bay, which would be affected by a major tanker or barge spill of refined product.

In summary, small and moderate spills of refined product at or near the MOT would be expected to have limited short-term impact to commercial and recreational fisheries, mostly involving restricted access and use of Bay-Delta waters or boats (Class II). A

major tanker or barge spill would be anticipated to have a significant impact on Bay-Delta commercial and recreational sport fishing, including limited access to Bay-Delta or open coast waters, use of boats and equipment, reduced or closed fishing seasons, reduced standing stocks of important fish and invertebrate populations, and potential loss of critical habitat (Class I).

Mitigation Measures for Impact FSH-1:

Implement **MM BIO-3b**, and **MM BIO-3c**. (See Section 4.2, Biological Resources.)

Implement **MM OS-1a** through **MM OS-1d~~c~~**. (See Section 4.1, Operational Safety/Risk of Accidents.)

MM FSH-1a. Post Notices at Spill Sites, Marinas, Launch Ramps, and Fishing Sites. In the event of a~~n~~ Marine Oil Terminal or associated vessel spill, Shore shall immediately post notices in English, Vietnamese, Cantonese, and Spanish, in areas most likely to be seen by commercial and recreational sport fishing interests. Notices shall include a contact telephone number and website where the public can obtain additional information on spill response cleanup activities, Bay-Delta area or fisheries closures, fish consumption advisories issued as result of the spill, how to become involved in cleanup activities, and how to document and obtain compensation for financial impacts.

MM FSH-1b. Compensation. If damages to fishing operations or related businesses occur due to a~~n~~ Marine Oil Terminal or associated vessel spill, reasonable compensation shall be provided. Potential losses shall be documented as soon as possible after the spill incident has occurred. Shore's spill response manuals will be updated to provide effective procedures for notifying the public how and where to submit compensation claims, personnel or entities responsible for processing claims, and procedures and deadlines for the timely processing of claims.

Rationale for Mitigation

MM BIO-3b, BIO-3c, and OS-1a through OS-1d~~c~~ collectively reduce the potential for small, moderate, and major spills of refined products transported through the MOT to be reduced and thereby reduce the potential impact to Bay-Delta commercial and recreational sport fishing. Mitigation Measures MM FSH-1a and MM FSH-1b provide for better notification and communication with commercial and recreational sport fishermen

about the areas of the Bay-Delta that may be closed, potential impact of the spill on fish and invertebrate fish species of commercial or recreational fishing importance, how to become involved in cleanup activities, and if financially affected by the spill, how to obtain timely compensation.

Residual Impacts

Residual impacts following small and moderate spills of refined product at or near the MOT would be mitigated to less than significant (Class II). Residual impacts following a major tanker or barge spill would be significant and unavoidable (Class I).

Impact and Mitigation Summary

Table 4.3-6 presents a summary of commercial and sport fisheries impacts that would be associated with the proposed Project and corresponding recommended mitigation measures.

Table 4.3-6. Summary of Commercial and Sport Fisheries Impacts and Mitigation Measures

Impact	Mitigation Measures
FSH-1: Impacts to Commercial and Recreational Fishing as a Result of Accidental Releases or Spills	**MM BIO-3b.** Develop Cleanup Procedures
	MM BIO-3c. Conduct Post-Spill Studies
	MM OS-1a. Install Tension-Monitoring Devices
	MM OS-1b. Install an Allision Avoidance System
	MM OS-1c. Replace Existing Loading Arms
	MM OS-1d. Install Remote Release System
	MM FSH-1a. Post Notices at Spill Sites, Marinas, Launch Ramps, and Fishing Sites
	MM FSH-1b. Compensation

4.3.5 Impacts of Alternatives

No Project Alternative

Under the No Project Alternative, Shore's lease would not be executed and the existing MOT would be subsequently decommissioned with its components reused, abandoned in place, removed, or a combination thereof. However, unless local demand and dependency on the petroleum products currently transported through the MOT are significantly reduced, potential impacts to commercial and recreational sport fishing would not decrease and would only be transferred to another terminal or mode of transportation.

Delay in implementation of mitigation measures for addressing commercial and recreational sport fishing impacts from these other terminals could result in increased risk and impact to these activities. If a new lease for the MOT was not granted, decommissioning and deconstruction of the MOT would occur with its own unique set of potential environmental impacts to commercial and recreational sport fishing. However, mitigation measures would likely be required, ensuring that impacts would be less than significant.

Limitations on Terminal Use Alternative

Under the Limitations on Terminal Use Alternative, Shore's lease would be executed but with restrictions on the number, type, or size of marine vessels that would be allowed to call at the marine terminal, or restrictions on the type of product that could be loaded or unloaded. Unless local demand for these products is significantly reduced, it is anticipated that the gasoline, diesel, jet fuel, and other refined products currently shipped through the MOT would be transported through other Bay-Delta marine terminals and/or railroad and truck terminals, with similar or greater projected impacts to commercial and recreational sport fishing, depending on the transportation mode, facility location, design, and operation. However, the potential impacts associated with the MOT may be slightly reduced under this alternative compared to the proposed Project.

4.3.6 Cumulative Projects Impact Analysis

The cumulative projects listed in Table 3.5-1 (see Section 3.5, Cumulative Projects) would collectively have an effect on Bay-Delta commercial and recreational sport fishing by incrementally adding to present space use conflicts and potentially resulting in increased organic and inorganic contaminant loading. However, no commercial fishing occurs in the immediate vicinity of the MOT, and recreational fishing occurs from shore and both anchored and drifting boats primarily within the shallower areas of the Bay. Therefore, because vessel traffic and operations at the MOT would not increase from existing levels, the proposed Project would not present any cumulatively considerable contribution to cumulative space use conflicts.

With regard to cumulative impacts on recreational and commercial fisheries from the effects of an accidental spill of petroleum products, the proposed Project was determined to have a significant unavoidable effect following a major tanker or barge spill, and this would also be cumulatively considerable (Class I).

Small and moderate spills of refined product at or near the MOT would be mitigated to less than significant for the proposed Project. Because none of the cumulative projects identified in Table 3.5-1 would be likely to result in overlapping spill impacts at or near the MOT, the proposed Project's impact would not be cumulatively considerable (Class II).

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4.4 HYDROLOGY AND WATER QUALITY

4.4.1 Environmental Setting

The Shore Marine Oil Terminal (MOT) operated by Shore Terminals LLC (a NuStar Energy Company), hereafter referred to as Shore, is primarily located along the coastal area of the Carquinez Strait, a narrow channel that separates San Pablo Bay from Suisun Bay. Both the San Pablo and Suisun Bays represent segments of the larger hydrologic unit known as the San Francisco Bay Estuary. The Project area includes both land-based portions and submerged areas at the mouth of the Carquinez Strait. For the purposes of this analysis, the baseline conditions against which impacts are analyzed are those conditions existing as of the publication of the proposed Project's Notice of Preparation (NOP), November 28, 2007.

Surface Water

The Project area lies within the San Francisco Bay Area Hydrologic Basin. The San Francisco Bay functions as the drainage outlet for waters of the Central Valley and includes the main Bay segments such as San Pablo and Suisun Bays. The region's waterways, wetlands, and bays mark the centerpiece of the United States' fourth largest metropolitan region. Because of its highly dynamic and complex environmental conditions, the basin supports an extraordinarily diverse and productive ecosystem. The basin's deepwater channels, tidelands, and marshlands provide a wide variety of habitats that have become increasingly vital to the survival of several plant and animal species.

San Francisco Bay can be divided into distinct water bodies that have different physical and chemical properties. The northern reach includes three major embayments: Suisun Bay, San Pablo Bay, and Central Bay. The northern reach conveys outflow from the Delta at its head and thus can be considered to be a typical estuary. Central Bay is deeper and more oceanic in character than the northern and southern reaches because of its proximity to ocean inflow through the Golden Gate Bridge (GGB), a deep narrow channel through the coastal range. The southern reach is separated from the northern reach by the Central Bay and extends from the Oakland Bay Bridge to San Jose.

Fresh water strongly influences environmental conditions in the San Francisco Bay Estuary. Over 90 percent of the estuary's fresh water originates from the Sacramento-San Joaquin drainage basin and enters the northern reach. The Sacramento River provides about 80 percent of this flow, and the San Joaquin River and other streams

contribute the remainder. The remaining 10 percent of fresh water comes from the San Francisco Bay watershed and flows into the southern reach. The southern reach, like the northern reach, has the physiographic characteristics of an estuary but lacks the freshwater inflow to drive a strong estuarine circulation. As a result, circulation in the southern reach is influenced predominantly by tides, evaporation, and wastewater discharges and thus functions much like a tidally oscillating lagoon for most of the year.

In the San Francisco Bay Water Quality Control Plan (Basin Plan), the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) identifies a number of beneficial uses of San Pablo Bay that must be protected. The beneficial uses include commercial and sport fishing, estuarine habitat, industrial service supply, fish migration, navigation, recreation, wildlife habitat, preservation of rare and endangered species, and fish spawning (SFBRWQCB 2007a).

The land-based portions of the Project area are located within the Carquinez Drainages watershed, which includes all drainages of northwestern Contra Costa County that flow into Carquinez Strait. These drainages, which typically flow from south to north and are characterized as short and steep, ~~which~~ are mostly unnamed with the exception of Canada del Cierbo, Edwards Creek, and Bull Valley Creek. The MOT is located within the Edwards Creek subwatershed.

Groundwater

Shallow groundwater aquifers are closely linked to the local surface waters. As surface water runoff flows from the East Bay Hills toward the Bay, it percolates through permeable alluvial soils into underlying shallow groundwater systems. Deeper groundwater aquifers are also present, separated in areas from shallow groundwater by low-permeability soil layers. According to a map of groundwater basins and subbasins of California, the MOT is not located in a recognized basin, likely due to the presence of relatively shallow soils. Therefore, the local groundwater system is likely not significant and generally not used for any water supply sources.

Climate

Northwestern Contra Costa County has a moderate climate with an average of approximately 23 inches of precipitation per year. The climate is generally characterized by relatively cool summers and mild winters. In summer, a steady marine wind blows through the GGB and up the Carquinez Strait. This moderating influence is reflected in

average July temperatures of 65 degrees Fahrenheit (°F) and average January temperatures of 50°F.

Water Quality

As required by the ~~f~~Federal Clean Water Act (CWA), described below, the SFBRWQCB identified San Pablo Bay as an impaired water body for the following contaminants, as part of what is known as the 303(d) list: chlordane, pesticides (i.e., dichloro-diphenyl-trichloroethane [DDT] and dieldrin), dioxins, furan compounds, ~~exotic (~~non-indigenenous~~)~~ species, mercury, polychlorinated biphenyls (PCBs), selenium, and nickel (SFBRWQCB 2007b). The sources of these pollutants or stressors include nonpoint sources from urban development, atmospheric deposition, ballast water, industrial and municipal point sources, agriculture, natural sources, and ~~exotic~~ non-native species.

Pollutants of Concern (POC) that are not specified within the 303(d) list for San Pablo Bay are addressed by the California Toxics Rule (CTR) which compiles recommended water quality criteria for priority pollutants. The CTR includes Criteria Maximum Concentrations (CMC), which are estimates of the highest concentration of a POC in surface water to which an aquatic community can be exposed briefly without resulting in an unacceptable effect. POC data were collected for the Regional Monitoring Program (RMP) for Water Quality in the San Francisco Estuary at the Davis Point (BD40) sample location, which is located just west of the MOT; this monitoring was conducted at least once annually from 1993 through 2001. The POCs include arsenic, cadmium, lead, copper, mercury, nickel, selenium, silver, and zinc. The sampling results suggest that, with the exception of copper, ambient conditions near the MOT are typically well below those considered acutely toxic.

Sea Level Rise

Scientific research to date indicates that observed climate change around the globe will likely result in sea level rise. Sea level rise is defined as the measured, continual increase in steady astronomical tide elevations. Historic average sea levels in San Francisco Bay, measured at the San Francisco (Fort Point) National Oceanic and Atmospheric Association (NOAA) tide station were reviewed for this analysis. The monthly mean sea levels during the period of 1906 to 2006 show a linear trend in sea level rise of approximately 2 millimeters per year (mm/yr). During this period, unusually high spikes are noted due to El Niño episodes. However, evidence of accelerated sea level rise due to effects of global climate change is not yet evident in the measured tide record for San Francisco.

Predictions in sea level rise at the GGB are considered reasonable for the MOT. Based on the measured sea level rise of 2.01 mm/yr, the sea level rise at the MOT over a 30-year period is estimated to be 0.2 foot (see Appendix C1). Mean Higher High Water (MHHW) at the terminal is presently 5.86 feet (~~MLLW~~MHHW), and would therefore expected to be approximately 6.06 feet (~~MLLW~~MHHW) in 2039.

The Bay Conservation and Development Commission (BCDC) estimate of long-term eustatic sea level rise is 16 inches over 50 years, or 0.75 foot over the 30-year lease period (see Appendix C1). ~~The BCDC estimate is speculative and based on predictions of events that have not yet occurred.~~

Tsunami Impacts at the Terminal

Tsunamis are long seismic sea waves generated by sudden vertical movements of the sea floor caused by submarine earthquakes, landslides, or volcanic activity. In general, the strength of a tsunami diminishes with the distance it travels. The likelihood of a tsunami being generated by nearby events in the San Francisco Bay Area is low because most of the region's faults have a strike-slip style of faulting where the primary mode of movement is lateral rather than vertical. Accordingly, a tsunami affecting the Bay Area will likely have a distal source with diminished energy. Further, the wave will be constricted as it crosses into the ~~b~~Bay through the GGB. As it moves across the Bay it will dissipate further as it reaches the more inland areas of the Bay, such as where the MOT is located.

During historical times from 1851 to the present, 51 credible tsunamis have been observed or recorded inside San Francisco Bay. Forty-three of the tsunamis were generated in the far Pacific Ocean and eight were generated either in San Francisco Bay, San Pablo Bay, or near to the coast. Of these, five produced waves exceeding 1.6 feet in the San Francisco Bay area. Two tsunami events in 1960 and 1964 are well documented and summarized below:

- The 1960 magnitude 9.5 earthquake off the coast of Chile created a tsunami with maximum wave height (trough to crest) of 2.9 feet at the NOAA Presidio (GGB) tide station and 0.1 foot at an unspecified tide station in Carquinez Strait.

- The 1964 magnitude 9.2 earthquake in Prince William Sound, Alaska, created a tsunami with a maximum measured wave height of 7.5 feet at the NOAA Presidio tide station. The measured tsunami height in Carquinez Strait was not available but it was likely a much lower height.

Locally generated tsunamis within San Francisco Bay and San Pablo Bay are not known to create high waves. A magnitude 6.7 earthquake beneath San Pablo Bay in 1898 created maximum tsunami wave heights of 2.0 feet within the San Francisco Bay-San Pablo Bay area. By comparison, the 1906 San Francisco earthquake generated tsunami waves of 0.3 foot.

Numerical modeling of tsunami wave propagation in San Francisco Bay shows a maximum modeled wave height at the MOT of 1.8 feet (see Appendix C-1). In general, the site is very well protected from significant tsunami effects. The recommended maximum tsunami height and current velocity that should be assumed to occur at the terminal during the lease period are 2.6 feet and 1.0 knot (nautical miles per hour), respectively. The tsunami wave is expected to behave as a long-period steady current by the time it reaches the MOT.

4.4.2 Regulatory Setting

Federal

Federal Clean Water Act

Under the ~~Clean Water Act (~~CWA~~)~~ of 1977, the U.S. Environmental Protection Agency (USEPA) seeks to restore and maintain the chemical, physical, and biological integrity of the nation's waters. The statute employs a variety of regulatory and nonregulatory tools to reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff. The CWA authorizes the USEPA to implement water quality regulations. The USEPA has delegated authority for water permitting to the California State Water Resources Control Board (SWRCB), which has nine regional boards. The San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) regulates water quality in the Project area.

Section 303 of the ~~Clean Water Act~~CWA requires states to establish water quality standards consisting of designated beneficial uses of water bodies and water quality standards to protect those uses for all waters of the United States. Under ~~Clean Water Act~~ CWA section 303(d), territories and authorized tribes are required to develop lists of impaired waters. Impaired waters are those that do not meet water quality standards, even after point sources of pollution have installed the required levels of pollution control technology. The law requires that these jurisdictions establish priority rankings for waterways on the lists and develop action plans to improve water quality. This process includes development of Total Maximum Daily Loads (TMDLs) that set waste

load[1] allocations for point source and load allocations for nonpoint source pollutants. The Ducheny Bill (Assembly Bill [AB] 1740) requires the SWRCB and its nine Regional Water Quality Control Boards to post this list and to provide an estimated completion date for each TMDL.

National Pollutant Discharge Elimination System

Part of the ~~Clean Water Act~~ CWA provides for the National Pollutant Discharge Elimination System (NPDES), in which discharges into navigable waters are prohibited except in compliance with specified requirements and authorizations. Under this system, municipal and industrial facilities are required to obtain an NPDES permit that specifies allowable limits, based on available wastewater treatment technologies, for pollutant levels in their effluent. In California, the USEPA has delegated the implementation of this program to the SWRCB and its nine Regional Water Quality Control Boards.

Also covered under NPDES as of December 18, 2008, the ~~Final~~ Vessel General Permit for Discharges Incidental to the Normal Operation of Vessels was signed by the USEPA.[2] The 2008 Vessel General Permit (VGP) regulates discharges incidental to the normal operation of vessels operating in a capacity as a means of transportation. The VGP includes general effluent limits applicable to all discharges; general effluent limits applicable to 26 specific discharge streams; narrative water-quality based effluent limits; inspection, monitoring, recordkeeping, and reporting requirements; and additional requirements applicable to certain vessel types. Recreational vessels as defined in section 502(25) of the ~~Clean Water Act~~ CWA are not subject to this permit. In addition, with the exception of ballast water discharges, non-recreational vessels less than 79 feet (24.1 meters) in length, and all commercial fishing vessels, regardless of length, are not subject to this permit.

[1] The load represents the total amount of a pollutant that can be discharged over a given time period. This differs from the discharge limits that usually focus on the concentration of a pollutant in the wastewater discharged into the receiving water.

[2] The USEPA signed the final VGP on December 18, 2008, with an effective date of December 19, 2008. Subsequently, the U.S. District Court for the Northern District of California signed an order providing that "the exemption for discharges incidental to the normal operation of a vessel, contained in 40 CFR § 122.3(a), is vacated as of February 6, 2009." Therefore, the regulated community needed to comply with the terms of the VGP as of February 6, 2009. Pursuant to this action, the SWRCB issued its section 401 certification for the VGP on December 17, 2008, and modified its certification on February 4, 2009. This modification deleted certification conditions #1, #2, #5, #7, #8, #9, #10, #13, #14, #15, and 7.1 and 7.2 from certification condition #16 and Attachments 4, 5, and 6 from certification condition #17.

Oil Pollution Act

The Oil Pollution Act of 1990 (OPA 90) established a single uniform Federal system of liability and compensation for damages caused by oil spills in U.S. navigable waters. The ~~Act~~ OPA 90 requires removal of spilled oil and establishes a national system of planning for, and responding to, oil spill incidents. It includes provisions to:

- Improve oil spill prevention, preparedness, and response capability;
- Establish limitations on liabilities for damages resulting from oil pollution;
- Provide funding for natural resource damage assessments;
- Implement a fund for the payment of compensation for such damages; and
- Establish an oil pollution research and development program.

The Secretary of Interior is responsible for spill prevention, oil spill contingency plans, oil spill containment and cleanup equipment, financial responsibility certification, and civil penalties for offshore facilities and associated pipelines in all Federal and State waters. The U.S. Department of Transportation (DOT) designated the U.S. Coast Guard (USCG) as the lead agency for offshore oil spill response, which includes responsibility for coordination of Federal responses to marine emergencies. The USCG is also responsible for enforcing vessel compliance with the ~~Act~~ OPA 90.

Marine Plastic Pollution Research and Control Act

Originally enacted as the Act to Prevent Pollution from Ships, it prohibited any discharge of oil from a ship within 12 nautical miles (nm) (22 kilometers (km)) of land, unless it did not exceed 15 parts per million (ppm) (15 ~~mg~~milligrams per ~~L~~liter) or the ship had oil-water separating equipment. The Act was amended in 1987 to implement Annex V of the International Convention of the Prevention of Pollution from Ships. As such, it prohibits the discharge of plastic, garbage, and floating dunnage within 3~~three~~ nm (6~~six~~ km) of land. Beyond 3~~three~~ nm (6~~six~~ km), garbage must be ground to less than 1 inch (0.025 meter), but discharge of plastic and floating dunnage is still restricted. This Act requires manned offshore platforms, drilling rigs, and support vessels operating under a Federal oil and gas lease to develop waste management plans and to post placards reflecting discharge limitations and restrictions on plastics and other forms of solid wastes. The USCG enforces these requirements.

USCG Regulatory Authority

Primary responsibility for the enforcement of U.S. maritime laws and regulations falls upon the USCG. The USCG is responsible for managing and regulating provisions for safe navigation of vessels in U.S. waters, as well as the enforcement of environmental and pollution prevention regulations. As such, the USCG provides for the regulation and enforcement of hazardous working conditions on the outer continental shelf (OCS), for the management and regulations of measures for pollution prevention in territorial waters, and for ensuring the implementation of provisions in the Oil Pollution Act, ~~and~~ the Marine Plastic Pollution Research and Control Act, and the National Invasive Species Act. The USCG also enforces the ~~Clean Water Act~~ CWA, including certain components of the USEPA Vessel General Permit, and approval of procedures to be followed and the equipment used for the transfer of oil from vessel to vessel and between onshore and offshore facilities and vessels. The USCG also conducts pollution surveillance patrols to detect oil discharges within the territorial sea and contiguous zone and has enforcement authority over violations. The USCG maintains strike team responsibilities should an oil spill occur.

State

Porter-Cologne Act

The SWRCB and its nine Regional Water Quality Control Boards share the responsibility under the Porter-Cologne Act to formulate and adopt water policies and plans, and to adopt and implement measures to fulfill ~~Clean Water Act~~ CWA requirements. Specific to the proposed Project area, the Regional Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) serves to protect the water quality of the State consistent with identified beneficial uses.

Prior to authorizations of waste discharge by the Regional Board, the Porter-Cologne Act requires reports of waste discharges to be filed. The Regional Board then prescribes Waste Discharge Requirements, which serve as NPDES permits under a provision of the Porter-Cologne Act. The Basin Plan, the Enclosed Bays and Estuaries Plan, and the NPDES permit regulate discharges from the refinery wastewater treatment plant into San Pablo Bay.

State Water Resources Control Board

The SWRCB administers water rights, water pollution control, and water quality functions statewide. It provides policy guidance and budgetary authority to nine Regional Water

Quality Control Boards, which conduct planning, permitting, and enforcement activities. The SWRCB shares the authority for implementation of the ~~Clean Water Act~~ CWA and the State Porter-Cologne Act with the nine Regional Boards. (See the discussion of the NPDES above for further discussion of SWRCB and the VGP.) The water quality near the MOT is under the jurisdiction of the SFBRWQCB.

Developed to apply statewide to all enclosed bays and estuaries, the Enclosed Bays and Estuaries Plan was one of the water quality policies that the SWRCB developed for California. As defined by the SWRCB, enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. San Francisco Bay and its constituent parts, including San Pablo Bay, fall under this category. However, State water quality control plans with water quality criteria for priority toxic pollutants were subsequently invalidated by a State court order in 1994.

California Ocean Plan

The SWRCB, according to legislative policy set forth in ~~Section~~ section 13000 of the California Water Code, is responsible for developing and implementing the California Ocean Plan for protection of the quality of ocean waters and to control the discharge of waste to ocean waters of the State. Ocean waters are defined as the territorial marine waters of the State as defined by California law and do not include enclosed bays, estuaries, and coastal lagoons. However, if a discharge outside of territorial waters could affect the quality of ocean waters of the State, then the discharge may be regulated to assure no violation of the Ocean Plan will occur. The Plan includes setting water quality objectives based on protection of identified beneficial uses.

Water Quality Control Plan for the San Francisco Region (Basin Plan)

The SFBRWQCB is responsible for developing and implementing the Water Quality Control Plan for the San Francisco Region (Basin Plan), which documents approaches to implementing State and Federal policies in the context of actual water quality conditions. The SFBRWQCB's other activities include permitting of waste discharges, and implementing monitoring programs of pollutant effects.

On June 21, 1995, the ~~Board~~ SFBRWQCB adopted a revised Basin Plan, which the SWRCB and the Office of Administrative Law approved in 1995. The Basin Plan identifies beneficial uses of receiving waters, water quality objectives imposed to protect the designated beneficial uses, and strategies and schedules for achieving water quality objectives. Section 303(c)(2)(B) of the ~~Clean Water Act~~ CWA requires Basin Plans to

include water quality objectives governing approximately 68 of USEPA's list of 126 pollutants.

Water quality objectives are achieved primarily through the establishment and enforcement of Waste Discharge Requirements for each wastewater discharger. The Basin Plan was amended in 1992 to include stricter water quality criteria than had previously been adopted under the 1991 Enclosed Bays and Estuaries Plan. Although the Enclosed Bays and Estuaries Plan was later invalidated by court order, certain water quality criteria based on that plan remain in the Basin Plan. State policy for water quality control in California is directed toward achieving the highest water quality consistent with maximum benefit to the people of the State. Therefore, all water resources must be protected from pollution and nuisance that may occur from waste discharges. Beneficial uses of surface waters, groundwaters, marshes, and mudflats serve as a basis for establishing water quality standards and discharge prohibitions to attain this goal.

The State Implementation Policy~~ (SIP)~~, also implemented by the SFBRWQCB, establishes the policy for determining effluent limitations for toxic pollutants~~. The SIP~~ and establishes the implementation policy for all toxic pollutants including dioxins and furans. The ~~SIP~~ policy also requires monitoring for a minimum of 3 years by all major NPDES dischargers for the 17 dioxin and furan compounds, whether or not a limit is necessary to prevent exceedance of the water quality standard that has been established for one of the dioxin compounds (2,3,7,8-TCDD). In summary, the steps involve:

- Identifying applicable criteria and objectives;
- Determining whether there is a reasonable potential for the pollutant to cause or contribute to exceedance of a water quality criterion or objective;
- Calculating a value for the effluent limit taking into consideration the applicable criteria or objective, and discharge variability; or
- If a TMDL is in effect, assigning a portion of the loading capacity to the discharge.

California Marine Invasive Species Act of 2003

Vessels 300 gross tons or larger and capable of carrying ballast water into the coastal waters of the State are subject to the Marine Invasive Species Act (MISA) (Public Resources Code (PRC) §§ 71200 through 71271). MISA's stated purpose is to move

the State expeditiously toward the elimination of the discharge of non-indigenous species to waters of the State. MISA is administered by the Marine Invasive Species Program, housed within the California State Lands Commission's (CSLC's) Marine Facilities Division (MFD).

Vessels subject to MISA are required to manage ballast water and vessel biofouling in order to prevent non-indigenous species introductions. Any ballast water to be discharged in waters of the State must be exchanged at legally specified distances offshore, depending upon where the vessel is transiting from, and where the ballast water intended for discharge originates (see PRC §§ 71201.7, 71204.3 and 71204.5, 2 CCR § 2280 *et seq*.).

In 2007 the CSLC adopted in regulation performance standards for ballast water discharge as directed by PRC section 71205.3 (2 CCR § 2291 *et seq*.). California's performance standards will be progressively implemented between January 1, 2010 and January 1, 2016. The specific date of compliance depends on the vessel's year of construction and ballast water capacity.

MISA also requires the master, owner, operator, or person in charge of a covered vessel, to adopt specified best management practices to minimize the uptake and release of non-indigenous species by discharging only minimal amounts of ballast water essential for the vessel's operation while in State waters, and minimize the discharge and uptake of ballast water in areas within, or that may directly affect, marine sanctuaries, marine preserves, marine parks, or coral reefs. Additionally, the master, owner, operator, or person in charge should minimize or avoid uptake of ballast: (1) within waters known to have infestations or populations of non-indigenous organisms and pathogens, (2) near a sewage outfall, or known or reported areas with the presence of toxic algal blooms, (3) where tidal flushing is known to be poor or in turbid waters, (4) in darkness when bottom-dwelling organisms may rise up in the water column, and (5) where sediments have been disturbed, such as near dredging operations or where propellers may have recently stirred up the sediment.

Biofouling organisms are to be controlled on the vessel's wetted surface areas, including ballast tanks. Vessels must remove biofouling organisms from their wetted surfaces on a regular basis (approximately every five years) in order to reduce the likelihood of the introduction of species from vessel biofouling (PRC § 71204(f)). Vessels must also rinse anchors and anchor chains when retrieving the anchor to remove organisms and sediments at their place of origin.

All vessels are required to complete and submit a Ballast Water Reporting Form, an annual Hull Husbandry Reporting Form, maintain a vessel-specific ballast water management plan and ballast tank log book, remit the necessary fee to the Board of Equalization, and submit to compliance verification inspections. Vessels that discharge ballast treated by a ballast water treatment system into California waters must file additional treatment technology reporting forms. Special exceptions to compliance with MISA are provided for vessels of the armed forces and vessels of "innocent passage," as defined in PRC section 71202.

~~Shipping operations that involve vessels of 300 gross tons or larger, being of either United States or foreign registry, and carrying, or capable of carrying, ballast water into the coastal waters of the state after operating outside of the coastal waters of the state are subject to the Marine Invasive Species Act (MISA) (Public Resources Code sections 71200 through 71271), which revised and expanded the California Ballast Water Management for Control of Non-indigenous Species Act of 1999 (AB 703). MISA is administered by the CSLC and imposes specific requirements on the master, owner, operator, or person in charge of a covered vessel, to minimize the uptake and release of non-indigenous species, by discharging only minimal amounts of ballast water that are essential for the vessel's operation while in state waters; minimize the discharge and uptake of ballast water in areas within, or that may directly affect, marine sanctuaries, marine preserves, marine parks, or coral reefs, within waters known to have infestations or populations of non-indigenous organisms and pathogens, near a sewage outfall, or known or reported areas with the presence of toxic algal blooms, where tidal flushing is known to be poor or in turbid waters, in darkness when bottom-dwelling organisms may rise up in the water column, and where sediments have been disturbed, such as near dredging operations or where propellers may have recently stirred up the sediment fouling organisms from the hull, piping, and tanks on a regular basis.~~

~~Fouling organisms are to be controlled both in ballast tanks and from the hull by cleaning ballast tanks regularly in mid-ocean waters, or under controlled arrangements in port or in dry dock, to remove fouling organisms and sediments, and to dispose of those organisms and sediments in accordance with local, state, and federal law; by rinsing anchors and anchor chains when retrieving the anchor to remove organisms and sediments at their place of origin; the removal and proper disposal of hull fouling organisms from hull, piping, propellers, sea chests, and other submerged portions of a vessel, on a regular basis. The act additionally requires the master, owner, operator, agent, or person in charge of a covered vessel, to develop a ballast water management plan specific for the vessel that enables the master or other appropriate ship's officer or~~

~~crew member to train all ship's personnel on the proper management of ballast water and fouling organisms on the ship so that non-indigenous species are not introduced into California waters. This plan and other ballast water management and ship fouling organism control action records, is to be available to the CSLC. Special exceptions to compliance with MISA are provided for vessels of the armed forces and vessels of "innocent passage," as defined in section 71202.~~

~~The Marine Facilities Division (MFD) of the CSLC administers the State's Marine Invasive Species Program.~~ The CSLC vessel Inspection Program consists of field offices located in both Northern and Southern California and implements a monitoring program to ensure compliance. All vessels are required to submit to compliance inspections, which include sample collection of ballast water and sediment, examination of documents, and any additional appropriate inquiries as needed. The ~~Act~~ MISA specifies that field inspection of ballast water and sediments be conducted from at least 25 percent of arriving vessels, with enforcement administered through the imposition of administrative civil and criminal penalties.

California Oil Spill Prevention and Response Act

Following the 1989 *Exxon Valdez* crude oil spill and 1990 *American Trader* crude oil spill off Huntington Beach, the Lempert-Keene-Seastrand Oil Spill Prevention and Response Act was passed to help prevent future spills and increase response capabilities. The Act covers all aspects of marine oil spill prevention and response in California. As both a prevention and response organization, the Office of Spill Prevention and Response (OSPR) has the Department of Fish and Game's public trustee and custodial responsibilities for protecting, managing, and restoring the State's fish, wildlife, and plants. It is one of the few State agencies in the nation that has both major pollution response authority and public trustee authority for wildlife and habitat. This mandate ensures that prevention, preparedness, restoration, and response will provide the best protection for California's natural resources. The Act also gave the CSLC certain authority over marine terminals.

Local

Bay Conservation and Development Commission

The San Francisco Bay Plan was completed and adopted by the ~~San Francisco Bay Conservation and Development Commission (~~BCDC~~)~~ in 1968, ~~and~~ submitted to the California Legislature and Governor in January 1969, and most recently amended in

October 2011 (BCDC 2011). The Bay Plan was prepared by the BCDC over a three-year period pursuant to the McAteer-Petris Act of 1965, which established the BCDC as a temporary agency to prepare an enforceable plan to guide the future protection and use of San Francisco Bay and its shoreline. In 1969, the Legislature acted upon the BCDC's recommendations in the Bay Plan and revised the McAteer-Petris Act by designating the BCDC as the agency responsible for maintaining and carrying out the provisions of the Act and the Bay Plan for the protection of the Bay and its natural resources and the development of the Bay and shoreline to their highest potential with a minimum of Bay fill.

The McAteer-Petris Act directs the BCDC to exercise its authority to issue or deny permit applications for placing fill, extracting materials, or changing the use of any land, water, or structure within the area of its jurisdiction, in conformity with the provisions and policies of both the McAteer-Petris Act and the San Francisco Bay Plan. Thus, the BCDC is directed by the Act to carry out its regulatory process in accord with the Bay Plan policies and Bay Plan maps which guide the protection and development of the Bay and its tributary waterways, marshes, managed wetlands, salt ponds, and shoreline. The Bay Plan policies relate to the safety of fills, dredging, and protection of shoreline among other issues.

The BCDC is charged with:

- Regulating all filling and dredging in San Francisco Bay. This includes San Pablo and Suisun Bays, sloughs and certain creeks and tributaries that are part of the Bay system, salt ponds, and certain other areas that have been diked-off from the Bay;

- Regulating new development within the first 100 feet inland from the Bay to ensure that maximum feasible public access to the Bay is provided;

- Minimizing pressures to fill the Bay by ensuring that the limited amount of shoreline area suitable for high-priority water-oriented uses is reserved for ports, water-related industries, water-oriented recreation, airports and wildlife areas;

- Pursuing an active planning program to study Bay issues so that BCDC plans and policies are based upon the best available current information;

- Administering the Federal Coastal Zone Management Act within the San Francisco Bay segment of the California coastal zone to ensure that Federal activities reflect BCDC policies; and

- Participating in the region-wide State and Federal programs to prepare a Long-Term Management Strategy (LTMS) for dredging and dredge material disposal in San Francisco Bay.

Contra Costa County Watershed Program (CWP)

The Contra Costa County Watershed Program (CWP) is responsible for implementation and enforcement of the stormwater quality program in the unincorporated area of Contra Costa County. The CWP includes: new development and construction controls; public education and industrial outreach; municipal maintenance; inspection activities; and illicit discharge control activities. CWP staff implements the Contra Costa Clean Water Program Joint Municipal ~~National Pollutant Discharge Elimination System (~~NPDES~~)~~ permits issued by the ~~San Francisco Bay Regional Water Quality Control Board~~ SFBRWQCB and the Central Valley Regional Water Quality Control Board (Central Valley RWQCB) for the unincorporated areas of the county. The Joint Municipal NPDES permits contain a comprehensive plan to reduce the discharge of pollutants in stormwater to the "maximum extent practicable" (MEP). Many of the requirements of the CWP would not apply to the MOT with the exception of the construction controls enforcement.

Contra Costa County General Plan

The Project would be required to conform to the following Contra Costa County General Plan policies:

Water Resources Goals

Goal 8-T: To conserve, enhance, and manage water resources, protect their quality, and assure an adequate long-term supply of water for domestic, fishing, industrial, and agricultural use.

General Water Resources Policies

Policy 8-75: Preserve and enhance the quality of surface and groundwater resources.

Policies for Activity Along Natural Watercourses

Policy 8-91: Grading, filling, and construction activity near watercourses shall be conducted in such a manner as to minimize impacts from increased runoff, erosion, sedimentation, biochemical degradation, or thermal pollution.

Contra Costa County Code

The ordinance code for Contra Costa County is current through Ordinance 2005-34 and the October 2005 code update, which includes ordinances relating to Hazardous Materials Release Plans and Responses. The following ordinance would be applicable to the MOT:

> *450-2.002 Purpose:* Health and Safety Code Chapter 6.95 requires, among other things, that any business which handles a specified quantity of a hazardous material establish a business plan for emergency response to a release or threatened release of a hazardous material, which includes an inventory of hazardous materials handled by the business and report to the administering agency and the State Office of Emergency Services, occurrences of specified releases or threatened releases of hazardous materials.
>
> The purpose of this division is to impose regulations in addition to Health and Safety Code Chapter 6.95, for the protection of the public and emergency rescue personnel in the county and to facilitate implementation of said chapter, as authorized by Health and Safety Code section 25500. (Ordinances. 88-74 ~~section~~ § 2, 87-5 ~~section~~ § 2).

4.4.3 Significance Criteria

Impacts to marine water quality are considered significant if any of the following apply:

- The water quality objectives contained in the Water Quality Control Plan for the San Francisco Basin are exceeded;
- The water quality objectives in the California Ocean Plan are exceeded;
- The water quality criteria in the California Toxics Rule are exceeded;
- Project operations or discharges occur that change background levels of chemical and physical constituents or elevate turbidity, producing long-term changes in the receiving environment of the site, area, or region, thereby impairing the beneficial uses of the receiving water; or
- Contaminant levels in the water column, sediment, or biota are increased to levels shown to have the potential to cause harm to marine organisms even if the levels do not exceed formal objectives in the Water Quality Control Plan.

In addition to the significance criteria mentioned above, this analysis also included an evaluation of potential impacts as a result of sea level rise and tsunami hazards. As discussed above, predictions in sea level rise based on historical data estimate sea level rise at a rate of 2.01 mm/yr. At this rate, the sea level rise at the MOT over a

30-year period is estimated to be 0.2 foot (see Appendix C-1). Mean Higher High Water (MHHW) at the terminal is presently 5.86 feet (~~MLLW~~MHHW), and would therefore be expected to reach 6.06 feet (~~MLLW~~MHHW) in 2039. Similarly, BCDC estimates a long-term eustatic sea level rise of 16 inches over 50 years, or 0.75 foot over the 30-year lease period (see Appendix C1). While the BCDC estimate is speculative and based on predictions of events that have not yet occurred, the BCDC estimate represents a relatively small change in sea level that would not be likely to significantly affect the existing mooring system at the MOT during the 30-year lease period. Either of these relatively small changes in sea level would not be expected to affect operations at the MOT during the lease period, and there would be no impact on the MOT. Therefore, the potential impacts of sea level rise on the MOT are not discussed further in this document.

The tsunami hazard for the MOT has been estimated at a maximum height of 2.6 feet, based on modeling results (see Appendix C-1). The MOT in its current configuration and location is fairly well protected. Potential waves of 2.6 feet might be expected to interrupt operations; however, they are not expected to cause measurable damage to the terminal or moored vessels (see Appendix C-1). Therefore, the potential impacts of tsunamis on the MOT are not discussed further in this section.

Finally, potential impacts to the aquatic communities of San Francisco Bay from the introduction of ~~exotic~~ non-indigenous or harmful species via ships' ballast water are discussed in detail in Section 4.2~~3~~, Biological Resources.

4.4.4 Impact Analysis and Mitigation

Petroleum Product Spills

As part of routine operations under the proposed new lease, the MOT would continue to handle large quantities of petroleum products. The pipelines used to offload the petroleum products from berthed vessels are connected to storage facilities (which are not part of the MOT) located upland of the wharf. The wharf pipelines used to transfer petroleum products are limited to maximum operating pressures of 150 pounds per square inch (psi). Pressure gauges are installed at the MOT and dock pump manifold to monitor pipeline pressures. All receiving lines contain one-way check valves which prevent product backflow. Wharf piping is pressure relieved at the upland tank farm and governed by 150 psi pressure relief devices.

An Oil Spill Response Plan and Manual, last updated in August 2005, provides the protocol that would be taken in the event of an accidental release. The existing MOT maintains a supply of spill response equipment such as 1,600 feet of 18-inch curtain containment boom (800 feet on each end) for immediate response to an accidental release. According to the existing Oil Spill Response Plan, second level spill response services are provided by National Response Corporation (NRC) for on-water, onshore, and shallow-water response. NRC equipment in the Bay Area includes 73 boats, 64,900 feet of boom, 20 skimmers, 80,615-barrel storage capacity, and other miscellaneous equipment.

The existing facility revised its Oil Spill Response Plan in December 2000, and updated the Manual in August 2005. In the past, Shore has also participated in emergency response drills provided by California OSPR and the USCG. The existence of a thorough spill response plan can be an effective means of minimizing the potential impact of an accidental release. Overall, the operations under the new lease would be similar to the existing operations (baseline) with the types and quantities of hazardous materials not substantially changing. While there is no guarantee against accidental upset conditions, appropriate preventative measures, combined with the faculty to provide swift response in the event of a release, can minimize the potential impacts. Operational safety measures are also discussed separately in Section 4.1, Operational Safety/Risk of Accidents. Adherence to the requirements of the Oil Spill Response Plan along with other operational safety measures as required by local, State, and Federal regulations would ensure that the potential impact from petroleum oil spills is less than significant (Class III). The potential impacts on water quality affecting biological resources are discussed in Section 4.2, Biological Resources.

Contaminants that Do Not Exceed Water Quality Objectives

The presence of hydrocarbon-based fluids and solids in or on operational equipment and vessels poses a potential for the accidental release of these materials into Bay waters. As discussed above, operational protocols proposed by Shore are designed to minimize the potential for accidental releases, and existing improvements include the use of secondary containment for all anticipated MOT drips and small releases. However, even strict adherence to these protocols and spill response measures cannot absolutely guarantee that no contaminants will ever be released. Implementation of the spill response measures that are also proposed as part of Shore operational protocols, as also described in the impact analysis for Impact HWQ-2 (below), would minimize the potential release of hydrocarbon-based fluids and solids to the Bay. As also discussed

in Section 4.2, Biological Resources, the operational protocols and spill response plans would provide initial protection and a regulatory approved plan for swift control of any potential spill incident.

In addition, the pollutants or stressors for San Pablo Bay that have been identified in the Water Quality Control Plan do not include hydrocarbon-based fluids or solids and largely consist of contaminants (i.e., pesticides and herbicides) that would not be associated with MOT operations. Therefore, the potential impact from any contaminants originating from the MOT that do not exceed Water Quality Control Plan objectives is less than significant (Class III).

Water Quality Impacts due to Release of Hazardous Materials During Routine Operations and Potential for Accident Conditions

Marine anti-fouling paints have been commonly used to reduce nuisance algal and ~~marine growth~~biofouling on ships. These paints include high concentrations of biocides that contain copper, sodium, and zinc, ~~and tributyltin (TBT)~~among others, all of which are toxic to marine life that may settle on or attach to the ~~hull~~ wetted surfaces of ships. Usage of these paints, as is discussed in Section 4.2, Biological Resources, is essential under the MISA to reduce introduction of invasive species through ~~hull~~ vessel biofouling. Vessels berthing at the MOT routinely use anti-fouling paints and would continue to do so in the future with the proposed Project, in compliance with MISA and ~~other~~ related regulations. Thus, potential impacts from biocides, other than tin biocides, used on vessels berthed at the MOT are considered part of the existing baseline conditions for the MOT. ~~Tin biocides are addressed in Impact HWQ-2.~~

Project operations require the handling of hazardous materials such as fuels, oils, and waste products for operation and maintenance of facility equipment such as the handling and disposal of hazardous waste ballast water from moored vessels at the terminal. Inadvertent release of large quantities of these materials into the environment could adversely impact Bay waters and affect water quality objectives, standards, and goals. Existing equipment and operating procedures include spill prevention measures and containment of work areas. The wharf deck is surrounded by a 6-inch-high curb to contain any potential spills or contaminated stormwater runoff, which is then directed into a 3-barrel-capacity sump. Normal operations include emptying the sump immediately upon filling, which is automatically triggered through an initial threshold level, and then pumping liquid contents into a 2-inch-diameter steel slop line that discharges to a slop tank at the upland main terminal. The sump is inspected daily by an on-site employee. The slop tank is eventually emptied for off-site disposal. Vessels

are also required to meet Federal and State ballast water regulations. These regulations are part of the cooperative agreements with the CSLC, USCG, and the SFBRWQCB under the Water Quality Control Plan that prohibit vessel wastes from being discharged into the Bay.

Therefore, the existing containment features that are part of operations are designed to prevent ~~any~~ or at least minimize to the extent possible any discharges of contaminants into the Bay. Otherwise, the MOT does not include any direct discharges to the Bay which would impact any water quality objectives found in the San Francisco Bay Water Quality Control Plan. Similarly, without any discharges to the Bay, there would be no potential for the water quality objectives of the California Ocean Plan to be exceeded.

Water quality criteria found in the ~~California Toxics Rule (~~CTR~~)~~ contain ~~Criteria Maximum Concentrations (~~CMCs~~)~~, which are quantified estimates of the highest concentration of contaminants (including arsenic, cadmium, lead, copper, mercury, nickel, selenium, silver, and zinc) in surface water to which an aquatic community can be exposed briefly without resulting in an unacceptable effect. ~~The CMC concentrations along with d~~Data were collected at least once annually from 1993 through 2001 for the Regional Monitoring Program (RMP) for Water Quality in the San Francisco Estuary at the Davis Point (BD40) sample location, which is located just west of the MOT~~; this monitoring was conducted at least once annually from 1993 through 2001~~. These results suggest that, with the exception of copper, ambient conditions near the MOT are typically well below those considered acutely toxic. For copper, this exceedance is not atypical, and the Regional Water Quality Control Board has developed objectives intended to manage copper concentrations in the Bay. However, as mentioned above, the MOT does not include any direct discharges to the Bay and has secondary containment features to minimize the potential for residual contaminants to enter the Bay. Therefore, the MOT would not significantly impact the CTR criteria.

No changes in daily operations, numbers, or types of vessel using the MOT are proposed by Shore. The small size of the tankers and barges calling on the MOT requires less water depth than what is present in the San Francisco Bay navigation channels. As discussed in Section 4.2, Biological Resources, disturbance of seafloor sediments from prop wash is expected to be no greater than the natural daily tidal-induced disturbance in the area. Although some disturbance of bottom sediments and associated biota might occur, it would likely be similar to existing conditions. Therefore, Project operations would not change background levels of chemical and physical

constituents or elevate turbidity producing long-term changes in the receiving environment of the site, area, or region.

In addition, as required by Contra Costa County Ordinance 2005-34, Shore is required to have a business plan for emergency response to any release or threatened release of a hazardous material. The plan typically includes an inventory of hazardous materials handled by the business, and outlines training procedures for employees, emergency response procedures, and preventative measures to minimize the potential for accidental release.

Adherence to the regulatory framework regarding the storage, handling, and disposal of hazardous materials, combined with the secondary containment facilities that already exist at the MOT, would reduce the potential for adverse effects to a less-than-significant level (Class III).

Impact HWQ-1: Water Quality Impacts Associated with ~~Segregated~~ Discharged Ballast Water

Discharge of ballast water that contains ~~exotic~~ non-native or harmful microorganisms could impair several of the study area's beneficial uses, including commercial and sport fishing, estuarine habitat, fish migration, preservation of rare and endangered species, water contact recreation, non-contact water recreation, fish spawning, and wildlife habitat. Therefore, discharge of ~~segregated~~ ballast water is determined to have a potentially significant impact to water quality. (Class I)

Ballast water is used to provide stability to vessels, including tankers and barges. Ballast water is taken to compensate for the lightering of vessels bringing products to the MOT. Segregated ballast water is kept in tanks which are segregated from the petroleum product being transported on the tankers and barges. Non-segregated ballast water is considered a hazardous waste in California and cannot be discharged to Bay or coastal waters.

Ballast water from segregated ballast tanks may be discharged from vessels to San Francisco Bay as vessels transfer product to and from the MOT. ~~Exotic~~ Non-native or harmful organisms in ballast water may have significant adverse impacts to biological resources and water quality. Impacts to biological resources are discussed in Section 4.2~~3~~, Biological Resources. Release of ~~segregated~~ ballast water could have a significant adverse impact to water quality if viruses, toxic algae, or other harmful microorganisms were released. Release of harmful microorganisms would violate the water quality objective for toxicity in the Basin Plan (SFBRWQCB 2007a). This

objective states that waters be maintained free of toxic substances in concentrations that are lethal to or that produce other detrimental responses in aquatic organisms.

The MISA prohibits vessels ~~entering California waters after operating outside the United States Exclusive Economic Zone~~ from discharging ballast water into State waters unless the vessel has carried out ~~a mid-ocean~~appropriate ballast water exchange procedure, or is using an environmentally sound alternative shipboard treatment technology approved by the CSLC. Every ship entering State waters is required to submit a ~~b~~Ballast Water Reporting Form~~exchange plan~~, including the coordinates of the location where ballast exchange takes place.

Ballast water ~~Mid-ocean~~ exchange ~~of ballast water~~ is considered an interim measure to reduce the introduction of ~~exotic~~ non-native species until ~~effective treatment technologies are developed~~ California's performance standards for the discharge of ballast water are fully implemented. While ~~mid-ocean~~ballast water exchange reduces the introduction of ~~exotic~~ non-native organisms, it is not completely effective. Therefore, discharge of ~~segregated~~ ballast water is determined to have a potentially significant impact to water quality (Class I).

Mitigation Measure for Impact HWQ-1:

Implement **MM BIO-2**. (See Section 4.2, Biological Resources.)

Rationale for Mitigation

This measure (MM BIO-2) ~~would~~ provides ~~an~~ ~~interim~~ tracking mechanism to monitor the management of ballast water in California waters and to track the ~~until the~~ implementation of Article 4.7 Performance Standards for the Discharge of Ballast water for Vessels Operating in California Waters. Strict compliance with the MISA and associated regulations, including California's performance standards for the discharge of ballast waters, by vessels using the MOT will significantly reduce the potential for the introduction of non-native species to Bay-Delta waters. However, the possibility of introduction of non-native species from ballast water discharge still remains even with strict adherence to state regulations and permits. ~~As this measure would only be informative, e~~Even ~~together~~ with the implementation of MM BIO-1 and MM HWQ-2 (below), impacts would remain significant (Class I).

Residual Impacts

Until a feasible system to kill ~~exotic~~ all non-native or harmful organisms in ballast water is developed, the discharge of ballast water to San Francisco Bay will remain a significant adverse impact (Class I).

Impact HWQ-2: Water Quality Impacts Associated with Marine Anti-Fouling Paints

Marine anti-fouling paints that include organotin biocides could have a significant adverse impact to water quality when leached or dislodged from vessels berthing at the MOT. (Class II)

~~A resolution drafted by the~~The International Convention on the Control of Harmful Anti-Fouling Systems on Ships (AFS Convention) was approved by the International Maritime Organization ~~was approved~~ in 2001 ~~that called for the elimination of organotin biocides on January 1, 2003~~and entered into force on September 17, 2008. The AFS Convention ~~resolution language~~ banned the application of tin biocides as anti-fouling agents on ships by January 1, 2003, and prohibited the presence of tin biocides or required a protective barrier from them after January 1, 2008. Adherence to this resolution would ~~protect~~ minimize local water quality impacts to less-than-significant levels. Implementation of MM HWQ-2 would ensure that berthing vessels comply with the ~~resolution~~AFS Convention.

Mitigation Measure for Impact HWQ-2:

In addition to the mitigation measure presented below, implementation of Mitigation Measure BIO-1 (see Section 4.2, Biological Resources) would ensure that implementation of an effective anti-fouling program, including use of anti-fouling hull coatings, regular hull inspections, and additional cleaning of hull surfaces that have limited anti-fouling coating, is carried out.

MM HWQ-2. Documentation Certifying Compliance. Shore shall require representatives of vessels berthing at the Marine Oil Terminal (MOT) to provide documentation certifying that their vessel is in compliance with the 2001 International Maritime Organization Convention on the Control of Harmful Anti-Fouling Systems on Ships ~~resolution~~ regarding elimination of organotin biocides, and Shore shall provide a copy of such certification to the California State Lands Commission's Marine Facilities Division's Northern California Field and Sacramento Offices, either electronically or

by facsimile, prior to the vessel's entry into San Francisco Bay or at least 24 hours prior to the vessel's arrival at the MOT.

Rationale for Mitigation

This mitigation measure would ensure that Shore complies with an International Maritime Organization ~~resolution~~ AFS Convention for the elimination of organotin biocides. Adherence to this ~~resolution~~convention, in combination with MM BIO-1, would ~~protect~~ minimize local water quality impacts and would reduce the potentially significant impact to less than significant.

Impact and Mitigation Summary

Table 4.4-1 presents a summary of hydrology and water quality impacts that would be associated with the MOT, and lists the corresponding recommended mitigation measures.

Table 4.4-1. Summary of Hydrology and Water Quality Impacts and Mitigation Measures

Impacts	Mitigation Measures
HWQ-1: Water Quality Impacts Associated with ~~Segregated~~ Discharged Ballast Water	**MM BIO-2.** Ballast Water Management ~~Questionnaire~~
HWQ-2: Water Quality Impacts Associated with Marine Anti-Fouling Paints	**MM HWQ-2.** Documentation Certifying Compliance

4.4.5 Impacts of Alternatives

No Project Alternative

Under the No Project Alternative, Shore would not be granted a new lease for the marine oil terminal and the existing wharf would be decommissioned, abandoned, removed, or a combination thereof. In addition, the upland terminal would continue to operate but product would no longer be delivered or shipped by marine vessel. Closing of the wharf would reduce the volume of products handled at the upland terminal substantially, by 40 percent of total volume handled. However, because it can be expected that demand for these products will continue, the No Project Alternative may result in diversion of some product shipments to other marine oil terminals in the region.

The cessation of operations at the existing terminal would reduce the potential for accidental spills and upset conditions to occur at the MOT and would eliminate any ballast water

discharge at that location. However, with increased operations at other terminals, the potential impacts would merely be displaced, not eliminated. Therefore, the potential hydrology and water quality impacts of the No Project Alternative would be similar to the proposed Project.

Limitations on Terminal Use Alternative

Under the Limitations on Terminal Use Alternative, Shore would be granted a new lease but with restrictions on the number, type, or size of marine vessels that would be allowed to call at the marine terminal, or restrictions on the type of product that could be loaded or unloaded. It is anticipated that the hydrology and water quality impacts under this alternative would not be substantially different than those identified for the proposed Project.

4.4.6 Cumulative Projects Impact Analysis

The water quality of San Pablo Bay has been compromised over time by inputs of pollutants from a variety of sources. Any further contribution of a contaminant already at significantly high levels to the waters of San Pablo Bay would have a significant impact at the cumulative level. The identified stressors or pollutants in San Pablo Bay, according to the 303(d) list, include chlordane, pesticides (i.e., DDT and dieldrin), dioxins, furan compounds, mercury, PCBs, selenium, nickel, and exotic species. The major sources of these contaminants include municipal wastewater and industrial discharges and a variety of nonpoint sources such as urban and agricultural runoff; riverine inputs; dredging and dredge material disposal; marine vessel inputs such as ballast water; and inputs from air pollutants, spills, and accidents. In general, urban storm water runoff is responsible for the greatest mass loadings of most contaminants.

Of the contaminants listed above, operations at the MOT would not contribute to chlordane, DDT, dieldrin, dioxins, or furan compounds. Operations at the MOT would generally not include the handling, storage, or transport of significant quantities of PCBs, mercury, selenium, or nickel. Assessment of the proposed Project's potential impacts from exotic species is discussed in Section 4.2, Biological Resources. The MOT would not include any discharges of water or wastewater as there is no processing of water or wastewater as part of the MOT; stormwater from the MOT is collected onsite. Therefore, any releases of these contaminants from the MOT are unlikely and would not be considered cumulatively considerable.

The proposed Project has the potential to adversely impact water quality from organotin biocides in marine anti-fouling paints used on vessels that visit the MOT. MM HWQ-2 requires all vessels that visit the MOT to comply with a resolution drafted by the International Maritime Organization's AFS Convention that eliminates the use of organotin biocides. Because this mitigation essentially eliminates the MOT's potential contribution to water quality degradation from marine anti-fouling paints containing organotin biocides, the MOT's contribution would not be cumulatively considerable.

The discharge of ~~segregated~~ ballast water from vessels mooring and berthing at the MOT could be a source of the introduction of ~~exotic~~ non-native or harmful organisms to bay waters. MM BIO-2 would require these vessels to report and track ballast water discharges but would only be informative. Although the MOT neither discharges nor handles any ballast water, and vessels that call at the MOT are required to comply with State provisions, compliance is not enough to ensure full mitigation of this potential impact. Therefore, ~~and so~~ the proposed Project's contribution to future introduction of ~~exotic~~ non-native or harmful organisms species to Bay-Delta waters would be cumulatively considerable and significant cumulative impacts would occur (Class I) even with implementation of MM HWQ-2, MM BIO-1, and MM BIO-2.

4.5 LAND USE AND RECREATION

This ~~S~~section addresses potential impacts to land uses associated with the proposed Project and alternatives. The analysis considers potential impacts resulting from the granting of a new lease allowing Shore Terminals LLC (a NuStar Energy Company), hereafter referred to as Shore, to continue current transfer operations of petroleum products from the wharf to its upland main terminal storage facility. Land use and recreation issues include compatibility of the proposed improvements with adjacent land uses, potential conflicts with applicable plans and policies, potential conflicts with planning efforts to protect recreational resources, and residual impacts on sensitive shoreline land and recreation due to a release of petroleum products. This evaluation is based on review of local and regional land use plans and policies. For the purposes of this analysis, the baseline conditions against which impacts are analyzed are those conditions existing as of the publication of the proposed Project's Notice of Preparation (NOP), November 28, 2007. As of the writing of this Environmental Impact Report (EIR), land uses and recreational areas have not changed materially in the study area since the publication of the NOP. Therefore, current/existing land and recreational uses are used here to describe baseline conditions.

4.5.1 Environmental Setting

Project Location

The Shore Marine Oil Terminal (MOT) is located in northwestern Contra Costa County at the western entrance to the Carquinez Strait, just north of the ConocoPhillips San Francisco Refinery (see Figure 2-1 in Section 2.0, Project Description). Specifically, the lease area lies just west of the Carquinez Bridge and the unincorporated town of Crockett, across and to the south of the Vallejo ship channel. The MOT is within approximately 10.09 ± acres of sovereign tide and submerged land leased from the California State Lands Commission (CSLC). Shore's upland main terminal operations are separate from wharf operations, and are not part of the proposed lease. However, because potential impacts resulting from the Project would extend to these areas, existing and designated land uses in lands adjacent to the lease area are considered part of the study area in this evaluation.

Existing Offshore Uses Near the MOT

Existing land uses at the MOT include water-related industry. The MOT is adjacent to a shipping channel that is navigable and used for commercial and military shipping. Deep-water ship traffic bound for the Port of Stockton and the Port of Sacramento

passes through the Carquinez Strait. The MOT receives and distributes petroleum products from marine vessels~~, including gasoline, fuel oil (diesel, JP-5 and JP-8), and ethanol~~. It has been in operation since 1981.

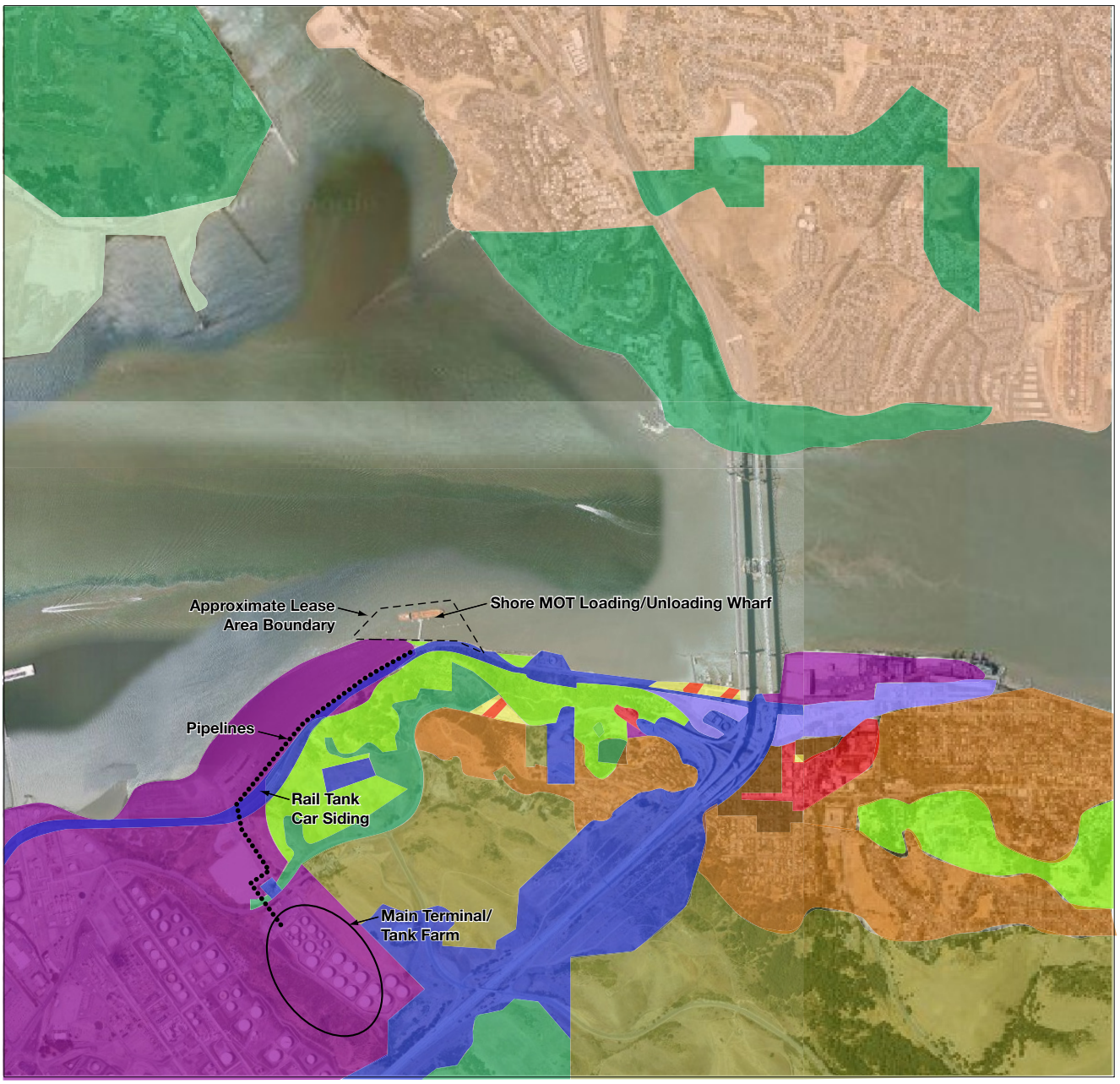
The lease area, shown in Figure 4.5-1, is designated *Water (WA)* in the Contra Costa County General Plan. The *WA* designation is applied to approximately 68 square miles of water in the San Francisco-San Pablo Bay and the Sacramento-San Joaquin River estuary system within the county. Uses allowed in the *WA* designation area include water-oriented recreation such as boating and fishing, and transport facilities associated with adjacent heavy industrial plants, such as ports and wharves (Contra Costa County 2005). The site is also designated for water-related industry by the Bay Conservation and Development Commission (BCDC 2008a). The Project area is zoned *Unrestricted* (*U*) by the Contra Costa County Zoning Code. According to Chapter 84-64.002 of the code, "All land within a *U* unrestricted district may be used for any lawful use …" (Contra Costa County 2008a).

Existing offshore land uses further away from the MOT area include recreational boating areas, sewage outfalls, a refinery, disposal sites, and industrial shipping areas. The MOT is situated near multiple sewage outfalls. The Rodeo Sanitary District, the Crockett Community Services District, and the Vallejo Sanitation and Flood Control District all release effluent through outfalls in San Pablo Bay or the Carquinez Strait. In San Pablo Bay, west of the MOT, the ConocoPhillips Refinery has a marine offshore terminal that extends approximately 0.3 miles (1,800 feet) from Davis Point north into the Bay. In addition, there are several dredged material disposal sites in San Francisco Bay; the two closest to the Project area are the San Pablo Bay site and the Carquinez Strait site (ACOE 2001). Offshore uses adjacent to the north shore of the Carquinez Strait primarily include shipping and boating associated with the Mare Island Strait and harbors, and other boating facilities along the shores of the cities of Vallejo and Benicia.

Existing Onshore Uses Near the MOT

Onshore land uses immediately adjacent to the MOT lease area consist primarily of industrial storage and transshipping facilities associated with the MOT. Facilities include connecting pipelines, a railroad tank car loading/unloading area, Union Pacific Railroad mainline tracks, and ConocoPhillips' paved open storage area.[1] The MOT

[1] The ConocoPhillips open storage area has been declared a state response cleanup site, due to contamination from metals, petroleum, and methyl tertbutyl ether. The California Department of Toxic Substances Control (DTSC) serves as the lead agency for cleanup efforts (DTSC 2009a).



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Feet

SV (Single Family Residential-Very Low)
SH (Single Family Residential-High)
ML (Multiple Family Residential-Low)
CO (Commercial)
LI (Light Industry)
HI (Heavy Industry)
PS (Public/Semi-Public)
PR (Parks and Recreation)
OS (Open Space)
AL (Agricultural Lands)
Marsh
Urban Residential

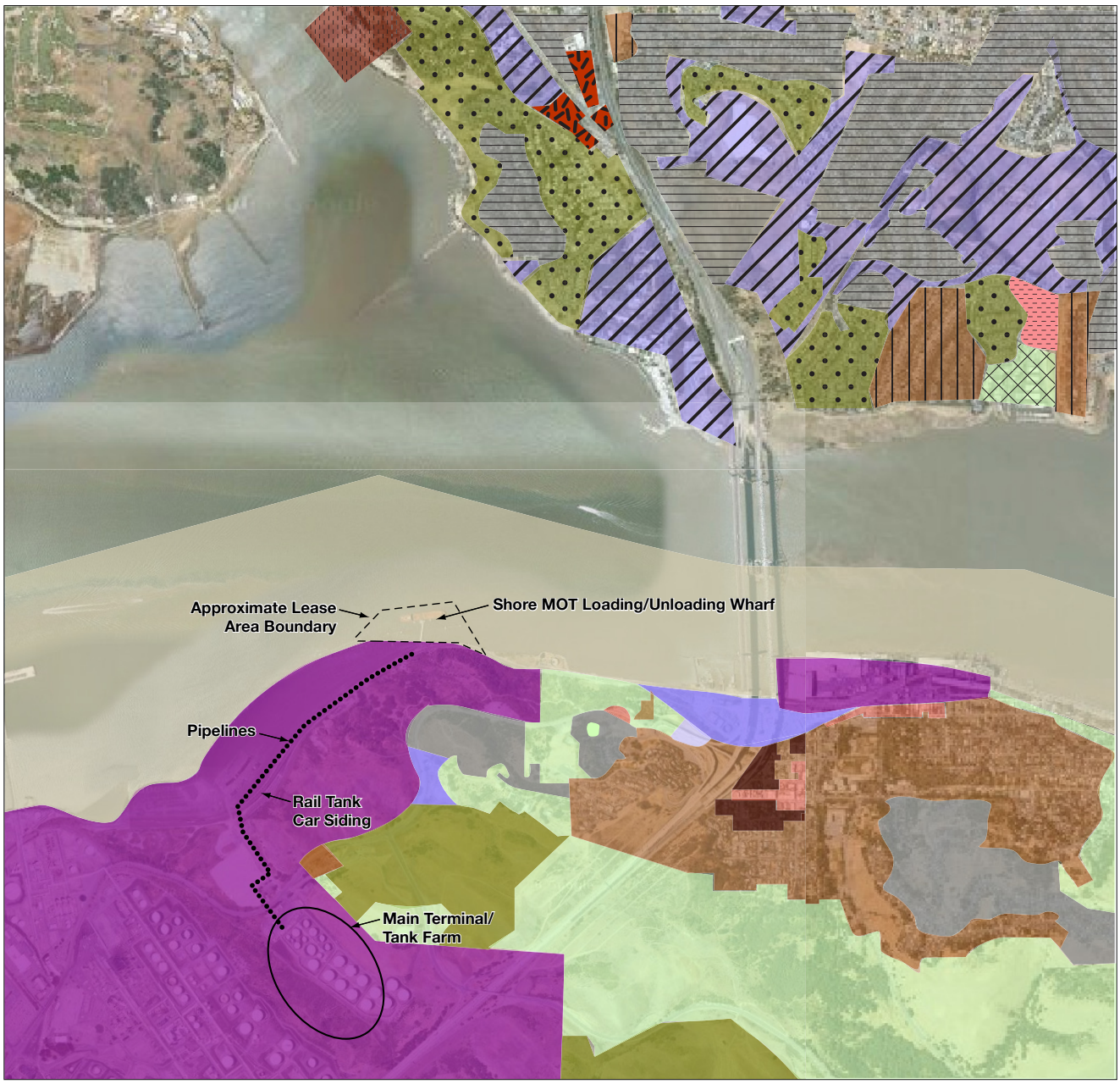
SOURCE: Contra Costa County 2008

Shore Marine Oil Terminal Lease Project EIR
Figure 4.5-1
Land Use Designations

cannot be accessed from adjacent public shore areas, and physical security is controlled by fencing along the facility perimeter. The area south of the railroad tracks and north of the main terminal is open space associated with the East Bay Regional Park District (described in more detail later under 'Recreational Opportunities' below).

The onshore land immediately adjacent to the lease area falls under the General Plan land use designation *Heavy Industrial* (*HI*) (see Figure 4.5-1). *HI* land uses include chemical or petroleum product processing and refining, metalworking, heavy equipment operation and similar activities. Land use designations for areas adjacent to the *HI* area include *Public/Semi-Public* (*PS*), *Open Space* (*OS*), and *Parks and Recreation* (*PR*). A strip of land designated *PS* runs through the *HI* area, which consists of two sets of Union Pacific Railroad tracks. The *PS* designation generally includes properties owned by public governmental agencies and public transportation corridors. To the south of the railroad tracks is land designated *OS*. This land designation includes wetlands, tidelands, other areas of significant ecological resources or geologic hazards, as well as privately owned properties for which future development rights have been deeded to a public or private agency. To the south of the *OS* area is land designated *PR,* a designation that includes public park facilities owned by cities, the district, Contra Costa County, or the region, as well as golf courses. *PR* allowable uses include passive and active recreation-oriented activities, and ancillary commercial uses such as restaurants and snack bars (Contra Costa County 2005).

The onshore land immediately adjacent to the lease area is zoned *Heavy Industrial (HI).* (See Figure 4.5-2 for the zoning districts in the vicinity of the Project site.) *HI* zones allow for the manufacturing or processing of petroleum, lumber, steel, chemicals, explosives, fertilizers, gas, rubber, paper, cement, sugar, and all other industrial or manufacturing products. Zoning designations in the land adjacent to the *HI* area include *Planned Unit (P-1)* and *General Agriculture (A-2). P-1* zoning allows any land uses permitted by an approved final development plan, which are in harmony with each other, serve to fulfill the function of the planned unit development, and are consistent with the general plan; detached single-family dwellings; and residential second units. *A-2* zones allow all types of agriculture, agriculturally related uses, farm stands, single-family dwellings, foster homes, family daycare homes, and some residential second units.



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R-6 (Single Family Residential)
M-12 (Multiple Family Residential)
A-2 (General Agriculture)
A-4 (Agricultural Preserve)
R-B (Retail Business)
C-M (Controlled Manufacturing)
L-I (Light Industrial)
H-I (Heavy Industrial)
P-1 (Planned Unit)
U (Unrestricted)

Freeway Shopping and Service
Waterfront Shopping and Service
High Density Residential
Medium Density Residential
Planned Development Commercial
Public Facilities
Rural Residential
Intensive Use

SOURCE: Contra Costa County 2008

Shore Marine Oil Terminal Lease Project EIR

Figure 4.5-2
Zoning Districts

General Shoreline Uses in San Pablo Bay, Carquinez Strait, and Suisun Bay

The shoreline around San Pablo Bay, Carquinez Strait, and Suisun Bay is primarily tidal flats and marshes, interspersed with development (ABAG 2008b). The area between the MOT and the unincorporated community of Rodeo, approximately 1 mile to the southwest of the lease area, is dominated by port-related industrial development. This development is associated with the Shore MOT and the ConocoPhillips San Francisco MOT and refinery. Shoreline land use designations in the community of Rodeo include *HI*, *PS*, *PR*, and *Airport Commercial (ACO)*. South of the community of Rodeo is the city of Hercules, whose shoreline designations include *OS*, *Business Park*, *ACO*, *PS*, and *Mixed Use*. The remainder of the southern edge of the San Pablo Bay shoreline is predominantly designated park areas, with a large water- and port-based industrial area along the shores of North Richmond (Contra Costa County 2005; BCDC 2008a).

To the east of the MOT, the Carquinez Bridge connects the unincorporated community of Crockett (on the south) to the city of Vallejo (on the north). North of the MOT is Mare Island in Vallejo. The shoreline of the west and south sides of Mare Island is tidal marshes, designated *Marsh* and *Parks and Recreation* in the Solano County General Plan (see Figure 4.5-1). Mare Island Strait, located along the east side of the island, has several water-related industrial sites, with land use designations including *Urban Industrial* and *Urban Residential* (BCDC 2008a; Solano County 2008). The remaining shoreline around San Pablo Bay is predominantly Wildlife Refuge Area and Waterfront Park (BCDC 2008a).

Along the Carquinez Strait, adjacent to the Carquinez Bridge to the east, are industrial facilities associated with the C&H Sugar Company. The remainder of the shoreline is a mixture of designated park lands, water-related industrial uses, and urban uses (BCDC 2008a). Further east, the shoreline of Suisun Bay is predominantly salt pond/wetland areas and wildlife refuges. A few industrial areas are located on the south side of Suisun Bay, including the Concord Naval Weapons Station (BCDC 2008a).

General Shoreline Uses in the San Francisco Bay

The San Francisco Bay shoreline is characterized by a wide spectrum of land uses. Much of the western and eastern coastlines are urbanized, consisting of housing and port-based and other industrial areas, including two airports: San Francisco International Airport and Metropolitan Oakland International Airport. A significant portion of the shoreline is coastal wetlands and designated park areas. The south end

of the Bay is characterized by tidal marshes, salt ponds, and managed wetlands. Marinas and piers are present throughout the Bay (BCDC 2008a).

Recreational Opportunities Near the MOT

There are no designated recreational opportunities within the lease area, or on lands onshore immediately adjacent to the lease area. The MOT is not accessible to the public from the shoreline, as the proximity of heavy-industrial areas and railroad tracks preclude safe physical access to the shoreline. Nevertheless, the Bay water adjacent to the lease area is used by recreational boaters, and there are numerous marinas and harbors in the environs of the project area including Crockett Marine Service, located just east of the MOT terminal in Crockett, and Point Pinole Fishing Pier. Furthermore, recreational fishermen are known to frequent the shoreline adjacent to the terminal, and small fishing boats and paddle craft have been known to transit the area, occasionally loitering or anchoring in the vicinity of the dock (CSLC 2009). Table 4.5-1 provides a list of marina facilities and fishing piers in the Project area.

Furthermore, there are several formally designated recreational areas onshore within the vicinity of the MOT. A portion of the land between the railroad tracks and San Pablo Avenue is open space under the jurisdiction of the East Bay Regional Park District (EBRPD). This land is referred to as 'Selby Property' by the EBRPD, though it is officially considered part of the Carquinez Strait Regional Shoreline Park.[2] Selby Property is an 8.1-acre piece of land with two fire roads. The northern fire road, which is approximately one-third mile long, also serves as a hiking trail, heading from San Pablo Road up to a bench that overlooks San Pablo Bay. According to the EBRPD, Selby Park is an isolated area that receives little use, estimated at less than one person per day (Hitchen 2008).

Along the southern border of Selby Park, approximately 1,000 feet south of the lease area boundary, is a portion of the Bay Trail. The Bay Trail is a planned recreational corridor that will eventually encircle San Francisco and San Pablo Bays with a continuous 500-mile network of hiking and bicycling trails (ABAG 2008a). Roughly 290 miles of the trail have been completed. The part of the Bay Trail in the study area consists of an on-street, unimproved portion that follows San Pablo Avenue along the southern border of Selby Park toward the Carquinez Bridge. This portion of the Bay Trail contains no designated bike lanes or sidewalks. A small section of the Bay

[2] On public maps Selby Property is sometimes referred to as 'Carquinez Strait Regional Park' or 'Carquinez Strait Trail Park.'

Table 4.5-1. Marina Facilities and Fishing Piers in the Project Area

MARINA FACILITIES	
Suisun Bay	**San Francisco Bay (cont'd)**
Suisun City Marina	Horseshoe Harbor and Presidio Yacht Club
Solano Yacht Club	Brickyard Cove Marina
Antioch Marina	Channel Marina
Pittsburg Marina	Richmond Yacht Harbor
McAvoy Yacht Harbor	Marina Bay Yacht Harbor
Carquinez Strait	Berkeley Marina
Benicia Marina and Yacht Club	Emeryville City Marina
Glen Cove Marina	Emery Cove Marina
Vallejo Yacht Club	Jack London Marina
Vallejo Municipal Marina	Portobello Marina
Martinez Marina	5th Avenue Marina
Crockett Marine Service	North Basin 1 & 2
San Pablo Bay	Embarcadero Cove Marina
Napa Valley Marina	Union Point Marina
Port Sonoma Marina	Marina Village Yacht Harbor
Bel Marin Keys Yacht Club	Oakland Yacht Club
Loch Lomond Marina and Yacht Club	Encinal Yacht Club
Marin Yacht Harbor and Yacht Club	Fortman Marina & Alameda Yacht Club
Lowrie Yacht Harbor	Grand Marina
San Rafael Yacht Club	Alameda Marina and Island Yacht Club
Point San Pablo Yacht Harbor	Ballena Isle Marina and ~~Ballens~~ Ballena Bay Yacht Club
San Francisco Bay	San Leandro Marina
Paradise Cay Yacht Harbor	Spinnaker Yacht Club
Corinthian Yacht Club	Brisbane Marina and Sierra Yacht Club
San Francisco Yacht Club	Oyster Cove Marina
Angel Island State Park	Oyster Point Marina and Yacht Club
Richardson Bay Marina	Coyote Point Marina and Yacht Club
Clipper Yacht Harbor	Pete's Harbor
Marina Plaza Harbor	Redwood City Yacht Harbor/Sequoia Yacht Club
Schoonmaker Point Marina	San Francisco Marina
Pelican Harbor	Pier 33 Marina
Sausalito Cruising and Yacht Club	Treasure Island Marina
Sausalito Yacht Harbor	South Beach Harbor

Source: Bay Area Recreation 2009

Table 4.5-1. Marina Facilities and Fishing Piers in the Project Area (cont.)

FISHING PIERS	
Berkeley Fishing Pier (Berkeley)	Mission Rock Pier (San Francisco)
Brisbane Fishing Pier (Brisbane)	Ninth Street Pier (Benicia)
Candlestick Park Public Pier (San Francisco)	Oyster Point Fishing Pier (South San Francisco)
China Camp Pier (China Camp)	Pacifica Fishing Pier (Pacifica)
Eckley Pier (Port Costa)	Paradise Beach Fishing Pier (Tiburon)
Emeryville Fishing Pier (Emeryville)	Pier 7 Fishing Pier (San Francisco)
First Street Pier (Benicia)	Pittsburg Fishing Pier (Pittsburg)
F.D. Roosevelt Fishing Pier (Oakland)	Point Benicia (Benicia)
Fort Mason Piers (San Francisco)	Point Pinole Fishing Pier (Point Pinole)
Fort Point Pier (San Francisco)	San Francisco Municipal Pier (San Francisco)
Fruitvale Bridge Park Pier (Oakland)	San Leandro Fishing Pier (San Leandro)
Marina Green Jetty (San Francisco)	San Mateo County Fishing Pier (Foster City)
Martinez Regional Shoreline Fishing Pier (Martinez)	Twenty-fourth Street Pier (San Francisco)
Middle Harbor Park Pier (Oakland)	Vallejo Fishing Pier (Vallejo)

Source: DeLorme 2003; CSLC 2009

Trail diverges off San Pablo Avenue up the hiking road in Selby Property. This section of the trail is referred to as San Pablo Bay Regional Trail, and is labeled as an off-street, shared use or gravel path. Overall, the Bay Trail provides opportunities for a variety of recreational activities in the vicinity of the Project including hiking, walking, jogging, and bicycling (ABAG 2008a). However, at its closest point, the Bay Trail is located approximately 0.2 mile upland from the proposed Project. As such, the Bay Trail does not intersect with the Project area at any location.

The Contra Costa County General Plan (2005) depicts the locations of future recreational areas onshore near the lease area. Figure 9-4 in the Open Space Element of the General Plan shows a proposed neighborhood park near San Pablo Avenue in Crockett, approximately one-half mile south of the lease area boundary. Figure 9-6 in the Open Space Element of the General Plan shows a proposed pedestrian trail that would pass through Selby Property, and Figure 9-7 shows a proposed equestrian trail near the shoreline. The EBRPD Master Plan (2007) also shows a potential regional trail from Point Pinole to the Carquinez Strait that would pass along the shoreline adjacent to the lease area.

Recreational Opportunities in San Pablo Bay, Carquinez Strait, and Suisun Bay

The San Francisco Bay-Delta system (including San Pablo Bay, Carquinez Strait, and Suisun Bay) provides many unique water-based and onshore recreational opportunities. Water-related recreational activities in the greater San Pablo Bay, Carquinez Strait, and Suisun Bay areas include boating, fishing, surfing, windsurfing, and swimming (BCDC 2008a). A list of marina facilities and fishing piers in the San Francisco Bay-Delta system is provided in Table 4.5-1. Onshore recreational uses and areas, many of which provide access to the shoreline, are described below, by location.

San Pablo Bay Shoreline Recreational Areas

The San Pablo Bay is home to numerous shoreline recreational areas, the largest of which is the San Pablo Bay National Wildlife Refuge. Located along the entire north shore of San Pablo Bay, the San Pablo Bay National Wildlife Refuge was created in 1974 to protect migratory birds, wetland habitat, and endangered species. The Refuge is composed largely of tidelands leased from the CSLC and includes open bay/tidal marsh, mudflats, and seasonal and managed wetland habitats. Ultimate plans for the Refuge include protection and conservation of more than 20,000 acres of critical wildlife in northern San Pablo Bay. The Refuge is open year-round during daylight hours, and provides recreational opportunities including fishing, hunting, wildlife observation and photography (USFWS 2008).

Other major shoreline recreational areas on San Pablo Bay include (BCDC 2008a):

- San Pablo Bay Wildlife Area (west shore);
- John F. McInnis County Park (west shore);
- China Camp State Park (west shore);
- Point Pinole Regional Shoreline (south shore);
- San Pablo Regional Shoreline (southeast shore);
- Lone Tree Point (east shore); and
- Mare Island (east shore).

Carquinez Strait Shoreline Recreational Areas

In addition to public waterfronts in the cities of Crockett, Martinez, Vallejo (including Mare Island), and Benicia, the Carquinez Strait contains three designated recreation areas along its shoreline. The Carquinez Strait Regional Shoreline is a 1,415-acre regional park managed by the EBRPD, located on the south shore of the Strait between

Crockett and Martinez. Recreational activities available at the park include hiking, horseback, and bicycle trails (EBRPD 2008). Southeast of Carquinez Strait Regional Shoreline is Martinez Regional Shoreline, also managed by EBRPD. Recreational activities in Martinez Regional Shoreline include hiking, horseback riding, bicycling, fishing, boating, walking, bocce ball, softball, and soccer (EBRPD 2008). The Benicia State Recreation Area is located on the north shore of the Strait. Managed by California State Parks, Benicia State Recreation Area provides trails and water access, with opportunities for bicycling, running, walking, horseback riding, roller skating, picnicking, bird watching, and fishing (California State Parks 2008).

Suisun Bay Shoreline Recreational Areas

The Suisun Marsh is the largest contiguous estuarine marsh in the United States, with 84,000 acres of land, bays, and sloughs (CDFG 2008). This Bay is home to several wildlife refuge areas under the jurisdiction of California Department of Fish and Game. The largest, Grizzly Island Wildlife Area, is a patchwork of 10 distinct land parcels located around the west, north, and east sides of the Bay. The Grizzly Island Complex occupies about 15,300 acres of prime Suisun Bay wildlife habitat. Smaller reserves include Point Edith Wildlife Area in the southwest corner of the Bay, as well as Peytonia Slough Ecological Reserve and Hill Slough Wildlife Area in the north. These refuges provide a variety of recreational activities such as wildlife viewing, nature tours, hiking, hunting, fishing, and boating (CDFG 2008).

Recreational Opportunities in San Francisco Bay

The San Francisco Bay provides a wide variety of recreational resources including State, county, and regional shoreline parks; beaches; landings; fishing piers; marinas; harbors; and other designated recreation areas. Table 4.5-2 contains a list of the major shoreline designated recreational areas in the San Francisco Bay, south of the Richmond-San Rafael Bridge and north of the Dumbarton Bridge.

In addition to designated onshore recreational areas, Bay waters are used for extensive boating and fishing, and are home to numerous fishing piers, marinas, and harbors. Table 4.5-1 contains a list of the marina facilities and fishing piers located in the San Francisco Bay.

Table 4.5-2. Wildlife Refuges and Waterfront Parks and Beaches in the San Francisco Bay

Wildlife Refuge or Reserve	
Albany Mudflats Ecological Reserve	Emeryville Crescent Wildlife Area
Bair Island Ecological Reserve	Marin Islands National Wildlife Refuge and State Ecological Reserve
Corte Madera Marsh and Ecological Reserve	Mount Tamalpais Waterfowl Refuge
Don Edwards San Francisco Bay National Wildlife Refuge	Redwood Shores Ecological Reserve
Eden Landing Ecological Reserve	
Waterfront Park or Beach	
Alcatraz	Hayward Regional Shoreline
Angel Island	Keil Cove-Bluff Point Park (proposed)
Baker Beach	Lincoln Park
Brisbane Aquatic Park (proposed)	Martin Luther King Jr. Regional Shoreline
Caesar Chavez Park	Menlo Park Bayfront Park
Candlestick Point State Recreation Area	Middle Harbor Shoreline Park
Crissy Field	Miller/Knox Regional Shoreline
Coyote Point County Park	Ocean Beach
East Shore State Park	Oyster Bay Regional Shoreline
Emeryville Crescent Wildlife Area	Point Isabel Regional Shoreline
Fort Mason	Point Pinole Regional Shoreline Park
Fort Point	Ravenswood Open Space Preserve
Gateway Shoreline Park	Robert W. Crown Memorial State Beach
Golden Gate National Recreation Areas	Yerba Buena Island

Source: BCDC 2008a; Only in San Francisco 2009

Recreational Uses on the Outer Coast

California's 1,100 miles of shoreline provide a wide variety of opportunities for passive and active recreation. The coast features natural elements such as beaches and coastal bluffs, as well as designated recreational areas that include such features as hiking and equestrian trails, beaches, picnic areas, volleyball areas, and locations for nature viewing and shore fishing. Also along the outer coast are fishing piers, as well as facilities for recreational boaters such as berthing and launching facilities. Water-based recreation along the outer coast includes fishing, surfing, swimming, diving, and other water sports.

Designated recreation areas on the outer coast, in the greater Project area, include Mt. Tamalpais State Park, Stinson Beach, the Bolinas Lagoon, Golden Gate National Recreation Area, and Mussel Rock Park.

4.5.2 Regulatory Setting

Federal

There are no Federal regulations related to land use and recreation relevant to the Project.

State

California State Lands Commission

The ~~California State Lands Commission (~~CSLC~~)~~ was established in 1938 and has the authority and responsibility to manage State-owned sovereign lands consistent with the Public Trust Doctrine for commerce, navigation, fisheries, open space, recreation, and other recognized Public Trust purposes. The CSLC is composed of the Lieutenant Governor, the State Controller, and the State Director of Finance. A staff of more than 200 specialists assists the CSLC with respect to mineral resources, land management, boundary determination, petroleum engineering, and the natural sciences. CSLC has primary responsibility over State tidelands, as well as primary responsibility for determining the precise boundary between public tidelands and private lands. The issuance of any lease, permit, or other entitlement for use of State lands by the CSLC requires review for compliance with the California Environmental Quality Act (CEQA) (CSLC 2008).

The Marine Facilities Division (MFD) of the CSLC conducts thorough inspections of all marine oil terminals, including evaluation of structural fitness-for-purpose; mechanical, electrical, and fire detection / suppression systems; and pipelines. The MFD engineers perform seismic and structural reassessment of existing marine oil terminals. In addition, appropriate design criteria are being developed for new terminals and for the rehabilitation of existing facilities. MFD personnel work with Federal, other State, and local agencies in order to prevent, respond to, and mitigate marine oil spill pollution and enforce rules, laws, and regulations against polluters.

California Department of Toxic Substances Control

The Department of Toxic Substances Control (DTSC) regulates hazardous waste, cleans up existing contamination, and looks for ways to reduce the hazardous waste produced in California. DTSC operates programs to: evaluate soil, water, and air samples taken at sites, and develop new analytical methods; prevent releases of hazardous waste by ensuring that those who generate, handle, transport, store, and dispose of wastes do so properly; oversee site cleanups and deal with the aftermath of

improper hazardous waste management; take enforcement actions against those who fail to manage hazardous wastes appropriately; explore and promote means of preventing pollution, and encourage reuse and recycling; practice other environmental sciences, including toxicology, risk assessment, and technology development; and involve the public in DTSC's decision-making (DTSC 2009b).

Regional

Association of Bay Area Governments (ABAG)

ABAG is the official comprehensive planning agency for the San Francisco Bay region. It is composed of the 101 cities and nine counties within the Bay Area, and its mission is to strengthen cooperation and coordination among local governments. ABAG examines regional issues including the environment, housing, transportation, education, and economic development, and its 38-member Executive Board (assembled of locally elected officials based on regional population) meets bimonthly to make operating decisions, authorize expenditures, appoint committee members, and recommend policy. As an advisory organization, ABAG has limited statutory authority (ABAG 2008c).

San Francisco Bay Area Conservancy Program

The San Francisco Bay Area Conservancy Program was established by the California State Legislature in 1997 to address the resource and recreational goals of the San Francisco Bay area, given the area's unique natural resource and recreational needs. The conservancy helps public agencies and private nonprofit organizations preserve open space, promote the use of habitat restoration projects for environmental education, protect and restore fish and wildlife habitat, provide public access to open space areas, and restore urban waterfronts in the nine Bay Area counties (Bay Conservancy 2008).

San Francisco Bay Conservation and Development Commission (BCDC)

BCDC was created pursuant to the McAteer-Petris Act of 1965, and is composed of 27 appointees from local governments and State/Federal agencies. The BCDC has jurisdiction over the open water, marshes, and mudflats of greater San Francisco Bay, including San Pablo and Suisun Bays, as well as the first 100 feet inland from the shoreline around San Francisco Bay. Among its duties, the BCDC is charged with regulating all filling and dredging in San Francisco Bay, regulating new development within the first 100 feet inland from the Bay to ensure that maximum feasible public access to the Bay is provided, and administering the Federal Coastal Zone

Management Act within the San Francisco Bay segment of the California coastal zone to ensure that Federal activities reflect BCDC policies. BCDC permits are required for Projects along the shoreline of the San Francisco Bay that would (BCDC 2008b, 2011):

- Place solid material, build or repair docks, pile-supported or cantilevered structures, dispose of material or berth a vessel for a long period in San Francisco Bay or in certain tributaries that flow into the Bay;
- Dredge or extract material from the Bay bottom;
- Substantially change the use of any structure or area;
- Construct, remodel or repair a structure; or
- Subdivide property or grade land.

In its 2008 San Francisco Bay Plan (as amended in October 2011), BCDC outlines policies concerning *Water-Related Industry* on the bay. Policies relevant to the proposed Project and alternatives include (BCDC 2008a, 2011):

> *Policy 1:* Sites designated for both water-related industry and port uses in the Bay Plan should be reserved for those industries and port uses that require navigable, deep water for receiving materials or shipping products by water in order to gain a significant transportation cost advantage.
>
> *Policy 2:* Linked industries, water-using industries, and industries which gain only limited economic benefits by fronting on navigable water, should be located in adjacent upland areas. However, pipeline corridors serving such facilities may be permitted within water-related industrial priority use areas, provided pipeline construction and use does not conflict with present or future water-transportation use of the site.
>
> *Policy 4:* Water-related industry and port sites should be planned and managed so as to avoid wasteful use of the limited supply of waterfront land… .

East Bay Regional Park District

The East Bay Regional Park District (EBRPD) includes more than 98,000 acres of county park land in Alameda and Contra Costa Counties. EBRPD operates 65 parks with more than 1,150 miles of trails, and has a Master Plan that defines the vision and the mission of the EBRPD. EBRPD sets priorities for the future; explains the District's multi-faceted responsibilities; and provides policies and guidelines for achieving the highest standards of service in resource conservation, management, interpretation, public access and recreation. EBRPD's mission is to provide recreational opportunities,

ensure the natural beauty of the land, and protect wildlife habitat. Recreational activities available in the Park District include fishing, swimming, hiking, bicycling, nature programs, golf, and picnicking (EBRPD 2008).

Local

Contra Costa County General Plan

Contra Costa County considers industrial development along its shoreline a historical legacy of the county. In its Contra Costa County General Plan 2005-2020, the county asserts that port-oriented heavy industrial uses are important to the county economic base, and advocates for the protection of the continued use of appropriate shoreline areas for heavy industries that rely on water traffic (Contra Costa County 2005). The county includes in this definition not only the deep-water Port of Richmond, but also the many private ports and proprietary wharves that serve large petroleum refineries and other industrial firms.

The following goals and policies from the Contra Costa County General Plan related to land use and recreation were considered in this analysis (Contra Costa County 2005):

<u>Land Use Element</u>

Policy 3-42: Industrial development shall be concentrated in select locations adjacent to existing major transportation corridors and facilities.

Policy 3-43: Industrial employment centers shall be designed to be unobtrusive and harmonious with adjacent areas and development.

Policy 3-158: This plan supports the concept of the Carquinez Straits Regional Shoreline Park on the border between the Rodeo and Crockett planning areas, which is planned by the East Bay Regional Park District in their Master Plan. This plan also affirms the policy in the East Bay Regional Park District's Master Plan that a regional shoreline trail extending from Martinez to Point Pinole shall be implemented.

<u>Open Space Element</u>

Goal 9-A: To preserve and protect the ecological, scenic and cultural/historic, and recreational resource lands of the County.

Policy 9-16: Providing public facilities for outdoor recreation should remain an important land use objective in the County, as a method of promoting high scenic quality, for air quality maintenance, and to enhance outdoor recreation opportunities for all residents.

Goal 9-36: To develop a sufficient amount of conveniently located, properly designed park and recreational facilities to serve the needs of all residents.

Goal 9-37: To develop a system of interconnected hiking, riding and bicycling trails and paths suitable for both active recreational use and for the purpose of transportation/circulation.

Policy 9-43: Regional-scale public access to scenic areas on the waterfront shall be protected and developed, and water-related recreation, such as fishing, boating, and picnicking, shall be provided.

Conservation Element

Goal 8-V: To preserve and restore remaining natural waterways in the county which have been identified as important and irreplaceable natural resources.

Policy 8-78: Where feasible, existing natural waterways shall be protected and preserved in their natural state, and channels which already are modified shall be restored. A natural waterway is defined as a waterway which can support its own environment of vegetation, fowl, fish and reptiles, and which appears natural.

Policy 8-84: Riparian resources in the Delta and along the shoreline shall be protected and enhanced.

Policy 8-96: Land use activities in the immediate vicinity of harbors and adjacent facilities shall be compatible with the continued optimum commercial and recreational operations of the harbor.

Transportation and Circulation Element--Ports and Proprietary Wharves

Goal 5-S: To maintain the economic viability of the county's existing ports, wharves and shipping lanes.

Policy 5-77: The continued use of existing ports and proprietary wharves shall be recognized and encouraged.

Policy 5-78: Water-oriented industrial uses which require deep water access shall be encouraged along the shoreline, while other industrial uses which could be located on inland sites shall be discouraged.

Contra Costa County Zoning Code

As discussed in the setting, the lease area is zoned *U* by the Contra Costa County Zoning Code. The area adjacent to the Project area is zoned *H-I* (Contra Costa County 2008).

4.5.3 Significance Criteria

Land use/recreational impacts will be considered significant if the Project would result in the following:

- Conflicts with existing or known future land uses, or adopted land use plans, policies, or ordinances;
- Conflicts with planning efforts to protect the recreational resources of the Project area;
- Incompatible adjacent land uses as defined by planning documentation; or
- Residual impacts on sensitive shoreline lands and/or water and non-water recreation due to a release of petroleum products.

4.5.4 Impact Analysis and Mitigation

Conflicts with Existing or Known Future Land Uses, or Adopted Land Use Plans, Policies, or Ordinances

Land Use, Zoning, and Adjacent Uses

The proposed Project would not result in conflicts with the existing land use designations in the Contra Costa County General Plan (Contra Costa 2005), San Francisco Bay Plan (BCDC 2008a), or Contra Costa County Zoning Ordinance (Contra Costa 2008). As discussed in Section 4.5.1, Environmental Setting, ~~above,~~ the proposed Project would be located in an area designated in the General Plan as *WA*. The *WA* designation explicitly allows for transport facilities associated with adjacent heavy industrial plants, such as ports and wharves. Also, Policy 5-77 in the Transportation and Circulation Element of the General Plan, and Policy 1 in the Water-Related Industry Chapter of the San Francisco Bay Plan, require that the continued use of existing ports and proprietary wharves be recognized and encouraged. Furthermore, the proposed Project would not conflict with zoning designations. The Contra Costa County Zoning Ordinance dictates that all land within a *U* district may be used for any lawful uses. Therefore, proposed Project activities would have no impact.

Water Recreation

As described in Section 2.3.4, Volumes and Types of Materials Handled, approximately 105 marine vessels visited the MOT in 2007, or approximately one vessel every three days. The proposed Project would continue the existing level of marine vessel traffic to and from the MOT, and no changes to shoreline access would occur. Furthermore,

tankers and other large ships are required to use established vessel traffic lanes to avoid conflicts with recreational boaters. Therefore, access to water-related recreation would not be affected by the proposed Project.

Potential Impacts to Planning Efforts to Protect the Recreational Resources of the Project Area

Under the proposed Project, Shore would continue operation of its MOT under current conditions. The new lease, if granted by the CSLC, would allow Shore to continue transfer operations of petroleum products from the wharf to its upland main terminal storage facility. The new lease would encompass the same leasehold area as the current lease. Current MOT operational practices do not conflict with recreational resources in the Project area including the Bay Trail, Selby Property, and water-related recreation in the Bay. Furthermore, a new CSLC lease would not foreseeably trigger any changes to the Project area that would create a conflict with planning efforts to protect recreational resources, including proposed trails. Consequently, there would be no impact to planning efforts in the Project area.

Incompatible Adjacent Land Uses as Defined by Planning Documentation

The onshore land adjacent to the lease area to the south is designated *Heavy Industrial (HI)* in the Contra Costa General Plan (Contra Costa 2005). Permitted land uses in the *HI* designation include chemical or petroleum product processing and refining, heavy equipment operation, and similar activities. That same land area is also zoned *Heavy Industrial (H-I)* in the Contra Costa County Zoning Code (Contra Costa 2008), a designation that allows for the manufacturing or processing of petroleum, chemicals, and all other industrial or manufacturing products. As such, continued operation of the MOT would be consistent with the land use and zoning designations of the parcels adjacent to the lease area.

Furthermore, the Contra Costa County General Plan (Contra Costa 2005) has numerous policies that encourage offshore industrial development in appropriate locations, including:

- *Land Use Element, Policy 3-42:* Industrial development shall be concentrated in select locations adjacent to existing major transportation corridors and facilities.

- *Transportation and Circulation Element Policy 5-78:* Water-oriented industrial uses which require deep water access shall be encouraged along the shoreline, while other industrial uses which could be located on inland sites shall be discouraged.

The Shore MOT is adjacent to an existing major transportation corridor and facilities: the Union Pacific Railroad mainline tracks and railroad tank car loading/unloading area. Furthermore, MOT operations are considered a water-oriented industrial use which requires deep-water access. As such, a new CSLC lease would constitute encouragement of such industry along the shoreline. Therefore, because the proposed Project would not change land uses from current baseline conditions and would not result in any incompatible adjacent land uses as defined by planning documentation, the proposed Project would have no impact.

Accidental Small (50 Barrels or Less) Spills of Highly Volatile Products

Since products, such as gasoline, are highly volatile and flammable, Shore's Oil Spill Response Plan states that, given the potential for ignition by engines operating near the spill, no attempt should be made to clean up the spill and no engine equipment should be operated near the spill to prevent ignition. The modeling results described in Section 4.1, Operational Safety/Risk of Accidents, show that, for a small spill of gasoline (i.e., 50 barrels or less), the product would evaporate quickly and would not persist to shoreline environments. Potential impacts to recreational resources from a spill of gasoline or other highly volatile product can be adverse but would be less than significant (Class III) since the product would evaporate quickly from the water surface.

Impact LUR-1: Impacts on Sensitive Shoreline Lands, and/or Water and Non-Water Recreation Due to a Release of Accidental Spills of Relatively Low-Volatility Petroleum Products or Large Accidental Spills of Highly Volatile Products

Spills of relatively low-volatility petroleum products or large volumes of highly volatile products could result in a temporary disturbance to Bay waters used for recreation as well as recreational facilities and designated areas. (Class II)

Accidental Spills at or Near the Shore MOT

Release of relatively low-volatility petroleum products or large volumes of highly volatile products could disturb both sensitive shoreline lands and/or water and non-water recreation to the degree that the shoreline and recreational activity areas would be rendered temporarily unusable. The degree of disturbance would be determined by a multitude of factors, including spill size and location, the type of material spilled, prevailing winds and weather conditions, the sensitivity and vulnerability of the resource, response capability to the spill, and other factors.

Spill risk is analyzed in Section 4.1, Operational Safety/Risk of Accidents. The analysis for this section looks at the 'residual impacts' of a petroleum products spill on water and non-water recreation. 'Residual impacts' are considered the potential impacts from petroleum products on recreation that remain for an extended period of time, after cleanup efforts have ceased. Impacts to sensitive shoreline lands are analyzed in Section 4.2, Biological Resources, and consequently are not addressed in this section.

As discussed in Section 4.5.1, Environmental Setting, the primary water-based recreational uses near the MOT are boating, fishing, and water sports such as swimming, surfing, or wind-surfing. Onshore recreation near the MOT consists of waterfront designated parks along the southeast portion of San Pablo Bay and along the Carquinez Strait.

Spill Scenarios 1, 2, 5, 6, 11, 12, 15, and 16 all analyze the probability that a critical amount of petroleum product from a spill at the MOT would reach key points along the shoreline. (See Section 4.1, Operational Safety/Risk of Accidents, for a complete description of scenario variables and results.) According to the model, for a spill at the MOT of 50 or 434 barrels, the extent of disruption would likely be limited to recreation in the Carquinez Strait and where the Strait connects to San Pablo Bay to the west and Suisun Bay to the east.

For a spill at or near the MOT, affected recreational areas may include, but not be limited to: the water in the Carquinez Strait, the water in San Pablo Bay near the Carquinez Strait, the water in Suisun Bay near the Carquinez Strait, Lone Tree Point, Mare Island, the Carquinez Strait Regional Shoreline, the Martinez Regional Shoreline, and the Benicia State Recreation Area. Also impacted could be the Vallejo Municipal Marina, Vallejo Yacht Club, Glen Cove Marina, Benicia Marina and Yacht Club, Napa Valley Yacht Club, Napa Valley Marina, Crockett Marine Service, Martinez Marina, McAvoy Yacht Harbor, Pittsburg Marina, Antioch Marina, and local fishing piers.

A spill of relatively low-volatility petroleum products or large volumes of highly volatile products near the MOT would have the potential to temporarily disrupt recreational uses under numerous circumstances, for example: if areas in the water and/or on shore are temporarily closed for cleanup efforts and/or public safety purposes; if the presence of spilled product contaminates the water making it unsafe to swim; if the presence of spilled product discourages boaters from taking vessels out due to risk of damage to the boat; if the presence of the spill deters recreational users from visiting shoreline parks and beaches due to the presence of spilled product and/or its odor; if fisheries must be

closed due to human health risk; and/or if the presence of spilled product in marinas and harbors damages marine vessels and/or marinas.

Because the proposed Project includes the potential for a petroleum spill at or near the MOT, which could result in the presence of petroleum products remaining after cleanup efforts, the impact to recreational resources is potentially significant. However, given the spill prevention measures and response capabilities currently in place (see Section 4.1, Operational Safety/Risk of Accidents), residual impacts on recreation remaining after first response efforts would be temporary and of short duration. As a result, implementation of mitigation measures MM OS-1a through MM OS-1d~~e~~ would reduce potentially significant recreation impacts to less than significant (Class II).

Richmond-San Rafael Bridge Spill

Spill Scenarios 7, 8, 17, and 18 analyze the effects of a spill at the Richmond-San Rafael Bridge. According to the model, for a diesel spill of 20,000 barrels the potentially affected area extends from the Carquinez Strait in the north, through the San Francisco Bay as far south as Hunters Point on the west and Oakland on the east, and out through the Golden Gate Bridge (GGB) to the outer coast. A gasoline spill of the same magnitude would have slightly less far-reaching consequences, with a potentially affected area south of the Richmond-San Rafael Bridge, north of the Bay Bridge, and east of the GGB.

For a spill at or near the Richmond-San Rafael Bridge, affected boating areas may include, but not be limited to: the Carquinez Strait, San Pablo Bay near the Carquinez Strait, the upper and middle portion of the San Francisco Bay, and the Golden Gate Strait. Affected recreational areas may include: Lone Tree Point, Mare Island, the Carquinez Strait Regional Shoreline, the Benicia State Recreation Area, Marin Islands National Wildlife Refuge and State Ecological Reserve, Corte Madera Marsh and Ecological Reserve, Albany Mudflats Ecological Reserve, Mount Tamalpais Waterfowl Refuge, Emeryville Crescent Wildlife Area, Alcatraz, Angel Island, Baker Beach, Caesar Chavez Park, China Camp State Park, Crissy Field, East Shore State Park, Emeryville Crescent Wildlife Area, Fort Mason, Fort Point, Gateway Shoreline Park, Golden Gate National Recreation Areas, Keil Cove-Bluff Point Park (proposed), Lincoln Park, Middle Harbor Shoreline Park, Miller/Knox Regional Shoreline, Ocean Beach, Point Isabel Regional Shoreline, Point Pinole Regional Shoreline Park, Robert W. Crown Memorial State Beach, Yerba Buena Island, and local fishing piers. In addition, the following 34 marina facilities may be impacted by a spill at or near the Richmond-San Rafael Bridge:

- Benicia Marina and Yacht Club
- Glen Cove Marina
- Vallejo Yacht Club
- Vallejo Municipal Marina
- Martinez Marina
- Crockett Marine Service
- Loch Lomond Marina and Yacht
- Marin Yacht Harbor and Yacht
- Lowrie Yacht Harbor
- San Rafael Yacht Club
- Point San Pablo Yacht Harbor
- Paradise Cay Yacht Harbor
- Corinthian Yacht Club
- San Francisco Yacht Club
- Angel Island State Park
- Richardson Bay Marina
- Clipper Yacht Harbor
- Marina Plaza Harbor
- Schoonmaker Point Marina
- Pelican Harbor
- Sausalito Cruising and Yacht Club
- Sausalito Yacht Harbor
- Horseshoe Harbor and Presidio
- Brickyard Cove Marina
- Channel Marina
- Richmond Yacht Harbor
- Marina Bay Yacht Harbor
- Berkeley Marina
- Emeryville City Marina
- Emery Cove Marina
- San Francisco Marina
- Pier 33 Marina
- Treasure Island Marina
- South Beach Harbor

Because the proposed Project includes the potential for spills of relatively low-volatility petroleum products or large volumes of highly volatile products at or near the Richmond-San Rafael Bridge, the impact to recreational resources is potentially significant. However, given the spill prevention measures and response capabilities currently in place (see Section 4.1, Operational Safety/Risk of Accidents), residual impacts on recreation remaining after first response efforts would be temporary and of short duration. As a result, implementation of mitigation measures MM OS-1a through MM OS-1~~c~~d would reduce potentially significant recreation impacts to less than significant (Class II).

Golden Gate Bridge Spill

Spill Scenarios 9, 10, 19, and 20 analyze the effects of a spill at the GGB. According to the model, for a diesel spill of 20,000 barrels the potentially affected area extends from Point San Pablo in the north, through the San Francisco Bay as far south as Alameda, and out through the GGB up and down the outer coast. A gasoline spill of the same magnitude would again have less far-reaching consequences, with a potentially affected area including the Marin Shoreline north of the bridge, the San Francisco shoreline south of the bridge, and the nearby islands.

For a spill at or near the GGB, affected boating areas may include, but not be limited to: the upper and middle portion of the San Francisco Bay, the Golden Gate Strait, and the coast outside of the GGB. Affected designated reserves may include: Albany Mudflats Ecological Reserve, Emeryville Crescent Wildlife Area, Mount Tamalpais Waterfowl

Refuge, and Corte Madera Marsh Ecological Reserve. Affected recreational areas may include: Point Pinole Regional Shoreline Park, Miller/Knox Regional Shoreline, Point Isabel Regional Shoreline, Caesar Chavez Park, East Shore State Park, Gateway Shoreline Park, Middle Harbor Shoreline Park, Robert W. Crown Memorial State Beach, Baker Beach, Alcatraz, Angel Island, Crissy Field, Fort Mason, Fort Point, Golden Gate National Recreation Areas, Keil Cove-Bluff Point Park (proposed), Lincoln Park, Ocean Beach, Yerba Buena Island, Mt. Tamalpais State Park, Stinson Beach Federal Park, Muir Beach, Mussel Rock Park, and local fishing piers. In addition, the following 29 marina facilities may be impacted by a spill at or near the GGB:

- Loch Lomond Marina and Yacht
- Marin Yacht Harbor and Yacht
- Lowrie Yacht Harbor
- San Rafael Yacht Club
- Point San Pablo Yacht Harbor
- Paradise Cay Yacht Harbor
- Corinthian Yacht Club
- San Francisco Yacht Club
- Angel Island State Park
- Richardson Bay Marina
- Clipper Yacht Harbor
- Marina Plaza Harbor
- Schoonmaker Point Marina
- Pelican Harbor
- Sausalito Cruising and Yacht Club
- Sausalito Yacht Harbor
- Horseshoe Harbor and Presidio
- Brickyard Cove Marina
- Channel Marina
- Richmond Yacht Harbor
- Marina Bay Yacht Harbor
- Berkeley Marina
- Emeryville City Marina
- Emery Cove Marina
- Ballena Isle Marina and ~~Ballends~~ and Ballena Bay Yacht Club
- San Francisco Marina
- Pier 33 Marina
- Treasure Island Marina
- South Beach Harbor

Because the proposed Project includes the potential for spills of relatively low-volatility petroleum products or large volumes of highly volatile products at or near the GGB, the impact to recreational resources is potentially significant. However, given the spill prevention measures and response capabilities currently in place (see Section 4.1, Operational Safety/Risk of Accidents), residual impacts on recreation remaining after first response efforts would be temporary and of short duration. As a result, implementation of mitigation measures MM OS-1a through MM OS-1d~~c~~ would reduce potentially significant recreation impacts to less than significant (Class II).

Mitigation Measures for Impact LUR-1:

Implement **MM OS-1a through MM OS-1d~~c~~**. (See Section 4.1, Operational Safety/Risk of Accidents).

Rationale for Mitigation

Combined with existing operational procedures and controls, these mitigation measures would help protect shorelines and recreational resources through improved spill prevention capabilities, and facilitating the safe and efficient transit of vessel traffic in the Bay. By reducing the likelihood that a spill would occur, reducing the quantity of spilled product, and ensuring a timely and comprehensive cleanup of spills, implementation of these measures would ensure that the potential impacts resulting from a spill are temporary and do not persist for an extended duration. The mitigation measures reduce the likelihood that substantial residual petroleum products would remain after a cleanup, thereby reducing the impact to shoreline and on-water recreational resources from spills to less than significant.

Impact and Mitigation Summary

Table 4.5-3 presents a summary of land use and recreation impacts that would be associated with the proposed Project and corresponding recommended mitigation measures.

Table 4.5-3. Summary of Land Use and Recreation Impacts and Mitigation Measures

Impacts	Mitigation Measures
LUR-1: Impacts on Sensitive Shoreline Lands, and/or Water and Non-Water Recreation Due to a Release of Accidental Spills of Relatively Low-Volatility Petroleum Products or Large Accidental Spills of Highly Volatile Products	**MM OS-1a.** Install Tension-Monitoring Devices
	MM OS-1b. Install an Allision Avoidance System
	MM OS-1c. Replace Existing Loading Arms
	MM OS-1d. Install Remote Release System

4.5.5 Impacts of Alternatives

No Project Alternative

Under the No Project Alternative, Shore would not be granted a new lease and the existing wharf would be subsequently decommissioned with its components reused, abandoned in place, removed, or a combination thereof. The decommissioning of the MOT would be governed by an Abandonment and Restoration Plan, which would include, among other steps, actions to abandon and/or remove all wharf components above and below the seafloor, as well as Site Cleanup Verification.

Like the proposed Project, the No Project Alternative would not conflict with Contra Costa County General Plan or Zoning designations, nor would it conflict with BCDC

designations or planning efforts to protect the recreational resources of the Project area. Like the proposed Project, the No Project Alternative would not create incompatible adjacent land uses as defined by planning documentation. However, the No Project Alternative would be inconsistent with BCDC and county plans and policies protecting and encouraging water-related industry, including (BCDC 2008a, 2011; Contra Costa County 2005):

- San Francisco Bay Plan: *Water-Related Industry Policy 1*; and
- Transportation and Circulation Element, Contra Costa County General Plan: *Goal 5-S*, *Policy 5-77,* and *Policy 5-78.*

~~However, a~~Although under the No Project Alternative Shore would not be granted a new lease, the alternative would not render the site unusable for other water-related or shipping uses. Therefore, such plan inconsistencies would be less than significant.

The No Project Alternative would remove the MOT from the water, potentially benefiting recreational boaters. Furthermore, the No Project Alternative would have no risk of spills from operations and maintenance, which would eliminate potentially significant impacts to recreational areas arising from spills at the MOT. The impacts to recreational areas arising from spills from marine vessel traffic, however, would not be substantially affected under this alternative as the petroleum products no longer handled at the Shore MOT would most likely be diverted to other marine terminals in the region.

Therefore, in summary, the No Project Alternative would have similar impacts to land use and recreation as compared to the proposed Project, except that removal of the wharf facility could provide some benefit to recreational boaters by eliminating a nearshore structure.

Limitations on Terminal Use Alternative

Under the Limitations on Terminal Use Alternative, Shore would be granted a new lease but with restrictions on the number, type, or size of marine vessels that would be allowed to call at the marine terminal, or restrictions on the type of product that could be loaded or unloaded.

Because the site would be used for similar purposes as the proposed Project, this alternative would have the essentially the same impacts with respect to conflicts with existing or known future land uses, or adopted land use plans, policies, or ordinances;

conflicts with planning efforts to protect the recreational resources of the Project area; and incompatible adjacent land uses as defined by planning documentation.

The operational restrictions in the Limitations on Terminal Use Alternative may result in avoidance or reduction of potential impacts to recreational resources from petroleum product spills, compared to the proposed Project.

4.5.6 Cumulative Projects Impact Analysis

Because the proposed Project would have no conflicts with existing or known future land uses, or adopted land use plans, policies, or ordinances; would not conflict with planning efforts to protect the recreational resources of the Project area; and would not result in incompatible adjacent land uses as defined by planning documentation, the proposed Project would therefore not contribute to any cumulative impacts in these areas. Similarly, routine operations of the proposed Project would not result in any impacts to recreational resources, and so would not contribute to cumulative recreation impacts.

However, the proposed Project, as well as several cumulative projects listed in Table 3.5-1, each has a risk of an accidental spill of petroleum products. Based on historical perspective (see Section 4.1, Operational Safety/Risk of Accidents), the probability of a spill from marine vessel traffic in the Bay is very low (less than three spills per 10,000 vessel calls[3]), so the likelihood of multiple accidental spills occurring simultaneously and affecting the same recreational area is extremely slim. Furthermore, over the past 20 years (1989 to 2008), the overall number of GGB ship traffic arrivals has remained fairly constant, ranging from a low of 2,897 arrivals in 1997 to a high of 3,671 arrivals in 1991 (see Section 3.5.3, Regional Characteristics of Marine Vessel Transportation in Bay and Along Coastal Shipping Lanes off Northern California). Because the nature of the cumulative projects shown in Table 3.5-1 is not unlike that of past projects in the Bay over the past 20 years, and total vessel traffic has remained fairly steady over that time, it follows that the cumulative projects would not be expected to have a material effect on total marine vessel traffic, and therefore no material effect on the cumulative risk of an accidental spill of petroleum products in the Bay or the likelihood that substantial residual petroleum products would remain after a cleanup. Therefore, the cumulative impact to shoreline and on-water recreational resources from spills would be less than significant and the proposed Project's contribution would not be cumulatively considerable.

[3] The probability of a spill of 238 barrels or greater at marine terminals in the Bay Area is about 2.7×10^{-4} per vessel call (i.e., less than three spills for every 10,000 vessel calls).

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4.6 AIR QUALITY

This section discusses the existing air quality conditions that occur within the study area. This section also identifies significance criteria, assesses potential Project-related impacts to existing air quality conditions, and identifies mitigation measures, if needed, that are designed to reduce or eliminate adverse impacts.

4.6.1 Environmental Setting

Air quality is a function of both the amount and location of pollutant emissions as well as meteorological conditions and topographic features that influence pollutant movement and dispersal. Atmospheric conditions such as wind speed, wind direction, atmospheric stability, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants, which affects air quality.

Regional Topography, Climate, and Meteorology

The Shore Marine Oil Terminal (MOT) Lease Project (the proposed Project) is located in the northeastern section of San Pablo Bay, at the mouth of the Carquinez Strait, a sea-level gap between the Coast Range and the Diablo Range. The proposed Project is within Contra Costa County and is in the Bay Area Air Basin (Basin).

Temperature variation in the proposed Project area is relatively moderate seasonally, as well as daily. The average maximum and minimum winter (i.e., January) temperatures in the region are 54ºF and 41ºF, respectively, while average summer (i.e., July) maximum and minimum temperatures are 80ºF and 55ºF, respectively (WRCC 2009). The annual average of total precipitation received in the Project area is approximately 18 inches (WRCC 2009). The prevailing wind at the marine terminal is from the north, northwest, and southwest. Winds from the north and northwest are typically associated with the summer Pacific High and winds from the southwest are characteristic of winter storm systems. Wind tends to be strongest in the afternoon, with speeds 15 to 20 miles per hour common in the region.

Between late spring and early fall, a layer of warm air often overlies a layer of cool air influenced by San Francisco Bay, resulting in air temperature gradients that cause stagnation of air referred to as an inversion. Typical winter inversions are formed when the sun heats the upper layers of air, trapping air below that has been cooled by contact with the colder surface of the earth during the night. Although each inversion type

predominates at certain times of the year, both types can occur at any time of the year. Because inversions inhibit the vertical mixing of air in the atmosphere, they can prevent air pollution from dispersing, contributing to higher ground surface pollutant concentrations.

Existing Air Quality

Monitoring stations that collect air quality data are located throughout the Bay Area. The closest monitoring station to the proposed Project site is the San Pablo station located on Rumrill Boulevard, San Pablo, approximately 8 miles southwest of the Project area. This monitoring station collects data for ozone (O_3), carbon monoxide (CO), and nitrogen dioxide (NO_2). The closest monitoring station to the proposed Project area that collects other criteria pollutant data is in Concord on Treat Boulevard, approximately 12 miles southeast of the Project area. The Concord station also measures particulate matter 10 microns or smaller in diameter (PM_{10}) and particulate matter 2.5 microns or smaller in diameter ($PM_{2.5}$). Recent air quality data for ozone, CO, and NO_2 collected at the San Pablo station and data for PM_{10} and $PM_{2.5}$ collected at the Concord monitoring station are summarized in Table 4.6-1 and compared with California Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS).

Criteria air pollutants are classified in each air basin, county, or in some cases, within a specific urbanized area. The classification is determined by comparing actual monitoring data with State and Federal standards. If a pollutant concentration is lower than the standard, the area is classified as “attainment” for that pollutant. If an area exceeds the standard, the area is classified as “non-attainment” for that pollutant. If there are not enough data available to determine whether the standard is exceeded in an area, the area is designated “unclassified.” The Basin attainment status for criteria pollutants is summarized in Table 4.6-2.

The criteria air pollutants most relevant to air quality planning and regulation in the Basin include ozone, PM_{10}, and $PM_{2.5}$. The Basin is classified as non-attainment for State PM_{10} and $PM_{2.5}$ standards as well as State 1-hour and 8-hour ozone standards. With respect to Federal standards, the Basin is classified as non-attainment for the 8-hour ozone standard and the 24-hour $PM_{2.5}$ standard. For all other State and Federal criteria air pollutant standards, the Basin is classified as either unclassified or as attainment (BAAQMD 2008). Below are summary descriptions of the criteria pollutants.

Table 4.6-1. Study Area Air Quality Summary - 2006 through 2008

	Standard	Monitoring Data by Year		
		2006	2007	2008
Ozone (O_3)				
Highest 1 Hour Average (ppm)	0.09	0.06	0.07	0.08
Days over State Standard		0	0	0
Highest 8 Hour Average (ppm)	0.07	0.05	0.05	0.06
Days over State Standard		0	0	0
Carbon Monoxide (CO)				
Highest 8 Hour Average (ppm)	9.0	1.4	1.2	1.3
Days over State Standard		0	0	0
Nitrogen Dioxide (NO_2)				
Highest 1 Hour Average (ppm)	0.18	0.06	0.05	0.06
Days over State Standard		0	0	0
Particulate Matter (PM_{10})				
Highest 24 Hour Average (µg/m^3)	50	81	52	51
Days over State Standard		3	2	1
State Annual Average (µg/m^3)	20	18.5	16.8	---
Particulate Matter ($PM_{2.5}$)				
Highest 24 Hour Average (µg/m^3)	35	62	46	60
Days over National Standard		5	7	2
State Annual Average (µg/m^3)	12	10.0	8.7	---

Notes: ppm = parts per million; µg/m^3 = micrograms per cubic meter.
--- indicates there were insufficient or no data available to determine the value.
Source: CARB 2009

Table 4.6-2. Attainment Status of Bay Area Air Basin

Pollutant	Federal Status	State Status
Ozone (O_3) – 1 hour	N/A	Non-attainment
Ozone (O_3) – 8 hour	Non-attainment	Non-attainment
Carbon Monoxide (CO)	Attainment	Attainment
Nitrogen Dioxide (NO_2)	Attainment	Attainment
Sulfur Dioxide (SO_2)	Unclassified	Attainment
Inhalable Particulate (PM_{10})	Unclassified	Non-attainment
Respirable Particulate ($PM_{2.5}$)	Non-attainment	Non-attainment
Lead (Pb)	Attainment	Attainment

Note: N/A = not applicable.
Source: BAAQMD 2008

Ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and can cause substantial damage to vegetation and other materials. Ozone is not emitted directly into the atmosphere but is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG) and nitrogen oxides (NO_x). ROG and NO_x are known as precursor compounds for ozone. Significant ozone production generally requires ozone precursors to be present in a stable atmosphere with strong sunlight for approximately three hours.

Ozone is a regional air pollutant because it is not emitted directly by sources but is formed downwind of sources of ROG and NO_x under the influence of wind and sunlight. Ozone concentrations tend to be higher in the late spring, summer, and fall, when the long sunny days combine with regional subsidence inversions to create conditions conducive to the formation and accumulation of secondary photochemical compounds, like ozone.

Particulate Matter (PM_{10} and $PM_{2.5}$) consists of particulate matter that is 10 microns or less in diameter and 2.5 microns or less in diameter, respectively. PM_{10} and $PM_{2.5}$ represent fractions of particulate matter that can be inhaled into the air passages and the lungs and can cause adverse health effects. Particulate matter in the atmosphere results from many kinds of dust- and fume-producing industrial and agricultural operations, fuel combustion, and atmospheric photochemical reactions.

Some sources of particulate matter, such as demolition and construction activities, are more local in nature, while others, such as vehicular traffic, have a more regional effect. Very small particles of certain substances (e.g., sulfates and nitrates) can cause lung damage directly, or can contain adsorbed gases (e.g., chlorides or ammonium) that may be injurious to health. Particulates also can damage materials and reduce visibility.

Carbon Monoxide (CO) is a non-reactive pollutant that is a product of incomplete combustion and is mostly associated with motor vehicle traffic. High CO concentrations develop primarily during winter when periods of light winds combine with the formation of ground-level temperature inversions (typically from the evening through early morning). These conditions result in reduced dispersion of vehicle emissions. Motor vehicles also exhibit increased CO emission rates at low air temperatures. When inhaled at high concentrations, CO combines with hemoglobin in the blood and reduces the oxygen-carrying capacity of the blood. This results in reduced oxygen reaching the

brain, heart, and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease, or anemia.

Nitrogen Dioxide (NO_2) is a combustion product of all fossil fuels and is associated primarily with combustion emissions from motor vehicles, petroleum-refining operations, industrial sources, aircraft, ships, and railroads. NO_2 is irritating to the eyes and respiratory tract. The Bay Area is in attainment status with both Federal and State NO_2 standards.

Sulfur Dioxide (SO_2) is a combustion product of sulfur or sulfur-containing fuels such as coal, which are restricted in the Bay Area. SO_2 is also a precursor to the formation of atmospheric sulfate, particulate matter (PM_{10} and $PM_{2.5}$), and contributes to potential atmospheric sulfuric acid formation that could precipitate downwind as acid rain. The Bay Area is in attainment status with both Federal and State SO_2 standards.

Lead (Pb) has a range of adverse neurotoxin health effects, and was formerly released into the atmosphere primarily via combustion of leaded gasoline. The phase-out of leaded gasoline in California resulted in decreasing levels of atmospheric lead. The Bay Area is in attainment status with both Federal and State lead standards.

Toxic Air Contaminants

In addition to the criteria air pollutants, another group of airborne pollutants called toxic air contaminants (TACs) are known to be highly hazardous to health, even in small quantities. TACs are airborne substances capable of causing short-term (acute) and/or long-term (chronic or carcinogenic) adverse human health effects (e.g., injury or illness).

TACs can be emitted from a variety of common sources, including gasoline stations, automobiles, dry cleaners, industrial operations, painting operations, etc. Natural emission sources include windblown dust and wildfires. Farms, large construction sites, and residential areas can also contribute to toxic air emissions. The California Air Resources Board (CARB) has recently identified diesel particulate matter as also being a TAC. Regulation of TACs is achieved through Federal and State controls on individual sources. The 1990 Federal Clean Air Act Amendments offer a comprehensive plan for achieving significant reduction in both mobile and stationary source emissions of certain designated Hazardous Air Pollutants (HAPs).[1] All major stationary sources of designated

[1] The federally-regulated Hazardous Air Pollutants are also typically included in the list of Toxic Air Contaminants regulated by the CARB and local air districts.

HAPs are required to obtain and pay the required fees for an operating permit under Title V of the Federal Clean Air Act Amendments.

TAC impacts are assessed using a standard Maximally Exposed Individual (MEI) health risk of 10 in one million. The CARB and local air districts have determined that any source that poses a risk to the general population that is equal to or greater than 10 people out of one million contracting cancer is excessive. When estimating this risk, it is assumed that an individual is continuously exposed to the maximum concentration of any given TAC for 70 years. If the risk of such exposure meets or exceeds the threshold of 10 excess cancer cases per one million people, then the CARB and the local air district may require the installation of toxic best available control technology (TBACT) or maximum available control technology (MACT) to reduce the risk threshold.

Greenhouse Gas Emissions and Climate Change

Gases that trap heat in the atmosphere are referred to as greenhouse gases (GHGs) because they capture heat radiated from the sun as it is reflected back into the atmosphere, similar to a greenhouse. The accumulation of GHGs has been implicated as a driving force for global climate change. Definitions of climate change vary between and across regulatory authorities and the scientific community, but in general can be described as the changing of the earth's climate caused by natural fluctuations and the impact of human activities that alter the composition of the global atmosphere. Both natural processes and human activities emit GHGs.

The major concern is that increases in GHGs are causing global climate change. Global climate change is a change in the average weather on earth that can be measured by wind patterns, storms, precipitation, and temperature. Potential global warming impacts in California may include, but are not limited to, loss in snow pack, sea level rise, more extreme heat days per year, more high ozone days, more large forest fires, and more drought years.

Globally, climate change has the potential to impact numerous environmental resources through potential, though uncertain, impacts related to future air temperatures and precipitation patterns. The projected effects of global warming on weather and climate are likely to vary regionally, but are expected to include the following direct effects (IPCC 2001):

- Higher maximum temperatures and more hot days over nearly all land areas;

- Higher minimum temperatures, fewer cold days and frost days over nearly all land areas;
- Reduced diurnal temperature range over most land areas;
- Increase of heat index over land areas; and
- More intense precipitation events.

Also, secondary effects are likely to include a global rise in sea level, impacts to agriculture, changes in disease vectors, and changes in habitat and biodiversity. While the possible outcomes and the feedback mechanisms involved are not fully understood, and much research remains to be done, the potential for substantial environmental, social, and economic consequences over the long term may be great.

The accumulation of GHGs in the atmosphere regulates the earth's temperature; however, emissions from human activities such as electricity production and motor vehicles have elevated the concentration of GHGs in the atmosphere. This accumulation of GHGs has contributed to an increase in the temperature of the earth's atmosphere and contributed to global climate change. GHGs include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulfur hexafluoride (SF_6), perfluorocarbons (PFCs), and hydrofluorocarbons (HFCs). Carbon dioxide is the reference gas for climate change because it gets the most attention and is considered the most important GHG. To account for the warming potential of GHGs, GHG emissions are often quantified and reported as CO_2 equivalents (CO_2e). The effects of GHG emission sources (i.e., individual projects) are reported in metric tons per year of CO_2e.

The California Energy Commission (CEC) estimated that in 2004, California produced 492 million gross metric tons of CO_2e GHG emissions (CEC 2006). The CEC found that transportation is the source of 41 percent of the State's GHG emissions, followed by electricity generation at 22 percent and industrial sources at 21 percent.

Sensitive Receptors

For the purposes of air quality and public health analyses, sensitive receptors are generally defined as land uses with population concentrations that would be particularly susceptible to disturbance from dust, air pollutant concentrations, or other disruptions associated with project construction and/or operation. These receptors generally include schools, daycare centers, hospitals, residential areas, and parks. Some receptors are considered more sensitive than others to air pollutants. The reasons for

greater than average sensitivity include pre-existing health problems, proximity to emissions sources, or duration of exposure to air pollutants. Schools, hospitals, and convalescent homes are considered to be relatively sensitive to poor air quality because children, elderly people, and the infirm are more susceptible to respiratory distress and other air quality-related health problems than the general public.

Residential areas are considered sensitive to poor air quality because people usually stay home for extended periods of time, with associated greater exposure to ambient air quality. Recreational uses are also considered sensitive due to the greater exposure to ambient air quality conditions because vigorous exercise associated with recreation places a high demand on the human respiratory system. The nearest sensitive receptors to the proposed Project site are residences approximately 0.4 mile (2,000 feet) to the southeast of the terminal, along Vista Del Rio Street and Kendall Avenue in the unincorporated town of Crockett.

Baseline Emissions

In order to estimate the air quality baseline emissions associated with Shore's existing operations, the MOT vessel calls per year were reviewed for the past 10 years (i.e., 1999 through 2008). It was determined that the year 2003 would best represent a conservative estimate of existing emissions because the MOT experienced the most vessel calls that year during the 10-year study period. Table 4.6-3 presents the estimated baseline emissions associated with existing operations at the Shore MOT. Refer to Appendix F for all assumptions and emission factors used to estimate the emissions.

Table 4.6-3. Estimated Baseline Emissions

Sources	Emissions					
	NO_x	PM10	PM2.5	ROG	CO	CO2e
Vessel Emissions	31	1	1	1	3	1,884
Vessel Loading	NA	NA	NA	6	NA	NA
Electricity Usage	NA	NA	NA	NA	NA	20
Total (tons/year)	31	1	1	7	3	1,904
Total (metric tons/year)	---	---	---	---	---	1,727

Note: see Appendix F for all assumption and emission factors used to estimate the baseline emissions.

4.6.2 Regulatory Setting

Air quality is addressed through the efforts of various Federal, State, and local government agencies. These agencies work jointly and individually to improve air quality through legislation, regulations, planning, policy-making, education, and a variety of programs. The air pollutants of concern, the agencies primarily responsible for improving the air quality within the proposed Project area, and the pertinent regulations are discussed below.

Criteria Air Quality Pollutants

Criteria air pollutants are a group of pollutants for which Federal or State regulatory agencies have adopted ambient air quality standards. Criteria air pollutants include ozone (O_3), CO, NO_2, SO_2, particulate matter (both PM_{10} and $PM_{2.5}$), and lead. Most of the criteria pollutants are directly emitted. However, as discussed above, ozone is a secondary pollutant that is formed in the atmosphere by chemical reactions between oxides of nitrogen (NO_x) and reactive organic gases (ROG).

To protect human health and the environment, the U.S. Environmental Protection Agency (USEPA) has set “primary” and “secondary” maximum ambient thresholds for the criteria pollutants. Primary thresholds were set to protect human health, particularly sensitive receptors such as children, the elderly, and individuals suffering from chronic lung conditions such as asthma and emphysema. Secondary standards were set to protect the natural environment and prevent further deterioration of animals, crops, vegetation, and buildings.

The NAAQS are defined as the maximum acceptable concentration that may be reached but not exceeded more than once per year. California has adopted more stringent CAAQS for most of the criteria air pollutants. Table 4.6-4 presents both sets of ambient air quality standards (i.e., Federal and State) and provides a brief discussion of the related health effects and principal sources for each pollutant. California has also established State ambient air quality standards for sulfates, hydrogen sulfide, and vinyl chloride; however, given the description of the proposed Project, emissions of these pollutants are not expected. Therefore, there is no further mention of these pollutants in this EIR.

Table 4.6-4. State and Federal Criteria Air Pollutant Standards, Effects, and Sources

Pollutant	Averaging Time	State Standard	National Standard	Pollutant Health and Atmospheric Effects	Major Pollutant Sources
Ozone (O_3)	1 Hour 8 Hour	0.09 ppm 0.07 ppm	--- 0.08 ppm	High concentrations can directly affect lungs, causing irritation. Long-term exposure may cause damage to lung tissue.	Formed when ROG and NO_X react in the presence of sunlight. Major sources include on-road motor vehicles, solvent evaporation, and commercial/ industrial mobile equipment.
Carbon Monoxide (CO)	1 Hour 8 Hour	20 ppm 9.0 ppm	35 ppm 9 ppm	A chemical asphyxiant, CO interferes with the transfer of oxygen to the blood and deprives sensitive tissues of oxygen.	Internal combustion engines, primarily gasoline-powered motor vehicles.
Nitrogen Dioxide (NO_2)	1 Hour Annual	0.18 ppm 0.03 ppm	– 0.053 ppm	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown.	Motor vehicles, petroleum-refining operations, industrial sources, aircraft, ships, and railroads.
Sulfur Dioxide (SO_2)	1 Hour 3 Hour 24 Hour Annual	0.25 ppm – 0.04 ppm –	– 0.5 ppm 0.14 ppm 0.03 ppm	Irritates upper respiratory tract; injurious to lung tissue. Can yellow the leaves of plants, destructive to marble, iron, and steel. Limits visibility, reduces sunlight.	Fuel combustion, chemical plants, sulfur recovery plants, and metal processing.
Respirable Particulate Matter (PM_{10})	24 Hour Annual	50 µg/m^3 20 µg/m^3	150 µg/m^3 –	May irritate eyes and respiratory tract, decreases lung capacity, cancer and increased mortality. Produces haze and limits visibility.	Dust and fume-producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g. wind-raised dust and ocean sprays).
Fine Particulate Matter ($PM_{2.5}$)	24 Hour Annual	– 12 µg/m^3	35 µg/m^3 15 µg/m^3	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and results in surface soiling.	Fuel combustion in motor vehicles, equipment, and industrial sources; residential and agricultural burning. Also formed from photochemical reactions of other pollutants, including NO_x, SO_2, and organics.

Table 4.6-4. State and Federal Criteria Air Pollutant Standards, Effects, and Sources (cont.)

Pollutant	Averaging Time	State Standard	National Standard	Pollutant Health and Atmospheric Effects	Major Pollutant Sources
Lead	Monthly Quarterly	1.5 µg/m^3 –	– 1.5 µg/m^3	Disturbs gastrointestinal system, and causes anemia, kidney disease, and neuromuscular and neurological dysfunction.	Present source: lead smelters, battery manufacturing & recycling facilities. Past source: combustion of leaded gasoline.

Notes: ppm = parts per million; µg/m^3 = micrograms per cubic meter.
Source: BAAQMD 2008

Federal

The USEPA is responsible for implementing the myriad of programs established under the Federal Clean Air Act, such as establishing and reviewing the NAAQS and judging the adequacy of State Implementation Plans (SIPs). The USEPA has delegated the authority to implement many of the Federal programs to the states while retaining an oversight role to ensure that the programs continue to be implemented.

State

The CARB is responsible for establishing and reviewing the State standards, compiling the California SIP, securing approval of that plan from the USEPA, and identifying toxic air contaminants. The CARB also regulates mobile sources of emissions in California such as construction equipment, trucks, and automobiles, and oversees the activities of California's air quality management districts, which are organized at the county or regional level. County or regional air quality management districts are primarily responsible for regulating stationary sources at industrial and commercial facilities within their geographic areas and for preparing the air quality plans that are required under the Federal Clean Air Act and California Clean Air Act.

California Code of Regulations (CCR), Title 13, section 2299.2

In 2008, the CARB adopted CCR, Title 13, section 2299.2, referred to as *Fuel Sulfur and Other Operational Requirements for Ocean-going Vessels within California Waters and 24 Nautical Miles of the California Baseline*. It requires the use of low-sulfur marine distillate fuels in order to reduce emissions of PM, NO_x, and sulfur oxides (SO_x) from the

use of auxiliary diesel and diesel-electric engines, main propulsion diesel engines, and auxiliary boilers on ocean-going vessels within "Regulated California Waters." The regulation requires fuel sulfur content limits for auxiliary and main diesel engines of 1.5 and 0.5 percent for marine gas oil and marine diesel oil, respectively. The regulation includes additional sulfur content limits to be achieved by January 1, 2012.

CCR Title 17, section 93118.3

The purpose of CCR, Title 17, section 93118.3, referred to as *Airborne Toxic Control Measure for Auxiliary Diesel Engines Operated on Ocean-Going Vessels At-Berth in a California Port*, is to reduce hotelling (or at-berth) emissions and associated health impacts from diesel-fueled auxiliary engines on board ships docked at California ports. Operators of container ship fleets, refrigerated cargo ship fleets, and passenger ship fleets are required to comply with this regulation in addition to the ports and terminals that receive them. It should be noted that the Ports of Los Angeles, Long Beach, Oakland, San Francisco, San Diego, and Hueneme are subject to this regulation. All other ocean-going fleets, terminals, and ports are not affected by the regulation.

Assembly Bill 32 – California Global Warming Solutions Act

In 2006, California passed the California Global Warming Solutions Act of 2006 (Assembly Bill No. 32; California Health and Safety Code Division 25.5, § 38500, *et seq*., or AB 32). It requires the CARB to design and implement emission limits, regulations, and other measures, such that statewide GHG emissions will be reduced to 1990 levels by 2020.

In December 2007, the CARB approved the 2020 emission limit of 427 million metric tons of CO_2e of GHG. The 2020 target of 427 million metric tons of CO_2e requires the reduction of 169 million metric tons of CO_2e, or approximately 30 percent, from the State's projected 2020 emissions of 596 million metric tons of CO_2e (business-as-usual).

Also in December 2007, the CARB adopted mandatory reporting and verification regulations pursuant to AB 32. The regulations became effective January 1, 2009, with the first reports covering 2008 emissions. The mandatory reporting regulations require reporting for certain types of facilities that make up the bulk of the stationary source emissions in California. The regulation language identifies major facilities as those that generate more than 25,000 metric tons per year of CO_2e. Cement plants, oil refineries, electric-generating facilities/providers, cogeneration facilities, and hydrogen plants and

other stationary combustion sources that emit more than 25,000 metric tons per year CO_2e make up 94 percent of the point source CO_2e emissions in California (CARB 2007).

In December 2008, the CARB published its *Climate Change Scoping Plan* (CARB 2008). The *Climate Change Scoping Plan* proposes a comprehensive set of actions designed to reduce overall carbon emissions in California. Key elements of the *Climate Change Scoping Plan* include:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
- Achieving a statewide renewables energy mix of 33 percent;
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;
- Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets;
- Adopting and implementing measures pursuant to existing state laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard; and
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the state's long-term commitment to AB 32 implementation. (CARB 2008)

The *Climate Change Scoping Plan* states that local governments are "essential partners" in the effort to reduce GHG emissions, and that they have "broad influence and, in some cases, exclusive jurisdiction" over activities that contribute to GHG emissions. The plan acknowledges that local governments have broad influence and, in some cases, exclusive authority over activities that contribute to significant direct and indirect GHG emissions through their planning and permitting processes, local ordinances, outreach and education efforts, and municipal operations. Many of the proposed measures to reduce GHG emissions rely on local government actions. The plan encourages local governments to reduce GHG emissions by approximately 15 percent from current levels by 2020 (CARB 2008).

The *Climate Change Scoping Plan* also includes recommended measures that were developed to reduce GHG emissions from key sources and activities while improving public health, promoting a cleaner environment, preserving our natural resources, and

ensuring that the impacts of the reductions are equitable and do not disproportionately impact low-income and minority communities. These measures also put the State on a path to meet the long-term 2050 goal of reducing California's GHG emissions to 80 percent below 1990 levels. The measures in the Scoping Plan will be developed over the next two years and be in place by 2012.

Local

Bay Area Air Quality Management District

Locally, air quality is regulated by air quality management districts or air pollution control districts. The Project site is located in Contra Costa County, which is within the jurisdiction of the Bay Area Air Quality Management District (BAAQMD). The BAAQMD has produced guidance for evaluating potential air quality impacts of projects. These guidance documents are developed so that projects that comply with their requirements, and do not exceed any thresholds of significance, will be in conformity with air district air quality plans.

In December 1999, the BAAQMD adopted its CEQA Guidelines, Assessing the Air Quality Impacts of Projects and Plans, as a guidance document to provide lead government agencies, consultants, and project proponents with uniform procedures for assessing air quality impacts and preparing the air quality sections of environmental documents for projects subject to CEQA (BAAQMD 1999). The BAAQMD CEQA Guidelines are advisory and local jurisdictions are not required to utilize the methodology outlined therein. The document describes the criteria that the BAAQMD uses when reviewing and commenting on the adequacy of environmental documents. It recommends thresholds for use in determining whether projects would have significant adverse environmental impacts, identifies methodologies for predicting project emissions and impacts, and identifies measures that can be used to avoid or reduce air quality impacts.

The Federal Clean Air Act and the California Clean Air Act require plans to be developed for areas designated as non-attainment (with the exception of areas designated as non-attainment for the State PM_{10} standard). The BAAQMD is preparing the 2009 Bay Area Clean Air Plan, which will replace the existing Bay Area 2005 Ozone Strategy. This plan will include ozone control measures and will also consider the impacts of these control measures on particulate matter, air toxics, and GHGs in a single, integrated plan (BAAQMD 2009a). However, until the new plan is published, the Bay Area 2005 Ozone Strategy is the applicable air quality plan for the Project study area.

In addition, the BAAQMD has adopted rules designed to preserve air quality and protect public health (BAAQMD 2009b). At least one of the rules (Regulation 8, Rule 44, Marine Tank Vessel Operations) would apply to the proposed Project. Regulation 8, Rule 44 limits emissions of organic compounds to the atmosphere during marine tank vessel operations.

Contra Costa County

The Conservation Element of the Contra Costa County General Plan includes goals and policies that aim to improve local and regional air quality throughout the county (Contra Costa County 2005). The following air resources policies may be applicable to the proposed Project:

> *Policy 8-103:* When there is a finding that a proposed project might significantly affect air quality, appropriate mitigation measures shall be imposed.

> *Policy 8-104:* Proposed projects shall be reviewed for their potential to generate hazardous air pollutants.

4.6.3 Significance Criteria

Air quality impacts would be significant if the proposed Project would result in the following:

- Emissions that substantially contribute to an exceedance of a State or Federal ambient air quality standard;
- Operations contributing to an exceedance of localized carbon monoxide emissions in excess of the CAAQS (i.e., 20 parts per million (ppm) for 1 hour or 9 ppm for 8 hours);
- Operations resulting in emissions which exceed the following emission thresholds:
  - Reactive Organic Gases (ROG), 15 tons/year, 80 pounds (lbs)/day,
  - Nitrogen Oxides, 15 tons/year, 80 lbs/day, and
  - PM_{10} (suspended particulate matter 10 microns or less in diameter), 15 tons/year, 80 lbs/day;
- Uses that create objectionable odors that would be considered a nuisance under a BAAQMD rule or regulation;
- Exposure of sensitive receptors (including residential areas) or the general public to substantial levels of toxic air contaminants or objectionable odors;

- The potential for the accidental release of acutely hazardous air emissions; or
- Contribution to a cumulatively significant effect on the emission of GHG.

4.6.4 Impact Analysis and Mitigation

Air emissions associated with Shore's existing MOT operations arise from a number of activities and sources as summarized in Table 4.6-5. For emissions estimates associated with Shore's existing MOT operations, refer to Table 4.6-3.

Table 4.6-5. Existing Sources of Air Emissions at the Shore MOT

Activity	Emission Source(s)	Pollutants Emitted
Marine vessel traffic	Combustion emissions from vessel propulsion and ancillary engines while docking and mooring at the MOT	NO_x, ROG, CO, SO_2, PM_{10}, $PM_{2.5}$, Diesel Particulate Matter (DPM) and other TACs, GHGs
Product loading and unloading	Organic liquid fugitive emissions	ROG, TACs
Electricity usage (lighting and pumps)	Indirect emissions from offsite electricity generation	NO_x, ROG, CO, PM_{10}, $PM_{2.5}$, TACs, GHGs

Under the proposed Project, Shore would be granted a new lease and operations of the MOT would continue as currently conducted. There would be no construction activities associated with the proposed Project, and there would be no change in operations that would result in new or increased levels of air emissions or odors. Therefore, there would be no change in air emissions associated with routine operations and no air quality or odor impacts would occur (No Impact).

As discussed in Section 4.1, Operational Safety/Risk of Accidents, the probability exists for accidental spills of petroleum products as a result of MOT operations. Since 1992, when the CSLC began tracking spills from marine terminals, there have been three reported spills at the Shore MOT ranging in size from 1 pint to 10 barrels. ROG emissions in the form of evaporative hydrocarbons can be released to the atmosphere from such spills; the quantity of ROG emissions from a spill depends on a number of factors, including the type and volume of product spilled and how much of the spilled material is contained and captured. However, given the very infrequent occurrence and relatively small volume of spills reported at the MOT, ROG emissions from spills would be inconsequential. Furthermore, since the proposed Project would not result in any physical or operational change that could increase the frequency or volume of spills, there would not be any new or increased air quality impacts expected (No Impact).

With regard to GHG emissions, the Shore MOT was in operation prior to 1990 and so its GHG emissions are included in the statewide 1990 GHG inventory (1990 is the "baseline" year for GHG emissions established under AB 32). Although data on marine vessel visits in 1990 are not available, data since 1999 (see Table 2-2 in Section 2, Project Description) show only modest year-to-year variability in vessel visits at the Shore MOT. It is reasonable to assume, therefore, that vessel visits (and, consequently, GHG emissions) in 1990 were not substantially different than would occur with the continuation of existing operations under a new lease. Because the goal of AB 32 is to reduce the statewide GHG emissions to 1990 levels by 2020, and the Shore MOT GHG emissions are included in the 1990 baseline, continuation of existing operations would not result in a cumulatively significant effect on the emission of GHG (No Impact).

4.6.5 Impacts of Alternatives

No Project Alternative

Under the No Project Alternative, Shore would not be granted a new lease and the existing MOT would be subsequently decommissioned with its components reused, abandoned in place, removed, or a combination thereof. Decommissioning and removal of the MOT under the No Project Alternative would likely result in short-term emissions associated with the operation of equipment (e.g., cranes, marine vessels, etc.), followed by a permanent reduction in air emissions and GHGs from the MOT because it would no longer operate. Reuse of the MOT may result in greater or lesser air emissions and GHGs than the proposed Project, depending on the nature of the reuse; abandonment in place would result in a permanent decrease in air emissions and GHGs from the MOT.

However, the No Project Alternative may result in indirect increases of air emissions and GHGs. Approximately 40 percent of the total product throughput at the Shore upland terminal either comes in or is shipped out by marine vessel. Because it can be expected that demand for the products currently handled at the Shore MOT would continue with or without the proposed Project, the No Project Alternative may therefore result in an increase of truck and/or rail transport from the Shore upland terminal. The limited truck and rail capacity at the upland terminal could not accommodate all the displaced product and would likely lead to diversion of some product shipments to other marine terminals more distant from the final destination, thereby resulting in even more truck and rail transport over greater distances. The increase in truck and rail traffic would likely result in an increase in air emissions and GHGs compared with the proposed Project. The No Project Alternative, therefore, would likely result in a greater impact to air quality than the proposed Project.

Limitations on Terminal Use Alternative

Under the Limitations on Terminal Use Alternative, Shore would be granted a new lease but with restrictions on the number, type, or size of marine vessels that would be allowed to call at the marine terminal, or restrictions on the type of product that could be loaded or unloaded. It is anticipated that the air quality and GHG impacts under this alternative would not be substantially different than the proposed Project, as any emission reductions achieved from reduced MOT operations would likely be offset by emission increases at either the upland terminal or elsewhere in the air basin.

4.6.6 Cumulative Projects Impact Analysis

Because the proposed Project would not individually result in any air quality impacts over existing conditions, there would be no cumulative impacts.

4.7 NOISE

4.7.1 Environmental Setting

This section discusses the existing noise conditions that occur within the Project area. This section also identifies significance criteria, assesses potential Project-related impacts to existing noise conditions, and identifies mitigation measures, if needed, that are designed to reduce or eliminate adverse impacts.

Fundamentals of Environmental Sound and Noise

Sound is mechanical energy transmitted by pressure waves through a medium such as air. Noise can be defined as unwanted sound. Sound is characterized by various parameters that include the rate of oscillation of sound waves (frequency), the speed of propagation, and the pressure level or energy content (amplitude). In particular, the sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound level. Sound pressure level is measured in decibels (dB), with zero dB corresponding roughly to the threshold of human hearing, and 120 to 140 dB corresponding to the threshold of pain.

Sound pressure fluctuations can be measured in units of hertz (Hz), which correspond to the frequency of a particular sound. Typically, sound does not consist of a single frequency, but rather a broad band of frequencies varying in levels of magnitude (sound power). When all the audible frequencies of a sound are measured, a sound spectrum is plotted consisting of a range of frequency spanning 20 to 20,000 Hz. The sound pressure level, therefore, constitutes the additive force exerted by a sound corresponding to the sound frequency/sound power level spectrum.

The typical human ear is not equally sensitive to all frequencies of the audible sound spectrum. As a consequence, when assessing potential noise impacts, sound is measured using an electronic filter that de-emphasizes the frequencies below 1,000 Hz and above 5,000 Hz in a manner corresponding to the human ear's decreased sensitivity to low and extremely high frequencies instead of the mid-range frequency. This method of frequency weighting is referred to as A-weighting and is expressed in units of A-weighted decibels (dBA).[1]

[1] All noise levels reported herein reflect A-weighted decibels unless otherwise stated.

Noise Exposure and Community Noise

An individual's noise exposure is a measure of the noise experienced by the individual over a period of time. A noise level is a measure of noise at a given instant in time. However, noise levels rarely persist consistently over a long period of time. Community noise varies continuously over time with respect to the contributing sound sources of the community noise environment. Community noise is primarily the product of many distant noise sources, which constitute a relatively stable background noise exposure, with individual contributors being unidentifiable. Background noise levels change throughout a typical day, but do so gradually, corresponding with the addition and subtraction of distant noise sources and atmospheric conditions. The addition of short-duration, single-event noise sources (e.g., aircraft flyovers, motor vehicles, and sirens) makes community noise constantly variable throughout a day.

These successive additions of sound to the community noise environment vary the community noise level from instant to instant, requiring the measurement of noise exposure over a period of time to legitimately characterize a community noise environment and evaluate cumulative noise impacts. This time-varying characteristic of environmental noise is described using statistical noise descriptors. The most frequently used noise descriptors are summarized below:

- **L_{eq}:** The equivalent sound level is used to describe noise over a specified period of time, in terms of a single numerical value. The L_{eq} is the constant sound level which would contain the same acoustic energy as the varying sound level, during the same time period (i.e., the average noise exposure level for the given time period).

- **L_{max}:** The instantaneous maximum noise level measured during the measurement period of interest.

- **L_{dn}:** The energy average of the A-weighted sound levels occurring during a 24-hour period, and which accounts for the greater sensitivity of most people to nighttime noise by weighting noise levels at night ("penalizing" nighttime noises). Noise between 10:00 p.m. and 7:00 a.m. is weighted (penalized) by adding 10 dBA to take into account the greater annoyance of nighttime noises. It should be noted that some jurisdictions also refer to L_{dn} as <u>day-night average sound level (</u>DNL<u>)</u>.

- **CNEL:** Similar to the L_{dn}, the Community Noise Equivalent Level adds a 5 dBA "penalty" for the evening hours between 7:00 p.m. and 10:00 p.m. in addition to a 10 dBA penalty between the hours of 10:00 p.m. and 7:00 a.m.

- **$L_{\#}$**: a statistical description of the sound level that is exceeded over some fraction of a given period of time. For example, the L_{10} noise level represents the noise level that is exceeded 10 percent of the time.

Effects of Noise on People

The effects of noise on people can be placed into three categories:

- Subjective effects of annoyance, nuisance, dissatisfaction;
- Interference with activities such as speech, sleep, learning; and
- Physiological effects such as hearing loss or sudden startling.

Environmental noise typically produces effects in the first two categories. Workers at industrial plants often experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise, or the corresponding reactions of annoyance and dissatisfaction. A wide variation exists in the individual thresholds of annoyance, and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Thus, an important way of predicting a human reaction to a new noise environment is the way the new noise compares to the existing noise levels to which one has adapted: called the "ambient noise" level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it. With regard to increases in A-weighted noise level, the following relationships occur:

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived;
- Outside of the laboratory, a 3 dBA change is considered a just-perceivable difference when the change in noise is perceived but does not cause a human response;
- A change of at least 5 dBA is required before any noticeable change in human response would be expected; and
- A 10 dBA change is subjectively heard as approximately a doubling in loudness, and can cause an adverse response.

These relationships occur in part because of the logarithmic nature of sound and the decibel system. A ruler is a *linear* scale: It has marks on it corresponding to equal quantities of distance. One way of expressing this is to say that the ratio of successive intervals is equal to one. A *logarithmic* scale is different in that the ratio of successive intervals is not equal to one. Each interval on a logarithmic scale is some common factor larger than the previous interval. A typical ratio is 10, so that the marks on the scale read: 1, 10, 100, 1,000, 10,000, etc., doubling the variable plotted on the x-axis. The human ear perceives sound in a non-linear fashion; hence the decibel scale was developed. Because the decibel scale is based on logarithms, two noise sources do not combine in a simple additive fashion, rather logarithmically. For example, if two identical noise sources produce noise levels of 50 dBA, the combined sound level would be 53 dBA, not 100 dBA.

Noise Attenuation and Addition of Sources

Point sources of noise, including stationary mobile sources such as idling vehicles or onsite construction equipment, attenuate (lessen) at a rate of 6.0 dBA to 7.5 dBA per doubling of distance from the source, depending upon the type of ground surface between the source and the receiver. Hard ground surfaces, such as parking lots and calm water, attenuate sound at a lesser rate (i.e., 6.0 dBA per doubling of distance) compared to the attenuation of sound between a source and receiver due to soft ground surfaces such as soft dirt, grass, or scattered bushes and trees (i.e., 7.5 dBA per doubling of distance). Widely distributed noises such as a large industrial facility spread over many acres or a street with moving vehicles (a “line” source) would typically attenuate at a lower rate of approximately 3.0 to 4.5 dBA per doubling distance from the source (also dependent upon the type of ground surface between the source and the receiver) (Caltrans 1998).

Because decibels are represented on a logarithmic scale, noise levels of two sources cannot be added linearly for a combined noise level of the sources. Two noise sources that produce the same sound level, or differ by up to 1 dBA, will produce a combined sound level that is 3 dBA greater than the highest sound level of the individual sources. When two noise levels differ by 2 to 3 dBA, or 4 to 9 dBA, the combined sound level will be 2 dBA or 1 dBA, respectively, greater than the highest sound level of the individual sources (Caltrans 1998).

Fundamentals of Groundborne Vibration

Vibration is sound radiated through the ground. The rumbling sound caused by the vibration of room surfaces is called groundborne noise. The ground motion caused by vibration is measured in the U.S. as vibration decibels (VdB).

The background vibration velocity level in residential and educational areas is usually around 50 VdB. Groundborne vibration is normally perceptible to humans at approximately 65 VdB. A vibration velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels for most people.

Most perceptible indoor vibration is caused by sources within buildings, such as the operation of mechanical equipment, the movement of people, or the slamming of doors. Typical outdoor sources of perceptible groundborne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the groundborne vibration from traffic is rarely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration velocity level, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings. Construction activities can generate groundborne vibrations, which can pose a risk to nearby structures. Constant or transient vibrations can weaken structures, crack facades, and disturb occupants (FTA 2006).

Construction vibrations can be transient, random, or continuous. Transient construction vibrations occur from blasting, impact pile driving, and wrecking balls. Continuous vibrations result from vibratory pile drivers, large pumps, and compressors. Random vibration can result from jack hammers, pavement breakers, and heavy construction equipment. The general human response to different levels of groundborne vibration velocity levels is described in Table 4.7-1.

Table 4.7-1. Human Response to Different Levels of Groundborne Vibration

Vibration Velocity Level	Human Reaction
65 VdB	Approximate threshold of perception for many people.
75 VdB	Approximate dividing line between barely perceptible and distinctly perceptible. Many people find that transportation-related vibration at this level is unacceptable.
85 VdB	Vibration acceptable only if there are an infrequent number of events per day.

Source: Federal Railroad Administration (FRA 2005).

Existing Conditions

Ambient Noise Environment

Ambient noise levels were measured near the Shore Marine Oil Terminal (MOT) in order to characterize existing noise conditions in the vicinity of the Project site. Two 24-hour noise measurements were collected just south of the MOT at the wharf access gate. The L_{dn} levels for each of the 24-hour measurement periods were estimated to be 67 dBA, which is typical for an industrial area. Refer to Figures 4.7-1 and 4.7-2 for other statistical noise data (i.e., L_{eq}, L_{max}, L_{10}, and $L_{99.9}$) associated with the 24-hour measurements.

It should be noted that a representative of Shore informed ESA that maintenance activities occurred on Tuesday afternoon at a portable toilet that was located only approximately 10 feet from the noise meter. This may be the source of the L_{max} level that occurred on Tuesday afternoon between 3:00 p.m. and 4:00 p.m. (see Figure 4.7-1). In addition, the Union Pacific Railroad (UPRR) mainline lies along the shore just south of the MOT, approximately 115 feet south-southeast of the noise measurement location. The UPRR is primarily a freight line that generates high noise levels during pass-bys. The L_{dn} noise level created by trains operating along the UPRR was estimated to be approximately 70 dBA at a distance of approximately 250 feet from the centerline of the railroad right-of-way (Contra Costa County 2005).

Sensitive Receptors

Human response to noise varies considerably from one individual to another. Effects of noise at various levels can include interference with sleep, concentration, and communication, and can cause physiological and psychological stress and hearing loss. Given these effects, some land uses are considered more sensitive to ambient noise levels than others. In general, residences, schools, hotels, hospitals, and nursing homes are considered to be the most sensitive to noise. Places such as churches, libraries, and cemeteries, where people tend to pray, study, and/or contemplate are also sensitive to noise. Commercial and industrial uses are considered the least noise-sensitive. The nearest sensitive receptors to the proposed Project site are residences approximately 0.4 mile (2,000 feet) to the southeast of the terminal, along Vista Del Rio Street and Kendall Avenue in the unincorporated town of Crockett.

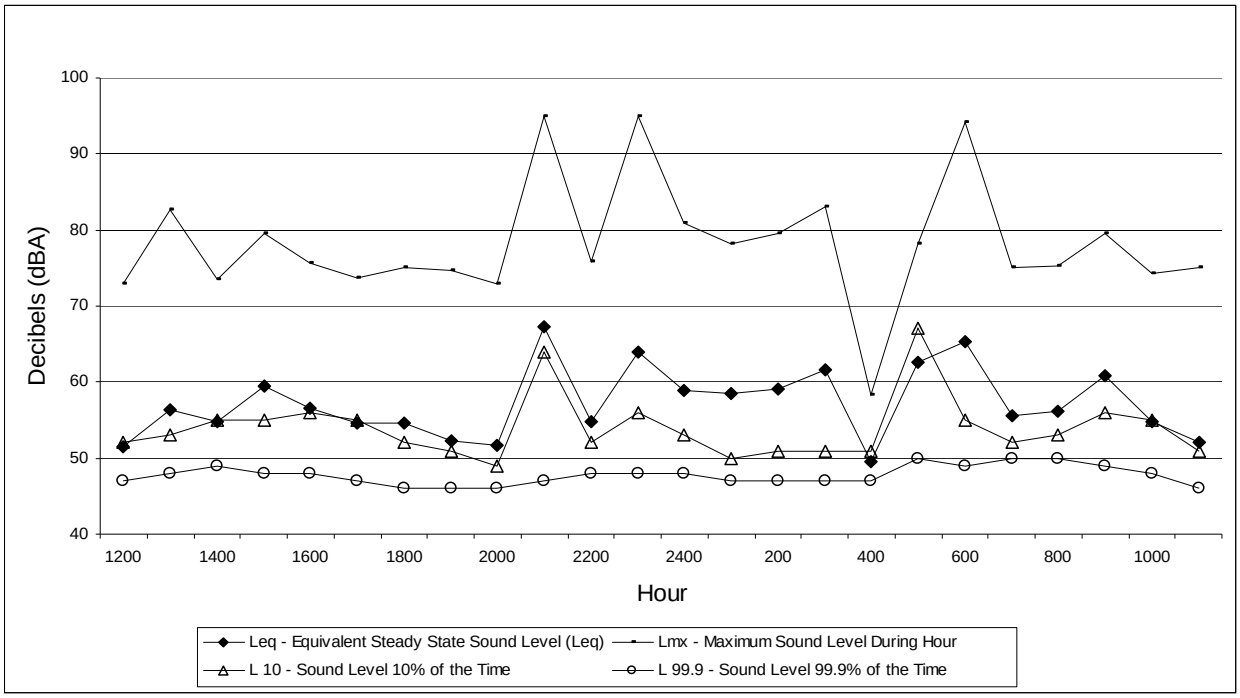

Figure 4.7-1
24-Hour Noise Measurement Data – Monday/Tuesday, June 22/23, 2009

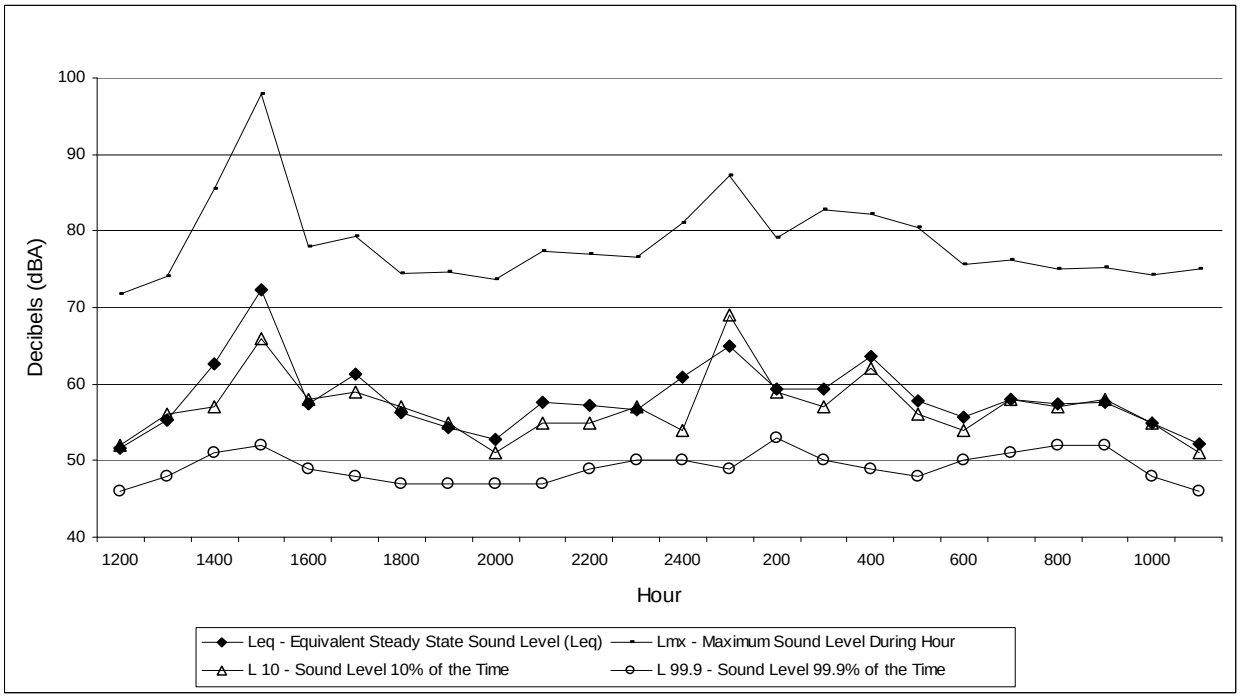

Figure 4.7-2
24-Hour Noise Measurement Data – Tuesday/Wednesday, June 23/24, 2009

4.7.2 Regulatory Setting

Federal, State, and local agencies regulate different aspects of environmental noise. Federal and State agencies generally set noise standards for mobile sources such as aircraft and motor vehicles, while regulation of stationary sources is left to local agencies. Local regulation of noise involves implementation of general plan policies and noise ordinance standards. Local general plans identify general principles intended to guide and influence development plans; local noise codes establish standards and procedures for addressing specific noise sources and activities.

~~Federal, State, and local agencies regulate different aspects of environmental noise. Federal and State agencies generally set noise standards for mobile sources such as aircraft and motor vehicles, while regulation of stationary sources is left to local agencies. Local regulation of noise involves implementation of general plan policies and noise ordinance standards. Local general plans identify general principles intended to guide and influence development plans.~~

Contra Costa County

The Noise Element of the Contra Costa County General Plan contains goals and policies to reduce or eliminate the effects of excessive noise in the community. Goals strive to improve the overall environment in the county by reducing annoying and physically harmful levels of noise and maintaining appropriate noise conditions in all areas of the county. The county also strives to ensure that new developments will be constructed to limit the effects of exterior noise on the residents, at the same time recognizing the economic impacts of noise control and encouraging an equitable distribution of these costs.

To this end, the Contra Costa County General Plan requires that new projects meet acceptable exterior noise level standards as established in the Noise and Land Use Compatibility Guidelines contained in Figure 11-6 (see Table 4.7-2) of that Plan. These guidelines, along with future noise contour maps contained in the general plan, are to be used by the county as a guide for evaluating the compatibility of “noise sensitive” projects in potentially noisy areas. If an area is currently below the maximum “normally acceptable” noise level, an increase in noise up to the maximum is not necessarily to be allowed.

Table 4.7-2. Land Use Compatibility for Community Noise Environments, dBA

Land Use Category	Community Noise Exposure, DNL or CNEL			
	Normally Acceptable[a]	Conditionally Acceptable[b]	Normally Unacceptable[c]	Clearly Unacceptable[d]
Residential – Low Density Single Family, Duplex, Mobile Homes	< 60	55 to 70	70 to 75	> 75
Residential – Multi Family	< 65	60 to 70	70 to 75	> 75
Transient Lodging – Motels, Hotels	< 65	60 to 70	70 to 80	> 80
Schools, Libraries, Churches, Hospitals, Nursing Homes	< 70	60 to 70	70 to 80	> 80
Auditoriums, Concert Halls, Amphitheatres	–	< 70	–	> 65
Sports Arena, Outdoor Spectator Sports	–	< 75	–	> 70
Playgrounds, Neighborhood Parks	< 70	–	67.5 to 75	> 72.5
Golf Courses, Riding Stables, Water Recreation, Cemeteries	< 75	–	70 to 80	> 80
Office Buildings, Business, Commercial and Professional	< 70	67.5 to 77.5	> 75	–
Industrial, Manufacturing, Utilities, Agriculture	< 75	70 to 80	> 75	–

[a] Normally Acceptable – Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
[b] Conditionally Acceptable – New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design.
[c] Normally Unacceptable – New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.
[d] Clearly Unacceptable – New construction or development clearly should not be undertaken.

Source: Contra Costa County 2005

The County General Plan Noise Element (Noise Element) also establishes a DNL standard for outdoor noise levels in residential areas of 60 dB. However, the county recognizes that a DNL of 60 dB or less may not be achievable in all residential areas due to economic or aesthetic constraints.

Construction activities are to be concentrated during the hours of the day that are not noise-sensitive for adjacent land uses and commissioned to occur during normal work hours of the day to provide relative quiet during the more sensitive evening and early morning periods.

The Noise Element establishes noise exposure standards for land use compatibility (see Table 4.7-2). The MOT portion of the site that is adjacent to the shore is zoned for heavy-industrial use. For industrial land uses within the county, the normally acceptable noise level is in the range of 50 to 75 dBA DNL, and the conditionally acceptable range is 70 to 80 dBA DNL. For multi-family residential land uses, the normally acceptable noise level is in the range of 50 to 65 dBA DNL, and the conditionally acceptable range is 60 to 70 dBA DNL. Policy 11-2 of the Noise Element sets the standard for outdoor noise levels in residential areas at 60 dB DNL. However, Policy 11-3 states that if the primary noise source is train pass-by events, then the standard for outdoor noise levels in residential areas is a DNL of 70 dB. A higher DNL is allowable since the DNL is controlled by relatively few train pass-by events that are disruptive outdoors only for short periods.

Contra Costa County does not have an ordinance specifically addressing noise. Noise complaints within the unincorporated areas of the county are addressed through application of peace disturbance sections of the County Code and application of generic nuisance ordinances of the County Code.

4.7.3 Significance Criteria

A noise impact is considered to be significant if:

- The project noise level, timing, or duration exceeds a local noise ordinance, or any applicable noise regulation promulgated on the State or Federal level, including:
  - The Contra Costa County General Plan Noise Element maximum CNEL for Industrial land uses of 75 dBA; or
  - The project would increase the ambient noise level above ordinance-specified limits by more than 5 dBA (substantial increase), or by 3 dBA in areas already exceeding ordinance-specified limits.
- The project would expose persons to, or result in the generation of, excessive groundborne vibration or groundborne noise levels.

4.7.4 Impact Analysis and Mitigation

Noise associated with Shore's existing MOT operations is part of the baseline conditions and arises from intermittent activities such as the operation of low-horsepower drain and sump pumps (i.e., less than 5 horsepower) as well as engine noise from the mooring of marine vessels. These existing noise sources are approximately 2,000 feet from the nearest residences, and the terrain south of the MOT

blocks the line of sight between the MOT and the nearest residences. Operational noise levels as loud as 80 dBA at the MOT would be expected to generate levels of up to 35 dBA at the nearest residences, accounting for attenuation due to distance and intervening terrain. Given the high ambient noise levels in the area as shown in Figures 4.7-1 and 4.7-2, operational noise levels associated with the MOT are negligible at the nearest sensitive receptor locations.

Under the proposed Project, Shore would be granted a new lease and operations of the MOT would continue as currently conducted. There would be no construction activities associated with the proposed Project, and there would be no change in operations that would result in new or increased levels of noise. Therefore, there would be no change in the baseline noise levels discussed in Section 4.7.1 and no noise impacts would occur (No Impact).

4.7.5 Impacts of Alternatives

No Project Alternative

Under the No Project Alternative, Shore would not be granted a new lease and the existing MOT would be subsequently decommissioned with its components reused, abandoned in place, removed, or a combination thereof. Decommissioning and removal of the MOT under the No Project Alternative would result in short-term noise levels associated with the operation of equipment (e.g., cranes, marine vessels, etc.), followed by a permanent reduction in noise from the MOT because it would no longer operate. Reuse of the MOT may result in more or less noise than current operations, depending on the nature of the reuse; abandonment in place would result in a permanent decrease in noise from the MOT.

Limitations on Terminal Use Alternative

Under the Limitations on Terminal Use Alternative, Shore would be granted a new lease but with restrictions on the number, type, or size of marine vessels that would be allowed to call at the MOT, or restrictions on the type of product that could be loaded or unloaded. It is anticipated that the frequency with which noise occurs at the MOT under this alternative may be slightly less than for the proposed Project in proportion to the lessened activity level (i.e., vessels may visit less often or less product may be transferred through the MOT). However, the sound level generated from those transfer activities when they occur would likely be the same as for the proposed Project. Therefore, this alternative may result in less frequent or shorter duration noise events, but at similar sound levels as the proposed Project.

4.7.6 Cumulative Projects Impact Analysis

Because the proposed Project would not individually result in any noise impacts over existing conditions, there would be no cumulative impacts.

4.8 TRAFFIC AND TRANSPORTATION

This section addresses potential impacts to traffic and transportation associated with the proposed Project and alternatives in an unincorporated area of northwestern Contra Costa County between the cities of Crockett and Rodeo (see Figure 2-1 in ~~Chapter~~ Section 2.0, Project Description). The analysis considers potential impacts to local roadways and transportation facilities resulting from the granting of a new lease allowing Shore to continue current transfer operations of petroleum products between its Marine Oil Terminal (MOT) and its upland main terminal storage facility. For the purposes of this analysis, the baseline conditions against which impacts are analyzed are those conditions as of the publication of the Notice of Preparation (NOP), November 28, 2007. This section provides a discussion of roadway and intersection terminology, a description of the local roadway system, a description of the rail system, marine transportation, the regulatory setting, and the impact analysis.

4.8.1 Environmental Setting

Roadway Transportation System

Roadway Capacity and Level of Service

Traffic is typically measured and averaged over a 24-hour period. This average daily traffic (ADT) is often based on an actual 24-hour traffic count taken during mid-week. In some cases, traffic is measured at various times during the day and extrapolated to the ADT. Seasonal variations may also be taken into account by collecting data during different months of the year.

The capacity of a roadway segment or intersection is the maximum rate of vehicular traffic flow under prevailing traffic, design, and operational conditions. Factors affecting capacity include traffic controls, lane widths, grades, the amount of truck and bus traffic, the availability of on-street parking, parking turnover, and turn movements. Capacity is commonly defined for hourly periods of time. However, for generalized planning purposes, it is useful to define capacity as the maximum volume of traffic that a roadway may be expected to carry during a 24-hour period to maintain a level of service (LOS) E. Daily capacities are based on data derived from the “Highway Capacity Manual” for various facilities under ideal conditions as listed in Table 4.8-1.

The LOS of a roadway segment or intersection is a qualitatively defined measure of prevailing traffic, design, and operational conditions. The LOS, denoted alphabetically

Table 4.8-1. Daily Capacities for Major and Minor Arterials

Facility Geometrics	Capacity in Vehicles Per Day (LOS E)
8-lane Divided Regional Arterial	80,000
8-lane Divided Major Arterial	72,000
6-lane Divided Major Arterial	54,000
4-lane Divided Major Arterial	36,000
4-lane Undivided Major Arterial	30,000
2-lane Undivided Major Arterial	15,000
4-lane Minor Arterial	24,000
2-lane Minor Arterial	12,000

Source: TRB 2000

from A to F, best to worst, is a summary evaluation of the degree of congestion, roadway design constraints, delay, accident potential, and driver discomfort experienced during a given period of time (i.e., peak hour for intersections and 24 hours for roadway segments). While LOS A is the most desirable operational condition for a roadway or intersection, LOS C is considered a benchmark for planning purposes. The LOS may be quantitatively calculated by a number of methods that generally compare traffic volumes with the physical and operational capacity of the roadway under study. For roadway segments and controlled intersections, the volume to capacity (V/C) ratio is indicative of the LOS. The LOS interpretation is presented in Table 4.8-2.

Table 4.8-2. LOS Interpretation

LOS	Volume/Capacity (V/C) Ratio
A	0 - 0.60
B	0.61 - 0.70
C	0.71 - 0.80
D	0.81 - 0.90
E	0.91 - 1.00
F	> 1.00

Existing Roadways

In the vicinity of the Project, Interstate 80 (I-80) and State Route 4 (SR-4) are the major regional transportation corridors. Project traffic to and from the MOT and the main terminal facility accesses I-80 at the Cummings Skyway ramps. Both the MOT and the main terminal are accessed from San Pablo Avenue via local roads. The MOT area is

accessed from San Pablo Avenue along "A" Street and the main terminal facility is accessed from San Pablo Avenue via Old County Road. The major roadways that would serve the Project are described below.

Interstate 80

I-80 is a major interstate highway in the United States. In the Project area, I-80 connects downtown San Francisco to Sacramento. It is a generally east-west highway with six to eight lanes within the Project area. Between the Willow Avenue and Cummings Skyway exits, I-80 carries an estimated annual ADT volume of 126,000 vehicles (Caltrans 2009).

State Route 4

SR-4 extends from I-80 in Contra Costa County to SR-89 in Alpine County. The route traverses west to east and is a two-lane to four-lane road within the Project area. Annual ADT on SR-4 south of I-80 is 38,000 vehicles (Caltrans 2009).

San Pablo Avenue

San Pablo Avenue is a major arterial roadway in Alameda and Contra Costa Counties, which extends from downtown Oakland to Crockett. The route traverses north to south and is a four-lane road within the Project area. Annual ADT on San Pablo Avenue in the area is estimated at 9,300 vehicles (CCTA 2009). Based on a capacity of 30,000 ADT, San Pablo Avenue operates with a V/C ratio of 0.31 or at LOS A. Table 4.8-3 illustrates the estimated 2009 directional ADT for the Project area on San Pablo Avenue. The traffic volumes shown in Table 4.8-3 include volumes associated with operations of the MOT and the main terminal.

Table 4.8-3. Traffic Volumes for San Pablo Avenue

Northbound ADT	Southbound ADT
5,080	4,220

Source: Contra Costa Transportation Authority (CCTA) 2009

Cummings Skyway

Cummings Skyway links SR-4 to I-80 and San Pablo Avenue within Contra Costa County. The route traverses west to east and is a two-lane to three-lane road within the Project area. Annual ADT on Cummings Skyway west of I-80 is estimated at 2,800 vehicles (CCTA 2009).

Project Site Access

There is no public access to the MOT. Authorized personnel access the facility through the ConocoPhillips upland property. Only Shore company vehicles and other pre-authorized vehicles are allowed into the wharf area. Vehicles accessing the wharf may include operation and maintenance vehicles to transport technicians between the wharf and upland parking areas. Trucks access the main terminal facility daily to load petroleum products.

Existing and Future Rail Transportation

The Union Pacific Railroad runs through the Project area and along the San Pablo Bay shoreline. Shore uses railroad tank cars (approximately 3,710 tank cars in 2007) to offload petroleum products at the upland terminal.

Marine Transportation

The MOT is a single-berth dock that can accommodate one vessel at a time. The MOT can moor ships up to 831 feet in length, with a maximum of 100,000 dead weight tons. Both port and starboard side mooring are acceptable. In 2007, approximately 105 marine vessels visited the MOT; approximately 37 of these vessels were barges and the other 68 were tankers. Vessels positioning to moor at the MOT do so adjacent to the major shipping channel at the mouth of the Carquinez Strait.

4.8.2 Regulatory Setting

The portions of the ground transportation system in the Project area available for public use are regulated by Federal, State, and county agencies. Interstate highways and State routes and bridges are governed by the Federal Highway Administration (FHWA) and California Department of Transportation (Caltrans); county roads are governed by Contra Costa County; and other local streets and highways are governed by local cities. In all cases, specific standards apply with respect to the planning, design, and operation of roadways and intersections. Not all governing agencies impose the same criteria (e.g., cross sections and rights-of-way for the same street may differ from jurisdiction to jurisdiction).

Rail facilities are regulated in the State by the California Public Utilities Commission (CPUC). Train operations are also subject to the CPUC guidelines; the design and operation of railroad grade crossings are subject to Federal Railroad Administration guidelines. Numerous other Federal agencies also have regulatory authority over rail transportation.

4.8.3 Significance Criteria

A transportation impact would be considered significant if any of the following apply:

- Project-related traffic or construction of the alternative must use an access road which is already at or exceeding LOS E, or brings a roadway down to LOS E (E level traffic flow = 75 to 100 percent of capacity);
- Project-related traffic or other activities would result in a substantial safety hazard to motorists, bicyclists, or pedestrians;
- Project-related traffic or other activities would prevent movement of emergency vehicles;
- Project-related traffic or other activities would restrict one or more lanes of a primary or secondary arterial during peak-hour traffic, thereby reducing its capacity and creating congestion; or
- Project implementation results in insufficient parking.

4.8.4 Impact Analysis and Mitigation

The wharf operation requires one employee on a 12-hour shift, for a total of two employees per day[1] (Shore 2009). Daily employee trips are estimated at 2.5 trips per employee, which results in approximately 5 daily vehicle trip ends per day.

Rail traffic at the upland terminal would generally be expected to continue at existing levels (approximately 200 tank cars per month). All MOT-related vehicle traffic enters the MOT and the main terminal from San Pablo Avenue. San Pablo Avenue is a four-lane undivided arterial roadway with a capacity of 30,000 ADT. The proposed new lease would not alter the existing traffic patterns or add to the San Pablo Avenue estimated daily traffic volume of 9,300 ADT. San Pablo Avenue would continue to operate at a V/C ratio of 0.31 percent, which correlates to LOS A. Therefore, operations of the proposed Project would not contribute to an increase in the V/C ratio and would not prevent movement of emergency vehicles or result in a substantial safety hazard to motorists, bicyclists, or pedestrians. The proposed Project also would not result in restriction of one or more lanes of a primary or secondary arterial during peak-hour traffic and therefore would not create congestion. In addition, there is no construction associated with the proposed Project and so the existing parking conditions would not

[1] This staffing level is valid for the baseline year 2007 and continues to be valid at the time of publication of this EIR.

be altered. Therefore, there would be no surface traffic-related impact associated with the proposed Project.

Vessels mooring at the MOT do so adjacent to the major shipping channel at the mouth of the Carquinez Strait, which can affect the operation of both up-bound and down-bound commercial vessel traffic. In the event of a spill, fire, or other similar event at the MOT, the effects of passing vessels on these events may require vessel traffic to temporarily moderate their speed. These potential reductions in passing vessel speed would be temporary and would affect only those vessels in close proximity to the MOT at the time. Therefore, there would be no marine vessel traffic-related impact associated with the proposed Project.

4.8.5 Impacts of Alternatives

No Project Alternative

Under the No Project Alternative, Shore would not be granted a new lease and the existing wharf would be decommissioned with its components abandoned in place, removed, reused, or a combination thereof. The decommissioning of the MOT would follow an Abandonment and Restoration Plan as described in Section 3.3.1, No Project Alternative.

Under the No Project Alternative, the upland terminal would continue to operate but product would no longer be delivered or shipped by marine vessel. Approximately 40 percent of the total throughput at the upland terminal either comes in or is shipped out by marine vessel. Pipeline transportation accounts for another 40 percent of the total, with truck and rail transportation combined accounting for about 20 percent of the total (based on 2007 data; see Table 3.3-1 in Section 3.0, Alternatives and Cumulative Projects).

Closing the wharf would reduce the volume of products handled at the upland terminal substantially, by 40 percent of total volume handled. Outbound pipeline capacity is limited at the Shore terminal, and there is little pipeline capacity remaining to make up for the loss of marine vessel transportation. There are no inbound truck offloading facilities (only outbound loading), and there are no outbound rail loading facilities (only inbound offloading) at the upland terminal. Further, the inbound rail facility is near maximum capacity due to railroad operation service levels. Given these constraints on the existing modes of product transport, the total product throughput at the upland terminal would likely decrease by up to 40 percent under the No Project Alternative. Because it can be expected that demand for these products will continue, the

No Project Alternative may therefore result in diversion of some product shipments to other marine terminals, with a corresponding increase in outbound rail car and/or truck transportation to final destinations not served by existing pipelines. Under the No Project Alternative, the wharf employee vehicles (five daily trip ends) would be removed from local roadways and the upland terminal truck trips would likely be reduced by 40 percent.

Under this alternative, the appurtenant structures on the MOT could be dismantled. While much of the construction effort itself would be via barge, if any of the fixtures would be relocated, they could be hauled offsite via heavy trucks. It is anticipated that a construction crew of 25 workers with five trucks would be required on a daily basis during dismantling. The workforce trips and the truck trips (passenger car equivalents) are calculated to add as many as 70 ADT. The addition of 70 ADT on San Pablo Avenue would result in an increase in roadway V/C ratio of about 3.0 percent and the road would continue to operate at LOS A. After demolition, because the MOT would no longer be operational, the projected traffic volume on San Pablo Avenue would be reduced and would continue to be operational at LOS A.

Traffic impacts for MOT reuse may be more or less than for the proposed Project, depending upon the nature of the reuse. Abandonment of the MOT would result in reduced traffic volumes on San Pablo Avenue as described above for the post-demolition scenario.

Limitations on Terminal Use Alternative

Under the Limitations on Terminal Use Alternative, Shore would be granted a new lease but with restrictions on the number, type, or size of marine vessels that would be allowed to call at the marine terminal, or restrictions on the type of product that could be loaded or unloaded. Depending on the nature and extent of the restrictions, this alternative could result in the about the same or fewer employee and truck trips than the proposed Project. Therefore, traffic impacts from this alternative would be similar to or slightly less than for the proposed Project.

4.8.6 Cumulative Projects Impacts Analysis

The Contra Costa County Transportation and Circulation Element notes that: “In 1990, over 1 million trips were made by Contra Costa County residents on an average weekday.” Based on projections given in the Element, travel in the county is increasing at a rate of approximately 3.3 percent per year. The CCTA Transportation Model

Update Project Mapping Web Site indicates that traffic on San Pablo Avenue south of Cummings Skyway was forecast to grow at 5 percent per year between 2000 and 2030 (estimated 16,100 ADT in 2030). Assuming that local traffic meets and maintains forecasted growth rates on San Pablo Avenue, 30 years from now this route would carry approximately 25,000 ADT (close to the design capacity of the road) and would operate with a V/C ratio of about 0.84 percent, or LOS D. The proposed Project would not be expected to add vehicles to the local roadways and freeways because traffic from the Project is already existing and is assumed in the model forecast. Therefore, MOT future operations would neither raise the LOS to E nor place vehicles on a roadway operating at LOS E. As such, the proposed Project would not contribute to cumulative traffic congestion that is projected to result in the Project area.

4.9 VISUAL RESOURCES/LIGHT AND GLARE

The purpose of this section is to document the baseline visual or aesthetic resources in the Project area and to assess the potential aesthetic impacts that might occur as a result of operation of the proposed Project. A summary of the public regulations and policies pertaining to visual quality in the vicinity of the proposed Project is also provided.

For purposes of this analysis, visual resources are generally defined as the natural and built features of the landscape that can be seen. The combination of landform, water, and vegetation patterns represents the natural landscape features that define an area's visual character, whereas built features such as buildings, roads, and other structures reflect human or cultural modifications to the landscape. These natural and built landscape features or visual resources contribute to the public's experience and appreciation of the environment. Depending on the extent to which a Project's presence would alter the perceived visual character and quality of the environment, visual or aesthetic impacts may occur. It should be noted that an aesthetic resource need not be of exceptional visual quality to impart value to its viewers.

The Project area for visual resources encompasses the landscapes directly affected by operation of the Shore Marine Oil Terminal (MOT), and the surrounding areas that would be within view of the MOT and/or affected by a petroleum product spill at the MOT. For the purposes of this analysis, the baseline conditions against which impacts are analyzed are those conditions as of the publication of the Notice of Preparation (NOP), November 28, 2007. As of the writing of this Environmental Impact Report (EIR), visual conditions have not changed since the publication of the NOP. Therefore, current/existing visual conditions are used here to describe baseline conditions.

4.9.1 Environmental Setting

General Visual Characteristics of the Outer Coast

Outside of the Golden Gate Bridge (GGB), the California coastline is a mixture of pristine coastline, rock outcroppings, coastal bluffs, beaches, and urban development. To the north of the GGB, the Marin shoreline consists primarily of natural features such as rolling hills, sandy beaches, and jagged rock outcroppings. The area is dominated by designated parks and recreational areas, including Mt. Tamalpais State Park, Stinson Beach, Muir Beach, the Bolinas Lagoon, Golden Gate National Recreation Area, and the Point Reyes National Seashore. Vegetation is diverse, ranging from salt marshes to redwood areas. To the south of the bridge, the City of San Francisco's western coast is

more developed, containing residential and commercial development as well as numerous parks. The Presidio, Lincoln Park, Baker Beach, and Ocean Beach are all recreational areas along the shore. The outer coast is also dotted with fishing piers, as well as harbor areas and facilities for recreational boaters such as berthing and launching facilities.

General Visual Characteristics of the Bay

The San Francisco Bay makes up a substantial part of the largest estuary along the Pacific shore of North and South America. The Bay contains a wide diversity of habitats, including sub-tidal areas, tidal flats, tidal marsh, diked baylands, salt ponds, managed marsh, and agricultural baylands. San Francisco Bay is an essential resting place, feeding area, and wintering ground for millions of birds on the Pacific Flyway, while also sustaining nearly 500 species of fish, invertebrates, birds, mammals, insects, and amphibians (BCDC 2008).

In addition to abundant wildlife, the Bay contains numerous ports, marine terminals, harbors, and naval terminals. Marine vessels traveling to the Port of Sacramento and the Port of Stockton traverse Bay waters, and are a common sight. The Bay also contains many urbanized and industrial areas, as well as several dozen designated recreation areas, located along its shores (BCDC 2008). In the central and south-central portion of the San Francisco Bay in particular, urban development -- including residential, water-based industry, and other industry -- is prevalent on the western and eastern shores.

The shorelines of San Pablo Bay, the Carquinez Strait, and Suisun Bay are predominately tideland and marshland, interspersed with recreational areas and urban and industrial development. Approximately half of San Pablo Bay's shorelines are wildlife refuge areas, a classification that includes national wildlife refuges, State wildlife areas and ecological reserves, as well as other shoreline sites around the Bay. Their primary purpose is to protect threatened or endangered native plants, wildlife, and aquatic organisms, and/or preserve unique habitat types or highly significant wildlife habitats (BCDC 2008). The San Pablo Bay National Wildlife Refuge encompasses the entire north shore of the Bay, while the San Pablo Bay Wildlife Area encompasses the majority of the west shore. The south shoreline of the San Pablo Bay is primarily waterfront park/beach area, including John F. McInnis County Park, China Camp State Park, and Point Pinole Regional Shoreline, as well as water-related industrial development (i.e., ports, harbors, and associated industrial facilities). The west and

southwest side shoreline is lined with water-related industry, waterfront parks (including San Pablo Regional Shoreline), and some urban development (BCDC 2008).

The Carquinez Strait connects San Pablo Bay on the west to Suisun Bay on the east, and serves as a shipping channel for commercial and military shipping. The Strait is traversed by the Carquinez Bridge, and its shorelines are home to industrial areas, parks, and urban development. Suisun Bay is the largest contiguous estuarine marsh in the entire United States, and is ringed by salt ponds, tidal marsh, and managed wetlands. Its shoreline includes some water-related industrial development, and several wildlife refuge areas including the Grizzly Island Wildlife Area, Point Edith Wildlife Area, Peytonia Slough Ecological Reserve, and Hill Slough Wildlife Area (BCDC 2008).

Visual Character of the MOT

The ~~Shore~~ MOT lease area (Project site) is located along the shore of the Carquinez Strait approximately 1 mile east of the unincorporated town of Crockett and the Carquinez Bridge, in the northwest portion of Contra Costa County. Figure 2-1 in Section *2*.0, Project Description, shows the proposed Project's location within its regional landscape context. Figures 4.9-1 through 4.9-7 present a set of photographs taken from representative vantage points in the vicinity of the Project site that portray the existing visual character of the area.

The Project site constitutes approximately 10 acres of sovereign tidal and submerged public land, and is characterized by existing industrial facilities. Within this area is the wharf, a single-berth dock with a deck that consists of a 32-foot-wide by 72-foot-long concrete loading platform supported by ~~pre-stressed concrete~~steel pipe piles. Figure 4.9-1 shows an aerial view of the MOT. An 8-foot by 12-foot MOT Control Room is located on the main wharf platform. The wharf connects to land via a 260-foot-long elevated trestle paved with a 12-foot-wide access road and sidled with a 15-foot-wide pipe rack along the west side of the roadway (see Figure 2-3 in Section 2.0, Project Description). Figure 4.9-2 shows the view of the pipe rack and trestle, looking toward the shore from the MOT. The total length of the wharf, between the outermost mooring dolphins, is 0.2 mile (approximately 1,004 feet).

Visual Character of the Adjacent Area

Onshore, the land adjacent to the MOT is characterized by a steeply sloping upland and shoreline. The upland hills range between 35 and 50 percent slopes, climbing 250 to 300 feet from the water's edge. The shoreline on either side of the trestle is secured

with riprap, and supports limited vegetation. Figure 4.9-3 shows the shoreline to the east of the MOT, and Figure 4.9-4 shows the shoreline to the west. The trestle connects the wharf to the shoreline at the east end of a relatively flat, long and narrow filled 'bench'. This large asphalt expanse stretches west between the steep hillside and the water's edge, and is a former U.S. Environmental Protection Agency Superfund site (see Figure 4.9-5). The bench provides an open storage laydown for the nearby ConocoPhillips Refinery. It is approximately 150 feet wide at the trestle, though roughly 70 feet of that width is occupied by the Union Pacific mainline railroad tracks.

Along the shore, southwest of the bench area, are industrial facilities associated with ConocoPhillips San Francisco Refinery, including a large petroleum product tank farm and associated facilities. Further down the shoreline is the unincorporated town of Rodeo. Inland from the bench area is an 8.1-acre piece of open space and park land owned by East Bay Regional Park District, called Selby Property. Selby Property is located at a former refinery site, and is characterized by steep rocky cliffs with a mosaic of coastal scrub, eucalyptus, and non-native grassland. The property has two fire roads, the northern of which serves as a hiking trail and spur off the Bay Trail, running from San Pablo Road to a bench that overlooks San Pablo Bay. Selby Property is infrequently used, and park officials estimate that it gets less than one visitor per day. Between Selby Property and ConocoPhillips Refinery is Shore's main terminal/tank farm (see Figure 2-2 in Section 2.0, Project Description).

To the east of the MOT, the railroad tracks continue along the shoreline at the base of steep open space terrain. The open space area is characterized by high rocky cliffs with low-growing herbs, grasses, small shrubby vegetation, and some trees such as poplars. The top of the cliff has more trees, including eucalyptus. (See Section 4.2, Biological Resources, for additional information.) A small industrial site containing a large tank and two buildings is located approximately 0.3 mile to the east of the MOT. Roughly 1 mile to the east of the MOT is the Carquinez Bridge, as well as industrial facilities associated with C&H Sugar. East of the bridge is the unincorporated town of Crockett. Figure 4.9-6 shows the view looking east from the MOT.

Views of the MOT

Short-range public views of the MOT (adjacent to the site) are available from the adjacent waterway and the adjacent shoreline. From the water, the MOT is visible to boaters in the Carquinez Strait. The duration of visibility is short, as boaters can see the MOT while passing by. From the shore adjacent to the MOT, the view of the lease area

Figure 4.9-1
Aerial View of the Shore Marine Oil Terminal

Figure 4.9-2
View of the Pipe Rack and Trestle, Looking Toward the Shore from the Marine Oil Terminal

Figure 4.9-3
View of the Shoreline to the East of the Marine Oil Terminal

Figure 4.9-4
View of the Shoreline to the West of the Marine Oil Terminal

Figure 4.9-5
View of Paved Bench on the Shoreline

Figure 4.9-6
View Looking East from the Marine Oil Terminal

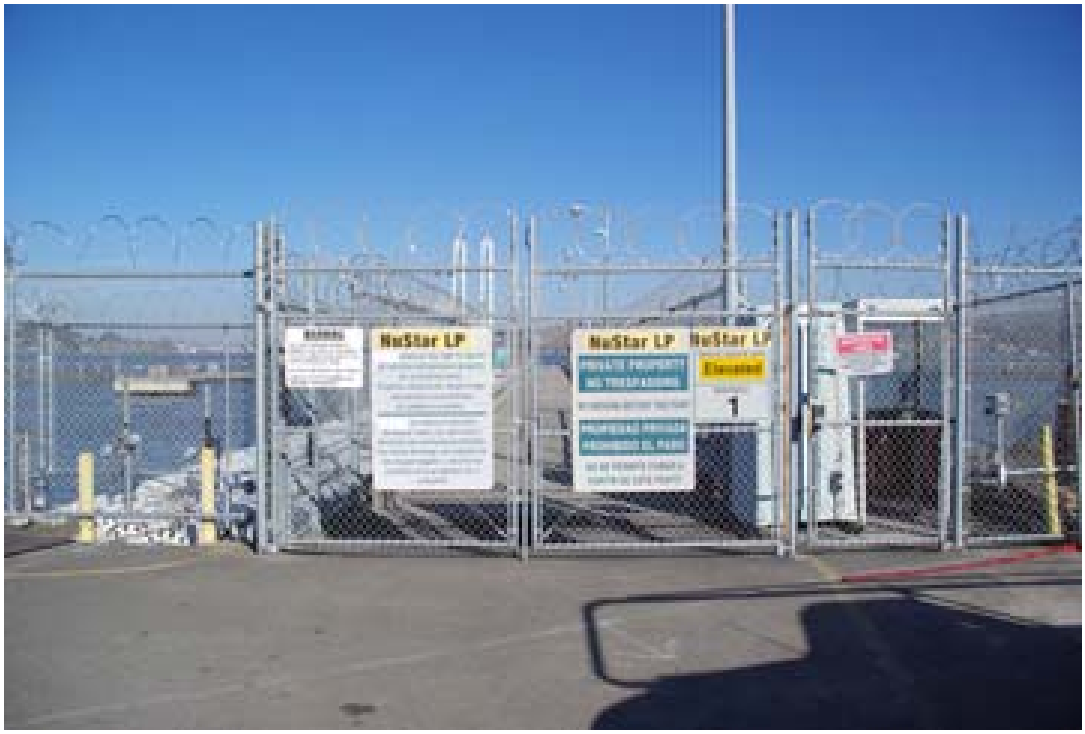

Figure 4.9-7
View of Fencing at the Entrance to the Wharf

includes the MOT, panoramic open water views of the Carquinez Strait, and marine traffic including commercial vessels and recreational boats. Views further out include the city of Vallejo shoreline across the Strait, and views of San Pablo Bay. However, views from the adjacent shoreline are not considered public, as access to the MOT is restricted to MOT personnel, and the MOT cannot be accessed from adjacent public shore areas. Physical security is controlled by fencing along the facility perimeter, which includes 7-foot-high fencing with 1-foot concertina wire at the wharf, and 7-foot-high fencing with 1-foot barbed wire at the terminal. Figure 4.9-7 shows the fencing at the entrance to the wharf access.

The slope of the shoreline and open space area block most angles of potential public views of the MOT. Consequently, long-range public views of the MOT (within one-half mile from the site) are available from only a few precise locations. The MOT is visible from the ConocoPhillips Refinery and marine offshore terminal to the southwest, the west span of the Carquinez Bridge to the east, the shores of the city of Vallejo across the Strait to the north, and from boaters out in Carquinez Strait and San Pablo Bay. The MOT is visible from Interstate 80 on the Carquinez Bridge, and no other public

roadways. The MOT is not visible from Selby Property, as views of the MOT are fully obscured by steep terrain and dense vegetation.

Exterior lighting is provided at the MOT to allow for nighttime operations. Lighting is provided by permanent fixtures between sunset and sunrise, and during times of reduced visibility. Wharf lighting consists of 13 lights and four strobe lights in the following locations: one light onshore; four lights along the wharf access trestle; six lights at the joints of the breasting and mooring dolphins; two lights at the loading wharf; and four strobe lights – one at each end of the two breasting dolphin dolphins and one at the far end of each of the two mooring dolphins. All lights are on photocell, and are on during night operations regardless of whether or not vessels are present. Strobe lights are required by the United States Coast Guard and have battery backup. Lighting is for navigational purposes, and is visible from all locations with views of the MOT.

Scenic Vistas

In its General Plan, Contra Costa County (2005) identifies its numerous scenic vistas as a major component of the perception of the county as a desirable place to live and work. The General Plan identifies four kinds of scenic locations in the county including: (1) scenic ridges, hillsides, and rock outcroppings; (2) the San Francisco Bay/Delta estuary system; (3) Scenic Highways and Expressways; and (4) Scenic Routes.

Of these four kinds of scenic locations, the only one that occurs in or near the lease area is (2), the San Francisco Bay/Delta estuary system. The waterway in which the lease area is located, and the adjacent shoreline, is part of the General Plan's designated 'Scenic Waterways' system, as defined in its Open Space Element. This designation is intended to draw attention to the location's scenic character for consideration when reviewing nearby projects and development proposals. The MOT is not visible from any designated Scenic Ridges, Scenic Highways and Expressways, or Scenic Routes in the county. San Pablo Avenue, which passes approximately one-quarter mile south of the lease area, is a designated Scenic Route from the town of Rodeo to the town of Crockett (Contra Costa County 2005). However, the MOT is not visible from any portion of San Pablo Avenue.

The San Francisco Bay and nearby outer coast are lined with several dozen cities and unincorporated areas, falling under the jurisdiction of eight different counties. Many of these cities and counties have their own scenic resource policies, and there are numerous designated scenic vistas around the San Francisco Bay and outer coast that overlook areas potentially subject to petroleum product spills. Some of the more well

known scenic vistas include, but are not limited to: multiple scenic overlooks in the Presidio in San Francisco (Immigrant Point, Inspiration Point, and Crissy Field Overlook), North and South Vista Points at either end of the Golden Gate Bridge, and views from designated recreation areas such as Mount Tamalpais, Angel Island, and Alcatraz (Presidio Trust 2009; About.com 2009). In addition, in its 2008 Bay Plan, the Bay Conservation and Development Commission (BCDC) points out that many waterfront parks and wildlife refuges designated in the Bay Plan also contain vista points (BCDC 2008).

4.9.2 Regulatory Setting

The California Environmental Quality Act (CEQA) Guidelines require that an Environmental Impact Report (EIR) identify the regulatory context in which the Project is proposed. Specifically, an EIR must provide a discussion of any inconsistencies that may exist between the proposed Project and applicable general plans and/or regional plans (State CEQA Guidelines § 15125(d)).

The lease area is located in unincorporated Contra Costa County. For purposes of this analysis, the lease area site would be subject to Contra Costa County's plans and policies, as well as the plans and policies of the BCDC.

Federal

The United States Code of Federal Regulations (CFR), Title 33 CFR section 154.570, pertains to lighting of facilities in navigable waters transferring oil or hazardous material in bulk. Section 154.570, which would pertain to the proposed Project, states:

(a) Except as provided in paragraph (c) of this section, for operations between sunset and sunrise, a facility must have fixed lighting that adequately illuminates:

(1) Each transfer connection point on the facility;

(2) Each transfer connection point in use on any barge moored at the facility to or from which oil or hazardous material is being transferred;

(3) Each transfer operations work area on the facility; and

(4) Each transfer operation work area on any barge moored at the facility to or from which oil or hazardous material is being transferred.

(b) Where the illumination is apparently inadequate, the Captain of the Port (COTP) may require verification by instrument of the levels of illumination. On a horizontal plane 3 feet above the barge deck or walking surface, illumination must measure at least:

(1) 5.0 foot candles at transfer connection points; and

(2) 1.0 foot candle in transfer operations work areas.

(c) For small or remote facilities, the COTP may authorize operations with an adequate level of illumination provided by the vessel or by portable means.

(d) Lighting must be located or shielded so as not to mislead or otherwise interfere with navigation on the adjacent waterways.

State

The California Department of Transportation (Caltrans) has a State Scenic Highways program to preserve and protect Scenic Highway corridors from changes that would diminish the aesthetic value of lands adjacent to highways (section 260 *et seq*. of the California Streets and Highways Code). The State Scenic Highway System includes a list of highways that either are eligible for designation as Scenic Highways or have been so designated. These highways are identified in section 263 of the Streets and Highways Code. Although Contra Costa County has one officially designated State Scenic Highway (Interstate 680 through State Route 24) and one eligible State Scenic Highway (State Route 4), neither of these routes passes through or has views of the Project site (DOT 2009).

The greater Bay Area has a number of eligible Scenic Highways that could potentially have views of a petroleum product spill in the Bay. These include State Route 1 (San Francisco and Marin Counties), Interstate 80 (San Francisco and Alameda Counties), and State Route 37 (Marin, Sonoma, and Solano Counties). However, these routes are not officially designated Scenic Highways and currently have eligible status (DOT 2009).

Local

The Contra Costa General Plan includes policies related to aesthetic quality, recognizing both natural and developed characteristics that influence the composition of the visual environment. Policies pertaining to aesthetics and visual resources relevant to the proposed Project include the following (Contra Costa County 2005):

Open Space Element

Goal 9-A: To preserve and protect the ecological, scenic and cultural/historic, and recreational resources lands of the County.

Policy 9-2: Historic and scenic features, watersheds, natural waterways, and areas important for the maintenance of natural vegetation and wildlife populations shall be preserved and enhanced.

Goal 9-10: To preserve and protect areas of identified high scenic value, where practical, and in accordance with the Land Use Element map.

Goal 9-12: To preserve the scenic qualities of the San Francisco Bay/Delta estuary system and the Sacramento-San Joaquin River/Delta shoreline.

4.9.3 Significance Criteria

Visual impacts would be considered adverse and significant if routine operations and maintenance over the lease period would:

- Substantially degrade the existing visual character or quality of the site and its surroundings;
- Unusually contrast with or degrade the character of the viewshed;
- Result in a substantial adverse effect on a scenic area or vista; or
- Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area.

The proposed Project is a new lease at the location of Shore's existing lease, and would involve no construction or change to the existing visual character of the lease area. Consequently, no visual simulations are necessary for this analysis. This analysis also considers the event of an accidental petroleum product spill and analyzes those potential impacts separately from normal MOT operations.

4.9.4 Impact Analysis and Mitigation

Visual Effects of Routine Operations

The proposed Project is a new lease from the California State Lands Commission (CSLC); no new development is proposed. As the proposed Project would permit the continuation of current operations, the Project would not alter the existing visual conditions at the lease area or adjacent areas.

Operation of the MOT involves tanker activity at the existing wharf, and vessel transit through existing shipping lanes in the Carquinez Strait. The MOT is located in a designated water-related industrial area. It provides product loading and unloading services for petroleum product companies, distributors, and brokers in the San Francisco Bay, Sacramento, and Northern California region and serves as a transfer point for petroleum products from the wharf to its upland main terminal storage facility. The original lease was issued to former owner Wickland in 1981, and the proposed Project would allow Shore to continue current operations until 2036.

Ships berthing at the MOT would continue as under present conditions. The berthing of ships at the MOT is not noticeable from the shoreline adjacent to the lease area, though it would be noticeable to transit vessels in the Carquinez Strait. However, the presence of a wharf and ships is consistent with the industrial character of the Project area, and would not detract from the overall Bay view. Because the proposed Project operations would not alter or degrade the existing visual character or quality of the site and its surroundings, there would be no impact (No Impact).

Character of the Viewshed

Under the proposed Project, short- and long-range public views of the MOT would not change from baseline conditions. As discussed above in 4.9.1, Environmental Setting, the MOT is located in an area characterized by port-related industry. Public views of the MOT are visible to boaters, drivers on the west span of the Carquinez Bridge, and from select locations onshore. The viewshed in which the MOT is located includes several other industrial sites along the shoreline to the southwest, the east, and the north of the lease area. The viewshed also includes frequent views of marine vessel traffic passing through the Carquinez Strait.

Because Shore's new lease would not change current conditions, the proposed Project would consequently not alter the public's experience of the environment. Furthermore, the continued presence of the MOT would not contrast with or degrade the perceived visual character and quality of the viewshed (No Impact).

Scenic Area or Vista

The Contra Costa County General Plan acknowledges the importance of both the natural resources and locations that characterize the county, and specifically identifies scenic areas within the Project vicinity. As discussed above in 4.9.1, Environmental Setting, the lease area is in a location designated as a Scenic Waterway.

Although designated as a Scenic Waterway, the Project site is characterized by existing industrial structures associated with the MOT, which has been operating since the early 1980s. There is no new development proposed as part of the Project; therefore, on-shore and off-shore views of the scenic area would not change from baseline conditions. Furthermore, continued operation and maintenance of the Project would not obstruct or result in a substantial adverse effect to prominent visual resources including ridges, scenic roads, or open space. The proposed Project would not appear prominent from outlying hills and ridges. The closest public open space to the Project site is Selby Property, located south of the lease area. However, the MOT is not visible from the trails or bench in Selby Property, due to intervening trees and hillsides. To view the MOT from the open space area, one would have to hike from San Pablo Avenue toward the coastline through areas not designated or used as hiking areas.

Views of the Scenic Waterway would not change from baseline conditions; therefore, implementation of the proposed Project would not result in new or altered impacts to the site (No Impact).

New Sources of Light or Glare

Current lighting at the MOT would continue at existing locations and levels. As discussed above in Section 4.9.1, Environmental Setting, exterior lighting is provided at the MOT to allow for nighttime operations and during times of reduced visibility. As the facilities would be operational 24 hours per day, seven days a week, the lighting plans would be based on the need for seasonal variations and would be used for safety and security needs. Lights on the MOT would be visible from all locations with a view of the MOT, including the Carquinez Bridge and off-shore locations. Because no new development would occur as part of the proposed Project, operation and maintenance of the MOT would not result in new sources of light and glare (No Impact).

Accidental Small (50 Barrels or Less) Spills of Highly Volatile Products

Products, such as gasoline, are highly volatile and flammable and could cause adverse impacts if ignited, resulting in a flammable vapor cloud. Since the product is highly volatile and flammable, the Oil Spill Response Plan (Shore 2003) states that, given the potential for ignition by engines operating near the spill, no attempt should be made to clean up the spill and no engine equipment should be operated near the spill to prevent ignition. The spill modeling results show (see Section 4.1, Operational Safety/Risk of Accidents) that, for a small spill of gasoline (i.e., 50 barrels or less), the product would evaporate quickly and would not persist on shoreline environments. Potential impacts

to visual resources from a spill of gasoline would be adverse but less than significant (Class III), since the product would evaporate quickly from the water surface.

Impact VIS-1: Degradation of Visual Resources Due to a Release of Accidental Spills of Relatively Low-Volatility Petroleum Products or Large Accidental Spills of Highly Volatile Products

A spill of relatively low-volatility petroleum products or a large accidental spill of highly volatile products could adversely alter or degrade the existing visual character or quality of the MOT lease area and its surroundings, unusually contrast with or degrade the character of the viewshed, and/or temporarily result in a substantial adverse effect on a designated scenic area. (Class II)

In general, impacts resulting from a spill of petroleum products would have the potential to temporarily adversely alter or degrade the visual quality of Bay waters and the affected shoreline. The degree of impact would be determined by a multitude of factors, such as spill size, location, type of material spilled, wind conditions, currents, the vulnerability of the shoreline, as well as the effectiveness of early containment and cleanup efforts.

Accidental Spills at or Near the MOT

Spill risk for the proposed Project is analyzed in Section 4.1, Operational Safety/Risk of Accidents. Spill Scenarios 1, 2, 5, 6, 11, 12, 15, and 16 analyze the probability that a critical amount of product from a spill at the MOT would reach key points along the shoreline. (See Section 4.1, Operational Safety/Risk of Accidents for a complete description of scenario variables and results.) According to the modeling, for a spill at or near the MOT of 50 or 434 barrels, the extent of this disruption would likely be limited to the Carquinez Strait and where the Strait connects to San Pablo Bay to the west and Suisun Bay to the east. In Scenarios 1, 2, 5, 6, 11, 12, 15, and 16 the probability of exceeding the levels of concern is greater along the shorelines of the Carquinez Strait, but is less throughout the remainder of the San Francisco Bay.

A spill at or near the MOT would potentially be visible to the public from areas that include, but are not limited to: the Carquinez Strait, Carquinez Bridge, San Pablo Bay near the Carquinez Strait, Suisun Bay near the Carquinez Strait, portions of the Bay Trail, the Selby Property, Lone Tree Point, Mare Island, Carquinez Strait Regional Shoreline, Martinez Regional Shoreline, and the Benicia State Recreation Area. Also impacted could be the Vallejo Municipal Marina, Vallejo Yacht Club, Glen Cove Marina, Benicia Marina and Yacht Club, Napa Valley Yacht Club, Napa Valley Marina, Crockett Marine Service, Martinez Marina, McAvoy Yacht Harbor, Pittsburg Marina, Antioch

Marina, and local fishing piers. Several of these locations are within Contra Costa County's "Scenic Waterway System."

The presence of petroleum products in the water and on the shore has the potential to create various adverse visual impacts. The MOT serves as a transfer point for gasoline, diesel, JP-5, JP-8, ethanol, and some gasoline blendstocks. Primary visual impacts resulting from a spill of these products may include, but are not limited to: a sheen of fuel on the water; dead birds and other wildlife; dead marine plants along the shore; and spill cleanup crews and equipment, such as booms. In addition, any spill has the potential to create a negative impression of the Project site and/or viewshed. Once aware of the spill, the public would react negatively to the visual effects of the spill. If public sensitivity becomes high and if the spill cannot be contained by immediate booming and cleanup, the visual effects of even a small spill could be significant.

Consequently, a spill at or near the MOT of relatively low-volatility petroleum products or a large accidental spill of highly volatile products would have the potential to temporarily adversely alter or degrade the existing visual character or quality of the MOT lease area and its surroundings, unusually contrast with or degrade the character of the viewshed, and/or temporarily result in a substantial adverse effect on a designated scenic area. However, given the spill prevention measures and response capabilities currently in place (see Section 4.1, Operational Safety/Risk of Accidents), residual impacts on visual resources remaining after first response efforts would be temporary and of short duration. As a result, implementation of mitigation measures MM OS-1a through MM OS-1d~~1c~~ would reduce significant visual resource impacts to less than significant (Class II).

Richmond-San Rafael Bridge Spill

Spill Scenarios 7, 8, 17, and 18 analyze the effects of a spill at the Richmond-San Rafael Bridge. According to the modeling (see Section 4.1, Operational Safety/Risk of Accidents), a diesel spill of 20,000 barrels would affect areas from the Carquinez Strait in the north, down through the San Francisco Bay as far south as Hunters Point on the west and Oakland on the east, and out through the GGB to the outer coast. A gasoline spill of the same magnitude would have slightly less far-reaching consequences, affecting areas south of the San Rafael-Richmond Bridge, north of the Bay Bridge, and east of the GGB.

For a spill at or near the Richmond-San Rafael Bridge, affected public areas may include, but may not be limited to: the Carquinez Strait, San Pablo Bay near the Carquinez Strait, the upper and middle portion of the San Francisco Bay, and the Golden Gate Strait.

Affected recreational areas may include: Lone Tree Point, Mare Island, the Carquinez Strait Regional Shoreline, the Benicia State Recreation Area, Marin Islands National Wildlife Refuge and State Ecological Reserve, Corte Madera Marsh and Ecological Reserve, Albany Mudflats Ecological Reserve, Mount Tamalpais Waterfowl Refuge, Emeryville Crescent Wildlife Area, Alcatraz, Angel Island, Baker Beach, Caesar Chavez Park, China Camp State Park, Crissy Field, East Shore State Park, Emeryville Crescent Wildlife Area, Fort Mason, Fort Point, Gateway Shoreline Park, Golden Gate National Recreation Area, Keil Cove-Bluff Point Park (proposed), Lincoln Park, Middle Harbor Shoreline Park, Miller/Knox Regional Shoreline, Ocean Beach, Point Isabel Regional Shoreline, Point Pinole Regional Shoreline Park, Robert W. Crown Memorial State Beach, and Yerba Buena Island. In addition, 34 marina facilities around the Bay may also be impacted by a spill at or near the San Rafael-Richmond Bridge, as well as numerous fishing piers (see Section 4.5, Land Use and Recreation, for more details). Several of these locations are within the viewshed of scenic vista points, including the GGB and the Presidio.

Because the proposed Project includes the potential for spills of relatively low-volatility petroleum products or large volumes of highly volatile products at or near the Richmond-San Rafael Bridge, the impact to visual resources is potentially significant. However, given the spill prevention measures and response capabilities currently in place (see Section 4.1, Operational Safety/Risk of Accidents), residual impacts on visual resources remaining after first response efforts would be temporary and of short duration. As a result, implementation of mitigation measure MM OS-1c would reduce potentially significant visual resource impacts to less than significant (Class II).

Golden Gate Bridge Spill

Spill Scenarios 9, 10, 19, and 20 analyze the effects of a spill at the GGB. According to the modeling (see Section 4.1, Operational Safety/Risk of Accidents), a diesel spill of 20,000 barrels would affect areas from Point San Pablo in the north, down through the San Francisco Bay as far south as Alameda, and out through the GGB up and down the outer coast. A gasoline spill of the same magnitude would again have less far-reaching consequences, affecting the Marin Shoreline to the north of the bridge, the San Francisco shoreline to the south of the bridge, and the nearby islands.

For a spill at or near the GGB, affected public areas may include, but not be limited to: the upper and middle portion of the San Francisco Bay, the Golden Gate Strait, and the coast outside of the GGB. Affected designated reserves may include: Albany Mudflats Ecological Reserve, Emeryville Crescent Wildlife Area, Mount Tamalpais Waterfowl

Refuge, and Corte Madera March Ecological Reserve. Affected recreational areas may include: Point Pinole Regional Shoreline Park, Miller/Knox Regional Shoreline, Point Isabel Regional Shoreline, Caesar Chavez Park, East Shore State Park, Gateway Shoreline Park, Middle Harbor Shoreline Park, Robert W. Crown Memorial State Beach, Baker Beach, Alcatraz, Angel Island, Crissy Field, Fort Mason, Fort Point, Golden Gate National Recreation Area, Keil Cove-Bluff Point Park (proposed), Lincoln Park, Ocean Beach, Yerba Buena Island, Mt. Tamalpais State Park, Stinson Beach Federal Park, Muir Beach, Mussel Rock Park, and local fishing piers. In addition, 29 marina facilities throughout the Bay may be impacted by a spill at or near the GGB (see Section 4.5, Land Use and Recreation.) Like above, several of these locations are within the viewshed of scenic vista points around the San Francisco Bay.

Because the proposed Project includes the potential for spills of relatively low-volatility petroleum products or large volumes of highly volatile products at or near the GGB, the impact to visual resources is potentially significant. However, given the spill prevention measures and response capabilities currently in place (see Section 4.1, Operational Safety/Risk of Accidents), residual impacts on visual resources remaining after first response efforts would be temporary and of short duration. As a result, implementation of mitigation measure MM OS-1d~~1c~~ would reduce potentially significant visual resource impacts to less than significant (Class II).

Mitigation Measures for Impact VIS-1:

Implement **MM OS-1a** through **MM OS-1d~~1c~~**. (See Section 4.1, Operational Safety/Risk of Accidents.)

Rationale for Mitigation

Combined with existing operational procedures and controls, these mitigation measures would help protect visual resources through improved spill prevention capabilities, and facilitating the safe and efficient transit of vessel traffic in the Bay. By reducing the likelihood that a spill would occur, reducing the quantity of spilled product, and ensuring a timely and comprehensive cleanup of spills, implementation of these measures would ensure that the potential impacts resulting from a spill are temporary and do not persist for an extended duration. The mitigation measures reduce the likelihood that substantial residual petroleum products would remain after a cleanup, thereby reducing the impact to visual resources from spills to less than significant.

Impact and Mitigation Summary

Table 4.9-1 presents a summary of visual resource/light and glare impacts that would be associated with the proposed Project and corresponding recommended mitigation measures.

Table 4.9-1. Summary of Visual Resource/Light and Glare Impacts and Mitigation Measures

Impacts	Mitigation Measures
VIS-1: Degradation of Visual Resources Due to a Release of Accidental Spills of Relatively Low-Volatility Petroleum Products or Large Accidental Spills of Highly Volatile Products	**MM OS-1a.** Install Tension-Monitoring Devices
	MM OS-1b. Install an Allision Avoidance System
	MM OS-1c. Replace Existing Loading Arms
	MM OS-1d. Install Remote Release System

4.9.5 Impacts of Alternatives

No Project Alternative

Under the No Project Alternative, Shore would not be granted a new lease and the existing wharf would be subsequently decommissioned with its components reused, abandoned in place, removed, or a combination thereof. The decommissioning of the MOT would be governed by an Abandonment and Restoration Plan, which would include, among other steps, actions to abandon and/or remove all wharf components above and below the seafloor, as well as Site Cleanup Verification.

Depending on whether the MOT would be reused, abandoned in place, or removed, the No Project Alternative could result in fewer and/or less significant impacts than the Proposed Project with respect to visual resource significance criteria. If decommissioning and removal is implemented under the No Project Alternative, then all existing sources of light on the MOT would be removed. Further, the industrial facilities would be removed from a scenic location, and there would be no risk of accidental spill at the MOT. These changes would result in beneficial impacts to a Scenic Waterway and an improvement to the existing visual character and quality of the Project site and its surroundings.

If the existing MOT structures are abandoned in place, it is likely that some safety lighting would need to be retained and the industrial facilities would remain, resulting in a limited reduction in lighting and no improvement to the existing visual character and quality of the Project site and its surroundings. However, the risk of accidental spills would be eliminated at the site, which would be a benefit compared with the proposed Project.

If the existing MOT structures are reused, impacts to visual resources may be more or less than the proposed Project depending on the nature of the reuse. However, it can be assumed that any reuse would not be for a marine oil terminal, so a reuse scenario under the No Project Alternative would likely present a lower risk of accidental spills and, therefore, result in less impact to visual resources than the proposed Project.

Limitations on Terminal Use Alternative

Under the Limitations on Terminal Use Alternative, Shore would be granted a new lease but with restrictions on the number, type, or size of marine vessels that would be allowed to call at the marine terminal, or restrictions on the type of product that could be loaded or unloaded.

Because the site would be used for similar purposes as the proposed Project, this alternative would similarly have no impact with respect to degradation of the character of the viewshed, effects on scenic areas, and light and glare from routine operations and maintenance. By reducing the risk of petroleum product spills, this alternative may reduce the risk of adverse effects on scenic areas, degradation of the visual character or quality of the site and its surroundings, and degradation of the character of the viewshed from accidental spills. While this comparative reduction in risk would be beneficial, the residual impacts of petroleum product on visual resources would nevertheless result in the same potentially significant impacts described for the proposed Project.

4.9.6 Cumulative Projects Impact Analysis

Visual Effects of MOT and Tanker Activities

Continued operation of the MOT and related tanker movements are part of an established pattern of marine vessel movement through San Pablo Bay and the Carquinez Strait. This pattern of movement has been in place for many decades, is part of the baseline conditions for this proposed Project, and would be expected to continue over the next 30 years. The proposed Project, in conjunction with anticipated cumulative projects described in Section 3.5, Cumulative Projects, would not alter public expectations of the visual quality of the area, and would consequently not result in significant adverse changes or contribute to cumulative impacts in the environment.

Visual Effects of a Spill

The proposed Project, as well as several cumulative projects listed in Table 3.5-1 (see Section 3.5, Cumulative Projects), each pose a risk of an accidental spill of petroleum products. Based on historical perspective (see Section 4.1, Operational Safety/Risk of

Accidents), the probability of a spill from marine vessel traffic in the Bay is very low,[1] so the likelihood of multiple accidental spills occurring simultaneously and affecting the same visual resource are extremely slim. Furthermore, over the past 20 years (1989 to 2008), the overall number of GGB ship traffic arrivals has remained fairly constant, ranging from a low of 2,897 arrivals in 1997 to a high of 3,671 arrivals in 1991 (see Section 3.5.3, Regional Characteristics of Marine Vessel Transportation in Bay and Along Coastal Shipping Lanes off Northern California). Because the nature of the cumulative projects shown in Table 3.5-1 is not unlike that of past projects in the Bay over the past 20 years, and total vessel traffic has remained fairly steady over that time, it follows that the cumulative projects would not be expected to have a material effect on total marine vessel traffic. ~~and t~~Therefore, the cumulative projects would have no material effect on the cumulative risk of an accidental spill of petroleum products in the Bay or the likelihood that substantial residual petroleum products would remain after a cleanup. Therefore, the cumulative impact to visual resources from spills would be less than significant and the proposed Project's contribution would not be cumulatively considerable (Class II).

[1] The probability of a spill of 238 barrels or greater at marine terminals in the Bay Area is about 2.7×10^{-4} per vessel call (i.e., less than three spills for every 10,000 vessel calls).

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4.10 CULTURAL RESOURCES

This section describes existing conditions in the Shore Marine Oil Terminal (MOT) Project area and evaluates the potential for the proposed Project and alternatives to result in significant impacts related to cultural resources. For the purposes of this analysis, the baseline conditions against which impacts are analyzed are those conditions as of the publication of the Notice of Preparation (NOP), November 28, 2007. Cultural resources are defined as prehistoric and historic sites, structures, and districts, or any other physical evidence associated with human activity considered important to a culture, a subculture, or a community for scientific, traditional, religious, or any other reason. For analysis purposes, cultural resources may be categorized into three groups: archaeological resources, historic resources, and contemporary Native American resources.

Archaeological resources are places where human activity has measurably altered the earth or left deposits of physical remains. Archaeological resources may be either prehistoric-era (before the introduction of writing in a particular area) or historic-era (after the introduction of writing). The majority of such places in California are associated with either Native American or Euro-American occupation of the area. The most frequently encountered prehistoric or historic Native American archaeological sites are village settlements with residential areas and sometimes cemeteries; temporary camps where food and raw materials were collected; smaller, briefly occupied sites where tools were manufactured or repaired; and special-use areas like caves, rock shelters, and sites of rock art. Historic-era archeological sites may include foundations or features such as privies, corrals, and trash dumps.

Historic resources are standing structures of historic or aesthetic significance that are generally 50 years of age or older (i.e., anything built in the year 1959 or before). In California, historic resources considered for protection tend to focus on architectural sites dating from the Spanish Period (1529-1822) through the early years of the Depression (1929-1930), although there has been recent attention paid to WWII and Cold War era facilities. Earlier historic resources are often associated with archaeological deposits of the same age.

Contemporary Native American resources, also called ethnographic resources, can include archaeological resources, rock art, and the prominent topographical areas, features, habitats, plants, animals, and minerals that contemporary Native Americans value and consider essential for the preservation of their traditional values. These

locations are sometimes hard to define and traditional culture often prohibits Native Americans from sharing these locations with the public.

Paleontology is a branch of geology that studies the life forms of the past, especially prehistoric life forms, through the study of plant and animal fossils. Paleontological resources represent a limited, non-renewable, and impact-sensitive scientific and educational resource. As defined in this section, paleontological resources are the fossilized remains or traces of multi-cellular invertebrate and vertebrate animals and multi-cellular plants, including their imprints from a previous geologic period. Fossil remains such as bones, teeth, shells, and leaves are found in the geologic deposits (rock formations) where they were originally buried. Paleontological resources include not only the actual fossil remains, but also the collecting localities, and the geologic formations containing those localities.

4.10.1 Environmental Setting

Physical Environment

The study area is located in the Bay Area-Delta Bioregion. This Bioregion comprises a variety of natural communities, which range from salt marshes to chaparral to oak woodlands. As the Project area has been developed and urbanized, vegetation and the wildlife habitat it affords have been highly disturbed. Originally, vegetation at this site would have been a mosaic of tidal brackish marshes, native coastal prairie, coastal scrub, and oak woodlands. Dominant flora would have included coastal live oak, buckeye, willow, western sycamore, tule, and sedges. Important animal food resources for past inhabitants of the Project area would have included salmon, Bay mussel, California oyster, rock-nesting waterfowl, and sea mammals.

Cultural Overview

Prehistoric Setting

Early urbanization of the Bay Area and massive amounts of filling along the Bay shores have, in many cases, destroyed or at least obscured the archaeological record. Many of the original surveys of archaeological sites in the Bay region were conducted between 1906 and 1908 by N.C. Nelson and yielded the initial documentation of nearly 425 “earth mounds and shell heaps” along the littoral zone of the Bay (Nelson 1909). From these beginnings, the most notable sites in the Bay region were excavated scientifically, like the Emeryville shellmound (CA-Ala-309), the Ellis Landing site (CA-Cco-295) in Richmond, and the Fernandez site (CA-CC0-259) in Rodeo Valley

(Morrato 1984). These dense midden sites have been carbon dated to be up to 2,300 years old, but other evidence from around the Bay suggests that human occupation in the region is of greater antiquity, dating to at least 5000 B.C. (Jones 1992). While many interpretations exist as to the function of the shellmounds, much of the evidence suggests that they served as sociopolitical landmarks on the cultural landscape and may have served as ceremonial features as well. The nearest major shellmound to the proposed Project area, the Fernandez site, is unique in that it was located 5 miles (8 kilometers) from the Bay shore. The site, now destroyed, was occupied beginning around 2,000 years before present until early historic times (Moratto 1984).

Prehistoric Chronology

The prehistory of the Bay Area can be divided into the Late Archaic (8000 through 3500 B.C.), the Early Period (3500 through 500 B.C.), the Middle Period (500 B.C. through A.D. 1000), and the Late Period (A.D. 1000 through 1700) (Milliken et al. 2007).

Late Archaic (also known as the Early Holocene) populations were generally mobile foragers, and the archaeological assemblages from this period consist of millingstones and handstones, and large wide-stemmed and leaf-shaped projectile points (Milliken et al. 2007). The earliest known occupation of the Bay Area is dated around 8000 B.C., although it is likely that humans inhabited the area as early as 11500 B.C. Sea-level changes and post-Gold Rush sedimentation have obscured older materials. Recent evidence indicates that the lowest level strata of several of the oldest Bay mounds are now 20 feet (6 meters) below sea level, while virtually all other major estuarine environments along the California coast yield significant archaeological materials older than 5,000 years (Broughton 1999). Therefore, it is difficult to generalize about earlier periods of occupation since much of the archaeological evidence may lie below the current Bay water level.

The Early Period or the so-called “Berkeley Pattern” (3000 through 500 B.C.) is characterized by almost exclusive use of cobble mortars and pestles, which is often associated with a heavy reliance on acorns in the economy (Moratto 1984). Such unusually intensive reliance on one foodstuff indicates that a shift away from the earlier reliance on a broad spectrum of dietary sources to supply demand was needed by around 1000 A.D. The Late Pleistocene/Early Holocene profusion of food availability along lakeshores and estuaries likely led to an overexploitation of the resources that led, initially, to population increases, which may explicate the shift toward exploiting a readily available, yet lower ranked resource like acorns or seeds.

The population increases and larger, more complex settlements that began in the late-Early Period typify the Middle Period (ca. 500 B.C. through A.D. 1000) (Arnold et al. 2004). The sociopolitical landscape also appears to become more elaborate with clear differentiations in wealth. During the Late Period (ca. A.D. 1000 through 1700), however, new sites start to decline in the record and the large shellmounds were abandoned. The Late Period also showed population declines and concomitant changes in resource use, likely due to human-caused depletions in some terrestrial food sources during the Middle Period (Broughton 1994).

Ethnographic Setting

The proposed Project area is within the traditional territory of the Costanoan or Ohlone people (Margolin 1978). These people were collectively referred to by ethnographers as Costanoan, but were actually distinct sociopolitical groups that spoke at least eight languages of the same Penutian language group. The Costanoan occupied a large territory from San Francisco Bay and Carquinez Strait in the north to the Big Sur and Salinas Rivers in the south. The primary sociopolitical unit was the tribelet, or village community, which was overseen by one or more chiefs. The Project area is located within the territory of the Karkin tribelet, so-called for the Costanoan language they spoke. Two villages, *Turis* and *Suyusuyu*, were located in close proximity to the Project area.

Economically, the Ohlone engaged in hunting and gathering. Their territory encompassed both coastal and open valley environments that contained a wide variety of resources, including grass seeds, acorns, bulbs and tubers, bear, deer, elk, antelope, a variety of bird species, and rabbit and other small mammals. The Ohlone acknowledged private ownership of goods and songs, and village ownership of rights to land and/or natural resources; they appear to have aggressively protected their village territories, requiring monetary payment for access rights in the form of clamshell beads, and even shooting trespassers if caught. After European contact, Ohlone society was severely disrupted by missionization, disease, and displacement.

Historic Setting

During California's Spanish Period, Mission Dolores in San Francisco used the East Bay for livestock grazing and agricultural purposes. Land grants to private citizens began after Mexico seceded from Spain in 1822 and increased substantially after the secularization of the missions began in 1833. A provisional grant for Rancho El Pinole was made in 1823 to Don Ignacio Martinez. Rancho El Pinole was used for both

farming and cattle ranching, and encompassed much of modern day Rodeo, Hercules, Oluem, and Pinole. A substantial part of this land was later purchased by brothers John and Patrick Tormey (Tormey 2006a).

In 1848, California became a United States territory as a result of the Treaty of Guadalupe Hidalgo, and California was formally admitted as a state in 1850. Contra Costa County was one of the original 27 counties created by the California legislature, and included what is today Contra Costa and Alameda Counties. Alameda County was created from the western and southern sections of Contra Costa County in 1853.

The Gold Rush of the late 1840s brought a massive influx of immigrants to California, increasing the state's 1848 population of less than 14,000 to 224,000 in four years. A ferry service across Carquinez Strait from Martinez to Benicia which began around this same time became an important route to the gold fields for those traveling from San Francisco. The initial explosion in population associated with the Gold Rush was followed by the construction of the transcontinental railroad in 1869.

By 1877, Contra Costa County had an estimated population of 10,300 people. Port Costa at Carquinez Strait was a major shipping port for wheat grown in Contra Costa County. Early farmers in the area were initially Portuguese immigrants in the 1880s, followed by the Irish and the Italians in the 1890s through 1990s, and Japanese in the early 20th century.

Around 1875, the San Pablo & Tulare Railroad Co. built a station near the Project area, naming it Tormey Station after the landowner whose ranch the station was built upon (Tormey 2006b). In 1884, the Selby Smelting and Refining Co. moved its operations from San Francisco to Contra Costa County and built a lead smelter on the Project site. Selby also purchased a large tract of land near Tormey Station and, in order to provide affordable housing to its workers, constructed a company town, which came to be called Tormey. The smelter remained in business for nearly 100 years, until the Selby Smelter was closed in 1971, its workers laid off and evicted, and the town of Tormey, which Selby had retained ownership of, was razed along with the plant itself.

Recorded Cultural Resources Near the Proposed Project Area

A records search was conducted in 2006 at the California Historic Resources Information System - Northwest Information Center. This search included examination of records for archaeological sites and surveys within 1 mile of the proposed Project area, as well as the California Historic Resources Inventory, the California Register of

Historic Resources, the National Register of Historic Places, California Historic Landmarks, California Points of Historic Interest, and historic maps (Sentinel 2006).

Nine cultural resources have been recorded within 1 mile of the proposed Project area, and two of these were identified in or immediately adjacent to the Shore MOT. The first, the Selby Smelter (P-07-001131), was an historic lead smelter constructed by Thomas Selby in 1885. The site was located along the shore, immediately adjacent to the Shore MOT, and was listed as a Contra Costa County Point of Historic Interest. However, the smelter was razed in 1971 and the site was later designated a Superfund site and appears to have been either fully excavated or capped. Any remaining cultural material associated with the site has most likely been destroyed as a result of this.

The second cultural resource is located just outside the proposed Project area and consists of a small shellmound site that was never formally recorded and thus did not receive a designated site number. However, it has been postulated that this shellmound may be equivalent to one that Nels Nelson documented in 1906. The site was described as badly disturbed in 1979 and could not be relocated in 1999 (Sentinel 2006).

Paleontological Resources

Fossil remains are found in the geologic deposits (sedimentary rock formations) within which they were originally buried. A paleontologically important deposit is one that has a high probability of producing unique, scientifically important fossils. This is determined by the abundance and densities of fossil specimens and/or previously recorded fossil sites in exposures of the deposit. Therefore, the potential paleontological sensitivity of the Project site can be assessed by identifying the paleontological importance of geologic deposits in the area.

The study area is located in the Coast Ranges geomorphic province, near the westerly boundary of the adjacent Great Valley province to the east. Geologic maps (Wagner and Bortugno 1982) indicate that the westerly part of the study area is underlain by sedimentary rocks of the Miocene-age San Pablo Group. The rocks are described as fossiliferous marine sandstone and shale. More recently (Wagner 2006) some of these rocks have been remapped as belonging to the Paleocene Las Juntas Shale and the Vine Hill Sandstone. Easterly portions of the study area are underlain by Lower Cretaceous- and Upper Jurassic-age rocks of the Great Valley Complex consisting of marine sandstone, shale, siltstone, mudstone, and conglomerate. Many of these formations are paleontologically sensitive. In addition to the rock units, man-made fill soils are mapped

(Graymer et al. 2002) along the shoreline immediately west and southwest of the wharf. Relatively young, unconsolidated bay deposits can be expected offshore. Surficial topsoil deposits are present onshore with alluvial soils in the natural drainages.

4.10.2 Regulatory Setting

Federal

Archaeological resources are protected through the National Historic Preservation Act (NHPA) of 1966, as amended (16 USC 470f), and its implementing regulation, Protection of Historic Properties (36 CFR Part 800), the Archaeological and Historic Preservation Act of 1974, and the Archaeological Resources Protection Act of 1979. Prior to implementing an "undertaking" (e.g., issuing a federal permit), section 106 of the NHPA requires federal agencies to consider the effects of the undertaking on historic properties and to afford the Advisory Council on Historic Preservation and the State Historic Preservation Officer a reasonable opportunity to comment on any undertaking that would adversely affect properties eligible for listing in the National Register of Historic Places. As indicated in section 101(d)(6)(A) of the NHPA, properties of traditional religious and cultural importance to a tribe are eligible for inclusion in the National Register. Under the NHPA, a cultural resource is considered significant if it meets the National Register listing criteria at 36 CFR 60.4.

At this time, no federal permits are required and no federal funding will be used, and thus the Project need not be in compliance with section 106 of NHPA. However, if in the future, U.S. Army Corps of Engineers (ACOE) permits for maintenance dredging and disposal are required, section 106 will apply.

First authorized by the Historic Sites Act of 1935, the National Register of Historic Places (National Register) was established by the NHPA of 1966, as "an authoritative guide to be used by federal, State, and local governments, private groups and citizens to identify the Nation's historic resources and to indicate what properties should be considered for protection from destruction or impairment" (CFR 36 § 60.2). The National Register recognizes both historical-period and prehistoric archaeological properties that are significant at the national, state, and local levels.

To be eligible for listing in the National Register, a resource must be significant in American history, architecture, archaeology, engineering, or culture. Districts, sites, buildings, structures, and objects of potential significance must meet one or more of the following four established criteria (U.S. Department of the Interior 1995):

A. Are associated with events that have made a significant contribution to the broad patterns of our history;

B. Are associated with the lives of persons significant in our past;

C. Embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. Have yielded, or may be likely to yield, information important in prehistory or history.

Unless the property possesses exceptional significance, it must be at least 50 years old to be eligible for National Register listing (U.S. Department of the Interior 1995).

In addition to meeting the criteria of significance, a property must have integrity. Integrity is defined as "the ability of a property to convey its significance" (U.S. Department of the Interior 1995). The National Register recognizes seven qualities that, in various combinations, define integrity. To retain historic integrity a property must possess several, and usually most, of these seven aspects. Thus, the retention of the specific aspects of integrity is paramount for a property to convey its significance. The seven factors that define integrity are location, design, setting, materials, workmanship, feeling, and association.

State

The State implements the NHPA through its statewide comprehensive cultural resources surveys and preservation programs. The California Office of Historic Preservation (OHP), as an office of the California Department of Parks and Recreation, implements the policies of the NHPA on a statewide level. The OHP also maintains the California Historic Resources Inventory. The State Historic Preservation Officer (SHPO) is an appointed official who implements historic preservation programs within the State's jurisdictions.

California Register of Historical Resources

The California Register of Historical Resources (California Register) is "an authoritative guide in California to be used by state and local agencies, private groups, and citizens to identify the State's historical resources and to indicate what properties are to be protected, to the extent prudent and feasible, from substantial adverse change" (California Public Resources Code (PRC) § 5024.1(a)). The criteria for eligibility for the

California Register are based upon National Register criteria (~~California~~ PRC § 5024.1(b)). Certain resources are determined by the statute to be automatically included in the California Register, including California properties formally determined eligible for, or listed in, the National Register of Historic Places.

To be eligible for the California Register of Historical Resources, a prehistoric or historical-period property must be significant at the local, State, and/or Federal level under one or more of the following criteria:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
2. Is associated with the lives of persons important in our past;
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
4. Has yielded, or may be likely to yield, information important in prehistory or history.

A resource eligible for the California Register must meet one of the criteria of significance described above, and retain enough of its historic character or appearance (integrity) to be recognizable as an historical resource and to convey the reason for its significance. It is possible that an historic resource may not retain sufficient integrity to meet the criteria for listing in the National Register, but it may still be eligible for listing in the California Register.

Additionally, the California Register consists of resources that are listed automatically and those that must be nominated through an application and public hearing process. The California Register automatically includes the following:

- California properties listed on the National Register of Historic Places and those formally Determined Eligible for the National Register of Historic Places;
- California Registered Historical Landmarks from No. 770 onward; and
- Those California Points of Historical Interest that have been evaluated by the OHP and have been recommended to the State Historical Commission for inclusion on the California Register.

Other resources that may be nominated to the California Register include:

- Historical resources with a significance rating of Category 3 through 5 (those properties identified as eligible for listing in the National Register of Historic Places, the California Register of Historical Resources, and/or a local jurisdiction register);
- Individual historical resources;
- Historical resources contributing to historic districts; and
- Historical resources designated or listed as local landmarks, or designated under any local ordinance, such as an historic preservation overlay zone.

California Environmental Quality Act

The California Environmental Quality Act (CEQA) is the principal statute governing environmental review of projects occurring in the State; it requires lead agencies to determine if a proposed project would have a significant effect on historical resources. CEQA is codified at ~~Public Resources Code~~PRC section 21000 *et seq*.

The State CEQA Guidelines define an historical resource as: (1) a resource listed in the California Register of Historical Resources; (2) a resource included in a local register of historical resources, as defined in PRC section 5020.1(k) or identified as significant in an historical resource survey meeting the requirements of PRC section 5024.1(g); and (3) any object, building, structure, site, area, place, record, or manuscript which a Lead Agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California by the Lead Agency, provided the Lead Agency's determination is supported by substantial evidence in light of the whole record.

If a Lead Agency determines that an archaeological site is an historical resource, the provisions of section 21084.1 of CEQA and section 15064.5 of the State CEQA Guidelines apply. Under CEQA, archaeological resources are sometimes treated differently than "historical resources." Thus it is important to first determine whether certain archaeological sites are "historical resources" for purposes of CEQA. The distinction may be important because mitigation measures sometimes differ for archaeological and historical resources.

If an archaeological site does not meet the criteria for an historical resource contained in the State CEQA Guidelines, then the site may qualify as a unique archaeological resource under PRC section 21083.

As defined in PRC section 21083.2, a "unique" archaeological resource is an archaeological artifact, object, or site, about which it can be clearly demonstrated that without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

- Contains information needed to answer important scientific research questions and there is a demonstrable public interest in that information;
- Has a special and particular quality such as being the oldest of its type or the best available example of its type; or
- Is directly associated with a scientifically recognized important prehistoric or historic event or person.

The State CEQA Guidelines note that if an archaeological resource is neither a unique archaeological nor an historical resource, the effects of the project on those resources shall not be considered a significant effect on the environment (State CEQA Guidelines ~~section~~ § 15064.5(c)(4)).

California State Lands Commission

Artifacts found on lands under the jurisdiction of the ~~California State Lands Commission (~~CSLC~~)~~ are considered the property of the State of California. Any disposition of these artifacts requires the approval of the CSLC and a transfer of title may be required.

Copies of all cultural resource reports must be submitted to the CSLC for any projects or studies completed on land under the jurisdiction of the CSLC.

Local

Contra Costa County General Plan

The Contra Costa County General Plan contains the following goals and policies concerning cultural resources (Contra Costa County 2005):

- Historic and Cultural Resources Goal 9-31: To identify and preserve important archaeological and historic resources within the County.
- Policy 9.32: Areas which have identifiable and important archaeological or historic significance shall be preserved for such uses, preferably in public ownership.

- Development Review Process 9-j: As a condition of approval of discretionary permits, include a procedure to be followed in the event that archaeological resources are encountered during development or construction.

Paleontological Resources

Federal

A variety of Federal statutes specifically address paleontological resources. They are generally applicable to a project if that project includes federally owned or federally managed lands or involves a Federal agency license, permit, approval, or funding. Federal legislative protection for paleontological resources stems from the Antiquities Act of 1906 (Public Law 59-209; 16 United States Code 431 *et seq*.; 34 Stat. 225), which calls for protection of historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest on Federal lands.

State

Paleontological resources are also afforded protection by CEQA. Appendix G (Part V) of the State CEQA Guidelines provides guidance relative to significant impacts on paleontological resources, stating that a project will normally result in a significant impact on the environment if it will "… disrupt or adversely affect a paleontologic resource or site or unique geologic feature, except as part of a scientific study." Section 5097.5 of the ~~Public Resources Code~~PRC specifies that any unauthorized removal of paleontological remains is a misdemeanor. Further, the California Penal Code section 622.5 sets the penalties for the damage or removal of paleontological resources.

California State Lands Commission

Fossils found on lands under the jurisdiction of the CSLC are considered the property of the State of California. Any disposition of these artifacts requires the approval of the CSLC and a transfer of title may be required.

Copies of all paleontological resource reports must be submitted to the CSLC for any projects or studies completed on land under the jurisdiction of the CSLC.

Professional Standards

The Society for Vertebrate Paleontology (SVP) has established standard guidelines for acceptable professional practices in the conduct of paleontological resource assessments and surveys, monitoring and mitigation, data and fossil recovery, sampling procedures, and specimen preparation, identification, analysis, and curation. Most

practicing professional paleontologists in the nation adhere closely to the SVP's assessment, mitigation, and monitoring requirements as specifically provided in its standard guidelines. Most California State regulatory agencies accept the SVP standard guidelines as a measure of professional practice.

4.10.3 Significance Criteria

Based on Appendix G of the State CEQA Guidelines concerning cultural resources, Project implementation may have a significant impact on the environment if it would result in any of the following:

- A substantial adverse change in the significance of an historical resource that is either listed in or eligible for listing on the National Register of Historic Places, the California Register of Historical Resources, or a local register of historical resources pursuant to section 5020.1 of the Public Resources Code;
- A substantial adverse change to a unique archaeological resource;
- Disturbance or destruction of a paleontological resource or site or unique geologic feature; or
- Disturbance of any human remains, including those interred outside of formal cemeteries.

4.10.4 Impact Analysis and Mitigation

Historic Resources

One historical resource, the Selby Smelter, was recorded within the Project area. However, the smelter facility was destroyed in 1971 and the site was later declared an U.S. Environmental Protection Agency Superfund site and has since been leveled and capped. Therefore, the proposed Project would have no impacts on historical resources.

Archaeological Resources

Several archaeological resources have been recorded near the Project area. However, under the proposed Project, Shore would continue operation of its MOT under current conditions. No ground-disturbing activities would take place as a result of the proposed Project. Therefore, there would be no impacts to archaeological resources.

Paleontological Resources

Under the proposed Project, Shore would continue operation of its MOT under current conditions. No ground-disturbing activities would take place as a result of the proposed Project. Therefore, there would be no impacts to paleontological resources.

Human Remains

Under the proposed Project, Shore would continue operation of its MOT under current conditions. No ground-disturbing activities would take place as a result of the proposed Project. Therefore, there would be no impacts to human remains.

4.10.5 Impacts of Alternatives

No Project Alternative

Under the No Project Alternative, Shore would not be granted a new lease and the existing wharf would be subsequently decommissioned with its components reused, abandoned in place, removed, or a combination thereof.

As discussed above, two cultural resources were recorded within close proximity to the Project area: the Selby Smelter, which has since been destroyed, and a small shellmound to the southwest of the Project area. Neither would be adversely impacted by the decommissioning and removal of the wharf under the No Project Alternative. However, removal of the wharf would involve ground-disturbing activities and could therefore potentially impact previously unrecorded cultural resources. Reuse of the wharf may have more or less impact on previously unrecorded cultural resources depending on whether the reuse would also involve ground-disturbing activities. Abandonment of the wharf would not be likely to have an impact on previously unrecorded cultural resources.

The Project area is underlain by sedimentary rocks of the Miocene-age San Pablo Group, described as fossiliferous marine sandstone and shale, as well as the Great Valley Complex consisting of marine sandstone, shale, siltstone, mudstone, and conglomerate. These sedimentary formations are potentially sensitive for paleontological resources. Removal of the wharf would involve ground-disturbing activities. If these activities are restricted to areas underlain by artificial fill, there would be no impact. However, if these activities extend into the more sensitive marine sandstones, they could potentially impact paleontological resources. Reuse of the wharf may have more or less impact on paleontological resources depending on whether the reuse would also involve ground-disturbing activities that would disturb the

more sensitive marine sandstones. Abandonment of the wharf would not be likely to have an impact on paleontological resources.

Limitations on Terminal Use Alternative

Under the Limitations on Terminal Use Alternative, Shore would be granted a new lease but with restrictions on the number, type, or size of marine vessels that would be allowed to call at the marine terminal, or restrictions on the type of product that could be loaded or unloaded. It is anticipated that, as with the proposed Project, there would be no impacts to cultural or paleontological resources under this alternative because it would not involve any ground-disturbing activities.

4.10.6 Cumulative Projects Impact Analysis

Because the proposed Project would not individually result in any impacts to cultural or paleontological resources, there would be no cumulative impacts.

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4.11 GEOLOGY, SOILS, AND SEISMICITY

This section describes existing conditions in the Shore Marine Oil Terminal (MOT) Project area and evaluates the potential for the proposed Project and alternatives to result in significant impacts related to exposing people or structures to unfavorable geologic hazards, soils, and/or seismic conditions. For the purposes of this analysis, the baseline conditions against which impacts are analyzed are those conditions as of the publication of the Notice of Preparation (NOP), November 28, 2007. In addition, the results of the Marine Oil Terminal Engineering and Maintenance Standards (MOTEMS) Initial Audit Report dated February 2010 conducted for the Shore MOT, which includes geotechnical investigations conducted by Engeo (2009a and 2009b), have been incorporated into this section. Following a description of the regulatory framework, proposed Project components are evaluated for their potential to create or be affected by significant impacts.

4.11.1 Environmental Setting

Regional Geology

The study area is located in what is known as the Coast Ranges geomorphic province. California has been divided into geomorphic provinces, which display unique, defining features based on geology, faults, topographic relief, and climate (CGS 2002). The Coast Ranges are characterized by northwest-trending mountain ranges and valleys. The province is located in the western portion of California, bordered by the Pacific Ocean, and stretches from the Oregon border south to the Santa Ynez Mountains near Santa Barbara. The Coast Ranges are generally composed of thick sedimentary strata and volcanic rocks that have been structurally altered and deformed from the San Andreas fault zone. The northern and southern parts of the ranges are separated by a structural depression that makes up the San Francisco Bay. In the proposed Project area, the Franklin fault (Jennings 1994; Engeo 2009b) separates sedimentary rocks from much older rocks on the east (United States Geological Survey [USGS] 2008) more characteristic of the adjacent Great Valley province.

The Great Valley province is located to the east and consists of an alluvial plain about 50 miles wide and 400 miles long in the central part of California. The northern part is drained by the Sacramento River and the southern part by the San Joaquin River. The two rivers join in the Sacramento-San Joaquin Delta where they ultimately drain into the San Francisco Bay by way of the Carquinez Strait. The proposed Project site is located at the mouth of the Carquinez Strait.

Regional Faulting

The San Francisco Bay Area is considered seismically active, with numerous active faults that have the potential for significant earthquakes. A fault is considered active if it has shown evidence of displacement within the last 11,000 years. The San Andreas and Hayward faults have had significant events within historic times. The nearest fault to the proposed Project site is the Franklin fault, which is mapped within the proposed Project area. This fault shows evidence of displacement sometime between 11,000 and 1.6 million years ago and is therefore considered to be a "potentially active" fault. Because of this classification, the fault has not been delineated as an Alquist-Priolo Earthquake Fault Zone by the State. However, there is disagreement in published reports as to the possible activity level of the Franklin fault (Engeo 2009b). In addition, the fault has been designated by the California Department of Transportation (Caltrans) (Mualchin 1996) as being capable of generating an earthquake magnitude of 6.5 and, thus, may be considered a significant seismic source.

The nearest active faults to the proposed Project site are the West Napa fault, located about 7 miles north, the Hayward fault about 8 miles to the southwest, and the Concord-Green Valley fault which is about 8 miles to the east. Please see Table 4.11-1.

Soils

Based on soil survey information obtained from the United States Department of Agriculture (USDA 2008), the major soil units mapped in the proposed Project area consist of Los Osos clay loam and Millsholm loam. A loam is friable soil containing a relatively equal mixture of sand and silt and a somewhat smaller portion of clay. A clay loam designates a soil with a higher clay content. The primary parent material of the agricultural soils is residuum weathered from sandstone and shale.

From a geotechnical engineering perspective, soils refer to the surficial materials that overlie geologic formational materials or bedrock. Designations for these surficial materials in the Project area include alluvium, bay (or estuarine) deposits, landslide deposits, topsoil, and fill. Soils can be in a relatively loose or unconsolidated condition and, as such, susceptible to consolidation and settlement with the addition of structural loads.

Table 4.11-1. Principal Active Faults/Significant Seismic Sources

Fault	Distance (miles) and Direction from Site	Maximum Moment Magnitude[1,2]
Franklin	<1 (site vicinity)	6.5
West Napa	7 North	6.5
Hayward	8 Southwest	7.3
Concord-Green Valley	8 East	6.7
Rodgers Creek	12 Northwest	7.0
Mount Diablo	17 Southeast	6.7
Calaveras	21 Southeast	6.9
Great Valley Segment 5	24 East	6.5
Great Valley Segment 4	25 East	6.6
Greenville	25 Northeast	6.9
San Andreas	25 Southwest	7.9
Hunting Creek-Berryessa	27 North	7.1
San Gregorio	29 Southwest	7.4
Point Reyes	33 West	7.0
Monte Vista-Shannon	43 South	6.7
Maacama-Garberville	43 Northwest	7.5
Great Valley Segment 3	44 Northeast	6.9
Collayomi	55 North	6.5
Bartlett Springs	62 North	7.6

[1] Blake (2001) and Mualchin (1996).
[2] The reported potential maximum magnitudes are Maximum Moment Magnitudes rather than Richter Scale Magnitudes, a scale that is generally no longer used.

Local Geology, Drainage, and Groundwater

A geologic map published by the California Geological Survey (formerly the California Division of Mines and Geology [Wagner and Bortugno 1982]) indicates that the westerly part of the proposed Project area is underlain by sedimentary rocks known as the San Pablo Group. The rocks are described as fossiliferous marine sandstone and shale. More recently (Wagner and Gutierrez 2006), some of these rocks have been remapped as belonging to the Las Juntas Shale and the Vine Hill Sandstone. Easterly portions of the proposed Project area are underlain by rocks of the Great Valley Complex consisting of marine sandstone, shale, siltstone, mudstone, and conglomerate. As stated above, the Franklin fault provides a separation of the younger rocks from the older rocks on the east. In addition to the sedimentary rocks, some areas of the site are mapped as Pinole Tuff, a volcanic rock made up primarily of volcanic ash. In addition to the rock

units, man-made fill soils are mapped (Graymer et al. 2002) along the shoreline immediately west and southwest of the wharf. Relatively young, unconsolidated bay deposits can be expected offshore. Surficial topsoil deposits are present onshore with alluvial soils in the natural drainages.

The proposed Project site drains to the north and west toward Carquinez Strait and San Pablo Bay, respectively. Relatively steep slopes are present nearby to the south of the wharf with low rolling hills beyond. Groundwater can be expected to occur at or slightly above the level of the Bay.

The wharf lease area constitutes approximately 10 acres of water surface in the Carquinez Strait. The trestle connecting the wharf to the shoreline is at the very east end of a relatively flat, long and narrow filled bench stretching west between the steep hillside and the water's edge. This paved bench is about 150 feet wide at the trestle, with approximately 70 feet of that width occupied by the Southern Pacific mainline railroad tracks. The bench, a U.S. Environmental Protection Agency Superfund site, provides open storage for ConocoPhillips.

Geologic Hazards

A geologic hazard is a geologic condition, either natural or man-made, that poses a potential danger to life and property. A discussion of possible geologic hazards in the proposed Project area is presented in the following sections.

Seismic Activity

Based on the tectonic setting and the historical record, the proposed Project area is in a region that is characterized by a relatively high level of seismic activity. According to a probabilistic seismic hazard model for California (USGS/CGS 2002), peak horizontal ground accelerations having a 10 percent probability of exceedance in 50 years can be estimated to be approximately 0.45g (45 percent of gravity).[1] Also, based on a regional earthquake probability study, there is a 63 percent probability of at least one magnitude 6.7 or greater earthquake occurring in a 30-year interval in the San Francisco Bay region (USGS 2009). Historic earthquakes of magnitude 6.0 or greater with epicenters within approximately 62 miles of the proposed Project area are shown in Table 4.11-2, below.

[1] This was estimated assuming soft rock (e.g., sedimentary rock). The acceleration was rounded up to the nearest 0.05g and is provided here for comparison purposes only and is not intended for any type of design work.

Table 4.11-2. Historic Earthquakes that Affected the Proposed Project Site

Date	Magnitude (M)	Approximate Epicentral Distance (miles)
June 10, 1836	6.8	17
June, 1838	7.0	32
November 26, 1858	6.1	42
October 8, 1865	6.3	55
October 21, 1868	6.8	25
May 19, 1889	6.0	19
April 19, 1892	6.4	27
April 21, 1892	6.2	35
March 31, 1898	6.2	13
April 18, 1906	8.2	28
July 1, 1911	6.6	62
April 24, 1984	6.2	58

Source: United States Geological Survey 2009

The MOTEMS Initial Audit Report included analyses for site-specific design earthquake motions, peak ground accelerations (PGA), and spectral acceleration values (Engeo 2009a) (see Tables 4.11-3 and 4.11-4).

Surface Fault Rupture

Seismically induced ground rupture is defined as the physical displacement of surface deposits in response to an earthquake's seismic waves. The magnitude, sense, and nature of fault rupture can vary for different faults or even along different strands of the same fault. Ground rupture is considered more likely along active faults.

The proposed Project site is not within an Alquist-Priolo Earthquake Fault Zone, as designated by the Alquist-Priolo Earthquake Fault Zoning Act, and no mapped active faults are known to pass through the immediate area. The risk of ground rupture at the site is low due to the absence of zoned, active fault traces at the Project site, based on current understanding. However, based on a study by the USGS geologic and seismic hazards relative to a potential liquid natural gas project on the southern portion of Mare Island (north of the proposed Project site), it was concluded that available data were

Table 4.11-3. Design Earthquake Motions

Risk Classification	Seismic Performance Level	Probability of Exceedance	Return Period
High	Level 2	10% in 50 Years	475 years
Moderate	Level 1	65% in 50 Years	48 years
	Level 2	15% in 50 Years	308 years

Source: Engeo 2009a

Table 4.11-4. Peak Ground Acceleration and Spectral Accelerations Soil Class S_E (5% Damping)

Risk Classification	Seismic Performance Level	Probability of Exceedance	Site Class**		
			Spectral Acceleration (% g)		PGA (% g)
			Sxs	Sxl	
High	Level 2	10% in 50 Years	0.90	0.95	0.36*
Moderate	Level 1	65% in 50 Years	0.33	0.35	0.13
	Level 2	15% in 50 Years	0.74	0.79	0.30

* value of PGA used for liquefaction evaluation
** PGA = peak ground acceleration
Sxs = Short period spectral acceleration (0.2 seconds)
Sxl = Long period spectral acceleration (1.0 second)
Source: Engeo 2009a

inconclusive regarding the recency of faulting of the Franklin fault (Holzer et al. 2002, Engeo 2009a and 2009b).

The Franklin fault is present in the vicinity of the proposed Project site (Engeo 2009b). The eastern trace of the Franklin fault passes approximately 1,200 feet east of the southern end of the trestle. The offshore projection of this fault trace passes approximately 150 feet and 700 feet east of the easternmost dolphin and the south end of the trestle, respectively. The western trace was mapped at the contact between rocks of Cretaceous and Eocene age, approximately 600 feet west of the onshore end of the trestle.

Liquefaction

Soil liquefaction can be caused by strong vibratory motion due to earthquakes. Research and historical data indicate that loose granular soils and non-plastic silts that are saturated by relatively shallow groundwater are susceptible to liquefaction.

Liquefaction causes soil to lose strength and "liquefy," triggering structural distress or failure due to the dynamic settlement of the ground or a loss of strength in the soils underneath structures.

Soils having a "very high" potential for liquefaction are mapped (USGS 2008) along the shoreline in the proposed Project area. These probably include the aforementioned fill soils present just west and southwest of the wharf.

Data from onsite soil borings were used to further evaluate the potential for liquefaction (Engeo 2009a). The investigation indicated that the sandy silt encountered in Boring 1-B3 has the potential to liquefy. Boring 1-B3 is located onshore on the shoreline embankment just north of the railroad and near the terminus of the wharf trestle. The study concluded that localized zones of sandy silt beneath the shoreline embankment could liquefy during a seismic event. The study further concluded that the offshore soils are not susceptible to liquefaction.

Settlement estimates result in potential theoretical liquefaction-induced vertical strain settlement of approximately 2 to 4 inches onshore. The geotechnical investigation recommended that the pipeline should be evaluated for the ability to tolerate this amount of differential vertical movement over the distance between the first fixed point on the support structure to the point where the pipe enters the embankment (Engeo 2009a).

Lateral Spreading

Lateral spreading of ground surface during an earthquake usually takes place along weak shear zones that have formed within a liquefiable soil layer. Lateral spread has generally been observed to take place in the direction of a free-face (i.e., retaining wall, slope, or channel). For sites located in proximity to a free-face, the amount of lateral ground displacement is strongly correlated with the distance of the site from the free-face. Other factors such as earthquake magnitude, distance from the earthquake epicenter, thickness of the liquefiable layers, and the fines content and particle sizes for the liquefiable layers also affect the amount of lateral ground displacement. Because liquefiable soils are mapped in the proposed Project area adjacent to the Bay (a free-face), lateral spreading is possible as a result of earthquakes. However, such liquefaction has a low potential of causing damage due to the very gentle slopes of the soils prone to liquefaction. The onsite geotechnical investigation also concluded that lateral spreading instability is not significant at this site (Engeo 2009a).

Slope Stability

The geotechnical investigations included slope stability analyses on the as-constructed slope configuration as of 1982 (Engeo 2009a). The results indicated that the factor of safety under several scenarios is greater than the minimum factor of 1.2 required by MOTEMS. In addition, the analyses estimated a seismically induced slope displacement of less than 1 inch, which is less than the required MOTEMS criteria of less than 0.5 feet.

Tsunamis

Tsunamis are typically long seismic sea waves generated by sudden vertical movements of the sea floor caused by submarine earthquakes, landslides, or volcanic activity. Tsunamis may be generated at great distance from shore (far-field events) or nearby (near-field events). In general, the strength of a tsunami diminishes with the distance it travels. The likelihood of a tsunami being generated by nearby events in the San Francisco Bay Area is low because most of the region's faults have a strike-slip style of faulting where the primary mode of movement is lateral rather than vertical. Accordingly, a tsunami affecting the Bay Area will likely have a distal source with diminished energy. Further, the wave will be constricted as it crosses into the Bay through the Golden Gate Bridge (GGB). As it moves across the Bay it will dissipate further as it reaches the more inland areas of the Bay, such as where the Project site is located. In the case of a far-field event, the Bay area would have hours of warning; for a near-field event, there may be only a few minutes of warning, if any.

During historical times from 1851 to the present, 52 credible tsunamis have been observed or recorded inside San Francisco Bay. Forty-four of the tsunamis were generated in the far Pacific Ocean and eight were generated either in San Francisco Bay, San Pablo Bay, or near to the coast. Of these, five produced waves exceeding 1.6 feet in the San Francisco Bay Area. Two tsunami events in 1960 and 1964 are well documented and summarized below:

- The 1960 magnitude 9.5 earthquake off the coast of Chile created a tsunami with maximum wave height (trough to crest) of 2.9 feet at the National Oceanographic and Atmospheric Administration (NOAA) Presidio GGB tide station and 0.1 foot at an unspecified tide station in Carquinez Strait.

- The 1964 magnitude 9.2 earthquake in Prince William Sound, Alaska, created a tsunami with a maximum measured wave height of 7.5 feet at the NOAA Presidio tide station. The measured tsunami height in Carquinez Strait was not available but it was likely a much lower height.

On March 10, 2011, a 9.0 earthquake that occurred off Japan's east coast produced a tsunami with waves that came ashore in northern and central California around 8:00 a.m. on March 11. According to the Central and Northern California Ocean Observing System (CeNCOOS) website, www.cencoos.org/sections/news/Tsunami_2011.shtml, damage in California due to this tsunami was extensive, mostly affecting harbors and marinas where surges were not blocked by beaches or cliffs. Tsunami wave heights across northern California varied from approximately 8 feet (Crescent City) to 4 feet (Monterey Bay). Although these wave heights are not unusual for California, the speed and wave length created a series of surges resembling flash floods that flowed in and out of the harbors with high speed and force, reversing direction every 15-20 minutes. Many boats and docks were sunk or set loose in the harbors as a result. Crescent City was especially badly hit, but Santa Cruz Harbor also sustained significant damage. Damage on the West Coast may have been less than it could have been because the tsunami hit during low tide.

Locally-generated tsunamis within San Francisco Bay and San Pablo Bay are not known to create high waves. A magnitude 6.7 earthquake beneath San Pablo Bay in 1898 created maximum tsunami wave heights of 2.0 feet within the San Francisco Bay-San Pablo Bay Area. By comparison, the 1906 San Francisco earthquake generated tsunami waves of 0.3 foot.

Numerical modeling of tsunami wave propagation in San Francisco Bay shows a maximum modeled wave height at the MOT of 1.8 feet (see Appendix C-1). In general, the site is very well protected from significant tsunami effects. The recommended maximum tsunami height and current velocity that ~~should be assumed to~~ could reasonably occur at the MOT during the lease period are 2.6 feet and 1.0 knots, respectively. The tsunami wave ~~is~~ would be expected to behave as a long-period steady current by the time it reaches the MOT.

In addition, the MOTEMS provide estimated tsunami run-up for areas of California. The maximum credible tsunami water levels and current speeds of the Selby locale and Shore Marine Oil Terminal area are 2.6 feet and 1.6 feet/second, respectively. Water levels may be positive or negative and current velocities may vary in direction. These values are to be added to the mean high tide and maximum site-specific currents to determine maximum run-up and potential damage.

Expansive Soils

Expansive soils contain significant amounts of clay particles that have the ability to give up water (shrink) or take on water (swell). When these soils swell, the change in volume can exert significant pressures on loads that are placed on them (such as buildings) and can result in structural distress and/or damage.

Landslides

There are no indications of landslides at the Project site. There are steep slopes in natural materials just south of the wharf, which may have slope stability problems, particularly during a strong earthquake. Landslides have been reported (Woodward-Clyde 1979) in hilly areas southwest of the wharf, but well removed from it.

Sea Level Rise

Scientific research to date indicates that observed climate change around the globe will likely result in sea level rise. Sea level rise is defined as the measured, continual increase in steady astronomical tide elevations. Historic average sea levels in San Francisco Bay, measured at the San Francisco (Fort Point) NOAA tide station, were reviewed for this analysis. The monthly mean sea levels during the period of 1906 to 2006 show a linear trend in sea level rise of approximately 2 millimeters per year (mm/yr). During this period, unusually high spikes are noted due to El Niño episodes. However, evidence of accelerated sea level rise due to effects of global climate change is not yet evident in the measured tide record for San Francisco.

Predictions in sea level rise at the GGB are considered reasonable for the Shore Terminal. Based on the measured sea level rise of 2 mm/yr, the sea level rise at the Terminal over a 30-year period is estimated to be 0.2 feet (see Appendix C.1). Mean Higher High Water (MHHW) at the Terminal is presently 5.86 feet higher than Mean Lower Low Water (MLLW), and would therefore expected to be approximately 6.06 feet (MLLW) in 2039. Section 3103F.5.3.4 of the MOTEMS also requires that each MOT consider the predicted sea level rise over the remaining life of a terminal. Shore has and will continue to consider sea level rise in Terminal assessments.

4.11.2 Regulatory ~~Content~~ Setting

State

Seismic Hazards Mapping Act

The State Department of Conservation, California Geological Survey (CGS), provides guidance with regard to seismic hazards. Under the CGS Seismic Hazards Mapping Act, seismic hazard zones are to be identified and mapped to assist local governments for planning and development purposes. The intent of the Act is to protect the public from the effects of strong ground shaking, liquefaction, landslides, or other types of ground failure, and other hazards caused by earthquakes. CGS Special Publication 117, Guidelines for Evaluating and Mitigating Seismic Hazards in California (CGS 2008), provides guidance for evaluation and mitigation of earthquake-related hazards for projects within designated zones of required investigations. This Act will not apply to the proposed Project or its alternatives as seismic hazard zones have not yet been established in the Project area.

California Building Code

The California Building Code (CBC) has been codified in the California Code of Regulations (CCR) as Title 24, Part 2. Title 24 is administered by the California Building Standards Commission, which, by law, is responsible for coordinating all building standards. Under State law, all building standards must be centralized in Title 24 or they are not enforceable. The purpose of the CBC is to establish minimum standards to safeguard the public health, safety, and general welfare through structural strength, means of egress facilities, and general stability by regulating and controlling the design, construction, quality of materials, use and occupancy, location, and maintenance of all building and structures within its jurisdiction. The CBC is based on the International Building Code, formerly known as the Uniform Building Code (UBC). The 2007 CBC is based on the 2006 International Building Code (IBC) published by the International Code Conference. In addition, the CBC contains necessary California amendments, which are based on the American Society of Civil Engineers (ASCE) Minimum Design Standards 7-05. ASCE 7-05 provides requirements for general structural design and includes means for determining earthquake loads as well as other loads (flood, snow, wind, etc.) for inclusion into building codes. The provisions of the CBC apply to the construction, alteration, movement, replacement, and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures throughout California.

The earthquake design requirements take into account the occupancy category of the structure, site class, soil classifications, and various seismic coefficients, which are used to determine a Seismic Design Category (SDC) for a project. The SDC is a classification system that combines the occupancy categories with the level of expected ground motions at the site and ranges from SDC A (very small seismic vulnerability) to SDC E/F (very high seismic vulnerability and near a major fault). Design specifications are then determined according to the SDC.

Marine Oil Terminal Engineering and Maintenance Standards

The MOTEMS (24 CCR § 3101F *et seq.*) became an enforceable part of the CBC on February 6, 2006. ~~The California legislature passed the Lempert-Keene-Seastrand Oil Spill Prevention and Response Act of 1990 in response to previous incidents. The Act defines specific tasks for the California State Lands Commission (CSLC) to provide standards for MOTs to prevent future oil spills. In order to fulfill this mandate, the Marine Facilities Division (MFD) of the CSLC requested a Federal Emergency Management Agency (FEMA) hazard mitigation grant to develop these standards.~~ These standards apply to all existing and new MOTs in California, and include criteria for inspection, structural analysis and design, mooring and berthing, geotechnical considerations (a seismic and structural assessment, based on current seismic criteria), and analysis and review of the fire, piping, mechanical, and electrical systems. MOTEMS requires each MOT to conduct an engineering audit to determine the level of compliance and an evaluation of the continuing fitness-for-purpose of the facility. For high-risk MOTs, MOTEMS required these audits to have been completed by August 6, 2008. High-risk facilities are determined by the total volume of flowing and stored oil; lower risk levels are determined based on the number of transfers per year and the maximum size of vessels that may call on the terminal. The Shore MOT has been assigned a medium risk rating. The MOTEMS are an evolving regulation which may be revised and amended on a continual basis. California MOTs must track and comply with the most current version of MOTEMS.

Local

Contra Costa County General Plan

The county of Contra Costa has established goals, policies, and programs in regard to geologic hazards. These are outlined in the Conservation and Safety Element sections of the Contra Costa County General Plan. The policies related to geology and soils are generally associated with new construction and development, which is not part of the

proposed Project. However, any improvements required as part of MOTEMS, mentioned above, may be subject to the policies and programs of the General Plan.

4.11.3 Significance Criteria

Seismic effects could result in significant hazards to structures when not properly accounted for in facility design or construction. Impacts are considered significant if any of the following conditions apply:

- Settlement of the soil that could substantially damage equipment and components of the wharf;
- Ground motion due to a seismic event that could induce liquefaction, settlement, or a tsunami that could damage structural components;
- Deterioration of structural components of the wharf due to corrosion, weathering, fatigue, or erosion that could reduce structural stability;
- Increase in loading conditions, vessel size, or number of vessels that could overstress the existing facilities and reduce the structural stability of the wharf; or
- Damage to petroleum pipelines and/or valves along the pipelines from any of the above conditions that could release petroleum products into the environment.

The tsunami hazard for the MOT has been estimated at a maximum height of 2.6 feet, based on modeling results (see Appendix C.1). Potential waves of 2.6 feet at the MOT, in its current configuration, might be expected to interrupt operations; however, such waves would not be expected to cause substantial damage to the MOT or a moored vessel (see Appendix C.1). Additionally, MOTEMS section 3103F.5.7 requires that each MOT have a Tsunami Plan. This Plan should address far-field versus near-field tsunami events, notifications and communications, tsunami warning system and notification details, tsunami response actions, tidal levels, currents (magnitude and direction) and seiche conditions, loss of utilities, tsunami plan accessibility and training, and post-event inspection. The Tsunami Plan shall be revisited and revised where necessary, and at least every 3 years. Therefore, the potential impacts of tsunamis on the MOT are not discussed further in this section.

4.11.4 Impact Analysis and Mitigation

Approach to Analysis

Under the proposed Project, Shore would be granted a new lease and operations of the MOT would continue as currently conducted. There would be no construction activities

associated with the proposed Project. Based on its geographical location, the proposed Project would not result in impacts related to the following criteria:

- *Settlement of Soils.* Continued operation of the wharf under the proposed Project does not include the construction of any new structures that would be affected by long-term (non-seismic) settlement of soils. Based on the length of operation of the current facility, the effects of soils settlement, if present, would have already been evident. Therefore, the proposed Project would result in no impact related to long-term settlement of soils.

- *Increase in Loading Conditions.* The proposed Project would continue operations at the MOT as currently conducted. Vessel size and visitation frequency are not expected to change from current conditions. Further, compliance with MOTEMS engineering audit requirements and implementation of any required structural upgrades would ensure that the structural stability of the wharf is maintained to appropriate engineering standards. Therefore, there would be no impact relative to overstressing the wharf.

Ground Motion Due to a Seismic Event

Ground Shaking

The Project site would likely experience at least one major earthquake (Richter magnitude (M) 6.7 or higher) within the next 30 years. The intensity of such an event would depend on the causative fault and the distance to the epicenter, the moment magnitude, and the duration of shaking. A seismic event in the Bay Area could produce ground accelerations at the Project site ranging from moderate (MM-VI) to very strong (MM-VIII) (ABAG 2009). An earthquake of this intensity could cause moderate damage especially in unreinforced structures.

While the Project facility was originally constructed during a time of different building code requirements, the original design did include ~~pre-stressed concrete~~steel pipe piles for the wharf which provide resistance to potential ground shaking forces. The MOT is required to adhere to the MOTEMS and has undergone ~~is undergoing~~ a MOTEMS Audit. Prior facility improvements include seismic engineering elements such as safety valves on the pipelines, which were added to reduce the risk of a spill from pipe rupture. The Shore MOT has been assigned a medium risk rating under MOTEMS, based on the exposed total volume of oil during transfer, the number of transfers per year, and the maximum size of vessels that may call on the terminal. This medium risk rating has relevance to the required schedule of adherence to any required upgrades and improvements to meet or exceed the MOTEMS. Shore is currently working to meet the

requirements of MOTEMS. Therefore, with adherence to the requirements of the MOTEMS, the proposed Project would have a less-than-significant impact related to ground shaking (Class III).

Ground Failure Due to Liquefaction

Areas ranked as having a very high potential for liquefaction are present in the vicinity of the proposed Project site but are limited to the nearshore areas. However, the wharf is supported by ~~prestressed concrete~~steel pipe piles, which have been seated in more competent materials at depth. Therefore, the proposed Project would have a less-than-significant impact from liquefaction (Class III).

Slope Failure or Landslides

The proposed Project site is generally not located in an area that would be susceptible to landslides and no identified landslides are present. A steep slope present south of the wharf may be subject to slope instability, particularly during a strong earthquake. However, the Southern Pacific railway, which is located between the wharf and the slope, serves as a buffer zone for any slope failure debris, should it occur. Therefore, the proposed Project would have a less-than-significant impact from slope failures or landslides (Class III).

Deterioration of Structural Components

The wharf is in a corrosive environment, and weathering and erosion are occurring in the Project vicinity. However, Shore's adherence to the required inspection, maintenance, and repair operations for the MOT in accordance with MOTEMS ensures that deterioration of structural components would be identified and corrected prior to the occurrence of structural failure (Class III).

Damage to Petroleum Pipelines

Impact GEO-1: Accidental Spills of Petroleum Products from Damage to Petroleum Pipelines due to Seismic Events

Spills of petroleum products could occur due to damage to transfer pipelines during a seismic event either at the loading arms or at the shore embankment. (Class II)

The original EIR for the Project (Woodward-Clyde 1979) indicated that the proposed steel pipe pile foundations for the wharf were expected to encounter bedrock at shallow depths. The EIR also indicated that the piles would have to be anchored in sandstone

rock. It is reasonable to assume, therefore, that the pile foundations bear on non-compressible formational materials (i.e., bedrock), as this would have been typical geotechnical design requirements at the time the piles were installed. Accordingly, significant settlement of the wharf's foundations under static conditions is not expected. Consequently, the potential for damage to the pipelines on the wharf and onshore due to failure of the wharf's structural foundation from static settlement is considered low. However, assessing the potential for pipeline damage from dynamic factors, including differential displacements or deformation or damage to the piles from seismic events, ~~would~~ requires pipeline stress analyses and detailed seismic study. These analyses ~~will~~ were~~be~~ conducted, and risks to the pipelines assessed, during the MOTEMS Initial Audit. The MOTEMS Initial Audit indicated that two areas of potential failure exist. The first could occur at the pipe connections to the loading arms on the wharf, and the second could occur at the point where the pipelines enter the shore embankment (Honegger 2009). Should either of these pipeline failures occur during product transfer at the wharf, a significant amount of petroleum product could be released into the environment. ~~Shore would be required to implement any upgrades or seismic improvements that the MOTEMS Initial Audit identifies would be necessary to reduce the likelihood of pipeline damage during a seismic event.~~ Although ~~B~~block valves are currently present on~~shore the~~ to limit pipeline flow~~s~~ in the unlikely event of the failure of the wharf's steel pipe pile foundations, and Shore has proposed APM-2 to provide more flexibility on two of the four principal transfer pipelines (see Section 2.3.7, Measures Designed Into Proposed Project to Avoid Potential Impacts), ~~thus further reducing~~ the potential for a spill from any of these pipelines ~~should the foundation components of the wharf fail~~ due to ~~geology, soils, and~~ seismic conditions still requires additional mitigation measures (Class II~~I~~).

Mitigation Measure for Impact GEO-1:

MM GEO-1a. Provide Pipeline Flexibility on Transfer Pipelines at the Loading Arms. Within two years after approval of the new lease by the California State Lands Commission (CSLC), Shore shall provide additional flexibility to the loading arm to transfer pipeline connections, based on detailed engineering analysis, by the installation of one or more of the following options:

1. Installation of U-shaped expansion loops at each of the four 12-inch pipelines.

2. Replacement of hard connections to loading arms with a section of flexible reinforced hose to accommodate at least +/- 4.6 inches of movement.

3. Installation of expansion joints in lines to absorb relative axial movement.

Shore may install alternate technology that provides an equivalent level of protection, as reviewed by CSLC staff and only if approved by the CSLC at a publicly noticed meeting.

MM GEO-1b. Provide Pipeline Flexibility on Transfer Pipelines at the Embankment. Within six months after approval of the new lease by the California State Lands Commission (CSLC), Shore shall complete and submit to the CSLC a detailed engineering analysis to investigate/validate methods for providing improved flexibility for the section of transfer pipelines between the embankment and the block valves to increase settlement capacity to more than 4 inches. Methods to be investigated shall include, but not be limited to, replacement of the soil cover on the section of transfer pipelines between the embankment and the block valves with lightweight geofoam. Shore shall install the preferred technology within one year of approval by CSLC staff.

Rationale for Mitigation

These mitigation measures would ensure that the transfer pipeline flexibility would be sufficient to accommodate seismic motions and reduce the likelihood of transfer pipeline failure. The impact would be reduced to less than significant.

Impact and Mitigation Summary

Table 4.11-5 presents a summary of operational safety/risk of accident impacts that would be associated with the proposed Project and the corresponding recommended mitigation measures.

Table 4.11-5. Summary of Geology, Soils, and Seismicity Impacts and Mitigation Measures

Impacts	Mitigation Measures
GEO-1: Accidental Spills of Petroleum Products from Damage to Petroleum Pipelines due to Seismic Events	**MM GEO-1a.** Provide Pipeline Flexibility on Transfer Pipelines at the Loading Arms **MM GEO-1b.** Provide Pipeline Flexibility on Transfer Pipelines at the Embankment

4.11.5 Impacts of Alternatives

No Project Alternative

Under the No Project Alternative, Shore would not be granted a new lease and the existing MOT would be subsequently decommissioned with its components reused, abandoned in place, removed, or a combination thereof. Decommissioning and removal of the MOT under the No Project Alternative would result in a reduction of the potential for exposure to geologic and seismic hazards and therefore less impacts than the proposed Project. Reuse of the MOT may result in more or less exposure to geologic and seismic hazards than current operations, depending on the nature of the reuse. Abandonment in place would likely result in a greater potential for impacts related to geologic and seismic hazards and corrosion, as the MOT structures would no longer be maintained.

Limitations on Terminal Use Alternative

Under the Limitations on Terminal Use Alternative, Shore would be granted a new lease but with restrictions on the number, type, or size of marine vessels that would be allowed to call at the MOT, or restrictions on the type of product that could be loaded or unloaded. However, the potential for geologic and seismic hazards and corrosion would remain the same as for the proposed Project.

4.11.6 Cumulative Projects Impact Analysis

The entire San Francisco Bay Area is within a seismically active region with a wide range of geologic and soil conditions. These conditions can vary widely within a short distance, making the cumulative context for potential impacts resulting from exposing people and structures to related risks one that is more localized or site-specific. The proposed Project, as discussed above, would have less-than-significant impacts related to geologic, soils, or seismic hazards and corrosion. None of the past, present, and reasonably foreseeable future projects identified in Section 3.5, Cumulative Projects, would have the potential to affect the geologic, soils, or seismic hazards and corrosion conditions at the location of the proposed Project. Therefore, the proposed Project would not result in a cumulatively significant impact related to geologic, soils, or seismic hazards and corrosion conditions, and the risk posed by the proposed Project from those hazards would not be cumulatively considerable.

5.0 SOCIOECONOMIC EFFECTS AND ENVIRONMENTAL JUSTICE

5.1 SOCIOECONOMIC EFFECTS

This section presents the socioeconomic analysis for the proposed Project. The regional and local population and existing economic conditions are presented, followed by a discussion of the contribution that the Shore Terminals LLC (a NuStar Energy Company), hereafter referred to as Shore Marine Oil Terminal (MOT), makes to the regional and local economies. Impacts on socioeconomics from the proposed Project and alternatives are then presented. The level of impact of MOT operations to the local and regional economy is also assessed.

5.1.1 Analysis and Conditions

Population

Table 5.1-1 summarizes Contra Costa County demographics from the 1990 and 2000 census. It also shows the demographics for the proposed Project area, which consists of the unincorporated towns of Rodeo and Crockett. The county's growth rate from 1990 through 2000 was 18 percent. During the same time period, housing increased by 38,407 units or 12.1 percent. Employment increased by 11 percent from 1990 through 2000. By comparison, the local communities of Rodeo and Crockett grew less rapidly both in population and new housing over the same period of time.

Table 5.1-1. Demographic Characteristics for Contra Costa County and the Rodeo-Crockett Local Area

Characteristic	1990	2000	1990 - 2000	
			Growth	Percent
Total Population				
Rodeo-Crockett	10,817	11,911	1,094	10.1
Contra Costa County	803,732	948,816	145,084	18.1
Housing Units				
Rodeo-Crockett	4,356	4,574	218	5.0
Contra Costa County	316,170	354,577	38,407	12.1
Employment				
Rodeo-Crockett	5,166	5,987	821	15.9
Contra Costa County	406,507	451,357	44,850	11.0

Source: U.S. Census 2000a

By 2010, Contra Costa County's population ~~is~~ was projected to increase by 12 percent to 1,061,900; by 2020 its population is expected to increase to 1,157,000 or a 21.9 percent increase from its 2000 levels. Future growth over the same period for the Rodeo-Crockett area is projected to reach 12,600 by 2010 and 13,200 in 2020 – a comparative increase of 5.8 percent and 10.8 percent, respectively (ABAG 2006).

Employment

As shown in Table 5.1-1, between 1990 and 2000, employment in Contra Costa County grew by 11 percent. Table 5.1-2 shows employment in Contra Costa County by major industry. The services sector experienced the most job growth, with a 45 percent increase in employment between 1990 and 2000. The second largest increase in the number of jobs was in the transportation, communications, and utilities sector, which experienced a 33 percent growth in employment over the same time period.

Table 5.1-2. Contra Costa County Employment by Industrial Sector

Industry Sector	1990	2000	1990 - 2000	
			Growth	Percent
Agriculture, Forestry, Fisheries, and Mining	9,016	2,311	-6,705	-74
Construction	31,543	34,403	2,860	9
Manufacturing	47,056	38,281	-8,775	-19
Transportation, Communications, and Utilities	34,150	45,283	11,133	33
Wholesale and Retail Trade	84,165	69,052	-15,113	-18
Finance, Insurance, and Real Estate	46,217	47,361	1,144	2
Services	135,332	195,863	60,531	45
Public Administration	19,028	18,803	-225	-1
Total	**406,507**	**451,357**	**44,850**	**11**

Source: U.S. Census 2000b

The categories of agriculture (including forestry, fisheries, and mining industries), manufacturing, wholesale and retail trade, and public administration decreased in the number of jobs. The decreases ranged from 1 percent for public administration to 74 percent for agriculture (including forestry, fisheries, and mining industries). Petroleum industries are shown in the manufacturing sector.

Table 5.1-3 shows the employment in the Rodeo-Crockett area by major industry. The services sector experienced the most job growth with a 67 percent increase in employment. The second largest increase in the number of jobs occurred in the transportation,

communications, and utilities sector which had a 48 percent increase in employment between 1990 and 2000.

Table 5.1-3. Employment in the Rodeo-Crockett Area by Industrial Sector

Industry Sector	1990	2000	1990 - 2000	
			Growth	Percent
Agriculture, Forestry, Fisheries, and Mining	95	27	-68	-72
Construction	375	416	41	11
Manufacturing	817	572	-245	-30
Transportation, Communications, and Utilities	508	754	246	48
Wholesale and Retail Trade	991	812	-179	-18
Finance, Insurance, and Real Estate	630	584	-46	-7
Services	1,499	2,503	1,004	67
Public Administration	251	319	68	27
Total	**5,166**	**5,987**	**821**	**16**

Source: U.S. Census 2000b

The categories of agriculture (including forestry, fisheries, and mining industries), manufacturing, wholesale and retail trade, and financial and real estate industries decreased in the number of jobs. The decreases ranged from 7 percent for the financial sector to 72 percent for agriculture (including forestry, fisheries, and mining industries).

Shore's MOT Contribution to the Economy

The MOT is located approximately 1 mile west of the Interstate 80 Carquinez Strait Bridge on the south shoreline of the Carquinez Strait in an unincorporated, heavy-industrial area (formerly the small town of Selby) between the towns of Rodeo and Crockett, in Contra Costa County. The MOT operates 24 hours per day, 365 days per year, and employs a terminal manager, 11 technicians, and three office staff. As currently operated, the Shore facility receives and distributes refined petroleum products by pipeline, marine vessels, railroad tank cars, and trucks. Shore does not ship crude oil through its MOT. In 2005,[1] 110 marine vessels, 2,435 railroad tank cars, and 12,270 trucks transferred product at the site. For the project baseline year 2007, Shore reported a throughput of over 10.8 million barrels of petroleum product across the wharf (Shore 2008).

[1] 2005 was used as it was the most recent year for which concurrent data on marine vessels at the wharf and rail/truck loadings at the upland terminal were available.

The number of ~~tanker and barge~~vessel visits to the MOT for the period from ~~January 2005~~1999 through ~~November~~ 2008~~,~~ are presented in Table ~~4.1~~2-2 (see Section ~~4.1~~2.0, ~~Operational Safety/Risk of Accidents~~ Project Description). During the ~~most recent four~~10-year period, the maximum number of vessel calls occurred in ~~2006~~2003, ~~where~~ when the maximum number was ~~about~~ approximately ~~25~~ 30 percent greater than the average of approximately ~~106~~ 104 vessel calls per year. However, the amount of product transferred during the maximum year was only 13 percent greater than an average year.

The MOT operates solely as a transfer operation facilitating the loading and unloading of refined petroleum to and from storage on behalf of oil companies, distributors, and brokers in the San Francisco Bay, Sacramento, and Northern California region. Consequently, while the facility handles a major volume of valuable oil commodities, the MOT is a service facility (as opposed to a processing/manufacturing operation) and as such, the MOT operation's role and revenues represent a very small part of the Contra Costa County's petroleum processing industry. The company's staff of 15 employees contributes a positive but small portion to the county's total employment – representing less than 0.01 percent of the county's total of approximately 451,000 jobs.

As discussed in Section 3.0, Alternatives and Cumulative Projects, it is estimated that Shore facilities handle at least 40 percent of the petroleum products that pass through the Shore main terminal. As such, the MOT provides a key amenity for the main Shore storage facility terminal's future operation.

Regulatory Setting

There are no regulatory requirements that apply to socioeconomics.

5.1.2 Relationship to Alternatives

Impact Significance Criteria

Impacts were considered to be significant if the proposed Project or any alternatives would:

- Result in a substantial decrease in the employment and economic base of the towns of Rodeo and Crockett, Contra Costa County, or Shore;
- Induce substantial growth or concentration of population, or displace a large number of people; or
- Have a potential to impact the local or regional economy due to spills of petroleum products.

Impact Analysis and Mitigation

Proposed Project

The proposed Project would enable continued operation of the facility at its existing service level and, therefore, would result in no changes in the employment or economic activity level. Consequently, the proposed Project would have no impact to either the local or countywide economy.

Given the proposed Project's absence of a job increase or new development that displaces any local residents, the proposed Project would have no growth effects to the local or Contra Costa County economy. The only potentially significant economic effects that might be associated with the proposed Project would be potential indirect adverse economic effects that might result from petroleum product spill effects to local physical resources. The indirect economic effects are analyzed below.

<u>Effects of Future Petroleum Product Spills</u>

Extensive analysis and discussion of the potential resource impacts from the effect of an accidental release of petroleum products at or near the MOT are presented elsewhere in this Environmental Impact Report (EIR). The spill risk for the proposed Project is analyzed in Section 4.1, Operational Safety/Risk of Accidents. The location and severity of any such accidental spill would determine the nature, location, and severity of any related environmental effects, and the analysis has accordingly modeled a variety of future spill scenarios. The resource-specific potential impacts are discussed in detail under their appropriate resource sections.

While there is no guarantee against accidental upset conditions, appropriate preventative measures combined with the faculty to provide swift responses in the event of a release can minimize the potential impacts, depending on the size of the spill. Operational safety measures are also discussed in Section 4.1, Operational Safety/Risk of Accidents, of this document. Adherence to the requirements of the Oil Spill Response Plan and other operational safety measures as required by local, State, and Federal regulations would reduce the potential impact to the greatest extent practical. However, there remains a significant and unavoidable adverse environmental impact associated with the possibility of a large spill (i.e., more than 50 barrels of petroleum product) somewhere within the Bay. Given the unknown specifics of any such accident, the nature and location of any such event's physical impacts are indeterminate. However, in any case, the duration of almost any major accident is nonetheless relatively short term. The economic activity for the local and regional economy associated with any of the resource areas that might be potentially

affected depends on the size of the spill. Future spill impacts would be temporary. For example, the recreation and commercial fishing activity within the MOT vicinity or greater region that would be potentially impacted by a Project-related spill event would be relatively limited. Furthermore, the recreation and commercial fishing activity could relocate to other recreational or fishery locations for the relatively short duration of the spill event. As discussed in more detail in Section 4.5, Land Use and Recreation, local recreation is minimal and hence generates negligible revenues and employment for the local or County economy. Similarly, Section 4.3, Commercial and Sport Fisheries, also details the extent of commercial and sport fishing activity in the MOT vicinity. While these activities generate greater employment and revenues, their magnitude is very small, especially compared to the employment and revenues of the other industry sectors (such as Services, Manufacturing, and Trade) which play a far greater economic role in the local and Contra Costa County economy.

As a result, given the relatively minor role of the indirect economic effects associated with any of the potentially affected resource areas, and that most of the Project-related effects are projected to be less than significant, the resulting overall socioeconomic impact is projected to be less than significant.

No Project Alternative

Under the No Project Alternative, a new lease for the terminal would not be granted and the existing wharf would be either decommissioned, abandoned, removed, or a combination thereof. In addition, the upland terminal would continue to operate but product would no longer be delivered or shipped by marine vessel. Approximately 40 percent of the total product throughput at the Shore upland terminal either comes in or is shipped out by marine vessel. Because it can be expected that demand for the products currently handled at the MOT would continue with or without the proposed Project, the No Project Alternative may therefore result in an increase of truck and/or rail transport from the Shore upland terminal. The limited truck and rail capacity at the upland terminal could not accommodate the entire displaced product and would likely lead to diversion of some product shipments to other marine terminals more distant from the final destination.

The cessation of operations at the existing terminal site would reduce the potential for accidental spills and upset conditions to occur at the Project site. However, with increased operations at other terminals, the potential impacts would likely remain relatively similar to those of existing conditions. Other terminals have similar regulatory compliance requirements as the proposed Project, which would maintain potential impacts to less-than-significant levels.

While closure of the MOT might have the beneficial effect of reducing the risks of accidental spill impacts occurring locally, closure of the MOT operations would eliminate the employment and revenue benefits that the MOT generates for the local economy. However, the analysis presumes that most of any "displaced" petroleum product transfers would be relocated to another marine terminal in the region. Consequently, the identified risk reduction benefits are expected to be minimal, and the MOT's lost employment and revenues benefits would be similarly transferred to another marine terminal facility. In any case, the resulting socioeconomic impact is projected to be less than significant.

Limitations on the Terminal Use Alternative

Under the Limitations on Terminal Use Alternative, Shore would be granted a new lease but with restrictions on the number, type, or size of marine vessels that would be allowed to call at the marine terminal, or restrictions on the type of product that could be loaded or unloaded.

Since the site would be used for similar purposes as the proposed Project, this alternative would have the same type of socioeconomic effects as those identified for the proposed Project, although the magnitude of the effects would be correspondingly diminished. While the lesser risk of accidental spill impacts would be beneficial, limits on future MOT operations would reduce employment and revenue benefits that the MOT generates for the local economy. However, the analysis presumes that most of any "displaced" product transfers would be relocated to a nearby alternative facility. In any case, the resulting socioeconomic impact is projected to be less than significant.

5.1.3 Cumulative Projects Analysis

As discussed above, the only socioeconomic impacts associated with the proposed Project are the indirect effects associated with the potential petroleum product spill impacts to local physical resources. Consequently, only the related cumulative impacts associated with potential spills would have the potential to result in cumulative socioeconomic impacts. The past, current, and foreseeable projects are identified in Section 3.5.2, Description of Cumulative Projects.

According to Section 4.1, Operational Safety/Risk of Accidents, the cumulative impact of these other projects in conjunction with the proposed Project would represent a significant and unavoidable adverse effect of the proposed Project.

However, the adverse impact is an unavoidable aspect of the MOT and Onshore Oil Terminal facilities' function by which it generates its positive direct economic impacts (i.e. generating the MOT revenues and employment) as well as the indirect benefits of helping to meet the regional fuel and energy demand. Furthermore, demand for the oil product is independent of the Project and is expected to remain irrespective of whether the proposed Project is approved. If the Project is not approved, the MOT transfer activities would likely be relocated elsewhere in the region and would entail a comparable degree of major spill risk. As a result, approval or closure of the MOT would not be expected to appreciably change the overall total likelihood or magnitude of any major spill and any resulting economic impacts. Consequently, the proposed Project would have a less-than-significant cumulative contribution to any potential adverse socioeconomic cumulative impacts that might be associated with MOT operations.

5.2 ENVIRONMENTAL JUSTICE

This section discusses the distributional patterns of high-minority and low-income populations on a regional basis and characterizes the distribution of such populations adjacent to the proposed Project. This discussion focuses on whether the proposed Project has the potential to affect area(s) of high-minority population(s) and low-income communities, thus creating an inconsistency with the intent of the environmental justice policy. An inconsistency with the California State Lands Commission (CSLC) environmental justice policy would occur if the proposed Project would:

- Have a potential to disproportionately impact minority and/or low-income populations at levels exceeding the corresponding medians for Contra Costa County, where the Project is located; and/or

- Result in a substantial disproportionate decrease in the employment and economic base of minority and/or low-income populations residing in Contra Costa County and/or immediately surrounding cities.

Background

On February 11, 1994, President Clinton issued an "Executive Order on Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" designed to focus attention on environmental and human health conditions in areas of high minority populations and low-income communities, and promote non-discrimination in programs and projects substantially affecting human health and the environment (White House 1994). The order requires the U.S. Environmental Protection Agency

(USEPA) and all other Federal agencies (and ~~S~~state agencies receiving Federal funds) to develop strategies to address this issue. The agencies are required to identify and address any disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and/or low-income populations.

In 1997, the USEPA's Office of Environmental Justice released the *Environmental Justice Implementation Plan*, supplementing the USEPA environmental justice strategy and providing a framework for developing specific plans and guidance for implementing Executive Order 12898. Federal agencies received a framework for the assessment of environmental justice in the USEPA's *Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analysis* in 1998. This approach emphasizes the importance of selecting an analytical process appropriate to the unique circumstances of the potentially affected community.

While many state agencies have utilized the USEPA's Environmental Justice Implementation Plan as a basis for the development of their own environmental justice strategies and policies, the majority of California State agencies do not have guidance for incorporation of the environmental justice impact assessment into California Environmental Quality Act (CEQA) analysis. The Air Resources Board (ARB) has, for example, examined this issue and has received advice from legal counsel, by a memorandum entitled "CEQA and Environmental Justice." This memorandum states, in part, "For the reasons set forth below, we will conclude that CEQA can readily be adapted to the task of analyzing cumulative impacts/environmental justice whenever a public agency (including the ARB, the air pollution control districts, and general purpose land use agencies) undertakes or permits a project or activity that may have a significant adverse impact on the physical environment. All public agencies in California are currently obliged to comply with CEQA, and no further legislation would be needed to include an environmental justice analysis in the CEQA documents prepared for the discretionary actions public agencies undertake."

State

Under Assembly Bill (AB) 1553, signed into law in October 2001, the Governor's Office of Planning and Research (OPR) is required to adopt guidelines for addressing environmental justice issues in local agencies' general plans. Currently, the OPR is in the process of updating the General Plan Guidelines to incorporate the requirements of AB 1553.

The CSLC developed and adopted an environmental justice policy to ensure equity and fairness in its own processes and procedures. The CSLC adopted an amended environmental justice policy on October 1, 2002, to ensure that: "Environmental Justice is an essential consideration in the Commission's processes, decisions and programs and that all people who live in California have a meaningful way to participate in these activities." The policy stresses equitable treatment of all members of the public and commits to consider environmental justice in its processes, decision-making, and regulatory affairs. The policy is implemented, in part, through identification of, and communication with, relevant populations that could be adversely and disproportionately affected by CSLC projects or programs, and by ensuring that a range of reasonable alternatives is identified that would minimize or eliminate environmental issues affecting such populations. This discussion is provided in this document consistent with and in furtherance of the CSLC's environmental justice policy. The staff of the CSLC is required to report back to the CSLC on how environmental justice is integrated into its programs, processes, and activities (CSLC 2002).

Local

Regional and local environmental justice assessments have been performed by agencies within the study area, such as the Bay Area Metropolitan Transportation Commission's (MTC) *2001 Regional Transportation Plan Equity Analysis and Environmental Justice Report.* Methods applied in this EIR analysis are consistent with those used in the MTC report.

5.2.1 Setting

This section analyzes the distributional patterns of high-minority and low-income populations within the proposed Project's affected region and specifically characterizes the distribution of such populations within the census block areas adjacent to the Project site.

Project Study Area

The initial study area for the environmental justice analysis has been determined based on the census tracts that overlap with the radius of 0.28 mile (1,500 feet) from the sites where onshore activities would occur. This is considered a conservative boundary for the environmental justice analysis and any potential significant impacts of air quality, noise, or hazardous materials to local residents from the proposed Project's activities.

Racial and income data were collected for all census blocks that were found to intersect with the potential impact radius for the shoreside location of the MOT and the onshore main terminal tank farm.

According to the USEPA's "Final Guidance for Incorporation of Environmental Justice Concerns in USEPA's National Environmental Policy Act (NEPA) Compliance Analyses" (April 1998), a minority or low-income community is disproportionately affected when the community would bear an uneven level of health and environmental effects compared to the general population. Further, the State CEQA Guidelines recommend that the "community of comparison" selected should be the smallest governmental unit that encompasses the impact footprint for each resource. Therefore, the "community of comparison" for the Project site was determined as the city within whose jurisdiction each site was located. Racial and income demographic information was also obtained for all of the "communities of comparison" identified for the proposed Project.

Study Area Demographics

One census block group was identified as intersecting with the Project study area for the onshore Project location. The majority of the terminal, pipeline, and tank facilities lie inside Census Tract 3580 (Block Group 5). The majority of the residential population within Census Tract 3580 (Block Group 5) is located approximately 0.5 mile east of the MOT site and is within Contra Costa County's unincorporated area. However, although separated from Crockett by Highway 80, the community is similar in character to the neighboring city of Crockett.

The nearest other census block group is Census Tract 3560.01 (Block Group 3) which is located approximately 0.25 mile southeast of the main terminal tank farm. However, since there is no residential population within this portion of Census Tract 3560.01 and its residential population is located almost a mile south-southwest of the tank farm, the census tract does not represent a potential community of concern for the environmental justice analysis.

The other nearby census block group is Census Tract 3570 (Block Group 1), which is located approximately 0.75 mile east of the MOT wharf and covers the community of Crockett. While the census block is outside the expected impact area of the Project site, the city of Crockett is used as the "community of comparison" for the proposed Project as it is the nearest and most representative community near the residential community that could be potentially impacted by the proposed Project.

Minority Populations

Information regarding racial diversity was derived from the 2000 Census (U.S. Census Bureau 2000c). Table 5.2-1 presents the racial composition for one census block group within 0.28 mile (1,500 feet) of the proposed Project.

As an added measure to ensure that study area minority populations are adequately and fully identified, census data were gathered for Hispanic origin. Hispanic is considered an origin, not a race, by the U.S. Census Bureau. An origin can be viewed as the heritage, nationality group, lineage, or country of birth of the person or the person's parents or ancestors before their arrival in the United States (U.S. Census Bureau 2003). People who identify their origin as Spanish, Hispanic, or Latino may be of any race. Therefore, those who are counted as Hispanic are also counted under one or more race categories, as described above.

Low-Income Populations

The Council on Environmental Quality's (CEQ) environmental justice guidance does not clearly set the demarcations at the census poverty thresholds, but states that: "Low-income populations in an affected area should be identified with the annual statistical poverty thresholds from the Bureau of the Census' Current Population Reports, Series P-60 on Income and Poverty."

Poverty level thresholds vary according to a household's size and composition. The most current poverty thresholds (2002) are $18,849 for a two-parent household with two children. The poverty thresholds provide one national measurement of income that is not adjusted for regional costs of living. The U.S. Census Bureau's poverty statistical data also report population data income ratios from 50 percent to 200 percent of the poverty threshold (U.S. Census Bureau 2000d). For many Federal and State programs serving low-income households, eligibility levels are significantly higher than the poverty level. Table 5.2-2 presents the proportions of residents with incomes less than the poverty level (and those with income less than and greater than 200 percent of the poverty level) for all 19 of the census blocks and eight counties of comparison within the Project study area.

Table 5.2-1. Racial Characteristics of Census Block Groups Located Within the Potential Impact Radius of the Proposed Project

Location	Facility	Total Population	White	Hispanic / Latino	Black	American Indian / Alaska Native	Asian	Native Hawaiian / Pacific Islander	Other
Contra Costa County		**948,816**	**57.9%**	**17.7%**	**9.2%**	**0.4%**	**10.8%**	**0.3%**	**3.7%**
Crockett		**3,194**	**79.2%**	**11.6%**	**3.1%**	**0.8%**	**2.6%**	**0.0%**	**2.7%**
Unincorporated									
# Census 3580 - 5	MOT, pipelines and Terminal	1,134	46.0%	18.6%	24.0%	0.9%	6.3%	0.0%	4.2%

Notes: # Indicates census block groups with total minority populations greater than 50%.
Source: U.S. Census Bureau, Census Summary File 1 (SF 1) P4. "Hispanic or Latino, and Not Hispanic or Latino by Race, Total Population,"

Table 5.2-2. Income Characteristics of Census Block Groups Located Within the Potential Impact Radius of the Proposed Project

Location	Facility	Total Population	Income Less Than Poverty Level	Income Less Than 200% of Poverty Level	Income More Than 200% of Poverty Level
Contra Costa County		**938,310**	**7.6%**	**18.7%**	**81.3%**
Crockett		**3,288**	**7.4%**	**19.8%**	**80.2%**
Unincorporated					
< $ Census 3580 - 5	MOT, pipelines and Terminal	1,090	33.7%	52.5%	47.5%

Notes: < $ Indicates census block groups with more than 30% population of residents who have incomes less than 200% of the poverty level.
Source: U.S. Census Bureau, Census, Summary File 3 (SF 3) P88. "Ratio of Income in 1999 to Poverty Level,"

5.2.2 Policy Analysis and Conditions

Methodology

As identified in other sections of this EIR, the proposed Project has the potential to result in significant adverse physical effects on the environment. These effects would represent conflicts with the CSLC environmental justice policy if they disproportionately affect minority or low-income populations or decrease these communities' employment and/or economic base.

A two-step process has been conducted to assess the proposed Project's consistency with the CSLC environmental justice policy. First, areas within the study area containing minority or low-income populations that may be disproportionately affected ("community of concern") were identified using Metropolitan Transportation Commission (MTC) and CEQ guidance.

The second step of the process evaluated the proposed Project's significant, unmitigated adverse resource effects to determine whether these effects would have a disproportionate environmental impact on any of the identified minority and/or low-income population. Impacts for each resource are generally discussed in this analysis, and specific information on impacts should be drawn from the appropriate EIR section. The analysis also evaluates whether the proposed Project would have any impacts on local employment or the communities' local economies.

For any identified significant unmitigated adverse effect, more detailed and site-specific review of the residential population within the "communities of concern" will be performed. Census block areas typically may encompass relatively large residential areas that may extend beyond the area where the resource impacts might be located; additional site-specific demographic review may be required to identify and evaluate the actual population located within the "potential impact radius" that would be affected. The site-specific analysis would also potentially be used to evaluate the nature and severity of the specific resource impacts and thereby determine (if possible) appropriate mitigation measures.

"Communities of Concern" Definitions

Minority Populations

According to the CEQ guidelines for environmental justice analysis:

> "Minority populations should be identified where either (a) the minority population of the affected area exceeds 50 percent or (b) the minority population percentage of the affected area is meaningfully greater than the majority population percentage in the general population or other appropriate unit of geographic analysis. A minority population also exists if there is more than one minority group present and the minority percentage, as calculated by aggregating all minority persons, meets one of the above-stated thresholds" (CEQ 1997).

MTC's *2001 Regional Transportation Plan Equity Analysis and Environmental Justice Report* identified areas within the MTC planning area that had high proportions of minority and low-income populations. According to MTC criteria, areas with high percentages of minority populations (Minority Zones) were those having minority populations of 70 percent or more.

As a conservative assumption, the environmental justice analysis uses the CEQ minority population definition to identify "communities of concern" within the Project study area.

Low-Income Populations

The CEQ's environmental justice guidance does not clearly set the demarcations at the census poverty thresholds, but states that: "Low-income populations in an affected area should be identified with the annual statistical poverty thresholds from the Bureau of the Census' Current Population Reports, Series P-60 on Income and Poverty."

The MTC *2001 Regional Transportation Plan Equity Analysis and Environmental Justice Report* provides one of the most substantial recent environmental justice analyses and is used by several other Bay Area agencies as a model. In its definition of low-income communities, the report states (MTC 2001):

> "Low-income is defined as the household income that is at or below the U.S. Department of Health and Human Services Poverty Guidelines. For the purposes of this exercise [i.e., 2001 Regional Transportation Plan Equity Analysis] the definition of low-income to households was established as households at or below 200 percent of poverty. This level was used to reflect the relatively high cost of living in the Bay Area. Zones, where the low-income population was 30 percent of the total population or greater, were included in the Equity Analysis."

As a conservative assumption, the environmental justice analysis uses the MTC low-income population definition to identify "communities of concern" within the Project study area.

Areas with Meaningfully Greater Minority or Low-Income Populations

For those communities that do not meet either of above "community of concern" definitions, their minority and low-income percentages were compared to those of the communities of comparison to determine whether the remaining study area census block groups have meaningfully greater minority or low-income populations. A census track's minority or low-income population differences were considered "meaningfully greater" if its population of low-income or minority residents sufficiently altered the character of the community to enable it to be clearly distinguished from that of its community of comparison.

5.2.3 Relationship to Alternatives

Communities of Concern Identified Within the Project Study Area

The above identified "communities of concern" criteria were applied to the census block group identified within the study area. In addition, the census block group was compared to demographic data for the community of comparison to determine whether that specific block group had a "meaningfully greater" percentage of minority or low-income population.

Under the CEQ guidelines for minority populations, Census Tract 3580 (Block Group 5) identified in Table 5.2-1 qualifies as a "community of concern." Based on the MTC low-income definitions, Census Tract 3580 (Block Group 5) also qualifies as a "community of concern" on that basis.

Environmental Justice Impacts to a Surrounding Community of Concern

Proposed Project

Census Tract 3580 (Block Group 5), which encompasses the Project site, qualifies as a community of concern and therefore an environmental justice analysis is warranted to determine if the proposed Project would disproportionately affect this local residential population.

It should be noted that identification of a "community of concern" does not necessarily entail that any individuals within the community would be adversely affected by the proposed Project. Both the nature of the specific effects and its relationship to the local residents are necessary factors determining whether physical impacts would occur. The initial Project study area has been conservatively assumed to be those census tracts that overlap within 0.28 mile (1,500 feet) of the Project site. Individuals living outside this radius would generally be presumed not to be vulnerable to significant

impacts from Project-related activities proposed to occur at Project sites. The census block group generally extends far beyond the impact radius.

Another important factor relevant to the environmental justice analysis is that the proposed future Project operations would be unchanged from its current activities and land uses at the site and the surrounding vicinity. Consequently, since no changes in the Project's current air quality, noise, or recreation effects are expected to occur, the proposed new lease would therefore have no impact on these resources. As a result, no inconsistency with the CSLC environmental justice policy would be expected to result from the effects of Project-related activities to the area's air quality or noise conditions.

Based on the environmental analysis conducted for this EIR, several potential significant impacts were identified within the other resource areas that require mitigation to ensure that their effects would be less than significant. The principal potential environmental impacts to the local residential populations in the vicinity of the proposed Project consist of hazardous material or waste releases (discussed under Section 4.4, Hydrology and Water Quality), or the various resource impacts that could be associated with an accidental release of petroleum product at or near the MOT (Section 4.1, Operational Safety/Risk of Accidents).

Water quality and waste handling regulations, as well as the MOT's stormwater pollution prevention plan, would ensure that the potential impacts from any hazardous materials or waste within the study area through improper handling or storage, accidental upset conditions, or stormwater runoff would be reduced to a less-than-significant level. Consequently, there would be no inconsistency with the CSLC environmental justice policy that would result from the effects of Project-related operations to hydrology and water quality.

Extensive analysis and discussion of the potential temporary resource impacts from the unlikely effect of an accidental release of petroleum product at or near the MOT are discussed elsewhere in this EIR. The spill risk for the proposed Project is analyzed in Section 4.1, Operational Safety/Risk of Accidents. The location and severity of any such accidental spill would determine the nature, location, and severity of any related environmental effects; the analysis has accordingly modeled a wide variety of future spill scenarios. The resource-specific potential impacts are discussed in detail under their appropriate resource sections.

While there is no guarantee against accidental upset conditions, appropriate preventative measures combined with the faculty to provide swift responses in the event of a release can minimize the potential impacts. Operational safety measures are also discussed separately in Section 4.1, Operational Safety/Risk of Accidents. Adherence to the requirements of the Oil Spill Response Plan along with other operational safety measures as required by local State and Federal regulations would reduce the potential impact to the greatest extent practicable.

However, there would remain a significant and unavoidable adverse environmental impact associated with the possibility of a large spill (i.e., more than 50 barrels of petroleum product) somewhere within the Bay. Given the unknown specifics of any such accident, the nature and location of any such event's physical impacts are unknown. However, the duration of most accidents would be relatively short term. The economic activity for the local and regional economy associated with any of the resource areas that might be potentially affected depends on the size of the spill. Future spill impacts would be temporary. Furthermore, the geographical area that would be affected by any future spill would vary considerably given the nature, location, and timing of the spill. Therefore, resulting impacts, although largely limited to coastal areas, would not disproportionately affect low-income or minority communities. Consequently, there is no inconsistency with the CSLC environmental justice policy resulting from the effects of Project-related operations.

The MOT has been operational for several decades. As a result, the continued operation of the facility would ensure the proposed Project's current employment and local economic activity levels are maintained. The facilities' current operations have a positive economic impact to the surrounding local communities, due to the proposed Project's employment and revenue benefits to the local economy. Consequently, given the absence of any local employment or economic activity decreases, no inconsistency with the CSLC environmental justice policy would be expected to result from the proposed Project's economic effects.

No Project Alternative

Under the No Project Alternative, a new lease for the terminal would not be granted and the existing wharf would be either decommissioned, abandoned, removed, or a combination thereof. In addition, the upland terminal would continue to operate but product would no longer be delivered or shipped by marine vessel. Approximately 40 percent of the total product throughput at the Shore upland terminal either comes in or is shipped out by marine vessel. Because it can be expected that demand for the

products currently handled at the Shore facility would continue with or without the proposed Project, the No Project Alternative may therefore result in an increase of truck and/or rail transport from the Shore upland terminal. The limited truck and rail capacity at the upland terminal could not accommodate the entire displaced product and would likely lead to diversion of some product shipments to other marine terminals more distant from the final destination.

The cessation of operations at the existing terminal would reduce the potential for accidental spills and upset conditions to occur at the Project site. However, with increased operations at other terminals, the potential impacts would likely remain relatively similar to those of existing conditions. Other terminals have similar regulatory compliance requirements as the proposed Project, which would reduce potential impacts to less-than-significant levels.

While closure of the MOT might have the beneficial effect of reducing the risks of accidental spill impacts occurring locally, closure of the MOT operations would eliminate the employment and revenue benefits that the MOT generates for the local economy. However, the analysis presumes that most of any “displaced” product transfers would be relocated to a nearby alternative facility. Consequently, the identified risk reduction benefits are expected to be minimal, and the MOT’s lost employment and revenues benefits would be similarly transferred to the other facility. In any case, no inconsistency with the CSLC environmental justice policy would be expected to result under the No Project Alternative.

Limitations on Terminal Use Alternative

Under the Limitations on Terminal Use Alternative, Shore would be granted a new lease but with restrictions on the number, type, or size of marine vessels that would be allowed to call at the marine terminal, or restrictions on the type of product that could be loaded or unloaded.

Since the site would be used for similar purposes as the proposed Project, this alternative would have the same type of environmental justice effects as those for the proposed Project, although the magnitude of the effects would be correspondingly diminished. While the lesser risk of accidental spill impacts would be beneficial, limits on future MOT operations would reduce employment and revenues benefits the MOT generates for the local economy. However, the analysis presumes that most of any “displaced” product transfers would be relocated to a nearby alternative facility. Consequently, the identified risk reduction benefits are expected to be minimal and the

MOT's lost employment and revenues benefits would be similarly transferred to the other facility. In any case, no inconsistency with the CSLC environmental justice policy would be expected to result under the Limitations on Terminal Use Alternative.

5.2.4 Cumulative Projects Policy Analysis

As discussed above, the only environmental justice impacts associated with the proposed Project are the indirect effects associated with the potential petroleum product spill impacts to local physical resources. Consequently, only the cumulative impacts associated with potential spills would have the potential to result in cumulative environmental justice impacts. The past, current, and foreseeable projects are identified in Section 3.5.2, Description of Cumulative Projects.

According to Section 4.1, Operational Safety/Risk of Accidents, the cumulative impact of other projects in conjunction with the proposed Project would represent a significant and unavoidable adverse environmental impact associated with the possibility of a large spill (i.e., more than 50 barrels of petroleum product) somewhere within the Bay from the Project and the other reasonably foreseeable future projects. Given the unknown specifics of any such accident, the nature and location of any such event's physical impacts are unknown. However, in any case, the duration of most major accidents is nonetheless expected to be relatively short term. The economic activity for the local and regional economy associated with any of the resource areas that might be potentially affected is relatively minor, and any future spill impacts would be temporary. Furthermore, the geographical area that would be affected by any future spill would vary considerably given the nature, location, and timing of the spill. Therefore, resulting impacts, although largely limited to coastal areas, would not disproportionately affect low-income or minority communities but could affect a wide variety of coastal communities within the region. Consequently, there is no inconsistency with the CSLC environmental justice policy resulting from the cumulative effects of the proposed Project's future operations.

This adverse impact is an unavoidable aspect of the MOT's function by which it generates its positive direct economic impacts (i.e., generating the MOT revenues and employment) and the indirect benefits of helping to meet the regional fuel and energy demand. Furthermore, demand for oil products is independent of the proposed Project and is expected to remain irrespective of whether the proposed Project is approved. If the proposed Project is not approved, the MOT transfer activities would likely be relocated elsewhere in the region and would entail a comparable degree of major spill risk. As a result, approval or closure of the MOT would not appreciably change the overall total likelihood or magnitude of any major spill and any resulting adverse

impacts. Consequently, the proposed Project would have a less-than-significant cumulative contribution to any potential adverse economic cumulative impacts that might be associated with a major spill occurrence. As a result, approval of the proposed Project would be consistent with the CSLC environmental justice policy since no disproportionate employment or economic impacts to communities of concern would be expected from the project's less-than-significant cumulative impacts.

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6.0 OTHER REQUIRED CEQA SECTIONS AND ENVIRONMENTALLY SUPERIOR ALTERNATIVE

6.1 INTRODUCTION TO ADDITIONAL CEQA REQUIREMENTS DISCUSSED IN THIS SECTION

This section discusses broader questions posed by the California Environmental Quality Act (CEQA). These include significant effects that cannot be mitigated to less-than-significant levels, irreversible/irretrievable commitment of resources, the balance between short- and long-term uses of the environment, and growth-inducing impacts.

6.2 SIGNIFICANT ENVIRONMENTAL EFFECTS OF PROPOSED PROJECT THAT CANNOT BE AVOIDED AND CANNOT BE MITIGATED TO LESS THAN SIGNIFICANT

Effects on all environmental resources were evaluated to determine any impacts that would remain significant after mitigation (Class I). Significant environmental impacts that cannot be avoided in the granting of a new lease by the California State Lands Commission (CSLC) to Shore Terminals LLC (a NuStar Energy Company), hereafter referred to as Shore, are presented below.

- **Potential Impacts to Public Health and Safety from Accidental Spills of Persistent Product or Highly Volatile Products.** Spills of persistent product (e.g., diesel and jet fuel) or large volumes of highly volatile products (e.g., gasoline) could reach the shore, potentially causing injury to members of the public. For spills of 50 barrels (2,100 gallons) or less, mitigation measures, combined with Shore's existing quick-release system on the transfer arms, would lower the probability that a spill would occur and would reduce the consequence of an oil spill if it occurs to less than significant (Class II). The impacts to public health and safety associated with the potential consequences of a spill greater than 50 barrels would be significant and unavoidable (Class I).

- **Potential Impacts to Biological Resources from the Introduction of ~~Invasive~~ Non-indigenous Species from ~~Hull~~ Vessel Bio~~F~~fouling.** The release of non-indigenous aquatic organisms attached to or associated with the ~~submerged~~ wetted portion of a vessel or its appurtenances, including, but not limited to, sea chests, propellers, anchors, and associated chains (collectively called ~~hull~~ vessel biofouling), could impair estuarine habitat, fish migration, preservation of rare and endangered species, fish spawning, and wildlife habitat (Class I).

- **Potential Impacts to Biological Resources from the Introduction of ~~Invasive~~ Non-indigenous Species from Ballast Water.** Discharge of ballast water that contains non-indigenous aquatic organisms could impair estuarine habitat, fish

migration, preservation of rare and endangered species, fish spawning, and wildlife habitat (Class I).

- **Potential Impacts to Biological Resources from the Accidental Release of Petroleum Products.** The accidental release of refined petroleum products from the Shore Marine Oil Terminal (MOT) has the potential to affect marine biota inhabiting or using Bay-Delta waters as well as all intertidal and subtidal habitats. Especially at risk are marine birds, marine mammals, intertidal and shallow subtidal communities, as well as special-status fish, bird, plant, and marine mammal species. The MOT has sufficient booms and deployment equipment on-site to contain small accidental releases that enter Bay-Delta waters. Depending on the time of year, spill volume, and tidal cycle, accidental releases of refined product could come into contact with both soft and hard substrate intertidal habitat in the Carquinez Strait and San Pablo Bay within hours of the release and before regional response capability could be on-site. Spill response measures that could be put in place quickly to prevent oiling of intertidal habitat or to recover and rehabilitate most at-risk taxa would reduce the overall impact to the Bay-Delta ecosystem (Class II). Large spills originating from tanker or barge incidents while in transit to the MOT would impact important and sensitive habitats with the San Francisco Bay-Delta, including critical fisheries habitat and protected species. Impacts would remain significant (Class I) even with implementation of the recommended mitigation measures.

- **Impacts to Commercial and Sport Fishing as a Result of Accidental Releases or Spills.** Accidental releases or spills of refined hydrocarbon products shipped through the MOT can impact the Bay-Delta and open coast ecosystems and commercial or sport fisheries. Residual impacts following small and moderate spills of refined product at or near the MOT would be mitigated to less than significant (Class II). Residual impacts following a major tanker or barge spill would be significant and unavoidable (Class I).

- **~~Impacts to~~ Water Quality Impacts ~~as a Result of Discharge of~~ Associated with ~~Segregated~~ *Discharged* Ballast Water.** The discharge of ballast water from vessels mooring and berthing at the MOT could be a source of the introduction of viruses, toxic algae, or other harmful microorganisms to Bay waters. Proposed mitigation would require these vessels to report and track ballast water discharges but would only be informative. Although the MOT neither discharges nor handles any ballast water, and vessels that call at the MOT are required to comply with State provisions, compliance is not enough to ensure full mitigation of this potential impact. Therefore, the proposed Project's contribution to future introduction of viruses, toxic algae, or other harmful microorganisms to Bay-Delta waters would be significant and unavoidable (Class I).

6.3 SIGNIFICANT ENVIRONMENTAL EFFECTS OF PROPOSED PROJECT THAT WOULD BE IRREVERSIBLE IF THE PROPOSED PROJECT IS IMPLEMENTED

The State CEQA Guidelines sections 15126.2(c) and 15127 require that an EIR consider significant irreversible environmental changes which would be involved in the proposed actions should they be implemented. An impact would fall into this category if:

- The Project would involve a large commitment of non-renewable resources during the Project;
- The primary and secondary impacts of the Project would generally commit future generations to similar uses (e.g., a highway provides access to a previously remote area); or
- The Project would involve uses in which irreversible damage could result from any potential environmental accidents associated with the Project.

Determination of whether the proposed Project would result in significant irreversible effects requires a determination of whether key resources would be degraded or destroyed with little possibility of restoring them.

Operation of the proposed Project would allow for the continued transfer of non-renewable resources (petroleum products), although the proposed Project itself would not utilize significant amounts of non-renewable resources. While the proposed Project would facilitate the delivery of non-renewable resources, these resources would be exploited and expended now and in the near future regardless of the proposed Project. The production and use of the petroleum products that would be transferred by the proposed Project has been, or will be, approved by permitting agencies. Therefore, the primary and secondary impacts resulting from the proposed Project would be less than significant.

Also, the potential exists for accidental petroleum product spills to impact public health and safety, biological resources, visual resources, fisheries, and recreation. Although the risk of product spill cannot be completely eliminated, the proposed Project has been designed to meet or exceed all applicable safety requirements.

In addition, though the proposed Project would have significant and unavoidable impacts to biological resources, a large-scale spill of the kinds of petroleum products transferred by the MOT would not cause enough biological damage to result in the

elimination of a species (an irreversible impact). For these reasons, the proposed Project does not involve uses in which irreversible damage would occur.

6.4 GROWTH-INDUCING IMPACTS OF THE PROPOSED PROJECT

The State CEQA Guidelines require the consideration and discussion of growth-inducing impacts of a proposed Project in an EIR. As specified in section 15126.2(d) of the State CEQA Guidelines, an EIR would:

> *Discuss the ways in which the proposed Project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are Projects which would remove obstacles to population growth (a major expansion if a waste water treatment plant might, for example, allow for more construction in service areas). Increases in the population may tax existing community service facilities, requiring construction of new facilities that could cause significant environmental effects. Also discuss the characteristics of some Projects which may encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively. It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.*

The following six criteria are used as a guide in evaluating the growth-inducing potential of the proposed Project:

1. Would the Project foster growth or remove obstacles to economic or population growth?

The proposed Project would not provide a new source of petroleum products in the Project area, and would not serve new areas. Rather, the proposed Project involves the granting of a new lease for operation of the MOT, which has been operating since 1981 at its current location under lease from the CSLC. Because the proposed Project does not entail an increase in handling capability, it would not directly or indirectly foster growth, remove obstacles to economic or population growth, or create a need for housing.

2. Would the Project provide new employment?

The proposed Project would continue to provide employment for 15 staff including the terminal manager, 11 technicians, and 3 office staff. No new temporary or permanent positions would result from operation of the proposed Project.

3. Would the Project provide new access to undeveloped or underdeveloped areas?

The proposed Project would not involve the creation of any new roads, temporary or permanent, or new access to the shoreline.

4. Would the Project extend public services to a previously unserved area?

The proposed Project would not directly extend public service to areas currently unserved by petroleum products. The proposed Project would maintain existing conditions for petroleum product transfers in the area.

5. Would the Project tax existing community services?

The proposed Project would not require any new permanent or temporary workers; therefore, no community services would be required.

6. Would the Project cause development elsewhere?

The proposed Project would not cause development in the region or elsewhere at any greater rate than it has in previous years' operation. The proposed Project would allow for the continued operation of the MOT under a proposed 30-year lease, and Shore currently has no plans to expand its operations or the equipment on the MOT. As such, the proposed Project would constitute a continuation of current practices, and would not serve to increase rates of development elsewhere.

Summary

The proposed Project would not cause development, economic growth, or population growth. The proposed Project would constitute the continuation of current petroleum product transfer practices, and would not increase or decrease the amount of petroleum product transferred through the Project area. The potential customers that would be served by the proposed Project are not solely dependent on the Project for access to petroleum products. Therefore, the proposed Project would not cause any significant growth-inducing impacts either directly or indirectly in the surrounding environment.

6.5 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

The State CEQA Guidelines (§ 15126.6(d)) require that an EIR must include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed Project. The State CEQA Guidelines (§ 15126.6(e)(2)) further state, in part, that "*If the environmentally superior alternative is the "No Project"*

alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives." (Emphasis added.)

Table 6-1 summarizes the environmental impacts for the proposed Project and alternatives. In this case, the No Project Alternative would not simply eliminate all of the potential environmental effects of the proposed Project. In particular, a decision not to approve the lease would result in closure of the MOT but would have no effect on regional demand for the petroleum products currently handled by the MOT. The limited capacity of the existing pipelines and truck/rail loading facilities at Shore's upland terminal would be unable to accommodate the large volume of petroleum products currently shipped by marine vessel, so these products would have to be shipped in and out of other marine terminals in the region. This could result in similar regional impacts in all resource areas, depending upon the location of the other terminals. So while direct impacts of the proposed Project may be reduced or eliminated in the immediate vicinity of the MOT under the No Project Alternative, similar direct impacts would arise elsewhere in the region. Therefore, the No Project Alternative is not the environmentally superior alternative.

The determination of an environmentally superior alternative is difficult because of the many factors that must be balanced. In addition, although there would be minor differences of impacts between the proposed Project and the Limitations on Terminal Use Alternative, they each would result in the same impact significance levels within each environmental resource area.

The Limitations on Terminal Use Alternative would result in lower risk of an accidental spill of petroleum products at the MOT, and therefore less risk of collateral impacts to operational safety, hydrology and water quality, biological resources, commercial and sport fisheries, recreation, and visual resources in the immediate vicinity of the proposed Project. However, that risk would merely be displaced to other terminals in the region since the regional demand for the petroleum products transferred at the MOT is expected to continue. Further, to the extent that the displaced product throughput from the MOT would result in increased truck and rail transportation – which have an inherently higher risk of accidental spills than marine vessel transportation – the potential environmental effects of the Limitations on Terminal Use Alternative may be greater than for the proposed Project.

In summary, both the No Project Alternative and the Limitations on Terminal Use Alternative would displace potentially significant impacts of the proposed Project to

other locations within the region. The extent and exact location of these indirect impacts cannot be known because it is not possible to ascertain what volumes of which petroleum products would be displaced to any given terminal, or what the ultimate transportation mode or distance would be. For the proposed Project, the only significant unavoidable impacts would be associated with an accidental spill of a large volume of petroleum products, potential impacts to biological resources through the introduction of non-indigenous species via either hull fouling or ballast water discharge from ships calling at the MOT, and potential impacts to water quality from viruses, toxic algae, or other harmful microorganisms that may be discharged in ballast water. The current regulatory requirements governing spill prevention and response and the additional mitigation measures imposed in this EIR would minimize to the extent practical the risks of, and possible environmental effects from, a significant accidental spill and with greater certainty than could be assured under either of the two alternatives. Therefore, the proposed Project is selected as the environmentally superior alternative.

Table 6-1. Summary of Environmental Impacts for Proposed Project and Alternatives

Impact Class I = Significant adverse impact that remains significant after mitigation.
II = Significant adverse impact that can be eliminated or reduced below an issue's significance criteria.
III = Adverse impact that does not meet or exceed an issue's significance criteria.
IV = Beneficial impact. Impact numbers are not applicable (NA) to Class IV impacts.

Impact No.	Impact Summary	Proposed Project	No Project	Limitations on Terminal Use Alternative
Section 4.1 Operational Safety/Risk of Accidents				
OS-1	**Accidental spills of relatively low-volatility petroleum products or large accidental spills of highly volatile products.** Spills of relatively low-volatility petroleum products (e.g., diesel and jet fuel) or large volumes of highly volatile products (e.g., gasoline) could reach the shore, potentially causing injury to members of the public.	I	I	I
OS-2	**Potential for fires or explosion of gasoline, ethanol, or other blended product vapors during product transfer, or from other sources of ignition in areas where vapor could be present.** Potential impacts to public safety could occur from an explosion of gasoline, ethanol, or other blended product vapors due to an inadequately operating vapor control system.	II	II	II
Section 4.2 Biological Resources				
BIO-1	**Potential impacts to biological resources from the introduction of non-indigenous species from vessel biofouling.** The release of non-indigenous aquatic organisms attached to or associated with the wetted portions of a vessel or its appurtenances, including, but not limited to, sea chests, propellers, anchors, and associated chains (collectively called vessel biofouling), could impair estuarine habitat, fish migration, preservation of rare and endangered species, fish spawning, and wildlife habitat.	I	I	I

Impact No.	Impact Summary	Proposed Project	No Project	Limitations on Terminal Use Alternative
BIO-2	**Potential impacts to biological resources from the introduction of non-indigenous species from ballast water.** Discharge of ballast water that contains non-indigenous aquatic organisms could impair estuarine habitat, fish migration, preservation of rare and endangered species, fish spawning, and wildlife habitat.	I	I	I
BIO-3	**Potential impacts to biological resources from the accidental release of petroleum products.** The accidental release of refined petroleum products from the MOT has the potential to affect marine biota inhabiting or using Bay-Delta waters as well as all intertidal and subtidal habitats. Especially at risk are marine birds, marine mammals, intertidal and shallow subtidal communities, as well as special-status fish, bird, plant, and marine mammal species.	I	I	I
Section 4.3 Commercial and Sport Fisheries				
FSH-1	**Impacts to commercial and sport fishing as a result of accidental releases or spills.** Accidental releases or spills of refined hydrocarbon products shipped through the Shore MOT can impact the Bay-Delta and open coast ecosystems and commercial or recreational fisheries.	I	I	I
Section 4.4 Hydrology and Water Quality				
HWQ-1	**Water quality impacts associated with discharged ballast water.** Discharge of ballast water that contains non-native or harmful microorganisms could impair several of the study area's beneficial uses, including commercial and sport fishing, estuarine habitat, fish migration, preservation of rare and endangered species, water contact recreation, non-contact water recreation, fish spawning, and wildlife habitat. Therefore, discharge of ballast water is determined to have a potentially significant impact to water quality.	I	I	I

Impact No.	Impact Summary	Proposed Project	No Project	Limitations on Terminal Use Alternative
HWQ-2	**Water quality impacts associated with marine anti-fouling paints.** Marine anti-fouling paints that include organotin biocides could have a significant adverse impact to water quality when leached or dislodged from vessels berthing at the MOT.	II	II	II
Section 4.5 Land Use and Recreation				
LUR-1	**Impacts on sensitive shoreline lands, and/or water and non-water recreation due to a release of accidental spills of relatively low-volatility petroleum products or large accidental spills of highly volatile products.** Spills of relatively low-volatility petroleum products or large volumes of highly volatile products could result in a temporary disturbance to Bay waters used for recreation as well as recreational facilities and designated areas.	II	II	II
Section 4.9 Visual Resources/Light and Glare				
VIS-1	**Degradation of visual resources due to a release of accidental spills of relatively low-volatility petroleum products or large accidental spills of highly volatile products.** A spill of relatively low-volatility petroleum products or large accidental spill of highly volatile products could adversely alter or degrade the existing visual character or quality of the MOT lease area and its surroundings, unusually contrast with or degrade the character of the viewshed, and/or temporarily result in a substantial adverse effect on a designated scenic area.	II	III	II
Section 4.11 Geology, Soils, and Seismicity				
GEO-1	**Accidental spills of petroleum products from damage to petroleum pipelines due to seismic events.** Spills of petroleum products could occur due to damage to transfer pipelines during a seismic event either at the loading arms or at the shore embankment.	II	III	II

7.0 MITIGATION MONITORING PROGRAM

As the Lead Agency under the California Environmental Quality Act (CEQA), the California State Lands Commission (CSLC) is required to adopt a program for reporting or monitoring regarding the implementation of mitigation measures for the Shore Marine Oil Terminal (MOT) Lease Project, if it is approved, to ensure that the adopted mitigation measures are implemented as defined in this Environmental Impact Report (EIR). This Lead Agency responsibility originates in Public Resources Code section 21081.6(a) (Findings), and the State CEQA Guidelines sections 15091(d) (Findings) and 15097 (Mitigation Monitoring or Reporting).

7.1 MONITORING AUTHORITY

The purpose of a Mitigation Monitoring Program (MMP) is to ensure that measures adopted to mitigate or avoid significant impacts are implemented. An MMP can be a working guide to facilitate not only the implementation of mitigation measures by the Project proponent, but also the monitoring, compliance, and reporting activities of the CSLC and any monitors it may designate.

The CSLC may delegate duties and responsibilities for monitoring to other environmental monitors or consultants as deemed necessary, and some monitoring responsibilities may be assumed by responsible agencies, such as affected jurisdictions and cities, and the California Department of Fish and Game (CDFG). The number of construction monitors assigned to the Project will depend on the number of concurrent construction activities and their locations. The CSLC or its designee(s), however, will ensure that each person delegated any duties or responsibilities is qualified to monitor compliance.

Any mitigation measure study or plan that requires the approval of the CSLC must allow at least 60 days for adequate review time. When a mitigation measure requires that a mitigation program must be developed during the design phase of the project, the Applicant must submit the final program to CSLC for review and approval at least 60 days before construction begins. Other agencies and jurisdictions may require additional review time. It is the responsibility of the environmental monitor assigned to each spread[1] to ensure that appropriate agency reviews and approvals are obtained.

[1] Often, construction activities for a project may occur concurrently at multiple separate locations called “spreads.” Depending on the distance between these spreads and the nature of the construction or deconstruction activities, one or more environmental monitors may be required to monitor compliance at each spread.

The CSLC or its designee will also ensure that any deviation from the procedures identified under the monitoring program is approved by the CSLC. Any deviation and its correction shall be reported immediately to the CSLC or its designee by the environmental monitor assigned to the construction spread.

7.2 ENFORCEMENT RESPONSIBILITY

The CSLC is responsible for enforcing the procedures adopted for monitoring through the environmental monitor assigned to each construction spread. Any assigned environmental monitor shall note problems with monitoring, notify appropriate agencies or individuals about any problems, and report the problems to the CSLC or its designee.

7.3 MITIGATION COMPLIANCE RESPONSIBILITY

The Applicant is responsible for successfully implementing all the mitigation measures in the MMP, and is responsible for assuring that these requirements are met by all of its construction contractors and field personnel. Standards for successful mitigation also are implicit in many mitigation measures that include such requirements as obtaining permits or avoiding a specific impact entirely. Other mitigation measures include detailed success criteria. Additional mitigation success thresholds will be established by applicable agencies with jurisdiction through the permit process and through the review and approval of specific plans for the implementation of mitigation measures.

7.4 GENERAL MONITORING PROCEDURES

Environmental Monitors. Many of the monitoring procedures will be conducted during the construction phase of the Project, if there is a construction phase. The CSLC and the environmental monitor(s) are responsible for integrating the mitigation monitoring procedures into the construction process in coordination with the Applicant. To oversee the monitoring procedures and to ensure success, the environmental monitor assigned to each construction spread must be on site during that portion of construction that has the potential to create a significant environmental impact or other impact for which mitigation is required. The environmental monitor is responsible for ensuring that all procedures specified in the monitoring program are followed.

Construction Personnel. A key feature contributing to the success of mitigation monitoring will be obtaining the full cooperation of construction personnel and supervisors. Many of the mitigation measures require action on the part of the

construction supervisors or crews for successful implementation. To ensure success, the following actions, detailed in specific mitigation measures, will be taken:

- Procedures to be followed by construction companies hired to do the work will be written into contracts between the Applicant and any construction contractors. Procedures to be followed by construction crews will be written into a separate document that all construction personnel will be asked to sign, denoting agreement.
- One or more pre-construction meetings will be held to inform and train construction personnel about the requirements of the monitoring program.
- A written summary of mitigation monitoring procedures will be provided to construction supervisors for all mitigation measures requiring their attention.

General Reporting Procedures. Site visits and specified monitoring procedures performed by other individuals will be reported to the environmental monitor assigned to the relevant construction spread. A monitoring record form will be submitted to the environmental monitor by the individual conducting the visit or procedure so that details of the visit can be recorded and progress tracked by the environmental monitor. A checklist will be developed and maintained by the environmental monitor to track all procedures required for each mitigation measure and to ensure that the timing specified for the procedures is adhered to. The environmental monitor will note any problems that may occur and take appropriate action to rectify the problems.

Public Access to Records. The public is allowed access to records and reports used to track the monitoring program. Monitoring records and reports will be made available for public inspection by the CSLC or its designee on request.

7.5 MITIGATION MONITORING TABLE

The following sections present the mitigation monitoring tables for each environmental discipline. Each table lists the following information, by column:

- Impact (impact number, title, and impact class);
- Mitigation Measure (title and full text);
- Location (where the impact occurs and the mitigation measure should be applied);
- Monitoring/reporting action (the action to be taken by the monitor or Lead Agency);

- Effectiveness criteria (how the agency can know if the measure is effective);
- Responsible agency; and
- Timing (before, during, or after construction; during operation, etc.).

Table 7-1. Mitigation Monitoring Program – Applicant Proposed Measures

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
N/A	APM-1: Powered containment boom reels ~~will be~~were installed and became operational in November 2009.	MOT	Verify installation	Contain potential spills	CSLC	2009
N/A	APM-2: The seismic assessment reported in the 2010 MOTEMS Initial Audit of the NuStar Selby Marine Terminal identified that two of the four product lines serving the wharf have insufficient flexibility to accommodate the predicted seismic displacements of the wharf moving during an earthquake. To provide the necessary flexibility and prevent the potential for pipeline rupture and oil spill, a U-shaped expansion loop will be introduced into each of these two at-risk product lines. The new expansion loops will consist of 60 feet of new piping, inserted into the alignment of the existing P-4 and P-5 lines. The loops will be installed on the wharf, starting approximately 2 feet from the first set of existing 12-inch pipe elbows. Lateral stops will also be added to the 2nd and 5th pile cap bents (counting from the wharf) to provide necessary lateral restraint for the upgraded system. This work is exclusively intended to address the seismic deficiencies reported in the 2010 MOTEMS Initial Audit. No increase in pipeline capacity or throughput is associated with this work. NOTE: This APM is superseded by Mitigation Measures GEO-1a and GEO-1b.	N/A	N/A	N/A	N/A	N/A

Table 7-2. Mitigation Monitoring Program – Operational Safety / Risk of Accidents

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
OS-1: Accidental spills of relatively low-volatility petroleum products or large accidental spills of highly volatile products. Spills of relatively low-volatility petroleum products (e.g., diesel and jet fuel) or large volumes of highly volatile products (e.g., gasoline) could reach the shore, potentially causing injury to members of the public. (Class I, or Class II, depending on the size and complexity of the spill)	MM OS-1a. Install Tension-Monitoring Devices. Shore shall ~~I~~install and maintain tension-monitoring devices to monitor all mooring lines and environmental loads and avoid excessive tension or slack conditions that could result in damage to the terminal structure and/or equipment and/or vessel mooring line failures that could result in spills. Line tensions and environmental data shall be integrated, recorded, and relayed to the Control Room system, Terminal operator(s), and vessel operator(s). This system shall ~~also~~ include, but not be limited to, quick-release hooks only (with load cells), site-specific anemometer(s), and visual and audible alarms that can support preset limits and shall be able to record and store monitoring data. Shore shall document procedures and training for systems use and communications between the Terminal and vessel operator(s). Routine inspection, testing and maintenance of all equipment and systems in accordance with manufacturer's recommendations and necessity are required to ensure safety and reliability, to the satisfaction of California State Lands Commission (CSLC) staff. This system shall be implemented within two years of certification of this Environmental Impact Report or sooner if required for Marine Oil Terminal Engineering and Maintenance Standards ~~MOTEMS~~ compliance. Shore may install alternate technology that provides an equivalent level of protection, as reviewed by CSLC staff and only if approved by the CSLC at a publicly noticed meeting.	MOT	Verify installation	Avoid excessive tension or slack conditions that could result in spills	CSLC	Within 2 years of project approval and EIR certification
	MM OS-1b. Install an Allision Avoidance System. Shore shall ~~I~~install and maintain an Allision Avoidance System (AAS) at the Shore Marine Oil Terminal (MOT) to prevent damage to the wharf and/or vessel during docking operations. The AAS shall also be used and alarmed to monitor vessel drift (both surge and sway) during all mooring operations, and shall be equipped	MOT	Verify installation	Prevent damage to the wharf and/or vessel during docking operations	CSLC	Within 2 years of project approval and EIR certification

Table 7-2. Mitigation Monitoring Program – Operational Safety / Risk of Accidents

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
	with an Automatic Identification System (AIS) receiver to capture passing vessel parameters. This system shall be integrated with the tension-monitoring system such that all data collected are ~~is~~ available in the Control Room and to the Operator(s) at all times and to vessel operator(s) during berthing operations, and shall be able to record and store monitoring data. Prior to implementing this measure, Shore shall consult with the San Francisco Bar Pilots, the U.S. Coast Guard, and the staff of the California State Lands Commission (CSLC) and provide information that would allow the CSLC to determine, on the basis of such consultations and information regarding the nature, extent, and adequacy of the existing berthing system, the most appropriate application and timing of an AAS at the MOT. This system shall be implemented within two years of certification of this~~e~~ Environmental Impact Report~~EIR~~ or sooner if required for Marine Oil Terminal Engineering and Maintenance Standards ~~MOTEMS~~ compliance. Shore shall document procedures and training for systems use and communications between the Terminal and vessel operator(s). Routine inspection, testing, and maintenance of all equipment and systems in accordance with manufacturer's recommendations and necessity are required to ensure safety and reliability, to the satisfaction of CSLC staff. Shore may install alternate technology that provides an equivalent level of protection, as reviewed by CSLC staff and only if approved by the CSLC at a publicly noticed meeting.					
	MM OS-1c. Replace Existing Loading Arms. Shore shall replace the existing loading arms on the Marine Oil Terminal~~MOT~~ with loading arms that have quick-connect/disconnect couplers and emergency quick-release systems, consistent with Marine Oil Terminal Engineering and Maintenance Standards ~~MOTEMS~~	MOT	Verify loading arm replacement	Limit spill volume in the event of loading arm break-away	CSLC	Within 2 years of project approval and EIR certification

Table 7-2. Mitigation Monitoring Program – Operational Safety / Risk of Accidents

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
	~~S~~sections 3110F.2, 3110F.2.2.1, 3110F.8 and all other applicable regulations, within two years of certification of this Environmental Impact Report~~EIR~~. Shore may install alternate technology that provides an equivalent level of protection, as reviewed by CSLC staff and approved by the Commission at a publicly noticed meeting.					
	MM OS-1d. Install Remote Release System. Shore shall install and maintain mooring quick-release devices that shall be able to be activated within 60 seconds. These devices shall be capable of being engaged by electric/push button release mechanism and by integrated remotely operated release system. Shore shall document procedures and training for systems use and communications between Terminal and vessel operator(s). Routine inspection, testing, and maintenance of all equipment and systems in accordance with manufacturer's recommendations and necessity are required to ensure safety and reliability, to the satisfaction of California State Lands Commission (CSLC) staff. Shore may install alternate technology that provides an equivalent level of protection, as reviewed by CSLC staff and only if approved by the CSLC at a publicly noticed meeting.	MOT	Verify remote release system installation	Limit spill volume in the event of loading arm break-away	CSLC	Within 2 years of project approval and EIR certification
OS-2: Potential for fires or explosion of gasoline, ethanol, or other blended product vapors during product transfer, or from other sources of ignition in areas where vapor could be present. Potential impacts to public safety could occur from an explosion of gasoline, ethanol, or other blended product vapors due to an inadequately operating vapor control system. (Class II)	MM OS-2. Prepare ~~and Implement a~~ New Hazard and Operability (HAZOP) Study. Within 90 days of project approval and Environmental Impact Report ~~EIR~~ certification, Shore shall prepare for California State Lands Commission ~~CSLC~~ and U.S. Coast Guard ~~USCG~~ approval a new ~~Hazard and Operability (HAZOP)~~ Study for all Shore Marine Oil Terminal ~~MOT~~ operations including all sources of vapor and ignition, and identify steps needed to eliminate the identified possible accidents.	MOT	Verify submittal of new HAZOP Study	Reduce likelihood of accidental fires and explosions	CSLC	Within 90 days of project approval and EIR certification

Table 7-3. Mitigation Monitoring Program – Biological Resources

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
BIO-1: Potential impacts to biological resources from the introduction of ~~invasive~~ non-indigenous species from ~~hull~~ vessel biofouling. The release of non-indigenous aquatic organisms attached to or associated with the ~~submerged~~ wetted portions of a vessel or its appurtenances, including, but not limited to, sea chests, propellers, anchors, and associated chains (collectively called ~~hull~~ vessel biofouling), could impair estuarine habitat, fish migration, preservation of rare and endangered species, fish spawning, and wildlife habitat. (Class I)	MM BIO-1. Compliance with the California Marine Invasive Species Act. Beginning as of the date of certification of this Environmental Impact Report's Mitigation Monitoring Program ~~and continuing until the date of implementation of the regulations described in Public Resources Code Section 71204.6~~, Shore shall advise owners, operators, and shipping agents representing vessels calling at the Marine Oil Terminal (MOT) about the California Marine Invasive Species Act ~~(MISA)~~ and associated regulations, and shall ensure that the vessel is in compliance with Public Resources Code sections 71204(e) and 71204(f) and California Code of Regulations, Title 2, Division 3, Chapter 1, Article 4.8. ~~Shore shall ensure that the Master (Captain) or authorized representative of vessels intending to call at the MOT certify that their vessel is in compliance with PRC Section 71204(f)(2) and California Code of Regulations, Title 2, Division 3, Chapter 1, Article 4.8, Section 2298.~~	All vessels calling at the MOT	Verify documentation of vessel certification	Compliance with MISA to reduce the introduction of non-indigenous ~~invasive~~ species from hull fouling	CSLC	Beginning as of the date of project approval and EIR certification
BIO-2: Potential impacts to biological resources from the introduction of non-indigenous~~invasive~~ species from ballast water. Discharge of ballast water that contains non-indigenous aquatic organisms could impair estuarine habitat, fish migration, preservation of rare and endangered species, fish spawning, and wildlife habitat. (Class I)	Implement MM BIO-1	See Impact BIO-1, above	See Impact BIO-1, above	See Impact BIO-1, above	See Impact BIO-1, above	See Impact BIO-1, above
	MM BIO-2. Ballast Water Management ~~Questionnaire~~. Following the adoption of the Mitigation Monitoring Program for the proposed Project, Shore shall advise both agents and representatives of shipping companies having control over vessels that have informed Shore of plans to call at the Marine Oil Terminal (MOT) about the California Marine Invasive Species Act and associated implementing regulations. Shore shall ensure that all vessels submit required reporting forms, as applicable for each vessel, to the California State Lands Commission Marine Facilities Division, including but not limited to, the Ballast Water Reporting Form, the Hull Husbandry Reporting Form, the Ballast Water Treatment Technology Reporting	All vessels calling at the MOT	Verify completion of ~~vessel questionnaire~~ required forms	Compliance with MISA to reduce the introduction of non-indigenous ~~invasive~~ species from ballast water discharge	CSLC	Beginning as of the date of project approval and EIR certification

Table 7-3. Mitigation Monitoring Program – Biological Resources

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
	Form, and/or the Ballast Water Treatment Supplemental Reporting Form prior to the vessel's entry into San Francisco Bay or in the alternative, at least 24 hours prior to the vessel's arrival at the MOT. Shore shall not discharge any non-segregated ballast water received at the MOT to San Francisco Bay. If Shore needs to unload non-segregated ballast water, it shall be unloaded into a tanker truck or other suitable waste handling vehicle and disposed of at an appropriate facility. All vessels calling at the MOT must also have removed biofouling organisms from their wetted surfaces on a regular basis.~~Beginning as of the date of certification of this EIR's Mitigation Monitoring Program and continuing until the date of implementation of the regulations described in Public Resources Code, Section 71204.6, Shore shall ensure that a questionnaire, developed in conjunction with the California State Lands Commission (CSLC) MISP staff and containing the following questions, is provided to the vessel operator:~~ ~~1. Does the vessel intend to discharge ballast water in San Francisco Bay, the Carquinez Strait or any other location(s) in a Bay waterway on it transit to Shore Marine Oil Terminal?~~ ~~2. Does the vessel intend to discharge ballast water at the Shore Marine Oil Terminal?~~ ~~3. Which of the following means specified in the California MISA or Title 2, Division 3, Chapter 1, Article 4.6, has the vessel operator used or intends to use on the current voyage to manage the vessel's ballast water: a mid-ocean exchange (as defined in Section 71200(g)); a near-coastal exchange (as defined in Section 71202(b)); or retain all ballast water on board?~~ ~~Shore shall ensure that the questionnaire be completed on behalf of the vessel, by its Captain or authorized representative, and provided to the CSLC's~~					

Table 7-3. Mitigation Monitoring Program – Biological Resources

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
	~~Marine Facilities Division's Northern California Field and Sacramento Offices, either electronically or by facsimile, prior to the vessel's entry into San Francisco Bay, or in the alternative, at least 24 hours prior to the vessel's arrival at the MOT.~~					
BIO-3: Potential impacts to biological resources from the accidental release of petroleum products. The accidental release of refined petroleum products from the MOT has the potential to affect marine biota inhabiting or using Bay-Delta waters as well as all intertidal and subtidal habitats. Especially at risk are marine birds, marine mammals, intertidal and shallow subtidal communities, as well as special-status fish, bird, plant, and marine mammal species. (Class I)	MM BIO-3a. Rescue and Rehabilitation. Shore shall ensure that procedures are in place to bring bird rescue and rehabilitators to the site as soon after the accidental release occurred to rescue birds following a release event that is not immediately contained at the Shore terminal. This includes having contractual arrangements in place as part of Shore's Spill Prevention Control and Countermeasure plan so that bird rescue personnel and equipment can be on-site within hours of the onset of an accidental release. Contact info for a bird rescue center (such as the International Bird Rescue Research Center listed below) shall be kept onsite and notified in the event of an accidental release greater than 10 barrels. International Bird Rescue Research Center Northern California San Francisco Oiled Wildlife Care and Education Center 4369 Cordelia Rd. Fairfield, CA 94534 Main line: (707) 207-0380 Fax: (707)207-0395 Wildlife hospital: (707) 207-0380 ext. 110	MOT	Verify contractual arrangements in place and contact info on site	Minimize marine bird mortality in the event of a spill	CSLC	Within 60 days of project approval and EIR certification
	MM BIO-3b. Develop Cleanup Procedures. Shore shall develop procedures for the cleanup of any sensitive biological areas contacted by released hydrocarbon products from the operations of the terminal, including transportation within the Bay-Delta, in consultation with biologists from California Department of Fish and Game and the National Marine Fisheries Service to avoid damage from cleanup activities.	MOT	Verify that cleanup procedures have been developed	Minimize impacts to sensitive biological areas in the event of a spill	CSLC, with CDFG and NMFS	Within 60 days of project approval and EIR certification

Table 7-3. Mitigation Monitoring Program – Biological Resources

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
	MM BIO-3c. Conduct Post-Spill Studies. If Marine Oil Terminal related damage occurs to Bay-Delta marine habitats or biological resources, any loss or impact shall be documented as soon as possible after a serious accidental spill or release. Shore's spill response plans shall be updated within ~~6~~ six months of the execution of the lease to provide guidance to spill response managers so that qualified resources can be on-site as soon as possible after initial impact to enable post-spill studies to begin immediately.	MOT	Verify updated spill response plans; verify reports of accidental spills	Minimize impacts to sensitive biological areas in the event of a spill	CSLC	Updated spill response plans within 6 months of lease execution; spill documentation within 2 weeks of spill event

Table 7-4. Mitigation Monitoring Program – Commercial and Sport Fisheries

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
FSH-1: Impacts to commercial and recreational fishing as a result of accidental releases or spills. Accidental releases or spills of refined hydrocarbon products shipped through the Shore MOT can impact the Bay-Delta, open coast ecosystems, and commercial or recreational fisheries. (Class I and II)	Implement MM BIO-3b, and MM BIO-3c.	See Impact BIO-3, above	See Impact BIO-3, above	See Impact BIO-3, above	See Impact BIO-3, above	See Impact BIO-3, above
	Implement MM OS-1a through MM OS-1d~~c~~.	See Impact OS-1, above	See Impact OS-1, above	See Impact OS-1, above	See Impact OS-1, above	See Impact OS-1, above
	MM FSH-1a. Post Notices at Spill Sites, Marinas, Launch Ramps, and Fishing Sites. In the event of a~~n~~ Marine Oil Terminal ~~MOT~~ or associated vessel spill, Shore shall immediately post notices in English, Vietnamese, Cantonese, and Spanish, in areas most likely to be seen by commercial and recreational sport fishing interests. Notices shall include a contact telephone number and website where the public can obtain additional information on spill response cleanup activities, Bay-Delta area or fisheries closures, fish	Areas affected by a spill	Verify posting of required notification	Notify public of areas potentially affected by spill	CSLC	Within 24 hours in the event of a spill

Table 7-4. Mitigation Monitoring Program – Commercial and Sport Fisheries

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
	consumption advisories issued as result of the spill, how to become involved in cleanup activities, and how to document and obtain compensation for financial impacts.					
	MM FSH-1b. Compensation. If damages to fishing operations or related businesses occur due to a~~n~~ Marine Oil Terminal ~~MOT~~ or associated vessel spill, reasonable compensation shall be provided. Potential losses shall be documented as soon as possible after the spill incident has occurred. Shore's spill response manuals will be updated to provide effective procedures for notifying the public how and where to submit compensation claims, personnel or entities responsible for processing claims, and procedures and deadlines for the timely processing of claims.	Areas affected by a spill	Verify update of spill response manuals to include public notification procedures	Compensate for impacts to fishing operations or related businesses	CSLC	Updated spill response plans within 6 months of lease execution

Table 7-5. Mitigation Monitoring Program – Hydrology and Water Quality

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
HWQ-1: Water quality impacts associated with ~~segregated~~ discharged ballast water. Discharge of ballast water that contains ~~exotic~~ non-native or harmful microorganisms could impair several of the study area's beneficial uses, including commercial and sport fishing, estuarine habitat, fish migration, preservation of rare and endangered species, water contact recreation, non-contact water recreation, fish spawning, and wildlife habitat. Therefore, discharge of ~~segregated~~ ballast water is determined to have a potentially significant impact to water quality. (Class I)	Implement MM BIO-2.	See Impact BIO-2, above	See Impact BIO-2, above	See Impact BIO-2, above	See Impact BIO-2, above	See Impact BIO-2, above

Table 7-5. Mitigation Monitoring Program – Hydrology and Water Quality

HWQ-2: Water quality impacts associated with marine anti-fouling paints. Marine anti-fouling paints that include organotin biocides could have a significant adverse impact to water quality when leached or dislodged from vessels berthing at the MOT. (Class II)	MM HWQ-2. Documentation Certifying Compliance. Shore shall require representatives of vessels berthing at the Marine Oil Terminal (MOT) to provide documentation certifying that their vessel is in compliance with the 2001 International Maritime Organization Convention on the Control of Harmful Anti-Fouling Systems on Ships ~~resolution~~ regarding elimination of organotin biocides, and Shore shall provide a copy of such certification to the California State Lands Commission's Marine Facilities Division's Northern California Field and Sacramento Offices, either electronically or by facsimile, prior to the vessel's entry into San Francisco Bay or at least 24 hours prior to the vessel's arrival at the MOT.	All vessels calling at the MOT	Verify documentation of vessel certification	Eliminate water quality degradation from organotin biocides	CSLC	Prior to each vessel's entry into San Francisco Bay or at least 24 hours prior to the vessel's arrival at the project site

Table 7-6. Mitigation Monitoring Program – Land Use and Recreation

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
LUR-1: Impacts on sensitive shoreline lands, and/or water and non-water recreation due to a release of accidental spills of relatively low-volatility petroleum products or large accidental spills of highly volatile products. Spills of relatively low-volatility petroleum products or large volumes of highly volatile products could result in a temporary disturbance to Bay waters used for recreation as well as recreational facilities and designated areas. (Class II)	Implement MM OS-1a through MM OS-1d~~c~~.	See Impact OS-1, above	See Impact OS-1, above	See Impact OS-1, above	See Impact OS-1, above	See Impact OS-1, above

Table 7-7. Mitigation Monitoring Program – Visual Resources/Light and Glare

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
VIS-1: Degradation of visual resources due to a release of accidental spills of relatively low-volatility petroleum products or large accidental spills of highly volatile products. A spill of relatively low-volatility petroleum products or a large accidental spill of highly volatile products could adversely alter or degrade the existing visual character or quality of the MOT lease area and its surroundings, unusually contrast with or degrade the character of the viewshed, and/or temporarily result in a substantial adverse effect on a designated scenic area. (Class II)	Implement MM OS-1a through MM OS-1d~~c~~.	See Impact OS-1, above	See Impact OS-1, above	See Impact OS-1, above	See Impact OS-1, above	See Impact OS-1, above

Table 7-8. Mitigation Monitoring Program – Geology, Soils, and Seismicity

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
GEO-1: Accidental spills of petroleum products from damage to petroleum pipelines due to seismic events. Spills of petroleum products could occur due to damage to transfer pipelines during a seismic event either at the loading arms or at the shore embankment. (Class II)	MM GEO-1a. Provide Pipeline Flexibility on Transfer Pipelines at the Loading Arms. Within two years after approval of the new lease by the California State Lands Commission (CSLC), Shore shall provide additional flexibility to the loading arm to transfer pipeline connections, based on detailed engineering analysis, by the installation of one or more of the following options: 1. Installation of U-shaped expansion loops at each of the four 12-inch pipelines. 2. Replacement of hard connections to loading arms with a section of flexible reinforced hose to accommodate at least +/- 4.6 inches of movement.	MOT	Verify installation of loading arm flexibility	Limit seismic effects on loading arms	CSLC	Within 2 years of project approval and EIR certification

Table 7-8. Mitigation Monitoring Program – Geology, Soils, and Seismicity

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
	3. Installation of expansion joints in lines to absorb relative axial movement. Shore may install alternate technology that provides an equivalent level of protection, as reviewed by CSLC staff and only if approved by the CSLC at a publicly noticed meeting.					
	MM GEO-1b. Provide Pipeline Flexibility on Transfer Pipelines at the Embankment. Within six months after approval of the new lease by the California State Lands Commission (CSLC), Shore shall complete and submit to the CSLC a detailed engineering analysis to investigate/validate methods for providing improved flexibility for the section of transfer pipelines between the embankment and the block valves to increase settlement capacity to more than 4 inches. Methods to be investigated shall include, but not be limited to, replacement of the soil cover on the section of transfer pipelines between the embankment and the block valves with lightweight geofoam. Shore shall install the preferred technology within one year of approval by CSLC staff.	MOT	Verify installation of transfer pipeline flexibility	Limit seismic effects on transfer pipelines	CSLC	Within 1 year of CSLC approval of preferred technology

8.0 REPORT PREPARATION SOURCES

8.1 EIR PREPARERS

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8.2 EIR INFORMATION CONSULTATIONS

Operational Safety/Risk of Accidents

- Steve Goldbeck, Bay Conservation and Development Commission (BCDC), 2009 – Discussed the BCDC's long-term eustatic sea level rise estimate of 16 inches over 50 years.

Land Use and Recreation

- John Hitchen, East Bay Regional Park District, Supervisor of the Point Pinole Regional Shoreline and San Pablo Bay Regional Trail, January 8 and 12, 2009 – Discussed the Carquinez Strait Regional Trail Park in Contra Costa County.

- Kent Peterson, Crockett Community Services District, General Manager, January 7, 2009 – Discussed sewage outfalls in Carquinez Strait.

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