APPENDIX A
Operational Emission Calculation Summary

PM10 (lb/day)	PM2.5 (lb/day)	NOX (lb/day)	SOX (lb/day)	CO (lb/day)	VOC (lb/day)

Table XX.
Peak Daily Operational Emissions - CEQA Baseline (lb/day)

Source Category	PM10	PM2.5	NOX	SOX	CO	VOC
2016 Baseline						
Ships - at Berth	33	31	751	121	71	32
Ships - at Anchorage	10	10	401	26	37	15
Ships - Transit	17	16	1,018	28	92	42
Tugboats	2	1	33	0	19	2
Fugitives						
Marine Loading						313
Tanks						56
Terminal Equipment	33	33	578	3	156	31
2016 Baseline Total	**96**	**91**	**2,781**	**177**	**374**	**491**

Table XX.
Peak Daily Operational Emissions Without Mitigation - Proposed Project (lb/day)

Source Category	PM10	PM2.5	NOX	SOX	CO	VOC
2016 Baseline						
Ships - at Berth	33	31	751	121	71	32
Ships - at Anchorage	10	10	401	26	37	15
Ships - Transit	17	16	1,018	28	92	42
Tugboats	2	1	33	0	19	2
Fugitives						
Marine Loading	-	-	-	-	-	313
Tanks						56
Terminal Equipment	33	33	578	3	156	31
2016 Baseline Total	**96**	**91**	**2,781**	**177**	**374**	**491**
Year 2032						
Ships - at Berth	33	31	751	121	71	32
Ships - at Anchorage	10	10	401	26	37	15
Ships - Transit	17	16	1,018	28	92	42
Tugboats	0	0	9	0	19	1
Fugitives						
Marine Loading						313
Tanks						56
Terminal Equipment	33	33	578	3	156	31
2032 Total	94	90	2,757	177	374	490
CEQA Impacts						
CEQA Baseline Emissions	96	91	2,781	177	374	491
Project Minus CEQA Baseline	(1)	(1)	(24)	-	-	(1)
Significance Threshold	150	55	55	150	550	55
Significant?	No	No	No	No	No	No
Year 2048						
Ships - at Berth	33	31	751	121	71	32
Ships - at Anchorage	10	10	401	26	37	15
Ships - Transit	17	16	1,018	28	92	42
Tugboats	0	0	9	0	19	1
Fugitives						
Marine Loading						313
Tanks						56
Terminal Equipment	33	33	578	3	156	31
2048 Total	94	90	2,757	177	374	490
CEQA Impacts						
CEQA Baseline Emissions	96	91	2,781	177	374	491
Project Minus CEQA Baseline	(1)	(1)	(24)	-	-	(1)
Significance Threshold	150	55	55	150	550	55
Significant?	No	No	No	No	No	No

Major Assumptions:

A reasonable 24-hr day, for both baseline and future conditions, would consist of a vessel discharging at berth, leaving, another vessel arriving, and another vessel at anchorage. For calculation purposes, the peak day emissions were calculated for 1 vessel discharging at berth, 1 vessel arriving (transiting through zones 1-6), and 1 vessel at anchorage. Since the emission rate (lb/hr) was calculated to be higher at berth during product discharge, than during transit, it was conservatively assumed that on a peak day, a vessel would spend 24 hours discharging at berth while another vessel would transit through zones 1-6. This a conservative assumption because the discharging vessel would not spend the full 24 hours at berth, it would need to vacate the berth and transit through zone 1, resulting in lower emissions.

It is assumed that 2 tugboats are required for each OGV transit event and 1 tugboat is required for each re-fueling barge.

Small re-fueling barges would not be able to berth at the same time as an OGV and are not assumed in peak day activity. Emissions associated with re-fueling ba

Other Assumptions:

On-terminal electricity use and worker trips are assumed not to change, per Port (conference call 10/10/17).

Future peak day tank fugitive emissions are assumed to be the same as baseline because only 1 vessel can be loaded on a peak day.

	CO2 (mty)	CH4 (mty)	N2O (mty)	CO2e (mty)

	DPM (lb/yr)	VOC (lb/yr)

Table XX.
Annual Operational GHG Emissions - CEQA Baseline (mty)

Source Category	CO2	CH4	N2O	CO2e
2016 Baseline				
Ships - at Berth	3,398	0	0	3,471
Ships - at Anchorage	400	0	0	406
Ships - Transit	8,904	0	0	9,037
Tugboats	251	0	0	255
Fugitives				
Marine Loading				
Tanks				
Terminal Equipment	1,460	0	0	1,462
2016 Baseline Total	**14,414**	**0**	**1**	**14,630**

Table XX.
Annual Operational DPM and VOC Emissions - CEQA Baseline (lb/yr)

Source Category	DPM	VOC
2016 Baseline		
Ships - at Berth	858	1,998
Tugboats	347	396
Fugitives		
Marine Loading		15,093
Tanks		20,470
Terminal Equipment	219	204
2016 Baseline Total	**1,424**	**38,161**

Notes: Excludes off-site emissions (i.e., anchorage and vessel transit)

Table XX.
Annual Operational GHG Emissions Without Mitigation - Proposed Project (mty)

Source Category	CO2	CH4	N2O	CO2e
2016 Baseline				
Ships - at Berth	3,398	0	0	3,471
Ships - at Anchorage	400	0	0	406
Ships - Transit	8,904	0	0	9,037
Tugboats	251	0	0	255
Fugitives				
Marine Loading	-	-	-	-
Tanks				
Terminal Equipment	1,460	0	0	1,462
2016 Baseline Total	**14,414**	**0**	**1**	**14,630**
Year 2032				
Ships - at Berth	5,372	0	0	5,489
Ships - at Anchorage	655	0	0	665
Ships - Transit	11,831	0	1	12,009
Tugboats	320	0	0	325
Fugitives				
Marine Loading				
Tanks				
Terminal Equipment	426	0	0	426
2032 Total	18,605	0	1	18,914
CEQA Impacts				
CEQA Baseline Emissions	14,414	0	1	14,630
Project Minus CEQA Baseline	4,191	0	0	4,284
Significance Threshold				10,000
Significant?				No
Year 2048				
Ships - at Berth	5,372	0	0	5,489
Ships - at Anchorage	655	0	0	665
Ships - Transit	11,831	0	1	12,009
Tugboats	320	0	0	325
Fugitives				
Marine Loading				
Tanks				
Terminal Equipment	426	0	0	426
2048 Total	18,605	0	1	18,914
CEQA Impacts				
CEQA Baseline Emissions	14,414	0	1	14,630
Project Minus CEQA Baseline	4,191	0	0	4,284
Significance Threshold				10,000
Significant?				No

Table XX.
Annual Operational DPM and VOC Emissions - Proposed Project (lb/yr)

Source Category	DPM	VOC
2016 Baseline		
Ships - Hotelling at Berth	858	1,998
Tugboats	347	396
Fugitives		
Marine Loading	-	15,093
Tanks		20,470
Terminal Equipment	219	204
2016 Baseline Total	**1,424**	**38,161**
Year 2032		
Ships - at Berth	1,233	2,995
Tugboats	92	251
Fugitives		
Marine Loading		4,400
Tanks		33,396
Terminal Equipment	64	60
2032 Total	1,389	41,101
CEQA Impacts		
CEQA Baseline Emissions	1,424	38,161
Project Minus CEQA Baseline	(35)	2,941

Year 2048		
Ships - at Berth	1,233	2,995
Tugboats	92	251
Fugitives		
Marine Loading		4,400
Tanks		33,396
Terminal Equipment	64	60
2048 Total	1,389	41,101
CEQA Impacts		
CEQA Baseline Emissions	1,424	38,161
Project Minus CEQA Baseline	(35)	2,941

Notes: Excludes off-site emissions (i.e., anchorage and vessel transit)
VOC is driven by tank fugitive emissions which increase with future increase in throughput.

	DPM (lb/yr)	VOC (lb/yr)

Table XX.
Annual Operational DPM and VOC Emissions - CEQA Baseline (lb/yr)

Source Category	DPM	VOC
2016 Baseline		
Ships - at Berth	858	1,998
Ships - at Anchorage	349	566
Ships - Transit	1,803	3,988
Tugboats	347	396
Fugitives		
Marine Loading		15,093
Tanks		20,470
Terminal Equipment	219	204
2016 Baseline Total	**3,576**	**42,715**

Notes: Includes all calculated project emissions.

Table XX.
Annual Operational DPM and VOC Emissions - Proposed Project (lb/yr)

Source Category	DPM	VOC
2016 Baseline		
Ships - Hotelling at Berth	858	1,998
Ships - at Anchorage	349	566
Ships - Transit	1,803	3,988
Tugboats	347	396
Fugitives		
Marine Loading	-	15,093
Tanks		20,470
Terminal Equipment	219	204
2016 Baseline Total	**3,576**	**42,715**
Year 2032		
Ships - at Berth	1,233	2,995
Ships - at Anchorage	573	928
Ships - Transit	2,393	5,376
Tugboats	92	251
Fugitives		
Marine Loading		4,400
Tanks		33,396
Terminal Equipment	64	60
2032 Total	4,355	47,405
CEQA Impacts		
CEQA Baseline Emissions	3,576	42,715
Project Minus CEQA Baseline	779	4,690

Year 2048		
Ships - at Berth	1,233	2,995
Ships - at Anchorage	573	928
Ships - Transit	2,393	5,376
Tugboats	92	251
Fugitives		
Marine Loading		4,400
Tanks		33,396
Terminal Equipment	64	60
2048 Total	4,355	47,405
CEQA Impacts		
CEQA Baseline Emissions	3,576	42,715
Project Minus CEQA Baseline	779	4,690

Notes: Includes all calculated project emissions.

Key used for summary tables

	1	2	3	4	5

Information provided by Starcrest
Information provided by PBF
Information provided by POLA
Peak Hour calculations
Peak Day calculations
Annual Calculations

Table XXX. **Operational OGV Emissions Witho**

Vessel Type

	Used to pull emission factors for peak		**Baseline**		
2016 Ocean Tug (ATB/ITB) Propulsion Engine	Tier I medium speed diesel			**2016**	Ocean Tug (ATB/ITB)
Ocean Tug (ATB/ITB) Auxiliary Engine	Tier I high speed diesel				Ocean Tug (ATB/ITB)
Ocean Tug (ATB/ITB) Auxiliary Pump	Tier I high speed diesel				Ocean Tug (ATB/ITB)
2016 Tanker - Chemical Propulsion Engine	Tier I slow speed diesel				Tanker - Chemical
Tanker - Chemical Auxiliary Engine	Tier I medium speed diesel				Tanker - Chemical
Tanker - Chemical Auxiliary Boiler	boiler				Tanker - Chemical
2016 Tanker - Handysize Propulsion Engine	Tier 0 slow speed diesel				Tanker - Handysize
Tanker - Handysize Auxiliary Engine	Tier 0 medium speed diesel				Tanker - Handysize
Tanker - Handysize Auxiliary Boiler	boiler				Tanker - Handysize
2016 Tanker - Panamax Propulsion Engine	Tier I slow speed diesel				Tanker - Panamax
Tanker - Panamax Auxiliary Engine	Tier I medium speed diesel				Tanker - Panamax
Tanker - Panamax Auxiliary Boiler	boiler				Tanker - Panamax
Baseline 2016			**Total 2016 Baseline**		
2016 CEQA Baseline OGV Propulsion Engine				2016	
2016 CEQA Baseline OGV Auxiliary Engine				2016	
2016 CEQA Baseline OGV Auxiliary Boiler				2016	
2016 CEQA Baseline OGV Auxiliary Pump				2016	
	Used to pull emission factors for peak	*Used to transfer efs for Annual*	**Proposed Project**		
2032 Ocean Tug (ATB/ITB) Propulsion Engine	Tier I medium sp	2032 ITB		**2032**	Ocean Tug (ATB/ITB)
Ocean Tug (ATB/ITB) Auxiliary Engine	Tier I high speed	2032 ITB			Ocean Tug (ATB/ITB)
Ocean Tug (ATB/ITB) Auxiliary Pump	Tier I high speed	2032 ITB			Ocean Tug (ATB/ITB)
2032 Tanker - Chemical Propulsion Engine	Tier I slow speed	2032 Tanker - Chemical			Tanker - Chemical
Tanker - Chemical Auxiliary Engine	Tier I medium sp	2032 Tanker - Chemical			Tanker - Chemical
Tanker - Chemical Auxiliary Boiler	boiler	2032 boiler			Tanker - Chemical
2032 Tanker - Handysize Propulsion Engine	Tier I slow speed	2032 Tanker - Handysize			Tanker - Handysize
Tanker - Handysize Auxiliary Engine	Tier I medium sp	2032 Tanker - Handysize			Tanker - Handysize
Tanker - Handysize Auxiliary Boiler	boiler	2032 boiler			Tanker - Handysize
2032 Tanker - Panamax Propulsion Engine	Tier I slow speed	2032 Tanker - Panamax			Tanker - Panamax
Tanker - Panamax Auxiliary Engine	Tier I medium sp	2032 Tanker - Panamax			Tanker - Panamax
Tanker - Panamax Auxiliary Boiler	boiler	2032 boiler			Tanker - Panamax
Proposed Project 2032			**Total 2032**		
2032 Proposed Project OGV Propulsion Engine				2032	
2032 Proposed Project OGV Auxiliary Engine				2032	
2032 Proposed Project OGV Auxiliary Boiler				2032	
2032 Proposed Project OGV Auxiliary Pump				2032	

	emission factors for peak day	Used to transfer efs for Annual	Proposed Project	
2048 Ocean Tug (ATB/ITB) Propulsion Engine	Tier I medium sp	2048 ITB	**2048**	Ocean Tug (ATB/ITB)
Ocean Tug (ATB/ITB) Auxiliary Engine	Tier I high speed	2048 ITB		Ocean Tug (ATB/ITB)
Ocean Tug (ATB/ITB) Auxiliary Pump	Tier I high speed	2048 ITB		Ocean Tug (ATB/ITB)
2048 Tanker - Chemical Propulsion Engine	Tier I slow speed	2048 Tanker - Chemical		Tanker - Chemical
Tanker - Chemical Auxiliary Engine	Tier I medium sp	2048 Tanker - Chemical		Tanker - Chemical
Tanker - Chemical Auxiliary Boiler	boiler	2048 boiler		Tanker - Chemical
2048 Tanker - Handysize Propulsion Engine	Tier I slow speed	2048 Tanker - Handysize		Tanker - Handysize
Tanker - Handysize Auxiliary Engine	Tier I medium sp	2048 Tanker - Handysize		Tanker - Handysize
Tanker - Handysize Auxiliary Boiler	boiler	2048 boiler		Tanker - Handysize
2048 Tanker - Panamax Propulsion Engine	Tier I slow speed	2048 Tanker - Panamax		Tanker - Panamax
Tanker - Panamax Auxiliary Engine	Tier I medium sp	2048 Tanker - Panamax		Tanker - Panamax
Tanker - Panamax Auxiliary Boiler	boiler	2048 boiler		Tanker - Panamax
Proposed Project 2048			**Total 2048**	
2048 Proposed Project OGV Propulsion Engine			2048	
2048 Proposed Project OGV Auxiliary Engine			2048	
2048 Proposed Project OGV Auxiliary Boiler			2048	
2048 Proposed Project OGV Auxiliary Pump			2048	

Notes:
Trips = one-way trips
Peak hourly emissions correspond to activity for 1 hour or less, if
Peak 8-hour emissions correspond to activity for 8 hour or less, if

Source:
Vessel characteristics, propulsion engine characteristics, auxiliary
Vessel characteristics, propulsion engine characteristics, auxiliary

ut Mitigation - Proposed Project

Engine/Source Type	Engine Rating (kW)	Model Year / Tier - Peak Day	Model Year / Tier - Annual	Max Rated Speed (knots)	Peak Day Berth Calls	Peak Day Anchorage Calls	Peak Day Transits (1-way)	Berth Hotelling Time Per Vessel (hr/call)	Anchorage Time Per Vessel (hr/call)	Annual Berth Calls
6	7	8	9	10	11	12	13	14	15	16
	Vessel Characteristics				Activity					
Propulsion Engine	6,767	2001	2001	14						
Auxiliary Engine								35		57
Auxiliary Pump								35		57
Propulsion Engine	9,633	2007	2007	15						
Auxiliary Engine								29	42	17
Auxiliary Boiler								29	42	17
Propulsion Engine	7,635	1997	1997	15						
Auxiliary Engine								39	45	7
Auxiliary Boiler								39	45	7
Propulsion Engine	11,299	2005	2005	15			1			
Auxiliary Engine					1	1	1	77	91	6
Auxiliary Boiler					1	1	1	77	91	6
					1	**1**	**1**			**87**
Propulsion Engine										
Auxiliary Engine										
Auxiliary Boiler										
Auxiliary Pump										
Propulsion Engine	6,767	Tier I	Tier I	14						
Auxiliary Engine								35		64
Auxiliary Pump								35		64
Propulsion Engine	9,633	Tier I	Tier I - III	15						
Auxiliary Engine								29	42	28
Auxiliary Boiler								29	42	28
Propulsion Engine	7,635	Tier I	Tier I - III	15						
Auxiliary Engine								39	45	11
Auxiliary Boiler								39	45	11
Propulsion Engine	11,299	Tier I	Tier I - III	15			1			
Auxiliary Engine					1	1	1	77	91	10
Auxiliary Boiler					1	1	1	77	91	10
					1	**1**	**1**			**113**
Propulsion Engine										
Auxiliary Engine										
Auxiliary Boiler										
Auxiliary Pump										

Propulsion Engine	6,767	Tier I	Tier I	14						
Auxiliary Engine								35		64
Auxiliary Pump								35		64
Propulsion Engine	9,633	Tier III	Tier III	15						
Auxiliary Engine								29	42	28
Auxiliary Boiler								29	42	28
Propulsion Engine	7,635	Tier III	Tier III	15						
Auxiliary Engine								39	45	11
Auxiliary Boiler								39	45	11
Propulsion Engine	11,299	Tier III	Tier III	15			1			
Auxiliary Engine					1	1	1	77	91	10
Auxiliary Boiler					1	1	1	77	91	10
					1	**1**	**1**			**113**
Propulsion Engine										
Auxiliary Engine										
Auxiliary Boiler										
Auxiliary Pump										

anchorage/hotelling/transit time is less than 1 hour.
anchorage/hotelling/transit time is less than 8 hour.

loads and boiler loads for vessels less than 11,000TEU were obtained from POLA 2012 Emissions Inventory
loads and boiler loads for vessels greater than 11,000TEU were obtained from POLB 2012 Emissions Inventory

17	18	19	20	21	22	23	24	25	26	27	28	29	30
										Hotelling		Transit	
Annual Anchorage Calls	Annual Transits (1-way)	Fuel Sulfur		Peak Day Berth Scaling Factor	Peak Day Anchorage Scaling Factor	Average Auxiliary Loads (kW)				Berth	Anchorage	Zone 1: Har	
					Transit	Maneuvering	Berth	Anchorage		Energy Demand (kW-hr/call)	Energy Demand (kW-hr/call)		Speed (knots)
								Anchorage					
	114	0.1%											6.0
	114	0.1%	0.7		79	208	102	79		3,570			
	114	0.1%	0.7				190			6,650			
	34	0.1%											6.0
12	34	0.1%	0.8	0.6	658	890	816	658		23,830	27,307		
	34	0.1%	0.8	0.6	371	371	821	371		23,976	15,397		
	14	0.1%											6.0
3	14	0.1%	0.6	0.5	537	601	820	537		31,739	24,004		
	14	0.1%	0.6	0.5	371	371	2,586	371		100,093	16,584		
	12	0.1%											6.0
4	12	0.1%	0.3	0.3	561	763	623	561		47,699	50,883		
	12	0.1%	0.3	0.3	371	371	3,293	371		252,123	33,650		
19	**174**												
	128	0.1%											6.0
	128	0.1%	0.7		79	208	102	79		3,570			
	128	0.1%	0.7				190			6,650			
	56	0.1%											6.0
19	56	0.1%	0.8	0.6	658	890	816	658		23,830	27,307		
	56	0.1%	0.8	0.6	371	371	821	371		23,976	15,397		
	23	0.1%											6.0
5	23	0.1%	0.6	0.5	537	601	820	537		31,739	24,004		
	23	0.1%	0.6	0.5	371	371	2,586	371		100,093	16,584		
	20	0.1%											6.0
7	20	0.1%	0.3	0.3	561	763	623	561		47,699	50,883		
	20	0.1%	0.3	0.3	371	371	3,293	371		252,123	33,650		
31	**226**												

	128									6.0
	128	0.7		79	208	102	79	3,570		
	128	0.7				190		6,650		
	56									6.0
19	56	0.8	0.6	658	890	816	658	23,830	27,307	
	56	0.8	0.6	371	371	821	371	23,976	15,397	
	23									6.0
5	23	0.6	0.5	537	601	820	537	31,739	24,004	
	23	0.6	0.5	371	371	2,586	371	100,093	16,584	
	20									6.0
7	20	0.3	0.3	561	763	623	561	47,699	50,883	
	20	0.3	0.3	371	371	3,293	371	252,123	33,650	
31	**226**									

31	32	33	34	35	36	37	38	39	40	41	42	43	44
rbor				**Zone 2: Breakwater to PZ**					**Zone 3: PZ to 20nm**				
Distance (nm)	Maneuvering Time (hr/trip)	Loaded Energy Demand (kW-hr/trip)	Propulsion Engine Load Factor	Speed (knots)	Distance (nm)	Transit Time (hr/trip)	Loaded Energy Demand (kW-hr/trip)	Propulsion Engine Load Factor	Speed (knots) - Peak Day	Speed (knots) - Average Annual	Distance (nm)	Transit Time (hr/trip) - Peak Day	Transit Time (hr/trip) - Average Annual
3.7	0.6	334	8%	9.0	8.2	0.9	1,782	29%	13.0	11.0	17.6	1.4	1.6
	0.6	128				0.9	72					1.4	1.6
	0.6	-				0.9	-					1.4	1.6
3.7	0.6	356	6%	9.0	8.2	0.9	1,924	22%	13.0	11.0	17.6	1.4	1.6
	0.6	549				0.9	597					1.4	1.6
	0.6	229				0.9	337					1.4	1.6
3.7	0.6	283	6%	9.0	8.2	0.9	1,525	22%	13.0	11.0	17.6	1.4	1.6
	0.6	371				0.9	488					1.4	1.6
	0.6	229				0.9	337					1.4	1.6
3.7	0.6	418	6%	9.0	8.2	0.9	2,257	22%	13.0	11.0	17.6	1.4	1.6
	0.6	471				0.9	509					1.4	1.6
	0.6	229				0.9	337					1.4	1.6
3.7	0.6	334	8%	9.0	8.2	0.9	1,782	29%	13.0	11.0	17.6	1.4	1.6
	0.6	128				0.9	72					1.4	1.6
	0.6	-				0.9	-					1.4	1.6
3.7	0.6	356	6%	9.0	8.2	0.9	1,924	22%	13.0	11.0	17.6	1.4	1.6
	0.6	549				0.9	597					1.4	1.6
	0.6	229				0.9	337					1.4	1.6
3.7	0.6	283	6%	9.0	8.2	0.9	1,525	22%	13.0	11.0	17.6	1.4	1.6
	0.6	371				0.9	488					1.4	1.6
	0.6	229				0.9	337					1.4	1.6
3.7	0.6	418	6%	9.0	8.2	0.9	2,257	22%	13.0	11.0	17.6	1.4	1.6
	0.6	471				0.9	509					1.4	1.6
	0.6	229				0.9	337					1.4	1.6

3.7	0.6	334	8%	9.0	8.2	0.9	1,782	29%	13.0	11.0	17.6	1.4	1.6
	0.6	128				0.9	72					1.4	1.6
	0.6	-				0.9	-					1.4	1.6
3.7	0.6	356	6%	9.0	8.2	0.9	1,924	22%	13.0	11.0	17.6	1.4	1.6
	0.6	549				0.9	597					1.4	1.6
	0.6	229				0.9	337					1.4	1.6
3.7	0.6	283	6%	9.0	8.2	0.9	1,525	22%	13.0	11.0	17.6	1.4	1.6
	0.6	371				0.9	488					1.4	1.6
	0.6	229				0.9	337					1.4	1.6
3.7	0.6	418	6%	9.0	8.2	0.9	2,257	22%	13.0	11.0	17.6	1.4	1.6
	0.6	471				0.9	509					1.4	1.6
	0.6	229				0.9	337					1.4	1.6

45	46	47	48	49	50	51	52	53	54	55	56	57	58
					Zone 4: 20nm to 40nm								Zone 5: 40
Loaded Energy Demand (kW-hr/trip) - Peak Day	Loaded Energy Demand (kW-hr/trip) - Average Annual	Propulsion Engine Load Factor during Maneuvering - Peak Day	Propulsion Engine Load Factor during Maneuvering - Annual Average	Speed (knots) - Peak Day	Speed (knots) - Average Annual	Distance (nm)	Transit Time (hr/trip) - Peak Day	Transit Time (hr/trip) - Average Annual	Loaded Energy Demand (kW-hr/trip) - Peak Day	Loaded Energy Demand (kW-hr/trip) - Average Annual	Propulsion Engine Load Factor during Maneuvering - Peak Day	Propulsion Engine Load Factor during Maneuvering - Annual Average	Speed (knots)
8,176	5,863	89%	54%	13.0	11.0	20.7	1.6	1.9	9,606	6,888	89%	54%	12.5
107	127						1.6	1.9	126	149			
-	-						1.6	1.9	-	-			
8,762	6,337	67%	41%	13.0	11.0	20.7	1.6	1.9	10,294	7,444	67%	41%	13.7
893	1,056						1.6	1.9	1,049	1,240			
504	595						1.6	1.9	592	699			
7,153	5,023	69%	41%	13.0	11.0	20.7	1.6	1.9	8,403	5,901	69%	41%	13.6
729	862						1.6	1.9	856	1,012			
504	595						1.6	1.9	592	699			
10,124	7,252	66%	40%	13.0	11.0	20.7	1.6	1.9	11,894	8,519	66%	40%	13.8
762	900						1.6	1.9	895	1,057			
504	595						1.6	1.9	592	699			
8,176	5,863	89%	54%	13.0	11.0	20.7	1.6	1.9	9,606	6,888	89%	54%	12.5
107	127						1.6	1.9	126	149			
-	-						1.6	1.9	-	-			
8,762	6,337	67%	41%	13.0	11.0	20.7	1.6	1.9	10,294	7,444	67%	41%	13.7
893	1,056						1.6	1.9	1,049	1,240			
504	595						1.6	1.9	592	699			
7,153	5,023	69%	41%	13.0	11.0	20.7	1.6	1.9	8,403	5,901	69%	41%	13.6
729	862						1.6	1.9	856	1,012			
504	595						1.6	1.9	592	699			
10,124	7,252	66%	40%	13.0	11.0	20.7	1.6	1.9	11,894	8,519	66%	40%	13.8
762	900						1.6	1.9	895	1,057			
504	595						1.6	1.9	592	699			

8,176	5,863	89%	54%	13.0	11.0	20.7	1.6	1.9	9,606	6,888	89%	54%	12.5
107	127						1.6	1.9	126	149			
-	-						1.6	1.9	-	-			
8,762	6,337	67%	41%	13.0	11.0	20.7	1.6	1.9	10,294	7,444	67%	41%	13.7
893	1,056						1.6	1.9	1,049	1,240			
504	595						1.6	1.9	592	699			
7,153	5,023	69%	41%	13.0	11.0	20.7	1.6	1.9	8,403	5,901	69%	41%	13.6
729	862						1.6	1.9	856	1,012			
504	595						1.6	1.9	592	699			
10,124	7,252	66%	40%	13.0	11.0	20.7	1.6	1.9	11,894	8,519	66%	40%	13.8
762	900						1.6	1.9	895	1,057			
504	595						1.6	1.9	592	699			

59	60	61	62	63	64	65	66	67	68	69	70	71	72
nm to 50nm SCAB Over-Water boundary				**Zone 6: 50nm to 170nm State Over-Water Boundary**						**Exhaust Emission Factors** (g/kW-hr) - Peak Da			
Distance (nm)	Transit Time (hr/trip)	Loaded Energy Demand (kW-hr/trip)	Propulsion Engine Average Load in Open Ocean	Speed (knots)	Distance (nm)	Transit Time (hr/trip)	Loaded Energy Demand (kW-hr/trip)	Propulsion Engine Average Load in Open Ocean		PM10	PM2.5	DPM	NOx
2.5	0.2	1,080	80%	12.5	127.5	10.2	55,076	80%		0.26	0.24	0.26	12.20
	0.2	16				10.2	804			0.26	0.24	0.26	9.80
	0.2					10.2				0.26	0.24	0.26	9.80
2.5	0.2	1,402	80%	13.7	127.5	9.3	71,514	80%		0.26	0.24	0.26	16.00
	0.2	120				9.3	6,106			0.26	0.24	0.26	12.20
	0.2					9.3				0.14	0.13		2.00
2.5	0.2	1,119	80%	13.6	127.5	9.3	57,071	80%		0.26	0.24	0.26	17.00
	0.2	98				9.3	5,017			0.26	0.24	0.26	13.80
	0.2					9.3				0.14	0.13		2.00
2.5	0.2	1,634	80%	13.8	127.5	9.2	83,322	80%		0.26	0.24	0.26	16.00
	0.2	101				9.2	5,171			0.26	0.24	0.26	12.20
	0.2					9.2				0.14	0.13		2.00
2.5	0.2	1,080	80%	12.5	127.5	10.2	55,076	80%		0.26	0.24	0.26	12.20
	0.2	16				10.2	804			0.26	0.24	0.26	9.80
	0.2					10.2				0.26	0.24	0.26	9.80
2.5	0.2	1,402	80%	13.7	127.5	9.3	71,514	80%		0.26	0.24	0.26	16.00
	0.2	120				9.3	6,106			0.26	0.24	0.26	12.20
	0.2					9.3				0.14	0.13		2.00
2.5	0.2	1,119	80%	13.6	127.5	9.3	57,071	80%		0.26	0.24	0.26	16.00
	0.2	98				9.3	5,017			0.26	0.24	0.26	12.20
	0.2					9.3				0.14	0.13		2.00
2.5	0.2	1,634	80%	13.8	127.5	9.2	83,322	80%		0.26	0.24	0.26	16.00
	0.2	101				9.2	5,171			0.26	0.24	0.26	12.20
	0.2					9.2				0.14	0.13		2.00

2.5	0.2	1,080	80%	12.5	127.5	10.2	55,076	80%	0.26	0.24	0.26	12.20
	0.2	16				10.2	804		0.26	0.24	0.26	9.80
	0.2					10.2			0.26	0.24	0.26	9.80
2.5	0.2	1,402	80%	13.7	127.5	9.3	71,514	80%	0.26	0.24	0.26	16.00
	0.2	120				9.3	6,106		0.26	0.24	0.26	12.20
	0.2					9.3			0.14	0.13		2.00
2.5	0.2	1,119	80%	13.6	127.5	9.3	57,071	80%	0.26	0.24	0.26	16.00
	0.2	98				9.3	5,017		0.26	0.24	0.26	12.20
	0.2					9.3			0.14	0.13		2.00
2.5	0.2	1,634	80%	13.8	127.5	9.2	83,322	80%	0.26	0.24	0.26	16.00
	0.2	101				9.2	5,171		0.26	0.24	0.26	12.20
	0.2					9.2			0.14	0.13		2.00

73	74	75	76	77	78	79	80	81	82	83	84	85	86
y Fleet Mix								**Exhaust Emission Factors** (g/kW-hr) - Annual Fleet Mix					
SOx	CO	HC	VOC	CO2	CH4	N2O		PM10	PM2.5	DPM	NOx	SOx	CO
0.43	1.10	0.50	0.53	649.00	0.01	0.03		0.26	0.24	0.26	12.20	0.43	1.10
0.46	0.90	0.40	0.42	656.00	0.01	0.03		0.26	0.24	0.26	9.80	0.46	0.90
0.46	0.90	0.40	0.42	656.00	0.01	0.03		0.26	0.24	0.26	9.80	0.46	0.90
0.39	1.40	0.60	0.63	589.00	0.01	0.03		0.26	0.24	0.26	16.00	0.39	1.40
0.46	1.10	0.40	0.42	656.00	0.01	0.03		0.26	0.24	0.26	12.20	0.46	1.10
0.61	0.20	0.10	0.11	922.00	0.00	0.07		0.14	0.13		2.00	0.61	0.20
0.39	1.40	0.60	0.63	589.00	0.01	0.03		0.26	0.24	0.26	17.00	0.39	1.40
0.46	1.10	0.40	0.42	656.00	0.01	0.03		0.26	0.24	0.26	13.80	0.46	1.10
0.61	0.20	0.10	0.11	922.00	0.00	0.07		0.14	0.13		2.00	0.61	0.20
0.39	1.40	0.60	0.63	589.00	0.01	0.03		0.26	0.24	0.26	16.00	0.39	1.40
0.46	1.10	0.40	0.42	656.00	0.01	0.03		0.26	0.24	0.26	12.20	0.46	1.10
0.61	0.20	0.10	0.11	922.00	0.00	0.07		0.14	0.13		2.00	0.61	0.20
0.43	1.10	0.50	0.53	649.00	0.01	0.03		0.26	0.24	0.26	12.20	0.43	1.10
0.46	0.90	0.40	0.42	656.00	0.01	0.03		0.26	0.24	0.26	9.80	0.46	0.90
0.46	0.90	0.40	0.42	656.00	0.01	0.03		0.26	0.24	0.26	9.80	0.46	0.90
0.39	1.40	0.60	0.63	589.00	0.01	0.03		0.26	0.24	0.26	16.00	0.39	1.40
0.46	1.10	0.40	0.42	656.00	0.01	0.03		0.26	0.24	0.26	12.20	0.46	1.10
0.61	0.20	0.10	0.11	922.00	0.00	0.07		0.14	0.13		2.00	0.61	0.20
0.39	1.40	0.60	0.63	589.00	0.01	0.03		0.26	0.24	0.26	16.00	0.39	1.40
0.46	1.10	0.40	0.42	656.00	0.01	0.03		0.26	0.24	0.26	12.20	0.46	1.10
0.61	0.20	0.10	0.11	922.00	0.00	0.07		0.14	0.13		2.00	0.61	0.20
0.39	1.40	0.60	0.63	589.00	0.01	0.03		0.26	0.24	0.26	16.00	0.39	1.40
0.46	1.10	0.40	0.42	656.00	0.01	0.03		0.26	0.24	0.26	12.20	0.46	1.10
0.61	0.20	0.10	0.11	922.00	0.00	0.07		0.14	0.13		2.00	0.61	0.20

0.43	1.10	0.50	0.53	649.00	0.01	0.03	0.26	0.24	0.26	12.20	0.43	1.10
0.46	0.90	0.40	0.42	656.00	0.01	0.03	0.26	0.24	0.26	9.80	0.46	0.90
0.46	0.90	0.40	0.42	656.00	0.01	0.03	0.26	0.24	0.26	9.80	0.46	0.90
0.39	1.40	0.60	0.63	589.00	0.01	0.03	0.26	0.24	0.26	16.00	0.39	1.40
0.46	1.10	0.40	0.42	656.00	0.01	0.03	0.26	0.24	0.26	12.20	0.46	1.10
0.61	0.20	0.10	0.11	922.00	0.00	0.07	0.14	0.13		2.00	0.61	0.20
0.39	1.40	0.60	0.63	589.00	0.01	0.03	0.26	0.24	0.26	16.00	0.39	1.40
0.46	1.10	0.40	0.42	656.00	0.01	0.03	0.26	0.24	0.26	12.20	0.46	1.10
0.61	0.20	0.10	0.11	922.00	0.00	0.07	0.14	0.13		2.00	0.61	0.20
0.39	1.40	0.60	0.63	589.00	0.01	0.03	0.26	0.24	0.26	16.00	0.39	1.40
0.46	1.10	0.40	0.42	656.00	0.01	0.03	0.26	0.24	0.26	12.20	0.46	1.10
0.61	0.20	0.10	0.11	922.00	0.00	0.07	0.14	0.13		2.00	0.61	0.20

87	88	89	90	91	92	93	94	95	96	97	98	99	100
							Unmitigated Emissions						
							Berth						
							Peak 1-Hour						
HC	VOC	CO2	CH4	N2O			PM10	PM2.5	DPM	NOX	SOX	CO	HC
							(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
0.50	0.53	649.00	0.01	0.03			-	-	-	-	-	-	-
0.40	0.42	656.00	0.01	0.03			-	-	-	-	-	-	-
0.40	0.42	656.00	0.01	0.03			-	-	-	-	-	-	-
0.60	0.63	589.00	0.01	0.03			-	-	-	-	-	-	-
0.40	0.42	656.00	0.01	0.03			-	-	-	-	-	-	-
0.10	0.11	922.00	0.00	0.07			-	-	-	-	-	-	-
0.60	0.63	589.00	0.01	0.03			-	-	-	-	-	-	-
0.40	0.42	656.00	0.01	0.03			-	-	-	-	-	-	-
0.10	0.11	922.00	0.00	0.07			-	-	-	-	-	-	-
0.60	0.63	589.00	0.01	0.03			-	-	-	-	-	-	-
0.40	0.42	656.00	0.01	0.03			0.36	0.33	0.36	16.76	0.63	1.51	0.55
0.10	0.11	922.00	0.00	0.07			1.02	0.94	-	14.52	4.43	1.45	0.73
							1.37	**1.27**	**0.36**	**31.28**	**5.06**	**2.96**	**1.28**
							0.357099	0.32963	0.357099	16.756173	0.63179	1.510802	0.549383
							1.016358	0.943761		14.5194	4.428417	1.45194	0.72597
0.50	0.53	649.00	0.01	0.03			-	-	-	-	-	-	-
0.40	0.42	656.00	0.01	0.03			-	-	-	-	-	-	-
0.40	0.42	656.00	0.01	0.03			-	-	-	-	-	-	-
0.60	0.63	589.00	0.01	0.03			-	-	-	-	-	-	-
0.40	0.42	656.00	0.01	0.03			-	-	-	-	-	-	-
0.10	0.11	922.00	0.00	0.07			-	-	-	-	-	-	-
0.60	0.63	589.00	0.01	0.03			-	-	-	-	-	-	-
0.40	0.42	656.00	0.01	0.03			-	-	-	-	-	-	-
0.10	0.11	922.00	0.00	0.07			-	-	-	-	-	-	-
0.60	0.63	589.00	0.01	0.03			-	-	-	-	-	-	-
0.40	0.42	656.00	0.01	0.03			0.36	0.33	0.36	16.76	0.63	1.51	0.55
0.10	0.11	922.00	0.00	0.07			1.02	0.94	-	14.52	4.43	1.45	0.73
							1.37	**1.27**	**0.36**	**31.28**	**5.06**	**2.96**	**1.28**
							0.357099	0.32963	0.357099	16.756173	0.63179	1.510802	0.549383
							1.016358	0.943761		14.5194	4.428417	1.45194	0.72597

0.50	0.53	649.00	0.01	0.03	-	-	-	-	-	-	-
0.40	0.42	656.00	0.01	0.03	-	-	-	-	-	-	-
0.40	0.42	656.00	0.01	0.03	-	-	-	-	-	-	-
0.60	0.63	589.00	0.01	0.03	-	-	-	-	-	-	-
0.40	0.42	656.00	0.01	0.03	-	-	-	-	-	-	-
0.10	0.11	922.00	0.00	0.07	-	-	-	-	-	-	-
0.60	0.63	589.00	0.01	0.03	-	-	-	-	-	-	-
0.40	0.42	656.00	0.01	0.03	-	-	-	-	-	-	-
0.10	0.11	922.00	0.00	0.07	-	-	-	-	-	-	-
0.60	0.63	589.00	0.01	0.03	-	-	-	-	-	-	-
0.40	0.42	656.00	0.01	0.03	0.36	0.33	0.36	16.76	0.63	1.51	0.55
0.10	0.11	922.00	0.00	0.07	1.02	0.94	-	14.52	4.43	1.45	0.73
					1.37	**1.27**	**0.36**	**31.28**	**5.06**	**2.96**	**1.28**
					0.357099	0.32963	0.357099	16.756173	0.63179	1.510802	0.549383
					1.016358	0.943761		14.5194	4.428417	1.45194	0.72597

101	102	103	104	105	106	107	108	109	110	111	112	113	114
	8-Hour	**Peak Day**								**Annual**			
VOC	CO	PM10	PM2.5	DPM	NOX	SOX	CO	HC	VOC	PM10	PM2.5	DPM	NOX
(lb/hr)	(lb/8-hr)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/yr)	(lb/yr)	(lb/yr)	(lb/yr)
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	116.64	107.67	116.64	4,396.39
-	-	-	-	-	-	-	-	-	-	217.27	200.56	217.27	8,189.35
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	232.21	214.34	232.21	10,895.85
-	-	-	-	-	-	-	-	-	-	125.80	116.81	-	1,797.15
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	127.35	117.55	127.35	6,759.16
-	-	-	-	-	-	-	-	-	-	216.25	200.80	-	3,089.29
-	-	-	-	-	-	-	-	-	-	-	-	-	-
0.58	4.53	8.57	7.91	8.57	402.15	15.16	36.26	13.19	13.88	164.04	151.43	164.04	7,697.45
0.76	4.36	24.39	22.65	-	348.47	106.28	34.85	17.42	18.35	466.89	433.54	-	6,669.92
1.34	**8.89**	**32.96**	**30.56**	**8.57**	**750.61**	**121.44**	**71.11**	**30.61**	**32.23**	**1,666.45**	**1,542.71**	**857.50**	**49,494.57**
0.5785	4.532407	8.57037	7.911111	8.57037	402.14815	15.16296	36.25926	13.18519	13.884	640.2362	590.9872	640.23619	29748.856
0.764446	4.35582	24.39259	22.65026		348.46561	106.282	34.84656	17.42328	18.34671	808.9453	751.1635		11556.362
										217.2685	200.5556	217.26852	8189.3519
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	130.96	120.89	130.96	4,936.30
-	-	-	-	-	-	-	-	-	-	243.95	225.19	243.95	9,195.06
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	380.56	351.29	380.56	17,857.09
-	-	-	-	-	-	-	-	-	-	206.17	191.45	-	2,945.33
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	208.71	192.65	208.71	9,793.17
-	-	-	-	-	-	-	-	-	-	354.41	329.10	-	5,063.00
-	-	-	-	-	-	-	-	-	-	-	-	-	-
0.58	4.53	8.57	7.91	8.57	402.15	15.16	36.26	13.19	13.88	268.85	248.17	268.85	12,615.27
0.76	4.36	24.39	22.65	-	348.47	106.28	34.85	17.42	18.35	765.19	710.53	-	10,931.26
1.34	**8.89**	**32.96**	**30.56**	**8.57**	**750.61**	**121.44**	**71.11**	**30.61**	**32.23**	**2,558.80**	**2,369.26**	**1,233.03**	**73,336.48**
0.5785	4.532407	8.57037	7.911111	8.57037	402.14815	15.16296	36.25926	13.18519	13.884	989.0808	912.9976	989.08076	45201.823
0.764446	4.35582	24.39259	22.65026		348.46561	106.282	34.84656	17.42328	18.34671	1325.771	1231.074		18939.593
										243.9506	225.1852	243.95062	9195.0617

-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	130.96	120.89	130.96	4,936.30
-	-	-	-	-	-	-	-	-	-	243.95	225.19	243.95	9,195.06
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	380.56	351.29	380.56	17,857.09
-	-	-	-	-	-	-	-	-	-	206.17	191.45	-	2,945.33
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	208.71	192.65	208.71	9,793.17
-	-	-	-	-	-	-	-	-	-	354.41	329.10	-	5,063.00
-	-	-	-	-	-	-	-	-	-	-	-	-	-
0.58	4.53	8.57	7.91	8.57	402.15	15.16	36.26	13.19	13.88	268.85	248.17	268.85	12,615.27
0.76	4.36	24.39	22.65	-	348.47	106.28	34.85	17.42	18.35	765.19	710.53	-	10,931.26
1.34	**8.89**	**32.96**	**30.56**	**8.57**	**750.61**	**121.44**	**71.11**	**30.61**	**32.23**	**2,558.80**	**2,369.26**	**1,233.03**	**73,336.48**
0.5785	4.532407	8.57037	7.911111	8.57037	402.14815	15.16296	36.25926	13.18519	13.884	989.0808	912.9976	989.08076	45201.823
0.764446	4.35582	24.39259	22.65026		348.46561	106.282	34.84656	17.42328	18.34671	1325.771	1231.074		18939.593
										243.9506	225.1852	243.95062	9195.0617

115	116	117	118	119	120	121	122	123	124	125	126	127
								Unmitigated Emissions				
								Anchorage				
								Peak 1-Hour				
SOX	CO	HC	VOC	CO2	CH4	N2O	CO2e	PM10	PM2.5	DPM	NOX	SOX
(lb/yr)	(lb/yr)	(lb/yr)	(lb/yr)	(mty)	(mty)	(mty)	(mty)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
-	-	-	-	-	-	-	-	-	-	-	-	-
206.36	403.75	179.44	188.96	133.49	0.00	0.01	135.35	-	-	-	-	-
384.40	752.08	334.26	351.98	248.66	0.00	0.01	252.13	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
410.83	982.41	357.24	376.17	265.75	0.00	0.01	269.46	-	-	-	-	-
548.13	179.72	89.86	94.62	375.80	0.00	0.03	385.04	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
225.31	538.77	195.92	206.30	145.74	0.00	0.01	147.78	-	-	-	-	-
942.23	308.93	154.46	162.65	646.00	0.00	0.05	661.89	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
290.23	694.03	252.38	265.75	187.74	0.00	0.01	190.36	0.32	0.30	0.32	15.09	0.57
2,034.33	666.99	333.50	351.17	1,394.74	0.00	0.11	1,429.04	0.11	0.11	-	1.64	0.50
5,041.81	**4,526.69**	**1,897.06**	**1,997.60**	**3,397.93**	**0.02**	**0.23**	**3,471.06**	**0.44**	**0.40**	**0.32**	**16.72**	**1.07**
1132.7256	2618.9693	984.978748	1037.18262	732.72963	0.0089357	0.032392	742.9588	0.321561	0.296825	0.321560847	15.0886243	0.568915
3524.6903	1155.6362	577.818086	608.442445	2416.5462	0.005242	0.191332	2475.9691	0.114506	0.106327		1.63580247	0.49892
384.39815	752.08333	334.259259	351.975	248.6568	0.0030324	0.010992	252.12814					
-	-	-	-	-	-	-	-	-	-	-	-	-
231.70	453.33	201.48	212.16	149.88	0.00	0.01	151.98	-	-	-	-	-
431.60	844.44	375.31	395.20	279.19	0.00	0.01	283.09	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
673.30	1,610.07	585.48	616.51	435.54	0.01	0.02	441.62	-	-	-	-	-
898.33	294.53	147.27	155.07	615.90	0.00	0.05	631.04	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
369.25	882.99	321.09	338.11	238.86	0.00	0.01	242.19	-	-	-	-	-
1,544.22	506.30	253.15	266.57	1,058.72	0.00	0.08	1,084.76	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
475.66	1,137.44	413.62	435.54	307.69	0.00	0.01	311.99	0.32	0.30	0.32	15.09	0.57
3,334.03	1,093.13	546.56	575.53	2,285.83	0.00	0.18	2,342.04	0.11	0.11	-	1.64	0.50
7,958.09	**6,822.24**	**2,843.95**	**2,994.68**	**5,371.62**	**0.03**	**0.38**	**5,488.70**	**0.44**	**0.40**	**0.32**	**16.72**	**1.07**
1749.9121	4083.8317	1521.6627	1602.31082	1131.971	0.0138045	0.050041	1147.7737	0.321561	0.296825	0.321560847	15.0886243	0.568915
5776.5758	1893.9593	946.979642	997.169563	3960.4507	0.008591	0.313571	4057.8382	0.114506	0.106327		1.63580247	0.49892
431.60494	844.44444	375.308642	395.2	279.1936	0.0034048	0.012342	283.09124					

-	-	-	-	-	-	-	-	-	-	-	-	-
231.70	453.33	201.48	212.16	149.88	0.00	0.01	151.98	-	-	-	-	-
431.60	844.44	375.31	395.20	279.19	0.00	0.01	283.09	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
673.30	1,610.07	585.48	616.51	435.54	0.01	0.02	441.62	-	-	-	-	-
898.33	294.53	147.27	155.07	615.90	0.00	0.05	631.04	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
369.25	882.99	321.09	338.11	238.86	0.00	0.01	242.19	-	-	-	-	-
1,544.22	506.30	253.15	266.57	1,058.72	0.00	0.08	1,084.76	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
475.66	1,137.44	413.62	435.54	307.69	0.00	0.01	311.99	0.32	0.30	0.32	15.09	0.57
3,334.03	1,093.13	546.56	575.53	2,285.83	0.00	0.18	2,342.04	0.11	0.11	-	1.64	0.50
7,958.09	**6,822.24**	**2,843.95**	**2,994.68**	**5,371.62**	**0.03**	**0.38**	**5,488.70**	**0.44**	**0.40**	**0.32**	**16.72**	**1.07**
1749.9121	4083.8317	1521.6627	1602.31082	1131.971	0.0138045	0.050041	1147.7737	0.321561	0.296825	0.321560847	15.0886243	0.568915
5776.5758	1893.9593	946.979642	997.169563	3960.4507	0.008591	0.313571	4057.8382	0.114506	0.106327		1.63580247	0.49892
431.60494	844.44444	375.308642	395.2	279.1936	0.0034048	0.012342	283.09124					

128	129	130	131	132	133	134	135	136	137	138	139	140	141
			8-Hour	**Peak Day**								**Annual**	
CO	HC	VOC	CO	PM10	PM2.5	DPM	NOX	SOX	CO	HC	VOC	PM10	PM2.5
(lb/hr)	(lb/hr)	(lb/hr)	(lb/8-hr)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/yr)	(lb/yr)
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	182.28	168.26
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	44.03	40.64
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.36	0.49	0.52	4.08	7.72	7.12	7.72	362.13	13.65	32.65	11.87	12.50	123.14	113.67
0.16	0.08	0.09	0.49	2.75	2.55	-	39.26	11.97	3.93	1.96	2.07	-	-
1.52	**0.58**	**0.61**	**4.57**	**10.47**	**9.68**	**7.72**	**401.39**	**25.63**	**36.58**	**13.84**	**14.57**	**349.45**	**322.57**
1.36045	0.494709	0.520929	4.081349	7.71746	7.1238095	7.71746	362.126984	13.65397	32.65079	11.8730159	12.50229	349.4517	322.57081
0.16358	0.0817901	0.086125	0.490741	2.748148	2.5518519		39.2592593	11.97407	3.925926	1.96296296	2.067		

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-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	298.74	275.76
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	72.16	66.61
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.36	0.49	0.52	4.08	7.72	7.12	7.72	362.13	13.65	32.65	11.87	12.50	201.82	186.29
0.16	0.08	0.09	0.49	2.75	2.55	-	39.26	11.97	3.93	1.96	2.07	-	-
1.52	**0.58**	**0.61**	**4.57**	**10.47**	**9.68**	**7.72**	**401.39**	**25.63**	**36.58**	**13.84**	**14.57**	**572.71**	**528.66**
1.36045	0.494709	0.520929	4.081349	7.71746	7.1238095	7.71746	362.126984	13.65397	32.65079	11.8730159	12.50229	572.7125	528.65772
0.16358	0.0817901	0.086125	0.490741	2.748148	2.5518519		39.2592593	11.97407	3.925926	1.96296296	2.067		

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-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	298.74	275.76
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	72.16	66.61
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.36	0.49	0.52	4.08	7.72	7.12	7.72	362.13	13.65	32.65	11.87	12.50	201.82	186.29
0.16	0.08	0.09	0.49	2.75	2.55	-	39.26	11.97	3.93	1.96	2.07	-	-
1.52	**0.58**	**0.61**	**4.57**	**10.47**	**9.68**	**7.72**	**401.39**	**25.63**	**36.58**	**13.84**	**14.57**	**572.71**	**528.66**
1.36045	0.494709	0.520929	4.081349	7.71746	7.1238095	7.71746	362.126984	13.65397	32.65079	11.8730159	12.50229	572.7125	528.65772
0.16358	0.0817901	0.086125	0.490741	2.748148	2.5518519		39.2592593	11.97407	3.925926	1.96296296	2.067		

142	143	144	145	146	147	148	149	150	151	152	153
										Unmitigated Emissions	
										Zone 1: Harbor	
										Peak 1-Hour	
DPM	NOX	SOX	CO	HC	VOC	CO2	CH4	N2O	CO2e	PM10	PM2.5
(lb/yr)	(lb/yr)	(lb/yr)	(lb/yr)	(lb/yr)	(lb/yr)	(mty)	(mty)	(mty)	(mty)	(lb/hr)	(lb/hr)
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
182.28	8,553.13	322.50	771.18	280.43	295.29	208.61	0.00	0.01	211.53	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
44.03	2,336.89	77.90	186.27	67.74	71.33	50.39	0.00	0.00	51.09	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	0.49	0.45
123.14	5,778.27	217.87	520.99	189.45	199.49	140.93	0.00	0.01	142.90	0.27	0.25
-	-	-	-	-	-	-	-	-	-	0.07	0.07
349.45	**16,668.29**	**618.26**	**1,478.45**	**537.62**	**566.11**	**399.94**	**0.00**	**0.02**	**405.52**	**0.83**	**0.77**
										0.488846	0.451243
349.4517	16668.29319	618.260726	1478.449563	537.6180229	566.111778	399.9361977	0.004877271	0.017680106	405.51945	0.269697	0.248951
										0.070612	0.065568
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
298.74	14,017.63	528.53	1,263.89	459.59	483.95	341.89	0.00	0.02	346.67	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
72.16	3,385.85	127.66	305.28	111.01	116.90	82.58	0.00	0.00	83.73	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	0.49	0.45
201.82	9,469.95	357.06	853.85	310.49	326.95	230.97	0.00	0.01	234.20	0.27	0.25
-	-	-	-	-	-	-	-	-	-	0.07	0.07
572.71	**26,873.43**	**1,013.26**	**2,423.01**	**881.10**	**927.79**	**655.45**	**0.01**	**0.03**	**664.60**	**0.83**	**0.77**
										0.488846	0.451243
572.7125	26873.43423	1013.26063	2423.014562	881.0962043	927.794303	655.4509907	0.007993305	0.02897573	664.60133	0.269697	0.248951
										0.070612	0.065568

-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
298.74	14,017.63	528.53	1,263.89	459.59	483.95	341.89	0.00	0.02	346.67	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
72.16	3,385.85	127.66	305.28	111.01	116.90	82.58	0.00	0.00	83.73	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	0.49	0.45
201.82	9,469.95	357.06	853.85	310.49	326.95	230.97	0.00	0.01	234.20	0.27	0.25
-	-	-	-	-	-	-	-	-	-	0.07	0.07
572.71	**26,873.43**	**1,013.26**	**2,423.01**	**881.10**	**927.79**	**655.45**	**0.01**	**0.03**	**664.60**	**0.83**	**0.77**
										0.488846	0.451243
572.7125	26873.43423	1013.26063	2423.014562	881.0962043	927.794303	655.4509907	0.007993305	0.02897573	664.60133	0.269697	0.248951
										0.070612	0.065568

154	155	156	157	158	159	160	161	162	163	164	165	166	167

s

						8-Hour	Peak Day						
DPM	NOX	SOX	CO	HC	VOC	CO	PM10	PM2.5	DPM	NOX	SOX	CO	HC
(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/8-hr)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
0.49	23.59	0.36	4.19	2.41	2.53	4.19	0.49	0.45	0.49	23.59	0.36	4.19	2.41
0.27	12.65	0.48	1.14	0.41	0.44	1.14	0.27	0.25	0.27	12.65	0.48	1.14	0.41
-	1.01	0.31	0.10	0.05	0.05	0.10	0.07	0.07	-	1.01	0.31	0.10	0.05
0.76	**37.26**	**1.14**	**5.44**	**2.87**	**3.02**	**5.44**	**0.83**	**0.77**	**0.76**	**37.26**	**1.14**	**5.44**	**2.87**
0.4888462	23.59438	0.359446	4.193533	2.4055212	2.533014	4.193533	0.488846	0.451243	0.488846	23.59438	0.359446	4.193533	2.4055212
0.2696965	12.65499	0.477155	1.141024	0.4149177	0.436908	1.141024	0.269697	0.248951	0.269697	12.65499	0.477155	1.141024	0.4149177
	1.008745	0.307667	0.100874	0.0504372	0.05311	0.100874	0.070612	0.065568		1.008745	0.307667	0.100874	0.0504372
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
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-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
0.49	23.59	0.36	4.19	2.41	2.53	4.19	0.49	0.45	0.49	23.59	0.36	4.19	2.41
0.27	12.65	0.48	1.14	0.41	0.44	1.14	0.27	0.25	0.27	12.65	0.48	1.14	0.41
-	1.01	0.31	0.10	0.05	0.05	0.10	0.07	0.07	-	1.01	0.31	0.10	0.05
0.76	**37.26**	**1.14**	**5.44**	**2.87**	**3.02**	**5.44**	**0.83**	**0.77**	**0.76**	**37.26**	**1.14**	**5.44**	**2.87**
0.4888462	23.59438	0.359446	4.193533	2.4055212	2.533014	4.193533	0.488846	0.451243	0.488846	23.59438	0.359446	4.193533	2.4055212
0.2696965	12.65499	0.477155	1.141024	0.4149177	0.436908	1.141024	0.269697	0.248951	0.269697	12.65499	0.477155	1.141024	0.4149177
	1.008745	0.307667	0.100874	0.0504372	0.05311	0.100874	0.070612	0.065568		1.008745	0.307667	0.100874	0.0504372

-	-	-	-	-	-	-	-	-	-	-	-	-	-
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-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
0.49	23.59	0.36	4.19	2.41	2.53	4.19	0.49	0.45	0.49	23.59	0.36	4.19	2.41
0.27	12.65	0.48	1.14	0.41	0.44	1.14	0.27	0.25	0.27	12.65	0.48	1.14	0.41
-	1.01	0.31	0.10	0.05	0.05	0.10	0.07	0.07	-	1.01	0.31	0.10	0.05
0.76	**37.26**	**1.14**	**5.44**	**2.87**	**3.02**	**5.44**	**0.83**	**0.77**	**0.76**	**37.26**	**1.14**	**5.44**	**2.87**
0.4888462	23.59438	0.359446	4.193533	2.4055212	2.533014	4.193533	0.488846	0.451243	0.488846	23.59438	0.359446	4.193533	2.4055212
0.2696965	12.65499	0.477155	1.141024	0.4149177	0.436908	1.141024	0.269697	0.248951	0.269697	12.65499	0.477155	1.141024	0.4149177
	1.008745	0.307667	0.100874	0.0504372	0.05311	0.100874	0.070612	0.065568		1.008745	0.307667	0.100874	0.0504372

168	169	170	171	172	173	174	175	176	177	178	179
	Annual										
VOC	PM10	PM2.5	DPM	NOX	SOX	CO	HC	VOC	CO2	CH4	N2O
(lb/day)	(lb/yr)	(lb/yr)	(lb/yr)	(lb/yr)	(lb/yr)	(lb/yr)	(lb/yr)	(lb/yr)	(mty)	(mty)	(mty)
-	35.12	32.42	35.12	1,381.85	36.08	226.11	123.75	130.31	24.70	0.00	0.00
-	8.38	7.74	8.38	315.92	14.83	29.01	12.89	13.58	9.59	0.00	0.00
-	-	-	-	-	-	-	-	-	-	-	-
-	14.17	13.08	14.17	683.91	10.42	121.55	69.73	73.42	7.14	0.00	0.00
-	10.70	9.87	10.70	501.89	18.92	45.25	16.46	17.33	12.24	0.00	0.00
-	2.40	2.23	-	34.30	10.46	3.43	1.71	1.81	7.17	0.00	0.00
-	4.62	4.27	4.62	237.17	3.40	39.67	22.76	23.96	2.33	0.00	0.00
-	2.97	2.75	2.97	157.86	5.26	12.58	4.58	4.82	3.40	0.00	0.00
-	0.99	0.92	-	14.12	4.31	1.41	0.71	0.74	2.95	0.00	0.00
2.53	5.87	5.41	5.87	283.13	4.31	50.32	28.87	30.40	2.95	0.00	0.00
0.44	3.24	2.99	3.24	151.86	5.73	13.69	4.98	5.24	3.70	0.00	0.00
0.05	0.85	0.79	-	12.10	3.69	1.21	0.61	0.64	2.53	0.00	0.00
3.02	**89.31**	**82.46**	**85.07**	**3,774.10**	**117.41**	**544.26**	**287.04**	**302.25**	**78.72**	**0.00**	**0.00**
2.533014	59.7817	55.18311	59.7817	2586.06161	54.2103581	437.663438	245.10476	258.0953076	37.12131755	0.00222359	0.00246853
0.436908	25.28785	23.34263	25.28785	1127.51845	44.7400367	100.539778	38.90438	40.9663119	28.94112373	0.000352941	0.00127941
0.05311	4.236728	3.934105		60.5246914	18.4600309	6.05246914	3.0262346	3.186625	12.656294	0.000027454	0.00100207
-	39.43	36.40	39.43	1,551.55	40.51	253.88	138.95	146.32	27.73	0.00	0.00
-	9.41	8.69	9.41	354.71	16.65	32.58	14.48	15.25	10.77	0.00	0.00
-	-	-	-	-	-	-	-	-	-	-	-
-	23.22	21.44	23.22	1,120.85	17.08	199.21	114.27	120.33	11.70	0.00	0.00
-	17.53	16.18	17.53	822.54	31.01	74.16	26.97	28.40	20.06	0.00	0.00
-	3.93	3.65	-	56.21	17.14	5.62	2.81	2.96	11.75	0.00	0.00
-	7.58	7.00	7.58	365.83	5.57	65.02	37.30	39.27	3.82	0.00	0.00
-	4.87	4.50	4.87	228.71	8.62	20.62	7.50	7.90	5.58	0.00	0.00
-	1.62	1.50	-	23.15	7.06	2.31	1.16	1.22	4.84	0.00	0.00
2.53	9.61	8.87	9.61	464.02	7.07	82.47	47.31	49.82	4.84	0.00	0.00
0.44	5.30	4.90	5.30	248.88	9.38	22.44	8.16	8.59	6.07	0.00	0.00
0.05	1.39	1.29	-	19.84	6.05	1.98	0.99	1.04	4.15	0.00	0.00
3.02	**123.91**	**114.42**	**116.97**	**5,256.29**	**166.15**	**760.31**	**399.90**	**421.09**	**111.31**	**0.00**	**0.01**
2.533014	79.85022	73.70789	79.85022	3502.25372	70.22579	600.588473	337.83209	355.7371861	48.09080871	0.003064813	0.0032767
0.436908	37.11846	34.26319	37.11846	1654.84387	65.6711194	149.800597	57.105321	60.13190324	42.48087687	0.000518059	0.00187797
0.05311	6.943527	6.447561		99.1932442	30.2539395	9.91932442	4.9596622	5.222524306	20.74225961	4.49941E-05	0.00164228

-	39.43	36.40	39.43	1,551.55	40.51	253.88	138.95	146.32	27.73	0.00	0.00
-	9.41	8.69	9.41	354.71	16.65	32.58	14.48	15.25	10.77	0.00	0.00
-	-	-	-	-	-	-	-	-	-	-	-
-	23.22	21.44	23.22	1,120.85	17.08	199.21	114.27	120.33	11.70	0.00	0.00
-	17.53	16.18	17.53	822.54	31.01	74.16	26.97	28.40	20.06	0.00	0.00
-	3.93	3.65	-	56.21	17.14	5.62	2.81	2.96	11.75	0.00	0.00
-	7.58	7.00	7.58	365.83	5.57	65.02	37.30	39.27	3.82	0.00	0.00
-	4.87	4.50	4.87	228.71	8.62	20.62	7.50	7.90	5.58	0.00	0.00
-	1.62	1.50	-	23.15	7.06	2.31	1.16	1.22	4.84	0.00	0.00
2.53	9.61	8.87	9.61	464.02	7.07	82.47	47.31	49.82	4.84	0.00	0.00
0.44	5.30	4.90	5.30	248.88	9.38	22.44	8.16	8.59	6.07	0.00	0.00
0.05	1.39	1.29	-	19.84	6.05	1.98	0.99	1.04	4.15	0.00	0.00
3.02	**123.91**	**114.42**	**116.97**	**5,256.29**	**166.15**	**760.31**	**399.90**	**421.09**	**111.31**	**0.00**	**0.01**
2.533014	79.85022	73.70789	79.85022	3502.25372	70.22579	600.588473	337.83209	355.7371861	48.09080871	0.003064813	0.0032767
0.436908	37.11846	34.26319	37.11846	1654.84387	65.6711194	149.800597	57.105321	60.13190324	42.48087687	0.000518059	0.00187797
0.05311	6.943527	6.447561		99.1932442	30.2539395	9.91932442	4.9596622	5.222524306	20.74225961	4.49941E-05	0.00164228

180	181	182	183	184	185	186	187	188	189	190	191	192	193
	Unmitigated Emissions												
	Zone 2: Breakwater to end of PZ												
	Peak 1-Hour								**8-Hour**	**Peak Day**			
CO2e	PM10	PM2.5	DPM	NOX	SOX	CO	HC	VOC	CO	PM10	PM2.5	DPM	NOX
(mty)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/8-hr)	(lb/day)	(lb/day)	(lb/day)	(lb/day)
25.18	-	-	-	-	-	-	-	-	-	-	-	-	-
9.73	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
7.33	-	-	-	-	-	-	-	-	-	-	-	-	-
12.41	-	-	-	-	-	-	-	-	-	-	-	-	-
7.35	-	-	-	-	-	-	-	-	-	-	-	-	-
2.39	-	-	-	-	-	-	-	-	-	-	-	-	-
3.45	-	-	-	-	-	-	-	-	-	-	-	-	-
3.03	-	-	-	-	-	-	-	-	-	-	-	-	-
3.03	1.29	1.19	1.29	79.62	1.94	6.97	2.99	3.14	6.97	1.29	1.19	1.29	79.62
3.76	0.29	0.27	0.29	13.70	0.52	1.24	0.45	0.47	1.24	0.29	0.27	0.29	13.70
2.59	0.10	0.10	-	1.49	0.45	0.15	0.07	0.08	0.15	0.10	0.10	-	1.49
80.25	**1.69**	**1.56**	**1.59**	**94.80**	**2.91**	**8.35**	**3.51**	**3.70**	**8.35**	**1.69**	**1.56**	**1.59**	**94.80**
37.933256	1.293782	1.194261	1.2937824	79.61738	1.940674	6.966521	2.985652	3.143891	6.9665208	1.293782	1.194261	1.2937824	79.61738
29.345152	0.291986	0.269525	0.2919856	13.70086	0.51659	1.235324	0.449209	0.473017	1.2353237	0.291986	0.269525	0.2919856	13.70086
12.967513	0.103975	0.096548		1.485351	0.453032	0.148535	0.074268	0.078204	0.1485351	0.103975	0.096548		1.485351
28.28	-	-	-	-	-	-	-	-	-	-	-	-	-
10.92	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
12.00	-	-	-	-	-	-	-	-	-	-	-	-	-
20.34	-	-	-	-	-	-	-	-	-	-	-	-	-
12.04	-	-	-	-	-	-	-	-	-	-	-	-	-
3.92	-	-	-	-	-	-	-	-	-	-	-	-	-
5.66	-	-	-	-	-	-	-	-	-	-	-	-	-
4.96	-	-	-	-	-	-	-	-	-	-	-	-	-
4.97	1.29	1.19	1.29	79.62	1.94	6.97	2.99	3.14	6.97	1.29	1.19	1.29	79.62
6.16	0.29	0.27	0.29	13.70	0.52	1.24	0.45	0.47	1.24	0.29	0.27	0.29	13.70
4.25	0.10	0.10	-	1.49	0.45	0.15	0.07	0.08	0.15	0.10	0.10	-	1.49
113.50	**1.69**	**1.56**	**1.59**	**94.80**	**2.91**	**8.35**	**3.51**	**3.70**	**8.35**	**1.69**	**1.56**	**1.59**	**94.80**
49.170947	1.293782	1.194261	1.2937824	79.61738	1.940674	6.966521	2.985652	3.143891	6.9665208	1.293782	1.194261	1.2937824	79.61738
43.073925	0.291986	0.269525	0.2919856	13.70086	0.51659	1.235324	0.449209	0.473017	1.2353237	0.291986	0.269525	0.2919856	13.70086
21.252312	0.103975	0.096548		1.485351	0.453032	0.148535	0.074268	0.078204	0.1485351	0.103975	0.096548		1.485351

28.28	-	-	-	-	-	-	-	-	-	-	-	-	-
10.92	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
12.00	-	-	-	-	-	-	-	-	-	-	-	-	-
20.34	-	-	-	-	-	-	-	-	-	-	-	-	-
12.04	-	-	-	-	-	-	-	-	-	-	-	-	-
3.92	-	-	-	-	-	-	-	-	-	-	-	-	-
5.66	-	-	-	-	-	-	-	-	-	-	-	-	-
4.96	-	-	-	-	-	-	-	-	-	-	-	-	-
4.97	1.29	1.19	1.29	79.62	1.94	6.97	2.99	3.14	6.97	1.29	1.19	1.29	79.62
6.16	0.29	0.27	0.29	13.70	0.52	1.24	0.45	0.47	1.24	0.29	0.27	0.29	13.70
4.25	0.10	0.10	-	1.49	0.45	0.15	0.07	0.08	0.15	0.10	0.10	-	1.49
113.50	**1.69**	**1.56**	**1.59**	**94.80**	**2.91**	**8.35**	**3.51**	**3.70**	**8.35**	**1.69**	**1.56**	**1.59**	**94.80**
49.170947	1.293782	1.194261	1.2937824	79.61738	1.940674	6.966521	2.985652	3.143891	6.9665208	1.293782	1.194261	1.2937824	79.61738
43.073925	0.291986	0.269525	0.2919856	13.70086	0.51659	1.235324	0.449209	0.473017	1.2353237	0.291986	0.269525	0.2919856	13.70086
21.252312	0.103975	0.096548		1.485351	0.453032	0.148535	0.074268	0.078204	0.1485351	0.103975	0.096548		1.485351

194	195	196	197	198	199	200	201	202	203	204	205	206
				Annual								
SOX	CO	HC	VOC	PM10	PM2.5	DPM	NOX	SOX	CO	HC	VOC	CO2
(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/yr)	(lb/yr)	(lb/yr)	(lb/yr)	(lb/yr)	(lb/yr)	(lb/yr)	(lb/yr)	(mty)
-	-	-	-	116.44	107.48	116.44	5,463.67	192.57	492.63	223.92	235.79	131.84
-	-	-	-	4.69	4.33	4.69	176.68	8.29	16.23	7.21	7.59	5.36
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	37.50	34.62	37.50	2,307.79	56.25	201.93	86.54	91.13	38.54
-	-	-	-	11.64	10.75	11.64	546.37	20.60	49.26	17.91	18.86	13.33
-	-	-	-	3.54	3.28	-	50.50	15.40	5.05	2.53	2.66	10.56
-	-	-	-	12.24	11.30	12.24	800.31	18.36	65.91	28.25	29.74	12.58
-	-	-	-	3.91	3.61	3.91	207.69	6.92	16.55	6.02	6.34	4.48
-	-	-	-	1.46	1.35	-	20.79	6.34	2.08	1.04	1.09	4.35
1.94	6.97	2.99	3.14	15.53	14.33	15.53	955.41	23.29	83.60	35.83	37.73	15.95
0.52	1.24	0.45	0.47	3.50	3.23	3.50	164.41	6.20	14.82	5.39	5.68	4.01
0.45	0.15	0.07	0.08	1.25	1.16	-	17.82	5.44	1.78	0.89	0.94	3.73
2.91	**8.35**	**3.51**	**3.70**	**211.69**	**195.44**	**205.45**	**10,711.44**	**359.67**	**949.84**	**415.53**	**437.55**	**244.72**
1.940674	6.966521	2.98565179	3.143891	181.70571	167.7283	181.7057	9527.16954	290.472224	844.062952	374.53673	394.3871809	198.9053278
0.51659	1.235324	0.44920861	0.473017	23.748162	21.92138	23.74816	1095.14816	42.0159783	96.8673118	36.535633	38.47202186	27.17900375
0.453032	0.148535	0.07426755	0.078204	6.2384746	5.792869		89.1210657	27.181925	8.91210657	4.4560533	4.692224109	18.6360704
-	-	-	-	130.74	120.68	130.74	6,134.64	216.22	553.12	251.42	264.74	148.03
-	-	-	-	5.26	4.86	5.26	198.38	9.31	18.22	8.10	8.53	6.02
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	61.46	56.73	61.46	3,782.21	92.19	330.94	141.83	149.35	63.16
-	-	-	-	19.08	17.62	19.08	895.45	33.76	80.74	29.36	30.91	21.84
-	-	-	-	5.79	5.38	-	82.77	25.24	8.28	4.14	4.36	17.31
-	-	-	-	20.06	18.52	20.06	1,234.46	30.09	108.02	46.29	48.75	20.61
-	-	-	-	6.41	5.92	6.41	300.91	11.35	27.13	9.87	10.39	7.34
-	-	-	-	2.39	2.22	-	34.08	10.39	3.41	1.70	1.79	7.13
1.94	6.97	2.99	3.14	25.44	23.49	25.44	1,565.81	38.17	137.01	58.72	61.83	26.15
0.52	1.24	0.45	0.47	5.74	5.30	5.74	269.45	10.16	24.29	8.83	9.30	6.57
0.45	0.15	0.07	0.08	2.04	1.90	-	29.21	8.91	2.92	1.46	1.54	6.11
2.91	**8.35**	**3.51**	**3.70**	**284.43**	**262.61**	**274.21**	**14,527.36**	**485.80**	**1,294.08**	**561.72**	**591.49**	**330.26**
1.940674	6.966521	2.98565179	3.143891	237.70354	219.4186	237.7035	12717.12	376.668885	1129.09028	498.26268	524.6705992	257.944314
0.51659	1.235324	0.44920861	0.473017	36.501524	33.69371	36.50152	1664.18205	64.5796203	150.381044	56.156192	59.13246968	41.7748155
0.453032	0.148535	0.07426755	0.078204	10.224167	9.493869		146.059524	44.5481549	14.6059524	7.3029762	7.690033957	30.54244871

-	-	-	-	130.74	120.68	130.74	6,134.64	216.22	553.12	251.42	264.74	148.03
-	-	-	-	5.26	4.86	5.26	198.38	9.31	18.22	8.10	8.53	6.02
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	61.46	56.73	61.46	3,782.21	92.19	330.94	141.83	149.35	63.16
-	-	-	-	19.08	17.62	19.08	895.45	33.76	80.74	29.36	30.91	21.84
-	-	-	-	5.79	5.38	-	82.77	25.24	8.28	4.14	4.36	17.31
-	-	-	-	20.06	18.52	20.06	1,234.46	30.09	108.02	46.29	48.75	20.61
-	-	-	-	6.41	5.92	6.41	300.91	11.35	27.13	9.87	10.39	7.34
-	-	-	-	2.39	2.22	-	34.08	10.39	3.41	1.70	1.79	7.13
1.94	6.97	2.99	3.14	25.44	23.49	25.44	1,565.81	38.17	137.01	58.72	61.83	26.15
0.52	1.24	0.45	0.47	5.74	5.30	5.74	269.45	10.16	24.29	8.83	9.30	6.57
0.45	0.15	0.07	0.08	2.04	1.90	-	29.21	8.91	2.92	1.46	1.54	6.11
2.91	**8.35**	**3.51**	**3.70**	**284.43**	**262.61**	**274.21**	**14,527.36**	**485.80**	**1,294.08**	**561.72**	**591.49**	**330.26**
1.940674	6.966521	2.98565179	3.143891	237.70354	219.4186	237.7035	12717.12	376.668885	1129.09028	498.26268	524.6705992	257.944314
0.51659	1.235324	0.44920861	0.473017	36.501524	33.69371	36.50152	1664.18205	64.5796203	150.381044	56.156192	59.13246968	41.7748155
0.453032	0.148535	0.07426755	0.078204	10.224167	9.493869		146.059524	44.5481549	14.6059524	7.3029762	7.690033957	30.54244871

207	208	209	210	211	212	213	214	215	216	217	218	219
			Unmitigated Emissions									
			Zone 3: end of PZ to 20nm									
			Peak 1-Hour								**8-Hour**	**Peak Day**
CH4	N2O	CO2e	PM10	PM2.5	DPM	NOX	SOX	CO	HC	VOC	CO	PM10
(mty)	(mty)	(mty)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/8-hr)	(lb/day)
0.00	0.01	133.71	-	-	-	-	-	-	-	-	-	-
0.00	0.00	5.44	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
0.00	0.00	39.14	-	-	-	-	-	-	-	-	-	-
0.00	0.00	13.51	-	-	-	-	-	-	-	-	-	-
0.00	0.00	10.82	-	-	-	-	-	-	-	-	-	-
0.00	0.00	12.77	-	-	-	-	-	-	-	-	-	-
0.00	0.00	4.54	-	-	-	-	-	-	-	-	-	-
0.00	0.00	4.46	-	-	-	-	-	-	-	-	-	-
0.00	0.00	16.20	4.27	3.95	4.27	263.05	6.41	23.02	9.86	10.39	31.25	5.80
0.00	0.00	4.07	0.32	0.30	0.32	15.09	0.57	1.36	0.49	0.52	1.85	0.44
0.00	0.00	3.82	0.11	0.11	-	1.64	0.50	0.16	0.08	0.09	0.22	0.16
0.00	**0.01**	**248.48**	**4.71**	**4.35**	**4.60**	**279.77**	**7.48**	**24.54**	**10.44**	**10.99**	**33.32**	**6.40**
0.003397797	0.009193191	201.826571	4.274489	3.945683	4.27448942	263.0455	6.411734	23.01648	9.8642063	10.38701	31.247629	5.803131
0.000331451	0.001201511	27.5584326	0.321561	0.296825	0.32156085	15.08862	0.568915	1.36045	0.494709	0.520929	1.8469734	0.436557
4.04253E-05	0.001475524	19.0943318	0.114506	0.106327		1.635802	0.49892	0.16358	0.0817901	0.086125	0.2220798	0.155456
0.00	0.01	150.13	-	-	-	-	-	-	-	-	-	-
0.00	0.00	6.11	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
0.00	0.00	64.15	-	-	-	-	-	-	-	-	-	-
0.00	0.00	22.15	-	-	-	-	-	-	-	-	-	-
0.00	0.00	17.73	-	-	-	-	-	-	-	-	-	-
0.00	0.00	20.94	-	-	-	-	-	-	-	-	-	-
0.00	0.00	7.44	-	-	-	-	-	-	-	-	-	-
0.00	0.00	7.30	-	-	-	-	-	-	-	-	-	-
0.00	0.00	26.56	4.27	3.95	4.27	263.05	6.41	23.02	9.86	10.39	31.25	5.80
0.00	0.00	6.66	0.32	0.30	0.32	15.09	0.57	1.36	0.49	0.52	1.85	0.44
0.00	0.00	6.26	0.11	0.11	-	1.64	0.50	0.16	0.08	0.09	0.22	0.16
0.01	**0.02**	**335.42**	**4.71**	**4.35**	**4.60**	**279.77**	**7.48**	**24.54**	**10.44**	**10.99**	**33.32**	**6.40**
0.004520239	0.012026336	261.767403	4.274489	3.945683	4.27448942	263.0455	6.411734	23.01648	9.8642063	10.38701	31.247629	5.803131
0.000509449	0.001846753	42.3580072	0.321561	0.296825	0.32156085	15.08862	0.568915	1.36045	0.494709	0.520929	1.8469734	0.436557
6.62526E-05	0.00241822	31.2934882	0.114506	0.106327		1.635802	0.49892	0.16358	0.0817901	0.086125	0.2220798	0.155456

0.00	0.01	150.13	-	-	-	-	-	-	-	-	-	-
0.00	0.00	6.11	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
0.00	0.00	64.15	-	-	-	-	-	-	-	-	-	-
0.00	0.00	22.15	-	-	-	-	-	-	-	-	-	-
0.00	0.00	17.73	-	-	-	-	-	-	-	-	-	-
0.00	0.00	20.94	-	-	-	-	-	-	-	-	-	-
0.00	0.00	7.44	-	-	-	-	-	-	-	-	-	-
0.00	0.00	7.30	-	-	-	-	-	-	-	-	-	-
0.00	0.00	26.56	4.27	3.95	4.27	263.05	6.41	23.02	9.86	10.39	31.25	5.80
0.00	0.00	6.66	0.32	0.30	0.32	15.09	0.57	1.36	0.49	0.52	1.85	0.44
0.00	0.00	6.26	0.11	0.11	-	1.64	0.50	0.16	0.08	0.09	0.22	0.16
0.01	**0.02**	**335.42**	**4.71**	**4.35**	**4.60**	**279.77**	**7.48**	**24.54**	**10.44**	**10.99**	**33.32**	**6.40**
0.004520239	0.012026336	261.767403	4.274489	3.945683	4.27448942	263.0455	6.411734	23.01648	9.8642063	10.38701	31.247629	5.803131
0.000509449	0.001846753	42.3580072	0.321561	0.296825	0.32156085	15.08862	0.568915	1.36045	0.494709	0.520929	1.8469734	0.436557
6.62526E-05	0.00241822	31.2934882	0.114506	0.106327		1.635802	0.49892	0.16358	0.0817901	0.086125	0.2220798	0.155456

220	221	222	223	224	225	226	227	228	229	230	231	232
							Annual					
PM2.5	DPM	NOX	SOX	CO	HC	VOC	PM10	PM2.5	DPM	NOX	SOX	CO
(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/yr)	(lb/yr)	(lb/yr)	(lb/yr)	(lb/yr)	(lb/yr)
-	-	-	-	-	-	-	383.11	353.64	383.11	17,976.72	633.61	1,620.85
-	-	-	-	-	-	-	8.28	7.65	8.28	312.19	14.65	28.67
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	123.49	113.99	123.49	7,599.55	185.24	664.96
-	-	-	-	-	-	-	20.57	18.99	20.57	965.43	36.40	87.05
-	-	-	-	-	-	-	6.25	5.80	-	89.24	27.22	8.92
-	-	-	-	-	-	-	40.31	37.21	40.31	2,635.41	60.46	217.03
-	-	-	-	-	-	-	6.91	6.38	6.91	366.98	12.23	29.25
-	-	-	-	-	-	-	2.57	2.39	-	36.74	11.21	3.67
5.36	5.80	357.12	8.70	31.25	13.39	14.10	49.88	46.04	49.88	3,069.42	74.82	268.57
0.40	0.44	20.48	0.77	1.85	0.67	0.71	6.19	5.71	6.19	290.51	10.95	26.19
0.14	-	2.22	0.68	0.22	0.11	0.12	2.20	2.05	-	31.49	9.61	3.15
5.90	**6.24**	**379.82**	**10.15**	**33.32**	**14.17**	**14.93**	**649.77**	**599.85**	**638.75**	**33,373.68**	**1,076.39**	**2,958.33**
5.356736	5.8031311	357.1158	8.704697	31.24763	13.3918409	14.101608	596.78745	550.8807	596.7875	31281.1006	954.1212299	2771.42048
0.402976	0.4365573	20.48461	0.772371	1.846973	0.67162668	0.7072229	41.962421	38.73454	41.96242	1935.10002	74.24120605	171.162171
0.144352		2.220798	0.677343	0.22208	0.11103988	0.116925	11.023232	10.23586		157.474743	48.02979675	15.7474743
-	-	-	-	-	-	-	430.16	397.07	430.16	20,184.38	711.42	1,819.90
-	-	-	-	-	-	-	9.30	8.58	9.30	350.52	16.45	32.19
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	202.39	186.82	202.39	12,454.82	303.59	1,089.80
-	-	-	-	-	-	-	33.72	31.13	33.72	1,582.23	59.66	142.66
-	-	-	-	-	-	-	10.24	9.51	-	146.25	44.61	14.62
-	-	-	-	-	-	-	66.06	60.98	66.06	4,065.08	99.09	355.69
-	-	-	-	-	-	-	11.33	10.46	11.33	531.70	20.05	47.94
-	-	-	-	-	-	-	4.22	3.91	-	60.22	18.37	6.02
5.36	5.80	357.12	8.70	31.25	13.39	14.10	81.74	75.46	81.74	5,030.45	122.62	440.16
0.40	0.44	20.48	0.77	1.85	0.67	0.71	10.15	9.37	10.15	476.11	17.95	42.93
0.14	-	2.22	0.68	0.22	0.11	0.12	3.61	3.36	-	51.62	15.74	5.16
5.90	**6.24**	**379.82**	**10.15**	**33.32**	**14.17**	**14.93**	**862.92**	**796.64**	**844.85**	**44,933.38**	**1,429.53**	**3,997.09**
5.356736	5.8031311	357.1158	8.704697	31.24763	13.3918409	14.101608	780.35201	720.3249	780.352	41734.7232	1236.706326	3705.55815
0.402976	0.4365573	20.48461	0.772371	1.846973	0.67162668	0.7072229	64.497301	59.53597	64.4973	2940.56898	114.1106096	265.719627
0.144352		2.220798	0.677343	0.22208	0.11103988	0.116925	18.065853	16.77543		258.083607	78.71550023	25.8083607

-	-	-	-	-	-	-	430.16	397.07	430.16	20,184.38	711.42	1,819.90
-	-	-	-	-	-	-	9.30	8.58	9.30	350.52	16.45	32.19
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	202.39	186.82	202.39	12,454.82	303.59	1,089.80
-	-	-	-	-	-	-	33.72	31.13	33.72	1,582.23	59.66	142.66
-	-	-	-	-	-	-	10.24	9.51	-	146.25	44.61	14.62
-	-	-	-	-	-	-	66.06	60.98	66.06	4,065.08	99.09	355.69
-	-	-	-	-	-	-	11.33	10.46	11.33	531.70	20.05	47.94
-	-	-	-	-	-	-	4.22	3.91	-	60.22	18.37	6.02
5.36	5.80	357.12	8.70	31.25	13.39	14.10	81.74	75.46	81.74	5,030.45	122.62	440.16
0.40	0.44	20.48	0.77	1.85	0.67	0.71	10.15	9.37	10.15	476.11	17.95	42.93
0.14	-	2.22	0.68	0.22	0.11	0.12	3.61	3.36	-	51.62	15.74	5.16
5.90	**6.24**	**379.82**	**10.15**	**33.32**	**14.17**	**14.93**	**862.92**	**796.64**	**844.85**	**44,933.38**	**1,429.53**	**3,997.09**
5.356736	5.8031311	357.1158	8.704697	31.24763	13.3918409	14.101608	780.35201	720.3249	780.352	41734.7232	1236.706326	3705.55815
0.402976	0.4365573	20.48461	0.772371	1.846973	0.67162668	0.7072229	64.497301	59.53597	64.4973	2940.56898	114.1106096	265.719627
0.144352		2.220798	0.677343	0.22208	0.11103988	0.116925	18.065853	16.77543		258.083607	78.71550023	25.8083607

233	234	235	236	237	238	239	240	241	242	243
						Unmitigated Emissions				
						Zone 4: 20nm to 40nm				
						Peak 1-Hour				
HC	VOC	CO2	CH4	N2O	CO2e	PM10	PM2.5	DPM	NOX	SOX
(lb/yr)	(lb/yr)	(mty)	(mty)	(mty)	(mty)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
736.75	775.80	433.78	0.01	0.02	439.93	-	-	-	-	-
12.74	13.42	9.48	0.00	0.00	9.61	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
284.98	300.09	126.90	0.00	0.01	128.89	-	-	-	-	-
31.65	33.33	23.55	0.00	0.00	23.88	-	-	-	-	-
4.46	4.70	18.66	0.00	0.00	19.12	-	-	-	-	-
93.01	97.94	41.42	0.00	0.00	42.07	-	-	-	-	-
10.64	11.20	7.91	0.00	0.00	8.02	-	-	-	-	-
1.84	1.93	7.68	0.00	0.00	7.87	-	-	-	-	-
115.10	121.20	51.25	0.00	0.00	52.06	4.27	3.95	4.27	263.05	6.41
9.52	10.03	7.09	0.00	0.00	7.18	0.32	0.30	0.32	15.09	0.57
1.57	1.66	6.59	0.00	0.00	6.75	0.11	0.11	-	1.64	0.50
1,302.28	**1,371.30**	**734.30**	**0.01**	**0.03**	**745.38**	**4.71**	**4.35**	**4.60**	**279.77**	**7.48**
1229.851672	1295.033811	653.3487431	0.011157214	0.030193772	662.943114	4.274489	3.945683	4.274489418	263.045503	6.41173413
64.55757048	67.97912171	48.02463491	0.000585666	0.00212304	48.69507638	0.321561	0.296825	0.321560847	15.0886243	0.56891534
7.873737173	8.291045243	32.92948061	7.14305E-05	0.002607215	33.73921726	0.114506	0.106327		1.63580247	0.49891975
827.23	871.07	487.05	0.01	0.02	493.95	-	-	-	-	-
14.31	15.07	10.64	0.00	0.00	10.79	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
467.06	491.81	207.97	0.00	0.01	211.24	-	-	-	-	-
51.88	54.63	38.59	0.00	0.00	39.13	-	-	-	-	-
7.31	7.70	30.58	0.00	0.00	31.33	-	-	-	-	-
152.44	160.52	67.88	0.00	0.00	68.94	-	-	-	-	-
17.43	18.36	12.97	0.00	0.00	13.15	-	-	-	-	-
3.01	3.17	12.59	0.00	0.00	12.90	-	-	-	-	-
188.64	198.64	84.00	0.00	0.00	85.32	4.27	3.95	4.27	263.05	6.41
15.61	16.44	11.61	0.00	0.00	11.77	0.32	0.30	0.32	15.09	0.57
2.58	2.72	10.79	0.00	0.00	11.06	0.11	0.11	-	1.64	0.50
1,747.50	**1,840.11**	**974.68**	**0.02**	**0.05**	**989.59**	**4.71**	**4.35**	**4.60**	**279.77**	**7.48**
1635.36657	1722.040999	846.9006407	0.014836046	0.03948101	859.4513107	4.274489	3.945683	4.274489418	263.045503	6.41173413
99.22661701	104.4856277	73.8150773	0.000900184	0.003263167	74.84556278	0.321561	0.296825	0.321560847	15.0886243	0.56891534
12.90418037	13.58810193	53.96775989	0.000117067	0.004272935	55.29482828	0.114506	0.106327		1.63580247	0.49891975

827.23	871.07	487.05	0.01	0.02	493.95	-	-	-	-	-
14.31	15.07	10.64	0.00	0.00	10.79	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
467.06	491.81	207.97	0.00	0.01	211.24	-	-	-	-	-
51.88	54.63	38.59	0.00	0.00	39.13	-	-	-	-	-
7.31	7.70	30.58	0.00	0.00	31.33	-	-	-	-	-
152.44	160.52	67.88	0.00	0.00	68.94	-	-	-	-	-
17.43	18.36	12.97	0.00	0.00	13.15	-	-	-	-	-
3.01	3.17	12.59	0.00	0.00	12.90	-	-	-	-	-
188.64	198.64	84.00	0.00	0.00	85.32	4.27	3.95	4.27	263.05	6.41
15.61	16.44	11.61	0.00	0.00	11.77	0.32	0.30	0.32	15.09	0.57
2.58	2.72	10.79	0.00	0.00	11.06	0.11	0.11	-	1.64	0.50
1,747.50	**1,840.11**	**974.68**	**0.02**	**0.05**	**989.59**	**4.71**	**4.35**	**4.60**	**279.77**	**7.48**
1635.36657	1722.040999	846.9006407	0.014836046	0.03948101	859.4513107	4.274489	3.945683	4.274489418	263.045503	6.41173413
99.22661701	104.4856277	73.8150773	0.000900184	0.003263167	74.84556278	0.321561	0.296825	0.321560847	15.0886243	0.56891534
12.90418037	13.58810193	53.96775989	0.000117067	0.004272935	55.29482828	0.114506	0.106327		1.63580247	0.49891975

244	245	246	247	248	249	250	251	252	253	254
			8-Hour	Peak Day						
CO	HC	VOC	CO	PM10	PM2.5	DPM	NOX	SOX	CO	HC
(lb/hr)	(lb/hr)	(lb/hr)	(lb/8-hr)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
23.02	9.86	10.39	36.71	6.82	6.29	6.82	419.54	10.23	36.71	15.73
1.36	0.49	0.52	2.17	0.51	0.47	0.51	24.07	0.91	2.17	0.79
0.16	0.08	0.09	0.26	0.18	0.17	-	2.61	0.80	0.26	0.13
24.54	**10.44**	**10.99**	**39.14**	**7.51**	**6.94**	**7.33**	**446.22**	**11.93**	**39.14**	**16.65**
23.0164815	9.86420635	10.3870093	36.7099003	6.81755292	6.29312577	6.81755292	419.541718	10.2263294	36.7099003	15.7328144
1.36044974	0.49470899	0.52092857	2.16983531	0.51287016	0.47341861	0.51287016	24.0654461	0.90738567	2.16983531	0.78903102
0.16358025	0.08179012	0.086125	0.26090063	0.18263044	0.16958541		2.60900632	0.79574693	0.26090063	0.13045032
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
23.02	9.86	10.39	36.71	6.82	6.29	6.82	419.54	10.23	36.71	15.73
1.36	0.49	0.52	2.17	0.51	0.47	0.51	24.07	0.91	2.17	0.79
0.16	0.08	0.09	0.26	0.18	0.17	-	2.61	0.80	0.26	0.13
24.54	**10.44**	**10.99**	**39.14**	**7.51**	**6.94**	**7.33**	**446.22**	**11.93**	**39.14**	**16.65**
23.0164815	9.86420635	10.3870093	36.7099003	6.81755292	6.29312577	6.81755292	419.541718	10.2263294	36.7099003	15.7328144
1.36044974	0.49470899	0.52092857	2.16983531	0.51287016	0.47341861	0.51287016	24.0654461	0.90738567	2.16983531	0.78903102
0.16358025	0.08179012	0.086125	0.26090063	0.18263044	0.16958541		2.60900632	0.79574693	0.26090063	0.13045032

-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
23.02	9.86	10.39	36.71	6.82	6.29	6.82	419.54	10.23	36.71	15.73
1.36	0.49	0.52	2.17	0.51	0.47	0.51	24.07	0.91	2.17	0.79
0.16	0.08	0.09	0.26	0.18	0.17	-	2.61	0.80	0.26	0.13
24.54	**10.44**	**10.99**	**39.14**	**7.51**	**6.94**	**7.33**	**446.22**	**11.93**	**39.14**	**16.65**
23.0164815	9.86420635	10.3870093	36.7099003	6.81755292	6.29312577	6.81755292	419.541718	10.2263294	36.7099003	15.7328144
1.36044974	0.49470899	0.52092857	2.16983531	0.51287016	0.47341861	0.51287016	24.0654461	0.90738567	2.16983531	0.78903102
0.16358025	0.08179012	0.086125	0.26090063	0.18263044	0.16958541		2.60900632	0.79574693	0.26090063	0.13045032

255	256	257	258	259	260	261	262	263	264	265
	Annual									
VOC	PM10	PM2.5	DPM	NOX	SOX	CO	HC	VOC	CO2	CH4
(lb/day)	(lb/yr)	(lb/yr)	(lb/yr)	(lb/yr)	(lb/yr)	(lb/yr)	(lb/yr)	(lb/yr)	(mty)	(mty)
-	450.08	415.46	450.08	21119.15	744.36	1904.19	865.54	911.41	509.61	0.01
-	9.73	8.98	9.73	366.76	17.22	33.68	14.97	15.76	11.14	0.00
-										
-	145.08	133.92	145.08	8927.99	217.62	781.20	334.80	352.54	149.08	0.00
-	24.17	22.31	24.17	1134.19	42.76	102.26	37.19	39.16	27.66	0.00
-	7.34	6.81		104.83	31.97	10.48	5.24	5.52	21.92	0.00
-	47.35	43.71	47.35	3096.10	71.03	254.97	109.27	115.07	48.66	0.00
-	8.12	7.50	8.12	431.13	14.37	34.37	12.50	13.16	9.30	0.00
-	3.02	2.81		43.17	13.17	4.32	2.16	2.27	9.03	0.00
16.57	58.60	54.09	58.60	3605.98	87.90	315.52	135.22	142.39	60.21	0.00
0.83	7.27	6.71	7.27	341.29	12.87	30.77	11.19	11.78	8.32	0.00
0.14	2.59	2.41		37.00	11.29	3.70	1.85	1.95	7.74	0.00
17.53	**763.36**	**704.71**	**750.41**	**39,207.59**	**1,264.55**	**3,475.46**	**1,529.93**	**1,611.02**	**862.66**	**0.01**
16.5666536	701.10945	647.177954	701.10945	36749.2232	1120.9073	3255.88128	1444.83707	1521.41343	767.557993	0.01310756
0.83084967	49.2977018	45.5055709	49.2977018	2273.36702	87.2190109	201.082337	75.8426182	79.8622769	56.419627	0.00068804
0.13736418	12.9501586	12.0251473		185.002266	56.4256912	18.5002266	9.25011331	9.74036931	38.6857499	8.3917E-05
-	505.35	466.48	505.35	23712.73	835.78	2138.03	971.83	1023.34	572.19	0.01
-	10.93	10.08	10.93	411.80	19.33	37.82	16.81	17.70	12.50	0.00
-										
-	237.77	219.48	237.77	14631.99	356.65	1280.30	548.70	577.78	244.33	0.00
-	39.61	36.57	39.61	1858.81	70.09	167.60	60.94	64.17	45.34	0.00
-	12.03	11.17		171.81	52.40	17.18	8.59	9.05	35.93	0.00
-	77.60	71.64	77.60	4775.68	116.41	417.87	179.09	188.58	79.74	0.00
-	13.31	12.29	13.31	624.65	23.55	56.32	20.48	21.57	15.24	0.00
-	4.95	4.60		70.75	21.58	7.07	3.54	3.72	14.79	0.00
16.57	96.03	88.65	96.03	5909.80	144.05	517.11	221.62	233.36	98.68	0.00
0.83	11.92	11.00	11.92	559.34	21.09	50.43	18.34	19.31	13.64	0.00
0.14	4.24	3.94		60.64	18.50	6.06	3.03	3.19	12.68	0.00
17.53	**1,013.76**	**935.89**	**992.53**	**52,788.00**	**1,679.42**	**4,695.80**	**2,052.97**	**2,161.78**	**1,145.06**	**0.02**
16.5666536	916.762191	846.242022	916.762191	49030.2013	1452.88996	4353.31178	1921.23838	2023.06402	994.943915	0.01742947
0.83084967	75.7718133	69.9432123	75.7718133	3454.59795	134.057824	312.169	116.57202	122.750338	86.7183923	0.00105754
0.13736418	21.2238711	19.7078803		303.198158	92.4754383	30.3198158	15.1599079	15.963383	63.4016456	0.00013753

-	505.35	466.48	505.35	23712.73	835.78	2138.03	971.83	1023.34	572.19	0.01
-	10.93	10.08	10.93	411.80	19.33	37.82	16.81	17.70	12.50	0.00
-										
-	237.77	219.48	237.77	14631.99	356.65	1280.30	548.70	577.78	244.33	0.00
-	39.61	36.57	39.61	1858.81	70.09	167.60	60.94	64.17	45.34	0.00
-	12.03	11.17		171.81	52.40	17.18	8.59	9.05	35.93	0.00
-	77.60	71.64	77.60	4775.68	116.41	417.87	179.09	188.58	79.74	0.00
-	13.31	12.29	13.31	624.65	23.55	56.32	20.48	21.57	15.24	0.00
-	4.95	4.60		70.75	21.58	7.07	3.54	3.72	14.79	0.00
16.57	96.03	88.65	96.03	5909.80	144.05	517.11	221.62	233.36	98.68	0.00
0.83	11.92	11.00	11.92	559.34	21.09	50.43	18.34	19.31	13.64	0.00
0.14	4.24	3.94		60.64	18.50	6.06	3.03	3.19	12.68	0.00
17.53	**1,013.76**	**935.89**	**992.53**	**52,788.00**	**1,679.42**	**4,695.80**	**2,052.97**	**2,161.78**	**1,145.06**	**0.02**
16.5666536	916.762191	846.242022	916.762191	49030.2013	1452.88996	4353.31178	1921.23838	2023.06402	994.943915	0.01742947
0.83084967	75.7718133	69.9432123	75.7718133	3454.59795	134.057824	312.169	116.57202	122.750338	86.7183923	0.00105754
0.13736418	21.2238711	19.7078803		303.198158	92.4754383	30.3198158	15.1599079	15.963383	63.4016456	0.00013753

266	267	268	269	270	271	272	273	274	275	276	277	278

Unmitigated Emissions

Zone 5: 40 nm to 50 nm

		Peak 1-Hour								8-Hour	Peak Day	
N2O	CO2e	PM10	PM2.5	DPM	NOX	SOX	CO	HC	VOC	CO	PM10	PM2.5
(mty)	(mty)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/8-hr)	(lb/day)	(lb/day)
0.02	516.83	-	-	-	-	-	-	-	-	-	-	-
0.00	11.29	-	-	-	-	-	-	-	-	-	-	-
											-	-
0.01	151.42	-	-	-	-	-	-	-	-	-	-	-
0.00	28.05	-	-	-	-	-	-	-	-	-	-	-
0.00	22.46										-	-
0.00	49.42	-	-	-	-	-	-	-	-	-	-	-
0.00	9.43	-	-	-	-	-	-	-	-	-	-	-
0.00	9.25										-	-
0.00	61.16	0.94	0.86	0.94	57.63	1.40	5.04	2.16	2.28	5.04	0.94	0.86
0.00	8.44	0.06	0.05	0.06	2.73	0.10	0.25	0.09	0.09	0.25	0.06	0.05
0.00	7.93										-	-
0.04	**875.67**	**0.99**	**0.92**	**0.99**	**60.36**	**1.51**	**5.29**	**2.25**	**2.37**	**5.29**	**0.99**	**0.92**
0.03547182	778.829517	0.936456	0.86442092	0.936456	57.62806	1.404684	5.042455	2.161052	2.275588	5.042455	0.936456	0.864421
0.00249416	57.2072657	0.05811928	0.05364857	0.05811928	2.727136	0.102826	0.245889	0.089414	0.094153	0.245889	0.058119	0.053649
0.00306297	39.6370333											
0.03	580.30	-	-	-	-	-	-	-	-	-	-	-
0.00	12.68	-	-	-	-	-	-	-	-	-	-	-
											-	-
0.01	248.16	-	-	-	-	-	-	-	-	-	-	-
0.00	45.97	-	-	-	-	-	-	-	-	-	-	-
0.00	36.81										-	-
0.00	81.00	-	-	-	-	-	-	-	-	-	-	-
0.00	15.45	-	-	-	-	-	-	-	-	-	-	-
0.00	15.16										-	-
0.00	100.23	0.94	0.86	0.94	57.63	1.40	5.04	2.16	2.28	5.04	0.94	0.86
0.00	13.83	0.06	0.05	0.06	2.73	0.10	0.25	0.09	0.09	0.25	0.06	0.05
0.00	12.99										-	-
0.06	**1,162.58**	**0.99**	**0.92**	**0.99**	**60.36**	**1.51**	**5.29**	**2.25**	**2.37**	**5.29**	**0.99**	**0.92**
0.04638253	1009.68852	0.936456	0.86442092	0.936456	57.62806	1.404684	5.042455	2.161052	2.275588	5.042455	0.936456	0.864421
0.00383359	87.9290128	0.05811928	0.05364857	0.05811928	2.727136	0.102826	0.245889	0.089414	0.094153	0.245889	0.058119	0.053649
0.00501987	64.9606935											

0.03	580.30	-	-	-	-	-	-	-	-	-	-	-
0.00	12.68	-	-	-	-	-	-	-	-	-	-	-
											-	-
0.01	248.16	-	-	-	-	-	-	-	-	-	-	-
0.00	45.97	-	-	-	-	-	-	-	-	-	-	-
0.00	36.81										-	-
0.00	81.00	-	-	-	-	-	-	-	-	-	-	-
0.00	15.45	-	-	-	-	-	-	-	-	-	-	-
0.00	15.16										-	-
0.00	100.23	0.94	0.86	0.94	57.63	1.40	5.04	2.16	2.28	5.04	0.94	0.86
0.00	13.83	0.06	0.05	0.06	2.73	0.10	0.25	0.09	0.09	0.25	0.06	0.05
0.00	12.99										-	-
0.06	**1,162.58**	**0.99**	**0.92**	**0.99**	**60.36**	**1.51**	**5.29**	**2.25**	**2.37**	**5.29**	**0.99**	**0.92**
0.04638253	1009.68852	0.936456	0.86442092	0.936456	57.62806	1.404684	5.042455	2.161052	2.275588	5.042455	0.936456	0.864421
0.00383359	87.9290128	0.05811928	0.05364857	0.05811928	2.727136	0.102826	0.245889	0.089414	0.094153	0.245889	0.058119	0.053649
0.00501987	64.9606935											

279	280	281	282	283	284	285	286	287	288	289	290	291	292
						Annual							
DPM	NOX	SOX	CO	HC	VOC	PM10	PM2.5	DPM	NOX	SOX	CO	HC	VOC
(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/yr)	(lb/yr)	(lb/yr)	(lb/yr)	(lb/yr)	(lb/yr)	(lb/yr)	(lb/yr)
-	-	-	-	-	-	70.57	65.14	70.57	3,311.21	116.71	298.55	135.71	142.90
-	-	-	-	-	-	1.03	0.95	1.03	38.81	1.82	3.56	1.58	1.67
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	27.33	25.23	27.33	1,681.69	40.99	147.15	63.06	66.41
-	-	-	-	-	-	2.33	2.15	2.33	109.49	4.13	9.87	3.59	3.78
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	8.98	8.29	8.98	587.15	13.47	48.35	20.72	21.82
-	-	-	-	-	-	0.79	0.73	0.79	41.90	1.40	3.34	1.21	1.28
-	-	-	-	-	-	-	-	-	-	-	-	-	-
0.94	57.63	1.40	5.04	2.16	2.28	11.24	10.37	11.24	691.54	16.86	60.51	25.93	27.31
0.06	2.73	0.10	0.25	0.09	0.09	0.70	0.64	0.70	32.73	1.23	2.95	1.07	1.13
-	-	-	-	-	-	-	-	-	-	-	-	-	-
0.99	**60.36**	**1.51**	**5.29**	**2.25**	**2.37**	**122.96**	**113.50**	**122.96**	**6,494.53**	**196.61**	**574.29**	**252.89**	**266.29**
0.936456	57.62806	1.404684	5.042455	2.161052	2.275588	118.1119	109.0263	118.11186	6271.598	188.0242	554.5636	245.42472	258.4322
0.058119	2.727136	0.102826	0.245889	0.089414	0.094153	4.850049	4.476969	4.8500493	222.9318	8.580856	19.72731	7.4616143	7.85708
-	-	-	-	-	-	79.23	73.14	79.23	3,717.86	131.04	335.22	152.37	160.45
-	-	-	-	-	-	1.16	1.07	1.16	43.58	2.05	4.00	1.78	1.87
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	44.79	41.34	44.79	2,756.11	67.18	241.16	103.35	108.83
-	-	-	-	-	-	3.82	3.53	3.82	179.44	6.77	16.18	5.88	6.20
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	14.72	13.59	14.72	905.67	22.08	79.25	33.96	35.76
-	-	-	-	-	-	1.29	1.19	1.29	60.71	2.29	5.47	1.99	2.10
-	-	-	-	-	-	-	-	-	-	-	-	-	-
0.94	57.63	1.40	5.04	2.16	2.28	18.42	17.00	18.42	1,133.35	27.63	99.17	42.50	44.75
0.06	2.73	0.10	0.25	0.09	0.09	1.14	1.06	1.14	53.63	2.02	4.84	1.76	1.85
-	-	-	-	-	-	-	-	-	-	-	-	-	-
0.99	**60.36**	**1.51**	**5.29**	**2.25**	**2.37**	**164.57**	**151.91**	**164.57**	**8,850.36**	**261.04**	**785.28**	**343.60**	**361.81**
0.936456	57.62806	1.404684	5.042455	2.161052	2.275588	157.1539	145.0652	157.15392	8512.99	247.9206	754.7908	332.18868	349.7947
0.058119	2.727136	0.102826	0.245889	0.089414	0.094153	7.417244	6.846687	7.4172443	337.367	13.12282	30.49124	11.411145	12.01594

-	-	-	-	-	-	79.23	73.14	79.23	3,717.86	131.04	335.22	152.37	160.45
-	-	-	-	-	-	1.16	1.07	1.16	43.58	2.05	4.00	1.78	1.87
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	44.79	41.34	44.79	2,756.11	67.18	241.16	103.35	108.83
-	-	-	-	-	-	3.82	3.53	3.82	179.44	6.77	16.18	5.88	6.20
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	14.72	13.59	14.72	905.67	22.08	79.25	33.96	35.76
-	-	-	-	-	-	1.29	1.19	1.29	60.71	2.29	5.47	1.99	2.10
-	-	-	-	-	-	-	-	-	-	-	-	-	-
0.94	57.63	1.40	5.04	2.16	2.28	18.42	17.00	18.42	1,133.35	27.63	99.17	42.50	44.75
0.06	2.73	0.10	0.25	0.09	0.09	1.14	1.06	1.14	53.63	2.02	4.84	1.76	1.85
-	-	-	-	-	-	-	-	-	-	-	-	-	-
0.99	**60.36**	**1.51**	**5.29**	**2.25**	**2.37**	**164.57**	**151.91**	**164.57**	**8,850.36**	**261.04**	**785.28**	**343.60**	**361.81**
0.936456	57.62806	1.404684	5.042455	2.161052	2.275588	157.1539	145.0652	157.15392	8512.99	247.9206	754.7908	332.18868	349.7947
0.058119	2.727136	0.102826	0.245889	0.089414	0.094153	7.417244	6.846687	7.4172443	337.367	13.12282	30.49124	11.411145	12.01594

Unmitigated Emissions

Zone 6: 50 nm to 170 nm

293	294	295	296	297	298	299	300	301	302	303	304	305
				Peak 1-Hour								**8-Hour**
CO2	CH4	N2O	CO2e	PM10	PM2.5	DPM	NOX	SOX	CO	HC	VOC	CO
(mty)	(mty)	(mty)	(mty)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/8-hr)
79.90	0.00	0.00	81.032	-	-	-	-	-	-	-	-	-
1.18	0.00	0.00	1.195	-	-	-	-	-	-	-	-	-
-	-	-										
28.08	0.00	0.00	28.522	-	-	-	-	-	-	-	-	-
2.67	0.00	0.00	2.708	-	-	-	-	-	-	-	-	-
-	-	-										
9.23	0.00	0.00	9.372	-	-	-	-	-	-	-	-	-
0.90	0.00	0.00	0.916	-	-	-	-	-	-	-	-	-
-	-	-										
11.55	0.00	0.00	11.729	5.18	4.78	5.18	318.84	7.77	27.90	11.96	12.59	223.19
0.80	0.00	0.00	0.809	0.32	0.30	0.32	15.09	0.57	1.36	0.49	0.52	10.88
-	-	-										
134.31	**0.00**	**0.01**	**136.28**	**5.50**	**5.08**	**5.50**	**333.93**	**8.34**	**29.26**	**12.45**	**13.11**	**234.07**
128.7559	0.002226	0.005976	130.6551571	5.181199	4.782646	5.181199295	318.843	7.771799	27.89877	11.9566138	12.590314	223.19012
5.550725	6.77E-05	0.000245	5.628214841	0.321561	0.296825	0.321560847	15.08862	0.568915	1.36045	0.49470899	0.5209286	10.883598
89.71	0.00	0.00	90.984	-	-	-	-	-	-	-	-	-
1.32	0.00	0.00	1.342	-	-	-	-	-	-	-	-	-
-	-	-										
46.02	0.00	0.00	46.744	-	-	-	-	-	-	-	-	-
4.38	0.00	0.00	4.438	-	-	-	-	-	-	-	-	-
-	-	-										
15.12	0.00	0.00	15.360	-	-	-	-	-	-	-	-	-
1.48	0.00	0.00	1.501	-	-	-	-	-	-	-	-	-
-	-	-										
18.92	0.00	0.00	19.222	5.18	4.78	5.18	318.84	7.77	27.90	11.96	12.59	223.19
1.31	0.00	0.00	1.326	0.32	0.30	0.32	15.09	0.57	1.36	0.49	0.52	10.88
-	-	-										
178.27	**0.00**	**0.01**	**180.92**	**5.50**	**5.08**	**5.50**	**333.93**	**8.34**	**29.26**	**12.45**	**13.11**	**234.07**
169.7819	0.003014	0.007951	172.3099549	5.181199	4.782646	5.181199295	318.843	7.771799	27.89877	11.9566138	12.590314	223.19012
8.488796	0.000104	0.000375	8.607303154	0.321561	0.296825	0.321560847	15.08862	0.568915	1.36045	0.49470899	0.5209286	10.883598

89.71	0.00	0.00	90.984	-	-	-	-	-	-	-	-	-
1.32	0.00	0.00	1.342	-	-	-	-	-	-	-	-	-
-	-	-										
46.02	0.00	0.00	46.744	-	-	-	-	-	-	-	-	-
4.38	0.00	0.00	4.438	-	-	-	-	-	-	-	-	-
-	-	-										
15.12	0.00	0.00	15.360	-	-	-	-	-	-	-	-	-
1.48	0.00	0.00	1.501	-	-	-	-	-	-	-	-	-
-	-	-										
18.92	0.00	0.00	19.222	5.18	4.78	5.18	318.84	7.77	27.90	11.96	12.59	223.19
1.31	0.00	0.00	1.326	0.32	0.30	0.32	15.09	0.57	1.36	0.49	0.52	10.88
-	-	-										
178.27	**0.00**	**0.01**	**180.92**	**5.50**	**5.08**	**5.50**	**333.93**	**8.34**	**29.26**	**12.45**	**13.11**	**234.07**
169.7819	0.003014	0.007951	172.3099549	5.181199	4.782646	5.181199295	318.843	7.771799	27.89877	11.9566138	12.590314	223.19012
8.488796	0.000104	0.000375	8.607303154	0.321561	0.296825	0.321560847	15.08862	0.568915	1.36045	0.49470899	0.5209286	10.883598

306	307	308	309	310	311	312	313	314	315	316	317	318
Peak Day								Annual				
PM10	PM2.5	DPM	NOX	SOX	CO	HC	VOC	PM10	PM2.5	DPM	NOX	SOX
(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/yr)	(lb/yr)	(lb/yr)	(lb/yr)	(lb/yr)
-	-	-	-	-	-	-	-	3,598.91	3,322.07	3,598.91	168,871.96	5,952.04
-	-	-	-	-	-	-	-	52.52	48.48	52.52	1,979.54	92.92
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	1,393.70	1,286.50	1,393.70	85,766.35	2,090.55
-	-	-	-	-	-	-	-	119.00	109.85	119.00	5,583.97	210.54
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	457.98	422.75	457.98	29,944.83	686.97
-	-	-	-	-	-	-	-	40.26	37.17	40.26	2,137.00	71.23
-	-	-	-	-	-	-	-	-	-	-	-	-
47.76	44.09	47.76	2,939.03	71.64	257.17	110.21	116.05	573.11	529.03	573.11	35,268.37	859.67
2.96	2.74	2.96	139.08	5.24	12.54	4.56	4.80	35.57	32.83	35.57	1,669.01	62.93
-	-	-	-	-	-	-	-	-	-	-	-	-
50.72	**46.82**	**50.72**	**3,078.12**	**76.88**	**269.71**	**114.77**	**120.86**	**6,271.06**	**5,788.67**	**6,271.06**	**331,221.04**	**10,026.86**
47.75926	44.085467	47.759256	2939.031	71.63888	257.16522	110.2136675	116.05499	6023.7047	5560.3428	6023.7047	319851.5161	9589.235607
2.964083	2.736077	2.9640834	139.0839	5.244148	12.540353	4.560128289	4.8018151	247.35251	228.3254	247.35251	11369.52331	437.6236763
-	-	-	-	-	-	-	-	4,040.88	3,730.05	4,040.88	189,610.63	6,683.00
-	-	-	-	-	-	-	-	58.97	54.43	58.97	2,222.64	104.33
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	2,284.12	2,108.42	2,284.12	140,561.51	3,426.19
-	-	-	-	-	-	-	-	195.03	180.03	195.03	9,151.51	345.06
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	750.58	692.84	750.58	46,189.41	1,125.87
-	-	-	-	-	-	-	-	65.99	60.91	65.99	3,096.24	116.74
-	-	-	-	-	-	-	-	-	-	-	-	-
47.76	44.09	47.76	2,939.03	71.64	257.17	110.21	116.05	939.27	867.01	939.27	57,800.95	1,408.90
2.96	2.74	2.96	139.08	5.24	12.54	4.56	4.80	58.29	53.81	58.29	2,735.32	103.13
-	-	-	-	-	-	-	-	-	-	-	-	-
50.72	**46.82**	**50.72**	**3,078.12**	**76.88**	**269.71**	**114.77**	**120.86**	**8,393.13**	**7,747.50**	**8,393.13**	**451,368.21**	**13,313.21**
47.75926	44.085467	47.759256	2939.031	71.63888	257.16522	110.2136675	116.05499	8014.8501	7398.3232	8014.8501	434162.4984	12643.94936
2.964083	2.736077	2.9640834	139.0839	5.244148	12.540353	4.560128289	4.8018151	378.27946	349.18104	378.27946	17205.71523	669.2636574

-	-	-	-	-	-	-	-	4,040.88	3,730.05	4,040.88	189,610.63	6,683.00
-	-	-	-	-	-	-	-	58.97	54.43	58.97	2,222.64	104.33
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	2,284.12	2,108.42	2,284.12	140,561.51	3,426.19
-	-	-	-	-	-	-	-	195.03	180.03	195.03	9,151.51	345.06
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	750.58	692.84	750.58	46,189.41	1,125.87
-	-	-	-	-	-	-	-	65.99	60.91	65.99	3,096.24	116.74
-	-	-	-	-	-	-	-	-	-	-	-	-
47.76	44.09	47.76	2,939.03	71.64	257.17	110.21	116.05	939.27	867.01	939.27	57,800.95	1,408.90
2.96	2.74	2.96	139.08	5.24	12.54	4.56	4.80	58.29	53.81	58.29	2,735.32	103.13
-	-	-	-	-	-	-	-	-	-	-	-	-
50.72	**46.82**	**50.72**	**3,078.12**	**76.88**	**269.71**	**114.77**	**120.86**	**8,393.13**	**7,747.50**	**8,393.13**	**451,368.21**	**13,313.21**
47.75926	44.085467	47.759256	2939.031	71.63888	257.16522	110.2136675	116.05499	8014.8501	7398.3232	8014.8501	434162.4984	12643.94936
2.964083	2.736077	2.9640834	139.0839	5.244148	12.540353	4.560128289	4.8018151	378.27946	349.18104	378.27946	17205.71523	669.2636574

Revisit these combined peak-hr and 8-hr emissio

Unmitigated Emissions

Total Transit Emissions Zones 1-5

Peak 1-Hour

319	320	321	322	323	324	325	326	327	328	329
CO	HC	VOC	CO2	CH4	N2O	CO2e	PM10	PM2.5	DPM	NOX
(lb/yr)	(lb/yr)	(lb/yr)	(mty)	(mty)	(mty)	(mty)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
15,226.16	6,920.98	7,287.79	4,074.89	0.06	0.18	4132.650	-	-	-	-
181.79	80.80	85.08	60.11	0.00	0.00	60.945	-	-	-	-
-	-	-	-	-	-		-	-	-	-
7,504.56	3,216.24	3,386.70	1,432.14	0.03	0.07	1454.611	-	-	-	-
503.47	183.08	192.78	136.19	0.00	0.01	138.096	-	-	-	-
-	-	-	-	-	-		-	-	-	-
2,466.04	1,056.88	1,112.89	470.61	0.01	0.02	477.995	-	-	-	-
170.34	61.94	65.22	46.08	0.00	0.00	46.722	-	-	-	-
-	-	-	-	-	-		-	-	-	-
3,085.98	1,322.56	1,392.66	588.92	0.01	0.03	598.157	4.27	3.95	4.27	263.05
150.48	54.72	57.62	40.71	0.00	0.00	41.276	0.32	0.30	0.32	15.09
-	-	-	-	-	-		0.11	0.11	-	1.64
29,288.84	**12,897.20**	**13,580.75**	**6,849.64**	**0.12**	**0.32**	**6,950.45**	**4.71**	**4.35**	**4.60**	**279.77**
28282.74369	12516.66056	13180.04357	6566.552099	0.113551145	0.304762388	6663.413013	4.274489	3.945683	4.274489418	263.0455
1006.092583	380.5423272	400.7110705	283.0869594	0.00345228	0.012514515	287.0389569	0.321561	0.296825	0.321560847	15.08862
							0.114506	0.106327		1.635802
17,096.04	7,770.93	8,182.79	4,575.31	0.07	0.20	4640.169	-	-	-	-
204.12	90.72	95.53	67.49	0.00	0.00	68.429	-	-	-	-
-	-	-	-	-	-		-	-	-	-
12,299.13	5,271.06	5,550.42	2,347.12	0.05	0.12	2383.946	-	-	-	-
825.14	300.05	315.95	223.21	0.00	0.01	226.324	-	-	-	-
-	-	-	-	-	-		-	-	-	-
4,041.57	1,732.10	1,823.90	771.28	0.02	0.04	783.380	-	-	-	-
279.17	101.52	106.90	75.52	0.00	0.00	76.573	-	-	-	-
-	-	-	-	-	-		-	-	-	-
5,057.58	2,167.54	2,282.41	965.17	0.02	0.05	980.313	4.27	3.95	4.27	263.05
246.63	89.68	94.44	66.72	0.00	0.00	67.647	0.32	0.30	0.32	15.09
-	-	-	-	-	-		0.11	0.11	-	1.64
40,049.38	**17,523.59**	**18,452.34**	**9,091.80**	**0.16**	**0.42**	**9,226.78**	**4.71**	**4.35**	**4.60**	**279.77**
38494.32888	16941.62251	17839.5285	8658.87447	0.153694399	0.405502094	8787.807701	4.274489	3.945683	4.274489418	263.0455
1555.053019	581.9683977	612.8127228	432.928619	0.005279617	0.019138613	438.9724609	0.321561	0.296825	0.321560847	15.08862
							0.114506	0.106327		1.635802

17,096.04	7,770.93	8,182.79	4,575.31	0.07	0.20	4640.169	-	-	-	-
204.12	90.72	95.53	67.49	0.00	0.00	68.429	-	-	-	-
-	-	-	-	-	-		-	-	-	-
12,299.13	5,271.06	5,550.42	2,347.12	0.05	0.12	2383.946	-	-	-	-
825.14	300.05	315.95	223.21	0.00	0.01	226.324	-	-	-	-
-	-	-	-	-	-		-	-	-	-
4,041.57	1,732.10	1,823.90	771.28	0.02	0.04	783.380	-	-	-	-
279.17	101.52	106.90	75.52	0.00	0.00	76.573	-	-	-	-
-	-	-	-	-	-		-	-	-	-
5,057.58	2,167.54	2,282.41	965.17	0.02	0.05	980.313	4.27	3.95	4.27	263.05
246.63	89.68	94.44	66.72	0.00	0.00	67.647	0.32	0.30	0.32	15.09
-	-	-	-	-	-		0.11	0.11	-	1.64
40,049.38	**17,523.59**	**18,452.34**	**9,091.80**	**0.16**	**0.42**	**9,226.78**	**4.71**	**4.35**	**4.60**	**279.77**
38494.32888	16941.62251	17839.5285	8658.87447	0.153694399	0.405502094	8787.807701	4.274489	3.945683	4.274489418	263.0455
1555.053019	581.9683977	612.8127228	432.928619	0.005279617	0.019138613	438.9724609	0.321561	0.296825	0.321560847	15.08862
							0.114506	0.106327		1.635802

ns if modeling is required

330	331	332	333	334	335	336	337	338	339	340	341	342	343
				8-Hour	Peak Day								Annual
SOX	CO	HC	VOC	CO	PM10	PM2.5	DPM	NOX	SOX	CO	HC	VOC	PM10
(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/8-hr)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/yr)
-	-	-	-	-	-	-	-	-	-	-	-	-	1,055.32
-	-	-	-	-	-	-	-	-	-	-	-	-	32.11
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	347.57
-	-	-	-	-	-	-	-	-	-	-	-	-	69.42
-	-	-	-	-	-	-	-	-	-	-	-	-	19.52
-	-	-	-	-	-	-	-	-	-	-	-	-	113.50
-	-	-	-	-	-	-	-	-	-	-	-	-	22.71
-	-	-	-	-	-	-	-	-	-	-	-	-	8.04
6.41	23.02	9.86	10.39	84.16	15.34	14.16	15.34	937.50	22.64	84.16	36.68	38.62	141.10
0.57	1.36	0.49	0.52	6.64	1.57	1.45	1.57	73.63	2.78	6.64	2.41	2.54	20.90
0.50	0.16	0.08	0.09	0.73	0.51	0.48	-	7.32	2.23	0.73	0.37	0.39	6.89
7.48	**24.54**	**10.44**	**10.99**	**91.53**	**17.42**	**16.08**	**16.91**	**1,018.45**	**27.65**	**91.53**	**39.46**	**41.55**	**1,837.09**
6.411734	23.01648	9.864206	10.38701	84.16004	15.33977	14.15979	15.33977	937.4973	22.635829	84.160039	36.676881	38.620755	1657.4962
0.568915	1.36045	0.494709	0.520929	6.639045	1.569229	1.448519	1.569229	73.63305	2.776328	6.6390453	2.4141983	2.5421508	145.14618
0.49892	0.16358	0.08179	0.086125	0.73239	0.512673	0.476053		7.3239	2.2337895	0.73239	0.366195	0.3856033	34.448594
-	-	-	-	-	-	-	-	-	-	-	-	-	1,184.92
-	-	-	-	-	-	-	-	-	-	-	-	-	36.05
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	569.63
-	-	-	-	-	-	-	-	-	-	-	-	-	113.77
-	-	-	-	-	-	-	-	-	-	-	-	-	31.99
-	-	-	-	-	-	-	-	-	-	-	-	-	186.02
-	-	-	-	-	-	-	-	-	-	-	-	-	37.22
-	-	-	-	-	-	-	-	-	-	-	-	-	13.17
6.41	23.02	9.86	10.39	84.16	15.34	14.16	15.34	937.50	22.64	84.16	36.68	38.62	231.25
0.57	1.36	0.49	0.52	6.64	1.57	1.45	1.57	73.63	2.78	6.64	2.41	2.54	34.26
0.50	0.16	0.08	0.09	0.73	0.51	0.48	-	7.32	2.23	0.73	0.37	0.39	11.29
7.48	**24.54**	**10.44**	**10.99**	**91.53**	**17.42**	**16.08**	**16.91**	**1,018.45**	**27.65**	**91.53**	**39.46**	**41.55**	**2,449.59**
6.411734	23.01648	9.864206	10.38701	84.16004	15.33977	14.15979	15.33977	937.4973	22.635829	84.160039	36.676881	38.620755	2171.8219
0.568915	1.36045	0.494709	0.520929	6.639045	1.569229	1.448519	1.569229	73.63305	2.776328	6.6390453	2.4141983	2.5421508	221.30634
0.49892	0.16358	0.08179	0.086125	0.73239	0.512673	0.476053		7.3239	2.2337895	0.73239	0.366195	0.3856033	56.457417

-	-	-	-	-	-	-	-	-	-	-	-	-	1,184.92
-	-	-	-	-	-	-	-	-	-	-	-	-	36.05
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	569.63
-	-	-	-	-	-	-	-	-	-	-	-	-	113.77
-	-	-	-	-	-	-	-	-	-	-	-	-	31.99
-	-	-	-	-	-	-	-	-	-	-	-	-	186.02
-	-	-	-	-	-	-	-	-	-	-	-	-	37.22
-	-	-	-	-	-	-	-	-	-	-	-	-	13.17
6.41	23.02	9.86	10.39	84.16	15.34	14.16	15.34	937.50	22.64	84.16	36.68	38.62	231.25
0.57	1.36	0.49	0.52	6.64	1.57	1.45	1.57	73.63	2.78	6.64	2.41	2.54	34.26
0.50	0.16	0.08	0.09	0.73	0.51	0.48	-	7.32	2.23	0.73	0.37	0.39	11.29
7.48	**24.54**	**10.44**	**10.99**	**91.53**	**17.42**	**16.08**	**16.91**	**1,018.45**	**27.65**	**91.53**	**39.46**	**41.55**	**2,449.59**
6.411734	23.01648	9.864206	10.38701	84.16004	15.33977	14.15979	15.33977	937.4973	22.635829	84.160039	36.676881	38.620755	2171.8219
0.568915	1.36045	0.494709	0.520929	6.639045	1.569229	1.448519	1.569229	73.63305	2.776328	6.6390453	2.4141983	2.5421508	221.30634
0.49892	0.16358	0.08179	0.086125	0.73239	0.512673	0.476053		7.3239	2.2337895	0.73239	0.366195	0.3856033	56.457417

344	345	346	347	348	349	350	351	352	353	354	355	356
										Unmitigated Emissions		
										Total Transit Emissions Z		
										Annual		
PM2.5	DPM	NOX	SOX	CO	HC	VOC	CO2	CH4	N2O	CO2e	CO2	CH4
(lb/yr)	(lb/yr)	(lb/yr)	(lb/yr)	(lb/yr)	(lb/yr)	(lb/yr)	(mty)	(mty)	(mty)	(mty)	(mty)	(mty)
974.14	1,055.32	########	1,723.33	4,542.33	2,085.67	2,196.21	1,179.82	0.02	0.05	1,196.68	5,254.71	0.08
29.64	32.11	1,210.35	56.81	111.15	49.40	52.02	36.75	0.00	0.00	37.26	96.86	0.00
-	-	-	-	-	-	-	-	-	-	-	-	-
320.84	347.57	########	510.52	1,916.79	839.11	883.59	349.73	0.01	0.02	355.30	1,781.87	0.04
64.08	69.42	3,257.37	122.82	293.70	106.80	112.46	79.45	0.00	0.00	80.56	215.64	0.00
18.13	-	278.87	85.06	27.89	13.94	14.68	58.31	0.00	0.00	59.75	58.31	0.00
104.77	113.50	7,356.14	166.72	625.94	274.02	288.54	114.21	0.00	0.01	116.03	584.82	0.01
20.97	22.71	1,205.54	40.18	96.09	34.94	36.80	25.99	0.00	0.00	26.36	72.07	0.00
7.46	-	114.83	35.02	11.48	5.74	6.05	24.01	0.00	0.00	24.60	24.01	0.00
130.25	141.10	8,605.48	207.17	778.53	340.95	359.02	141.92	0.00	0.01	144.18	730.84	0.02
19.29	20.90	980.80	36.98	88.43	32.16	33.86	23.92	0.00	0.00	24.26	64.63	0.00
6.40	-	98.42	30.02	9.84	4.92	5.18	20.58	0.00	0.00	21.09	20.58	0.00
1,695.97	**1,802.64**	**########**	**3,014.63**	**8,502.18**	**3,787.66**	**3,988.41**	**2,054.71**	**0.03**	**0.10**	**2,086.06**	**8,904.35**	**0.15**
1529.9965	1657.496168	86415.153	2607.7353	7863.5917	3539.7549	3727.362	1785.6893	0.0321127	0.083303	1812.18761	8352.2414	0.1456638
133.98109	145.1461804	6654.0655	256.79709	589.3789	223.30182	235.13681	166.11511	0.0020258	0.0073435	168.434142	449.20207	0.0054781
31.98798		492.12277	150.09744	49.212277	24.606138	25.910264	102.90759	0.0002232	0.0081478	105.438095	102.90759	0.0002232
1,093.77	1,184.92	########	1,934.96	5,100.16	2,341.81	2,465.92	1,324.71	0.02	0.06	1,343.64	5,900.02	0.09
33.28	36.05	1,358.99	63.79	124.81	55.47	58.41	41.26	0.00	0.00	41.84	108.75	0.00
-	-	-	-	-	-	-	-	-	-	-	-	-
525.81	569.63	########	836.69	3,141.41	1,375.22	1,448.10	573.17	0.01	0.03	582.29	2,920.29	0.06
105.02	113.77	5,338.47	201.29	481.34	175.03	184.31	130.21	0.00	0.01	132.02	353.41	0.00
29.71	-	457.04	139.40	45.70	22.85	24.06	95.57	0.00	0.01	97.92	95.57	0.00
171.71	186.02	########	273.23	1,025.85	449.08	472.88	187.18	0.00	0.01	190.16	958.46	0.02
34.36	37.22	1,746.68	65.86	157.49	57.27	60.30	42.60	0.00	0.00	43.20	118.12	0.00
12.23	-	188.19	57.40	18.82	9.41	9.91	39.35	0.00	0.00	40.32	39.35	0.00
213.47	231.25	########	339.53	1,275.92	558.79	588.40	232.60	0.01	0.01	236.30	1,197.76	0.02
31.62	34.26	1,607.42	60.61	144.93	52.70	55.50	39.21	0.00	0.00	39.75	105.92	0.00
10.48	-	161.31	49.20	16.13	8.07	8.49	33.73	0.00	0.00	34.56	33.73	0.00
2,261.47	**2,393.13**	**########**	**4,021.95**	**########**	**5,105.69**	**5,376.29**	**2,739.59**	**0.05**	**0.13**	**2,782.00**	**11,831.40**	**0.21**
2004.7587	2171.821882	115497.29	3384.4115	10543.339	4724.8884	4975.3075	2317.6615	0.0428642	0.1091176	2352.38813	10976.536	0.1965586
204.28278	221.3063419	10051.56	391.54199	908.5615	340.4713	358.51627	253.27796	0.0030888	0.0111967	256.813811	686.20658	0.0083684
52.424745		806.53453	245.99303	80.653453	40.326727	42.464043	168.65411	0.0003658	0.0133533	172.801322	168.65411	0.0003658

1,093.77	1,184.92	########	1,934.96	5,100.16	2,341.81	2,465.92	1,324.71	0.02	0.06	1,343.64	5,900.02	0.09
33.28	36.05	1,358.99	63.79	124.81	55.47	58.41	41.26	0.00	0.00	41.84	108.75	0.00
-	-	-	-	-	-	-	-	-	-	-	-	-
525.81	569.63	########	836.69	3,141.41	1,375.22	1,448.10	573.17	0.01	0.03	582.29	2,920.29	0.06
105.02	113.77	5,338.47	201.29	481.34	175.03	184.31	130.21	0.00	0.01	132.02	353.41	0.00
29.71	-	457.04	139.40	45.70	22.85	24.06	95.57	0.00	0.01	97.92	95.57	0.00
171.71	186.02	########	273.23	1,025.85	449.08	472.88	187.18	0.00	0.01	190.16	958.46	0.02
34.36	37.22	1,746.68	65.86	157.49	57.27	60.30	42.60	0.00	0.00	43.20	118.12	0.00
12.23	-	188.19	57.40	18.82	9.41	9.91	39.35	0.00	0.00	40.32	39.35	0.00
213.47	231.25	########	339.53	1,275.92	558.79	588.40	232.60	0.01	0.01	236.30	1,197.76	0.02
31.62	34.26	1,607.42	60.61	144.93	52.70	55.50	39.21	0.00	0.00	39.75	105.92	0.00
10.48	-	161.31	49.20	16.13	8.07	8.49	33.73	0.00	0.00	34.56	33.73	0.00
2,261.47	**2,393.13**	**########**	**4,021.95**	**########**	**5,105.69**	**5,376.29**	**2,739.59**	**0.05**	**0.13**	**2,782.00**	**11,831.40**	**0.21**
2004.7587	2171.821882	115497.29	3384.4115	10543.339	4724.8884	4975.3075	2317.6615	0.0428642	0.1091176	2352.38813	10976.536	0.1965586
204.28278	221.3063419	10051.56	391.54199	908.5615	340.4713	358.51627	253.27796	0.0030888	0.0111967	256.813811	686.20658	0.0083684
52.424745		806.53453	245.99303	80.653453	40.326727	42.464043	168.65411	0.0003658	0.0133533	172.801322	168.65411	0.0003658

Revisit these combined peak-hr and 8-hr emissions if modeling is required

Represents the max peak hour emissions for each vessel while at berth or maneuvering. Modeling may require different

Unmitigated Emissions

:ones 1-6

Total Emissions

357	358	359	360	361	362	363	364	365	366	367	368
			Peak 1-Hour								**8-Hour**
N2O	CO2e		PM10	PM2.5	DPM	NOX	SOX	CO	HC	VOC	CO
(mty)	(mty)		(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/8-hr)
0.24	5,329.33		-	-	-	-	-	-	-	-	-
0.00	98.21		-	-	-	-	-	-	-	-	-
-	-		-	-	-	-	-	-	-	-	-
0.09	1,809.91		-	-	-	-	-	-	-	-	-
0.01	218.65		-	-	-	-	-	-	-	-	-
0.00	59.75		-	-	-	-	-	-	-	-	-
0.03	594.02		-	-	-	-	-	-	-	-	-
0.00	73.08		-	-	-	-	-	-	-	-	-
0.00	24.60		-	-	-	-	-	-	-	-	-
0.04	742.34		0.49	0.45	0.49	23.59	0.36	4.19	2.41	2.53	4.19
0.00	65.53		0.36	0.33	0.36	16.76	0.63	1.51	0.55	0.58	5.67
0.00	21.09		1.02	0.94	-	14.52	4.43	1.45	0.73	0.76	4.46
0.42	**9,036.51**										
0.3880654	8475.601		0.488846153	0.451242603	0.48884615	23.594384	0.3594457	4.1935332	2.4055212	2.533013855	4.193533
0.019858	455.4731		0.357098765	0.32962963	0.35709877	16.756173	0.6317901	1.5108025	0.5493827	0.5785	5.673431
0.0081478	105.4381		1.016358025	0.943761023		14.5194	4.4284171	1.45194	0.72597	0.764446429	4.456695
0.26	5,983.81		-	-	-	-	-	-	-	-	-
0.00	110.27		-	-	-	-	-	-	-	-	-
-	-		-	-	-	-	-	-	-	-	-
0.14	2,966.24		-	-	-	-	-	-	-	-	-
0.02	358.35		-	-	-	-	-	-	-	-	-
0.01	97.92		-	-	-	-	-	-	-	-	-
0.05	973.54		-	-	-	-	-	-	-	-	-
0.01	119.77		-	-	-	-	-	-	-	-	-
0.00	40.32		-	-	-	-	-	-	-	-	-
0.06	1,216.61		0.49	0.45	0.49	23.59	0.36	4.19	2.41	2.53	4.19
0.00	107.40		0.36	0.33	0.36	16.76	0.63	1.51	0.55	0.58	5.67
0.00	34.56		1.02	0.94	-	14.52	4.43	1.45	0.73	0.76	4.46
0.56	**#######**	**-**	**1.86**	**1.72**	**0.85**	**54.87**	**5.42**	**7.16**	**3.68**	**3.88**	**14.32**
0.5146197	11140.2		0.488846153	0.451242603	0.48884615	23.594384	0.3594457	4.1935332	2.4055212	2.533013855	4.193533
0.0303354	695.7863		0.357098765	0.32962963	0.35709877	16.756173	0.6317901	1.5108025	0.5493827	0.5785	5.673431
0.0133533	172.8013		1.016358025	0.943761023		14.5194	4.4284171	1.45194	0.72597	0.764446429	4.456695

0.26	5,983.81		-	-	-	-	-	-	-	-	-
0.00	110.27		-	-	-	-	-	-	-	-	-
-	-		-	-	-	-	-	-	-	-	-
0.14	2,966.24		-	-	-	-	-	-	-	-	-
0.02	358.35		-	-	-	-	-	-	-	-	-
0.01	97.92		-	-	-	-	-	-	-	-	-
0.05	973.54		-	-	-	-	-	-	-	-	-
0.01	119.77		-	-	-	-	-	-	-	-	-
0.00	40.32		-	-	-	-	-	-	-	-	-
0.06	1,216.61		0.49	0.45	0.49	23.59	0.36	4.19	2.41	2.53	4.19
0.00	107.40		0.36	0.33	0.36	16.76	0.63	1.51	0.55	0.58	5.67
0.00	34.56		1.02	0.94	-	14.52	4.43	1.45	0.73	0.76	4.46
0.56	**#######**	**-**	**1.86**	**1.72**	**0.85**	**54.87**	**5.42**	**7.16**	**3.68**	**3.88**	**14.32**
0.5146197	11140.2		0.488846153	0.451242603	0.48884615	23.594384	0.3594457	4.1935332	2.4055212	2.533013855	4.193533
0.0303354	695.7863		0.357098765	0.32962963	0.35709877	16.756173	0.6317901	1.5108025	0.5493827	0.5785	5.673431
0.0133533	172.8013		1.016358025	0.943761023		14.5194	4.4284171	1.45194	0.72597	0.764446429	4.456695

369	370	371	372	373	374	375	376	377	378	379	380	381	382

combination of berth + transit segments.

Peak Day								Annual					
PM10	PM2.5	DPM	NOX	SOX	CO	HC	VOC	PM10	PM2.5	DPM	NOX	SOX	CO
(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/yr)	(lb/yr)	(lb/yr)	(lb/yr)	(lb/yr)	(lb/yr)
-	-	-	-	-	-	-	-	1,055.32	974.14	1,055.32	49,252.60	1,723.33	4,542.33
-	-	-	-	-	-	-	-	148.75	137.31	148.75	5,606.74	263.17	514.90
-	-	-	-	-	-	-	-	217.27	200.56	217.27	8,189.35	384.40	752.08
-	-	-	-	-	-	-	-	347.57	320.84	347.57	21,200.93	510.52	1,916.79
-	-	-	-	-	-	-	-	483.91	446.68	483.91	22,706.36	856.14	2,047.29
-	-	-	-	-	-	-	-	145.32	134.94	-	2,076.02	633.19	207.60
-	-	-	-	-	-	-	-	113.50	104.77	113.50	7,356.14	166.72	625.94
-	-	-	-	-	-	-	-	194.09	179.16	194.09	10,301.60	343.39	821.14
-	-	-	-	-	-	-	-	224.29	208.27	-	3,204.12	977.26	320.41
15.34	14.16	15.34	937.50	22.64	84.16	36.68	38.62	141.10	130.25	141.10	8,605.48	207.17	778.53
10.14	9.36	10.14	475.78	17.94	42.90	15.60	16.43	308.09	284.39	308.09	14,456.52	545.08	1,303.46
24.91	23.13	-	355.79	108.52	35.58	17.79	18.73	473.78	439.94	-	6,768.35	2,064.35	676.83
50.38	**46.65**	**25.48**	**1,769.07**	**149.09**	**162.64**	**70.07**	**73.78**	**3,852.99**	**3,561.24**	**3,009.60**	**159,724.20**	**8,674.70**	**#######**
15.33977	14.159786	15.33977	937.4973	22.63583	84.160039	36.676881	38.620755	1657.496	1529.996	1657.496	86415.15324	2607.735	7863.592
10.1396	9.3596301	10.1396	475.7812	17.93929	42.898305	15.599383	16.426151	1134.834	1047.539	1134.834	53071.21506	2007.783	4686.798
24.90527	23.126318		355.7895	108.5158	35.578951	17.789475	18.732318	843.3939	783.1515		12048.4845	3674.788	1204.848
								217.2685	200.5556	217.2685	8189.351852	384.3981	752.0833
-	-	-	-	-	-	-	-	1,184.92	1,093.77	1,184.92	55,301.17	1,934.96	5,100.16
-	-	-	-	-	-	-	-	167.02	154.17	167.02	6,295.29	295.49	578.14
-	-	-	-	-	-	-	-	243.95	225.19	243.95	9,195.06	431.60	844.44
-	-	-	-	-	-	-	-	569.63	525.81	569.63	34,745.97	836.69	3,141.41
-	-	-	-	-	-	-	-	793.07	732.06	793.07	37,213.20	1,403.12	3,355.29
-	-	-	-	-	-	-	-	238.17	221.15	-	3,402.37	1,037.72	340.24
-	-	-	-	-	-	-	-	186.02	171.71	186.02	11,346.72	273.23	1,025.85
-	-	-	-	-	-	-	-	318.09	293.62	318.09	14,925.70	562.77	1,345.76
-	-	-	-	-	-	-	-	367.58	341.33	-	5,251.19	1,601.61	525.12
15.34	14.16	15.34	937.50	22.64	84.16	36.68	38.62	231.25	213.47	231.25	14,103.43	339.53	1,275.92
10.14	9.36	10.14	475.78	17.94	42.90	15.60	16.43	504.92	466.08	504.92	23,692.63	893.33	2,136.22
24.91	23.13	-	355.79	108.52	35.58	17.79	18.73	776.48	721.02	-	11,092.57	3,383.23	1,109.26
50.38	**46.65**	**25.48**	**1,769.07**	**149.09**	**162.64**	**70.07**	**73.78**	**5,581.10**	**5,159.38**	**4,198.87**	**226,565.29**	**#######**	**#######**
15.33977	14.159786	15.33977	937.4973	22.63583	84.160039	36.676881	38.620755	2171.822	2004.759	2171.822	115497.2884	3384.412	10543.34
10.1396	9.3596301	10.1396	475.7812	17.93929	42.898305	15.599383	16.426151	1783.1	1645.938	1783.1	82126.81753	3154.715	7415.408
24.90527	23.126318		355.7895	108.5158	35.578951	17.789475	18.732318	1382.229	1283.498		19746.12737	6022.569	1974.613
								243.9506	225.1852	243.9506	9195.061728	431.6049	844.4444

-	-	-	-	-	-	-	-	1,184.92	1,093.77	1,184.92	55,301.17	1,934.96	5,100.16
-	-	-	-	-	-	-	-	167.02	154.17	167.02	6,295.29	295.49	578.14
-	-	-	-	-	-	-	-	243.95	225.19	243.95	9,195.06	431.60	844.44
-	-	-	-	-	-	-	-	569.63	525.81	569.63	34,745.97	836.69	3,141.41
-	-	-	-	-	-	-	-	793.07	732.06	793.07	37,213.20	1,403.12	3,355.29
-	-	-	-	-	-	-	-	238.17	221.15	-	3,402.37	1,037.72	340.24
-	-	-	-	-	-	-	-	186.02	171.71	186.02	11,346.72	273.23	1,025.85
-	-	-	-	-	-	-	-	318.09	293.62	318.09	14,925.70	562.77	1,345.76
-	-	-	-	-	-	-	-	367.58	341.33	-	5,251.19	1,601.61	525.12
15.34	14.16	15.34	937.50	22.64	84.16	36.68	38.62	231.25	213.47	231.25	14,103.43	339.53	1,275.92
10.14	9.36	10.14	475.78	17.94	42.90	15.60	16.43	504.92	466.08	504.92	23,692.63	893.33	2,136.22
24.91	23.13	-	355.79	108.52	35.58	17.79	18.73	776.48	721.02	-	11,092.57	3,383.23	1,109.26
50.38	**46.65**	**25.48**	**1,769.07**	**149.09**	**162.64**	**70.07**	**73.78**	**5,581.10**	**5,159.38**	**4,198.87**	**226,565.29**	**#######**	**#######**
15.33977	14.159786	15.33977	937.4973	22.63583	84.160039	36.676881	38.620755	2171.822	2004.759	2171.822	115497.2884	3384.412	10543.34
10.1396	9.3596301	10.1396	475.7812	17.93929	42.898305	15.599383	16.426151	1783.1	1645.938	1783.1	82126.81753	3154.715	7415.408
24.90527	23.126318		355.7895	108.5158	35.578951	17.789475	18.732318	1382.229	1283.498		19746.12737	6022.569	1974.613
								243.9506	225.1852	243.9506	9195.061728	431.6049	844.4444

383	384	385	386	387	388	389	390	391

HC	VOC	CO2	CH4	N2O	CO2e
(lb/yr)	(lb/yr)	(mty)	(mty)	(mty)	(mty)
2,085.67	2,196.21	5,254.71	0.08	0.24	5,329.33
228.85	240.98	230.35	0.00	0.01	233.56
334.26	351.98	248.66	0.00	0.01	252.13
839.11	883.59	1,781.87	0.04	0.09	1,809.91
744.47	783.93	690.01	0.01	0.03	699.64
103.80	109.30	434.12	0.00	0.03	444.79
274.02	288.54	584.82	0.01	0.03	594.02
298.60	314.42	268.21	0.00	0.01	271.95
160.21	168.70	670.01	0.00	0.05	686.49
340.95	359.02	730.84	0.02	0.04	742.34
473.98	499.11	393.31	0.00	0.02	398.80
338.42	356.35	1,415.33	0.00	0.11	1,450.13
6,222.34	**6,552.12**	**#######**	**0.17**	**0.67**	**12,913.09**
3539.755	3727.362	8352.241	0.1456638	0.38806543	8475.60063
1745.899	1838.431	1581.868	0.01929107	0.06993014	1603.95136
602.4242	634.3527	2519.454	0.00546519	0.19947953	2581.4072
334.2593	351.975	248.6568	0.0030324	0.01099245	252.12814

2,341.81	2,465.92	5,900.02	0.09	0.26	5,983.81
256.95	270.57	258.63	0.00	0.01	262.24
375.31	395.20	279.19	0.00	0.01	283.09
1,375.22	1,448.10	2,920.29	0.06	0.14	2,966.24
1,220.10	1,284.77	1,130.85	0.01	0.05	1,146.64
170.12	179.13	711.47	0.00	0.06	728.96
449.08	472.88	958.46	0.02	0.05	973.54
489.37	515.30	439.56	0.01	0.02	445.70
262.56	276.48	1,098.07	0.00	0.09	1,125.08
558.79	588.40	1,197.76	0.02	0.06	1,216.61
776.81	817.98	644.59	0.01	0.03	653.58
554.63	584.02	2,319.56	0.01	0.18	2,376.60
8,830.73	**9,298.76**	**#######**	**0.24**	**0.96**	**18,162.09**
4724.888	4975.307	10976.54	0.19655859	0.51461969	11140.1958
2743.23	2888.621	2473.629	0.0301662	0.10935248	2508.1613
987.3064	1039.634	4129.105	0.00895684	0.32692478	4230.63957
375.3086	395.2	279.1936	0.0034048	0.0123424	283.091245

2,341.81	2,465.92	5,900.02	0.09	0.26	5,983.81
256.95	270.57	258.63	0.00	0.01	262.24
375.31	395.20	279.19	0.00	0.01	283.09
1,375.22	1,448.10	2,920.29	0.06	0.14	2,966.24
1,220.10	1,284.77	1,130.85	0.01	0.05	1,146.64
170.12	179.13	711.47	0.00	0.06	728.96
449.08	472.88	958.46	0.02	0.05	973.54
489.37	515.30	439.56	0.01	0.02	445.70
262.56	276.48	1,098.07	0.00	0.09	1,125.08
558.79	588.40	1,197.76	0.02	0.06	1,216.61
776.81	817.98	644.59	0.01	0.03	653.58
554.63	584.02	2,319.56	0.01	0.18	2,376.60
8,830.73	**9,298.76**	**#######**	**0.24**	**0.96**	**18,162.09**
4724.888	4975.307	10976.54	0.19655859	0.51461969	11140.1958
2743.23	2888.621	2473.629	0.0301662	0.10935248	2508.1613
987.3064	1039.634	4129.105	0.00895684	0.32692478	4230.63957
375.3086	395.2	279.1936	0.0034048	0.0123424	283.091245

Table XX.

OGV Propulsion/Boiler Engine Emission Factors for 0.1% S MGO Fuel (g/kW-hr)

GHG Emission Factors for OGV Propulsion Power using Residual Oil (g/kW-hr)

Used to transfer emission factors to all baseline and future peak day calculations

	Engine	IMO Tier	Model Yea	PM10	PM2.5	DPM	NOx	SOx	CO	HC	VOC	CO2	CH4	N2O
Tier 0 Slow Speed Diesel	Slow Speed Diesel	Tier 0	≤1999	0.26	0.24	0.26	17	0.39	1.4	0.6	0.63	589	0.01	0.03
Tier 0 Medium Speed Diesel	Medium Speed Diesel	Tier 0	≤1999	0.26	0.24	0.26	13.2	0.43	1.1	0.5	0.53	649	0.01	0.03
Tier I Slow Speed Diesel	Slow Speed Diesel	Tier I	2000-2010	0.26	0.24	0.26	16.0	0.39	1.4	0.6	0.63	589	0.01	0.03
Tier I Medium Speed Diesel	Medium Speed Diesel	Tier I	2000-2010	0.26	0.24	0.26	12.2	0.43	1.1	0.5	0.53	649	0.01	0.03
Tier II Slow Speed Diesel	Slow Speed Diesel	Tier II	2011-2015	0.26	0.24	0.26	14.4	0.39	1.4	0.6	0.63	589	0.01	0.03
Tier II Medium Speed Diesel	Medium Speed Diesel	Tier II	2011-2015	0.26	0.24	0.26	10.5	0.43	1.1	0.5	0.53	649	0.01	0.03
Tier III Slow Speed Diesel	Slow Speed Diesel	Tier III	≥2016	0.26	0.24	0.26	3.4	0.39	1.4	0.6	0.63	589	0.01	0.03
Tier III Medium Speed Diesel	Medium Speed Diesel	Tier III	≥2016	0.26	0.24	0.26	2.6	0.43	1.1	0.5	0.53	649	0.01	0.03
	Gas Turbine	na	all	0.01	0.01	0.00	5.7	0.61	0.2	0.1	0.11	922	0.00	0.07
boiler	Steam Ship	na	all	0.14	0.13	0.00	2.0	0.61	0.2	0.1	0.11	922	0.00	0.07

Tier used to transfer emission factors to future Annual

Composite Emission Factors used in Annual 2032 Calculations

		Tier I	Tier II	Tier III	PM10	PM2.5	DPM	NOx	SOx	CO	HC	VOC	CO2	CH4	N2O
	Medium Speed Diesel														
2032 ITB	ITB	100%			0.26	0.24	0.26	12.2	0.43	1.1	0.5	0.53	649	0.01	0.03
	Slow Speed Diesel														
2032 Tanker - Chemical	Tanker - Chemical	23%	77%	0%	0.26	0.24	0.26	14.8	0.39	1.4	0.60	0.63	589	0.01	0.03
2032 Tanker - Handysize	Tanker - Handysize	15%	85%	0%	0.26	0.24	0.26	14.6	0.39	1.4	0.60	0.63	589	0.01	0.03
2032 Tanker - Panamax	Tanker - Panamax	20%	45%	35%	0.26	0.24	0.26	10.9	0.39	1.4	0.60	0.63	589	0.01	0.03
2032 boiler					0.14	0.13	0	2.0	0.61	0.2	0.1	0.1053	922	0.002	0.073

Composite Emission Factors used in Annual 2048 Calculations

		Tier I	Tier II	Tier III	PM10	PM2.5	DPM	NOx	SOx	CO	HC	VOC	CO2	CH4	N2O
	Medium Speed Diesel														
2048 ITB	ITB	100%			0.26	0.24	0.26	12.2	0.43	1.1	0.5	0.53	649	0.01	0.03
	Slow Speed Diesel														
2048 Tanker - Chemical	Tanker - Chemical	0%	0%	100%	0.26	0.24	0.26	3.4	0.39	1.4	0.60	0.63	589	0.01	0.03
2048 Tanker - Handysize	Tanker - Handysize	0%	0%	100%	0.26	0.24	0.26	3.4	0.39	1.4	0.60	0.63	589	0.01	0.03
2048 Tanker - Panamax	Tanker - Panamax	0%	0%	100%	0.26	0.24	0.26	3.4	0.39	1.4	0.60	0.63	589	0.01	0.03
2048 boiler					0.14	0.13	0	2	0.61	0.2	0.1	0.1053	922	0.002	0.073

Notes:

Slow speed diesel: engine speed < 150 rpm; assumed as default for propulsion engines

Medium speed diesel: engine speed > 150 rpm (500 rpm typical).

Composite emission factors used in future years are based on POLA 2014 EI emission factors and 2017 CAAP forecasted tier distribution.

Source:

POLA 2014 Emissions Inventory, Table 3.7.

2017 CAAP Bay-Wide Ocean Going Vessel International Maritime Organization Tier Forecast 2015-2050. Starcrest, June 2017.

Table XX.

OGV Auxiliary Engine Emission Factors for 0.1% MGO Fuel (g/kW-hr)

GHG Emission Factors for OGV Propulsion Power using Residual Oil, g/kW-hr

		Engine	IMO Tier	Model Year	PM10	PM2.5	DPM	NOx	SOx	CO	HC	VOC	CO2	CH4	N2O
Tier 0 High Speed Diesel		High Speed Diesel	Tier 0	≤1999	0.26	0.24	0.26	10.9	0.46	0.90	0.40	0.42	656	0.01	0.03
Tier 0 Medium Speed Diesel		Medium Speed Diesel	Tier 0	≤1999	0.26	0.24	0.26	13.8	0.46	1.10	0.40	0.42	656	0.01	0.03
Tier I High Speed Diesel	Tier I ITB	High Speed Diesel	Tier I	2000-2010	0.26	0.24	0.26	9.8	0.46	0.90	0.40	0.42	656	0.01	0.03
Tier I Medium Speed Diesel	Tier I Tanker	Medium Speed Diesel	Tier I	2000-2010	0.26	0.24	0.26	12.2	0.46	1.10	0.40	0.42	656	0.01	0.03
Tier II High Speed Diesel	Tier II Tanker	High Speed Diesel	Tier II	2011-2015	0.26	0.24	0.26	7.7	0.46	0.90	0.40	0.42	656	0.01	0.03
Tier II Medium Speed Diesel	Tier II Tanker	Medium Speed Diesel	Tier II	2011-2015	0.26	0.24	0.26	10.3	0.46	1.10	0.40	0.42	656	0.01	0.03
Tier III High Speed Diesel	Tier III Tanker	High Speed Diesel	Tier III	≥2016	0.26	0.24	0.26	2.0	0.46	0.90	0.40	0.42	656	0.01	0.03
Tier III Medium Speed Diesel	Tier III Tanker	Medium Speed Diesel	Tier III	≥2016	0.26	0.24	0.26	2.6	0.46	1.10	0.40	0.42	656	0.01	0.03

Tier used to transfer emission factors to future Annual

Composite Emission Factors used in Annual 2032 Calculations

		Engine	Tier I	Tier II	Tier III	PM10	PM2.5	DPM	NOx	SOx	CO	HC	VOC	CO2	CH4	N2O
		High Speed Diesel														
2032 ITB	2032 ITB	ITB	100%			0.26	0.24	0.26	9.8	0.46	0.90	0.40	0.42	656	0.01	0.03
		Medium Speed Diesel														
	2032 Tanker - Chemical	Tanker - Chemical	23%	77%	0%	0.26	0.24	0.26	10.7	0.46	1.10	0.40	0.42	656	0.01	0.03
	2032 Tanker - Handysize	Tanker - Handysize	15%	85%	0%	0.26	0.24	0.26	10.6	0.46	1.10	0.40	0.42	656	0.01	0.03
	2032 Tanker - Panamax	Tanker - Panamax	20%	45%	35%	0.26	0.24	0.26	8.0	0.46	1.10	0.40	0.42	656	0.01	0.03

Composite Emission Factors used in Annual 2048 Calculations

		Engine	Tier I	Tier II	Tier III	PM10	PM2.5	DPM	NOx	SOx	CO	HC	VOC	CO2	CH4	N2O
		High Speed Diesel														
2048 ITB	2048 ITB	ITB	100%			0.26	0.24	0.26	9.8	0.46	0.90	0.40	0.42	656	0.01	0.03
		Slow Speed Diesel				0.26	0.24	0.26	9.8	0.46	0.90	0.40	0.42	656	0.01	0.03
	2048 Tanker - Chemical	Tanker - Chemical	0%	0%	100%	0.26	0.24	0.26	2.6	0.46	1.10	0.40	0.42	656	0.01	0.03
	2048 Tanker - Handysize	Tanker - Handysize	0%	0%	100%	0.26	0.24	0.26	2.6	0.46	1.10	0.40	0.42	656	0.01	0.03
	2048 Tanker - Panamax	Tanker - Panamax	0%	0%	100%	0.26	0.24	0.26	2.6	0.46	1.10	0.40	0.42	656	0.01	0.03

Notes:

ITB auxiliary engines and product pumps are high speed. Tanker auxiliary engines are medium speed.

Calculations assume that auxiliary and propulsion engines are the same model year.

ITB auxiliary engines and product pumps and tanker auxiliary engines are conservatively assumed to be Tier 1 for peak day future years.

2017 CAAP tier distribution did not forecast ITB engines. Therefore, ITB auxiliary engines were conservatively assumed to be Tier I for annual, future year calculations.

2017 CAAP tier distribution forecasted tanker engines. Tanker auxiliary engines were assumed to be a composite of Tier I through III for annual, future year calculations.

Source:

POLA 2014 Emissions Inventory, Table 3.8.

2017 CAAP Bay-Wide Ocean Going Vessel International Maritime Organization Tier Forecast 2015-2050. Starcrest, June 2017.

Average Load Propulsion Engine - Propeller Law

$LF = (AS/MS)^3$

Where:

LF = load factor, percent

AS = actual speed, knots

MS = maximum speed, knots

Table XX.
OGV Low Load Adjustment Factors - Propulsion Engines

Load	PM10	PM2.5	DPM	NOx	SOx	CO	HC	VOC	CO2	CH4	N2O
2% docking loa	7.29	7.29	7.29	4.63	1.00	9.68	21.18	21.18	1.00	21.18	4.63
3% transit loac	4.33	4.33	4.33	2.92	1.00	6.46	11.68	11.68	1.00	11.68	2.92
4% transit loac	3.09	3.09	3.09	2.21	1.00	4.86	7.71	7.71	1.00	7.71	2.21
5% transit loac	2.44	2.44	2.44	1.83	1.00	3.89	5.61	5.61	1.00	5.61	1.83
6% transit loac	2.04	2.04	2.04	1.60	1.00	3.25	4.35	4.35	1.00	4.35	1.60
7% transit loac	1.79	1.79	1.79	1.45	1.00	2.79	3.52	3.52	1.00	3.52	1.45
8% transit loac	1.61	1.61	1.61	1.35	1.00	2.45	2.95	2.95	1.00	2.95	1.35
9% transit loac	1.48	1.48	1.48	1.27	1.00	2.18	2.52	2.52	1.00	2.52	1.27
10% transit loac	1.38	1.38	1.38	1.22	1.00	1.96	2.18	2.18	1.00	2.18	1.22
11% transit loac	1.30	1.30	1.30	1.17	1.00	1.79	1.96	1.96	1.00	1.96	1.17
12% transit loac	1.24	1.24	1.24	1.14	1.00	1.64	1.76	1.76	1.00	1.76	1.14
13% transit loac	1.19	1.19	1.19	1.11	1.00	1.52	1.60	1.60	1.00	1.60	1.11
14% transit loac	1.15	1.15	1.15	1.08	1.00	1.41	1.47	1.47	1.00	1.47	1.08
15% transit loac	1.11	1.11	1.11	1.06	1.00	1.32	1.36	1.36	1.00	1.36	1.06
16% transit loac	1.08	1.08	1.08	1.05	1.00	1.24	1.26	1.26	1.00	1.26	1.05
17% transit loac	1.06	1.06	1.06	1.03	1.00	1.17	1.18	1.18	1.00	1.18	1.03
18% transit loac	1.04	1.04	1.04	1.02	1.00	1.11	1.11	1.11	1.00	1.11	1.02
19% transit loac	1.02	1.02	1.02	1.01	1.00	1.05	1.05	1.05	1.00	1.05	1.01
20% transit loac	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Source: POLA 2014 Emissions Inventory, Table 3.10.

1 2 3 4 5 6 7 8 9 10 11 12 13

Information provided by Starcrest
Information provided by PBF
Information provided by POLA

Table XX.
Peak 24-hr Day Activity

Year	Peak Day Berth Calls	Peak Day Anchorage Calls	Peak Day Transits (1-way)	Tugboats
2016	1	1	1	2
2032	1	1	1	2
2048	1	1	1	2

Notes:

Baseline: peak day information was provided by Port (*Vessel Speed Data for Berth 238.csv* 6/28/17 and *DRAFT POLA 2016 OGV Activity Berth 238 (29 Aug 17)scg.xlsx*)

2032+: A reasonable 24-hr day, in future years, would consist of a vessel at anchorage, a vessel discharging at berth, leaving, and another vessel arriving. For calculation purposes, the peak day emissions were calculated for 1 vessel discharging at berth and 1 vessel arriving (transiting through zones 1-6). Since the emission rate (lb/hr) was calculated to be higher at berth, during product discharge, than during transit, it was conservatively assumed that on a peak day, a vessel would spend 24 hours discharging at berth while another vessel would transit through zones 1-6. This a conservative assumption because the discharging vessel would not spend the full 24 hours at berth, it would need to vacate the berth and transit through zone 1, resulting in lower emissions.

It is assumed that 2 tugboats are required for each vessel transit event.

Small re-fueling barges would not be able to berth at the same time as a vessel and are not assumed in a peak day. Emissions associated with re-fueling barges are much smaller than vessel emissions.

Information provided by Starcrest
Information provided by PBF
Information provided by POLA

2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

Table XX.
Activity

Year	Operation	Product	Vessel Calls OGV (Tankers, ATB/ITB)	Re-Fueling Barge	OGV	Total	Volume (bbls)
2016	Unloading	Alkylate	2		4	6	709,112
2016	Unloading	Gasoline	0		3	3	358,351
2016	Unloading	Raffinate	0		1	1	30,227
2016	Unloading	Renewable Fuels	0		0	0	-
2016	Unloading	Sour VGO	0		4	4	413,571
2016	Unloading	Sweet VGO	0		4	4	504,206
2016	Unloading	Crude Oil	0		0	0	-
2016	*Subtotal Unloading*	*Subtotal*	*2*	*0*	*16*	*18*	*2,015,467*
2016	Loading	Alkylate	0		1	1	148,868
2016	Loading	CSO	6		0	6	171,663
2016	Loading	ECA Marine Diesel		306	0	306	2,624,630
2016	Loading	Gasoline	3		2	5	656,120
2016	Loading	Heavy Naphtha	0		2	2	134,179
2016	Loading	LCO	10		3	13	538,324
2016	Loading	Sweet VGO	36		12	48	3,272,687
2016	*Subtotal Loading*	*Subtotal*	*55*	*306*	*20*	*381*	*7,546,471*
2016	**Total**	**Total**	**57**	**306**	**36**	**399**	**9,561,938**
2032	Unloading	Alkylate	0		0	0	0
2032	Unloading	Gasoline	0		0	0	0
2032	Unloading	Raffinate	0		0	0	0
2032	Unloading	Renewable Fuels	36		0	36	1,800,000
2032	Unloading	Sour VGO	12		12	24	3,600,000
2032	Unloading	Sweet VGO	0		0	0	0
2032	Unloading	Crude Oil	0		40	40	8,000,000
2032	*Subtotal Unloading*	*Subtotal*	*48*	*0*	*52*	*100*	*13,400,000*
2032	Loading	Alkylate	0		0	0	0
2032	Loading	CSO	12		0	12	600,000
2032	Loading	ECA Marine Diesel		365	0	365	0
2032	Loading	Gasoline	0		5	5	1,000,000
2032	Loading	Heavy Naphtha	0		0	0	0
2032	Loading	LCO	4		2	6	600,000
2032	Loading	Sweet VGO	0		0	0	0
2032	*Subtotal Loading*	*Subtotal*	*16*	*365*	*7*	*388*	*2,200,000*
2032	**Total**	**Total**	**64**	**365**	**59**	**488**	**15,600,000**

Source:
PBF - *Summary of Southwest Terminal Vessel Activity 2016 and Future Estimates.xlsx.* Activity would not change after 2032; fleet mix would change towards Tier 3 vessels.

Table XX.
Vessel Activity by Vessel Type

Year	Vessel Type	Vessel Calls - Annual Berth
2016	Ocean Tug (ATB/I	57
	Tanker - Chemica	17
	Tanker - Handysiz	7
	Tanker - Panamax	6
	OGV Total	87
	Re-Fueling Barge	306
2032	Ocean Tug (ATB/I	64
	Tanker - Chemica	28
	Tanker - Handysiz	11
	Tanker - Panamax	10
	OGV Total	113
	Re-Fueling Barge	365
2048	Ocean Tug (ATB/I	64
	Tanker - Chemica	28
	Tanker - Handysiz	11
	Tanker - Panamax	10
	OGV Total	113
	Re-Fueling Barge	365

Notes:
Annual activity was scaled from 2016 to future, based on thr
Ocean Tug activity at berth obtained from Port - 2015 Emissi
Tanker activity at berth provided by POLA: *DRAFT POLA 2016*
OGV anchorage hours obtained from Port - 2016 Emiss
2016 terminal berth calls by the percent of anchoring v
Re-Fueling Barges activity at berth provided by PBF.

Analysis:
More vessel calls projected in future years (at berth and at a
Vessels are projected to spend longer at berth and at anchor
Vessel activity is projected to stay unchanged on a daily basis

Table XX.
OGV Main Engine Characteristics and Loads

Year	Vessel Type	Engine Tier	Model Year	Main Eng Avg (kW)	Calls	Lloyd's Max Rated Speed
2016					1	
					0	
	Ocean Tug (ATB/ITB)	I	2009	8,160	0	
	Ocean Tug (ATB/ITB)	I	2004	6,825	0	
	Ocean Tug (ATB/ITB)	I	2001	6,825	0	
	Ocean Tug (ATB/ITB)	I	2001	6,767	1	
	Tanker - Chemical	0	1999	8,560	1	
	Tanker - Chemical	0	1998	11,749	1	
	Tanker - Chemical	I	2008	9,480	1	
	Tanker - Chemical	I	2006	8,561	1	
	Tanker - Chemical	I	2007	8,700	1	
	Tanker - Chemical	I	2008	8,700	2	
	Tanker - Chemical	I	2009	9,480	1	
	Tanker - Chemical	II	2013	12,460	1	
	Tanker - Chemical	II	2015	10,680	1	
	Tanker - Chemical	II	2014	7,240	0	
	Tanker - Chemical	II	2011	8,890	1	
	Tanker - Handysize	0	1996	8,056	2	
	Tanker - Handysize	0	1997	6,752	2	
	Tanker - Handysize	0	1998	8,561	1	
	Tanker - Panamax	I	2004	11,299	1	
	Tanker - Panamax	I	2000	10,518	0	
	Tanker - Panamax	I	2006	11,299	1	
	Vessel Averages					
	Ocean Tug (ATB/ITB)	I	2001	6,767		
	Tanker - Chemical	O-II	2007	9,633		
	Tanker - Handysize	O	1997	7,635		
	Tanker - Panamax	I	2005	11,299		
2032	Ocean Tug (ATB/ITB)	I		6,767		
	Tanker - Chemical	2017 CAAP distribution forecast		9,633		
	Tanker - Handysize	2017 CAAP distribution forecast		7,635		
	Tanker - Panamax	2017 CAAP distribution forecast		11,299		
2048	Ocean Tug (ATB/ITB)	I		6,767		
	Tanker - Chemical	2017 CAAP distribution forecast		9,633		
	Tanker - Handysize	2017 CAAP distribution forecast		7,635		
	Tanker - Panamax	2017 CAAP distribution forecast		11,299		

Source:
Baseline: Port - *Berth 238 Vessels 2016 - All.xls*
Baseline: Tanker - Chemical represent a weighted average of O, I, and II tier engines.
Future years: Assume same fleet size mix as baseline, per communications with Erin Sheehy (Port) on 6/21/17.
Future years: Fleet Tier mix was obtained from 2017 CAAP Bay-Wide Ocean Going Vessel International Maritime Organization Tier Forecast 2015-2050. Starcrest, June 2017.
Future years: 2017 CAAP Tier Forecast does not provide forecast for ITB. ITB fleet tier mix was assumed to be the same as baseline.

Table XX.
Fleet Mix, 2016

Vessel Type	Count	Fleet Mix
Ocean Tug (ATB/ITB use actual counts		
Tanker - Chemical	11	61%
Tanker - Handysize	5	28%
Tanker - Panamax	2	11%

Table XX.
Fleet Mix: Chemical Tankers, 2016

Tier	Count	Fleet Mix
Tier O	2	18%
Tier II	6	50%
Tier II	3	23%

Table XX.
IMO Tier Designation

Year KLD	Tier
-2000	0
2000-2009	I
2010-2015	II
2016+	II

Notes:
KLD is keel laid date.

Table XX.
Tier Distribution Forecast Not used in calculations

	Tier 0	Tier I	Tier II	Tier III
2032				
Tanker - Chemical	0%	23%	77%	0%
Tanker - Handysize	0%	15%	85%	0%
Tanker - Panamax	0%	20%	45%	35%
2048				
Tanker - Chemical	0%	0%	0%	100%
Tanker - Handysize	0%	0%	0%	100%
Tanker - Panamax	0%	0%	0%	100%

Source:
2017 CAAP Bay-Wide Ocean Going Vessel International Maritime Organization Tier Forecast 2015-2050. Starcrest, June 2017.

Table XX.
OGV Average Aux Engine & Aux Boiler Loads

Vessel Type	Engine Type	Transit	Average Loads (kW) Manuvering	Berth	Anchorage
Ocean Tug (ATB/ITB)	Auxiliary Engine	79	208	102	79
Ocean Tug (ATB/ITB)	Auxiliary Pump	0	0	190	0
Tanker - Chemical	Auxiliary Engine	658	890	816	658
Tanker - Chemical	Auxiliary Boiler	371	371	821	371
Tanker - Handysize	Auxiliary Engine	537	601	820	537
Tanker - Handysize	Auxiliary Boiler	371	371	2,586	371
Tanker - Panamax	Auxiliary Engine	561	763	623	561
Tanker - Panamax	Auxiliary Boiler	371	371	3,293	371

Source:

Port - 2015 Emissions Inventory, Tables 3.4 and 3.5.

Port - 2014 Emissions Inventory.

Table XX.

OGV Maximum Rated Vessel Speed

Category	Speed (knots)
Ocean Tug (ATB/ITB)	13.5
Tanker - Chemical	14.8
Tanker - Handysize	14.7
Tanker - Panamax	14.9

Source:

Maximum rated speed information obtained from 2011 POLA Inventory, Table 3.26 for ATB/ITB and from 2013 POLA Inventory, Table 3.22 for tankers.

Table XX.

OGV Transit Speed (knots)

		Zone 1: Harbor	Zone 2: Breakwater to start of PZ	Zone 3: start of PZ to 20nm		Zone 4: 20nm to 40nm		Zone 5: 40 nm to 50nm SCAB Over-Water Boundary	Zone 6: 50nm to 170nm State Over-Water Boundary
Year	Vessel Type	Peak Day and Annual Average	Peak Day and Annual Average	Peak Day	Annual Average	Peak Day	Annual Average	Peak Day and Annual Average	Peak Day and Annual Average
2016	Ocean Tug (ATB/ITB)	6	9	13	11	13	11	12.5	13
	Tanker - Chemical	6	9	13	11	13	11	13.7	14
	Tanker - Handysize	6	9	13	11	13	11	14	14
	Tanker - Panamax	6	9	13	11	13	11	14	14
2032+	Ocean Tug (ATB/ITB)	6	9	13	11	13	11	13	13
	Tanker - Chemical	6	9	13	11	13	11	14	14
	Tanker - Handysize	6	9	13	11	13	11	14	14
	Tanker - Panamax	6	9	13	11	13	11	14	14

Notes:

Zones 1 and 2: Transit speed is set by Harbor Pilot (*POLA Mariners Guide 2012*).

Zones 3 and 4: Baseline transit speed provided by Port wharfinger data (*Vessel Speed Data for Berth 238.csv* 6/28/17) - 13 for peak day and 11 for average; annual average speed was assumed to be same as baseline.

Zones 5 and 6: Baseline and 2032+ transit speeds in Zones 5 and 6 were calculated using the Propeller Law and 80% as the average propulsion engine load. 80%

VSRP (knots) within 40 miles of the Port. 12

2032+ transit speeds in Zones 3 and 4, without VSRP compliance, were calculated using the Propeller Law and 80% as the average propulsion engine load.

	1	2	3	4	5	6	7	8	9	10

Table XX.

OGV Control Compliance **Unmitigated**

	Sulfur Content	VSRP Zone 3 (PZ to 20nm)	VSRP Zone 4 (20nm-40nm)
2016	0.10%	97%	97%
2025	0.10%	97%	97%
2032	0.10%	97%	97%

Source:

Sulfur Content: CARB's Low Sulfur Fuel for Marine Auxiliary Engines, Main Engines, and Auxiliary Boilers.

VSRP compliance provided for 2016 baseline by Port (*Berth 238 VSRP compliance percentage.csv* 6/28/17). Future compliance assumed to be the same as baseline.

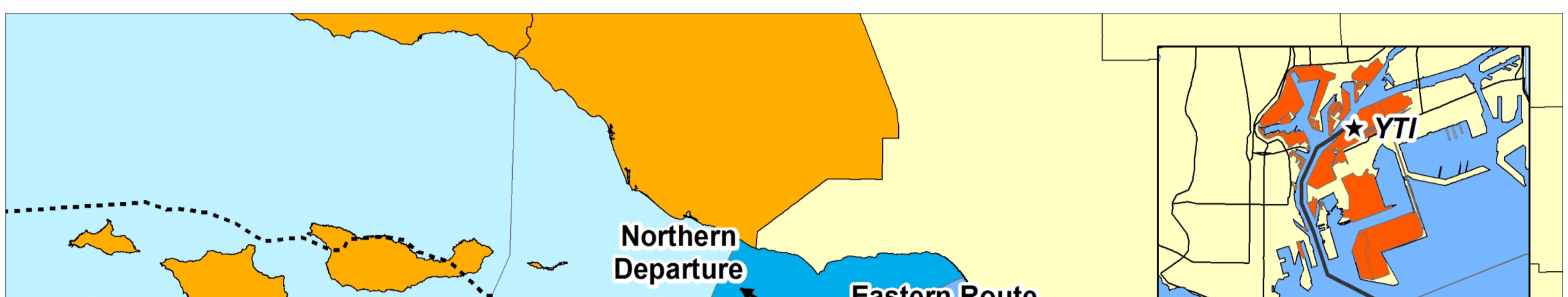
Table XX.

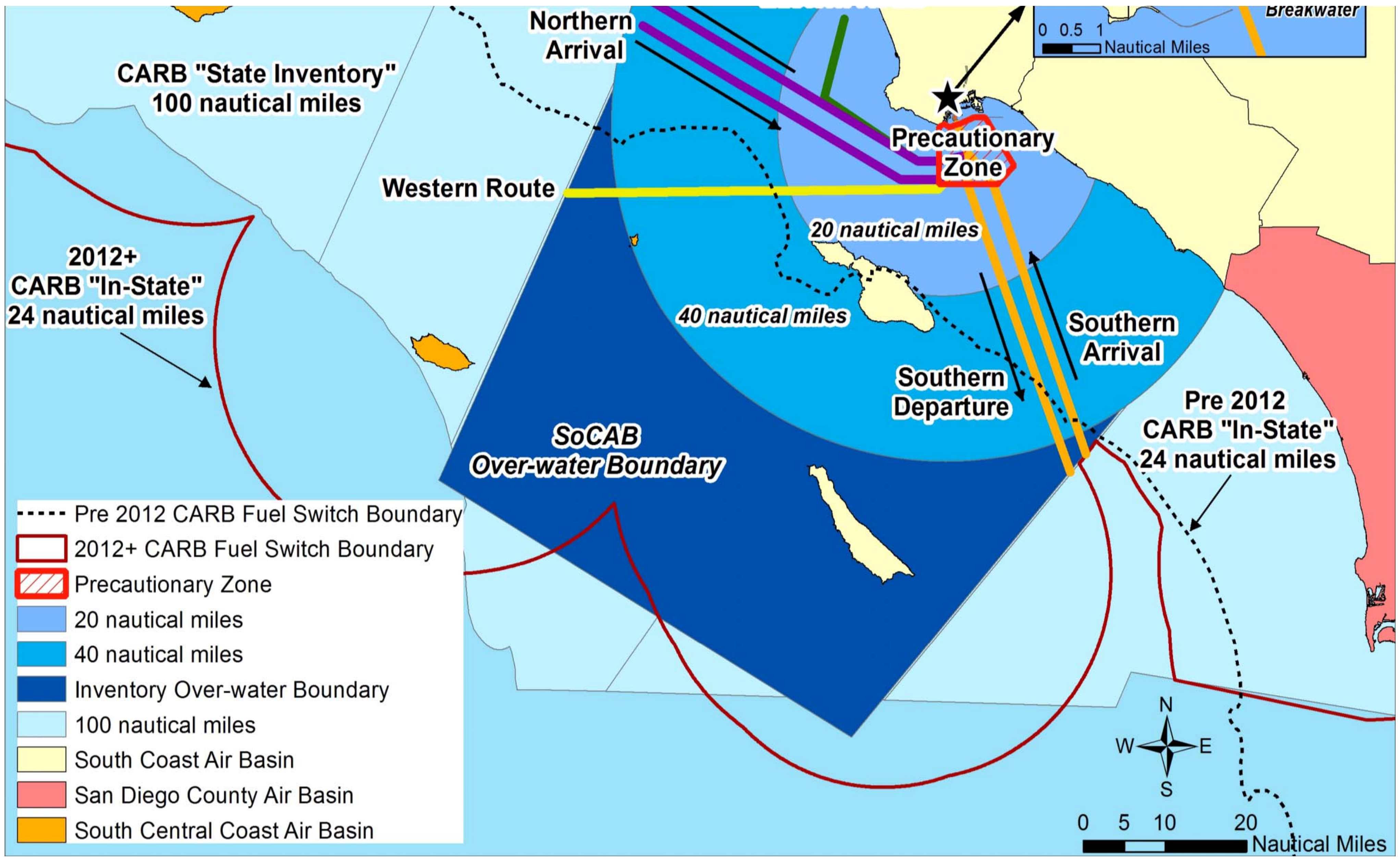
OGV Transit Distances (nm)

% Calls By Route	**Arrival**	**Departure**	Zone 1: Harbor	Zone 2: Breakwater to PZ		Zone 3: PZ to 20nm		Zone 4: 20nm to 40nm		Zone 5: 40 nm to 50nm SCAB Over-Water Boundary	Zone 6: 50nm to 170nm State Over-Water Boundary	1
				Arrival	Departure	Arrival	Departure	Arrival	Departure			2
East	0%	0%	3.7	7.63	7.63	25.75	25.75	0	0	0	130	3
North	46%	38%	3.7	8.57	7.63	21.91	21.68	21.37	20.75	0	130	4
South	36%	34%	3.7	8.47	7.36	11.11	12.55	20.18	19.92	3	127	5
West	18%	28%	3.7	8.58	8.58	18.97	18.97	21.12	21.12	7	123	6
Average	*25%*	*25%*	*3.7*	*8.17*		*17.65*		*20.73*		*2.5*	*127.5*	7

Source:

2013 Port Emissions Inventory, Table 3.1.




Northern Arrival
CARB "State Inventory" 100 nautical miles
Precautionary Zone
Western Route
20 nautical miles
2012+ CARB "In-State" 24 nautical miles
40 nautical miles
Southern Arrival
Southern Departure
Pre 2012 CARB "In-State" 24 nautical miles
SoCAB Over-water Boundary
Breakwater
0 0.5 1 Nautical Miles
Pre 2012 CARB Fuel Switch Boundary
2012+ CARB Fuel Switch Boundary
Precautionary Zone
20 nautical miles
40 nautical miles
Inventory Over-water Boundary
100 nautical miles
South Coast Air Basin
San Diego County Air Basin
South Central Coast Air Basin
N
W
E
S
0 5 10 20 Nautical Miles

17	18	19	20	21
	Vessel Activity (hr/yr)		Vessel Activity (hr/call)	
Anchorage	Berth	Anchorage	Berth	Anchorage
0		0	35	0
12	496	483	29	42
3	271	143	39	45
4	459	383	77	91
19	1,227	1,009	14	53
0		0	2	0
0		0	35	0
19	814	792	29	42
5	444	234	39	45
7	753	628	77	91
31	2,011	1,654	14	53
0		0	2	0
0		0	35	0
19	814	792	29	42
5	444	234	39	45
7	753	628	77	91
31	2,011	1,654	14	53
0		0	2	0

oughput and vessel calls (more vessel calls in the future). Peak day activity would not be affected (vessel size would not change)
ons Inventory, Table 3.2.
i OGV Activity Berth 238 (29 Aug 17)scg.xlsx
ions Inventory, Table 3.3. Anchorage calls were calculated by scaling
essels in the 2016 Port Inventory.

50%

nchorage).
age in future years, on an annual basis.
s.

Table XX.
Project Berth and Anchorage Activity, 2016

	Vessel Type	Vessel Count	Hours/Yr	Average Hours/Call	Total Days
	Tanker - Chemical	*31*	*1,703*	*55*	*71*
Tanker - Chemical anchora	Anchor-Hotelling	14	1,206	86	50
Tanker - Chemical Berth	Berth-Hotelling	17	496	29	21
	Tanker - Handysize	*14*	*638*	*46*	*27*
Tanker - Handysize anchor	Anchor-Hotelling	7	367	52	15
Tanker - Handysize Berth	Berth-Hotelling	7	271	39	11
	Tanker - Panamax	*14*	*3,794*	*271*	*158*
Tanker - panamax anchora	Anchor-Hotelling	8	3,334	417	139
Tanker - panamax Berth	Berth-Hotelling	6	459	77	19
	Total Anchorage	**29**	**4,908**	**555**	**204**
	Total Berth Hotelli	**30**	**1,227**	**144**	**51**
1	2	3	4	5	6

Source:
DRAFT POLA 2016 OGV Activity Berth 238 (29 Aug 17)scg.xlsx

Table XX.
Port Anchorage Activity, 2016

Vessel Type	Port Arrivals	Anchorage Calls	Percent of Anchoring Vessels
Tanker - Chemical	127	87	69%
Tanker - Handysize	35	16	46%
Tanker - Panamax	54	38	70%

Source:
Arrival calls: Port 2016 Emissions Inventory, Table 3.1.
Anchorage calls: Port 2016 Emissions Inventory, Table 3.3.

Information provided by Starcrest
Information provided by PBF
Information provided by POLA

Key from Vessel_Data worksheet: 13 16

Table XX.
Harbor Craft Data

				HC Characteristics								Vessel Activity				HC Energy Demand, Berth		
Year		**HC Classification**	**Engine Type**	**Engine Count per HC**	**HC Average MY**	**HC Average HP**	**HC Average kW**	**Load Factor**	**HC Engine Activity per HC, at Berth** (hr/one-way trip)	**HC Engine Activity per HC, during transit/maneuvering** (hr/one-way trip)	**HC Count per vessel**	**Peak Day Vessel Transit** (one-way trips/day)	**Average Day Vessel Transits** (one-way trips/day)	**Average Annual Vessel Transits** (one-way trips/yr)		**Peak Day HC Energy Demand** (kW-hr/day)	**Average Day HC Energy Demand** (kW-hr/day)	**Annual HC Energy Demand** (kW-hr/yr)
Baseline 2016																		
	OGV Assist	Assist Tugboat	Propulsion	2	2007	2,020	1,507	0.31	0.0	1.6	2	1	0.5	174		0	0	0
			Auxiliary	2	2010	208	155	0.43	0.0	1.6	2	1	0.5	174		0	0	0
	Re-Fueling Barge Assist	Tugboat	Propulsion	2	2009	731	545	0.31	0.0	0.3	1		1.7	612		0	0	0
			Auxiliary	2	2009	62	46	0.43	4.0	0.3	1		1.7	612		0	133	48,686
2016 Total																		
Proposed Project 2032	OGV Assist	Assist Tugboat	Propulsion	2	2007	2,020	1,507	0.31	0.0	1.6	2	1	0.6	226		0	0	0
			Auxiliary	2	2010	208	155	0.43	0.0	1.6	2	1	0.6	226		0	0	0
	Re-Fueling Barge Assist	Tugboat	Propulsion	2	2009	731	545	0.31	0.0	0.3	1		2.0	730		0	0	0
			Auxiliary	2	2009	62	46	0.43	4.0	0.3	1		2.0	730		0	159	58,073
2032 Total																		
2048	OGV Assist	Assist Tugboat	Propulsion	2	2007	2,020	1,507	0.31	0.0	1.6	2	1	0.6	226		0	0	0
			Auxiliary	2	2010	208	155	0.43	0.0	1.6	2	1	0.6	226		0	0	0
	Re-Fueling Barge Assist	Tugboat	Propulsion	2	2009	731	545	0.31	0.0	0.3	1		2.0	730		0	0	0
			Auxiliary	2	2009	62	46	0.43	4.0	0.3	1		2.0	730		0	159	58,073
2048 Total																		

Notes and Source:
Tugboats are used to assist OGVs during transit/maneuvering.
Tugboats are used to assist Re-Fueling barges during transit and at berth.
Tugboat engine characteristics are from the 2015 Port Emissions Inventory, Tables 4.1 and 4.2.
Applicable engine Tier is identified based on the EPA requirements for new engines and ARB harbor craft compliance schedule and average model year.
Example:
2004 MY engine (Tier 1 per EPA standards) would have to be replaced at the end of 2017, based on ARB's compliance schedule. At that time, the engine will need to be replaced with the relevant Tier engine applicable at the time (Tier 4).
Emission Factors:

EPA emission standards, which are reported as NOx+THC, were convered by Nox and HC assuming 95% and 5% are Nox and HC, respectively, per Carl Moyer Program guidelines.
SOx emission factor is based on 15 ppm fuel sulfur content.
PM2.5 is 89% of PM10, per SCAQMD 2006 Final Methodology to Calculate PM2.5 and PM 2.5 Significance Thresholds, Table 5.
CO2 and N20 emission factors are from IVL: Methodology for Calculating Emissions from Ships: Update on Emission Factors, 2004, also summarized in POLA 2009 Emissions Inventory, Appendix B. CH4 is 2% of HC, per IVL study.
There are no mitigation measures for operational HC. HC controls are implemented Port-wide via CAAP measures.

HC Activity: Time required to assist vessel (hr/one-way trip)

	OGV	**Re-Fueling Barge**
Propulsion engine at berth	0	0
Auxiliary engine at berth	0	2
Propulsion engine during transit/n	0.80	0.17
Auxiliary engine during transit	0.80	0.17

Notes:
HC OGV assist assumptions: Transit distance assumed to equal the average of OGV transit times in Zone 1 (harbor transit) times 1.3 to account for tug movement and assist time (2011 APL EIR/EIS, Appendix E, Table 1.3-221 or *Draft - Emission Factor Assumptions.doc*
HC re-fueling barge assumptions: Transit time is 10 minutes/trip, per Port communication on 6/21/17 with Erin Sheehy. HC stays with the re-fueling barge during product loading, turns off propulsion and runs auxiliary engines.

Harbor Craft Emission Factors - EPA Standards g/kW-hr

Engine Displacement	(kW)	EPA Tier	CARB Compliance MY Year	NMHC+NOx	PM10	PM2.5	DPM	NOx	SOX	CO	HC	VOC	CO2	CH4	N2O	
Category 1																Category 1 = HC auxiliai
		Tier 1	2004		0.40	0.36	0.40	9.80	0.006	5.00	0.38	0.39	652	0.008	0.031	
<0.9	37-75	Tier 2	2005	**7.50**	**0.40**	0.36	0.40	7.1	0.006	**5.00**	0.38	0.39	652	0.008	0.031	
0.9 < displ < 1.2	75-130	Tier 2	2004	**7.20**	**0.30**	0.27	0.30	6.8	0.006	**5.00**	0.36	0.38	652	0.007	0.031	
1.2 < displ < 2.5	130-560	Tier 2	2004	**7.20**	**0.20**	0.18	0.20	6.8	0.006	**5.00**	0.36	0.38	652	0.007	0.031	
2.5 < displ < 5	>560	Tier 2	2007	**7.20**	**0.20**	0.18	0.20	6.8	0.006	**5.00**	0.36	0.38	652	0.007	0.031	
<0.9	<19	Tier 3	2009	**7.5**	**0.40**	0.36	0.40	7.1	0.006	5.00	0.38	0.39	652	0.008	0.031	
<0.9	19-75	Tier 3	2009	**7.5**	**0.30**	0.27	0.30	7.1	0.006	5.00	0.38	0.39	652	0.008	0.031	
<0.9	75-3700	Tier 3	2012	**5.4**	**0.14**	0.12	0.14	5.1	0.006	5.00	0.27	0.28	652	0.005	0.031	
0.9 < displ < 1.2	100-175	Tier 3	2013	**5.4**	**0.12**	0.11	0.12	5.1	0.006	5.00	0.27	0.28	652	0.005	0.031	
1.2 < displ < 2.5	175-750	Tier 3	2014	**5.6**	**0.11**	0.10	0.11	5.3	0.006	5.00	0.28	0.29	652	0.006	0.031	
2.5 < displ < 5	>750	Tier 3	2013	**5.6**	**0.11**	0.10	0.11	5.3	0.006	5.00	0.28	0.29	652	0.006	0.031	
3.5 ≤ D < 7		Tier 3	2012	**5.8**	**0.11**	0.10	0.11	5.5	0.006	5.00	0.29	0.31	652	0.006	0.031	
	>3700	Tier 4	2014		**0.12**	0.11	0.12	**1.8**	0.006	5.00	**0.19**	0.20	652	0.004	0.031	
	2000-3700	Tier 4	2014		**0.04**	0.04	0.04	**1.8**	0.006	5.00	**0.19**	0.20	652	0.004	0.031	
	1400-2000	Tier 4	2016		**0.04**	0.04	0.04	**1.8**	0.006	5.00	**0.19**	0.20	652	0.004	0.031	
	600-1400	Tier 4	2017		**0.04**	0.04	0.04	**1.8**	0.006	5.00	**0.19**	0.20	652	0.004	0.031	
Category 2																Category 2 = HC propul
			MY													
>2.5	>37	Tier 1	2004		0.40	0.36	0.40	**17.0**	0.006	8.50	0.95	1.00	652	0.019	0.031	
5.0 ≤ D < 15	all	Tier 2	2007	**7.8**	**0.27**	0.24	0.27	7.4	0.006	**5.00**	0.39	0.41	652	0.008	0.031	

15 ≤ D < 20	< 3300 kW	Tier 2	2007	**8.7**	**0.50**	0.45	0.50	8.3	0.006	**5.00**	0.44	0.46	652	0.009	0.031
15 ≤ D < 20	≥ 3300 kW	Tier 2	2007	**9.8**	**0.50**	0.45	0.50	9.3	0.006	**5.00**	0.49	0.52	652	0.010	0.031
20 ≤ D < 25	all	Tier 2	2007	**9.8**	**0.50**	0.45	0.50	9.3	0.006	**5.00**	0.49	0.52	652	0.010	0.031
25 ≤ D < 30	all	Tier 2	2007	**11.0**	**0.50**	0.45	0.50	10.5	0.006	**5.00**	0.55	0.58	652	0.011	0.031
7 ≤ D < 15	<2000	Tier 3	2013	**6.2**	**0.14**	0.12	0.14	5.9	0.006	**5.00**	0.31	0.33	652	0.006	0.031
7 ≤ D < 15	2000-3700	Tier 3	2013	**7.8**	**0.14**	0.12	0.14	7.4	0.006	**5.00**	0.39	0.41	652	0.008	0.031
15 ≤ D < 20	<2000	Tier 3	2014	**7.0**	**0.34**	0.30	0.34	6.7	0.006	**5.00**	0.35	0.37	652	0.007	0.031
20 ≤ D < 25	<2000	Tier 3	2014	**9.8**	**0.27**	0.24	0.27	9.3	0.006	**5.00**	0.49	0.52	652	0.010	0.031
25 ≤ D < 30	<2000	Tier 3	2014	**11.0**	**0.27**	0.24	0.27	10.5	0.006	**5.00**	0.55	0.58	652	0.011	0.031
all	2000-3700	Tier 4	2014		**0.04**	0.04	0.04	**1.8**	0.006	5.00	**0.19**	0.20	652	0.004	0.031
<15	>3700	Tier 4	2014		**0.12**	0.11	0.12	**1.8**	0.006	5.00	**0.19**	0.20	652	0.004	0.031
15 ≤ D < 30	>3700	Tier 4	2014		**0.25**	0.22	0.25	**1.8**	0.006	5.00	**0.19**	0.20	652	0.004	0.031
all	>3700	Tier 4	2016		**0.06**	0.05	0.06	**1.8**	0.006	5.00	**0.19**	0.20	652	0.004	0.031
all	1400-2000	Tier 4	2016		**0.04**	0.04	0.04	**1.8**	0.006	5.00	**0.19**	0.20	652	0.004	0.031
all	600-1400	Tier 4	2017		**0.04**	0.04	0.04	**1.8**	0.006	5.00	**0.19**	0.20	652	0.004	0.031

Source:

Federal Marine Compression-Ignition Engines - Exhaust Emission Standards Reference Guide, http://epa.gov/OMS/standards/nonroad/marineci.htm

Amendments to the Regulations to Reduce Emissions From Diesel Engines on Commercial Harbor Craft Operated Within California Waters and 24 Nautical Miles of the California Baseline. ARB 2011. Table 9, Compliance Dates for Engines on Crew and Supply Vessels

http://www.arb.ca.gov/regact/2010/chc10/frochc931185.pdf

EPA Tier 2 and Tier 3 emission standards are reported as NOx+THC. 5% is HC per Carl Moyer Program guidelines.

SOx emission factor is based on 15 ppm fuel sulfur content.

PM2.5 is 89% of PM10, per SCAQMD 2006 Final Methodology to Calculate PM2.5 and PM 2.5 Significance Thresholds, Table 5.

CO2 and N20 emission factors are from IVL: Methodology for Calculating Emissions from Ships: Update on Emission Factors, 2004, also summarized in POLA 2009 Emissions Inventory, Appendix B. CH4 is 2% of HC, per IVL study.

Bold numbers represent actual emission standards.

SOx Emission Factor

Harbor Craft	0.00552 g/hp-hr	
Dredging Equipment	use OFFROAD BSCF and convert to g SOx /hp-hr	
SOx (gms/hp-hr) = (S content in X/1,000,000) x (MW SO2/ MW S) x BSF =		
Where:		
X = S content in parts per million (ppm)		15 ppm
S MW = Molecular Weight		32
SO2 MW = Molecular Weight		64
BSFC for harbor craft = Brake Specific Fuel Consumption (per CARB 2007 Harbor Craft Methodology)		184 (g/hp-hr)

Habor Craft Load Factor

Type		Main Engine	Auxiliary Engine
Assist tugboat		0.31	0.43
Commercial fishing		0.27	0.43
Crew boat		0.38	0.32
Excursion		0.42	0.43
Ferry		0.42	0.43
Government		0.51	0.43
Ocean tug		0.68	0.43
Tugboat		0.31	0.43
Dive boat	Work boat	0.38	0.32

Source:

2013 POLA Emissions Inventory, Table 4.7

1 2 3 4

Table 8: Compliance Dates for Engines on Ferries, Excursion Vessels, Tugboats, Towboats, and Push Boats ~~Vessels~~ with Homeports in SCAQMD

Engine Model Year	Total Annual Hours of Operation	Compliance Date
1979 and earlier	> 300	12/31/2009
1980 – 1985	> 300	12/31/2010
1986 – 1990	> 300	12/31/2011
1991 – 1995	> 300	12/31/2012
1996 – 2000	> 300	12/31/2013
2001	> 300	~~13~~12/31/2014
2002	> 300	12/31/2015
2003	> 300	12/31/2016
2004	> 300	12/31/2017
2005	> 300	12/31/2018
2006	> 300	12/31/2019
2007	> 300	12/31/2020

[Note: For example, if a 1982-model year diesel engine on a tugboat operating in Regulated California Waters is used for 300 or more hours in 2009, the owner or operator must bring the engine into compliance with the requirements of subsection (e)(6)(C) by December 31, 2010.]

Table 8 is used to identify HC Tier.

Table 9: Compliance Dates for Engines on Crew and Supply Vessels Statewide

Engine Model Year	Total Annual Hours of Operation	Compliance Date
1985 and earlier	> 1500	12/31/2011
1985 and earlier	> 300 and < 1500	12/31/2012
1986 – 1995	> 1500	12/31/2013
1986 – 1995	> 300 and < 1500	12/31/2014
1996 – 2000	> 1500	12/31/2015
1996 – 2000	> 300 and < 1500	12/31/2016
2001 – 2002	> 300	12/31/2017
2003	> 300	12/31/2018
2004	> 300	12/31/2019
2005	> 300	12/31/2020
2006	> 300	12/31/2021
2007	> 300	12/31/2022

Regulatory Impact Analysis

Table 2-2
Nonroad Power Categories Corresponding
to Per-Cylinder Displacement Ranges

Displacement (liters/cylinder)	Approximate Corresponding Power Band from Land-based Nonroad Rulemaking	
power ≥37 kW displ.<0.9	37≤kW<75	50≤hp<100
0.9≤displ.<1.2	75≤kW<130	100≤hp<175
1.2≤displ.<2.5	130≤kW<560	175≤hp<750
2.5≤displ.<5.0	kW≥560	hp≥750

Source:
Final Regulatory Impact Analysis: Control of Emissions from Marine Diesel Engines. EPA420-R-99-026, November, 1999.

EPA Standards			ARB Emission Factors
Tier	kW	Displacement	HP Range
Tier 3 for C1	<3700 kW	disp <0.9	25-120 hp
		0.9<=disp<1.2	120-175 hp
		1.2<=disp<2.5	175-500 hp
		2.5<=disp<3.5	500-750 hp
		3.5<=disp<7.0	750-1900 hp
Tier 3 for C2	<=3700 kW	7<=disp<15	1900-3300 hp
		15<=disp<20	3300-5000 hp
		20<=disp<25	3300-5000 hp
		25<=disp<30	3300-5000 hp
Tier 4 for C1 & C2	600-1400kW		800-1900 hp
	1400-3700kW		1900-5000 hp
	>3700 kW		>5000 hp

per ARB e-mail 12/30/11

Table 2. Tier 2* Marine Emission Standards

Category	Displacement (D)	CO	NOx+THC	PM	Date
	dm³ per cylinder	*g/kWh*	*g/kWh*	*g/kWh*	
1	Power ≥ 37 kW D < 0.9	5.0	7.5	0.40	2005
	0.9 ≤ D < 1.2	5.0	7.2	0.30	2004
	1.2 ≤ D < 2.5	5.0	7.2	0.20	2004
	2.5 ≤ D < 5.0	5.0	7.2	0.20	2007[a]
2	5.0 ≤ D < 15	5.0	7.8	0.27	2007[a]
	15 ≤ D < 20 Power < 3300 kW	5.0	8.7	0.50	2007[a]
	15 ≤ D < 20 Power ≥ 3300 kW	5.0	9.8	0.50	2007[a]
	20 ≤ D < 25	5.0	9.8	0.50	2007[a]
	25 ≤ D < 30	5.0	11.0	0.50	2007[a]

* – Tier 1 standards are equivalent to the MARPOL Annex VI Tier I NOx limits
a – Tier 1 certification requirement starts in 2004

Table 5. Tier 3 Standards for Marine Diesel Category 1 Commercial Standard Power Density (≤ 35 kW/dm³) Engines

Power (P)	Displacement (D)	NOx+HC†	PM	Date
kW	*dm³ per cylinder*	*g/kWh*	*g/kWh*	
P < 19	D < 0.9	7.5	0.40	2009
19 ≤ P < 75	D < 0.9[a]	7.5	0.30	2009
		4.7[b]	0.30[b]	2014
75 ≤ P < 3700	D < 0.9	5.4	0.14	2012
	0.9 ≤ D < 1.2	5.4	0.12	2013
	1.2 ≤ D < 2.5	5.6	0.11[c]	2014
	2.5 ≤ D < 3.5	5.6	0.11[c]	2013
	3.5 ≤ D < 7	5.8	0.11[c]	2012

† Tier 3 NOx+HC standards do not apply to 2000-3700 kW engines.
a – < 75 kW engines ≥ 0.9 dm³/cylinder are subject to the corresponding 75-3700 kW standards.
b – Option: 0.20 g/kWh PM & 5.8 g/kWh NOx+HC in 2014.
c – This standard level drops to 0.10 g/kWh in 2018 for < 600 kW engines.

Table 8. Tier 4 Standards for Marine Diesel Category 1/2 Engines

Power (P)	NOx	HC	PM	Date
kW	*g/kWh*	*g/kWh*	*g/kWh*	
$P \geq 3700$	1.8	0.19	0.12[a]	2014[c]
	1.8	0.19	0.06	2016[b,c]
$2000 \leq P < 3700$	1.8	0.19	0.04	2014[c,d]
$1400 \leq P < 2000$	1.8	0.19	0.04	2016[c]
$600 \leq P < 1400$	1.8	0.19	0.04	2017[d]

a – 0.25 g/kWh for engines with 15–30 dm^3/cylinder displacement.
b – Optional compliance start dates can be used within these model years.
c – Option for Cat. 2: Tier 3 PM/NOx+HC at 0.14/7.8 g/kWh in 2012, and Tier 4 in 2015.
d – The Tier 3 PM standards continue to apply for these engines in model years 2014 and 2015 only.

Table 1. MARPOL Annex VI NOx Emission Limits

Tier	Date	NOx Limit, g/kWh		
		$n < 130$	$130 \leq n < 2000$	$n \geq 2000$
Tier I	2000	17.0	$45 \cdot n^{-0.2}$	9.8
Tier II	2011	14.4	$44 \cdot n^{-0.23}$	7.7
Tier III	2016†	3.4	$9 \cdot n^{-0.2}$	1.96

† In NOx Emission Control Areas (Tier II standards apply outside ECAs).

	HC Energy Demand, Transit			Unmitigated Emission Factors											Unmitigated Emissions Berth Peak 1-Hour				
	Peak Day HC Energy Demand (kW-hr/day)	**Average Day HC Energy Demand** (kW-hr/day)	**Annual HC Energy Demand** (kW-hr/yr)	**Engine Tier**	PM10 (g/kW-hr)	PM2.5 (g/kW-hr)	DPM (g/kW-hr)	NOX (g/kW-hr)	SOX (g/kW-hr)	CO (g/kW-hr)	VOC (g/kW-hr)	CO2 (g/kW-hr)	CH4 (g/kW-hr)	N2O (g/kW-hr)	PM10 (lb/hr)	PM2.5 (lb/hr)	DPM (lb/hr)	NOX (lb/hr)	SOX (lb/hr)
	1,498	714	260,645	Tier 2	0.44	0.39	0.44	8.86	0.01	5.00	0.49	652	0.01	0.03	0.00	0.00	0.00	0.00	0.00
	214	102	37,228	Tier 2	0.30	0.27	0.30	6.94	0.01	5.00	0.38	652	0.01	0.03	0.00	0.00	0.00	0.00	0.00
	0	94	34,486	Tier 2	0.44	0.39	0.44	8.86	0.01	5.00	0.49	652	0.01	0.03	0.00	0.00	0.00	0.00	0.00
	0	11	4,057	Tier 2	0.30	0.27	0.30	6.94	0.01	5.00	0.38	652	0.01	0.03	0.00	0.00	0.00	0.00	0.00
															0.00	**0.00**	**0.00**	**0.00**	**0.00**
	1,498	929	339,038	Tier 4	0.04	0.04	0.04	1.80	0.01	5.00	0.20	652	0.00	0.03	0.00	0.00	0.00	0.00	0.00
	214	133	48,425	Tier 3	0.24	0.21	0.24	6.13	0.01	5.00	0.34	652	0.01	0.03	0.00	0.00	0.00	0.00	0.00
	0	113	41,135	Tier 4	0.04	0.04	0.04	1.80	0.01	5.00	0.20	652	0.00	0.03	0.00	0.00	0.00	0.00	0.00
	0	13	4,839	Tier 3	0.24	0.21	0.24	6.13	0.01	5.00	0.34	652	0.01	0.03	0.00	0.00	0.00	0.00	0.00
															0.00	**0.00**	**0.00**	**0.00**	**0.00**
	1,498	929	339,038	Tier 4	0.04	0.04	0.04	1.80	0.01	5.00	0.20	652.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00
	214	133	48,425	Tier 3	0.24	0.21	0.24	6.13	0.01	5.00	0.34	652.00	0.01	0.03	0.00	0.00	0.00	0.00	0.00
	0	113	41,135	Tier 4	0.04	0.04	0.04	1.80	0.01	5.00	0.20	652.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00
	0	13	4,839	Tier 3	0.24	0.21	0.24	6.13	0.01	5.00	0.34	652.00	0.01	0.03	0.00	0.00	0.00	0.00	0.00
															0.00	**0.00**	**0.00**	**0.00**	**0.00**

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Nationwide.

		8-Hour	Peak Day							Average Annual											Transit Peak 1-Hour	
CO (lb/hr)	VOC (lb/hr)	CO (lb/8-hr)	PM10 (lb/day)	PM2.5 (lb/day)	DPM (lb/day)	NOX (lb/day)	SOX (lb/day)	CO (lb/day)	VOC (lb/day)	PM10 (lb/yr)	PM2.5 (lb/yr)	DPM (lb/yr)	NOX (lb/yr)	SOX (lb/yr)	CO (lb/yr)	VOC (lb/yr)	CO2 (mty)	CH4 (mty)	N2O (mty)	CO2e (mty)	PM10 (lb/hr)	PM2.5 (lb/hr)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.91	0.81
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.08
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	32.20	28.66	32.20	744.35	0.59	536.66	41.25	31.74	0.00	0.00	32.22	0.00	0.00
0.00	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**32.20**	**28.66**	**32.20**	**744.35**	**0.59**	**536.66**	**41.25**	**31.74**	**0.00**	**0.00**	**32.22**	**1.00**	**0.89**
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.07
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.06
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	30.73	27.35	30.73	784.49	0.71	640.14	43.48	37.86	0.00	0.00	38.43	0.00	0.00
0.00	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**30.73**	**27.35**	**30.73**	**784.49**	**0.71**	**640.14**	**43.48**	**37.86**	**0.00**	**0.00**	**38.43**	**0.15**	**0.14**
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.07
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.06
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	30.73	27.35	30.73	784.49	0.71	640.14	43.48	37.86	0.00	0.00	38.43	0.00	0.00
0.00	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**30.73**	**27.35**	**30.73**	**784.49**	**0.71**	**640.14**	**43.48**	**37.86**	**0.00**	**0.00**	**38.43**	**0.15**	**0.14**

					8-Hour	Peak Day							Average Annual										
DPM (lb/hr)	NOX (lb/hr)	SOX (lb/hr)	CO (lb/hr)	VOC (lb/hr)	CO (lb/8-hr)	PM10 (lb/day)	PM2.5 (lb/day)	DPM (lb/day)	NOX (lb/day)	SOX (lb/day)	CO (lb/day)	VOC (lb/day)	PM10 (lb/yr)	PM2.5 (lb/yr)	DPM (lb/yr)	NOX (lb/yr)	SOX (lb/yr)	CO (lb/yr)	VOC (lb/yr)	CO2 (mty)	CH4 (mty)	N2O (mty)	CO2e (mty)
0.91	18.25	0.01	10.30	1.01	16.51	1.46	1.30	1.46	29.25	0.02	16.51	1.62	254.27	226.30	254.27	5,090.36	3.17	2,873.07	282.11	169.94	0.00	0.01	172.50
0.09	2.04	0.00	1.47	0.11	2.36	0.14	0.13	0.14	3.27	0.00	2.36	0.18	24.62	21.91	24.62	569.17	0.45	410.36	31.54	24.27	0.00	0.00	24.64
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.64	29.94	33.64	673.51	0.42	380.14	37.33	22.48	0.00	0.00	22.82
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.68	2.39	2.68	62.03	0.05	44.72	3.44	2.65	0.00	0.00	2.68
1.00	**20.29**	**0.01**	**11.77**	**1.12**	**18.87**	**1.60**	**1.43**	**1.60**	**32.53**	**0.02**	**18.87**	**1.80**	**315.21**	**280.54**	**315.21**	**6,395.07**	**4.09**	**3,708.29**	**354.42**	**219.34**	**0.00**	**0.01**	**222.64**
0.08	3.71	0.01	10.30	0.41	16.51	0.13	0.12	0.13	5.94	0.02	16.51	0.66	29.90	26.61	29.90	1,345.39	4.13	3,737.19	149.54	221.05	0.00	0.01	224.34
0.07	1.80	0.00	1.47	0.10	2.36	0.11	0.10	0.11	2.89	0.00	2.36	0.16	25.62	22.80	25.62	654.15	0.59	533.78	36.25	31.57	0.00	0.00	32.04
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.63	3.23	3.63	163.23	0.50	453.43	18.14	26.82	0.00	0.00	27.22
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.56	2.28	2.56	65.37	0.06	53.34	3.62	3.16	0.00	0.00	3.20
0.15	**5.51**	**0.01**	**11.77**	**0.51**	**18.87**	**0.25**	**0.22**	**0.25**	**8.83**	**0.02**	**18.87**	**0.82**	**61.71**	**54.92**	**61.71**	**2,228.15**	**5.27**	**4,777.75**	**207.56**	**282.60**	**0.00**	**0.01**	**286.80**
0.08	3.71	0.01	10.30	0.41	16.51	0.13	0.12	0.13	5.94	0.02	16.51	0.66	29.90	26.61	29.90	1,345.39	4.13	3,737.19	149.54	221.05	0.00	0.01	224.34
0.07	1.80	0.00	1.47	0.10	2.36	0.11	0.10	0.11	2.89	0.00	2.36	0.16	25.62	22.80	25.62	654.15	0.59	533.78	36.25	31.57	0.00	0.00	32.04
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.63	3.23	3.63	163.23	0.50	453.43	18.14	26.82	0.00	0.00	27.22
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.56	2.28	2.56	65.37	0.06	53.34	3.62	3.16	0.00	0.00	3.20
0.15	**5.51**	**0.01**	**11.77**	**0.51**	**18.87**	**0.25**	**0.22**	**0.25**	**8.83**	**0.02**	**18.87**	**0.82**	**61.71**	**54.92**	**61.71**	**2,228.15**	**5.27**	**4,777.75**	**207.56**	**282.60**	**0.00**	**0.01**	**286.80**

Total

Peak 1-Hour							8-Hour	Peak Day							Average Annual								
PM10 (lb/hr)	PM2.5 (lb/hr)	DPM (lb/hr)	NOX (lb/hr)	SOX (lb/hr)	CO (lb/hr)	VOC (lb/hr)	CO (lb/8-hr)	PM10 (lb/day)	PM2.5 (lb/day)	DPM (lb/day)	NOX (lb/day)	SOX (lb/day)	CO (lb/day)	VOC (lb/day)	PM10 (lb/yr)	PM2.5 (lb/yr)	DPM (lb/yr)	NOX (lb/yr)	SOX (lb/yr)	CO (lb/yr)	VOC (lb/yr)	CO2 (mty)	CH4 (mty)
0.91	0.81	0.91	18.25	0.01	10.30	1.01	16.51	1.46	1.30	1.46	29.25	0.02	16.51	1.62	254.27	226.30	254.27	5,090.36	3.17	2,873.07	282.11	169.94	0.00
0.09	0.08	0.09	2.04	0.00	1.47	0.11	2.36	0.14	0.13	0.14	3.27	0.00	2.36	0.18	24.62	21.91	24.62	569.17	0.45	410.36	31.54	24.27	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.64	29.94	33.64	673.51	0.42	380.14	37.33	22.48	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	34.88	31.05	34.88	806.38	0.64	581.38	44.69	34.39	0.00
1.00	**0.89**	**1.00**	**20.29**	**0.01**	**11.77**	**1.12**	**18.87**	**1.60**	**1.43**	**1.60**	**32.53**	**0.02**	**18.87**	**1.80**	**347.41**	**309.20**	**347.41**	**7,139.42**	**4.69**	**4,244.95**	**395.67**	**251.09**	**0.00**
0.08	0.07	0.08	3.71	0.01	10.30	0.41	16.51	0.13	0.12	0.13	5.94	0.02	16.51	0.66	29.90	26.61	29.90	1,345.39	4.13	3,737.19	149.54	221.05	0.00
0.07	0.06	0.07	1.80	0.00	1.47	0.10	2.36	0.11	0.10	0.11	2.89	0.00	2.36	0.16	25.62	22.80	25.62	654.15	0.59	533.78	36.25	31.57	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.63	3.23	3.63	163.23	0.50	453.43	18.14	26.82	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.29	29.63	33.29	849.86	0.77	693.48	47.10	41.02	0.00
0.15	**0.14**	**0.15**	**5.51**	**0.01**	**11.77**	**0.51**	**18.87**	**0.25**	**0.22**	**0.25**	**8.83**	**0.02**	**18.87**	**0.82**	**92.43**	**82.27**	**92.43**	**3,012.64**	**5.98**	**5,417.89**	**251.04**	**320.46**	**0.00**
0.08	0.07	0.08	3.71	0.01	10.30	0.41	16.51	0.13	0.12	0.13	5.94	0.02	16.51	0.66	29.90	26.61	29.90	1,345.39	4.13	3,737.19	149.54	221.05	0.00
0.07	0.06	0.07	1.80	0.00	1.47	0.10	2.36	0.11	0.10	0.11	2.89	0.00	2.36	0.16	25.62	22.80	25.62	654.15	0.59	533.78	36.25	31.57	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.63	3.23	3.63	163.23	0.50	453.43	18.14	26.82	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.29	29.63	33.29	849.86	0.77	693.48	47.10	41.02	0.00
0.15	**0.14**	**0.15**	**5.51**	**0.01**	**11.77**	**0.51**	**18.87**	**0.25**	**0.22**	**0.25**	**8.83**	**0.02**	**18.87**	**0.82**	**92.43**	**82.27**	**92.43**	**3,012.64**	**5.98**	**5,417.89**	**251.04**	**320.46**	**0.00**

N2O (mty)	CO2e (mty)
0.01	172.50
0.00	24.64
0.00	22.82
0.00	34.90
0.01	**254.86**
0.01	224.34
0.00	32.04
0.00	27.22
0.00	41.63
0.02	**325.23**
0.01	224.34
0.00	32.04
0.00	27.22
0.00	41.63
0.02	**325.23**

Information provided by Starcrest
Information provided by PBF
Information provided by POLA

Table XX.
Fugitive Processes

Tanks
Valves and Pumps
Marine Loading

Table XX.
Tank Data

2016							Baseline 2016	2032	2048
AER	**Permit**	**A/N**	**Process**	**Product**	**Throughput**	**EF ROG**	**Emissions**	**Emissions**	**Emissions**
Device ID	**Device ID**		**ID**		**Mgal**	**lb/Mgal**	**lb/yr**	**lb/yr**	**lb/yr**
ES1		586986	P1	Vacuum gas	35,910	0.01	456.13		
ES1		586986	P2	Light cycle c	20,520	0.00	46.81		
ES2		586987	P1	Vacuum gas	58,802	0.00	286.46		
ES3		586988	P1	Vacuum gas	26,163	0.02	584.3		
ES4		586989	P1	Vacuum gas	25,611	0.02	585.62		
ES5		586990	P1	Distillate fu	40,299	0.00	125.43		
ES6		586991	P1	Distillate fu	45,916	0.00	140.17		
ES8		586993	P1	Gasoline (R'	1,113	0.92	1,021.27		
ES11		586995	P1	Gasoline (R'	41	7.15	291.56		
ES12		586996	P1	Gasoline (R'	10	7.92	80.77		
ES13		586997	P1	Gasoline (R'	11	7.74	85.92		
ES14		586998	P1	Gasoline (R'	1,710	0.36	616.96		
ES14		586998	P2	Gasoline (R'	6,842	0.08	535.57		
ES14		586998	P3	Jet naphtha	1,710	0.02	34.73		
ES15		586999	P1	Gasoline (R'	10,579	0.05	511.09		
ES15		586999	P2	Gasoline (R'	4,232	0.12	521.84		
ES16		587000	P1	Gasoline (R'	26,330	0.03	787.66		
ES16		587000	P2	Gasoline (R'	15,798	0.05	809.41		
ES17		587001	P1	Distillate fu	26,393	0.20	5,263.77		
ES18		587002	P1	Gasoline (R'	20,298	0.04	808.75		
ES18		587002	P2	Gasoline (R'	6,766	0.07	478.02		
ES18		587002	P3	Jet naphtha	10,149	0.02	165.91		
ES21		587005	P1	Vacuum gas	0	5,877,680,000.00	5,877.68		
ES21		587005	P2	Light cycle c	0	4,302,440.00	4.3		
ES24		587008	P1	Vacuum gas	46,663	0.00	135.4		
ES24		587008	P2	Clarified slu	9,333	0.02	199.46		
ES27		587011	P1	Distillate fu	8	0.31	2.46		
ES30		587014	P1	Light cycle c	1,417	0.01	12.42		
ES34			P1	Distillate fu	1	0.03	0.02		
Tank Emissions					**442,623**		**20,469.89**	**33,395.98**	**33,395.98**

Source:
2016 tank emissions were obtained from the 2016 AER.
2032 and 2048 tank emissions were calculated by scaling 2016 tank emissions by projected throughput. It was assumed, per Port, that overall product vapor pressure would not change.

Table XX.
Fugitive Components

AER Device ID	Permit Device ID		A/N	Process ID	Equipment	Count	Emissions lb/yr

Valves, fittings, etc. emissions are based on equipment count. No future change is projected in equipment count; emissions would remain as per baseline.

2 3 4 5 6 7 8

Table XX.
Marine Loading Emissions

Year	Loading (bbl/yr)	Emission Factor (lb/1000 bbl)	Emissions (lb/year)	Emissions (lb/day)
		VOC	VOC	VOC
2016	7,546,471	2	15,093	313
2032	2,200,000	2	4,400	313
2048	2,200,000	2	4,400	313

Notes:
Loading rate was provided by PBF.
Annual emissions are based on annual throughput.
Peak day emissions are based on estimated marine vessel loading rate.
Source:
Loading: *2016 SWT Vessel Activity + Potential Future Estimates - PBF Projections.xlsx*
VDU is used during all loading events. VDU emissions are restricted by SCAQMD Rule 1142(c)(1)(B).

			Sum of Volume (bbls)
bbl		**2016**	
9561938	used to produce higher o	Alkylate	857,980
Mgal		Crude Oil	0
401,601	Clarified slurry oil	CSO	171,663
	Distillate fuel oil no.2	ECA Marine Diesel	2,624,630
	Gasoline	Gasoline	1,014,471
	Jet naphtha (JP-4)	Heavy Naphtha	134,179
	Light cycle oil	LCO	538,324
	portion of an original liqu	Raffinate	30,227
		Renewable Fuels	0
	Vacuum gas oil	Sour VGO	413,571
	Vacuum gas oil	Sweet VGO	3,776,893
		Subtotal	9,561,938
		Total	9,561,938
		2032	
	used to produce higher o	Alkylate	0
		Crude Oil	8,000,000
	Clarified slurry oil	CSO	600,000
	Distillate fuel oil no.2	ECA Marine Diesel	0
	Gasoline	Gasoline	1,000,000
	Jet naphtha (JP-4)	Heavy Naphtha	0
	Light cycle oil	LCO	600,000
	portion of an original liqu	Raffinate	0
		Renewable Fuels	1,800,000
	Vacuum gas oil	Sour VGO	3,600,000
	Vacuum gas oil	Sweet VGO	0
		Subtotal	15,600,000
		Total	15,600,000

Difficult to match PBF-provided info to AER due to projected product changes. See e-mail sent to Matt 9/20/17

Emissions are a function of product vapor pressure and throughput. Per Port (10/11/17 conference call), assume no change in vapor pressure in future years. Therefore, AER tank data was scaled by projected throughput to obtain projected Tank emissions.

Table XX.
Marine Vessel Loading Rate

Vessel	Capacity (bbl)	Hotelling Time (hr/call)	Hr/Day	Loading Rate (bbl/day)
Panamax	500,000	77	24	156,733

Key used to transfer emissions to Summary Tables

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

Information provided by Starcrest

Information provided by PBF

Information provided by POLA

Table XX.

Terminal Equipment Combustion Exhaust

	Year	Equipment	Fuel	Throughput	Units	Emission Factors PM	NOx	SOx	CO	ROG	CO2	CH4	N2O	Annual Emissions PM10	PM2.5	NOx	SOx	CO	ROG	CO2	CH4
						lb/mmscf	lb/mmscf	lb/mmscf	lb/mmscf	lb/mmscf	kg/scf	kg/scf	kg/scf	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	mton/yr	mton/yr
Baseline 2016	2016	VDU	natural gas	29.21	mmscf/yr	7.5	130	0.6	35	7	0.05	9.66E-07	9.66E-08	219.07	216.88	3797.30	17.53	1022.35	204.47	1,460	0.03
Proposed Project 2032	2032	VDU	natural gas	8.52	mmscf/yr	7.5	130	0.6	35	7	0.05	9.662E-07	9.66E-08	63.87	63.23	1107.01	5.11	298.04	59.61	426	0.01
Proposed Project 2048	2048	VDU	natural gas	8.52	mmscf/yr	7.5	130	0.6	35	7	0.05	9.662E-07	9.66E-08	63.87	63.23	1107.01	5.11	298.04	59.61	426	0.01

Notes:

VDU is vapor destruction unit used to control vapors associated with product loading onto marine vessels.

2016 criteria pollutant emission factors and emissions are from 2016 AER.

2016 GHG emission factors are from The Climate Registry.

Projected future activity is scaled from 2016 AER based on product throughput, provided by PBF. VDU activity was scaled on product throughput associated with marine loading only; VDU is not used during unloading.

Activity would remain constant after 2032.

PM2.5 is assumed to be 99% of PM10. Source: *SCAQMD, Final –Methodology to Calculate Particulate Matter (PM) 2.5and PM 2.5 Significance Thresholds.* 2006.

Fugitive emissions associated with VDUare provided in Fugitive Data.

Other terminal equipment was not included, per Port's instruction.

VDU rating (MMBtu/hr)	HV (Btu/scf)	VDU max activity (MMscf/hr)	VDU max activity (MMscf/day)
189	1020	0.19	4.4

Notes:

HV is the average heating value of natural gas

Source:

SCAQMD permit G43161

24	25	26	27	28	29	30	31

		Daily Emissions					
N2O	CO2e	PM10	PM2.5	NOx	SOx	CO	ROG
mton/yr	mton/yr	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
0.00	1,462	33.35	33.02	578.12	2.67	155.65	31.13
0.00	426	33.35	33.02	578.12	2.67	155.65	31.13
0.00	426	33.35	33.02	578.12	2.67	155.65	31.13

Conversions

HC to VOC	1.053	EPA, 2010. Conversion Factors for Hydrocarbon Emission Components, EPA-420-R-10-015. July. Available online: http://www.epa.gov/oms/models/nonrdmdl/nonrdmdl2010/420r10015.pdf
g to lb	0.00220459	
g to mton	0.000001	
hp to kW	0.74599	

Table XX

GHG emission factors

	Fuel	CO2	Units	CH4	N2O	Units	CH4	N2O	Units
VDU[1],[2]	natural gas	0.05	kg/scf	0.001	0.0001	kg/MMBtu	9.66E-07	9.66E-08	kg/scf

Source:

[1] Emission factors are from the 2016 Climate Registry Default Emission Factors. Tables 12.1 and 12.9.

[2] Natural gas heating value: 1035 scf

Table XX

Fuel density

Diesel (lb/gal)	7.04

Table XX

Global Warming Potentials (GWP):

CO2	CH4	N2O	HCFC-22	404A
1	21	310	1,500	3,260

Source: The Climate Registry, General Protocols, v. 2.0, Table B.2. March 2013.

Revisions

Date	Revision
Jul-17	Revision 2: Incorporated fleet mix changes (provided by Port) due to Tier
9/15-9/30/2017	Revision 3
	Incorporated anchorage information, provided by Port.
	Emissions at berth were revised to reflect hotelling data provided in *DRAFT POLA 2016 OGV Activity Berth 238 (29 Aug 17)scg.xlsx* . Previous calculations relied on average hotelling times in the Port Emissions Inventory. Provided
	Incorporated VDU combustion and VDU fugitive emissions.
	Conservatively assumed that for tankers, aux boilers remain turned at all
10/12/2017	Version 4
	Incorporated John C. comments.
	Removed future OGV fleet engine projections, per Port request.
	Per Port, anchorage calls and activity previously provided by Port from wharf data was inacurrate. Calculations were revised to reflect Port 2016 EI. This
	Scaled AER tank emissions by weighed avg of vapor pressure and
	Renamed source categories in summary tables.

Questions

Date	Question	
6/21/2017	Were electrical shore pumps considered in past MOTEMS analyses? Or was this implied in the boiler loads provided by Starcrest? Using Starcrest's loads would result in a conservative estimate.	Per Port: assumed in boiler loads. This is a conservative assumption because it is unlikely that Starcrest actually assumed operation of shore pumps in their boiler loads. Keep note of this for HRA
	1 berth in baseline and 1 berth in future? What changes the peak day?	Baseline = 2 berths but only 1 vessel at any given time. Future =1 berth and 1 vessel.
	Anchorage during the baseline or future years?	Originally assumed that no anchorage during peak day (per Port) - this was revised to include anchorage during peak day (9/15/17). Anchorage affects annual baseline and future anchorage (can scale future off baseline). Anchorage provided by POLA 9/15/17.
	Assume same fleet mix in the future as in baseline?	Yes. Note that Port provided fleet mix for unloading only; fleet mix for loading is still needed for analysis. Per Erin (6/30/17) make assumption that fleet mix is the same for unloading and loading. Note response on 7/20/17 regarding Tier 3 fleet mix.
	Baseline vessel calls from Port (20 calls) and from applicant (18 calls) do not quite correlate.	Not a problem. Use Port's baseline data instead of applicant's baseline data (Berth 238 Vessels 2016 - All.xls).
	Port EI does not provide max rated speed or propulsion kW. Get from Starcrest, other MOTEMS documents or avg from 2016.	Average propulsion engine kW from *Berth 238 Vessels 2016 - All.xls.* Max rated speed provided in *Vessel Speed Data for Berth 238.csv*
	Need maneuvering speed or times and zone assumptions for barges and tanker types. Get from Starcrest or past MOTEMS documents.	See *Vessel Speed Data for Berth 238.csv* 6/28/17
	Small fueling barges	Fueling barges - 5,000-10,000 bbl diesel, average is 7,000 bbl, loading rate is 3,500-4,000 bbl/hr = 2 hours
	What is the peak day? 1 vessel? 1 ITB and 2 refueling barges? 4 refueling	1 at berth; 1 in transit
	What is re-fueling barge transit time (tugboat emissions)?	Use 10 minutes for both baseline and future.
	1 or 2 tugs per small re-fueling barge.	1 tug
	Shell calcs	Per Erin - cannot send
	PBF does not bunker (re-fuel vessels) at berth.	Correct
6/22/2017	Starcrest does not identify auxiliary boilers for ITBs.How does product get	Diesel-fired pumps.
	VSRP compliance for baseline is very high, but there was at least one vessel that did not comply. For peak day, should we assume 100% compliance in	Assume 100% compliance for baseline and future for peak day. Assume 97% for baseline and for future annual.
6/27/2017	Auxiliary engines can be either high or medium speed; high speed were	See *Draft Emission Factor Assumptions.docx* 7/20/17.
	Model year for auxiliary engines not provided by Port.	Calculations assume that auxiliary and propulsion engines are the same model year.
	For container ships, aux boilers are turned off when engine load > 20%. Is this the case for ITB and tankers as well?	Conservatively assumed that for tankers, aux boilers are turned on at all times (Port 9/19/17 e-mail).
6/30/2017	Need help reading the wharfinger info Erin provided. What does it mean when 'N' at berth?	Yes = vessel came to berth directly from sea; No = vessel came to berth from elsewhere.
	HRA	Erin to discuss w/ Port if HRA can be addressed qualitatively based on past MOTEMS. Will wait for DPM and GHG emissions before starting this discussion.
	Tankers are generally pretty slow and their speed in 2016 to B238/B239 was on average below 12knots in VSR zone. Assume same in future or increase	Use 12 for both baseline and future.
	Will operations at SWT-2 be considered part of the project? Will any physical changes happen at SWT-2? Is product currently piped there and will it continue to be piped to that site? Is there anything you want to do	Only crude oil (emissions will be low). Question to PBF: what amount of crude from future operations will end up in SWT-2? Can look at the SWT-1 AER to scale SWT-2 emissions.
	What is the speed limitation in the harbor? 5 knots?	See *Draft Emission Factor Assumptions.docx* 7/20/17.
	What are the tugboat engine ratings and loads for re-fueling barges.	See *Draft Emission Factor Assumptions.docx* 7/20/17.
7/12/2017	It was assumed that all OGVs calling at berth would utilize their boilers. However, this may not be the case for OGVs that are being loaded as shore-pumps may be used to load product onto OGVs. Clarification is still needed.	
	Is there any diesel- or gasoline-fueled equipment at the terminal that the Port wants to capture in the analysis?	No. Will not scale internal combusion engines in the AER by throughput. Will scale VDU.
	quantified. These emissions are expected to be minor compared to vessel hoteling and transit emissions. Emissions should include a vapor destruction	VDU AER and permit information provided 9/19/17.
7/20/2017	2017 CAP	Mention in document, but do not take credit.
	Tier 3 OGVs	Port now has Tier 3 fleet mix. Will send. Incorporate into 2048

7/31/2017	Engine speed: ITB propulsion = medium, ITB auxiliary = high, Tanker	*Draft-Emission Factors Assumptions.docx* 7/20/17
	Vessel speed: Zones 3 and 4: Baseline transit speed provided by Port wharfinger data (*Vessel Speed Data for Berth 238.csv 6/28/17*) - 13 for peak day and 11 for average; this does not match the 9 knots specified by the	Use: Zone 1: 6 knots; Zone 2: 9 knots; Zone 3 and 4: 11 knots average, 13 knots peak day.
	ITB pumps:	
	190 kW at berth only. The pumps do not circulate to keep the product fluid during transit or maneuvering?	No circulation to be considered in calculations. *Draft - Emission Factor Assumptions_lg_ECS 8-4-2017_tb comments.docx*
	What are the emission factors for ITB pumps? Used boiler emission factors in previous calcs.	ITB pumps assume Tier 1 High Speed Diesel 0.1% S – See Table 3.8 of 2014 Inventory. *Draft - Emission Factor Assumptions_lg_ECS 8-4-2017_tb comments.docx*
	ITB pumps: 2014 EI reference - unable to locate this information in 2014 EI. Please provide table or page number.	The ITB pumps are not in the Starcrest inventory. Per Starcrest e-mail Archana Agrawal to John Castleberry on 7/21/15 Sause Bros advised that their barges have 450 – 500 hp engines operating at 50 – 60% load to unload product. 475 hp x 0.746 kW/hp x 55% load = 195 kW. *Draft - Emission Factor Assumptions_lg_ECS 8-4-2017_tb*
	Assist and In-Harbor tugboats:	
	PBF said 2 tugboats are needed to assist each tanker. *Draft Emission Factors Assumptions.docx* stipulates 1 tugboat is needed to assist. Please	Conservatively assumed 2 tugboats.
	2010 auxiliary engines are Tier 2. Average model year for propulsion engines is 2007, which is also Tier 2, not Tier 1. Tier 2 assist tug propulsion	All tug propulsion and aux are Tier 2 for baseline. *Draft - Emission Factor Assumptions_lg_ECS 8-4-2017_tb comments.docx*
	Year 2032: What CAAP requirements should be used for future year (year 2032) assist tugboats and in-harbor tugboats? Used in calcs: Tier 4 propulsion engine, Tier 3 auxiliary engine, for all assist	Tier 4 propulsion and Tier 3 auxiliary have been assumed in previous inventory for 2023+. *Draft - Emission Factor Assumptions_lg_ECS 8-4-2017_tb comments.docx*
	Loading vs unloading rate. This may impact hoteling time for tanker loading.	**Erin still working on this.**
9/27/2017	Anchorage calls exceed berth calls in information provided for baseline in POLA: *DRAFT POLA 2016 OGV Activity Berth 238 (29 Aug 17)scg.xlsx*	
10/4/2017	Should we qualitatively discuss CARB's proposal to include Tankers in the	

APPENDIX B
CalEEMod Output

PBF Construction

South Coast AQMD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Heavy Industry	900.00	1000sqft	20.66	900,000.00	0

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.2 **Precipitation Freq (Days)** 31

Climate Zone 11 **Operational Year** 2020

Utility Company Los Angeles Department of Water & Power

CO2 Intensity (lb/MWhr) 1227.89 **CH4 Intensity (lb/MWhr)** 0.029 **N2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Construction Phase - Provided by POLA Engineering

Off-road Equipment - Off-Road Equipment - Provided by POLA Engineering

Off-road Equipment - Off-Road Equipment - Provided by POLA Engineering

Off-road Equipment - Off-Road Equipment - Provided by POLA Engineering

Off-road Equipment - Off-Road Equipment - Provided by POLA Engineering

Off-road Equipment - Off-Road Equipment - Provided by POLA Engineering

Off-road Equipment - Off-Road Equipment - Provided by POLA Engineering

Off-road Equipment - Off-Road Equipment - Provided by POLA Engineering

Off-road Equipment - Off-Road Equipment - Provided by POLA Engineering

Off-road Equipment - Off-Road Equipment - Provided by POLA Engineering

Off-road Equipment - Off-Road Equipment - Provided by POLA Engineering

Trips and VMT - Trips and VMT - Provided by POLA Engineering

Demolition -

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Fleet Mix -

Area Coating -

Energy Use -

Area Mitigation - SCAQMD Rule 1113

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2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.3605	4.1759	2.7185	7.2000e-003	0.1292	0.1563	0.2855	0.0317	0.1479	0.1796	0.0000	660.5741	660.5741	0.1227	0.0000	663.6418
2019	0.2604	3.1508	2.0457	6.1000e-003	0.1093	0.1085	0.2179	0.0266	0.1034	0.1300	0.0000	558.0108	558.0108	0.0952	0.0000	560.3911
Maximum	**0.3605**	**4.1759**	**2.7185**	**7.2000e-003**	**0.1292**	**0.1563**	**0.2855**	**0.0317**	**0.1479**	**0.1796**	**0.0000**	**660.5741**	**660.5741**	**0.1227**	**0.0000**	**663.6418**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.3605	4.1759	2.7185	7.2000e-003	0.1292	0.1563	0.2855	0.0317	0.1479	0.1796	0.0000	660.5737	660.5737	0.1227	0.0000	663.6414
2019	0.2604	3.1508	2.0457	6.1000e-003	0.1093	0.1085	0.2179	0.0266	0.1034	0.1300	0.0000	558.0104	558.0104	0.0952	0.0000	560.3907
Maximum	**0.3605**	**4.1759**	**2.7185**	**7.2000e-003**	**0.1292**	**0.1563**	**0.2855**	**0.0317**	**0.1479**	**0.1796**	**0.0000**	**660.5737**	**660.5737**	**0.1227**	**0.0000**	**663.6414**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	1-16-2018	4-15-2018	1.1410	1.1410
2	4-16-2018	7-15-2018	1.0392	1.0392
3	7-16-2018	10-15-2018	1.1167	1.1167
4	10-16-2018	1-15-2019	1.2666	1.2666
5	1-16-2019	4-15-2019	1.3174	1.3174
6	4-16-2019	7-15-2019	1.1064	1.1064
7	7-16-2019	9-30-2019	0.7210	0.7210
		Highest	1.3174	1.3174

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	3.6704	1.1000e-004	0.0116	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.0223	0.0223	6.0000e-005	0.0000	0.0238
Energy	0.0878	0.7985	0.6708	4.7900e-003		0.0607	0.0607		0.0607	0.0607	0.0000	6,433.3422	6,433.3422	0.1481	0.0431	6,449.8953
Mobile	0.5263	3.1020	7.9273	0.0282	2.2715	0.0286	2.3001	0.6088	0.0268	0.6356	0.0000	2,596.8894	2,596.8894	0.1283	0.0000	2,600.0976
Waste						0.0000	0.0000		0.0000	0.0000	226.5379	0.0000	226.5379	13.3880	0.0000	561.2381
Water						0.0000	0.0000		0.0000	0.0000	66.0285	1,509.3633	1,575.3918	6.8174	0.1675	1,795.7441
Total	**4.2845**	**3.9006**	**8.6096**	**0.0330**	**2.2715**	**0.0893**	**2.3608**	**0.6088**	**0.0875**	**0.6963**	**292.5664**	**10,539.6173**	**10,832.1836**	**20.4819**	**0.2106**	**11,406.9990**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	3.6704	1.1000e-004	0.0116	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.0223	0.0223	6.0000e-005	0.0000	0.0238
Energy	0.0878	0.7985	0.6708	4.7900e-003		0.0607	0.0607		0.0607	0.0607	0.0000	6,433.3422	6,433.3422	0.1481	0.0431	6,449.8953
Mobile	0.5263	3.1020	7.9273	0.0282	2.2715	0.0286	2.3001	0.6088	0.0268	0.6356	0.0000	2,596.8894	2,596.8894	0.1283	0.0000	2,600.0976
Waste						0.0000	0.0000		0.0000	0.0000	226.5379	0.0000	226.5379	13.3880	0.0000	561.2381
Water						0.0000	0.0000		0.0000	0.0000	66.0285	1,509.3633	1,575.3918	6.8174	0.1675	1,795.7441
Total	**4.2845**	**3.9006**	**8.6096**	**0.0330**	**2.2715**	**0.0893**	**2.3608**	**0.6088**	**0.0875**	**0.6963**	**292.5664**	**10,539.6173**	**10,832.1836**	**20.4819**	**0.2106**	**11,406.9990**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Topside Demolition	Demolition	1/1/2018	4/1/2018	5	65	
2	Berth 238 Demolition	Demolition	3/1/2018	6/20/2018	5	80	
3	Pile Driving Deck and Dolphins	Building Construction	6/21/2018	8/8/2018	5	35	
4	Platform Deck Construction/Forms	Building Construction	7/1/2018	8/24/2018	5	40	
5	Platform Deck Construction/Concrete	Building Construction	8/27/2018	8/27/2018	5	1	
6	Platform Deck Construction/Completion	Building Construction	8/28/2018	9/27/2018	5	23	
7	Breasting Dolphins Construction	Building Construction	9/28/2018	11/7/2018	5	29	
8	Mooring Dolphins Construction	Building Construction	10/1/2018	11/1/2018	5	24	
9	Topside Construction	Building Construction	11/6/2018	6/6/2019	5	153	
10	Berth 239 Demolition	Demolition	6/10/2019	9/28/2019	5	80	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Topside Demolition	Aerial Lifts	2	8.00	63	0.31
Topside Demolition	Air Compressors	1	8.00	78	0.48
Topside Demolition	Cranes	1	8.00	150	0.29
Topside Demolition	Cranes	1	8.00	260	0.29
Topside Demolition	Forklifts	1	8.00	89	0.20
Topside Demolition	Generator Sets	1	8.00	84	0.74

Topside Demolition	Welders	1	8.00	46	0.45
Berth 238 Demolition	Aerial Lifts	1	4.00	67	0.31
Berth 238 Demolition	Air Compressors	1	4.00	75	0.48
Berth 238 Demolition	Bore/Drill Rigs	1	8.00	595	0.50
Berth 238 Demolition	Concrete/Industrial Saws	1	4.00	65	0.73
Berth 238 Demolition	Cranes	1	8.00	297	0.29
Berth 238 Demolition	Excavators	1	8.00	220	0.38
Berth 238 Demolition	Other Construction Equipment	1	1.00	160	0.42
Pile Driving Deck and Dolphins	Aerial Lifts	1	4.00	67	0.31
Pile Driving Deck and Dolphins	Air Compressors	1	2.00	75	0.48
Pile Driving Deck and Dolphins	Bore/Drill Rigs	1	4.00	221	0.50
Pile Driving Deck and Dolphins	Bore/Drill Rigs	1	2.00	595	0.50
Pile Driving Deck and Dolphins	Cranes	1	8.00	297	0.29
Pile Driving Deck and Dolphins	Generator Sets	1	2.00	10	0.74
Pile Driving Deck and Dolphins	Other Construction Equipment	1	1.00	160	0.42
Pile Driving Deck and Dolphins	Welders	1	2.00	85	0.45
Platform Deck Construction/Forms	Aerial Lifts	1	8.00	67	0.31
Platform Deck Construction/Forms	Air Compressors	1	2.00	75	0.48
Platform Deck Construction/Forms	Cranes	1	8.00	289	0.29
Platform Deck Construction/Forms	Cranes	1	8.00	152	0.29
Platform Deck Construction/Forms	Generator Sets	1	4.00	10	0.74
Platform Deck Construction/Forms	Other Construction Equipment	1	1.00	160	0.42
Platform Deck Construction/Forms	Welders	1	2.00	85	0.45
Platform Deck Construction/Concrete	Aerial Lifts	1	8.00	67	0.31
Platform Deck Construction/Concrete	Air Compressors	1	2.00	75	0.48
Platform Deck Construction/Concrete	Cranes	1	8.00	289	0.29
Platform Deck Construction/Concrete	Cranes	1	8.00	152	0.29

Platform Deck Construction/Concrete	Generator Sets	1	4.00	10	0.74
Platform Deck Construction/Concrete	Other Construction Equipment	1	1.00	160	0.42
Platform Deck Construction/Concrete	Pumps	2	8.00	300	0.74
Platform Deck Construction/Concrete	Welders	1	2.00	85	0.45
Platform Deck Construction/Completion	Aerial Lifts	1	8.00	67	0.31
Platform Deck Construction/Completion	Air Compressors	1	2.00	75	0.48
Platform Deck Construction/Completion	Cranes	1	8.00	289	0.29
Platform Deck Construction/Completion	Cranes	1	8.00	152	0.29
Platform Deck Construction/Completion	Generator Sets	1	4.00	10	0.74
Platform Deck Construction/Completion	Other Construction Equipment	1	1.00	160	0.42
Platform Deck Construction/Completion	Welders	1	2.00	85	0.45
Breasting Dolphins Construction	Aerial Lifts	1	4.00	67	0.31
Breasting Dolphins Construction	Air Compressors	1	4.00	75	0.48
Breasting Dolphins Construction	Cranes	1	8.00	289	0.29
Breasting Dolphins Construction	Generator Sets	1	4.00	10	0.74
Breasting Dolphins Construction	Other Construction Equipment	1	1.00	160	0.42
Breasting Dolphins Construction	Welders	1	2.00	85	0.45
Mooring Dolphins Construction	Air Compressors	1	4.00	75	0.48
Mooring Dolphins Construction	Cranes	1	8.00	152	0.29
Mooring Dolphins Construction	Generator Sets	1	4.00	10	0.74
Topside Construction	Aerial Lifts	2	8.00	63	0.31
Topside Construction	Air Compressors	1	8.00	78	0.48
Topside Construction	Cranes	1	8.00	150	0.29
Topside Construction	Cranes	1	8.00	260	0.29
Topside Construction	Forklifts	1	8.00	89	0.20
Topside Construction	Generator Sets	1	8.00	84	0.74
Topside Construction	Welders	1	8.00	46	0.45

Berth 239 Demolition	Aerial Lifts	1	4.00	67	0.31
Berth 239 Demolition	Air Compressors	1	4.00	75	0.48
Berth 239 Demolition	Bore/Drill Rigs	1	8.00	595	0.50
Berth 239 Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Berth 239 Demolition	Cranes	1	8.00	297	0.29
Berth 239 Demolition	Excavators	1	8.00	220	0.38
Berth 239 Demolition	Other Construction Equipment	1	1.00	160	0.42

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Topside Demolition	8	20.00	0.00	14.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Berth 238 Demolition	7	20.00	0.00	375.00	14.70	50.00	20.00	LD_Mix	HDT_Mix	HHDT
Pile Driving Deck and Dolphins	8	16.00	95.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Platform Deck Construction/Forms	7	40.00	95.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Platform Deck Construction/Concrete	9	40.00	186.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Platform Deck Construction/Completio	7	40.00	95.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Breasting Dolphins Construction	6	16.00	13.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Mooring Dolphins Construction	3	12.00	17.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Topside Construction	8	20.00	148.00	14.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Berth 239 Demolition	7	20.00	0.00	375.00	14.70	50.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Topside Demolition - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.0700e-003	0.0000	1.0700e-003	1.6000e-004	0.0000	1.6000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0837	0.7364	0.6020	9.2000e-004		0.0409	0.0409		0.0392	0.0392	0.0000	80.4464	80.4464	0.0175	0.0000	80.8846
Total	**0.0837**	**0.7364**	**0.6020**	**9.2000e-004**	**1.0700e-003**	**0.0409**	**0.0420**	**1.6000e-004**	**0.0392**	**0.0393**	**0.0000**	**80.4464**	**80.4464**	**0.0175**	**0.0000**	**80.8846**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.0000e-005	2.2300e-003	4.1000e-004	1.0000e-005	1.2000e-004	1.0000e-005	1.3000e-004	3.0000e-005	1.0000e-005	4.0000e-005	0.0000	0.5400	0.5400	4.0000e-005	0.0000	0.5409
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.4500e-003	2.8300e-003	0.0303	8.0000e-005	7.1300e-003	6.0000e-005	7.1900e-003	1.8900e-003	5.0000e-005	1.9500e-003	0.0000	6.8413	6.8413	2.3000e-004	0.0000	6.8471
Total	**3.5100e-003**	**5.0600e-003**	**0.0308**	**9.0000e-005**	**7.2500e-003**	**7.0000e-005**	**7.3200e-003**	**1.9200e-003**	**6.0000e-005**	**1.9900e-003**	**0.0000**	**7.3813**	**7.3813**	**2.7000e-004**	**0.0000**	**7.3880**

3.2 Topside Demolition - 2018

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.0700e-003	0.0000	1.0700e-003	1.6000e-004	0.0000	1.6000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0837	0.7364	0.6020	9.2000e-004		0.0409	0.0409		0.0392	0.0392	0.0000	80.4463	80.4463	0.0175	0.0000	80.8845
Total	**0.0837**	**0.7364**	**0.6020**	**9.2000e-004**	**1.0700e-003**	**0.0409**	**0.0420**	**1.6000e-004**	**0.0392**	**0.0393**	**0.0000**	**80.4463**	**80.4463**	**0.0175**	**0.0000**	**80.8845**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.0000e-005	2.2300e-003	4.1000e-004	1.0000e-005	1.2000e-004	1.0000e-005	1.3000e-004	3.0000e-005	1.0000e-005	4.0000e-005	0.0000	0.5400	0.5400	4.0000e-005	0.0000	0.5409
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.4500e-003	2.8300e-003	0.0303	8.0000e-005	7.1300e-003	6.0000e-005	7.1900e-003	1.8900e-003	5.0000e-005	1.9500e-003	0.0000	6.8413	6.8413	2.3000e-004	0.0000	6.8471
Total	**3.5100e-003**	**5.0600e-003**	**0.0308**	**9.0000e-005**	**7.2500e-003**	**7.0000e-005**	**7.3200e-003**	**1.9200e-003**	**6.0000e-005**	**1.9900e-003**	**0.0000**	**7.3813**	**7.3813**	**2.7000e-004**	**0.0000**	**7.3880**

3.3 Berth 238 Demolition - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0321	0.0000	0.0321	4.8600e-003	0.0000	4.8600e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0803	0.9445	0.6225	1.8500e-003		0.0375	0.0375		0.0351	0.0351	0.0000	167.5940	167.5940	0.0487	0.0000	168.8125
Total	**0.0803**	**0.9445**	**0.6225**	**1.8500e-003**	**0.0321**	**0.0375**	**0.0696**	**4.8600e-003**	**0.0351**	**0.0400**	**0.0000**	**167.5940**	**167.5940**	**0.0487**	**0.0000**	**168.8125**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.6500e-003	0.0596	0.0111	1.5000e-004	3.2200e-003	2.2000e-004	3.4500e-003	8.9000e-004	2.1000e-004	1.1000e-003	0.0000	14.4639	14.4639	1.0200e-003	0.0000	14.4893
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.2500e-003	3.4800e-003	0.0373	9.0000e-005	8.7800e-003	7.0000e-005	8.8500e-003	2.3300e-003	7.0000e-005	2.4000e-003	0.0000	8.4200	8.4200	2.9000e-004	0.0000	8.4272
Total	**5.9000e-003**	**0.0631**	**0.0484**	**2.4000e-004**	**0.0120**	**2.9000e-004**	**0.0123**	**3.2200e-003**	**2.8000e-004**	**3.5000e-003**	**0.0000**	**22.8839**	**22.8839**	**1.3100e-003**	**0.0000**	**22.9165**

3.3 Berth 238 Demolition - 2018

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0321	0.0000	0.0321	4.8600e-003	0.0000	4.8600e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0803	0.9445	0.6225	1.8500e-003		0.0375	0.0375		0.0351	0.0351	0.0000	167.5938	167.5938	0.0487	0.0000	168.8123
Total	**0.0803**	**0.9445**	**0.6225**	**1.8500e-003**	**0.0321**	**0.0375**	**0.0696**	**4.8600e-003**	**0.0351**	**0.0400**	**0.0000**	**167.5938**	**167.5938**	**0.0487**	**0.0000**	**168.8123**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.6500e-003	0.0596	0.0111	1.5000e-004	3.2200e-003	2.2000e-004	3.4500e-003	8.9000e-004	2.1000e-004	1.1000e-003	0.0000	14.4639	14.4639	1.0200e-003	0.0000	14.4893
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.2500e-003	3.4800e-003	0.0373	9.0000e-005	8.7800e-003	7.0000e-005	8.8500e-003	2.3300e-003	7.0000e-005	2.4000e-003	0.0000	8.4200	8.4200	2.9000e-004	0.0000	8.4272
Total	**5.9000e-003**	**0.0631**	**0.0484**	**2.4000e-004**	**0.0120**	**2.9000e-004**	**0.0123**	**3.2200e-003**	**2.8000e-004**	**3.5000e-003**	**0.0000**	**22.8839**	**22.8839**	**1.3100e-003**	**0.0000**	**22.9165**

3.4 Pile Driving Deck and Dolphins - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0206	0.2431	0.1679	3.9000e-004		9.9300e-003	9.9300e-003		9.2800e-003	9.2800e-003	0.0000	35.3554	35.3554	0.0103	0.0000	35.6128
Total	**0.0206**	**0.2431**	**0.1679**	**3.9000e-004**		**9.9300e-003**	**9.9300e-003**		**9.2800e-003**	**9.2800e-003**	**0.0000**	**35.3554**	**35.3554**	**0.0103**	**0.0000**	**35.6128**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.2000e-003	0.2055	0.0530	4.3000e-004	0.0105	1.4800e-003	0.0120	3.0200e-003	1.4200e-003	4.4400e-003	0.0000	41.5266	41.5266	2.9600e-003	0.0000	41.6004
Worker	1.4900e-003	1.2200e-003	0.0131	3.0000e-005	3.0700e-003	2.0000e-005	3.1000e-003	8.2000e-004	2.0000e-005	8.4000e-004	0.0000	2.9470	2.9470	1.0000e-004	0.0000	2.9495
Total	**8.6900e-003**	**0.2068**	**0.0660**	**4.6000e-004**	**0.0136**	**1.5000e-003**	**0.0151**	**3.8400e-003**	**1.4400e-003**	**5.2800e-003**	**0.0000**	**44.4736**	**44.4736**	**3.0600e-003**	**0.0000**	**44.5500**

3.4 Pile Driving Deck and Dolphins - 2018

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0206	0.2431	0.1679	3.9000e-004		9.9300e-003	9.9300e-003		9.2800e-003	9.2800e-003	0.0000	35.3553	35.3553	0.0103	0.0000	35.6128
Total	**0.0206**	**0.2431**	**0.1679**	**3.9000e-004**		**9.9300e-003**	**9.9300e-003**		**9.2800e-003**	**9.2800e-003**	**0.0000**	**35.3553**	**35.3553**	**0.0103**	**0.0000**	**35.6128**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.2000e-003	0.2055	0.0530	4.3000e-004	0.0105	1.4800e-003	0.0120	3.0200e-003	1.4200e-003	4.4400e-003	0.0000	41.5266	41.5266	2.9600e-003	0.0000	41.6004
Worker	1.4900e-003	1.2200e-003	0.0131	3.0000e-005	3.0700e-003	2.0000e-005	3.1000e-003	8.2000e-004	2.0000e-005	8.4000e-004	0.0000	2.9470	2.9470	1.0000e-004	0.0000	2.9495
Total	**8.6900e-003**	**0.2068**	**0.0660**	**4.6000e-004**	**0.0136**	**1.5000e-003**	**0.0151**	**3.8400e-003**	**1.4400e-003**	**5.2800e-003**	**0.0000**	**44.4736**	**44.4736**	**3.0600e-003**	**0.0000**	**44.5500**

3.5 Platform Deck Construction/Forms - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0275	0.3006	0.2130	3.2000e-004		0.0144	0.0144		0.0134	0.0134	0.0000	28.7402	28.7402	8.0700e-003	0.0000	28.9419
Total	**0.0275**	**0.3006**	**0.2130**	**3.2000e-004**		**0.0144**	**0.0144**		**0.0134**	**0.0134**	**0.0000**	**28.7402**	**28.7402**	**8.0700e-003**	**0.0000**	**28.9419**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.2300e-003	0.2349	0.0605	4.9000e-004	0.0120	1.6900e-003	0.0137	3.4600e-003	1.6200e-003	5.0800e-003	0.0000	47.4589	47.4589	3.3800e-003	0.0000	47.5434
Worker	4.2500e-003	3.4800e-003	0.0373	9.0000e-005	8.7800e-003	7.0000e-005	8.8500e-003	2.3300e-003	7.0000e-005	2.4000e-003	0.0000	8.4200	8.4200	2.9000e-004	0.0000	8.4272
Total	**0.0125**	**0.2384**	**0.0979**	**5.8000e-004**	**0.0208**	**1.7600e-003**	**0.0225**	**5.7900e-003**	**1.6900e-003**	**7.4800e-003**	**0.0000**	**55.8789**	**55.8789**	**3.6700e-003**	**0.0000**	**55.9706**

3.5 Platform Deck Construction/Forms - 2018

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0275	0.3006	0.2130	3.2000e-004		0.0144	0.0144		0.0134	0.0134	0.0000	28.7401	28.7401	8.0700e-003	0.0000	28.9418
Total	**0.0275**	**0.3006**	**0.2130**	**3.2000e-004**		**0.0144**	**0.0144**		**0.0134**	**0.0134**	**0.0000**	**28.7401**	**28.7401**	**8.0700e-003**	**0.0000**	**28.9418**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.2300e-003	0.2349	0.0605	4.9000e-004	0.0120	1.6900e-003	0.0137	3.4600e-003	1.6200e-003	5.0800e-003	0.0000	47.4589	47.4589	3.3800e-003	0.0000	47.5434
Worker	4.2500e-003	3.4800e-003	0.0373	9.0000e-005	8.7800e-003	7.0000e-005	8.8500e-003	2.3300e-003	7.0000e-005	2.4000e-003	0.0000	8.4200	8.4200	2.9000e-004	0.0000	8.4272
Total	**0.0125**	**0.2384**	**0.0979**	**5.8000e-004**	**0.0208**	**1.7600e-003**	**0.0225**	**5.7900e-003**	**1.6900e-003**	**7.4800e-003**	**0.0000**	**55.8789**	**55.8789**	**3.6700e-003**	**0.0000**	**55.9706**

3.6 Platform Deck Construction/Concrete - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.5700e-003	0.0167	9.4000e-003	3.0000e-005		6.4000e-004	6.4000e-004		6.1000e-004	6.1000e-004	0.0000	2.7371	2.7371	2.7000e-004	0.0000	2.7439
Total	**1.5700e-003**	**0.0167**	**9.4000e-003**	**3.0000e-005**		**6.4000e-004**	**6.4000e-004**		**6.1000e-004**	**6.1000e-004**	**0.0000**	**2.7371**	**2.7371**	**2.7000e-004**	**0.0000**	**2.7439**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.0000e-004	0.0115	2.9600e-003	2.0000e-005	5.9000e-004	8.0000e-005	6.7000e-004	1.7000e-004	8.0000e-005	2.5000e-004	0.0000	2.3230	2.3230	1.7000e-004	0.0000	2.3271
Worker	1.1000e-004	9.0000e-005	9.3000e-004	0.0000	2.2000e-004	0.0000	2.2000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.2105	0.2105	1.0000e-005	0.0000	0.2107
Total	**5.1000e-004**	**0.0116**	**3.8900e-003**	**2.0000e-005**	**8.1000e-004**	**8.0000e-005**	**8.9000e-004**	**2.3000e-004**	**8.0000e-005**	**3.1000e-004**	**0.0000**	**2.5335**	**2.5335**	**1.8000e-004**	**0.0000**	**2.5378**

3.6 Platform Deck Construction/Concrete - 2018

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.5700e-003	0.0167	9.4000e-003	3.0000e-005		6.4000e-004	6.4000e-004		6.1000e-004	6.1000e-004	0.0000	2.7371	2.7371	2.7000e-004	0.0000	2.7439
Total	**1.5700e-003**	**0.0167**	**9.4000e-003**	**3.0000e-005**		**6.4000e-004**	**6.4000e-004**		**6.1000e-004**	**6.1000e-004**	**0.0000**	**2.7371**	**2.7371**	**2.7000e-004**	**0.0000**	**2.7439**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.0000e-004	0.0115	2.9600e-003	2.0000e-005	5.9000e-004	8.0000e-005	6.7000e-004	1.7000e-004	8.0000e-005	2.5000e-004	0.0000	2.3230	2.3230	1.7000e-004	0.0000	2.3271
Worker	1.1000e-004	9.0000e-005	9.3000e-004	0.0000	2.2000e-004	0.0000	2.2000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.2105	0.2105	1.0000e-005	0.0000	0.2107
Total	**5.1000e-004**	**0.0116**	**3.8900e-003**	**2.0000e-005**	**8.1000e-004**	**8.0000e-005**	**8.9000e-004**	**2.3000e-004**	**8.0000e-005**	**3.1000e-004**	**0.0000**	**2.5335**	**2.5335**	**1.8000e-004**	**0.0000**	**2.5378**

3.7 Platform Deck Construction/Completion - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0158	0.1729	0.1225	1.8000e-004		8.2800e-003	8.2800e-003		7.7200e-003	7.7200e-003	0.0000	16.5256	16.5256	4.6400e-003	0.0000	16.6416
Total	**0.0158**	**0.1729**	**0.1225**	**1.8000e-004**		**8.2800e-003**	**8.2800e-003**		**7.7200e-003**	**7.7200e-003**	**0.0000**	**16.5256**	**16.5256**	**4.6400e-003**	**0.0000**	**16.6416**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.7300e-003	0.1351	0.0348	2.8000e-004	6.8900e-003	9.7000e-004	7.8600e-003	1.9900e-003	9.3000e-004	2.9200e-003	0.0000	27.2889	27.2889	1.9400e-003	0.0000	27.3374
Worker	2.4400e-003	2.0000e-003	0.0215	5.0000e-005	5.0500e-003	4.0000e-005	5.0900e-003	1.3400e-003	4.0000e-005	1.3800e-003	0.0000	4.8415	4.8415	1.7000e-004	0.0000	4.8456
Total	**7.1700e-003**	**0.1371**	**0.0563**	**3.3000e-004**	**0.0119**	**1.0100e-003**	**0.0130**	**3.3300e-003**	**9.7000e-004**	**4.3000e-003**	**0.0000**	**32.1304**	**32.1304**	**2.1100e-003**	**0.0000**	**32.1831**

3.7 Platform Deck Construction/Completion - 2018

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0158	0.1729	0.1225	1.8000e-004		8.2800e-003	8.2800e-003		7.7200e-003	7.7200e-003	0.0000	16.5256	16.5256	4.6400e-003	0.0000	16.6416
Total	**0.0158**	**0.1729**	**0.1225**	**1.8000e-004**		**8.2800e-003**	**8.2800e-003**		**7.7200e-003**	**7.7200e-003**	**0.0000**	**16.5256**	**16.5256**	**4.6400e-003**	**0.0000**	**16.6416**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.7300e-003	0.1351	0.0348	2.8000e-004	6.8900e-003	9.7000e-004	7.8600e-003	1.9900e-003	9.3000e-004	2.9200e-003	0.0000	27.2889	27.2889	1.9400e-003	0.0000	27.3374
Worker	2.4400e-003	2.0000e-003	0.0215	5.0000e-005	5.0500e-003	4.0000e-005	5.0900e-003	1.3400e-003	4.0000e-005	1.3800e-003	0.0000	4.8415	4.8415	1.7000e-004	0.0000	4.8456
Total	**7.1700e-003**	**0.1371**	**0.0563**	**3.3000e-004**	**0.0119**	**1.0100e-003**	**0.0130**	**3.3300e-003**	**9.7000e-004**	**4.3000e-003**	**0.0000**	**32.1304**	**32.1304**	**2.1100e-003**	**0.0000**	**32.1831**

3.8 Breasting Dolphins Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0140	0.1479	0.1133	1.8000e-004		7.0300e-003	7.0300e-003		6.6500e-003	6.6500e-003	0.0000	15.7994	15.7994	4.0200e-003	0.0000	15.9000
Total	**0.0140**	**0.1479**	**0.1133**	**1.8000e-004**		**7.0300e-003**	**7.0300e-003**		**6.6500e-003**	**6.6500e-003**	**0.0000**	**15.7994**	**15.7994**	**4.0200e-003**	**0.0000**	**15.9000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.2000e-004	0.0233	6.0000e-003	5.0000e-005	1.1900e-003	1.7000e-004	1.3600e-003	3.4000e-004	1.6000e-004	5.0000e-004	0.0000	4.7084	4.7084	3.4000e-004	0.0000	4.7168
Worker	1.2300e-003	1.0100e-003	0.0108	3.0000e-005	2.5500e-003	2.0000e-005	2.5700e-003	6.8000e-004	2.0000e-005	7.0000e-004	0.0000	2.4418	2.4418	8.0000e-005	0.0000	2.4439
Total	**2.0500e-003**	**0.0243**	**0.0168**	**8.0000e-005**	**3.7400e-003**	**1.9000e-004**	**3.9300e-003**	**1.0200e-003**	**1.8000e-004**	**1.2000e-003**	**0.0000**	**7.1502**	**7.1502**	**4.2000e-004**	**0.0000**	**7.1607**

3.8 Breasting Dolphins Construction - 2018

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0140	0.1479	0.1133	1.8000e-004		7.0300e-003	7.0300e-003		6.6500e-003	6.6500e-003	0.0000	15.7994	15.7994	4.0200e-003	0.0000	15.9000
Total	**0.0140**	**0.1479**	**0.1133**	**1.8000e-004**		**7.0300e-003**	**7.0300e-003**		**6.6500e-003**	**6.6500e-003**	**0.0000**	**15.7994**	**15.7994**	**4.0200e-003**	**0.0000**	**15.9000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.2000e-004	0.0233	6.0000e-003	5.0000e-005	1.1900e-003	1.7000e-004	1.3600e-003	3.4000e-004	1.6000e-004	5.0000e-004	0.0000	4.7084	4.7084	3.4000e-004	0.0000	4.7168
Worker	1.2300e-003	1.0100e-003	0.0108	3.0000e-005	2.5500e-003	2.0000e-005	2.5700e-003	6.8000e-004	2.0000e-005	7.0000e-004	0.0000	2.4418	2.4418	8.0000e-005	0.0000	2.4439
Total	**2.0500e-003**	**0.0243**	**0.0168**	**8.0000e-005**	**3.7400e-003**	**1.9000e-004**	**3.9300e-003**	**1.0200e-003**	**1.8000e-004**	**1.2000e-003**	**0.0000**	**7.1502**	**7.1502**	**4.2000e-004**	**0.0000**	**7.1607**

3.9 Mooring Dolphins Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	8.6200e-003	0.0803	0.0513	7.0000e-005		4.6200e-003	4.6200e-003		4.3600e-003	4.3600e-003	0.0000	6.5406	6.5406	1.5300e-003	0.0000	6.5788
Total	**8.6200e-003**	**0.0803**	**0.0513**	**7.0000e-005**		**4.6200e-003**	**4.6200e-003**		**4.3600e-003**	**4.3600e-003**	**0.0000**	**6.5406**	**6.5406**	**1.5300e-003**	**0.0000**	**6.5788**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.8000e-004	0.0252	6.5000e-003	5.0000e-005	1.2900e-003	1.8000e-004	1.4700e-003	3.7000e-004	1.7000e-004	5.4000e-004	0.0000	5.0956	5.0956	3.6000e-004	0.0000	5.1047
Worker	7.7000e-004	6.3000e-004	6.7200e-003	2.0000e-005	1.5800e-003	1.0000e-005	1.5900e-003	4.2000e-004	1.0000e-005	4.3000e-004	0.0000	1.5156	1.5156	5.0000e-005	0.0000	1.5169
Total	**1.6500e-003**	**0.0259**	**0.0132**	**7.0000e-005**	**2.8700e-003**	**1.9000e-004**	**3.0600e-003**	**7.9000e-004**	**1.8000e-004**	**9.7000e-004**	**0.0000**	**6.6112**	**6.6112**	**4.1000e-004**	**0.0000**	**6.6216**

3.9 Mooring Dolphins Construction - 2018

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	8.6200e-003	0.0803	0.0513	7.0000e-005		4.6200e-003	4.6200e-003		4.3600e-003	4.3600e-003	0.0000	6.5406	6.5406	1.5300e-003	0.0000	6.5788
Total	**8.6200e-003**	**0.0803**	**0.0513**	**7.0000e-005**		**4.6200e-003**	**4.6200e-003**		**4.3600e-003**	**4.3600e-003**	**0.0000**	**6.5406**	**6.5406**	**1.5300e-003**	**0.0000**	**6.5788**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.8000e-004	0.0252	6.5000e-003	5.0000e-005	1.2900e-003	1.8000e-004	1.4700e-003	3.7000e-004	1.7000e-004	5.4000e-004	0.0000	5.0956	5.0956	3.6000e-004	0.0000	5.1047
Worker	7.7000e-004	6.3000e-004	6.7200e-003	2.0000e-005	1.5800e-003	1.0000e-005	1.5900e-003	4.2000e-004	1.0000e-005	4.3000e-004	0.0000	1.5156	1.5156	5.0000e-005	0.0000	1.5169
Total	**1.6500e-003**	**0.0259**	**0.0132**	**7.0000e-005**	**2.8700e-003**	**1.9000e-004**	**3.0600e-003**	**7.9000e-004**	**1.8000e-004**	**9.7000e-004**	**0.0000**	**6.6112**	**6.6112**	**4.1000e-004**	**0.0000**	**6.6216**

3.10 Topside Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0515	0.4532	0.3704	5.6000e-004		0.0252	0.0252		0.0241	0.0241	0.0000	49.5055	49.5055	0.0108	0.0000	49.7751
Total	**0.0515**	**0.4532**	**0.3704**	**5.6000e-004**		**0.0252**	**0.0252**		**0.0241**	**0.0241**	**0.0000**	**49.5055**	**49.5055**	**0.0108**	**0.0000**	**49.7751**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.0000e-005	5.8000e-004	1.1000e-004	0.0000	1.0000e-004	0.0000	1.0000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1412	0.1412	1.0000e-005	0.0000	0.1414
Vendor	0.0128	0.3660	0.0943	7.7000e-004	0.0187	2.6400e-003	0.0213	5.3800e-003	2.5200e-003	7.9100e-003	0.0000	73.9360	73.9360	5.2600e-003	0.0000	74.0676
Worker	2.1300e-003	1.7400e-003	0.0187	5.0000e-005	4.3900e-003	4.0000e-005	4.4200e-003	1.1700e-003	3.0000e-005	1.2000e-003	0.0000	4.2100	4.2100	1.4000e-004	0.0000	4.2136
Total	**0.0150**	**0.3683**	**0.1131**	**8.2000e-004**	**0.0232**	**2.6800e-003**	**0.0258**	**6.5800e-003**	**2.5500e-003**	**9.1400e-003**	**0.0000**	**78.2872**	**78.2872**	**5.4100e-003**	**0.0000**	**78.4226**

3.10 Topside Construction - 2018

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0515	0.4532	0.3704	5.6000e-004		0.0252	0.0252		0.0241	0.0241	0.0000	49.5054	49.5054	0.0108	0.0000	49.7751
Total	**0.0515**	**0.4532**	**0.3704**	**5.6000e-004**		**0.0252**	**0.0252**		**0.0241**	**0.0241**	**0.0000**	**49.5054**	**49.5054**	**0.0108**	**0.0000**	**49.7751**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.0000e-005	5.8000e-004	1.1000e-004	0.0000	1.0000e-004	0.0000	1.0000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1412	0.1412	1.0000e-005	0.0000	0.1414
Vendor	0.0128	0.3660	0.0943	7.7000e-004	0.0187	2.6400e-003	0.0213	5.3800e-003	2.5200e-003	7.9100e-003	0.0000	73.9360	73.9360	5.2600e-003	0.0000	74.0676
Worker	2.1300e-003	1.7400e-003	0.0187	5.0000e-005	4.3900e-003	4.0000e-005	4.4200e-003	1.1700e-003	3.0000e-005	1.2000e-003	0.0000	4.2100	4.2100	1.4000e-004	0.0000	4.2136
Total	**0.0150**	**0.3683**	**0.1131**	**8.2000e-004**	**0.0232**	**2.6800e-003**	**0.0258**	**6.5800e-003**	**2.5500e-003**	**9.1400e-003**	**0.0000**	**78.2872**	**78.2872**	**5.4100e-003**	**0.0000**	**78.4226**

3.10 Topside Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1314	1.1818	1.0212	1.5900e-003		0.0630	0.0630		0.0602	0.0602	0.0000	138.6112	138.6112	0.0297	0.0000	139.3544
Total	**0.1314**	**1.1818**	**1.0212**	**1.5900e-003**		**0.0630**	**0.0630**		**0.0602**	**0.0602**	**0.0000**	**138.6112**	**138.6112**	**0.0297**	**0.0000**	**139.3544**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.0000e-005	1.5500e-003	3.0000e-004	0.0000	1.1000e-004	1.0000e-005	1.2000e-004	3.0000e-005	1.0000e-005	4.0000e-005	0.0000	0.3941	0.3941	3.0000e-005	0.0000	0.3948
Vendor	0.0329	0.9750	0.2445	2.1400e-003	0.0527	6.3800e-003	0.0591	0.0152	6.1000e-003	0.0213	0.0000	207.0189	207.0189	0.0143	0.0000	207.3770
Worker	5.4600e-003	4.3300e-003	0.0471	1.3000e-004	0.0124	1.0000e-004	0.0125	3.2900e-003	9.0000e-005	3.3800e-003	0.0000	11.5180	11.5180	3.6000e-004	0.0000	11.5270
Total	**0.0384**	**0.9809**	**0.2919**	**2.2700e-003**	**0.0652**	**6.4900e-003**	**0.0717**	**0.0185**	**6.2000e-003**	**0.0247**	**0.0000**	**218.9310**	**218.9310**	**0.0147**	**0.0000**	**219.2988**

3.10 Topside Construction - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1314	1.1818	1.0212	1.5900e-003		0.0630	0.0630		0.0602	0.0602	0.0000	138.6111	138.6111	0.0297	0.0000	139.3542
Total	**0.1314**	**1.1818**	**1.0212**	**1.5900e-003**		**0.0630**	**0.0630**		**0.0602**	**0.0602**	**0.0000**	**138.6111**	**138.6111**	**0.0297**	**0.0000**	**139.3542**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.0000e-005	1.5500e-003	3.0000e-004	0.0000	1.1000e-004	1.0000e-005	1.2000e-004	3.0000e-005	1.0000e-005	4.0000e-005	0.0000	0.3941	0.3941	3.0000e-005	0.0000	0.3948
Vendor	0.0329	0.9750	0.2445	2.1400e-003	0.0527	6.3800e-003	0.0591	0.0152	6.1000e-003	0.0213	0.0000	207.0189	207.0189	0.0143	0.0000	207.3770
Worker	5.4600e-003	4.3300e-003	0.0471	1.3000e-004	0.0124	1.0000e-004	0.0125	3.2900e-003	9.0000e-005	3.3800e-003	0.0000	11.5180	11.5180	3.6000e-004	0.0000	11.5270
Total	**0.0384**	**0.9809**	**0.2919**	**2.2700e-003**	**0.0652**	**6.4900e-003**	**0.0717**	**0.0185**	**6.2000e-003**	**0.0247**	**0.0000**	**218.9310**	**218.9310**	**0.0147**	**0.0000**	**219.2988**

3.11 Berth 239 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0321	0.0000	0.0321	4.8600e-003	0.0000	4.8600e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0852	0.9287	0.6884	2.0000e-003		0.0388	0.0388		0.0367	0.0367	0.0000	178.0199	178.0199	0.0495	0.0000	179.2578
Total	**0.0852**	**0.9287**	**0.6884**	**2.0000e-003**	**0.0321**	**0.0388**	**0.0709**	**4.8600e-003**	**0.0367**	**0.0415**	**0.0000**	**178.0199**	**178.0199**	**0.0495**	**0.0000**	**179.2578**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.5600e-003	0.0563	0.0108	1.5000e-004	3.2200e-003	2.0000e-004	3.4300e-003	8.9000e-004	2.0000e-004	1.0800e-003	0.0000	14.2943	14.2943	1.0000e-003	0.0000	14.3194
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.8600e-003	3.0700e-003	0.0334	9.0000e-005	8.7800e-003	7.0000e-005	8.8500e-003	2.3300e-003	6.0000e-005	2.4000e-003	0.0000	8.1543	8.1543	2.5000e-004	0.0000	8.1607
Total	**5.4200e-003**	**0.0594**	**0.0442**	**2.4000e-004**	**0.0120**	**2.7000e-004**	**0.0123**	**3.2200e-003**	**2.6000e-004**	**3.4800e-003**	**0.0000**	**22.4487**	**22.4487**	**1.2500e-003**	**0.0000**	**22.4801**

3.11 Berth 239 Demolition - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0321	0.0000	0.0321	4.8600e-003	0.0000	4.8600e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0852	0.9287	0.6884	2.0000e-003		0.0388	0.0388		0.0367	0.0367	0.0000	178.0197	178.0197	0.0495	0.0000	179.2576
Total	**0.0852**	**0.9287**	**0.6884**	**2.0000e-003**	**0.0321**	**0.0388**	**0.0709**	**4.8600e-003**	**0.0367**	**0.0415**	**0.0000**	**178.0197**	**178.0197**	**0.0495**	**0.0000**	**179.2576**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.5600e-003	0.0563	0.0108	1.5000e-004	3.2200e-003	2.0000e-004	3.4300e-003	8.9000e-004	2.0000e-004	1.0800e-003	0.0000	14.2943	14.2943	1.0000e-003	0.0000	14.3194
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.8600e-003	3.0700e-003	0.0334	9.0000e-005	8.7800e-003	7.0000e-005	8.8500e-003	2.3300e-003	6.0000e-005	2.4000e-003	0.0000	8.1543	8.1543	2.5000e-004	0.0000	8.1607
Total	**5.4200e-003**	**0.0594**	**0.0442**	**2.4000e-004**	**0.0120**	**2.7000e-004**	**0.0123**	**3.2200e-003**	**2.6000e-004**	**3.4800e-003**	**0.0000**	**22.4487**	**22.4487**	**1.2500e-003**	**0.0000**	**22.4801**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.5263	3.1020	7.9273	0.0282	2.2715	0.0286	2.3001	0.6088	0.0268	0.6356	0.0000	2,596.8894	2,596.8894	0.1283	0.0000	2,600.0976
Unmitigated	0.5263	3.1020	7.9273	0.0282	2.2715	0.0286	2.3001	0.6088	0.0268	0.6356	0.0000	2,596.8894	2,596.8894	0.1283	0.0000	2,600.0976

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Heavy Industry	1,350.00	1,350.00	1350.00	5,978,175	5,978,175
Total	1,350.00	1,350.00	1,350.00	5,978,175	5,978,175

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Heavy Industry	16.60	8.40	6.90	59.00	28.00	13.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Heavy Industry	0.547828	0.043645	0.199892	0.122290	0.016774	0.005862	0.020637	0.032653	0.002037	0.001944	0.004777	0.000705	0.000956

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	5,564.0457	5,564.0457	0.1314	0.0272	5,575.4331
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	5,564.0457	5,564.0457	0.1314	0.0272	5,575.4331
NaturalGas Mitigated	0.0878	0.7985	0.6708	4.7900e-003		0.0607	0.0607		0.0607	0.0607	0.0000	869.2964	869.2964	0.0167	0.0159	874.4622
NaturalGas Unmitigated	0.0878	0.7985	0.6708	4.7900e-003		0.0607	0.0607		0.0607	0.0607	0.0000	869.2964	869.2964	0.0167	0.0159	874.4622

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Heavy Industry	1.629e +007	0.0878	0.7985	0.6708	4.7900e-003		0.0607	0.0607		0.0607	0.0607	0.0000	869.2964	869.2964	0.0167	0.0159	874.4622
Total		**0.0878**	**0.7985**	**0.6708**	**4.7900e-003**		**0.0607**	**0.0607**		**0.0607**	**0.0607**	**0.0000**	**869.2964**	**869.2964**	**0.0167**	**0.0159**	**874.4622**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Heavy Industry	1.629e +007	0.0878	0.7985	0.6708	4.7900e-003		0.0607	0.0607		0.0607	0.0607	0.0000	869.2964	869.2964	0.0167	0.0159	874.4622
Total		**0.0878**	**0.7985**	**0.6708**	**4.7900e-003**		**0.0607**	**0.0607**		**0.0607**	**0.0607**	**0.0000**	**869.2964**	**869.2964**	**0.0167**	**0.0159**	**874.4622**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Heavy Industry	9.99e+006	5,564.0457	0.1314	0.0272	5,575.4331
Total		**5,564.0457**	**0.1314**	**0.0272**	**5,575.4331**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Heavy Industry	9.99e+006	5,564.0457	0.1314	0.0272	5,575.4331
Total		**5,564.0457**	**0.1314**	**0.0272**	**5,575.4331**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	3.6704	1.1000e-004	0.0116	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.0223	0.0223	6.0000e-005	0.0000	0.0238
Unmitigated	3.6704	1.1000e-004	0.0116	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.0223	0.0223	6.0000e-005	0.0000	0.0238

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.4172					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	3.2522					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0900e-003	1.1000e-004	0.0116	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.0223	0.0223	6.0000e-005	0.0000	0.0238
Total	**3.6704**	**1.1000e-004**	**0.0116**	**0.0000**		**4.0000e-005**	**4.0000e-005**		**4.0000e-005**	**4.0000e-005**	**0.0000**	**0.0223**	**0.0223**	**6.0000e-005**	**0.0000**	**0.0238**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.4172					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	3.2522					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0900e-003	1.1000e-004	0.0116	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.0223	0.0223	6.0000e-005	0.0000	0.0238
Total	**3.6704**	**1.1000e-004**	**0.0116**	**0.0000**		**4.0000e-005**	**4.0000e-005**		**4.0000e-005**	**4.0000e-005**	**0.0000**	**0.0223**	**0.0223**	**6.0000e-005**	**0.0000**	**0.0238**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	1,575.3918	6.8174	0.1675	1,795.7441
Unmitigated	1,575.3918	6.8174	0.1675	1,795.7441

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Heavy Industry	208.125 / 0	1,575.3918	6.8174	0.1675	1,795.7441
Total		**1,575.3918**	**6.8174**	**0.1675**	**1,795.7441**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Heavy Industry	208.125 / 0	1,575.3918	6.8174	0.1675	1,795.7441
Total		**1,575.3918**	**6.8174**	**0.1675**	**1,795.7441**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	226.5379	13.3880	0.0000	561.2381
Unmitigated	226.5379	13.3880	0.0000	561.2381

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Heavy Industry	1116	226.5379	13.3880	0.0000	561.2381
Total		**226.5379**	**13.3880**	**0.0000**	**561.2381**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Heavy Industry	1116	226.5379	13.3880	0.0000	561.2381
Total		**226.5379**	**13.3880**	**0.0000**	**561.2381**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

PBF Construction

South Coast AQMD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Heavy Industry	900.00	1000sqft	20.66	900,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	11			**Operational Year**	2020
Utility Company	Los Angeles Department of Water & Power				
CO2 Intensity (lb/MWhr)	1227.89	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Construction Phase - Provided by POLA Engineering

Off-road Equipment - Off-Road Equipment - Provided by POLA Engineering

Off-road Equipment - Off-Road Equipment - Provided by POLA Engineering

Off-road Equipment - Off-Road Equipment - Provided by POLA Engineering

Off-road Equipment - Off-Road Equipment - Provided by POLA Engineering

Off-road Equipment - Off-Road Equipment - Provided by POLA Engineering

Off-road Equipment - Off-Road Equipment - Provided by POLA Engineering

Off-road Equipment - Off-Road Equipment - Provided by POLA Engineering

Off-road Equipment - Off-Road Equipment - Provided by POLA Engineering

Off-road Equipment - Off-Road Equipment - Provided by POLA Engineering

Off-road Equipment - Off-Road Equipment - Provided by POLA Engineering

Trips and VMT - Trips and VMT - Provided by POLA Engineering

Demolition -

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Fleet Mix -

Area Coating -

Energy Use -

Area Mitigation - SCAQMD Rule 1113

Table Name	Column Name	Default Value	New Value
tblAreaMitigation	UseLowVOCPaintParkingValue	0	100
tblConstructionPhase	NumDays	370.00	35.00
tblConstructionPhase	NumDays	370.00	40.00

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tblConstructionPhase	NumDays	370.00	23.00
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tblConstructionPhase	NumDays	20.00	80.00
tblConstructionPhase	NumDays	20.00	80.00
tblOffRoadEquipment	HorsePower	81.00	65.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
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tblOffRoadEquipment	PhaseName		Platform Deck Construction/Forms
tblOffRoadEquipment	PhaseName		Platform Deck Construction/Concrete
tblOffRoadEquipment	PhaseName		Platform Deck Construction/Completion
tblOffRoadEquipment	PhaseName		Breasting Dolphins Construction
tblOffRoadEquipment	PhaseName		Topside Construction
tblOffRoadEquipment	PhaseName		Berth 239 Demolition
tblOffRoadEquipment	PhaseName		Berth 238 Demolition
tblOffRoadEquipment	PhaseName		Pile Driving Deck and Dolphins

tblOffRoadEquipment	PhaseName		Platform Deck Construction/Forms
tblOffRoadEquipment	PhaseName		Platform Deck Construction/Concrete
tblOffRoadEquipment	PhaseName		Platform Deck Construction/Completion
tblOffRoadEquipment	PhaseName		Breasting Dolphins Construction
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tblOffRoadEquipment	PhaseName		Topside Construction
tblOffRoadEquipment	PhaseName		Berth 239 Demolition
tblOffRoadEquipment	PhaseName		Berth 238 Demolition
tblOffRoadEquipment	PhaseName		Pile Driving Deck and Dolphins
tblOffRoadEquipment	PhaseName		Pile Driving Deck and Dolphins
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tblTripsAndVMT	HaulingTripNumber	297.00	375.00
tblTripsAndVMT	HaulingTripNumber	0.00	14.00
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tblTripsAndVMT	VendorTripLength	6.90	50.00
tblTripsAndVMT	VendorTripNumber	148.00	95.00
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tblTripsAndVMT	WorkerTripNumber	378.00	20.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	4.8410	56.0500	36.3714	0.1088	1.8420	2.2058	3.5740	0.5161	2.0920	2.3605	0.0000	11,705.0574	11,705.0574	1.9830	0.0000	11,729.3237
2019	2.9948	37.9463	23.0715	0.0690	1.1728	1.2292	2.4020	0.3325	1.1747	1.5073	0.0000	7,036.2939	7,036.2939	1.3990	0.0000	7,057.7531
Maximum	**4.8410**	**56.0500**	**36.3714**	**0.1088**	**1.8420**	**2.2058**	**3.5740**	**0.5161**	**2.0920**	**2.3605**	**0.0000**	**11,705.0574**	**11,705.0574**	**1.9830**	**0.0000**	**11,729.3237**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	4.8410	56.0500	36.3714	0.1088	1.8420	2.2058	3.5740	0.5161	2.0920	2.3605	0.0000	11,705.0574	11,705.0574	1.9830	0.0000	11,729.3237
2019	2.9948	37.9463	23.0715	0.0690	1.1728	1.2292	2.4020	0.3325	1.1747	1.5073	0.0000	7,036.2939	7,036.2939	1.3990	0.0000	7,057.7531
Maximum	**4.8410**	**56.0500**	**36.3714**	**0.1088**	**1.8420**	**2.2058**	**3.5740**	**0.5161**	**2.0920**	**2.3605**	**0.0000**	**11,705.0574**	**11,705.0574**	**1.9830**	**0.0000**	**11,729.3237**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	20.1145	8.5000e-004	0.0925	1.0000e-005		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004		0.1970	0.1970	5.3000e-004		0.2102
Energy	0.4813	4.3755	3.6754	0.0263		0.3325	0.3325		0.3325	0.3325		5,250.6044	5,250.6044	0.1006	0.0963	5,281.8061
Mobile	3.0815	16.2752	46.1145	0.1612	12.7115	0.1568	12.8682	3.4013	0.1472	3.5486		16,374.4811	16,374.4811	0.7869		16,394.1524
Total	**23.6773**	**20.6515**	**49.8824**	**0.1875**	**12.7115**	**0.4897**	**13.2011**	**3.4013**	**0.4801**	**3.8814**		**21,625.2824**	**21,625.2824**	**0.8880**	**0.0963**	**21,676.1686**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	20.1145	8.5000e-004	0.0925	1.0000e-005		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004		0.1970	0.1970	5.3000e-004		0.2102
Energy	0.4813	4.3755	3.6754	0.0263		0.3325	0.3325		0.3325	0.3325		5,250.6044	5,250.6044	0.1006	0.0963	5,281.8061
Mobile	3.0815	16.2752	46.1145	0.1612	12.7115	0.1568	12.8682	3.4013	0.1472	3.5486		16,374.4811	16,374.4811	0.7869		16,394.1524
Total	**23.6773**	**20.6515**	**49.8824**	**0.1875**	**12.7115**	**0.4897**	**13.2011**	**3.4013**	**0.4801**	**3.8814**		**21,625.2824**	**21,625.2824**	**0.8880**	**0.0963**	**21,676.1686**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Topside Demolition	Demolition	1/1/2018	4/1/2018	5	65	
2	Berth 238 Demolition	Demolition	3/1/2018	6/20/2018	5	80	
3	Pile Driving Deck and Dolphins	Building Construction	6/21/2018	8/8/2018	5	35	
4	Platform Deck Construction/Forms	Building Construction	7/1/2018	8/24/2018	5	40	
5	Platform Deck Construction/Concrete	Building Construction	8/27/2018	8/27/2018	5	1	
6	Platform Deck Construction/Completion	Building Construction	8/28/2018	9/27/2018	5	23	
7	Breasting Dolphins Construction	Building Construction	9/28/2018	11/7/2018	5	29	
8	Mooring Dolphins Construction	Building Construction	10/1/2018	11/1/2018	5	24	
9	Topside Construction	Building Construction	11/6/2018	6/6/2019	5	153	
10	Berth 239 Demolition	Demolition	6/10/2019	9/28/2019	5	80	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Topside Demolition	Aerial Lifts	2	8.00	63	0.31
Topside Demolition	Air Compressors	1	8.00	78	0.48
Topside Demolition	Cranes	1	8.00	150	0.29
Topside Demolition	Cranes	1	8.00	260	0.29
Topside Demolition	Forklifts	1	8.00	89	0.20
Topside Demolition	Generator Sets	1	8.00	84	0.74
Topside Demolition	Welders	1	8.00	46	0.45
Berth 238 Demolition	Aerial Lifts	1	4.00	67	0.31
Berth 238 Demolition	Air Compressors	1	4.00	75	0.48
Berth 238 Demolition	Bore/Drill Rigs	1	8.00	595	0.50
Berth 238 Demolition	Concrete/Industrial Saws	1	4.00	65	0.73
Berth 238 Demolition	Cranes	1	8.00	297	0.29
Berth 238 Demolition	Excavators	1	8.00	220	0.38
Berth 238 Demolition	Other Construction Equipment	1	1.00	160	0.42
Pile Driving Deck and Dolphins	Aerial Lifts	1	4.00	67	0.31
Pile Driving Deck and Dolphins	Air Compressors	1	2.00	75	0.48
Pile Driving Deck and Dolphins	Bore/Drill Rigs	1	4.00	221	0.50
Pile Driving Deck and Dolphins	Bore/Drill Rigs	1	2.00	595	0.50
Pile Driving Deck and Dolphins	Cranes	1	8.00	297	0.29
Pile Driving Deck and Dolphins	Generator Sets	1	2.00	10	0.74
Pile Driving Deck and Dolphins	Other Construction Equipment	1	1.00	160	0.42
Pile Driving Deck and Dolphins	Welders	1	2.00	85	0.45
Platform Deck Construction/Forms	Aerial Lifts	1	8.00	67	0.31
Platform Deck Construction/Forms	Air Compressors	1	2.00	75	0.48
Platform Deck Construction/Forms	Cranes	1	8.00	289	0.29
Platform Deck Construction/Forms	Cranes	1	8.00	152	0.29

Platform Deck Construction/Forms	Generator Sets	1	4.00	10	0.74
Platform Deck Construction/Forms	Other Construction Equipment	1	1.00	160	0.42
Platform Deck Construction/Forms	Welders	1	2.00	85	0.45
Platform Deck Construction/Concrete	Aerial Lifts	1	8.00	67	0.31
Platform Deck Construction/Concrete	Air Compressors	1	2.00	75	0.48
Platform Deck Construction/Concrete	Cranes	1	8.00	289	0.29
Platform Deck Construction/Concrete	Cranes	1	8.00	152	0.29
Platform Deck Construction/Concrete	Generator Sets	1	4.00	10	0.74
Platform Deck Construction/Concrete	Other Construction Equipment	1	1.00	160	0.42
Platform Deck Construction/Concrete	Pumps	2	8.00	300	0.74
Platform Deck Construction/Concrete	Welders	1	2.00	85	0.45
Platform Deck Construction/Completion	Aerial Lifts	1	8.00	67	0.31
Platform Deck Construction/Completion	Air Compressors	1	2.00	75	0.48
Platform Deck Construction/Completion	Cranes	1	8.00	289	0.29
Platform Deck Construction/Completion	Cranes	1	8.00	152	0.29
Platform Deck Construction/Completion	Generator Sets	1	4.00	10	0.74
Platform Deck Construction/Completion	Other Construction Equipment	1	1.00	160	0.42
Platform Deck Construction/Completion	Welders	1	2.00	85	0.45
Breasting Dolphins Construction	Aerial Lifts	1	4.00	67	0.31
Breasting Dolphins Construction	Air Compressors	1	4.00	75	0.48
Breasting Dolphins Construction	Cranes	1	8.00	289	0.29
Breasting Dolphins Construction	Generator Sets	1	4.00	10	0.74
Breasting Dolphins Construction	Other Construction Equipment	1	1.00	160	0.42
Breasting Dolphins Construction	Welders	1	2.00	85	0.45
Mooring Dolphins Construction	Air Compressors	1	4.00	75	0.48
Mooring Dolphins Construction	Cranes	1	8.00	152	0.29
Mooring Dolphins Construction	Generator Sets	1	4.00	10	0.74

Topside Construction	Aerial Lifts	2	8.00	63	0.31
Topside Construction	Air Compressors	1	8.00	78	0.48
Topside Construction	Cranes	1	8.00	150	0.29
Topside Construction	Cranes	1	8.00	260	0.29
Topside Construction	Forklifts	1	8.00	89	0.20
Topside Construction	Generator Sets	1	8.00	84	0.74
Topside Construction	Welders	1	8.00	46	0.45
Berth 239 Demolition	Aerial Lifts	1	4.00	67	0.31
Berth 239 Demolition	Air Compressors	1	4.00	75	0.48
Berth 239 Demolition	Bore/Drill Rigs	1	8.00	595	0.50
Berth 239 Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Berth 239 Demolition	Cranes	1	8.00	297	0.29
Berth 239 Demolition	Excavators	1	8.00	220	0.38
Berth 239 Demolition	Other Construction Equipment	1	1.00	160	0.42

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Topside Demolition	8	20.00	0.00	14.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Berth 238 Demolition	7	20.00	0.00	375.00	14.70	50.00	20.00	LD_Mix	HDT_Mix	HHDT
Pile Driving Deck and Dolphins	8	16.00	95.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Platform Deck Construction/Forms	7	40.00	95.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Platform Deck Construction/Concrete	9	40.00	186.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Platform Deck Construction/Completio	7	40.00	95.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Breasting Dolphins Construction	6	16.00	13.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Mooring Dolphins Construction	3	12.00	17.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Topside Construction	8	20.00	148.00	14.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Berth 239 Demolition	7	20.00	0.00	375.00	14.70	50.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Topside Demolition - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0329	0.0000	0.0329	4.9800e-003	0.0000	4.9800e-003			0.0000			0.0000
Off-Road	2.5757	22.6594	18.5220	0.0282		1.2593	1.2593		1.2047	1.2047		2,728.5220	2,728.5220	0.5945		2,743.3833
Total	**2.5757**	**22.6594**	**18.5220**	**0.0282**	**0.0329**	**1.2593**	**1.2922**	**4.9800e-003**	**1.2047**	**1.2096**		**2,728.5220**	**2,728.5220**	**0.5945**		**2,743.3833**

3.2 Topside Demolition - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	1.8700e-003	0.0663	0.0123	1.7000e-004	3.7600e-003	2.5000e-004	4.0200e-003	1.0300e-003	2.4000e-004	1.2800e-003		18.4539	18.4539	1.2600e-003		18.4854
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1078	0.0773	1.0035	2.4500e-003	0.2236	1.7800e-003	0.2253	0.0593	1.6400e-003	0.0609		243.8703	243.8703	8.3200e-003		244.0782
Total	**0.1096**	**0.1436**	**1.0158**	**2.6200e-003**	**0.2273**	**2.0300e-003**	**0.2294**	**0.0603**	**1.8800e-003**	**0.0622**		**262.3242**	**262.3242**	**9.5800e-003**		**262.5636**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0329	0.0000	0.0329	4.9800e-003	0.0000	4.9800e-003			0.0000			0.0000
Off-Road	2.5757	22.6594	18.5220	0.0282		1.2593	1.2593		1.2047	1.2047	0.0000	2,728.5220	2,728.5220	0.5945		2,743.3833
Total	**2.5757**	**22.6594**	**18.5220**	**0.0282**	**0.0329**	**1.2593**	**1.2922**	**4.9800e-003**	**1.2047**	**1.2096**	**0.0000**	**2,728.5220**	**2,728.5220**	**0.5945**		**2,743.3833**

3.2 Topside Demolition - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	1.8700e-003	0.0663	0.0123	1.7000e-004	3.7600e-003	2.5000e-004	4.0200e-003	1.0300e-003	2.4000e-004	1.2800e-003		18.4539	18.4539	1.2600e-003		18.4854
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1078	0.0773	1.0035	2.4500e-003	0.2236	1.7800e-003	0.2253	0.0593	1.6400e-003	0.0609		243.8703	243.8703	8.3200e-003		244.0782
Total	**0.1096**	**0.1436**	**1.0158**	**2.6200e-003**	**0.2273**	**2.0300e-003**	**0.2294**	**0.0603**	**1.8800e-003**	**0.0622**		**262.3242**	**262.3242**	**9.5800e-003**		**262.5636**

3.3 Berth 238 Demolition - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.8025	0.0000	0.8025	0.1215	0.0000	0.1215			0.0000			0.0000
Off-Road	2.0073	23.6116	15.5628	0.0462		0.9372	0.9372		0.8785	0.8785		4,618.5184	4,618.5184	1.3432		4,652.0976
Total	**2.0073**	**23.6116**	**15.5628**	**0.0462**	**0.8025**	**0.9372**	**1.7396**	**0.1215**	**0.8785**	**1.0000**		**4,618.5184**	**4,618.5184**	**1.3432**		**4,652.0976**

3.3 Berth 238 Demolition - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0406	1.4433	0.2673	3.7200e-003	0.0819	5.5500e-003	0.0875	0.0225	5.3100e-003	0.0278		401.6185	401.6185	0.0275		402.3052
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1078	0.0773	1.0035	2.4500e-003	0.2236	1.7800e-003	0.2253	0.0593	1.6400e-003	0.0609		243.8703	243.8703	8.3200e-003		244.0782
Total	**0.1484**	**1.5205**	**1.2708**	**6.1700e-003**	**0.3055**	**7.3300e-003**	**0.3128**	**0.0817**	**6.9500e-003**	**0.0887**		**645.4889**	**645.4889**	**0.0358**		**646.3835**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.8025	0.0000	0.8025	0.1215	0.0000	0.1215			0.0000			0.0000
Off-Road	2.0073	23.6116	15.5628	0.0462		0.9372	0.9372		0.8785	0.8785	0.0000	4,618.5184	4,618.5184	1.3432		4,652.0976
Total	**2.0073**	**23.6116**	**15.5628**	**0.0462**	**0.8025**	**0.9372**	**1.7396**	**0.1215**	**0.8785**	**1.0000**	**0.0000**	**4,618.5184**	**4,618.5184**	**1.3432**		**4,652.0976**

3.3 Berth 238 Demolition - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0406	1.4433	0.2673	3.7200e-003	0.0819	5.5500e-003	0.0875	0.0225	5.3100e-003	0.0278		401.6185	401.6185	0.0275		402.3052
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1078	0.0773	1.0035	2.4500e-003	0.2236	1.7800e-003	0.2253	0.0593	1.6400e-003	0.0609		243.8703	243.8703	8.3200e-003		244.0782
Total	**0.1484**	**1.5205**	**1.2708**	**6.1700e-003**	**0.3055**	**7.3300e-003**	**0.3128**	**0.0817**	**6.9500e-003**	**0.0887**		**645.4889**	**645.4889**	**0.0358**		**646.3835**

3.4 Pile Driving Deck and Dolphins - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1775	13.8908	9.5963	0.0223		0.5672	0.5672		0.5302	0.5302		2,227.0069	2,227.0069	0.6486		2,243.2219
Total	**1.1775**	**13.8908**	**9.5963**	**0.0223**		**0.5672**	**0.5672**		**0.5302**	**0.5302**		**2,227.0069**	**2,227.0069**	**0.6486**		**2,243.2219**

3.4 Pile Driving Deck and Dolphins - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4042	11.5125	2.8670	0.0249	0.6080	0.0841	0.6922	0.1751	0.0805	0.2555		2,647.2513	2,647.2513	0.1802		2,651.7556
Worker	0.0862	0.0618	0.8028	1.9600e-003	0.1788	1.4300e-003	0.1803	0.0474	1.3100e-003	0.0487		195.0963	195.0963	6.6500e-003		195.2626
Total	**0.4904**	**11.5743**	**3.6699**	**0.0268**	**0.7869**	**0.0856**	**0.8724**	**0.2225**	**0.0818**	**0.3043**		**2,842.3476**	**2,842.3476**	**0.1868**		**2,847.0182**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1775	13.8908	9.5963	0.0223		0.5672	0.5672		0.5302	0.5302	0.0000	2,227.0069	2,227.0069	0.6486		2,243.2219
Total	**1.1775**	**13.8908**	**9.5963**	**0.0223**		**0.5672**	**0.5672**		**0.5302**	**0.5302**	**0.0000**	**2,227.0069**	**2,227.0069**	**0.6486**		**2,243.2219**

3.4 Pile Driving Deck and Dolphins - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4042	11.5125	2.8670	0.0249	0.6080	0.0841	0.6922	0.1751	0.0805	0.2555		2,647.2513	2,647.2513	0.1802		2,651.7556
Worker	0.0862	0.0618	0.8028	1.9600e-003	0.1788	1.4300e-003	0.1803	0.0474	1.3100e-003	0.0487		195.0963	195.0963	6.6500e-003		195.2626
Total	**0.4904**	**11.5743**	**3.6699**	**0.0268**	**0.7869**	**0.0856**	**0.8724**	**0.2225**	**0.0818**	**0.3043**		**2,842.3476**	**2,842.3476**	**0.1868**		**2,847.0182**

3.5 Platform Deck Construction/Forms - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3739	15.0311	10.6476	0.0160		0.7200	0.7200		0.6714	0.6714		1,584.0304	1,584.0304	0.4447		1,595.1466
Total	**1.3739**	**15.0311**	**10.6476**	**0.0160**		**0.7200**	**0.7200**		**0.6714**	**0.6714**		**1,584.0304**	**1,584.0304**	**0.4447**		**1,595.1466**

3.5 Platform Deck Construction/Forms - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4042	11.5125	2.8670	0.0249	0.6080	0.0841	0.6922	0.1751	0.0805	0.2555		2,647.2513	2,647.2513	0.1802		2,651.7556
Worker	0.2155	0.1545	2.0070	4.9000e-003	0.4471	3.5600e-003	0.4507	0.1186	3.2900e-003	0.1219		487.7407	487.7407	0.0166		488.1564
Total	**0.6198**	**11.6670**	**4.8741**	**0.0298**	**1.0551**	**0.0877**	**1.1428**	**0.2936**	**0.0838**	**0.3774**		**3,134.9920**	**3,134.9920**	**0.1968**		**3,139.9120**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3739	15.0311	10.6476	0.0160		0.7200	0.7200		0.6714	0.6714	0.0000	1,584.0304	1,584.0304	0.4447		1,595.1466
Total	**1.3739**	**15.0311**	**10.6476**	**0.0160**		**0.7200**	**0.7200**		**0.6714**	**0.6714**	**0.0000**	**1,584.0304**	**1,584.0304**	**0.4447**		**1,595.1466**

3.5 Platform Deck Construction/Forms - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4042	11.5125	2.8670	0.0249	0.6080	0.0841	0.6922	0.1751	0.0805	0.2555		2,647.2513	2,647.2513	0.1802		2,651.7556
Worker	0.2155	0.1545	2.0070	4.9000e-003	0.4471	3.5600e-003	0.4507	0.1186	3.2900e-003	0.1219		487.7407	487.7407	0.0166		488.1564
Total	**0.6198**	**11.6670**	**4.8741**	**0.0298**	**1.0551**	**0.0877**	**1.1428**	**0.2936**	**0.0838**	**0.3774**		**3,134.9920**	**3,134.9920**	**0.1968**		**3,139.9120**

3.6 Platform Deck Construction/Concrete - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.1437	33.3552	18.7995	0.0552		1.2760	1.2760		1.2274	1.2274		6,034.2773	6,034.2773	0.6013		6,049.3090
Total	**3.1437**	**33.3552**	**18.7995**	**0.0552**		**1.2760**	**1.2760**		**1.2274**	**1.2274**		**6,034.2773**	**6,034.2773**	**0.6013**		**6,049.3090**

3.6 Platform Deck Construction/Concrete - 2018

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.7914	22.5403	5.6134	0.0487	1.1905	0.1647	1.3552	0.3427	0.1576	0.5003		5,183.0395	5,183.0395	0.3528		5,191.8583
Worker	0.2155	0.1545	2.0070	4.9000e-003	0.4471	3.5600e-003	0.4507	0.1186	3.2900e-003	0.1219		487.7407	487.7407	0.0166		488.1564
Total	**1.0070**	**22.6948**	**7.6204**	**0.0536**	**1.6376**	**0.1683**	**1.8058**	**0.4613**	**0.1608**	**0.6221**		**5,670.7801**	**5,670.7801**	**0.3694**		**5,680.0148**

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Off-Road	3.1437	33.3552	18.7995	0.0552		1.2760	1.2760		1.2274	1.2274	0.0000	6,034.2773	6,034.2773	0.6013		6,049.3089
Total	**3.1437**	**33.3552**	**18.7995**	**0.0552**		**1.2760**	**1.2760**		**1.2274**	**1.2274**	**0.0000**	**6,034.2773**	**6,034.2773**	**0.6013**		**6,049.3089**

3.6 Platform Deck Construction/Concrete - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.7914	22.5403	5.6134	0.0487	1.1905	0.1647	1.3552	0.3427	0.1576	0.5003		5,183.0395	5,183.0395	0.3528		5,191.8583
Worker	0.2155	0.1545	2.0070	4.9000e-003	0.4471	3.5600e-003	0.4507	0.1186	3.2900e-003	0.1219		487.7407	487.7407	0.0166		488.1564
Total	**1.0070**	**22.6948**	**7.6204**	**0.0536**	**1.6376**	**0.1683**	**1.8058**	**0.4613**	**0.1608**	**0.6221**		**5,670.7801**	**5,670.7801**	**0.3694**		**5,680.0148**

3.7 Platform Deck Construction/Completion - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3739	15.0311	10.6476	0.0160		0.7200	0.7200		0.6714	0.6714		1,584.0304	1,584.0304	0.4447		1,595.1466
Total	**1.3739**	**15.0311**	**10.6476**	**0.0160**		**0.7200**	**0.7200**		**0.6714**	**0.6714**		**1,584.0304**	**1,584.0304**	**0.4447**		**1,595.1466**

3.7 Platform Deck Construction/Completion - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4042	11.5125	2.8670	0.0249	0.6080	0.0841	0.6922	0.1751	0.0805	0.2555		2,647.2513	2,647.2513	0.1802		2,651.7556
Worker	0.2155	0.1545	2.0070	4.9000e-003	0.4471	3.5600e-003	0.4507	0.1186	3.2900e-003	0.1219		487.7407	487.7407	0.0166		488.1564
Total	**0.6198**	**11.6670**	**4.8741**	**0.0298**	**1.0551**	**0.0877**	**1.1428**	**0.2936**	**0.0838**	**0.3774**		**3,134.9920**	**3,134.9920**	**0.1968**		**3,139.9120**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3739	15.0311	10.6476	0.0160		0.7200	0.7200		0.6714	0.6714	0.0000	1,584.0304	1,584.0304	0.4447		1,595.1466
Total	**1.3739**	**15.0311**	**10.6476**	**0.0160**		**0.7200**	**0.7200**		**0.6714**	**0.6714**	**0.0000**	**1,584.0304**	**1,584.0304**	**0.4447**		**1,595.1466**

3.7 Platform Deck Construction/Completion - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4042	11.5125	2.8670	0.0249	0.6080	0.0841	0.6922	0.1751	0.0805	0.2555		2,647.2513	2,647.2513	0.1802		2,651.7556
Worker	0.2155	0.1545	2.0070	4.9000e-003	0.4471	3.5600e-003	0.4507	0.1186	3.2900e-003	0.1219		487.7407	487.7407	0.0166		488.1564
Total	**0.6198**	**11.6670**	**4.8741**	**0.0298**	**1.0551**	**0.0877**	**1.1428**	**0.2936**	**0.0838**	**0.3774**		**3,134.9920**	**3,134.9920**	**0.1968**		**3,139.9120**

3.8 Breasting Dolphins Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9644	10.1982	7.8120	0.0123		0.4848	0.4848		0.4589	0.4589		1,201.0909	1,201.0909	0.3059		1,208.7390
Total	**0.9644**	**10.1982**	**7.8120**	**0.0123**		**0.4848**	**0.4848**		**0.4589**	**0.4589**		**1,201.0909**	**1,201.0909**	**0.3059**		**1,208.7390**

3.8 Breasting Dolphins Construction - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0553	1.5754	0.3923	3.4000e-003	0.0832	0.0115	0.0947	0.0240	0.0110	0.0350		362.2555	362.2555	0.0247		362.8718
Worker	0.0862	0.0618	0.8028	1.9600e-003	0.1788	1.4300e-003	0.1803	0.0474	1.3100e-003	0.0487		195.0963	195.0963	6.6500e-003		195.2626
Total	**0.1415**	**1.6372**	**1.1951**	**5.3600e-003**	**0.2620**	**0.0129**	**0.2750**	**0.0714**	**0.0123**	**0.0837**		**557.3517**	**557.3517**	**0.0313**		**558.1344**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9644	10.1982	7.8120	0.0123		0.4848	0.4848		0.4589	0.4589	0.0000	1,201.0909	1,201.0909	0.3059		1,208.7390
Total	**0.9644**	**10.1982**	**7.8120**	**0.0123**		**0.4848**	**0.4848**		**0.4589**	**0.4589**	**0.0000**	**1,201.0909**	**1,201.0909**	**0.3059**		**1,208.7390**

3.8 Breasting Dolphins Construction - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0553	1.5754	0.3923	3.4000e-003	0.0832	0.0115	0.0947	0.0240	0.0110	0.0350		362.2555	362.2555	0.0247		362.8718
Worker	0.0862	0.0618	0.8028	1.9600e-003	0.1788	1.4300e-003	0.1803	0.0474	1.3100e-003	0.0487		195.0963	195.0963	6.6500e-003		195.2626
Total	**0.1415**	**1.6372**	**1.1951**	**5.3600e-003**	**0.2620**	**0.0129**	**0.2750**	**0.0714**	**0.0123**	**0.0837**		**557.3517**	**557.3517**	**0.0313**		**558.1344**

3.9 Mooring Dolphins Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7187	6.6921	4.2721	6.2300e-003		0.3850	0.3850		0.3631	0.3631		600.8132	600.8132	0.1405		604.3245
Total	**0.7187**	**6.6921**	**4.2721**	**6.2300e-003**		**0.3850**	**0.3850**		**0.3631**	**0.3631**		**600.8132**	**600.8132**	**0.1405**		**604.3245**

3.9 Mooring Dolphins Construction - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0723	2.0601	0.5131	4.4500e-003	0.1088	0.0151	0.1239	0.0313	0.0144	0.0457		473.7187	473.7187	0.0322		474.5247
Worker	0.0647	0.0464	0.6021	1.4700e-003	0.1341	1.0700e-003	0.1352	0.0356	9.9000e-004	0.0366		146.3222	146.3222	4.9900e-003		146.4469
Total	**0.1370**	**2.1065**	**1.1152**	**5.9200e-003**	**0.2429**	**0.0161**	**0.2591**	**0.0669**	**0.0154**	**0.0823**		**620.0409**	**620.0409**	**0.0372**		**620.9716**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7187	6.6921	4.2721	6.2300e-003		0.3850	0.3850		0.3631	0.3631	0.0000	600.8132	600.8132	0.1405		604.3245
Total	**0.7187**	**6.6921**	**4.2721**	**6.2300e-003**		**0.3850**	**0.3850**		**0.3631**	**0.3631**	**0.0000**	**600.8132**	**600.8132**	**0.1405**		**604.3245**

3.9 Mooring Dolphins Construction - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0723	2.0601	0.5131	4.4500e-003	0.1088	0.0151	0.1239	0.0313	0.0144	0.0457		473.7187	473.7187	0.0322		474.5247
Worker	0.0647	0.0464	0.6021	1.4700e-003	0.1341	1.0700e-003	0.1352	0.0356	9.9000e-004	0.0366		146.3222	146.3222	4.9900e-003		146.4469
Total	**0.1370**	**2.1065**	**1.1152**	**5.9200e-003**	**0.2429**	**0.0161**	**0.2591**	**0.0669**	**0.0154**	**0.0823**		**620.0409**	**620.0409**	**0.0372**		**620.9716**

3.10 Topside Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.5757	22.6594	18.5220	0.0282		1.2593	1.2593		1.2047	1.2047		2,728.5220	2,728.5220	0.5945		2,743.3833
Total	**2.5757**	**22.6594**	**18.5220**	**0.0282**		**1.2593**	**1.2593**		**1.2047**	**1.2047**		**2,728.5220**	**2,728.5220**	**0.5945**		**2,743.3833**

3.10 Topside Construction - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	7.9000e-004	0.0282	5.2200e-003	7.0000e-005	5.0200e-003	1.1000e-004	5.1200e-003	1.2800e-003	1.0000e-004	1.3800e-003		7.8399	7.8399	5.4000e-004		7.8533
Vendor	0.6297	17.9353	4.4666	0.0387	0.9473	0.1310	1.0783	0.2727	0.1254	0.3981		4,124.1389	4,124.1389	0.2807		4,131.1561
Worker	0.1078	0.0773	1.0035	2.4500e-003	0.2236	1.7800e-003	0.2253	0.0593	1.6400e-003	0.0609		243.8703	243.8703	8.3200e-003		244.0782
Total	**0.7383**	**18.0407**	**5.4753**	**0.0413**	**1.1758**	**0.1329**	**1.3087**	**0.3333**	**0.1271**	**0.4604**		**4,375.8491**	**4,375.8491**	**0.2896**		**4,383.0876**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.5757	22.6594	18.5220	0.0282		1.2593	1.2593		1.2047	1.2047	0.0000	2,728.5220	2,728.5220	0.5945		2,743.3833
Total	**2.5757**	**22.6594**	**18.5220**	**0.0282**		**1.2593**	**1.2593**		**1.2047**	**1.2047**	**0.0000**	**2,728.5220**	**2,728.5220**	**0.5945**		**2,743.3833**

3.10 Topside Construction - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	7.9000e-004	0.0282	5.2200e-003	7.0000e-005	5.0200e-003	1.1000e-004	5.1200e-003	1.2800e-003	1.0000e-004	1.3800e-003		7.8399	7.8399	5.4000e-004		7.8533
Vendor	0.6297	17.9353	4.4666	0.0387	0.9473	0.1310	1.0783	0.2727	0.1254	0.3981		4,124.1389	4,124.1389	0.2807		4,131.1561
Worker	0.1078	0.0773	1.0035	2.4500e-003	0.2236	1.7800e-003	0.2253	0.0593	1.6400e-003	0.0609		243.8703	243.8703	8.3200e-003		244.0782
Total	**0.7383**	**18.0407**	**5.4753**	**0.0413**	**1.1758**	**0.1329**	**1.3087**	**0.3333**	**0.1271**	**0.4604**		**4,375.8491**	**4,375.8491**	**0.2896**		**4,383.0876**

3.10 Topside Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3256	20.9168	18.0739	0.0282		1.1152	1.1152		1.0657	1.0657		2,704.2958	2,704.2958	0.5800		2,718.7949
Total	**2.3256**	**20.9168**	**18.0739**	**0.0282**		**1.1152**	**1.1152**		**1.0657**	**1.0657**		**2,704.2958**	**2,704.2958**	**0.5800**		**2,718.7949**

3.10 Topside Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	7.5000e-004	0.0266	5.1000e-003	7.0000e-005	2.0300e-003	1.0000e-004	2.1300e-003	5.4000e-004	9.0000e-005	6.4000e-004		7.7487	7.7487	5.3000e-004		7.7619
Vendor	0.5706	16.9347	4.0938	0.0384	0.9472	0.1122	1.0594	0.2727	0.1073	0.3800		4,088.0516	4,088.0516	0.2705		4,094.8139
Worker	0.0980	0.0682	0.8987	2.3700e-003	0.2236	1.7400e-003	0.2253	0.0593	1.6000e-003	0.0609		236.1978	236.1978	7.3900e-003		236.3825
Total	**0.6693**	**17.0295**	**4.9976**	**0.0408**	**1.1728**	**0.1140**	**1.2868**	**0.3325**	**0.1090**	**0.4415**		**4,331.9981**	**4,331.9981**	**0.2784**		**4,338.9583**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3256	20.9168	18.0739	0.0282		1.1152	1.1152		1.0657	1.0657	0.0000	2,704.2958	2,704.2958	0.5800		2,718.7949
Total	**2.3256**	**20.9168**	**18.0739**	**0.0282**		**1.1152**	**1.1152**		**1.0657**	**1.0657**	**0.0000**	**2,704.2958**	**2,704.2958**	**0.5800**		**2,718.7949**

3.10 Topside Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	7.5000e-004	0.0266	5.1000e-003	7.0000e-005	2.0300e-003	1.0000e-004	2.1300e-003	5.4000e-004	9.0000e-005	6.4000e-004		7.7487	7.7487	5.3000e-004		7.7619
Vendor	0.5706	16.9347	4.0938	0.0384	0.9472	0.1122	1.0594	0.2727	0.1073	0.3800		4,088.0516	4,088.0516	0.2705		4,094.8139
Worker	0.0980	0.0682	0.8987	2.3700e-003	0.2236	1.7400e-003	0.2253	0.0593	1.6000e-003	0.0609		236.1978	236.1978	7.3900e-003		236.3825
Total	**0.6693**	**17.0295**	**4.9976**	**0.0408**	**1.1728**	**0.1140**	**1.2868**	**0.3325**	**0.1090**	**0.4415**		**4,331.9981**	**4,331.9981**	**0.2784**		**4,338.9583**

3.11 Berth 239 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.8025	0.0000	0.8025	0.1215	0.0000	0.1215			0.0000			0.0000
Off-Road	2.1306	23.2172	17.2108	0.0499		0.9695	0.9695		0.9169	0.9169		4,905.8337	4,905.8337	1.3645		4,939.9465
Total	**2.1306**	**23.2172**	**17.2108**	**0.0499**	**0.8025**	**0.9695**	**1.7719**	**0.1215**	**0.9169**	**1.0384**		**4,905.8337**	**4,905.8337**	**1.3645**		**4,939.9465**

3.11 Berth 239 Demolition - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0385	1.3646	0.2612	3.6800e-003	0.0819	5.0600e-003	0.0870	0.0225	4.8400e-003	0.0273		396.9456	396.9456	0.0271		397.6225
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0980	0.0682	0.8987	2.3700e-003	0.2236	1.7400e-003	0.2253	0.0593	1.6000e-003	0.0609		236.1978	236.1978	7.3900e-003		236.3825
Total	**0.1365**	**1.4328**	**1.1599**	**6.0500e-003**	**0.3055**	**6.8000e-003**	**0.3123**	**0.0817**	**6.4400e-003**	**0.0882**		**633.1434**	**633.1434**	**0.0345**		**634.0050**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.8025	0.0000	0.8025	0.1215	0.0000	0.1215			0.0000			0.0000
Off-Road	2.1306	23.2172	17.2108	0.0499		0.9695	0.9695		0.9169	0.9169	0.0000	4,905.8337	4,905.8337	1.3645		4,939.9465
Total	**2.1306**	**23.2172**	**17.2108**	**0.0499**	**0.8025**	**0.9695**	**1.7719**	**0.1215**	**0.9169**	**1.0384**	**0.0000**	**4,905.8337**	**4,905.8337**	**1.3645**		**4,939.9465**

3.11 Berth 239 Demolition - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0385	1.3646	0.2612	3.6800e-003	0.0819	5.0600e-003	0.0870	0.0225	4.8400e-003	0.0273		396.9456	396.9456	0.0271		397.6225
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0980	0.0682	0.8987	2.3700e-003	0.2236	1.7400e-003	0.2253	0.0593	1.6000e-003	0.0609		236.1978	236.1978	7.3900e-003		236.3825
Total	**0.1365**	**1.4328**	**1.1599**	**6.0500e-003**	**0.3055**	**6.8000e-003**	**0.3123**	**0.0817**	**6.4400e-003**	**0.0882**		**633.1434**	**633.1434**	**0.0345**		**634.0050**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	3.0815	16.2752	46.1145	0.1612	12.7115	0.1568	12.8682	3.4013	0.1472	3.5486		16,374.4811	16,374.4811	0.7869		16,394.1524
Unmitigated	3.0815	16.2752	46.1145	0.1612	12.7115	0.1568	12.8682	3.4013	0.1472	3.5486		16,374.4811	16,374.4811	0.7869		16,394.1524

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Heavy Industry	1,350.00	1,350.00	1350.00	5,978,175	5,978,175
Total	1,350.00	1,350.00	1,350.00	5,978,175	5,978,175

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Heavy Industry	16.60	8.40	6.90	59.00	28.00	13.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Heavy Industry	0.547828	0.043645	0.199892	0.122290	0.016774	0.005862	0.020637	0.032653	0.002037	0.001944	0.004777	0.000705	0.000956

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.4813	4.3755	3.6754	0.0263		0.3325	0.3325		0.3325	0.3325		5,250.6044	5,250.6044	0.1006	0.0963	5,281.8061
NaturalGas Unmitigated	0.4813	4.3755	3.6754	0.0263		0.3325	0.3325		0.3325	0.3325		5,250.6044	5,250.6044	0.1006	0.0963	5,281.8061

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Heavy Industry	44630.1	0.4813	4.3755	3.6754	0.0263		0.3325	0.3325		0.3325	0.3325		5,250.6044	5,250.6044	0.1006	0.0963	5,281.8061
Total		**0.4813**	**4.3755**	**3.6754**	**0.0263**		**0.3325**	**0.3325**		**0.3325**	**0.3325**		**5,250.6044**	**5,250.6044**	**0.1006**	**0.0963**	**5,281.8061**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Heavy Industry	44.6301	0.4813	4.3755	3.6754	0.0263		0.3325	0.3325		0.3325	0.3325		5,250.6044	5,250.6044	0.1006	0.0963	5,281.8061
Total		**0.4813**	**4.3755**	**3.6754**	**0.0263**		**0.3325**	**0.3325**		**0.3325**	**0.3325**		**5,250.6044**	**5,250.6044**	**0.1006**	**0.0963**	**5,281.8061**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	20.1145	8.5000e-004	0.0925	1.0000e-005		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004		0.1970	0.1970	5.3000e-004		0.2102
Unmitigated	20.1145	8.5000e-004	0.0925	1.0000e-005		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004		0.1970	0.1970	5.3000e-004		0.2102

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	2.2858					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	17.8200					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	8.7000e-003	8.5000e-004	0.0925	1.0000e-005		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004		0.1970	0.1970	5.3000e-004		0.2102
Total	**20.1145**	**8.5000e-004**	**0.0925**	**1.0000e-005**		**3.3000e-004**	**3.3000e-004**		**3.3000e-004**	**3.3000e-004**		**0.1970**	**0.1970**	**5.3000e-004**		**0.2102**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	2.2858					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	17.8200					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	8.7000e-003	8.5000e-004	0.0925	1.0000e-005		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004		0.1970	0.1970	5.3000e-004		0.2102
Total	**20.1145**	**8.5000e-004**	**0.0925**	**1.0000e-005**		**3.3000e-004**	**3.3000e-004**		**3.3000e-004**	**3.3000e-004**		**0.1970**	**0.1970**	**5.3000e-004**		**0.2102**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

PBF Construction

South Coast AQMD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Heavy Industry	900.00	1000sqft	20.66	900,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	11			**Operational Year**	2020
Utility Company	Los Angeles Department of Water & Power				
CO2 Intensity (lb/MWhr)	1227.89	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Construction Phase - Provided by POLA Engineering

Off-road Equipment - Off-Road Equipment - Provided by POLA Engineering

Off-road Equipment - Off-Road Equipment - Provided by POLA Engineering

Off-road Equipment - Off-Road Equipment - Provided by POLA Engineering

Off-road Equipment - Off-Road Equipment - Provided by POLA Engineering

Off-road Equipment - Off-Road Equipment - Provided by POLA Engineering

Off-road Equipment - Off-Road Equipment - Provided by POLA Engineering

Off-road Equipment - Off-Road Equipment - Provided by POLA Engineering

Off-road Equipment - Off-Road Equipment - Provided by POLA Engineering

Off-road Equipment - Off-Road Equipment - Provided by POLA Engineering

Off-road Equipment - Off-Road Equipment - Provided by POLA Engineering

Trips and VMT - Trips and VMT - Provided by POLA Engineering

Demolition -

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Fleet Mix -

Area Coating -

Energy Use -

Area Mitigation - SCAQMD Rule 1113

Table Name	Column Name	Default Value	New Value
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2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	4.8611	56.1024	36.2044	0.1071	1.8420	2.2059	3.5741	0.5161	2.0921	2.3606	0.0000	11,526.618 8	11,526.618 8	1.9832	0.0000	11,551.513 8
2019	3.0290	37.9651	23.4494	0.0678	1.1728	1.2309	2.4038	0.3325	1.1764	1.5090	0.0000	6,903.9158	6,903.9158	1.3997	0.0000	6,925.8678
Maximum	**4.8611**	**56.1024**	**36.2044**	**0.1071**	**1.8420**	**2.2059**	**3.5741**	**0.5161**	**2.0921**	**2.3606**	**0.0000**	**11,526.618 8**	**11,526.618 8**	**1.9832**	**0.0000**	**11,551.513 8**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	4.8611	56.1024	36.2044	0.1071	1.8420	2.2059	3.5741	0.5161	2.0921	2.3606	0.0000	11,526.618 8	11,526.618 8	1.9832	0.0000	11,551.513 8
2019	3.0290	37.9651	23.4494	0.0678	1.1728	1.2309	2.4038	0.3325	1.1764	1.5090	0.0000	6,903.9158	6,903.9158	1.3997	0.0000	6,925.8678
Maximum	**4.8611**	**56.1024**	**36.2044**	**0.1071**	**1.8420**	**2.2059**	**3.5741**	**0.5161**	**2.0921**	**2.3606**	**0.0000**	**11,526.618 8**	**11,526.618 8**	**1.9832**	**0.0000**	**11,551.513 8**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	20.1145	8.5000e-004	0.0925	1.0000e-005		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004		0.1970	0.1970	5.3000e-004		0.2102
Energy	0.4813	4.3755	3.6754	0.0263		0.3325	0.3325		0.3325	0.3325		5,250.6044	5,250.6044	0.1006	0.0963	5,281.8061
Mobile	2.9429	16.7369	42.7535	0.1526	12.7115	0.1575	12.8689	3.4013	0.1479	3.5492		15,510.7471	15,510.7471	0.7796		15,530.2373
Total	**23.5386**	**21.1132**	**46.5214**	**0.1788**	**12.7115**	**0.4903**	**13.2018**	**3.4013**	**0.4807**	**3.8821**		**20,761.5484**	**20,761.5484**	**0.8808**	**0.0963**	**20,812.2535**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	20.1145	8.5000e-004	0.0925	1.0000e-005		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004		0.1970	0.1970	5.3000e-004		0.2102
Energy	0.4813	4.3755	3.6754	0.0263		0.3325	0.3325		0.3325	0.3325		5,250.6044	5,250.6044	0.1006	0.0963	5,281.8061
Mobile	2.9429	16.7369	42.7535	0.1526	12.7115	0.1575	12.8689	3.4013	0.1479	3.5492		15,510.7471	15,510.7471	0.7796		15,530.2373
Total	**23.5386**	**21.1132**	**46.5214**	**0.1788**	**12.7115**	**0.4903**	**13.2018**	**3.4013**	**0.4807**	**3.8821**		**20,761.5484**	**20,761.5484**	**0.8808**	**0.0963**	**20,812.2535**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Topside Demolition	Demolition	1/1/2018	4/1/2018	5	65	
2	Berth 238 Demolition	Demolition	3/1/2018	6/20/2018	5	80	
3	Pile Driving Deck and Dolphins	Building Construction	6/21/2018	8/8/2018	5	35	
4	Platform Deck Construction/Forms	Building Construction	7/1/2018	8/24/2018	5	40	
5	Platform Deck Construction/Concrete	Building Construction	8/27/2018	8/27/2018	5	1	
6	Platform Deck Construction/Completion	Building Construction	8/28/2018	9/27/2018	5	23	
7	Breasting Dolphins Construction	Building Construction	9/28/2018	11/7/2018	5	29	
8	Mooring Dolphins Construction	Building Construction	10/1/2018	11/1/2018	5	24	
9	Topside Construction	Building Construction	11/6/2018	6/6/2019	5	153	
10	Berth 239 Demolition	Demolition	6/10/2019	9/28/2019	5	80	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

PBF Construction - South Coast AQMD Air District, Winter

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Topside Demolition	Aerial Lifts	2	8.00	63	0.31
Topside Demolition	Air Compressors	1	8.00	78	0.48
Topside Demolition	Cranes	1	8.00	150	0.29
Topside Demolition	Cranes	1	8.00	260	0.29
Topside Demolition	Forklifts	1	8.00	89	0.20
Topside Demolition	Generator Sets	1	8.00	84	0.74
Topside Demolition	Welders	1	8.00	46	0.45
Berth 238 Demolition	Aerial Lifts	1	4.00	67	0.31
Berth 238 Demolition	Air Compressors	1	4.00	75	0.48
Berth 238 Demolition	Bore/Drill Rigs	1	8.00	595	0.50
Berth 238 Demolition	Concrete/Industrial Saws	1	4.00	65	0.73
Berth 238 Demolition	Cranes	1	8.00	297	0.29
Berth 238 Demolition	Excavators	1	8.00	220	0.38
Berth 238 Demolition	Other Construction Equipment	1	1.00	160	0.42
Pile Driving Deck and Dolphins	Aerial Lifts	1	4.00	67	0.31
Pile Driving Deck and Dolphins	Air Compressors	1	2.00	75	0.48
Pile Driving Deck and Dolphins	Bore/Drill Rigs	1	4.00	221	0.50
Pile Driving Deck and Dolphins	Bore/Drill Rigs	1	2.00	595	0.50
Pile Driving Deck and Dolphins	Cranes	1	8.00	297	0.29
Pile Driving Deck and Dolphins	Generator Sets	1	2.00	10	0.74
Pile Driving Deck and Dolphins	Other Construction Equipment	1	1.00	160	0.42
Pile Driving Deck and Dolphins	Welders	1	2.00	85	0.45
Platform Deck Construction/Forms	Aerial Lifts	1	8.00	67	0.31
Platform Deck Construction/Forms	Air Compressors	1	2.00	75	0.48
Platform Deck Construction/Forms	Cranes	1	8.00	289	0.29
Platform Deck Construction/Forms	Cranes	1	8.00	152	0.29

Platform Deck Construction/Forms	Generator Sets	1	4.00	10	0.74
Platform Deck Construction/Forms	Other Construction Equipment	1	1.00	160	0.42
Platform Deck Construction/Forms	Welders	1	2.00	85	0.45
Platform Deck Construction/Concrete	Aerial Lifts	1	8.00	67	0.31
Platform Deck Construction/Concrete	Air Compressors	1	2.00	75	0.48
Platform Deck Construction/Concrete	Cranes	1	8.00	289	0.29
Platform Deck Construction/Concrete	Cranes	1	8.00	152	0.29
Platform Deck Construction/Concrete	Generator Sets	1	4.00	10	0.74
Platform Deck Construction/Concrete	Other Construction Equipment	1	1.00	160	0.42
Platform Deck Construction/Concrete	Pumps	2	8.00	300	0.74
Platform Deck Construction/Concrete	Welders	1	2.00	85	0.45
Platform Deck Construction/Completion	Aerial Lifts	1	8.00	67	0.31
Platform Deck Construction/Completion	Air Compressors	1	2.00	75	0.48
Platform Deck Construction/Completion	Cranes	1	8.00	289	0.29
Platform Deck Construction/Completion	Cranes	1	8.00	152	0.29
Platform Deck Construction/Completion	Generator Sets	1	4.00	10	0.74
Platform Deck Construction/Completion	Other Construction Equipment	1	1.00	160	0.42
Platform Deck Construction/Completion	Welders	1	2.00	85	0.45
Breasting Dolphins Construction	Aerial Lifts	1	4.00	67	0.31
Breasting Dolphins Construction	Air Compressors	1	4.00	75	0.48
Breasting Dolphins Construction	Cranes	1	8.00	289	0.29
Breasting Dolphins Construction	Generator Sets	1	4.00	10	0.74
Breasting Dolphins Construction	Other Construction Equipment	1	1.00	160	0.42
Breasting Dolphins Construction	Welders	1	2.00	85	0.45
Mooring Dolphins Construction	Air Compressors	1	4.00	75	0.48
Mooring Dolphins Construction	Cranes	1	8.00	152	0.29
Mooring Dolphins Construction	Generator Sets	1	4.00	10	0.74

Topside Construction	Aerial Lifts	2	8.00	63	0.31
Topside Construction	Air Compressors	1	8.00	78	0.48
Topside Construction	Cranes	1	8.00	150	0.29
Topside Construction	Cranes	1	8.00	260	0.29
Topside Construction	Forklifts	1	8.00	89	0.20
Topside Construction	Generator Sets	1	8.00	84	0.74
Topside Construction	Welders	1	8.00	46	0.45
Berth 239 Demolition	Aerial Lifts	1	4.00	67	0.31
Berth 239 Demolition	Air Compressors	1	4.00	75	0.48
Berth 239 Demolition	Bore/Drill Rigs	1	8.00	595	0.50
Berth 239 Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Berth 239 Demolition	Cranes	1	8.00	297	0.29
Berth 239 Demolition	Excavators	1	8.00	220	0.38
Berth 239 Demolition	Other Construction Equipment	1	1.00	160	0.42

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Topside Demolition	8	20.00	0.00	14.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Berth 238 Demolition	7	20.00	0.00	375.00	14.70	50.00	20.00	LD_Mix	HDT_Mix	HHDT
Pile Driving Deck and Dolphins	8	16.00	95.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Platform Deck Construction/Forms	7	40.00	95.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Platform Deck Construction/Concrete	9	40.00	186.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Platform Deck Construction/Completio	7	40.00	95.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Breasting Dolphins Construction	6	16.00	13.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Mooring Dolphins Construction	3	12.00	17.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Topside Construction	8	20.00	148.00	14.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Berth 239 Demolition	7	20.00	0.00	375.00	14.70	50.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Topside Demolition - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0329	0.0000	0.0329	4.9800e-003	0.0000	4.9800e-003			0.0000			0.0000
Off-Road	2.5757	22.6594	18.5220	0.0282		1.2593	1.2593		1.2047	1.2047		2,728.5220	2,728.5220	0.5945		2,743.3833
Total	**2.5757**	**22.6594**	**18.5220**	**0.0282**	**0.0329**	**1.2593**	**1.2922**	**4.9800e-003**	**1.2047**	**1.2096**		**2,728.5220**	**2,728.5220**	**0.5945**		**2,743.3833**

3.2 Topside Demolition - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	1.9200e-003	0.0672	0.0133	1.7000e-004	3.7600e-003	2.6000e-004	4.0200e-003	1.0300e-003	2.5000e-004	1.2800e-003		18.1228	18.1228	1.3200e-003		18.1558
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1172	0.0846	0.9082	2.2900e-003	0.2236	1.7800e-003	0.2253	0.0593	1.6400e-003	0.0609		228.1358	228.1358	7.7800e-003		228.3305
Total	**0.1191**	**0.1519**	**0.9215**	**2.4600e-003**	**0.2273**	**2.0400e-003**	**0.2294**	**0.0603**	**1.8900e-003**	**0.0622**		**246.2587**	**246.2587**	**9.1000e-003**		**246.4863**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0329	0.0000	0.0329	4.9800e-003	0.0000	4.9800e-003			0.0000			0.0000
Off-Road	2.5757	22.6594	18.5220	0.0282		1.2593	1.2593		1.2047	1.2047	0.0000	2,728.5220	2,728.5220	0.5945		2,743.3833
Total	**2.5757**	**22.6594**	**18.5220**	**0.0282**	**0.0329**	**1.2593**	**1.2922**	**4.9800e-003**	**1.2047**	**1.2096**	**0.0000**	**2,728.5220**	**2,728.5220**	**0.5945**		**2,743.3833**

3.2 Topside Demolition - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	1.9200e-003	0.0672	0.0133	1.7000e-004	3.7600e-003	2.6000e-004	4.0200e-003	1.0300e-003	2.5000e-004	1.2800e-003		18.1228	18.1228	1.3200e-003		18.1558
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1172	0.0846	0.9082	2.2900e-003	0.2236	1.7800e-003	0.2253	0.0593	1.6400e-003	0.0609		228.1358	228.1358	7.7800e-003		228.3305
Total	**0.1191**	**0.1519**	**0.9215**	**2.4600e-003**	**0.2273**	**2.0400e-003**	**0.2294**	**0.0603**	**1.8900e-003**	**0.0622**		**246.2587**	**246.2587**	**9.1000e-003**		**246.4863**

3.3 Berth 238 Demolition - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.8025	0.0000	0.8025	0.1215	0.0000	0.1215			0.0000			0.0000
Off-Road	2.0073	23.6116	15.5628	0.0462		0.9372	0.9372		0.8785	0.8785		4,618.5184	4,618.5184	1.3432		4,652.0976
Total	**2.0073**	**23.6116**	**15.5628**	**0.0462**	**0.8025**	**0.9372**	**1.7396**	**0.1215**	**0.8785**	**1.0000**		**4,618.5184**	**4,618.5184**	**1.3432**		**4,652.0976**

3.3 Berth 238 Demolition - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0419	1.4634	0.2899	3.6600e-003	0.0819	5.6600e-003	0.0876	0.0225	5.4100e-003	0.0279		394.4144	394.4144	0.0287		395.1328
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1172	0.0846	0.9082	2.2900e-003	0.2236	1.7800e-003	0.2253	0.0593	1.6400e-003	0.0609		228.1358	228.1358	7.7800e-003		228.3305
Total	**0.1590**	**1.5481**	**1.1980**	**5.9500e-003**	**0.3055**	**7.4400e-003**	**0.3129**	**0.0817**	**7.0500e-003**	**0.0888**		**622.5502**	**622.5502**	**0.0365**		**623.4632**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.8025	0.0000	0.8025	0.1215	0.0000	0.1215			0.0000			0.0000
Off-Road	2.0073	23.6116	15.5628	0.0462		0.9372	0.9372		0.8785	0.8785	0.0000	4,618.5184	4,618.5184	1.3432		4,652.0976
Total	**2.0073**	**23.6116**	**15.5628**	**0.0462**	**0.8025**	**0.9372**	**1.7396**	**0.1215**	**0.8785**	**1.0000**	**0.0000**	**4,618.5184**	**4,618.5184**	**1.3432**		**4,652.0976**

3.3 Berth 238 Demolition - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0419	1.4634	0.2899	3.6600e-003	0.0819	5.6600e-003	0.0876	0.0225	5.4100e-003	0.0279		394.4144	394.4144	0.0287		395.1328
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1172	0.0846	0.9082	2.2900e-003	0.2236	1.7800e-003	0.2253	0.0593	1.6400e-003	0.0609		228.1358	228.1358	7.7800e-003		228.3305
Total	**0.1590**	**1.5481**	**1.1980**	**5.9500e-003**	**0.3055**	**7.4400e-003**	**0.3129**	**0.0817**	**7.0500e-003**	**0.0888**		**622.5502**	**622.5502**	**0.0365**		**623.4632**

3.4 Pile Driving Deck and Dolphins - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1775	13.8908	9.5963	0.0223		0.5672	0.5672		0.5302	0.5302		2,227.0069	2,227.0069	0.6486		2,243.2219
Total	**1.1775**	**13.8908**	**9.5963**	**0.0223**		**0.5672**	**0.5672**		**0.5302**	**0.5302**		**2,227.0069**	**2,227.0069**	**0.6486**		**2,243.2219**

3.4 Pile Driving Deck and Dolphins - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4219	11.5317	3.1826	0.0242	0.6080	0.0854	0.6934	0.1751	0.0817	0.2568		2,572.1862	2,572.1862	0.1936		2,577.0251
Worker	0.0937	0.0677	0.7266	1.8300e-003	0.1788	1.4300e-003	0.1803	0.0474	1.3100e-003	0.0487		182.5087	182.5087	6.2300e-003		182.6644
Total	**0.5156**	**11.5994**	**3.9092**	**0.0260**	**0.7869**	**0.0868**	**0.8737**	**0.2225**	**0.0830**	**0.3055**		**2,754.6949**	**2,754.6949**	**0.1998**		**2,759.6895**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1775	13.8908	9.5963	0.0223		0.5672	0.5672		0.5302	0.5302	0.0000	2,227.0069	2,227.0069	0.6486		2,243.2219
Total	**1.1775**	**13.8908**	**9.5963**	**0.0223**		**0.5672**	**0.5672**		**0.5302**	**0.5302**	**0.0000**	**2,227.0069**	**2,227.0069**	**0.6486**		**2,243.2219**

3.4 Pile Driving Deck and Dolphins - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4219	11.5317	3.1826	0.0242	0.6080	0.0854	0.6934	0.1751	0.0817	0.2568		2,572.1862	2,572.1862	0.1936		2,577.0251
Worker	0.0937	0.0677	0.7266	1.8300e-003	0.1788	1.4300e-003	0.1803	0.0474	1.3100e-003	0.0487		182.5087	182.5087	6.2300e-003		182.6644
Total	**0.5156**	**11.5994**	**3.9092**	**0.0260**	**0.7869**	**0.0868**	**0.8737**	**0.2225**	**0.0830**	**0.3055**		**2,754.6949**	**2,754.6949**	**0.1998**		**2,759.6895**

3.5 Platform Deck Construction/Forms - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3739	15.0311	10.6476	0.0160		0.7200	0.7200		0.6714	0.6714		1,584.0304	1,584.0304	0.4447		1,595.1466
Total	**1.3739**	**15.0311**	**10.6476**	**0.0160**		**0.7200**	**0.7200**		**0.6714**	**0.6714**		**1,584.0304**	**1,584.0304**	**0.4447**		**1,595.1466**

3.5 Platform Deck Construction/Forms - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4219	11.5317	3.1826	0.0242	0.6080	0.0854	0.6934	0.1751	0.0817	0.2568		2,572.1862	2,572.1862	0.1936		2,577.0251
Worker	0.2343	0.1693	1.8164	4.5800e-003	0.4471	3.5600e-003	0.4507	0.1186	3.2900e-003	0.1219		456.2717	456.2717	0.0156		456.6609
Total	**0.6562**	**11.7010**	**4.9990**	**0.0288**	**1.0551**	**0.0890**	**1.1441**	**0.2936**	**0.0850**	**0.3786**		**3,028.4579**	**3,028.4579**	**0.2091**		**3,033.6861**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3739	15.0311	10.6476	0.0160		0.7200	0.7200		0.6714	0.6714	0.0000	1,584.0304	1,584.0304	0.4447		1,595.1466
Total	**1.3739**	**15.0311**	**10.6476**	**0.0160**		**0.7200**	**0.7200**		**0.6714**	**0.6714**	**0.0000**	**1,584.0304**	**1,584.0304**	**0.4447**		**1,595.1466**

3.5 Platform Deck Construction/Forms - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4219	11.5317	3.1826	0.0242	0.6080	0.0854	0.6934	0.1751	0.0817	0.2568		2,572.1862	2,572.1862	0.1936		2,577.0251
Worker	0.2343	0.1693	1.8164	4.5800e-003	0.4471	3.5600e-003	0.4507	0.1186	3.2900e-003	0.1219		456.2717	456.2717	0.0156		456.6609
Total	**0.6562**	**11.7010**	**4.9990**	**0.0288**	**1.0551**	**0.0890**	**1.1441**	**0.2936**	**0.0850**	**0.3786**		**3,028.4579**	**3,028.4579**	**0.2091**		**3,033.6861**

3.6 Platform Deck Construction/Concrete - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.1437	33.3552	18.7995	0.0552		1.2760	1.2760		1.2274	1.2274		6,034.2773	6,034.2773	0.6013		6,049.3090
Total	**3.1437**	**33.3552**	**18.7995**	**0.0552**		**1.2760**	**1.2760**		**1.2274**	**1.2274**		**6,034.2773**	**6,034.2773**	**0.6013**		**6,049.3090**

3.6 Platform Deck Construction/Concrete - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.8260	22.5779	6.2312	0.0473	1.1905	0.1672	1.3577	0.3427	0.1600	0.5027		5,036.0698	5,036.0698	0.3790		5,045.5440
Worker	0.2343	0.1693	1.8164	4.5800e-003	0.4471	3.5600e-003	0.4507	0.1186	3.2900e-003	0.1219		456.2717	456.2717	0.0156		456.6609
Total	**1.0604**	**22.7472**	**8.0476**	**0.0519**	**1.6376**	**0.1708**	**1.8084**	**0.4613**	**0.1633**	**0.6246**		**5,492.3415**	**5,492.3415**	**0.3945**		**5,502.2049**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.1437	33.3552	18.7995	0.0552		1.2760	1.2760		1.2274	1.2274	0.0000	6,034.2773	6,034.2773	0.6013		6,049.3089
Total	**3.1437**	**33.3552**	**18.7995**	**0.0552**		**1.2760**	**1.2760**		**1.2274**	**1.2274**	**0.0000**	**6,034.2773**	**6,034.2773**	**0.6013**		**6,049.3089**

3.6 Platform Deck Construction/Concrete - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.8260	22.5779	6.2312	0.0473	1.1905	0.1672	1.3577	0.3427	0.1600	0.5027		5,036.0698	5,036.0698	0.3790		5,045.5440
Worker	0.2343	0.1693	1.8164	4.5800e-003	0.4471	3.5600e-003	0.4507	0.1186	3.2900e-003	0.1219		456.2717	456.2717	0.0156		456.6609
Total	**1.0604**	**22.7472**	**8.0476**	**0.0519**	**1.6376**	**0.1708**	**1.8084**	**0.4613**	**0.1633**	**0.6246**		**5,492.3415**	**5,492.3415**	**0.3945**		**5,502.2049**

3.7 Platform Deck Construction/Completion - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3739	15.0311	10.6476	0.0160		0.7200	0.7200		0.6714	0.6714		1,584.0304	1,584.0304	0.4447		1,595.1466
Total	**1.3739**	**15.0311**	**10.6476**	**0.0160**		**0.7200**	**0.7200**		**0.6714**	**0.6714**		**1,584.0304**	**1,584.0304**	**0.4447**		**1,595.1466**

3.7 Platform Deck Construction/Completion - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4219	11.5317	3.1826	0.0242	0.6080	0.0854	0.6934	0.1751	0.0817	0.2568		2,572.1862	2,572.1862	0.1936		2,577.0251
Worker	0.2343	0.1693	1.8164	4.5800e-003	0.4471	3.5600e-003	0.4507	0.1186	3.2900e-003	0.1219		456.2717	456.2717	0.0156		456.6609
Total	**0.6562**	**11.7010**	**4.9990**	**0.0288**	**1.0551**	**0.0890**	**1.1441**	**0.2936**	**0.0850**	**0.3786**		**3,028.4579**	**3,028.4579**	**0.2091**		**3,033.6861**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3739	15.0311	10.6476	0.0160		0.7200	0.7200		0.6714	0.6714	0.0000	1,584.0304	1,584.0304	0.4447		1,595.1466
Total	**1.3739**	**15.0311**	**10.6476**	**0.0160**		**0.7200**	**0.7200**		**0.6714**	**0.6714**	**0.0000**	**1,584.0304**	**1,584.0304**	**0.4447**		**1,595.1466**

3.7 Platform Deck Construction/Completion - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4219	11.5317	3.1826	0.0242	0.6080	0.0854	0.6934	0.1751	0.0817	0.2568		2,572.1862	2,572.1862	0.1936		2,577.0251
Worker	0.2343	0.1693	1.8164	4.5800e-003	0.4471	3.5600e-003	0.4507	0.1186	3.2900e-003	0.1219		456.2717	456.2717	0.0156		456.6609
Total	**0.6562**	**11.7010**	**4.9990**	**0.0288**	**1.0551**	**0.0890**	**1.1441**	**0.2936**	**0.0850**	**0.3786**		**3,028.4579**	**3,028.4579**	**0.2091**		**3,033.6861**

3.8 Breasting Dolphins Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9644	10.1982	7.8120	0.0123		0.4848	0.4848		0.4589	0.4589		1,201.0909	1,201.0909	0.3059		1,208.7390
Total	**0.9644**	**10.1982**	**7.8120**	**0.0123**		**0.4848**	**0.4848**		**0.4589**	**0.4589**		**1,201.0909**	**1,201.0909**	**0.3059**		**1,208.7390**

3.8 Breasting Dolphins Construction - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0577	1.5780	0.4355	3.3100e-003	0.0832	0.0117	0.0949	0.0240	0.0112	0.0351		351.9834	351.9834	0.0265		352.6455
Worker	0.0937	0.0677	0.7266	1.8300e-003	0.1788	1.4300e-003	0.1803	0.0474	1.3100e-003	0.0487		182.5087	182.5087	6.2300e-003		182.6644
Total	**0.1515**	**1.6457**	**1.1621**	**5.1400e-003**	**0.2620**	**0.0131**	**0.2752**	**0.0714**	**0.0125**	**0.0839**		**534.4920**	**534.4920**	**0.0327**		**535.3099**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9644	10.1982	7.8120	0.0123		0.4848	0.4848		0.4589	0.4589	0.0000	1,201.0909	1,201.0909	0.3059		1,208.7390
Total	**0.9644**	**10.1982**	**7.8120**	**0.0123**		**0.4848**	**0.4848**		**0.4589**	**0.4589**	**0.0000**	**1,201.0909**	**1,201.0909**	**0.3059**		**1,208.7390**

3.8 Breasting Dolphins Construction - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0577	1.5780	0.4355	3.3100e-003	0.0832	0.0117	0.0949	0.0240	0.0112	0.0351		351.9834	351.9834	0.0265		352.6455
Worker	0.0937	0.0677	0.7266	1.8300e-003	0.1788	1.4300e-003	0.1803	0.0474	1.3100e-003	0.0487		182.5087	182.5087	6.2300e-003		182.6644
Total	**0.1515**	**1.6457**	**1.1621**	**5.1400e-003**	**0.2620**	**0.0131**	**0.2752**	**0.0714**	**0.0125**	**0.0839**		**534.4920**	**534.4920**	**0.0327**		**535.3099**

3.9 Mooring Dolphins Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7187	6.6921	4.2721	6.2300e-003		0.3850	0.3850		0.3631	0.3631		600.8132	600.8132	0.1405		604.3245
Total	**0.7187**	**6.6921**	**4.2721**	**6.2300e-003**		**0.3850**	**0.3850**		**0.3631**	**0.3631**		**600.8132**	**600.8132**	**0.1405**		**604.3245**

3.9 Mooring Dolphins Construction - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0755	2.0636	0.5695	4.3300e-003	0.1088	0.0153	0.1241	0.0313	0.0146	0.0459		460.2860	460.2860	0.0346		461.1519
Worker	0.0703	0.0508	0.5449	1.3800e-003	0.1341	1.0700e-003	0.1352	0.0356	9.9000e-004	0.0366		136.8815	136.8815	4.6700e-003		136.9983
Total	**0.1458**	**2.1144**	**1.1144**	**5.7100e-003**	**0.2429**	**0.0164**	**0.2593**	**0.0669**	**0.0156**	**0.0825**		**597.1675**	**597.1675**	**0.0393**		**598.1502**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7187	6.6921	4.2721	6.2300e-003		0.3850	0.3850		0.3631	0.3631	0.0000	600.8132	600.8132	0.1405		604.3245
Total	**0.7187**	**6.6921**	**4.2721**	**6.2300e-003**		**0.3850**	**0.3850**		**0.3631**	**0.3631**	**0.0000**	**600.8132**	**600.8132**	**0.1405**		**604.3245**

3.9 Mooring Dolphins Construction - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0755	2.0636	0.5695	4.3300e-003	0.1088	0.0153	0.1241	0.0313	0.0146	0.0459		460.2860	460.2860	0.0346		461.1519
Worker	0.0703	0.0508	0.5449	1.3800e-003	0.1341	1.0700e-003	0.1352	0.0356	9.9000e-004	0.0366		136.8815	136.8815	4.6700e-003		136.9983
Total	**0.1458**	**2.1144**	**1.1144**	**5.7100e-003**	**0.2429**	**0.0164**	**0.2593**	**0.0669**	**0.0156**	**0.0825**		**597.1675**	**597.1675**	**0.0393**		**598.1502**

3.10 Topside Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.5757	22.6594	18.5220	0.0282		1.2593	1.2593		1.2047	1.2047		2,728.5220	2,728.5220	0.5945		2,743.3833
Total	**2.5757**	**22.6594**	**18.5220**	**0.0282**		**1.2593**	**1.2593**		**1.2047**	**1.2047**		**2,728.5220**	**2,728.5220**	**0.5945**		**2,743.3833**

3.10 Topside Construction - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	8.2000e-004	0.0286	5.6600e-003	7.0000e-005	5.0200e-003	1.1000e-004	5.1300e-003	1.2800e-003	1.1000e-004	1.3800e-003		7.6992	7.6992	5.6000e-004		7.7133
Vendor	0.6573	17.9652	4.9582	0.0377	0.9473	0.1331	1.0803	0.2727	0.1273	0.4000		4,007.1953	4,007.1953	0.3015		4,014.7339
Worker	0.1172	0.0846	0.9082	2.2900e-003	0.2236	1.7800e-003	0.2253	0.0593	1.6400e-003	0.0609		228.1358	228.1358	7.7800e-003		228.3305
Total	**0.7753**	**18.0784**	**5.8720**	**0.0400**	**1.1758**	**0.1349**	**1.3108**	**0.3333**	**0.1290**	**0.4623**		**4,243.0304**	**4,243.0304**	**0.3099**		**4,250.7776**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.5757	22.6594	18.5220	0.0282		1.2593	1.2593		1.2047	1.2047	0.0000	2,728.5220	2,728.5220	0.5945		2,743.3833
Total	**2.5757**	**22.6594**	**18.5220**	**0.0282**		**1.2593**	**1.2593**		**1.2047**	**1.2047**	**0.0000**	**2,728.5220**	**2,728.5220**	**0.5945**		**2,743.3833**

3.10 Topside Construction - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	8.2000e-004	0.0286	5.6600e-003	7.0000e-005	5.0200e-003	1.1000e-004	5.1300e-003	1.2800e-003	1.1000e-004	1.3800e-003		7.6992	7.6992	5.6000e-004		7.7133
Vendor	0.6573	17.9652	4.9582	0.0377	0.9473	0.1331	1.0803	0.2727	0.1273	0.4000		4,007.1953	4,007.1953	0.3015		4,014.7339
Worker	0.1172	0.0846	0.9082	2.2900e-003	0.2236	1.7800e-003	0.2253	0.0593	1.6400e-003	0.0609		228.1358	228.1358	7.7800e-003		228.3305
Total	**0.7753**	**18.0784**	**5.8720**	**0.0400**	**1.1758**	**0.1349**	**1.3108**	**0.3333**	**0.1290**	**0.4623**		**4,243.0304**	**4,243.0304**	**0.3099**		**4,250.7776**

3.10 Topside Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3256	20.9168	18.0739	0.0282		1.1152	1.1152		1.0657	1.0657		2,704.2958	2,704.2958	0.5800		2,718.7949
Total	**2.3256**	**20.9168**	**18.0739**	**0.0282**		**1.1152**	**1.1152**		**1.0657**	**1.0657**		**2,704.2958**	**2,704.2958**	**0.5800**		**2,718.7949**

3.10 Topside Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	7.7000e-004	0.0270	5.5200e-003	7.0000e-005	2.0300e-003	1.0000e-004	2.1300e-003	5.4000e-004	1.0000e-004	6.4000e-004		7.6080	7.6080	5.5000e-004		7.6219
Vendor	0.5961	16.9467	4.5593	0.0373	0.9472	0.1139	1.0612	0.2727	0.1090	0.3817		3,971.0808	3,971.0808	0.2907		3,978.3474
Worker	0.1067	0.0747	0.8108	2.2200e-003	0.2236	1.7400e-003	0.2253	0.0593	1.6000e-003	0.0609		220.9312	220.9312	6.9000e-003		221.1037
Total	**0.7035**	**17.0483**	**5.3755**	**0.0396**	**1.1728**	**0.1158**	**1.2886**	**0.3325**	**0.1107**	**0.4432**		**4,199.6200**	**4,199.6200**	**0.2981**		**4,207.0730**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3256	20.9168	18.0739	0.0282		1.1152	1.1152		1.0657	1.0657	0.0000	2,704.2958	2,704.2958	0.5800		2,718.7949
Total	**2.3256**	**20.9168**	**18.0739**	**0.0282**		**1.1152**	**1.1152**		**1.0657**	**1.0657**	**0.0000**	**2,704.2958**	**2,704.2958**	**0.5800**		**2,718.7949**

3.10 Topside Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	7.7000e-004	0.0270	5.5200e-003	7.0000e-005	2.0300e-003	1.0000e-004	2.1300e-003	5.4000e-004	1.0000e-004	6.4000e-004		7.6080	7.6080	5.5000e-004		7.6219
Vendor	0.5961	16.9467	4.5593	0.0373	0.9472	0.1139	1.0612	0.2727	0.1090	0.3817		3,971.0808	3,971.0808	0.2907		3,978.3474
Worker	0.1067	0.0747	0.8108	2.2200e-003	0.2236	1.7400e-003	0.2253	0.0593	1.6000e-003	0.0609		220.9312	220.9312	6.9000e-003		221.1037
Total	**0.7035**	**17.0483**	**5.3755**	**0.0396**	**1.1728**	**0.1158**	**1.2886**	**0.3325**	**0.1107**	**0.4432**		**4,199.6200**	**4,199.6200**	**0.2981**		**4,207.0730**

3.11 Berth 239 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.8025	0.0000	0.8025	0.1215	0.0000	0.1215			0.0000			0.0000
Off-Road	2.1306	23.2172	17.2108	0.0499		0.9695	0.9695		0.9169	0.9169		4,905.8337	4,905.8337	1.3645		4,939.9465
Total	**2.1306**	**23.2172**	**17.2108**	**0.0499**	**0.8025**	**0.9695**	**1.7719**	**0.1215**	**0.9169**	**1.0384**		**4,905.8337**	**4,905.8337**	**1.3645**		**4,939.9465**

3.11 Berth 239 Demolition - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0397	1.3830	0.2826	3.6100e-003	0.0819	5.1600e-003	0.0871	0.0225	4.9400e-003	0.0274		389.7422	389.7422	0.0283		390.4498
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1067	0.0747	0.8108	2.2200e-003	0.2236	1.7400e-003	0.2253	0.0593	1.6000e-003	0.0609		220.9312	220.9312	6.9000e-003		221.1037
Total	**0.1463**	**1.4577**	**1.0934**	**5.8300e-003**	**0.3055**	**6.9000e-003**	**0.3124**	**0.0817**	**6.5400e-003**	**0.0883**		**610.6733**	**610.6733**	**0.0352**		**611.5535**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.8025	0.0000	0.8025	0.1215	0.0000	0.1215			0.0000			0.0000
Off-Road	2.1306	23.2172	17.2108	0.0499		0.9695	0.9695		0.9169	0.9169	0.0000	4,905.8337	4,905.8337	1.3645		4,939.9465
Total	**2.1306**	**23.2172**	**17.2108**	**0.0499**	**0.8025**	**0.9695**	**1.7719**	**0.1215**	**0.9169**	**1.0384**	**0.0000**	**4,905.8337**	**4,905.8337**	**1.3645**		**4,939.9465**

3.11 Berth 239 Demolition - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0397	1.3830	0.2826	3.6100e-003	0.0819	5.1600e-003	0.0871	0.0225	4.9400e-003	0.0274		389.7422	389.7422	0.0283		390.4498
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1067	0.0747	0.8108	2.2200e-003	0.2236	1.7400e-003	0.2253	0.0593	1.6000e-003	0.0609		220.9312	220.9312	6.9000e-003		221.1037
Total	**0.1463**	**1.4577**	**1.0934**	**5.8300e-003**	**0.3055**	**6.9000e-003**	**0.3124**	**0.0817**	**6.5400e-003**	**0.0883**		**610.6733**	**610.6733**	**0.0352**		**611.5535**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	2.9429	16.7369	42.7535	0.1526	12.7115	0.1575	12.8689	3.4013	0.1479	3.5492		15,510.7471	15,510.7471	0.7796		15,530.2373
Unmitigated	2.9429	16.7369	42.7535	0.1526	12.7115	0.1575	12.8689	3.4013	0.1479	3.5492		15,510.7471	15,510.7471	0.7796		15,530.2373

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Heavy Industry	1,350.00	1,350.00	1350.00	5,978,175	5,978,175
Total	1,350.00	1,350.00	1,350.00	5,978,175	5,978,175

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Heavy Industry	16.60	8.40	6.90	59.00	28.00	13.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Heavy Industry	0.547828	0.043645	0.199892	0.122290	0.016774	0.005862	0.020637	0.032653	0.002037	0.001944	0.004777	0.000705	0.000956

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.4813	4.3755	3.6754	0.0263		0.3325	0.3325		0.3325	0.3325		5,250.6044	5,250.6044	0.1006	0.0963	5,281.8061
NaturalGas Unmitigated	0.4813	4.3755	3.6754	0.0263		0.3325	0.3325		0.3325	0.3325		5,250.6044	5,250.6044	0.1006	0.0963	5,281.8061

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Heavy Industry	44630.1	0.4813	4.3755	3.6754	0.0263		0.3325	0.3325		0.3325	0.3325		5,250.6044	5,250.6044	0.1006	0.0963	5,281.8061
Total		**0.4813**	**4.3755**	**3.6754**	**0.0263**		**0.3325**	**0.3325**		**0.3325**	**0.3325**		**5,250.6044**	**5,250.6044**	**0.1006**	**0.0963**	**5,281.8061**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Heavy Industry	44.6301	0.4813	4.3755	3.6754	0.0263		0.3325	0.3325		0.3325	0.3325		5,250.6044	5,250.6044	0.1006	0.0963	5,281.8061
Total		**0.4813**	**4.3755**	**3.6754**	**0.0263**		**0.3325**	**0.3325**		**0.3325**	**0.3325**		**5,250.6044**	**5,250.6044**	**0.1006**	**0.0963**	**5,281.8061**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	20.1145	8.5000e-004	0.0925	1.0000e-005		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004		0.1970	0.1970	5.3000e-004		0.2102
Unmitigated	20.1145	8.5000e-004	0.0925	1.0000e-005		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004		0.1970	0.1970	5.3000e-004		0.2102

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	2.2858					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	17.8200					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	8.7000e-003	8.5000e-004	0.0925	1.0000e-005		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004		0.1970	0.1970	5.3000e-004		0.2102
Total	**20.1145**	**8.5000e-004**	**0.0925**	**1.0000e-005**		**3.3000e-004**	**3.3000e-004**		**3.3000e-004**	**3.3000e-004**		**0.1970**	**0.1970**	**5.3000e-004**		**0.2102**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	2.2858					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	17.8200					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	8.7000e-003	8.5000e-004	0.0925	1.0000e-005		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004		0.1970	0.1970	5.3000e-004		0.2102
Total	**20.1145**	**8.5000e-004**	**0.0925**	**1.0000e-005**		**3.3000e-004**	**3.3000e-004**		**3.3000e-004**	**3.3000e-004**		**0.1970**	**0.1970**	**5.3000e-004**		**0.2102**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

APPENDIX C
Historic Resources Evaluation

DUDEK
38 NORTH MARENGO
PASADENA, CALIFORNIA 91101
T: 626.204.9800

June 27, 2017 10016.0003

Erin Sheehy
Environmental Management Division
Port of Los Angeles
425 S. Palos Verdes Street
San Pedro, California 90731

Subject: Cultural Resources Updated Assessment for Berths 238-239 [PBF Energy] Marine Oil Terminal Wharf Improvements Project and Lease Renewal.

Dear Ms. Sheehy:

Dudek was retained by the Los Angeles Harbor Department (LAHD) to provide an updated cultural resources assessment for Berths 238-239 at the Port of Los Angeles (POLA), as part of the proposed Environmental Impact Report (EIR) for the Berths 238-239 [PBF Energy] Marine Oil Terminal Wharf Improvements Project and Lease Renewal. This assessment updates the previous evaluation of Berths 238-239 completed by ESA in 2010.

This study was completed under the provisions of the California Environmental Quality Act (CEQA). Public Resources Code (PRC) Section 5024.1, Title 14 California Code of Regulations (CCR) Section 15064.5 of the CEQA Guidelines, and in consideration of LAHD's Built Environment Historic, Architectural, and Cultural Resource Policy.

This report was prepared by Dudek Senior Architectural Historian and Archaeologist Samantha Murray, MA, RPA, who meets the Secretary of the Interior's Professional Qualification Standards for both architectural history and archaeology (36 CFR 61).

INTRODUCTION

Project Location

The overall Project site is located within the Port of Los Angeles Community Plan area in the City of Los Angeles, within Planning Area 3, which is adjacent to the City of Los Angeles communities of San Pedro and Wilmington (Figures 1 and 2, Attachment A). The Project site occupies various areas (pipelines) commencing at the northerly limits of LAHD's jurisdiction and along the western side of Terminal Island along the east side of the Main Channel at Berth 238-239. The Project site is generally bounded by the Main Channel and the Ports O' Call Village to the south and west; the former Southwest Marine Shipyard to the southeast; and the

Evergreen Container Terminal (Berth 236) to the north; and from the northerly limits of LAHD's jurisdiction between Figueroa Street and Marine Avenue south across the east basin channel into Terminal Island.

Land access to and from the Project site is provided by a network of freeways and arterial routes. The freeway network consists of the Harbor Freeway (Interstate-110), the Long Beach Freeway (Interstate-710), the San Diego Freeway (Interstate-405), and the Terminal Island Freeway (State Route103/State Route 47). Local access is provided by Ferry Street and South Seaside Avenue. Access on the Project site is via Wharf Street.

Project Description

Project Objectives

The proposed Project would address the Project objectives, as summarized below.

- PBF Energy proposes to renew its lease for a 30-year term for sites Southwestern Terminal (SWT)-I and SWT-II and its related pipelines (Figure 3, Attachment A).
- Comply with Marine Oil Terminal Engineering & Maintenance Standards (MOTEMS) requirements, which would ensure better resistance to earthquakes, protect the public and the environment, and reduce the potential for an oil spill, and consequently maintain the operation and viability of the marine oil terminal facility (primary objective).
- Optimize the use of existing land at the terminal and associated waterways in a manner that is consistent with the LAHD's public trust obligations by maintaining the existing facility's throughput capabilities and operational parameters through a new, long-term lease.
- Ensure continued reliability and availability of fuel supplies to help meet Southern California's energy needs given evolving market conditions and business cycle variability.

Together, these objectives define the project need, and are consistent with those set forth by LAHD for marine oil terminal operations.

Project Components

The proposed Improvement Project involves the construction and operation of a new, MOTEMS-compliant wharf structure (herein referred to as an unloading platform) at Berth 238

(Figure 4, Attachment A). Construction would consist of demolishing the existing Berth 238 platform, breasting dolphins (BD)1 and BD2, and landside mooring anchors and constructing a new concrete unloading platform, access ramp, berthing structures, landside mooring anchors, and associated catwalks. The new unloading platform at Berth 238 would be capable of handling Panamax class vessels along with various barges at its existing fender line elevation. The proposed facility would have an approximate 1,000-ft long berth area including a MOTEMS compliant unloading platform (approximate dimensions 130 feet long by 60 feet wide) to accommodate the proposed vessel classes.

The proposed Improvement Project consists of the following components to meet MOTEMS requirements:

- Demolition of the concrete wharf at Berth 238 including the concrete wharf structure, access trestle and removal of concrete piles at Berth 238. Piles that cannot be extracted would be cut at the mudline.
- Demolition of breasting dolphin BD1 and BD2 and their associated catwalks.
- Construction of a new deck including steel-reinforced concrete loading platform, access trestles, catwalks, and topside equipment required for loading and unloading operations at and adjacent to the new loading platform.
- Installation of a new fendering system, BDs and landside mooring anchors.
- Possible clean-up dredging to restore the existing berth of 35-foot depth.
- Demolition of the concrete wharf at Berth 239 after successful completion and commissioning of new Berth 238

BACKGROUND RESEARCH

As part of the cultural resources update prepared for the proposed project, Dudek conducted a California Historical Resources Information System records search at the South Central Coastal Information Center (SCCIC) on December 8, 2016, for the proposed project site and surrounding area. This search included its collection of mapped prehistoric, historic, and built-environment resources; Department of Parks and Recreation (DPR) Site Records; technical reports; and ethnographic references. Additional consulted sources included historical maps of the project area; the NRHP and CRHR; the California Historic Property Data File; and the lists of California State Historical Landmarks, California Points of Historical Interest, and Archaeological Determinations of Eligibility.

Previously Conducted Cultural Resources Studies

A review of records on file at the SCCIC indicate that one previously conducted study overlaps the current project area:

- LA-07842. *Phase I Archaeological Investigation of Limited Areas within the Torrance Refinery and Atwood, Southwestern Marine and Vernon Terminals, Los Angeles and Orange Counties, California* (Maki 2000). This study found that areas within and around the current project area are not considered sensitive for archaeological resources because it is built atop fill material.

LAHD also informed Dudek of another previous study that overlaps the project area, but was not identified via the SCCIC records search. The study, identified below and provided by LAHD, is being updated by this study:

- *Port of Los Angeles Berths 118-120, 148-149, 187-191, and 238-239 Historic Resources Evaluation Report* (ESA 2010).

Previously Recorded Cultural Resources

Records provided from SCCIC and LAHD indicate that there are three previously recorded resources that overlap the current project area. These resources consist of various buildings, structures, and objects constructed in and around Terminal Island dating from the early 1900s to the mid-20th century, including:

- P-19-167314: the location of a Japanese fishing community from the early 1900s (recorded by Fujita, K.M. 1979; eligibility status unknown). This resource will not be impacted by the proposed project;

- P-19-173042: the steam propulsion system of the Sierra Nevada ferryboat (recorded by Schwartz, S.J. n.d.; determined eligible for the NRHP). This resource will not be impacted by the proposed project;

- Berths 238-239: constructed for General Petroleum Corporation in 1925 (recorded by ESA 2010; recommended not eligible for NRHP and CRHR). This resource will be impacted by the proposed project and is being evaluated as part of the current update.

HISTORY OF BERTHS 238-239

The ESA 2010 Historic Resources Evaluation Report includes a complete historic context for LAHD, which includes a discussion of commercial shipping, containerization, oil production and shipping, and use of timber wharves at LAHD. Below is an excerpt from that context regarding the history of Berths 238 and 239:

> Berths 238 and 239 were constructed in 1925 for the General Petroleum Corporation (Board of Harbor Commissioners, 1925). The General Petroleum Company was founded by Captain John Barneson, a former whaler and shipping captain. He was responsible for the first oil pipeline constructed between Coalinga and Monterey in California. The pipeline was later expanded south over the Tejon Pass. In 1913, General Petroleum completed the first pipeline from the San Joaquin Valley to the Los Angeles Harbor. At that time, the company's port was in the Outer Harbor (Board of Harbor Commissioners, 1932). Captain Barneson was a pioneer in the use of oil as fuel for ocean-going vessels and eventually became the president and then chairman of the board of General Petroleum Corporation (LAT, November 1, 1926; February 26, 1941).
>
> In 1925, General Petroleum's harbor facility included three pipelines: one 8-inch for crude oil, one 8-inch for fuel oil, and one 6-inch for gasoline. The facility held 14 tanks with a total storage capacity of 975,000 barrels. Three ships could be loaded simultaneously (Board of Harbor Commissioners, 1925). On Christmas Day of that year, the corporation set an oil-loading record by simultaneously loading four tankers with a total capacity of 271,114 (LAT, December 26, 1925).
>
> By 1928, the facilities included 16 storage tanks with a total capacity of 1,050,000 barrels (Board of Harbor Commissioners, 1928). In 1929, an additional 6-inch gasoline pipeline was added, increasing total pumping capacity to 12,000 barrels per hour (Board of Harbor Commissioners, 1929).
>
> In 1930 and 1931, General Petroleum Corporation expanded its harbor facilities. The corporation constructed four new steel oil tanks and firewalls just north of Berth 238, at a total cost of $68,743. The four new steel tanks included two 40,000 barrel tanks and two 20,000 barrel tanks for refined oil storage (Drake, June 26, 1930). Other additions included mooring blocks at Berths 239-240 at a cost of $6,000 and a waste-water separator at Berth 238, which cost $19,410 (Cave, October 8, 1931; December 24, 1931). By the end of the fiscal year in 1931, General Petroleum had five pipelines (three 6-inch and two 8-inch) leading from its refineries to the loading stations at the harbor (Berths 238, 239, 240a, and 240b); seven pipelines for loading vessels at the dock (one 18-inch, four 12-inch, one 8-inch, and one 6-inch); and a total storage capacity of 1,263,000 barrels (Board of Harbor Commissioners, 1931).

> In 1945, General Petroleum erected a rack and catwalk for tank-car unloading at Berth 238 for $6500 (LAT, May 6, 1945). The total number of pipelines and storage capacity remained the same from 1931 to 1951 (Board of Harbor Commissioners, 1951). By 1952, over 30 millions barrels of oil were shipped from the General Petroleum terminal (Board of Harbor Commissioners, 1952).
>
> General Petroleum eventually became part of Mobil Oil, which was formed in 1960, and merged with Exxon in 1999 to become ExxonMobil. ExxonMobil currently operates the facilities at Berths 238-239.

On July 1, 2016, PBF Energy acquired Exxon-Mobil's California assets including the refinery in Torrance and the project site and related infrastructure, including pipelines, which provide access to sources of crude oil.

CULTURAL RESOURCES SURVEY

On June 5, 2017, Dudek Senior Architectural Historian and Archaeologist Samantha Murray, MA, RPA, conducted a pedestrian survey of the project area for both archaeological and built environment resources. Ms. Murray was accompanied by Erin Sheehy and Nicole Enciso from LAHD, and all parties were escorted by Michael Chumley, Southwest Terminal Supervisor.

The archaeological survey included a reconnaissance-level survey of the entire project site. The project area is fully developed with facilities and infrastructure related to the functions of the current tenant (PBF Energy) and exhibits 0% ground surface visibility. This portion of Terminal Island was not developed until the 1920s and is built entirely atop historic fill material. No archaeological resources were identified during the survey.

The built-environment survey entailed walking all portions of the project site and documenting each building and all visible portions of the wharfs with notes and photographs. Each element was assessed for significant changes in condition since the 2010 evaluation. Mr. Chumley confirmed that there have been no major changes (i.e., infrastructure removal/demolition or modifications) to the site since the 2010 evaluation. As a result of the built environment survey, Ms. Murray concluded that there have been no significant or noteworthy changes to Berths 238 and 239 since the 2010 ESA evaluation.

Dudek documented the fieldwork using field notes, digital photography, close-scale field maps, and aerial photographs. Photographs of the project site were taken with a Canon Power Shot SD90 digital camera with 12 megapixels and 3x optical zoom. All field notes, photographs, and records related to the current study are on file at Dudek's Pasadena, California, office.

Description of Surveyed Resources

The following description of Berths 238-239 is extracted from the ESA 2010 report. Dudek reviewed this description and concurs with the information provided. Further, Dudek did not identify any changes in the resources' condition. This was confirmed by the Southwest Terminal Supervisor, who stated that he was not aware of any major changes to the site since the 2010 evaluation.

> Located to the east of Wharf Street, Berths 238-239 are two separate concrete wharves each approximately 225 feet long by 30 feet wide. Plans for these wharves, designed by the engineering department of the General Petroleum Corporation, are dated March 12, 1925. The wharves are supported by asphalt impregnated and reinforced concrete pilings that are square in plan, although many of the pilings on Berth 239 in particular have been encased in concrete to provide additional strength, giving them a wider circular plan. Each wharf can be approached by two concrete ramps constructed in the same manner at the wharves. The decking on both wharves and the ramps is concrete with exposed aggregate, with evidence of more recent concrete patches. Recently constructed concrete bullrails are located along the waterside of the wharves, and painted iron cleats are interspersed along the bullrails at regular intervals. The fendering system along the length of both wharves consists of newer wood piles and rubber blocks. A steel hose tower is located near the southern end of Berth 239 which supports numerous steel pipes and rubber hoses. The tower assembly and piping system appears to have been constructed in the 1960s. Both berths contain one corrugated steel dock house each with a shed roof, aluminum sliding windows, and a steel door. The dock houses also appear to have been added in the 1960s. The seawall opposite Berth 239 is constructed of horizontal board-formed concrete, and appears to be in original condition, while the seawall opposite Berth 238 has generally the same dimensions but has been covered in newer concrete. Evidence of the location of former oil pipelines leading from the land to the water is apparent in the Berth 239 seawall, but these openings have been sealed off with brick and concrete. One square, concrete breasting dolphins was added to the northern end of Berth 238, while a similar dolphin was added to the southern end of Berth 239, which essentially lengthened each berth by about 75 feet. Both dolphins are accessed from the berths by wood frame walkways. Engineering plans from the Port of LA Engineering Division date the construction of the dolphins to 1963.
>
> Two timber pile wharves, Berths 240A and 240B, are located immediately west of and parallel to Wharf Street. These timber wharves are each about 230 feet by 40 feet wide, and are accessed by two ramps each. Constructed on top of Berth 240A is a large, wood framed warehouse about 160 feet long by 60 feet wide with a gable roof and wood siding.

Aerial photos of this facility in 1925 show one long timber wharf with a large, gable-roofed transit shed, which by 1957, had been replaced by two smaller timber wharfs (Berths 240A and B) and a transit shed atop Berth 240B.

The tank farm is encircled by a spill containment wall about 25 feet high. The wall is constructed of horizontal board formed concrete which is angled inward slightly. The walls divide the tank farm into approximately seven sections. The tank farm consists of 19 tanks clustered to the northeast of Berth 238. Tanks are mostly riveted and welded steel construction, most of which are about 40 feet high and about 120 feet in diameter. Most of the tanks date to the mid-1920s and early 1930s, except for one which was added in the 1990s, according to the facility operator. Many of them appear altered with newer aluminum insulation siding and new roofs covered by geodomes which were added in the 1980s and 1990s to reduce emissions. A pipe valve field is located to the south and east of the tank farm, consisting of numerous painted steel valve wheels. Located to the southeast of the tank farm is a single-story control house with a rectangular plan, flat roof, and painted concrete block walls with a roman brick base. The building is about 35 feet by 45 feet in dimension. The north-facing elevation of this building has a series of large observatory windows consisting of fixed panes set in aluminum frames. Doors are steel. The control house appears to have been constructed in the early 1960s.

According to plans dated to 2007 from the Port of LA Engineering Division, numerous repairs occurred to Berth 238, including piling replacement, repair of the seawall, abandonment of the northern dolphin, fender system rehabilitation, sealing of topside deck surfaces, and installation of containment berms. Plans also indicate that repairs to the fendering system to Berth 239 was also completed at this same time.

FINDINGS AND RECOMMENDATIONS

Archaeological Resources

No archaeological resources were identified within the project area as a result of the records search or survey. The entire project area is developed atop historic fill materials and has a very low potential for encountering archaeological resources at subsurface levels. Regardless, standard protection measures for unanticipated discoveries of archaeological resources and human remains have been provided below.

Unanticipated Discovery of Archaeological Resources

In the event that archaeological resources (sites, features, or artifacts) are exposed during construction activities for the proposed project, all construction work occurring within 100 feet of the find should immediately stop until a qualified archaeologist, meeting the Secretary of the Interior's Professional Qualification Standards, can evaluate the significance of the find and determine whether or not additional study is warranted. Depending on the significance of the find under CEQA (14 CCR 15064.5(f); PRC Section 21082), the archaeologist may simply record the find and allow work to continue. If the discovery proves significant under CEQA, additional work, such as preparation of an archaeological treatment plan, testing, or data recovery, may be warranted.

Unanticipated Discovery of Human Remains

In accordance with Section 7050.5 of the California Health and Safety Code, if human remains are found, the County Coroner shall be immediately notified of the discovery. No further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains shall occur until the County Coroner has determined, within 2 working days of notification of the discovery, the appropriate treatment and disposition of the human remains. If the County Coroner determines that the remains are, or are believed to be, Native American, he or she shall notify the NAHC in Sacramento within 24 hours. In accordance with California Public Resources Code, Section 5097.98, the NAHC must immediately notify those persons it believes to be the most likely descendant from the deceased Native American. The most likely descendant shall complete his or her inspection within 48 hours of being granted access to the site. The designated Native American representative would then determine, in consultation with the property owner, the disposition of the human remains.

Built Environment Resources

A qualified architectural historian reviewed the previous evaluation of Berths 238-239 prepared by ESA in 2010 (Attachment B). After conducting a site visit, talking with the Southwest Terminal Supervisor, reviewing updated records search results, and examining aerial photographs to assess changes to the site, Dudek confirmed that there have been no significant changes to the site since 2010, and that the original site description and evaluation are still relevant/accurate. Dudek finds that Berths 238-239 (including the wharves) are not eligible for NRHP, CRHR, or local designation, as either individual resources or as contributors to an historic district (Attachment C).

In summary, this evaluation update finds that Berths 238-239 are not eligible under all NRHP, CRHR, and City of Los Angeles designation criteria. Therefore, they are not considered historical resources under CEQA and impacts resulting from the proposed project will be considered less-than-significant. No additional study or mitigation is recommended for built environment resources within the proposed project area.

If you have any questions about this report please contact me directly at smurray@dudek.com or (626) 204-9826.

Sincerely,

Samantha Murray, MA, RPA
Senior Architectural Historian and Archaeologist

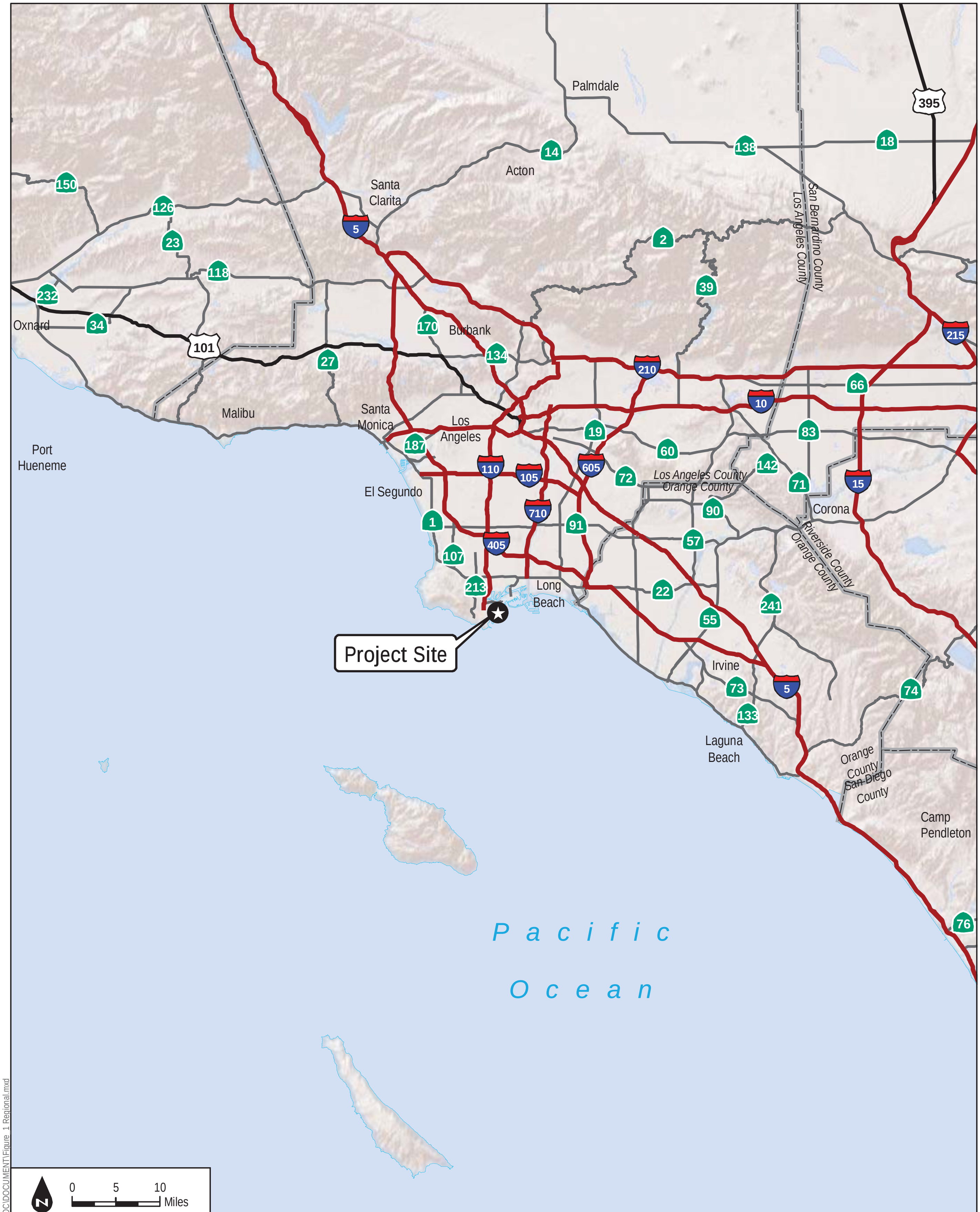
Attachment A: Maps and Figures
Attachment B: ESA 2010 Evaluation of Berths 238-239
Attachment C: Updated DPR form for Berths 238-239

cc: Matthew Valerio, Dudek

REFERENCES

ESA.2010. *Port of Los Angeles Berths 118-120, 148-149, 187-191, and 238-239 Historic Resources Evaluation Report*. Prepared for POLA by ESA.

ATTACHMENT A
MAPS AND FIGURES



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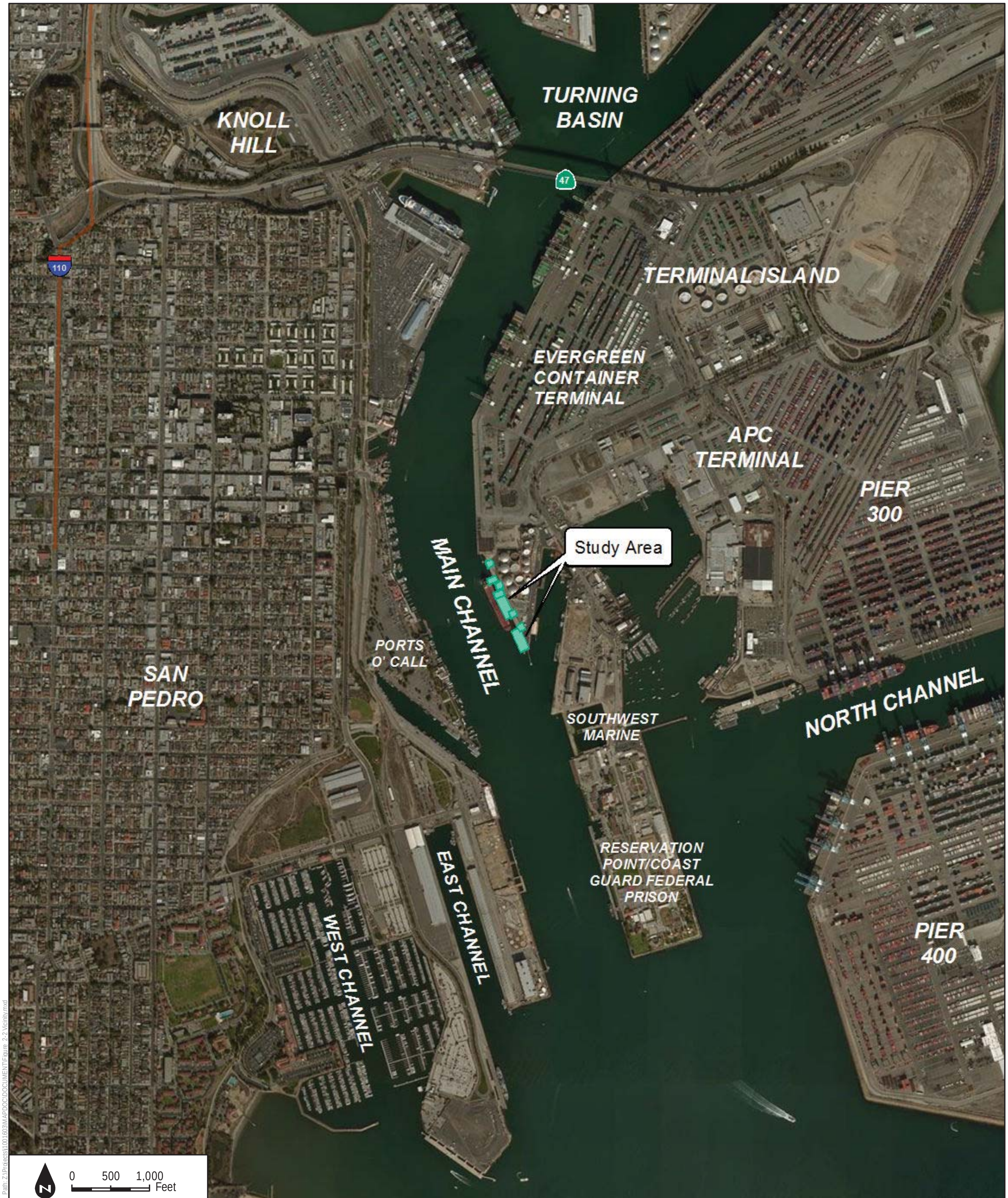
DUDEK

SOURCE: ESRI 2016

FIGURE 1
Regional Map

POLA MOTEMS



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SOURCE: USGS 7.5-Minute Series San Pedro Quadrangle

FIGURE 2
Vicinity Map

POLA MOTEMS

SOURCE: Bing Maps, 2017

FIGURE 3
Existing Conditions

DUDEK

POLA MOTEMS

DUDEK

SOURCE: Bing Maps, 2017

FIGURE 4

Existing Conditions

POLA MOTEMS

ATTACHMENT B
ESA 2010 EVALUATION OF BERTHS 238-239

Final

PORT OF LOS ANGELES BERTHS 118-120, 148-149, 187-191, AND 238-239

Historic Resources Evaluation Report

ADP# 090821-774
Agreement # 2528
PD# 7

Prepared for
Port of Los Angeles

May 2010

BERTHS 187 TO 194 — INNER HARBOR
PORT OF LOS ANGELES

Source: Port of Los Angeles, 1941

ESA

Final

PORT OF LOS ANGELES BERTHS 118-120, 148-149, 187-191, AND 238-239

Historic Resources Evaluation Report

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Prepared for
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May 2010

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HISTORIC RESOURCES EVALUATION

Port of Los Angeles Berths 118-120, 148-149, 187-191, and 238-239

1. Introduction

The Los Angeles Harbor Department (LAHD) has contracted with ESA to perform a historic resources survey and evaluation of wharves at Berths 118-120, 148-149, 187-191, and 238-239 (see Figure 1, Location Map). The LAHD is planning the Marine Oil Terminal Engineering Maintenance Standards (MOTEMS) project that would make a number of alterations to these wharves, including new fendering and dolphin systems to accommodate greater shipping loads.

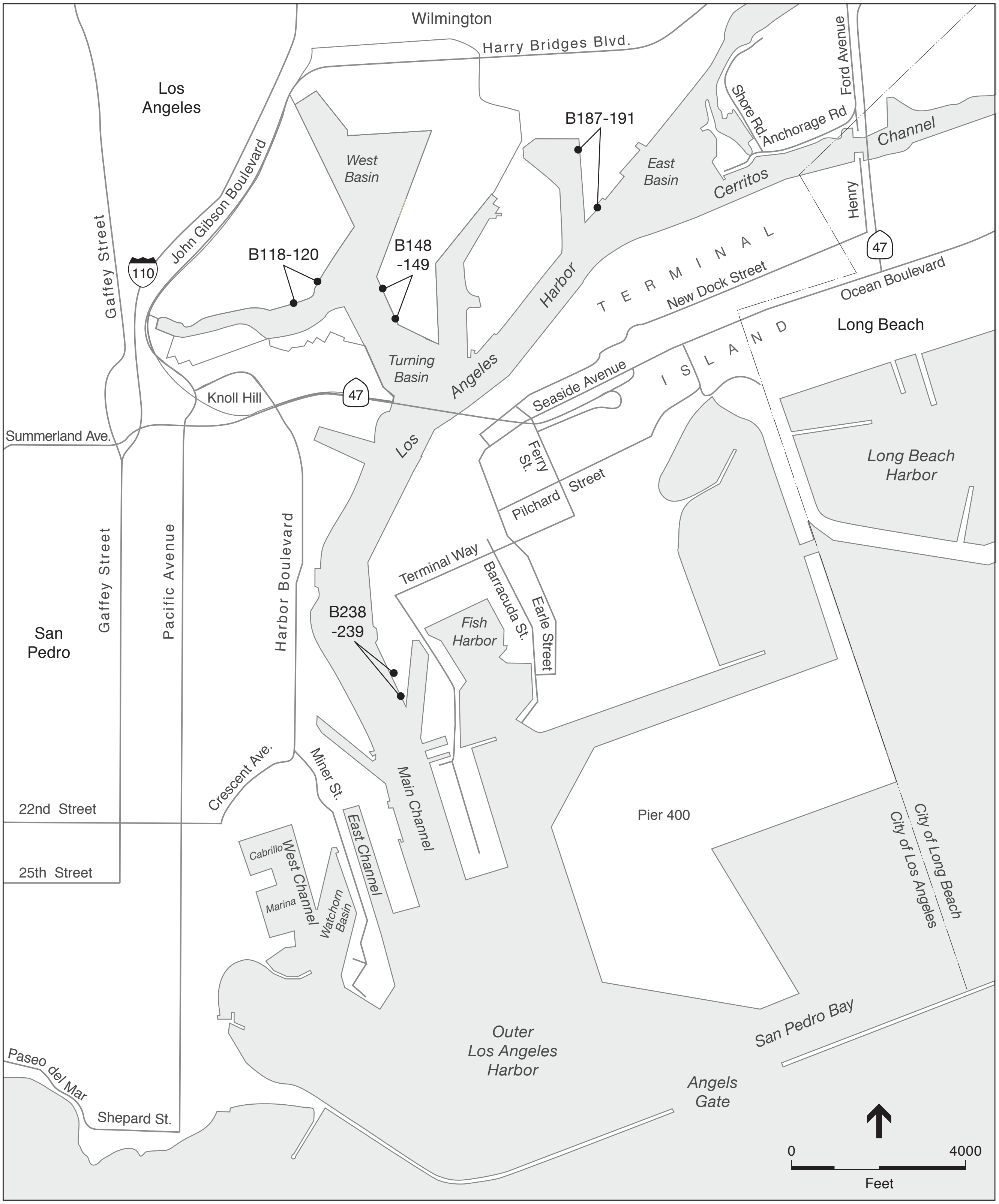
Previous studies of the site concluded that the timber wharves at the Port of Los Angeles (Port) may be eligible for listing in the National Register of Historic Places (NRHP) as part of a noncontiguous district composed of timber wharves located throughout the Port. The LAHD requested that ESA provide a conclusive evaluation of the eligibility of properties at Berths 118-120, 148-149, 187-191, and 238-239.

This report documents ESA's methods and findings of an intensive architectural survey and evaluation of Berths 118-120, 148-149, 187-191, and 238-239. Efforts included performing a review of previous studies; conducting additional archival research; surveying each of the buildings and structures at Berths 118-120, 148-149, 187-191, and 238-239; and applying the eligibility criteria for listing in the NRHP. All survey and evaluation work was conducted by ESA's senior preservation specialist, Brad Brewster, who meets the Secretary of Interior's professional qualification standards for both architectural history and preservation planning. Mr. Brewster supervised additional research conducted by Candace Ehringer, Registered Professional Archaeologist, who have more than 25 years of combined experience working on cultural resources studies.

1.1 Methods

Previous Study Findings

ESA reviewed previous inventories and evaluations of the various timber wharves at the Port of Los Angeles, including those by San Buenaventura Research Associates in 1996, and by Jones & Stokes in the early 2000s.



SOURCE: POLA; ESA, 2009

Figure 1
Location Map

Between 1992 and 1996, San Buenaventura Research Associates inventoried the timber wharves at the Port of Los Angeles and Berths 108-109, 115, and 120 as part of a larger, Portwide reconnaissance survey to identify areas with a potential for historical significance. San Buenaventura concluded that the timber wharves at the Port of Los Angeles formed a noncontiguous wharf district under Criterion A (events) because they "are a direct reflection of historic shipping technologies and represent an essential functional link in the maritime shipping process." As such, the wharves "are one of the most significant extant physical manifestations of the precontainerization era of Harbor development" (San Buenaventura Research Associates, 1997). Regarding the wharf at Berth 120 in particular, San Buenaventura recommended that it be "regarded as potentially eligible for the NRHP as a contributor to the wharf district pending further research on the historically related buildings and land uses" (San Buenaventura Research Associates, 1997).

In 2000, Jones & Stokes inventoried and evaluated the timber wharves at Berths 118-120, as part of an intensive-level survey to confirm the findings of the previous study by San Buenaventura Research Associates. Jones & Stokes found that none of the buildings or structures at Berths 118-120 appear to meet the criteria for listing in the NRHP because their integrity of setting has been compromised due to the many of the buildings that were constructed in the mid-1950s at the terminal, and were less than 50 years old at the time the report was prepared in 2000.

In 2001, Jones & Stokes inventoried and evaluated Berths 148- 151 and in anticipation of proposed project at that time which involved removal of the tank farm and associated buildings and structures. Jones & Stokes concluded that Berths 148-149 do not appear eligible for listing in the NRHP because they were constructed in 1955, after the period of significance, and did not meet the 50-year age threshold at the time the report was prepared in 2001 (Jones & Stokes, 2001).

1.2 Archival Research

Archival research for the current evaluation of Berths 118-120, 148-149, 187-191, and 238-239 was conducted at the Port of Los Angeles, the Los Angeles Public Library, and the South Central Coastal Information Center (SCCIC) at California State University at Fullerton.

1.3 Fieldwork

On December 9-10, 2009, Mr. Brewster conducted an intensive survey of the facilities at Berths 118-120, 148-149, 187-191, and 238-239. As part of this survey, Mr. Brewster took photographs and prepared descriptions of the wharves and structures at the berths. These descriptions are provided in Section 4, below, as well as in California Department of Parks and Recreation (DPR) forms 523A and B, located in Appendix A. With over 15 years of experience surveying and evaluating historic resources throughout the West Coast, Mr. Brewster meets the Secretary of the Interior's qualifications for architectural history.

1.4 Area of Potential Effects (APE)

The Area of Potential Effects (APE) was delineated for each of the facilities at Berths 118-120, 148-149, 187-191, and 238-239. The APE maps for each facility are show in Figures 2 through 5, below. Five separate APEs were identified for each of the five oil terminals that would be potentially affected by the proposed project. The APE includes the geographic areas within which the undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist, including all ground-disturbing activities, staging areas, and construction zones. As such, the APEs included not only the wharfs, but also the tank farms and all other facilities associated with each separate oil terminal, including a small buffer area surrounding each of the facilities.

1.5 Consultation Efforts

Letters requesting cultural and historical information about the project areas were sent to nine local Native American groups and seven local governmental groups, historical societies, and/or historic preservation advocacy groups on January 13, 2010 (see Appendix C – Consultation Letters). The only response received to date was a phone call from Robert Dorame, Tribal Chairman of the Gabrielino Tongva Indians of California, who said he might have information about concerning the MOTEMS work. Mr. Dorame said will he be sending comments to the port on or about February 8. As of March 22, 2010, no responses were received.

APE

SOURCE: POLA; ESA, 2009

Figure 4
Port of Los Angeles Berths 187-191

APE

SOURCE: POLA; ESA, 2009

Historic Resources Evaluation Report for Port of Los Angeles Berths 118-120, 148-149, 187-191, and 238-239 . 206278.06

Figure 3
Port of Los Angeles Berths 148-149

APE

SOURCE: POLA; ESA, 2009

Historic Resources Evaluation Report for Port of Los Angeles
Berths 118-120, 148-149, 187-191, and 238-239 . 206278.06

Figure 2
Port of Los Angeles Berths 118-120

APE

SOURCE: POLA; ESA, 2009

Figure 5
Port of Los Angeles Berths 238-239

2. Historic Setting

The following historical setting has been adapted from the intensive-level surveys of the Port of Los Angeles prepared by Jones & Stokes in the early 2000's, as well the reconnaissance-level surveys by San Buenaventura Research Associates from 1992 to 1996. Additional historical information by ESA has been inserted into the historic setting where appropriate.

2.1 Early History

The Port of Los Angeles is located approximately 20 miles from downtown Los Angeles, at the southernmost point in Los Angeles County. Due to its location on the Pacific Ocean, the surrounding area historically served as a port facility to varying degrees. Commonly referred to as San Pedro, the port is located within the boundaries of three historic ranchos: Rancho San Pedro, Rancho Los Palos Verdes, and Rancho Los Cerrios. These ranchos, conferred by Governor Pedro Fages to three veterans of the 1769 Portola expedition, possessed combined acreage equaling almost 84,000 acres (Beck and Haase 1974). Owners of the rancho lands earned a living through the raising of cattle and participation in the hide and tallow trade, and by 1830, San Pedro was considered a leading hide center on the west coast (Rawls and Bean 1993; Queenan 1986).

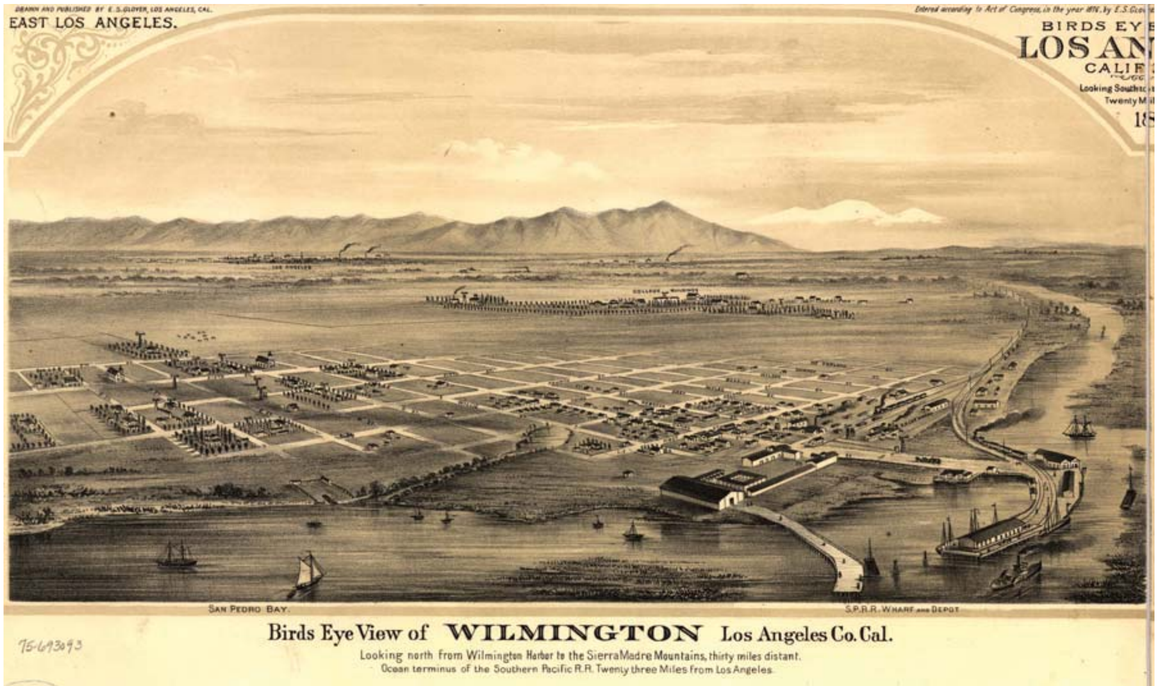
Following the annexation of California by the United States and the subsequent Gold Rush, an influx of new settlers descended upon the San Pedro area. While some residents realized the area's potential as a port area, the region was underused as a port during this period. Cattle and sheep ranching continued to dominate the economy, with one of the largest sheep operations in California, Flint, Bixby & Company, establishing the largest portion of its operation in San Pedro (Queenan 1986; Beck and Hasse 1974).

2.2 Commercial Shipping, 1857–1897

Arriving from Delaware in 1851, Phineas Banning, realized the potential of the area as a commercial shipping port, and in 1857, constructed docks in what would become Wilmington to take advantage of the increasing trade coming in and out of Los Angeles. Two primary routes to the southwest gold fields, the Gila River Trail and the Old Spanish Trail, ended in Los Angeles. Banning shuttled materials on smaller boats from his base in Wilmington to and from a second location on the Rancho San Pedro waterfront.

Banning also realized the importance of rail transportation between his operation on the bay and the growing city of Los Angeles. In 1869, Banning and his investors organized the Los Angeles & San Pedro Railroad (LA&SP), marking the beginning of a period of fierce rail competition in the San Pedro and Los Angeles area. Banning's LA&SP was the first route to establish a reliable means of moving cargo from the ships coming into San Pedro Harbor to the City of Los Angeles.

Although the LA&SP was the first short line in southern California, by 1872 it had been purchased by the Southern Pacific Railroad (SPRR). In an attempt to break the stranglehold that the SPRR had on shipping in the area, Senator John P. Jones from Nevada established the Los Angeles and



Library of Congress Map of Wilmington, Los Angeles County, CA (1877)

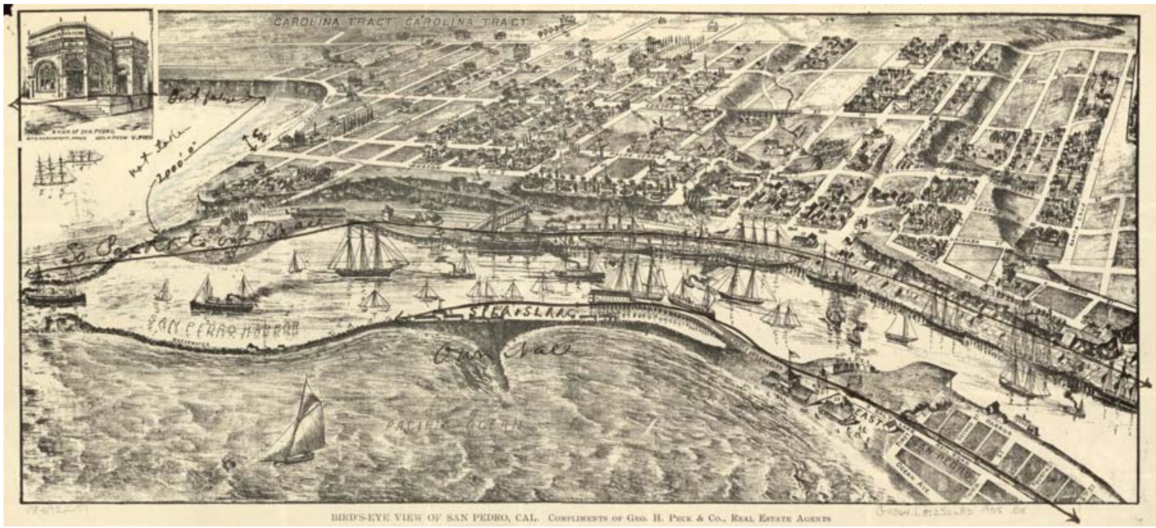
Independence Railroad (LA&I) a year before the SPRR's acquisition of the LA&SP. However, like the LA&SP, the LA&I soon was part of the SPRR system (Queenan, 1986).

Due in part to the improved transportation to and from the harbor, Los Angeles experienced rapid growth during the late nineteenth century. From a population in 1880 of 11,000, the city grew to 50,000 by 1890 and to 102,000 by the turn of the century (Matson, 1920). The increased population brought with it the need for more construction and living supplies, much of which came from ships destined for San Pedro shores.

2.3 San Pedro Bay and the Founding of Port of Los Angeles, 1897–1913

Growing commerce in Los Angeles eventually required the formal establishment of a shipping port. The federal government agreed to assist the City of Los Angeles by establishing its official harbor in San Pedro after several studies recommended it over other sites, including a Santa Monica site pursued by Collis Huntington, an influential member of the "Big Four" railroad barons. Following an extensive battle with Huntington, the San Pedro Harbor site won authorization from Congress in March 1897.

In 1906, in preparation for the opening of the Panama Canal, the City of Los Angeles extended its boundaries to coastal tidewaters when it annexed San Pedro. The Port of Los Angeles and the Los Angeles Harbor Commission were officially created in December 1907, and numerous harbor improvements followed, including the completion of the 2.11-mile breakwater, the broadening and dredging of the main channel, the completion of the first major wharf by the



Library of Congress Map of San Pedro, CA (ca. 1905)

SPRR, construction of the Angel's Gate lighthouse, and the construction of the first municipal pier and wholesale fish market. The construction of the breakwater was a "monumental engineering feat" requiring crane operators to place large boulders in precise locations 40 to 50 feet below the surface of the water. Both Wilmington and San Pedro were part of the City of Los Angeles by 1909, and because of this citywide growth, the Port of Los Angeles became the world's largest lumber importer by 1913 (Marquez and de Turenne, 2007; Matson 1920).

A 9-mile outer breakwater was completed in 1913, splitting the harbor into Inner and Outer Harbors. The Inner Harbor was known as Wilmington Harbor and the Outer Harbor was known as San Pedro Bay. The same year, dredging and filling of Mormon Island (Inner Harbor) allowed for its conversion from swamp land to land suitable for wharves and sheds (Marquez and de Turenne, 2007.) The first industries to use these new wharves and sheds were boatbuilding companies.

The opening of the Panama Canal in August 1914 decreased the amount of time spent by ships traveling between eastern and western U.S. ports, and promised to open up new trade opportunities worldwide. In preparation for this new trade, the City of Los Angeles completed one of many large municipal terminals in the harbor. However, the outbreak of World War I that same year temporarily stalled the movement toward expanded worldwide trade (Queenan, 1986).

2.4 Wartime Changes, 1914 – 1950

The principal use of the port changed again when England declared war on Germany. At the onset of World War I, the U.S. Navy took possession of a portion of the harbor for a training and submarine base in order to establish a significant presence on the Pacific coast. During the war, the Port was one of the chief sources of employment for residents of the area, with shipbuilding enterprises turning out vessels by the dozens for the war effort. The Port of Long Beach, established only two years before the onset of the war, offered the only southern California competition to the Port of Los Angeles in terms of shipping or shipbuilding.

Despite the previous use of the Port for the shipment of goods, it was not until 1915 that the Port of Los Angeles began constructing its first warehouse. Warehouse No. 1, located on 60 acres, was six stories in height, with a total storage capacity of 500,000 square feet. Warehouse No. 1 opened on March 6, 1917 to great fanfare with over 10,000 people in attendance. The completion of this building symbolized the Port’s transition to a significant seaport able to handle deep sea ships of varied cargo (Marquez and de Turenne, 2007; Queenan, 1986).

In 1917, Terminal Island was dredged and filled. Boatbuilding companies moved their facilities from Mormon Island to Terminal Island. Oil terminals and petroleum facilities took their place on Mormon Island (Marquez and de Turenne, 2007).

Between 1917 and 1930, distributors constructed a large number of new wharves, warehouses and sheds, indicating a significant increase in trade at the Port. By the end of the 1920s, over 25 million tons of cargo passed through the port yearly (Marquez and de Turenne, 2007).

Transportation systems improvements also encouraged the growth of the import and export trade in the harbor area. By 1917, a vast railroad network existed around the harbor and Los Angeles, which facilitated the efficient movement of goods throughout the country. Los Angeles had an advantage over the Port of San Francisco in that it did not have the Sierra Nevada posing an impediment to cargo shipments en route to the east coast (San Buenaventura Research Associates, 1992).

During the period following the end of World War I in 1918, the Port was increasingly used for importing lumber and other types of raw materials. Similar to the prewar period, the vast majority of inbound cargo to the Port consisted of lumber to satisfy the rapid growth of the Los Angeles area. Exceptional levels of new construction of houses and factories necessitated the importation of lumber on a large scale (Matson, 1920). Comparatively, the biggest export product passing through the Port during the postwar years was petroleum.

Following the end of the war, many trade restrictions were lifted, and the Port provided for the transportation of a wide variety of products. Although lumber and petroleum were the biggest commodities to pass through the Port at the time, Los Angeles featured almost all types of industry. Soon after the war’s end, many different types of commerce and business activities developed in the area. Although existing harbor facilities continued to be used for products such as oil, lumber, ships, and fish, new facilities were developed to handle products such as cotton, borax, citrus crops, and steel. In 1923, the City of Los Angeles passed a harbor improvement bond measure, resulting in the construction of additional wharves to meet the demands of increased imports and exports. In order to streamline the railroad portion of shipping in the harbor, the various railroad companies serving the Port consolidated operations by 1929 under the title the Harbor Belt Line Railroad. (Queenan, 1986; San Buenaventura Research Associates, 1992).

Harbor traffic slowed during the Depression years and the harbor witnessed a sharp decline in international trade. The Harbor Commission continued to make improvements, however, including a new breakwater extension, completed by 1937, and the construction of new cargo and passenger terminals. The federal government's Works Progress Administration (WPA) helped the Port finance improvements, including passenger and freight terminals and wharves (Queenan, 1986).

As one of the major American ports closest to the fighting in the Pacific Ocean, San Pedro experienced new life and distinction during World War II. Ship and aircraft production facilities in the harbor area worked day and night between 1941 and 1945 to manufacture more than 15 million tons of war equipment. In addition, hundreds of thousands of personnel passed through the Port when departing for and returning from combat.

The LAHD launched a broad restoration program following the war, as many facilities in the harbor required maintenance which had been delayed during the war years. During this time, the LAHD improved several of its buildings and removed many temporary wartime buildings (Queenan, 1986).

2.5 Containerization: 1950 to Present

With the rise of containerization following the end of World War II, methods of shipping changed dramatically. Prior to this new method, cargo loading was labor intensive, with individual pieces of cargo, drums, boxes, bags or crates, loaded into ships. Cargo was brought to the dock by truck or train and the individual pieces of cargo were unloaded into transit sheds, sorted and organized, and then moved to the wharf for loading as individual packages into the ship's cargo holds by either ship-based or shore-based cranes where it was then stowed. Alternatively, longshoremen would place the individual pieces of cargo in cargo nets that were hoisted into the ship where the individual pieces of cargo were unloaded and stowed. Some efficiency was achieved by placing several individual containers (e.g., drums, bags, or boxes) on a pallet and then loading the pallet into the cargo hold.

Containerization ships appropriate cargo in standard sized, sealable steel boxes, typically 20 or 40 feet long. Special trailers transport these boxes to and from the port by trucks or rail. An empty container is delivered by truck to a location (manufacture, warehouse, or other enterprise), is loaded with cargo and sealed, then transported by truck or train to the port, where shore-based cranes lift the container from the trailer and place it in the ship's cargo hold or on the ship's deck. After the container is delivered to the destination port, the process was repeated in reverse. This consolidation of cargo in standard-sized containers improves the overall efficiency of transport and allows greater integration of transport by truck, train, and ship.

The adaptation of the maritime industry to containerization involved not only the creation of new ships, truck trailers, rail cars, and cargo cranes designed and built specifically to handle the standard cargo containers, but also the construction of new port facilities. As the loading and unloading of ships and the associated handling was the most time consuming aspect of moving cargo through the Port, under the old loading methods, cargo terminals were designed to maximize the "surface area" of the terminal by providing as much berthing space as possible, with little backland (transit sheds) to service each wharf.

The containerization method required large-volume terminals, with extensive backlands, and internal roadways to service each wharf. The increased backlands reflected the need for storage of trailers and containers awaiting a ship's arrival, area needed for the loading and unloading of containers onto ships, and area needed to process the containers into and out of the terminal by truck or train. With the increased efficiency, the limiting factor of transferring of cargo became the organization and optimization of storage of containers awaiting shipment, movement to and from the wharf, and cargo flow into and out of the terminal via road or rail. This meant that ports had to either develop new terminals to meet the needs of the new geometry required by containerization or redevelop older terminals. In addition, with containerization, the weight of cargo "packages" (i.e., containers) increased dramatically, requiring much larger cranes and a corresponding move from timber to concrete wharves.

Major improvements to the Port in the 1970s included the deepening of the main channel to accommodate the larger container vessels entering the bay, the purchase of land to expand terminals, and the replacement of older wharves that could not bear the increased weight of newer containers.

Worldwide shipments through the Port increased during the latter half of the 20th century as ocean-going vessels grew to sizes no longer able to negotiate the Panama Canal. Using a "land-bridge" system, shippers wishing to pass materials from the Pacific Ocean to the Atlantic Ocean employed the more efficient practice of unloading at the Port of Los Angeles, moving materials cross country via truck or train, and loading materials onto ships on the east coast.

2.6 Port of Los Angeles Oil Production and Shipping

Oil production in Los Angeles encompasses an area know as the Los Angeles Basin; an area which is approximately 22 miles wide and 42 miles long and sits in the southern portion of Los Angeles County and the northwestern portion of Orange County. The Basin is bounded by the Santa Ana Mountains on the east and the Pacific Ocean on the southwest. Although not the first to be discovered in California, the Los Angeles Basin oilfields were important to California's petroleum industry during the first two decades of the 20th century, helping California in leading the nation in oil production for many years during the first four decades of the 20th century (Franks and Lambert, 1985).

Oil drilling began in the Los Angeles Basin before the turn of the century, and the Los Angeles area being considered a major refining center as early as 1909. The refining process of crude oil allowed for the production of many different types of usable products, including kerosene, grease, lubricating oils, and asphalt, and the constant growth of southern California led to an expanding need for these products.

Two major factors helped to increase the desirability of crude oil from California following the turn of the century: the conversion of many ocean-going vessels and west coast railroads from coal to oil and the dramatic rise of automobile use during the 1920s (Franks and Lambert, 1985; Rawls and Bean, 1993). Oil companies recognized the need for port facilities able to handle the increasing quantities of oil leaving the Los Angeles area, and in 1909, the Union Oil Company authorized the financing of the Outer Harbor and Dock and Wharf Company. The company was organized in order to create a terminal adequate for accommodating larger and heavier ocean-going steamers produced at the time, and also provided other improvements to the Port, such as new sea walls, wharves, and industrial sites (Welty and Taylor, 1956).

In 1919, the majority of California's oil came from the lower San Joaquin Valley, with the major refineries concentrated in the San Francisco Bay Area. However, the predominance of all aspects of the oil industry passed to the Los Angeles region by the 1920s. In 1923, oil from Signal Hill, Santa Fe Springs, and Huntington Beach, combined with the remaining smaller pools of the Los Angeles Basin, accounted for 20% of the world's total production of crude (Franks and Lambert 1985). Only the state of Oklahoma was able to compete with California in terms of total production numbers at the time, and in 1925, the value of oil refinery products was twice the value of the output of California's second-largest branch of manufacturing; the canning and preserving of fruits and vegetables (Rawls and Bean, 1993; Federal Trade Commission, 1921). Exports of oil from the Port of Los Angeles made it the largest oil port in the world.

Larger regional producers, including Standard Oil of California and Union Oil (both now Chevron), dominated the Port of Los Angeles during the 1920s. Many smaller local producers, including California Petroleum, Julian Oil, Hancock Oil, General Petroleum, Pan-American Oil (later, Richfield Oil), and Associated Oil, also used port facilities. The largest out-of-state producers located in the region were Texas Oil Company and Shell Oil (San Buenaventura Research Associates, 1995). California had firmly established itself as a major supplier of crude oil and the center of America's petroleum industry by the end of the 1920s (Franks and Lambert, 1985). Destinations across the country and around the globe received oil out of the Port of Los Angeles, and in light of this seemingly insatiable market, companies on both the east and west coasts acquired ships able to handle the larger oil cargoes (Oil Age, 1923).

Storage of oil was not initially considered an important priority, with some of the earliest tanks simply concrete-lined excavations covered with steel tops (Franks and Lambert, 1985). However, overproduction became a problem in the 1920s, and by 1930, California's oil wells were producing an amount of crude that was far in excess of what the market could absorb (Welty and Taylor, 1956). Worldwide, there was a lower demand for oil in the post-World War I era, and storage problems quickly becoming a primary concern (Franks and Lambert, 1985; Oil Age, 1922). Many of the major oil companies drafted plans to increase their storage in the southern portion of the state following the increased production in the Los Angeles Basin in the 1920s. In addition, many oil companies produced new terminals in an attempt to counteract the problem, some costing as much as $1,000,000 (Oil Age, 1924).

Seeking new sources of local oil at the end of the 1920s, the oil production companies began looking northward, and in 1936, the General Petroleum Company found the last major oil find in the Los Angeles Basin, the Wilmington Oil Field, marking the end of the Los Angeles Basin oil boom (Franks and Lambert, 1985).

2.7 Timber Wharves at the Port of Los Angeles

The Harbor Commission authorized the construction of many new facilities to accommodate the economic growth at the port following World War I. Partially funded by the $1,500,000 harbor improvement bond measure of 1923, this construction effort included projects such as wharf construction. When individual berths were leased, the Commission approved the building of new wharves at the terminals. As Port industry expanded so did wharf construction. In 1926, the municipal wharves measured 24,460 linear feet. By 1931, the wharves increased to 41,921 feet, and in 1940, the municipal wharves covered a total of 50,606 feet. By this time, the Port equipped all docks with truck loading ramps and railroad tracks and paved all areas surrounding the docks and terminals (Board of Harbor Commissioners, 1926; 1931; 1940).

Constructed between 1914 and 1950, the wharves at the Port of Los Angeles are composed of timber and poured concrete. Wharves vary from roughly 60 feet to more than 1,200 feet in length and typically range from 20 feet to 70 feet wide. In many cases, the Harbor Engineer's Office designed the structures, and the Los Angeles Harbor Department constructed them, with construction consisting primarily of creosoted timber piles driven vertically into the channels.

The wharves are arranged parallel to the shoreline and are accessed by ramps or aprons connecting the wharves to the landside or 'backlands' area. Some wharves obtained additional structural integrity and stability by driving piles diagonally into the channel bottoms. The decking materials are composed primarily of heavy milled timber planks set on timber girder and joist systems.

Attached fender pilings, ramps, stairways, railings, and platforms or floats are typical details included in the design of the wharves. Associated structures on or near the wharves include pipes, pumping equipment, concrete or riprap sea walls, and small buildings, such as pump houses, dock houses, and longshore toilets. An early harbor report stated, "Many of the older [wharf] structures have reached the stage when it is more economical to reconstruct extensive portions thereof, rather than continue innumerable and frequent small repairs" (Board of Harbor Commissioners, 1930). Removal and replacement of rotted or damaged timber pilings and decking material is part of the routine repair and maintenance of the wharves require.

The steady evolution of maritime shipping techniques over time have placed a greater reliance on mechanization and a reduced dependence on labor, leading to the progressive obsolescence of protected intermediate storage and traditional wharfage.

3. Regulatory Context and Significance Criteria

3.1 Federal Regulations

To establish the significance of a property, the National Register of Historic Places (National Register) criteria for evaluation set forth in 36 CFR Part 60.4 must be applied. The following criteria are designed to guide the states, federal agencies, and the Secretary of the Interior in evaluating potential entries for the National Register. The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects that possess at least one of the following:

A. that are associated with events that have made significant contribution to the broad patterns of our history; or

B. that are associated with the lives of persons significant in our past; or

C. that 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. that have yielded, or may be likely to yield, information important in prehistory or history.

The question of integrity is a another factor that must be addressed when determining the eligibility of a resource for listing in the National Register. The Secretary of the Interior describes integrity as “the ability of a property to convey its significance.” A property must retain certain intact physical features in order to convey its significance under one or more of the NRHP criteria. Integrity is judged on seven aspects; location, design, setting, workmanship, materials, feeling, and association.

If a particular resource meets one of these criteria and retains sufficient integrity to convey its historic significance, it is considered as an eligible “historic property” for listing in the National Register. Additionally, unless exceptionally significant, a property must be at least 50 years old to be eligible for listing.

Section 106

Section 106 of the National Historic Preservation Act (NHPA) of 1966 requires that a federal agency with direct or indirect jurisdiction over a proposed federal or federally-assisted undertaking, or issuing licenses or permits, must consider the effect of the proposed undertaking on historic properties. An historic site or property may include a prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in the National Register maintained by the U.S. Secretary of the Interior. Federal agencies must also allow the Advisory Council on Historic Preservation (ACHP) to comment on the proposed undertaking and its potential effects on historic properties.

The implementing regulations for Section 106 of the NHPA (36 CFR 800) require consultation with the State Historic Preservation Officer (SHPO), the ACHP, federally recognized Indian tribes and other Native Americans, and interested members of the public throughout the compliance process. The four principal steps are:

- initiate the Section 106 process (36 CFR 800.3);
- identify historic properties, resources eligible for inclusion in the NRHP (36 CFR Section 800.4);
- assess the effects of the undertaking on historic properties within the area of potential effect (36 CFR 800.5); and
- resolve adverse effects (36 CFR 800.6).

Adverse effects on historic properties are often resolved through preparation of a memorandum of agreement or programmatic agreement developed in consultation between the federal agency, the SHPO, Indian tribes, and interested members of the public. The ACHP is also invited to participate. The agreement describes stipulations to mitigate adverse effects on historic properties or listing in the National Register of Historic Places (36 CFR §60).

Significance Criteria under NHPA

A significant impact would occur if a proposed action results in an adverse effect to a property that is listed in or eligible for inclusion in the National Register. The specific Criteria of Effect and Adverse Effect, as defined in 36 CFR 800.9, used to evaluate an undertaking's effect on a historic property, are as follows:

- An undertaking has an effect on a historic property when it may alter the characteristics of the property that qualify the property for inclusion in the National Register. For the purpose of determining effect, alteration to features of the property's location, setting, or use may be relevant depending on a property's significant characteristics and should be considered.
- An undertaking is considered to have an adverse effect when the effect on a historic property may diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Adverse effects on historic properties include, but are not limited to:

  (1) Physical destruction, damage, or alteration of all or part of the property;

  (2) Isolation of the property from or alteration of the character of the property's setting when that character contributes to the property's qualification for the National Register;

  (3) Introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting;

  (4) Neglect of a property resulting in its deterioration or destruction; and

  (5) Transfer, lease, or sale of the property.

3.2 State Regulations

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 CRHR includes resources that are listed in or formally determined eligible for listing in the NRHP and some resources designated as California State Landmarks and Points of Historical Interest (PRC Section 5024.1, 14 California Code of Regulations [CCR] Section 4850). Properties of local significance that have been designated under a local preservation ordinance (local landmarks or landmark districts) or that have been identified in a local historical resources inventory may be eligible for listing in the CRHR and are presumed to be significant resources for purposes of CEQA unless a preponderance of evidence indicates otherwise (State CEQA Guidelines Section 15064.5[a][2]). The eligibility criteria for listing in the CRHR are similar to those for NRHP listing but focus on the importance of the resources to California history and heritage. A cultural resource may be eligible for listing in the CRHR if it (see 14 CCR Section 4852):

(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.

In addition to meeting one of the four criteria listed above, a resources eligible for listing in the California Register must retain historic integrity, and is typically fifty years old or older, except where it can be demonstrated that sufficient time has passed to understand the historical importance of the resource.

Significance Criteria under CEQA

The California Environmental Quality Act (CEQA) specifically addresses the protection of historic resources. Based on the Appendix G of the CEQA Guidelines, a project would have a significant impact on historic resources if it would, "result in a substantial adverse change in the significance of a historical resource that is either listed or eligible for listing on the National Register of Historic Places, the California Register of Historic Resources or a local register of historic resources."

3.3 Local Regulations

The Los Angeles Municipal and Administrative Codes address the preservation of historic and cultural monuments, and Preservation Zones. A list of historical and cultural monuments has been compiled and is maintained by the Cultural Heritage Commission, a board of five persons appointed by the Mayor and approved by the City Council. It is the responsibility of the Cultural Heritage Commission to oversee and approve the establishment of Preservation zones (LA Municipal Code Sec. 12.20.3) and to preserve monuments when such action is not in conflict with the public health, safety, and general welfare (LA Administrative Code Sec. 22.128).

According to Section 22.130 of the Los Angeles Municipal Code, a historical or cultural monument is “any site (including significant trees or other plant life located thereon), building or structure of particular historic or cultural significance to the City of Los Angeles, such as historic structures or sites in which the broad cultural, economic or social history of the nation, State or community is reflected or exemplified, or which are identified with historic personages or with important events in the main currents of national, State or local history or which embody the distinguishing characteristics of an architectural type specimen, inherently valuable for a study of a period, style or method of construction, or a notable work of a master builder, designer, or architect whose individual genius influenced his age.”

According to Section 22.171 of the Los Angeles Municipal Code, ‘The [Historic Preservation] Commission shall take all steps necessary to preserve Monuments not in conflict with the public health, safety and general welfare, powers and duties of the City of Los Angeles, or its several boards, officers or departments. These steps may include assistance in the creation of civic citizens' committees; assistance in the establishment of a private fund for the acquisition or restoration of designated Monuments; and recommendation that a Monument be acquired by a governmental agency where private acquisition is not feasible.”

3.4 Period of Significance and Significant Resource Types

The historic significance of the Port relates to the role that the Port facilities played in expanding the commercial and economic success of Los Angeles, which coincided with Los Angeles’ emergence as an “international” city between the early 1920s and the beginning of containerization in the 1950s. This period also coincides with the establishment of the Port for the transshipment of oil, an industry which played a major part in the development of Los Angeles in the first half of the twentieth century. The development of the oil terminals at the Port of Los Angeles helped establish the city as a major economic force in the region. By the 1950s the use of the Port of Los Angeles for the transshipment and storage of oil had been well established and had reached a mature state. As such, the period of significance for the theme of oil transshipment at the Port is 1920 to 1950. Facilities typically associated with this theme include wharves, seawalls, tanks and tank farms, spill containment walls, pipelines and pipe valves, pumphouses, dockhouses, offices, and warehouses.

4. Historic Resources

4.1 Berths 118–120

History

Plans dated October 1922 by the Associated Oil Company Engineering and Construction Department identify the layout and design of the timber wharves at Berths 118-120 (Associated Oil Company, 1922). At the time, the area was identified as the "Marine Loading Station, LA Harbor." The Associated Oil Company not only designed Berths 118-120, but also leased them from the Port to function as oil loading wharves. Within three years, Associated Oil installed two oil pipelines at Berth 120 to load both crude and fuel oil, and by 1930, additional pipelines accessed Berths 118 and 119. The Associated Oil Company had a storage capacity of 512,000 barrels and could load three vessels simultaneously. By 1935, the company installed more pipelines and increased storage space to 531,000 barrels. (Board of Harbor Commissioners, 1923; 1926; 1930; 1935).

In 1936, Associated Oil Company and Tide Water Oil Company merged with their former parent company, Tide Water Associated Oil Company, which stored up to 587,100 barrels at the harbor. The company supplied bunker fuel oil to vessels at a rate of 1,200 barrels per hour through use of a 3,000-barrel barge. By 1947, the harbor installed facilities for filling drums as well as railroad car loading racks and tank truck racks (Board of Harbor Commissioners, 1947). A fire occurred at the berths on June 25, 1954 that burned for 2 days and destroyed 11 oil storage tanks operated by Tide Water Associated Oil Company (Ditzel, 1986). Tide Water Associated Oil Company continued to lease the berths until at least 1957, when Time Oil Company assumed occupancy (see photo below).

Aerial Photo of Berths 118-120 (1957)

A review of plans on file with the Port of Los Angeles for Berths 118-120 indicate that an open storage areas behind Berths 112 – 118 was created in 1977, and that the rear (landside) area of Berths 118-120 was graded and paved in 1988. In 2005, plans indicated that Berths 118-119 underwent a rehabilitation project which made numerous repairs to the piles and deck, replaced a number of cap beams, and wrapped batter piles in 3 layers of “TYFO;” a type of PVC plastic wrap (Port of Los Angeles, 1977, 1988, 2005).

Over the years, handfuls of oil companies have leased this site including Time Oil Company (1957); Westoil Terminals (1974); GATX (2000), and most recently Kinder Morgan, which occupies the site today. Berths 118-119 are still used for the transshipment of oil, although Berth 120 has been abandoned and fenced off due to its deteriorated condition.

Description

Berths 118-119 consists of a continuous timber wharf approximately 820 feet long by 20 feet wide and about 15 feet above the water line. The deck and piles are of timber construction. The fendering system also consists of timber piles. Many of the timber piles are wrapped in PVC plastic. Most of the decking is horizontally-oriented wood decking, although welded steel plates cover the wood decking in the vicinity of the pipe, valve, and hoist machinery. Wood bullrails are located along the outer edges of both wharves, interspersed with iron cleats located at regular intervals. Four approach ramps constructed of similar timber piles and decking as the wharves, connect the structure to the land.

Located about 150 feet northeast from Berth 119 is the wharf at Berth 120. This structure is 400 feet long and 20 feet wide, and is constructed of identical materials as Berths 118-119, although it is more dilapidated. Four, small, corrugated metal dock houses are located on Berth 120, as are a number of steel cranes. As mentioned above, this berth has been abandoned and fenced off due to its deteriorated condition.

A number of structures are located on the landside or ‘backlands’ portion of Berths 118-120. Located immediately to the north of the Berth 119 is a small valve house with a rectangular plan, gable roof, and corrugated metal siding and roofing. Windows are metal sash. Located further to the north of Berth 119 is a large tank farm consisting of 12 steel tanks encircled by a spill containment wall. The wall is made of horizontal board-formed reinforced concrete about 15 feet tall and about 1 foot thick. The tanks are a combination of welded and riveted steel, range in size from about 25 feet to 135 feet in diameter, and are about 40 to 50 feet tall. Three of the tanks are topped with newer steel geodomes, and some of them are wrapped in corrugated aluminum insulation. A cluster of six smaller tanks are located immediately north of Berth 118, which are also encircled by a spill containment wall.

Other structures include an administration building, a pump house, heater units, a storage facility, an offload black-product rack, and an offload clean-product rack. The administration building is a one-story wood frame structure with stucco siding, a hip roof, and 1/1 woodframe windows. This building appears to date to the mid-1920s. The interior of the building appears to be highly altered. A concrete block warehouse with a flat roof and roll-up style doors was added to the rear of the administration building. This addition appears to date to the mid-1950s.

Evaluation

Many of the structures affiliated with Associated Oil and Tidewater Associated Oil were demolished after a fire occurred in the 1950s. The tank farm and other existing buildings were constructed after that period and are associated with Time Oil (which leased the site as early as 1957), Westoil, (which arrived in 1974), GATX, or Kinder Morgan (the current occupant). The remaining elements of the oil terminal from the 1920s include the wharves at Berths 119-120, the administration building (altered), and a small valve house. The 1950s fire destroyed tanks built in the early part of the century, resulting in the construction of new storage facilities and other buildings at the site circa 1955. While these newly constructed tanks and other buildings are now more than 50 years old as of 2009, they were built outside of the period of significance (1920 – 1950) and do not appear to retain historical significance on an individual basis or as a grouping of facilities. Lacking historical significance, the buildings and structures at Berths 118-120 do not appear to be eligible for listing in the NRHP.

The wharves located at Berths 118-120 also do not appear to meet the criteria for listing in the NRHP. Originally constructed in 1922 as a component of an oil terminal, the wharves would need to be evaluated as contributors to a terminal district to be considered eligible for listing in the NRHP. The integrity of setting at Berths 118-120 has been compromised because many of the many buildings and structures at the terminal have been constructed outside of the period of significance, as discussed above. No historical district can be formed because integrity of setting has been compromised. Thus, the wharves at Berths 118-120 do not appear to be eligible for listing in the NRHP. For similar reasons, the wharves at Berths 118-120 do not appear to be eligible for listing in the California Register or as a City of Los Angeles historical or cultural monument.

4.2 Berths 148–149

History

Union Oil, founded in California in 1890, purchased a 200-acre site in 1916 for a new refinery in Wilmington, adjacent to the Los Angeles Harbor during the Southern California oil boom. In 1920, Union Oil leased a 4-acre site adjacent to the Inner Harbor at Berths 148-151 with the intention to develop an oil receiving terminal. The site was an ideal location for the oil receiving terminal because it offered an easy approach, ample mooring space, and deep water for tankers. The site had also been previously used as a repair dock for Union Oil tankers. In addition, no rail or highway facilities were necessary because all loading and discharging could be accomplished through pipe lines (Board of Harbor Commissioners, 1940; 1952). The development of the oil terminal helped establish Union Oil's position as a prime shipper of petroleum products through the Port of Los Angeles.

Construction on the site began immediately. The Harbor constructed a 300 by 40-foot wharf (the wharf at Berth 150), and Union Oil installed storage tanks with a holding capacity of 335,000 barrels, as well as a number of outbuildings. In addition, the oil company installed six pipelines (two 10-inch field lines and one 12-, one 8-, and two 6-inch lines) which supplied oil from the berths to the nearby refinery. When the site was completed in 1920, it had the capacity to load three vessels simultaneously. By 1930, the company had increased tank storage capacity of petroleum products to 350,000 barrels. By 1931, Union Oil leased and constructed a wharf at Berth 149 as their operations expanded (Board of Harbor Commissioners, 1920; 1931).

Aerial Photo of Berths 148-149. Upper left side of photo. (1938)

One 19-inch oil field pipe line and five (12-, 10-, 8-, 6-, and 4-inch) refinery lines supplied the site in 1947. Barge services for 20,000 barrels were available for bunkering either diesel oil or fuel oil. The terminal also provided a storage capacity of 25,000 barrels of lubricating oil (Board of Harbor Commissioners, 1948).

The site was substantially modified and expanded in 1955 when Union Oil leased an additional 6 acres at the west end of pier A. Plans from the Office of the Harbor Engineer identify that the original 1930s wharf at Berth 149 was demolished and replaced with a new 600-foot, reinforced concrete wharf for Berths 148-149. Plans dated from 1955 show that a new tank farm with approximately 9 steel tanks, a spill containment wall, and many new associated outbuildings were constructed at this time (City of Los Angeles Harbor Department, 1955). The newer tanks are currently referred to as the “west end” tank farm, while the original 1920s tank farm is called the “east end” tank farm. The development of Berths 148-149 increased the total number of Union Oil tanks to 31 and storage capacity to 1,675,000 barrels which greatly improved Union Oil’s operations (Board of Harbor Commissioners, 1959). Approximately 3 million barrels of petroleum products were handled at the site each month, including crude oil, fuel oil, lubricants, gasoline, diesel, and other petroleum products (Welty and Taylor, 1956).

Tosco Corporation purchased Union Oil’s refinery business activities in 1997 and began official operation at Berths 148–149. ConocoPhillips, which occupies the site today, purchased the site from Tosco.

Description

Berths 148-149

The wharf at Berths 148-149 measures approximately 600 feet long by 35 feet wide, and stands approximately 15 high above the waterline. It features concrete construction throughout, including the deck. Concrete vehicular access ramps extend from the land to the wharf at two points. Two pedestrian-scale steel ramps or gangways also extend to the wharf. Wood bullrails are located along the outer edge of the wharf, interspersed with iron cleats located at regular intervals. The fendering system consists of timber piles and rubber blocks. Located on Berth 149 is a small metal frame dock house with a corrugated shed roof and metal sash windows. Also located on Berth 149 are numerous pipe manifolds, hoses, cranes, a steel joist, and a boom. Other steel pipes supported by concrete piles and beams run parallel to the wharf, between it and the land. These pipes transport oil and other petroleum products from the wharf to the nearby tanks and to the refinery in Wilmington. The wharf at Berth 148 was constructed in 1930 and reconstructed as a concrete wharf in 1955, the same year the wharf at Berth 149 was constructed.

Located to the northeast of Berths 148-149 are a number of facilities, including the west-end tank farm. The tank farm consists of approximately 9 welded steel storage tanks, accessed by metal stairs. Some tanks feature corrugated aluminum insulated siding to keep heavy oils viscous and easier to pump. Other tanks are topped with steel geodomes added to the tanks in 1993. The structures vary in diameter and are generally 40-50 feet in height. The tank farm is encircled by a spill containment wall about 15 feet in height. These west-end tanks were constructed circa 1955 according to site plans, and are used to store lighter oil products. Other facilities on the site include a dock house, gatehouse, and substation. These are described below.

Dock House

A dock house located on the wharf at Berth 149 measures approximately 10 by 8 feet in size by about 8 feet in height. It is a metal frame structure with a shed- roof clad in vertical-seamed transite. Windows are metal sash and the single entry door is solid steel. The building was constructed as a wharfman’s shelter house in circa 1955, and is currently used as a control house.

Gatehouse

Located at the entrance to the facility is the gatehouse, which is a small, shed-roofed building measuring approximately 10 by 10 feet in size and about 12 feet in height. The building has a flat roof with wide eaves. Walls are comprised of wood panels and are supported by a concrete perimeter foundation. It includes a single-entry door and a single-pane window. This building was likely was constructed circa 1955 when this part of the site was developed.

Substation

Located near the west-end tank farm is a small electrical substation building measuring approximately 15 by 10 feet. The building has a shed roof, transite siding, a single-entry door, and metal-framed multi-light windows. A tall vent is on the roof. The building is supported by a concrete foundation. This building was likely was constructed circa 1955 when this part of the site was developed.

Evaluation

Berths 148-149

The facility located at Berths 148-149 was constructed in 1955, after the period of significance (1920-1950). This development replaced an earlier and smaller timber wharf with a larger and more modern concrete wharf. An entirely new tank farm (the west-end tank farm) was also constructed at this time, as was the dock house, the substation, and gate house. By the 1950s the use of the Port of Los Angeles for the transshipment and storage of oil had been well established and had reached a mature state. While the facility at Berths 148-149 expanded Union Oil’s existing operation at the site, these berths do not appear to retain historical significance on an individual basis or as a grouping of related facilities. Lacking historical significance, the buildings and structures at Berths 148-149 do not appear to be eligible for listing in the NRHP. For similar reasons, the buildings and structures at Berths 148-149 do not appear to be eligible for listing in the California Register or as a City of Los Angeles historical or cultural monument.

4.3 Berths 187–191

History

By the early 1920s, the handling capacity of the harbor was under great strain. Several improvements were planned during this decade in the vicinity of Berths 187-191 to increase the capacity of its shipping facilities. The Vegetable Oil Products Company, which was founded in 1919, purchased a 30-year lease from the city in 1920 at Berth 187 to establish a vegetable oil plant for the handling of imported vegetable oil. Construction plans included both wood and concrete wharves, an Umbrella shed, new pavement, piping, drainage, and tracks. An extension from the Canal Avenue water main would supply water to the plant (Board of Harbor Commissioners, 1920). The Belt Line Railroad was also extended directly parallel to this facility along today’s Canal Street, and a railroad turntable was installed at the southernmost tip of Berths 190-191.

Aerial Photo of Berths 187-191 (1941)

Construction of the wharves and sheds associated with the Vegetable Oil Products Company at Berth 187, and Pacific Mail Steamship Company at Berth 188, were completed in July 1922 (LAT, July 20, 1922; November 26, 1922). Aside from the smaller umbrella shed at Berth 187, two large sheds were constructed on top of Berths 188 and 190, both of which were designed by the harbor engineer and built by the Austin Construction Company of California. Construction of the sheds was financed by the city and then leased to companies operating at the port. The shed at Berth 188 measured 480 feet long by 120 feet wide. The shed at Berth 190 measured 554 feet long by 120 feet wide. The sheds was constructed of a steel frame with corrugated steel walls and concrete foundation and floors (LAT, November 26, 1922).

The Vegetable Oil Products Company was the first of its kind on the west coast and its establishment eliminated the need to import vegetable oils from England (LAT, July 1, 1923). By 1923, the plant had a capacity to produce 35,000 to 40,000 pounds of edible product per day. Raw materials were imported from the Philippines and refined at the plant. In 1926, the company began to import whale oil, including "the first consignment of whale oil of importance brought to the port" (LAT, June 8, 1926).

By 1928 the exportation of vegetable oil outgrew the capacity of Berth 187 and new permanent facility was sought (LAT, August 23, 1928). In 1929, Vegetable Oil Products Company requested a lease and permission to construct a copra (coconut) crushing and vegetable-oil extraction plant at Berth 188, adjoining its current plant (Drake, July 25, 1929). By 1952, the Vegetable Oil Products

Company, Inc. was one of the largest importers and crushers of copra in the US. The terminal at Berth 187 included an industrial oil department at that time called the Vopcolene Division which produced fatty acids, industrial oils and refined glycerin (Board of Harbor Commissioners, 1952).

By 1925, Berth 188 was being utilized by the Garland Steamship Company and the Panama Mail Steamship Company (LAT, July 4, 1925). In 1929, the Norton, Lilly & Co., requested the Harbor Department install steel cargo masts at Berths 189 and 190 to facilitate the handling of heavy steel shipments (Drake, July 11, 1929).

Changes to the facilities at Berth 187 and 188 in the 1930s included the improvements of ramps, the resurfacing of the transit shed floor, the construction of a storage tank measuring 50 feet in diameter by 20 feet in height, and the enlargement of offices (LAT, January 11, 1934; December 20, 1934). Other improvements to Berths 188 and 189 in the 1930s included the replacement of track and ramp widening at a cost of $3,300 (LAT, January 5, 1933). Plans from 1937 also indicate that the wharf at Berth 191 was raised and widened at this time.

In the 1930s, Berths 187-191 were used by various shipping companies, including the Hammond Shipping Company at Berth 187, The Royal Mail-Holland-America-Furness lines at Berth 188, and the North, Lilly & Co. at Berths 189-191. United Fruit Company, Mitsui Bussan Kaisha, Donaldson Line, and other services served by the Banning Company stevedores continued to use Berths 187, 188 and 189 on secondary assignment (Drake, January 5, 1933).

By the early 1970s, the smaller umbrella shed on Berth 187 was demolished, and the larger transit sheds on piers 188 – 190 were used by the Coos Head Lumber and Plywood Company. By 1979, Berths 187-191 were used by the Wilmington Liquid Bulk Terminals, Inc. By the early 1980s, plans indicated that the larger transit sheds as well as most of the railroad tracks were intended for demolition. By the mid-1980s, the large, metal-clad warehouse which currently exists adjacent to Berth 188-190 was constructed. The Berth 187-191 facility is currently used by Vopak North America, which handles liquid oil products, chemicals, vegetable oils, and liquefied gases.

Description

Berths 187-191 consist of four continuous wharves located just west of, and parallel to, Canal Street in Los Angeles Harbor’s East Basin. Berths 187-190 run north-south, while Berth 191 runs at an angle from northeast to southwest. Berths 190 and 191 meet at point at the southernmost end of the facility.

The wharves at berths 187-189 are constructed of reinforced concrete pilings with concrete decking. They are approximately 50 wide and 1,150 feet long in total length. The outer edge of the decking consists concrete bullrails about 1 foot high, interspersed with iron cleats located at regular intervals along both wharves. The fendering system consists of wood pilings with rubber blocks. Unlike other oil terminals at the Port of LA, no open water exists between the wharves and the backlands. The backlands to the east of the wharves are entirely paved and fenced. A steel pipe bridge located at berth 188 contains pipes and pipe valves. Other machinery in the area includes manifolds and a steel crane.

The wharves at berths 190-191 are constructed of timber pilings and wood decking covered by asphalt. Berth 190 is about 750 feet long (as determined by the length of the asphalt decking) and about 50 feet wide. Berth 191 is about 500 feet long and about 50 feet wide. Wood bullrails are located along the entire length of the outer edge of both wharves, interspersed with iron cleats located at regular intervals. The fendering system consists of wood pilings connected by wood chucks. Two rows of railroad tracks are embedded in the asphalt decking of berth 190. The separation between Berth 190 and 189 and 191 is evident by a clear break in railroad tracks. The decking on Berth 191 consists of recently-applied asphalt with painted lanes, and the wood bull rails appear to be of relatively recent vintage. According to the Port, approximately 20 original timber piles on Berth 191 were replaced with new timber piles within the last six months.[1] The entire backlands area of Berths 191 is open and paved.

Buildings in the vicinity include a two story office building which is located at the northern end of Berth 187. The office building, about 200 feet long by about 70 feet wide, is rectangular in plan with a flat roof, and consists of horizontal board-formed poured concrete and concrete block construction. Ribbon windows are located on the eastern and western elevation, and consist of awning-type units made with metal sashes. Other windows are aluminum sliders. The office was originally a warehouse in the 1920s, but converted into an office building in the 1950s, which is evidenced by the concrete block infill of many original openings and the installation of the ribbon windows.

Other structures at Berths 187-191 include a large, two story cement warehouse toward the southern end of the facility near Berth 190 – 191. This building, about 460 feet long by about 200 feet wide, has an irregular plan, a shallow gable roof, and is clad in corrugated metal siding. Plans indicate this warehouse was constructed in the mid-1980s. At the southern end of this structure is a large, moveable piece of steel machinery called a Kovaco Pump which is used to suction powdered cement from ships and transport it to and from the warehouse. The pump runs along the length of Berth 191.

Other structures in the vicinity include a series of about 15 welded steel tanks each about 50 feet high. These tanks are located parallel to Berths 187-189 and west of Canal Street. Most of the tanks are about 40 feet in diameter, while two are about 60 feet in diameter. Other structures on the wharves include a small, corrugated metal operator’s office (dock house) located at Berth 187, and a small, stucco-clad restroom structure located at Berth 189. Both the dock house and the restroom structure appear to have been constructed in the 1970s.

Evaluation

The facilities at Berths 187-191 were originally built in the early 1920s for the Vegetable Oil Products Company and the Pacific Mail Steamship Company, which operated two large sheds located atop the wharves. Numerous railroad tracks once encircled theses facilities. Although the original concrete wharf structures are generally intact, the sheds were demolished and replaced

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1 Personal communication, Lily Becaria, Port of Los Angeles Engineering Department, with Brad Brewster, ESA, December 9, 2009.

with newer warehouse facilities in the 1980s. The majority of railroad tracks, as well as the railroad turntable at the intersection of Berths 190-191, were also removed around this same time. The decking, fendering system, and some of the pilings have also undergone various alterations over the years. The transshipment of food oils and mail were secondary, rather than primary, activities of the Port which were relatively short-lived. As such, these activities do not have a separate period of significance nor do they share the historical theme of petroleum transshipment as do the other terminals evaluated in this report.

The wharves at Berths 187-191 would need to be evaluated as contributors to a terminal district to be considered eligible for listing in the NRHP. As described above, the wharves at Berths 187-191 are not strongly associated with important historical themes at the Port, and their integrity has been compromised because all of the original terminal sheds have been demolished and replaced by newer facilities. No historical district can be formed due to a lack of important historical associations and reduced physical integrity. Thus, the wharves at Berths 187-191 do not appear to be eligible for listing in the NRHP. For similar reasons, the wharves at Berths 187-191 do not appear to be eligible for listing in the California Register or as a City of Los Angeles historical or cultural monument.

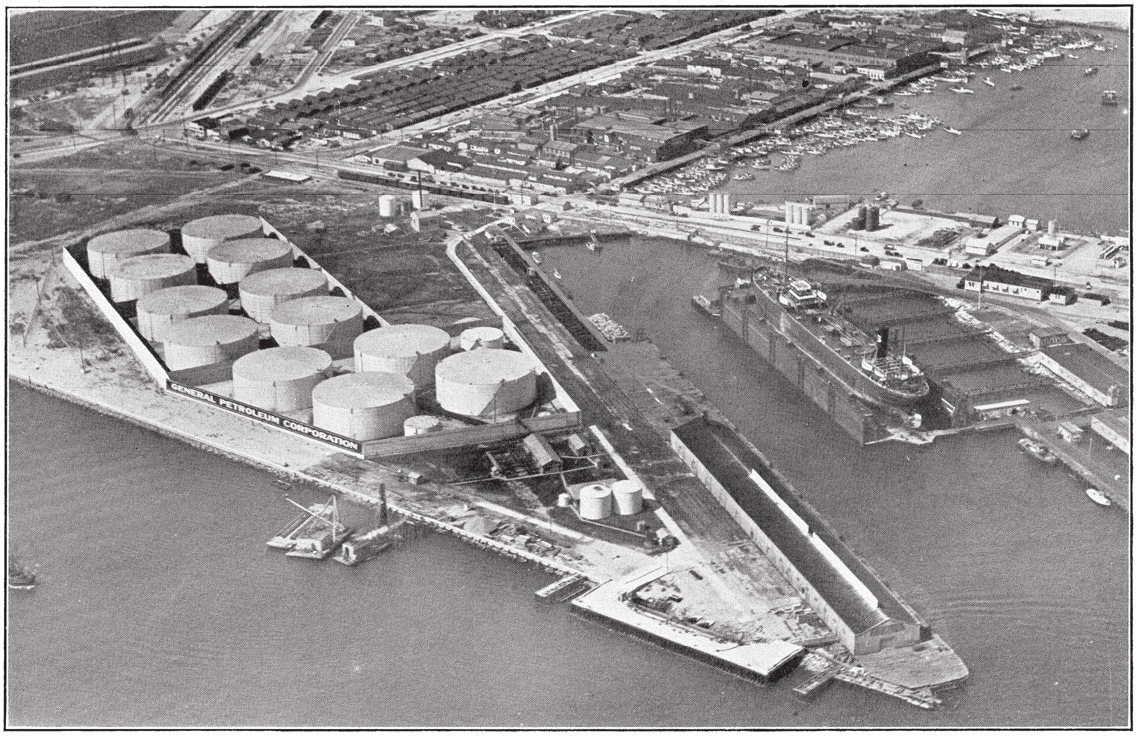
4.5 Berths 238–239

History

Berths 238 and 239 were constructed in 1925 for the General Petroleum Corporation (Board of Harbor Commissioners, 1925). The General Petroleum Company was founded by Captain John Barneson, a former whaler and shipping captain. He was responsible for the first oil pipeline constructed between Coalinga and Monterey in California. The pipeline was later expanded south over the Tejon Pass. In 1913, General Petroleum completed the first pipeline from the San Joaquin Valley to the Los Angeles Harbor. At that time, the company's port was in the Outer Harbor (Board of Harbor Commissioners, 1932). Captain Barneson was a pioneer in the use of oil as fuel for ocean-going vessels and eventually became the president and then chairman of the board of General Petroleum Corporation (LAT, November 1, 1926; February 26, 1941).

In 1925, General Petroleum's harbor facility included three pipelines: one 8-inch for crude oil, one 8-inch for fuel oil, and one 6-inch for gasoline. The facility held 14 tanks with a total storage capacity of 975,000 barrels. Three ships could be loaded simultaneously (Board of Harbor Commissioners, 1925). On Christmas Day of that year, the corporation set an oil-loading record by simultaneously loading four tankers with a total capacity of 271,114 (LAT, December 26, 1925).

By 1928, the facilities included 16 storage tanks with a total capacity of 1,050,000 barrels (Board of Harbor Commissioners, 1928). In 1929, an additional 6-inch gasoline pipeline was added, increasing total pumping capacity to 12,000 barrels per hour (Board of Harbor Commissioners, 1929).



General Petroleum Corporation, Loading Wharves

Aerial Photo of Berth 239 (1925)

In 1930 and 1931, General Petroleum Corporation expanded its harbor facilities. The corporation constructed four new steel oil tanks and firewalls just north of Berth 238, at a total cost of $68,743. The four new steel tanks included two 40,000 barrel tanks and two 20,000 barrel tanks for refined oil storage (Drake, June 26, 1930). Other additions included mooring blocks at Berths 239-240 at a cost of $6,000 and a waste-water separator at Berth 238, which cost $19,410 (Cave, October 8, 1931; December 24, 1931). By the end of the fiscal year in 1931, General Petroleum had five pipelines (three 6-inch and two 8-inch) leading from its refineries to the loading stations at the harbor (Berths 238, 239, 240a, and 240b); seven pipelines for loading vessels at the dock (one 18-inch, four 12-inch, one 8-inch, and one 6-inch); and a total storage capacity of 1,263,000 barrels (Board of Harbor Commissioners, 1931).

Aerial Photo of Berth 238-239 (1957)

In 1945, General Petroleum erected a rack and catwalk for tank-car unloading at Berth 238 for $6500 (LAT, May 6, 1945). The total number of pipelines and storage capacity remained the same from 1931 to 1951 (Board of Harbor Commissioners, 1951). By 1952, over 30 millions barrels of oil were shipped from the General Petroleum terminal (Board of Harbor Commissioners, 1952).

General Petroleum eventually became part of Mobil Oil, which was formed in 1960, and merged with Exxon in 1999 to become ExxonMobil. ExxonMobil currently operates the facilities at Berths 238-239.

Description

Located to the east of Wharf Street, Berths 238-239 are two separate concrete wharves each approximately 225 feet long by 30 feet wide. Plans for these wharves, designed by the engineering department of the General Petroleum Corporation, are dated March 12, 1925. The wharves are supported by asphalt impregnated and reinforced concrete pilings that are square in plan, although many of the pilings on Berth 239 in particular have been encased in concrete to provide additional strength, giving them a wider circular plan. Each wharf can be approached by two concrete ramps constructed in the same manner at the wharves. The decking on both wharves and the ramps is concrete with exposed aggregate, with evidence of more recent concrete patches. Recently constructed concrete bullrails are located along the waterside of the wharves, and painted iron cleats are interspersed along the bullrails at regular intervals. The fendering system along the length of both wharves consists of newer wood piles and rubber blocks. A steel hose tower is located near the southern end of Berth 239 which supports numerous steel pipes and rubber hoses. The tower assembly and piping system appears to have been constructed in the 1960s. Both berths contain one corrugated steel dock house each with a shed roof, aluminum sliding windows, and a steel door. The dock houses also appear to have been added in the 1960s. The seawall opposite Berth 239 is constructed of horizontal board-formed concrete, and appears to be in original condition, while the seawall opposite Berth 238 has generally the same dimensions but has been covered in newer concrete. Evidence of the location of former oil pipelines leading from the land to the water is apparent in the Berth 239 seawall, but these openings have been sealed off with brick and concrete. One square, concrete breasting dolphins was added to the northern end of Berth 238, while a similar dolphin was added to the southern end of Berth 239, which essentially lengthened each berth by about 75 feet. Both dolphins are accessed from the berths by wood frame walkways. Engineering plans from the Port of LA Engineering Division date the construction of the dolphins to 1963.

Two timber pile wharves, Berths 240A and 240B, are located immediately west of and parallel to Wharf Street. These timber wharves are each about 230 feet by 40 feet wide, and are accessed by two ramps each. Constructed on top of Berth 240A is a large, wood framed warehouse about 160 feet long by 60 feet wide with a gable roof and wood siding. Aerial photos of this facility in 1925 show one long timber wharf with a large, gable-roofed transit shed, which by 1957, had been replaced by two smaller timber wharfs (Berths 240A and B) and a transit shed atop Berth 240B.

The tank farm is encircled by a spill containment wall about 25 feet high. The wall is constructed of horizontal board formed concrete which is angled inward slightly. The walls divide the tank farm into approximately seven sections. The tank farm consists of 19 tanks clustered to the northeast of Berth 238. Tanks are mostly riveted and welded steel construction, most of which are about 40 feet high and about 120 feet in diameter. Most of the tanks date to the mid-1920s and early 1930s, except for one which was added in the 1990s, according to the facility operator.[2] Many of them appear altered with newer aluminum insulation siding and new roofs covered by geodomes which were added in the 1980s and 1990s to reduce emissions. A pipe valve field is located to the south and east of the tank farm, consisting of numerous painted steel valve wheels. Located to the southeast of the tank farm is a single-story control house with a rectangular plan, flat roof, and painted concrete block walls with a roman brick base. The building is about 35 feet by 45 feet in dimension. The north-facing elevation of this building has a series of large observatory windows consisting of fixed panes set in aluminum frames. Doors are steel. The control house appears to have been constructed in the early 1960s.

According to plans dated to 2007 from the Port of LA Engineering Division, numerous repairs occurred to Berth 238, including piling replacement, repair of the seawall, abandonment of the northern dolphin, fender system rehabilitation, sealing of topside deck surfaces, and installation of containment berms. Plans also indicate that repairs to the fendering system to Berth 239 was also completed at this same time.

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[2] Personal communication, Steve Brett, ExxonMobile, with Brad Brewster, ESA, December 9, 2010.

Evaluation

Berths 238-239 have been used continuously for the transshipment of oil since their original construction in the mid-1920s by the General Petroleum Corporation. The former General Petroleum Corporation facility is one of a few remaining oil terminals constructed at the Port of Los Angeles during the oil boom of the 1920s, a period which helped to establish the city as a major economic force in the region. As such, these berths may be eligible for listing in the NRHP Criteria A at the local level. However, while the original 1920s-era concrete wharf structures are generally intact, they have undergone various alterations over the years which have reduced their integrity. Changes which occurred in the 1960s, outside the facility's period of significance, include a newer tower assembly and piping system on Berth 239, two aluminum-clad dock houses (one on each wharf), and the addition of large, concrete breasting dolphins which essentially lengthened both wharves by about 75 feet each to accommodate larger ships. More recent changes include the encasement of the original square concrete pilings on Berth 239 with a wider, circular form, newer concrete bullrails along the waterside of both wharves, a newer fendering system along the length of both wharves consisting of replacement wood piles and rubber blocks, and alterations to the concrete seawall opposite Berth 238. Other changes to the setting have also occurred outside of this facility's period of significance, including alterations of many of the tanks with newer aluminum insulation siding and new roofs covered by geodomes which were added in the 1980s and 1990s. Other changes included the removal of a number of smaller facilities and three free-standing tanks just south of the tank farm (in the location of today's valve field), as well as the addition of a modern control house in the early 1960s. Alterations to adjacent Berths 240A and B are also apparent by 1957. The cumulative effect of these changes has resulted in a facility which looks significantly different from the one which operated in this location from the mid-1920s to 1950.

The wharves at Berths 238-239 would need to be evaluated as contributors to a terminal district to be considered eligible for listing in the NRHP. As described above, the integrity of the wharves at Berths 238-239 and their setting have been compromised to the extent that the facility no longer appears similar to when it was operated by the General Petroleum Corporation during the period of significance. No historical district can be formed because the integrity of materials, design, and setting has been substantially altered. Thus, the wharves at Berths 238-239 do not appear to be eligible for listing in the NRHP.

For similar reasons as described above, the wharves at Berths 238-239 to not appear eligible for listing in the CRHR, or as a City Monument.

5. Conclusions and Recommendations

Based on an intensive-level survey and evaluation, Berths 118-120, 148-149, 187-191, and 238-239 do not appear eligible for listing in the NRHP, CRHR, or as City Monuments due to a lack of historical significance, or a lack of physical integrity resulting from alterations which occurred to these facilities outside of the period of significance.

As none of these facilities are considered historic resources per federal, state, or local criteria, any changes that would occur to these facilities as a result of the proposed MOTEMS project would have no impact to historic resources. No project design changes for these berths are recommended.

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Berth 188

City of Los Angeles Harbor Department. *Wharf at Berths 188 Improvement Study*. January 19, 1921.

_____. *Wharf at Berths 188. Plan and General Layout.* January 19, 1921.

_____. *Shed at Berth 188. Steel Framing Diagram*. May 5, 1921.

Berth 189-190

City of Los Angeles Harbor Department. *Wharf and Shed 189-190. General Layout.* June 30, 1922.

_____. *Wharf at Berths 189-190. Typical Cross Section.* May 17, 1922.

_____. *Shed at Berth 189-190. General Design.* July 19, 1922.

Berth 191

City of Los Angeles Harbor Department. *Berth 191-192 Proposed Improvements*. November 28, 1922.

_____. Wharf at Berth 191. Raised Wharf & Widened Ramp. March 29, 1937.

General Petroleum Corporation. Engineering Office. *Fuel Oil Line Extension to Berths 188-189-190-191.* November 20, 1923.

Port of Los Angeles Engineering Division. *Permit Map. Coos Head Lumber & Plywood Company. Berths 190-193*. July 20, 1972.

Berths 238-239

General Petroleum Corporation Engineering Department, *Concrete Wharf No. 2 Southwestern Terminal.* March 12, 1925.

_____. *Reinforced Concrete Shell for Fifty Ton Concrete Mooring Anchor, Southwestern Terminal.* April 13, 1931.

_____. *Beth 238, 239 – Mooring Expansion. General Layout and Details of Dolphins*. June 4, 1963.

Port of Los Angeles Engineering Division. *Concrete Mooring Island at Berth 237 Landside Concrete Anchor and Mooring Island with Timber Walkway.* June, 1968.

_____. *B238 Wharf Rehabilitation. Overview of Scope of Work.* 2007.

APPENDIX A

Site Record Forms

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code

Other Listings
Review Code | Reviewer | Date

***Resource Name or #:** Port of Los Angeles, Berths 118-120

P1. Other Identifier:

***P2. Location:** ☐ **Not for Publication** ■ **Unrestricted** ***a. County:** Los Angeles

and (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad:** Long Beach, CA **Date:** 1981 **T** ; **R** ; **¼ of** **¼ of Sec** **;** M.D. **B.M.**

c. Address: City: Zip:

d. UTM: Zone: 10 ; mE/ mN (G.P.S.)

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate) Elevation:

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

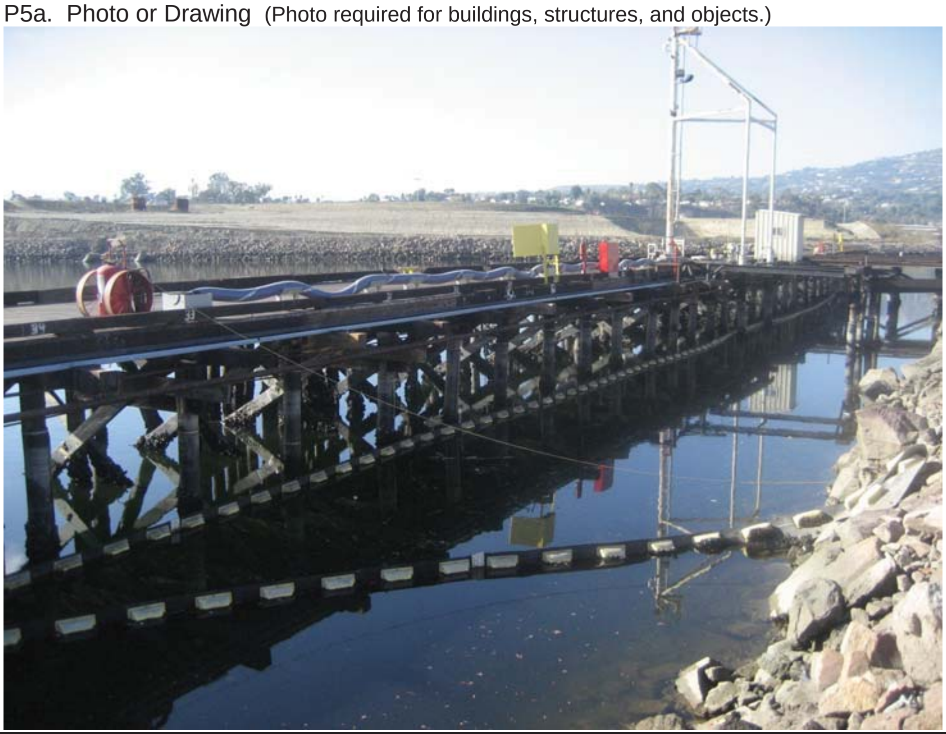
Berths 118-119 consists of a continuous timber wharf approximately 820 feet long by 20 feet wide and about 15 feet above the water line. The deck and piles are of timber construction. The fendering system also consists of timber piles. Many of the timber piles are wrapped in PVC plastic. Most of the decking appears to be original, although welded steel plates cover the decking in the vicinity of the pipe, valve, and hoist machinery. Wood bullrails are located along the outer edges of both wharves, interspersed with iron cleats located at regular intervals. Four approach ramps constructed of similar timber piles and decking as the wharves connect this structure with the land.

Located about 150 feet northeast from Berth 119 is the wharf at Berth 120. This structure is 400 feet long and 20 feet wide, and is constructed of identical materials as Berths 118-119, although it is more dilapidated. Four, small, corrugated metal dock houses are located on Berth 120, as are a number of steel cranes. A number of structures are located on the landside or 'backlands' portion of Berths 118-120. Located immediately to the north of the Berth 119 is a small valve house with a rectangular plan, gable roof, and corrugated metal siding and roofing. Windows are metal sash. Located further to the north of Berth 119 is a large tank farm consisting of 12 steel tanks encircled by a spill containment wall. The wall is made of horizontal board-formed (see continuation form)

***P3b. Resource Attributes:** (List attributes and codes) HP 11 Engineering Structure, HP 4 Ancillary Building

***P4. Resources Present:** ■Building ■Structure ☐Object ☐Site ☐District ☐Element of District ☐Other (Isolates, etc.)

P5a. Photo or Drawing (Photo required for buildings, structures, and objects.)



P5b. Description of Photo: (View, date, accession #)
Looking southeast 12/9/10

***P6. Date Constructed/Age and Sources:** ■Historic ☐Prehistoric ☐Both
1923

***P7. Owner and Address:**
Port of Los Angeles
425 Palos Verdes Street
San Pedro, CA 90733

***P8. Recorded by:** (Name, affiliation, and address)

Brad Brewster, ESA
225 Bush Street, Suite 1700
San Francisco, CA 94110

***P9. Date Recorded:** 12/4/09

***P10. Survey Type:** (Describe)
Intensive

***P11. Report Citation:** (Cite survey report and other sources, or enter "none.")

ESA. *Historic Resources Evaluation Report for Berths 118-120, 148-149, 187-191, and 238-239. Port of Los Angeles*. 2010.

***Attachments:** ☐NONE ■Location Map ☐Sketch Map ■Continuation Sheet ■Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
CONTINUATION SHEET

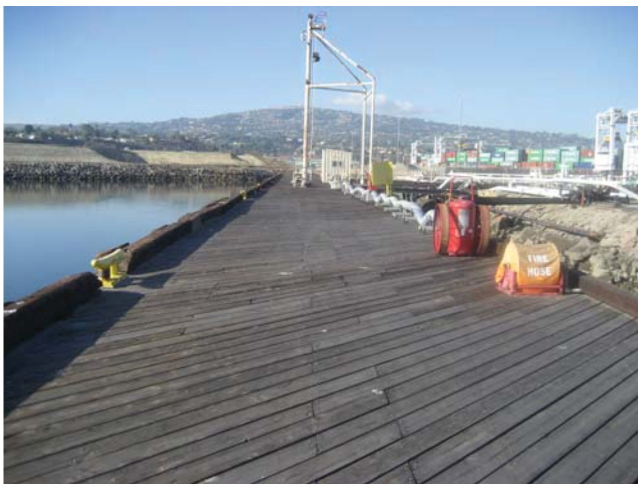
Primary #
HRI#
Trinomial

 ***Resource Name or #** (Assigned by recorder) Berths 118-120

***Recorded by:** Brad Brewster ***Date:** 12/14/09 ■ Continuation ☐ Update

reinforced concrete about 15 feet tall and about 1 foot thick. The tanks are a combination of welded and riveted steel, range in size from about 25 feet to 135 feet in diameter, and are about 40 to 50 feet tall. Three of the tanks are topped with newer steel geodomes, and some of them are wrapped in corrugated aluminum insulation. A cluster of six smaller tanks are located immediately north of Berth 118, which are also encircled by a spill containment wall.

Other structures include an office building, a pump house, heater units, a storage facility, an offload black-product rack, and an offload clean-product rack. The administration building is a one-story wood frame structure with stucco siding, a hip roof, and 1/1 woodframe windows. This building appears to date to the mid-1920s. The interior of the building appears to be highly altered. A concrete block warehouse with a flat roof and roll-up style doors was added to the rear of the administration building. This addition appears to date to the mid-1950s.



Berth 118

Berth 120

Tank Farm

Office Building

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary #
HRI#

BUILDING, STRUCTURE, AND OBJECT RECORD

***NRHP Status Code** 6Z

***Resource Name or #** (Assigned by recorder) Port of Los Angeles, Berths 118-120

B1. Historic Name: Berths 118-120
B2. Common Name:
B3. Original Use: Transshipment of oil   B4. Present Use: Transshipment of oil
***B5. Architectural Style:** Utilitarian
***B6. Construction History:** (Construction date, alterations, and date of alterations)

(see continuation sheet)

***B7. Moved?** ■No ☐Yes ☐Unknown **Date:** **Original Location:**
***B8. Related Features:**

B9a. Architect: Associated Oil Company   b. Builder: Los Angeles Harbor Department
***B10. Significance: Theme:** Transshipment of oil   **Area:** Los Angeles, CA
Period of Significance: 1920 – 1950   **Property Type:** Wharves   **Applicable Criteria:** N/A
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

Many of the structures affiliated with Associated Oil and Tidewater Associated Oil were demolished after a fire occurred in the 1950s. The tank farm and other existing buildings were constructed after that period and are associated with Time Oil (which leased the site as early as 1957), Westoil, (which arrived in 1974), GATX, or Kinder Morgan (the current occupant). The remaining elements of the oil terminal from the 1920s include the wharves at Berths 119-120, the administration building (altered), and a small valve house. The 1950s fire destroyed tanks built in the early part of the century, resulting in the construction of new storage facilities and other buildings at the site circa 1955. While these newly constructed tanks and other buildings are now more than 50 years old as of 2009, they were built outside of the period of significance (1920 – 1950) and do not appear to retain historical significance on an individual basis or as a grouping of facilities. Lacking historical significance, the buildings and structures at Berths 118-120 do not appear to be eligible for listing in the NRHP.

The wharves located at Berths 118-120 also do not appear to meet the criteria for listing in the NRHP. Originally constructed in 1922 as a component of an oil terminal, the wharves would need to be evaluated as contributors to a terminal district to be considered eligible for listing in the NRHP. The integrity of setting at Berths 118-120 has been compromised because many of the many buildings and structures at the terminal have been constructed outside of the period of significance, as discussed above. No historical district can be formed because integrity of setting has been compromised. Thus, the wharves at Berths 118-120 do not appear to be eligible for listing in the NRHP. For similar reasons, the wharves at Berths 118-120 do not appear to be eligible for listing in the California Register or as a City of Los Angeles historical or cultural monument.

B11. Additional Resource Attributes: (List attributes and codes) HP 11 Engineering Structure, HP 4 Ancillary Building

***B12. References:**

See References in evaluation report.

B13. Remarks:

***B14. Evaluator:** Brad Brewster, ESA
225 Bush Street, Suite 1700
San Francisco, CA 94110
***Date of Evaluation:** December, 2009

(Sketch Map with north arrow required.)

(This space reserved for official comments.)

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code

Other Listings
Review Code **Reviewer** **Date**

 ***Resource Name or #:** Port of Los Angeles, Berths 148-149

P1. Other Identifier:
***P2. Location:** ☐ **Not for Publication** ■ **Unrestricted** ***a. County:** Los Angeles
and (P2b and P2c or P2d. Attach a Location Map as necessary.)
***b. USGS 7.5' Quad:** Long Beach, CA **Date:** 1981 **T** ; **R** ; **¼ of** **¼ of Sec** **;** M.D. **B.M.**
c. Address: City: Zip:
d. UTM: Zone: 10 ; mE/ mN (G.P.S.)
e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate) Elevation:

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

The wharf at Berths 148-149 measures approximately 600 feet long by 35 feet wide, and stands approximately 15 high above the waterline. It features concrete construction throughout, including the deck. Concrete vehicular access ramps extend from the land to the wharf at two points. Two pedestrian-scale steel ramps or gangways also extend to the wharf. Wood bullrails are located along the outer edge of the wharf, interspersed with iron cleats located at regular intervals. The fendering system consists of timber piles and rubber blocks. Located on Berth 149 is a small metal frame dock house with a corrugated shed roof and metal sash windows. Also located on Berth 149 are numerous pipe manifolds, hoses, cranes, a steel joist, and a boom. Other steel pipes supported by concrete piles and beams run parallel to the wharf, between it and the land. These pipes transport oil and other petroleum products from the wharf to the nearby tanks and to the refinery in Wilmington. The wharf at Berth 148 was constructed in 1930 and reconstructed as a concrete wharf in 1955, the same year the wharf at Berth 149 was constructed. Located to the northeast of Berths 148-149 are a number of facilities, including the west end tank farm. The tank farm consists of approximately 9 welded steel storage tanks, accessed by metal stairs. Some tanks feature corrugated aluminum insulated siding to keep heavy oils viscous and easier to pump. Other tanks are topped with steel geodomes. The structures vary in diameter and are generally 40-50 feet in height. The tank farm is encircled by a spill containment wall about 15 feet in height.

***P3b. Resource Attributes:** (List attributes and codes) HP 11 Engineering Structure, HP 4 Ancillary Building
***P4. Resources Present:** ■Building ■Structure ☐Object ☐Site ☐District ☐Element of District ☐Other (Isolates, etc.)

P5a. Photo or Drawing (Photo required for buildings, structures, and objects.)

P5b. Description of Photo: (View, date, accession #)
Berth 148-149 looking west. 12/09/09

***P6. Date Constructed/Age and Sources:** ■Historic ☐Prehistoric ☐Both
1955

***P7. Owner and Address:**
Port of Los Angeles
425 Palos Verdes Street
San Pedro, CA 90733

***P8. Recorded by:** (Name, affiliation, and address)
Brad Brewster, ESA
225 Bush Street, Suite 1700
San Francisco, CA 94110

***P9. Date Recorded:** 12/4/09
***P10. Survey Type:** (Describe)
Intensive

***P11. Report Citation:** (Cite survey report and other sources, or enter "none.")
ESA. *Historic Resources Evaluation Report for Berths 118-120, 148-149, 187-191, and 238-239. Port of Los Angeles*. 2010.

***Attachments:** ☐NONE ■Location Map ☐Sketch Map ■Continuation Sheet ■Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary #
HRI#

BUILDING, STRUCTURE, AND OBJECT RECORD

Page 2 **of** 2

***NRHP Status Code** 6Z.

***Resource Name or #** (Assigned by recorder) Port of Los Angeles, Berths 148-149

B1. Historic Name: Berths 148-149
B2. Common Name:
B3. Original Use: Transshipment of oil
B4. Present Use: Transshipment of oil
***B5. Architectural Style:** Utilitarian
***B6. Construction History:** (Construction date, alterations, and date of alterations)

Original Berth 149 constructed in 1931, demolished and rebuilt at 148-149 in 1955.

***B7. Moved?** ■**No** ☐**Yes** ☐**Unknown** **Date:** **Original Location:**
***B8. Related Features:**

B9a. Architect: Los Angeles Harbor Engineer's Office
b. Builder: Los Angeles Harbor Department
***B10. Significance: Theme:** Transshipment of oil
Area: Los Angeles, CA
Period of Significance: 1920 – 1950 **Property Type:** Wharves **Applicable Criteria:** N/A
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

Berths 148-149. The facility located at Berths 148-149 was constructed in 1955, after the period of significance (1920-1950). This development replaced an earlier and smaller timber wharf with a larger and more modern concrete wharf. An entirely new tank farm (the west-end tank farm) was also constructed at this time, as was the dock house, the substation, and gate house. By the 1950s the use of the Port of Los Angeles for the transshipment and storage of oil had been well established and had reached a mature state. While the facility at Berths 148-149 expanded Union Oil's existing production capabilities, it does not appear to retain historical significance on an individual basis or as a grouping of related facilities. Lacking historical significance, the buildings and structures at Berths 148-149 do not appear to be eligible for listing in the NRHP. For similar reasons, the buildings and structures at Berths 148-149 do not appear to be eligible for listing in the California Register or as a City of Los Angeles historical or cultural monument.

B11. Additional Resource Attributes: (List attributes and codes) HP 11 Engineering Structure, HP 4 Ancillary Building

***B12. References:**

See References in evaluation report.

B13. Remarks:

***B14. Evaluator:** Brad Brewster, ESA
225 Bush Street, Suite 1700
San Francisco, CA 94110
***Date of Evaluation:** December, 2009

(Sketch Map with north arrow required.)

(This space reserved for official comments.)

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code

Other Listings
Review Code **Reviewer** **Date**

 ***Resource Name or #:** Port of Los Angeles, Berths 187-191

P1. Other Identifier:
***P2. Location:** ☐ **Not for Publication** ■ **Unrestricted** ***a. County:** Los Angeles
and (P2b and P2c or P2d. Attach a Location Map as necessary.)
***b. USGS 7.5' Quad:** Long Beach, CA **Date:** 1981 **T** ; **R** ; **¼ of** **¼ of Sec** **;** M.D. **B.M.**
c. Address: City: Zip:
d. UTM: Zone: 10 ; mE/ mN (G.P.S.)
e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate) Elevation:

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

Berths 187-191 consist of four continuous wharves located just west of, and parallel to, Canal Street in Los Angeles Harbor's East Basin. Berths 187-190 run north-south, while Berth 191 runs at an angle from northeast to southwest. Berths 190 and 191 meet at point at the southernmost end of the facility. The wharves at berths 187-189 are constructed of reinforced concrete pilings with concrete decking. They are approximately 50 wide and 1,150 feet long in total length. The outer edge of the decking consists concrete bullrails about 1 foot high, interspersed with iron cleats located at regular intervals along both wharves. The fendering system consists of wood pilings with rubber blocks. Unlike other oil terminals at the Port of LA, no open water exists between the wharves and the backlands. The backlands to the east of the wharves are entirely paved and fenced. A steel pipe bridge located at berth 188 contains pipes and pipe valves. Other machinery in the area includes manifolds and a steel crane.

The wharves at berths 190-191 are constructed of timber pilings and wood decking covered by asphalt. Berth 190 is about 750 feet long (as determined by the length of the asphalt decking) and about 50 feet wide. Berth 191 is about 500 feet long and about 50 feet wide. Wood bullrails are located along the entire length of the outer edge of both wharves, interspersed with iron cleats located at regular intervals. The fendering system consists of wood pilings connected by wood chucks. Two rows of railroad tracks are embedded in the asphalt decking of berth 190. The separation between Berth 190 and 189 and 191 is evident by a clear break in
(see continuation sheet)

***P3b. Resource Attributes:** (List attributes and codes) HP 11 Engineering Structure, HP 4 Ancillary Building
***P4. Resources Present:** ■Building ■Structure ☐Object ☐Site ☐District ☐Element of District ☐Other (Isolates, etc.)

P5a. Photo or Drawing (Photo required for buildings, structures, and objects.)

P5b. Description of Photo: (View, date, accession #)
Looking northeast on Berth 191 12/9/10

***P6. Date Constructed/Age and Sources:** ■Historic ☐Prehistoric ☐Both
1922

***P7. Owner and Address:**
Port of Los Angeles
425 Palos Verdes Street
San Pedro, CA 90733

***P8. Recorded by:** (Name, affiliation, and address)
Brad Brewster, ESA
225 Bush Street, Suite 1700
San Francisco, CA 94110
***P9. Date Recorded:** 12/4/09
***P10. Survey Type:** (Describe)
Intensive

***P11. Report Citation:** (Cite survey report and other sources, or enter "none.")
ESA. *Historic Resources Evaluation Report for Berths 118-120, 148-149, 187-191, and 238-239. Port of Los Angeles*. 2010.
***Attachments:** ☐NONE ■Location Map ☐Sketch Map ■Continuation Sheet ■Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

***Resource Name or #** (Assigned by recorder) Port of Los Angeles, Berths 187-191

***Recorded by:** Brad Brewster ***Date:** 12/14/09 ■ Continuation ☐ Update

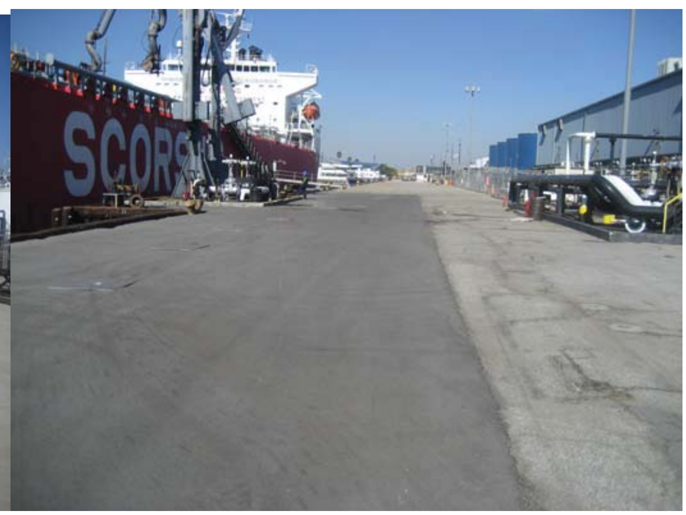
the railroad tracks. The decking on Berth 191 consists of recently-applied asphalt with painted lanes, and the wood bull rails appear to be of relatively recent vintage. According to the Port, approximately 20 original timber piles on Berth 191 were replaced with new timber piles within the last six months. The entire backlands area of Berths 191 is open and paved.

Buildings in the vicinity include a two story office building which is located at the northern end of Berth 187. The office building, about 200 feet long by about 70 feet wide, is rectangular in plan with a flat roof, and consists of horizontal board-formed poured concrete and concrete block construction. Ribbon windows are located on the eastern and western elevation, and consist of awning-type units made with metal sashes. Other windows are aluminum sliders. The office was originally a warehouse in the 1920s, but converted into an office building in the 1950s, which is evidenced by the concrete block infill of many original openings and the installation of the ribbon windows.

Other structures at Berths 187-191 include a large, two story cement warehouse toward the southern end of the facility near Berth 190 – 191. This building, about 460 feet long by about 200 feet wide, has an irregular plan, a shallow gable roof, and is clad in corrugated metal siding. Plans indicate this warehouse was constructed in the mid-1980s. At the southern end of this structure is a large, moveable piece of steel machinery called a Kovaco Pump which is used to suction powdered cement from ships and transport it to and from the warehouse. The pump runs along the length of Berth 191.

Other structures in the vicinity include a series of about 15 welded steel tanks each about 50 feet high. These tanks are located parallel to Berths 187-189 and west of Canal Street. Most of the tanks are about 40 feet in diameter, while two are about 60 feet in diameter. Other structures on the wharves include a small, corrugated metal operator's office (dock house) located at Berth 187, and a small, stucco-clad restroom structure located at Berth 189. Both the dock house and the restroom structure appear to have been constructed in the 1970s.

Berth 188



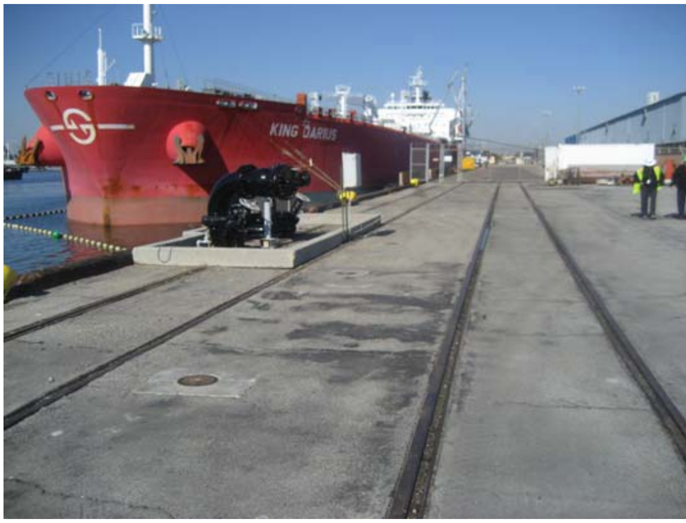
Berth 189

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
CONTINUATION SHEET

Primary #
HRI#
Trinomial

***Resource Name or #** (Assigned by recorder) Port of Los Angeles, Berths 187-191

***Recorded by:** Brad Brewster ***Date:** 12/14/09 ■ Continuation ☐ Update



Berth 190

Tank Farm By Berth 188


Office Building by Berth 187


Cement Warehouse by Berth 190-191

BUILDING, STRUCTURE, AND OBJECT RECORD

***NRHP Status Code** 6Z

***Resource Name or #** (Assigned by recorder) Port of Los Angeles, Berths 187-191

B1. Historic Name: Berths 187-191
B2. Common Name: Same
B3. Original Use: Transshipment of food oil and mail B4. Present Use: Transshipment of chemicals, vegetable oils, and liquefied gases
***B5. Architectural Style:** Utilitarian
***B6. Construction History:** (Construction date, alterations, and date of alterations)

***B7. Moved?** ■**No** ☐**Yes** ☐**Unknown** **Date:** **Original Location:**
***B8. Related Features:**

B9a. Architect: Los Angeles Harbor Engineer's Office b. Builder: Los Angeles Harbor Department
***B10. Significance: Theme:** Transshipment of food oils and mail **Area:** Los Angeles, CA
Period of Significance: N/A **Property Type:** N/A **Applicable Criteria:** N/A
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

The facilities at Berths 187-191 were originally built in the early 1920s for the Vegetable Oil Products Company and the Pacific Mail Steamship Company, which operated two large sheds located atop the wharves. Numerous railroad tracks once encircled theses facilities. Although the original concrete wharf structures are generally intact, the sheds were demolished and replaced with newer warehouse facilities in the 1980s. The majority of railroad tracks, as well as the railroad turntable at the intersection of Berths 190-191, were also removed around this same time. The decking, fendering system, and some of the pilings have also undergone various alterations over the years. The transshipment of food oils and mail were secondary, rather than primary, activities of the Port which were relatively short-lived. As such, these activities do not have a separate period of significance nor do they share the historical theme of petroleum transshipment as do the other terminals evaluated in this report.

The wharves at Berths 187-191 would need to be evaluated as contributors to a terminal district to be considered eligible for listing in the NRHP. As described above, the wharves at Berths 187-191 are not strongly associated with important historical themes at the Port, and their integrity has been compromised because all of the original terminal sheds have been demolished and replaced by newer facilities. No historical district can be formed due to a lack of important historical associations and reduced physical integrity. Thus, the wharves at Berths 187-191 do not appear to be eligible for listing in the NRHP. For similar reasons, the wharves at Berths 187-191 do not appear to be eligible for listing in the California Register or as a City of Los Angeles historical or cultural monument.

B11. Additional Resource Attributes: (List attributes and codes) HP 11 Engineering Structure, HP 4 Ancillary Building

***B12. References:**

See References in evaluation report.

B13. Remarks:

***B14. Evaluator:** Brad Brewster, ESA
225 Bush Street, Suite 1700
San Francisco, CA 94110
***Date of Evaluation:** December, 2009

(This space reserved for official comments.)

(Sketch Map with north arrow required.)

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code

Other Listings
Review Code | Reviewer | Date

***Resource Name or #:** Port of Los Angeles, Berths 238-239

P1. Other Identifier:

***P2. Location:** ☐ **Not for Publication** ■ **Unrestricted** ***a. County:** Los Angeles

and (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad:** Long Beach, CA **Date:** 1981 **T** ; **R** ; **¼ of** **¼ of Sec** **;** M.D. **B.M.**

c. Address: City: Zip:

d. UTM: Zone: 10 ; mE/ mN (G.P.S.)

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate) Elevation:

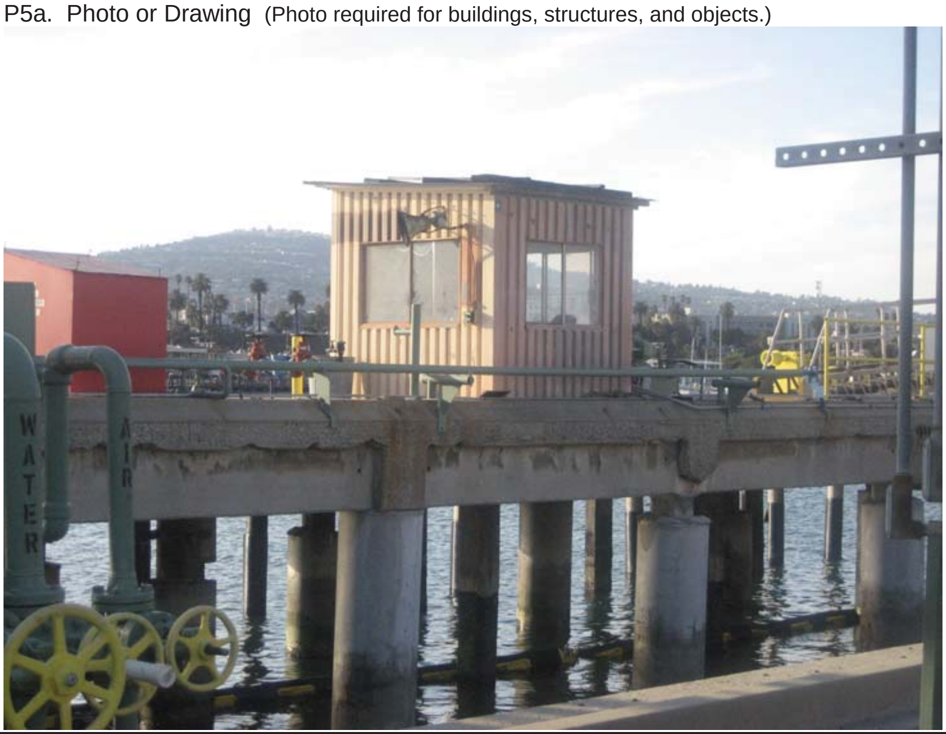
***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

Located to the east of Wharf Street, Berths 238-239 are two separate concrete wharves each approximately 225 feet long by 30 feet wide. Plans for these wharves, designed by the engineering department of the General Petroleum Corporation, are dated March 12, 1925. The wharves are supported by asphalt impregnated and reinforced concrete pilings that are square in plan, although many of the pilings on Berth 239 in particular have been encased in concrete to provide additional strength, giving them a wider circular plan. Each wharf can be approached by two concrete ramps constructed in the same manner at the wharves. The decking on both wharves and the ramps is concrete with exposed aggregate, with evidence of more recent concrete patches. Recently constructed concrete bullrails are located along the waterside of the wharves, and painted iron cleats are interspersed along the bullrails at regular intervals. The fendering system along the length of both wharves consists of newer wood piles and rubber blocks. A steel hose tower is located near the southern end of Berth 239 which supports numerous steel pipes and rubber hoses. The tower assembly and piping system appears to have been constructed in the 1960s. Both berths contain one corrugated steel dock house each with a shed roof, aluminum sliding windows, and a steel door. The dock houses also appear to have been added in the 1960s. The seawall opposite Berth 239 is constructed of horizontal board-formed concrete, and appears to be in original condition, while the seawall opposite Berth 238 has generally the same dimensions but has been covered in newer concrete. Evidence of the location of former oil pipelines leading from the land to the water is apparent in the Berth 239 seawall, but these
(see continuation sheet)

***P3b. Resource Attributes:** (List attributes and codes) HP 11 Engineering Structure, HP 4 Ancillary Building

***P4. Resources Present:** ■Building ■Structure ☐Object ☐Site ☐District ☐Element of District ☐Other (Isolates, etc.)

P5a. Photo or Drawing (Photo required for buildings, structures, and objects.)



P5b. Description of Photo: (View, date, accession #)
Looking northwest at Berth 238. 12/9/10

***P6. Date Constructed/Age and Sources:** ■Historic ☐Prehistoric ☐Both
1925

***P7. Owner and Address:**
Port of Los Angeles
425 Palos Verdes Street
San Pedro, CA 90733

***P8. Recorded by:** (Name, affiliation, and address)
Brad Brewster, ESA
225 Bush Street, Suite 1700
San Francisco, CA 94110

***P9. Date Recorded:** 12/4/09

***P10. Survey Type:** (Describe)
Intensive

***P11. Report Citation:** (Cite survey report and other sources, or enter "none.")
ESA. *Historic Resources Evaluation Report for Berths 118-120, 148-149, 187-191, and 238-239. Port of Los Angeles*. 2010.

***Attachments:** ☐NONE ■Location Map ☐Sketch Map ■Continuation Sheet ■Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
CONTINUATION SHEET

Primary #
HRI#
Trinomial

 ***Resource Name or #** (Assigned by recorder) Port of Los Angeles, Berth 238-239

***Recorded by:** Brad Brewster ***Date:** 12/14/09 ■ Continuation ☐ Update

openings have been sealed off with brick and concrete. One square, concrete breasting dolphin was added to the northern end of Berth 238, while a similar dolphin was added to the southern end of Berth 239, which essentially lengthened each berth by about 75 feet. Both dolphins are accessed from the berths by wood frame walkways. Engineering plans from the Port of LA Engineering Division date the construction of the dolphins to 1963.

Two timber pile wharves, Berths 240A and 240B, are located immediately west of and parallel to Wharf Street. These timber wharves are each about 230 feet by 40 feet wide, and are accessed by two ramps each. Constructed on top of Berth 240A is a large, wood framed warehouse about 160 feet long by 60 feet wide with a gable roof and wood siding. Aerial photos of this facility in 1925 show one long timber wharf with a large, gable-roofed transit shed, which by 1957, had been replaced by two smaller timber wharfs (Berths 240A and B) and a transit shed atop Berth 240B.

The tank farm is encircled by a spill containment wall about 25 feet high. The wall is constructed of horizontal board formed concrete which is angled inward slightly. The walls divide the tank farm into approximately seven sections. The tank farm consists of 19 tanks clustered to the northeast of Berth 238. Tanks are mostly riveted and welded steel construction, most of which are about 40 feet high and about 120 feet in diameter. Most of the tanks date to the mid-1920s and early 1930s, except for one which was added in the 1990s, according to the facility operator. Many of them appear altered with newer aluminum insulation siding and new roofs covered by geodomes which were added in the 1980s and 1990s to reduce emissions. A pipe valve field is located to the south and east of the tank farm, consisting of numerous painted steel valve wheels. Located to the southeast of the tank farm is a single-story control house with a rectangular plan, flat roof, and painted concrete block walls with a roman brick base. The building is about 35 feet by 45 feet in dimension. The north-facing elevation of this building has a series of large observatory windows consisting of fixed panes set in aluminum frames. Doors are steel. The control house appears to have been constructed in the early 1960s.

According to plans dated to 2007 from the Port of LA Engineering Division, numerous repairs occurred to Berth 238, including piling replacement, repair of the seawall, abandonment of the northern dolphin, fender system rehabilitation, sealing of topside deck surfaces, and installation of containment berms. Plans also indicate that repairs to the fendering system to Berth 239 was also completed at this same time.

Berth 238


Tank Farm (background) and Valve Field (foreground)

BUILDING, STRUCTURE, AND OBJECT RECORD

***NRHP Status Code** 6Z

***Resource Name or #** (Assigned by recorder) Port of Los Angeles, Berths 238-239

B1. Historic Name: Berths 238-139
B2. Common Name:
B3. Original Use: Transshipment of oil   B4. Present Use: Transshipment of oil
***B5. Architectural Style:** Utilitarian
***B6. Construction History:** (Construction date, alterations, and date of alterations)

(see continuation sheet)

***B7. Moved?** ■No ☐Yes ☐Unknown **Date:** **Original Location:**
***B8. Related Features:**

B9a. Architect: Los Angeles Harbor Engineer's Office   b. Builder: Los Angeles Harbor Department
***B10. Significance: Theme:** Shipping of oil   **Area:** Los Angeles, CA
Period of Significance: 1920 – 1950   **Property Type:** Wharves   **Applicable Criteria:** N/A
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

Berths 238-239 have been used continuously for the transshipment of oil since their original construction in the mid-1920s by the General Petroleum Corporation. The former General Petroleum Corporation facility is one of a few remaining oil terminals constructed at the Port of Los Angeles during the oil boom of the 1920s, a period which helped to establish the city as a major economic force in the region. As such, these berths may be eligible for listing in the NRHP Criteria A at the local level. However, while the original 1920s-era concrete wharf structures are generally intact, they have undergone various alterations over the years which have reduced their integrity. Changes which occurred in the 1960s, outside the facility's period of significance, include a newer tower assembly and piping system on Berth 239, two aluminum-clad dock houses (one on each wharf), and the addition of large, concrete breasting dolphins which essentially lengthened both wharves by about 75 feet each to accommodate larger ships. More recent changes include the encasement of the original square concrete pilings on Berth 239 with a wider, circular form, newer concrete bullrails along the waterside of both wharves, a newer fendering system along the length of both wharves consisting of replacement wood piles and rubber blocks, and alterations to the concrete seawall opposite Berth 238. Other changes to the setting have also occurred outside of this facility's period of significance, including alterations of many of the tanks with newer aluminum insulation siding and new roofs covered by geodomes which were added in the 1980s and 1990s. (see continuation sheet)

B11. Additional Resource Attributes: (List attributes and codes) HP 11 Engineering Structure, HP 4 Ancillary Building

***B12. References:**

See References in evaluation report.

B13. Remarks:

***B14. Evaluator:** Brad Brewster, ESA
225 Bush Street, Suite 1700
San Francisco, CA 94110
***Date of Evaluation:** December, 2009

(This space reserved for official comments.)

(Sketch Map with north arrow required.)

***Resource Name or #** (Assigned by recorder) Port of Los Angeles, Berths 238-239

***Recorded by:** Brad Brewster ***Date:** 12/14/09 ■ Continuation ☐ Update

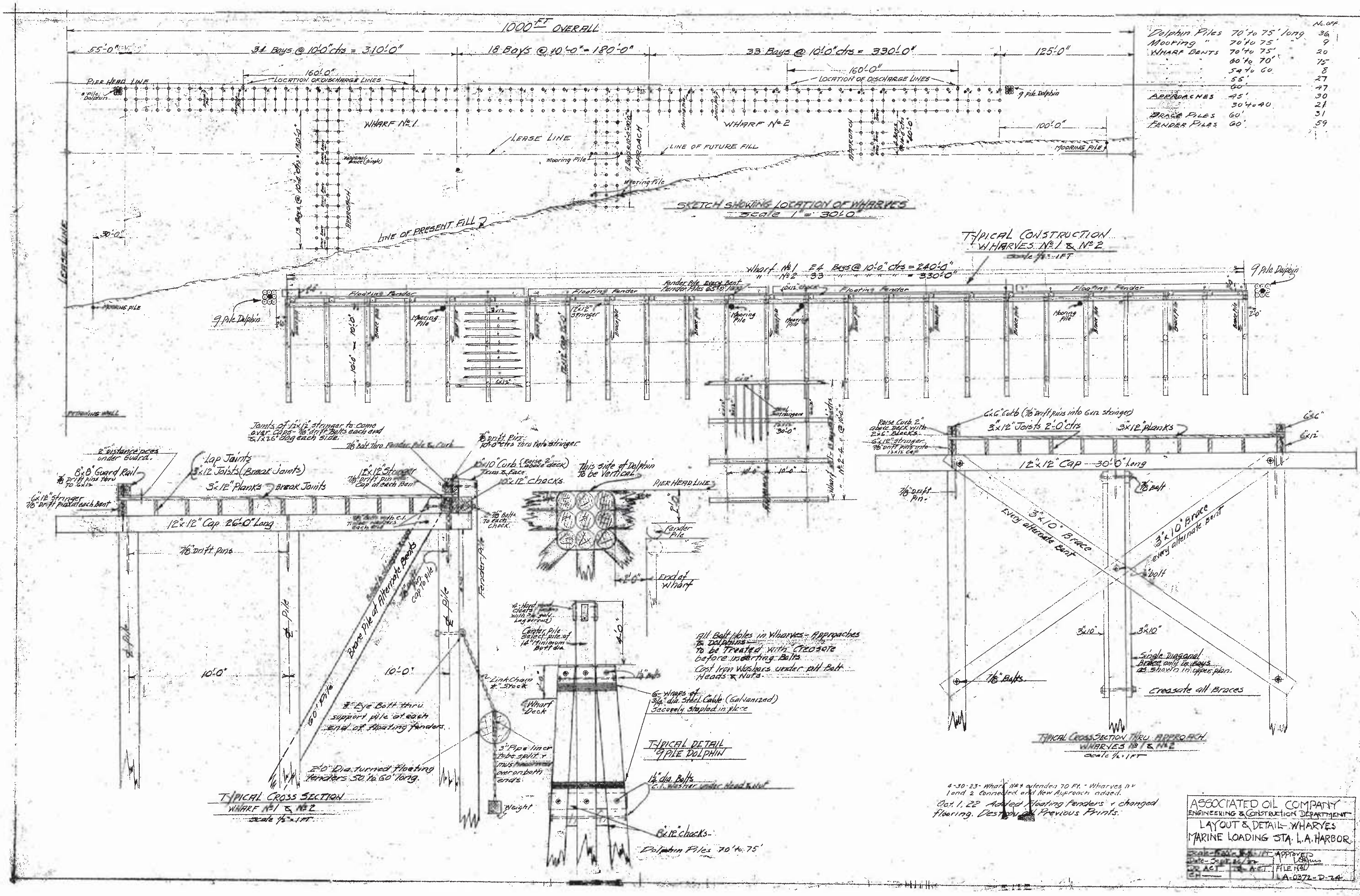
Other changes included the removal of a number of smaller facilities and three free-standing tanks just south of the tank farm (in the location of today's valve field), as well as the addition of a modern control house in the early 1960s. Alterations to adjacent Berths 240A and B are also apparent by 1957. The cumulative effect of these changes has resulted in a facility which looks significantly different from the one which operated in this location from the mid-1920s to 1950.

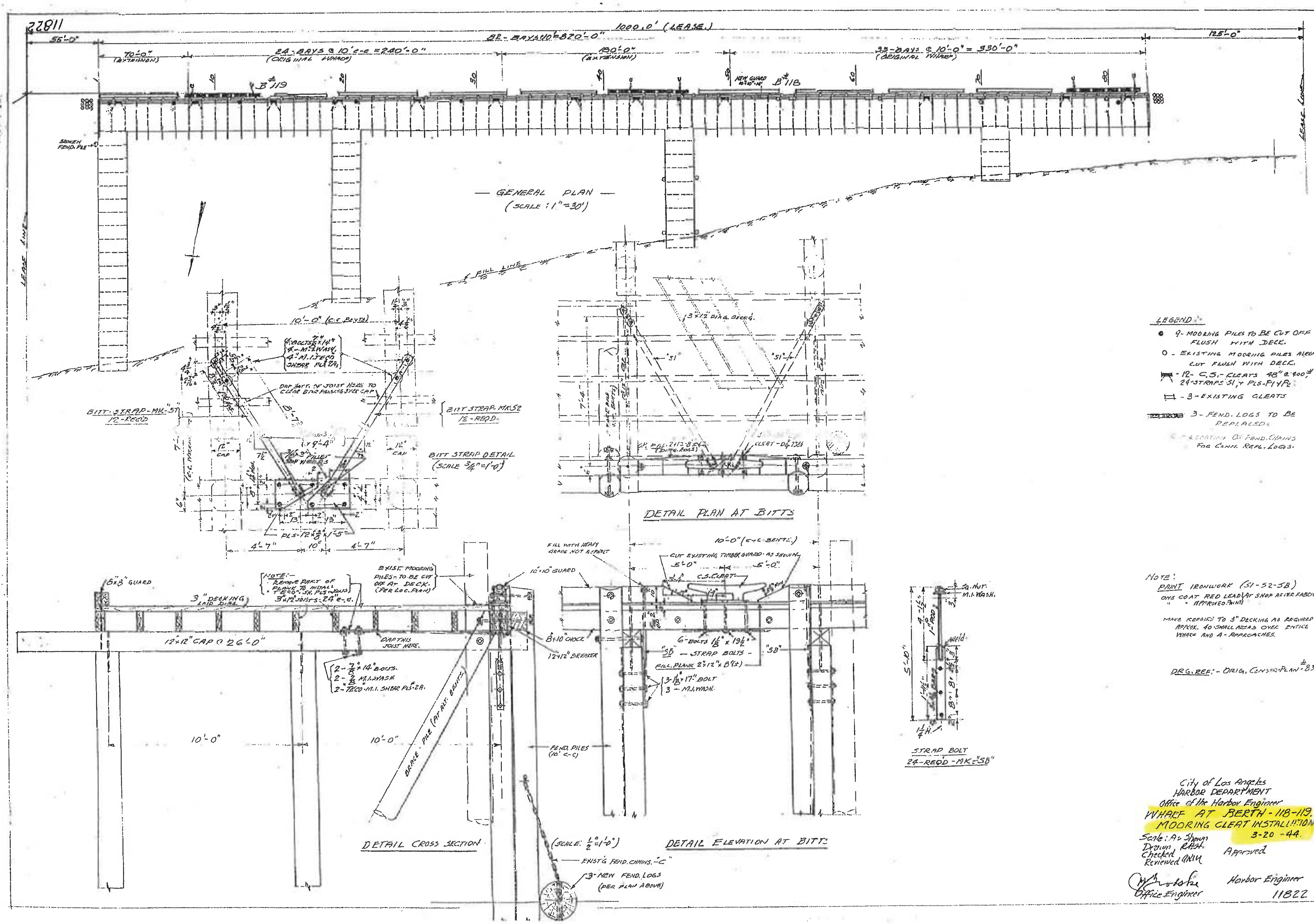
The wharves at Berths 238-239 would need to be evaluated as contributors to a terminal district to be considered eligible for listing in the NRHP. As described above, the integrity of the wharves at Berths 238-239 and their setting have been compromised to the extent that the facility no longer appears similar to when it was operated by the General Petroleum Corporation during the period of significance. No historical district can be formed because the integrity of materials, design, and setting has been substantially altered. Thus, the wharves at Berths 238-239 do not appear to be eligible for listing in the NRHP.

For similar reasons as described above, the wharves at Berths 238-239 to not appear eligible for listing in the CRHR, or as a City Monument.

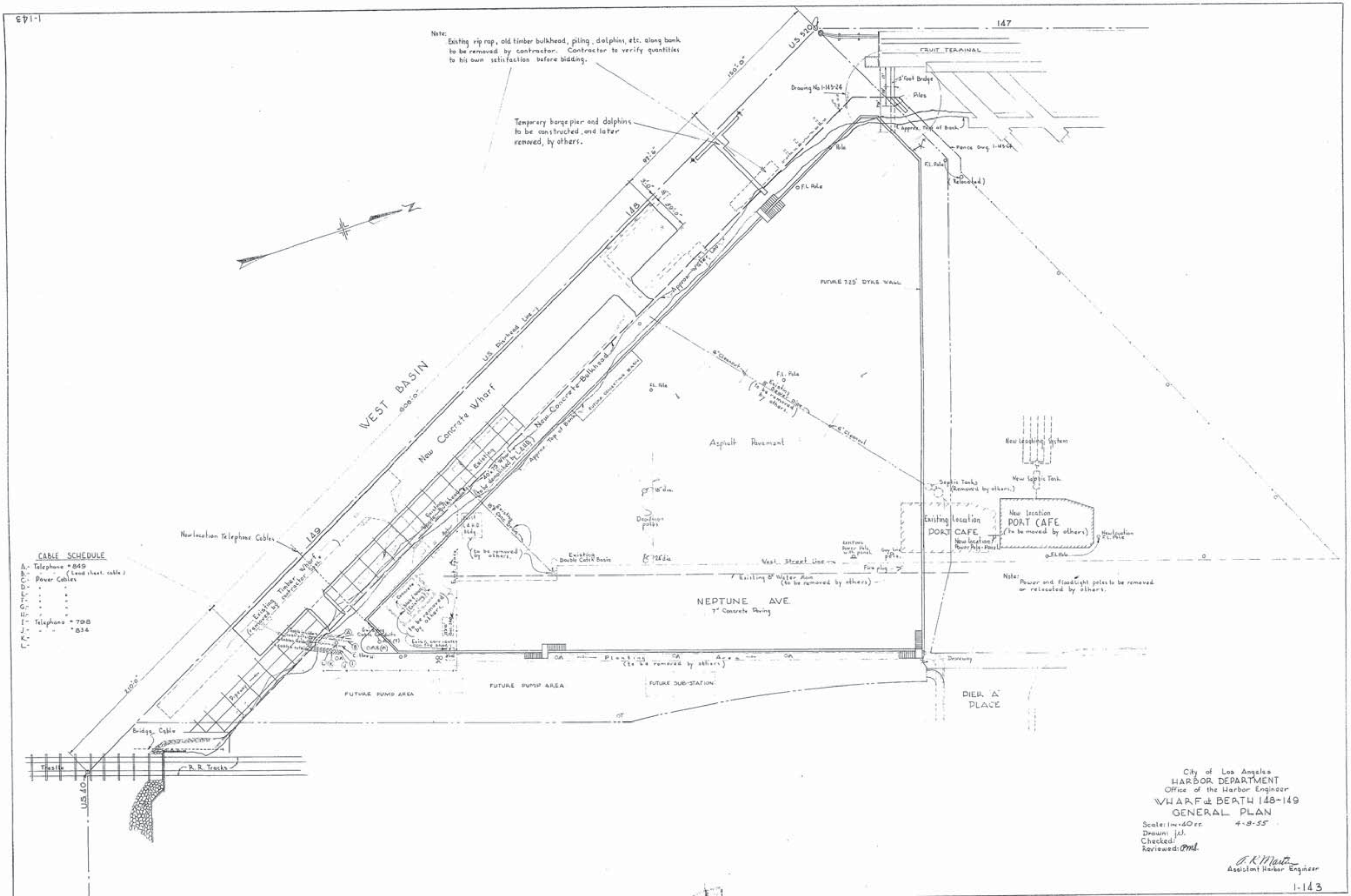
APPENDIX B

Plans and Drawings

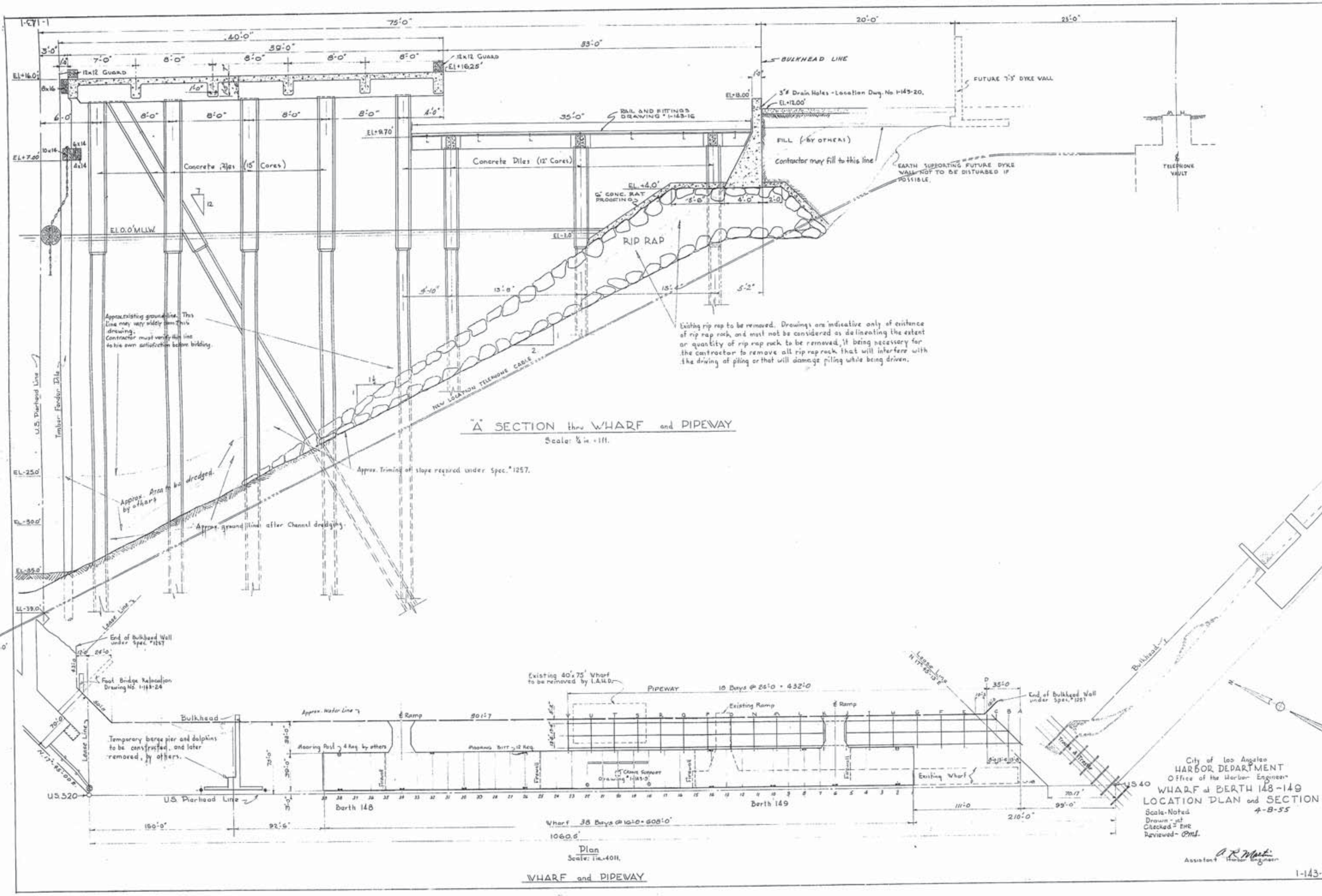

1000 FT OVERALL
55'-0"
34 Bays @ 10'-0" ctrs = 310'-0"
18 Bays @ 10'-0" = 180'-0"
33 Bays @ 10'-0" ctrs = 330'-0"
125'-0"
160'-0"
LOCATION OF DISCHARGE LINES
PIER HEAD LINE
9 Pile Dolphin
WHARF No 1
WHARF No 2
LEASE LINE
LINE OF FUTURE FILL
LINE OF PRESENT FILL
APPROACH
Mooring Pile
MOORING PILE
100'-0"
30'-0"
SKETCH SHOWING LOCATION OF WHARVES
Scale 1" = 30'-0"
Dolphin Piles 70' to 75' long 36
Mooring " 70' to 75' 9
Wharf Bents 70' to 75' 20
60' to 70' 75
54' to 60 8
55' 27
60' 47
Approaches 45' 30
30' to 40 21
Brace Piles 60' 31
Fender Piles 60' 59
TYPICAL CONSTRUCTION
WHARVES No 1 & No 2
Scale 1/8" = 1 FT
Wharf No 1 24 Bays @ 10'-0" ctrs = 240'-0"
" No 2 33 " = 330'-0"
Floating Fender
Mooring Pile
Brace Pile
9 Pile Dolphin
TYPICAL CROSS SECTION
WHARF No 1 & No 2
Scale 1/2" = 1 FT
12"x12" Cap 26'-0" Long
3"x12" Planks
3"x12" Joists (Break Joints)
Lap Joints
8"x8" Guard Rail
7/8" drift pins
10'-0"
60' Pile
Brace Pile at Alternate Bents
Fender Pile
2'-0" Dia. turned Floating Fenders 50' to 60' long.
3/4" Eye Bolt thru support pile at each end of floating fenders.
Weight
TYPICAL DETAIL
9 PILE DOLPHIN
This side of Dolphin to be Vertical
PIER HEAD LINE
Fender Pile
End of Wharf
6 Wraps of 3/4" dia. Steel Cable (Galvanized) Securely stapled in place
1 1/4" dia Bolts
8"x12" chocks
Dolphin Piles 70' to 75'
All Bolt Holes in Wharves - Approaches & Dolphins - to be Treated with Creosote before inserting Bolts.
Cast Iron Washers under all Bolt Heads & Nuts.
TYPICAL CROSS SECTION THRU APPROACH
WHARVES No 1 & No 2
Scale 1/2" = 1 FT
12"x12" Cap 30'-0" Long
3"x12" Joists 2'-0" ctrs
3"x12" planks
3"x10" Brace
Every alternate Bent
Single Diagonal Brace only in Bays as shown in upper plan.
Creosote all Braces
7/8" Bolts
4-30-23 - Wharf No 1 extended 70 Ft. - Wharves No 1 and 2 Connected and New Approach added.
Oct. 1, 22 Added Floating Fenders & changed flooring. Destroy all Previous Prints.
ASSOCIATED OIL COMPANY
ENGINEERING & CONSTRUCTION DEPARTMENT
LAYOUT & DETAIL - WHARVES
MARINE LOADING STA. L.A. HARBOR
A-0372-D-24

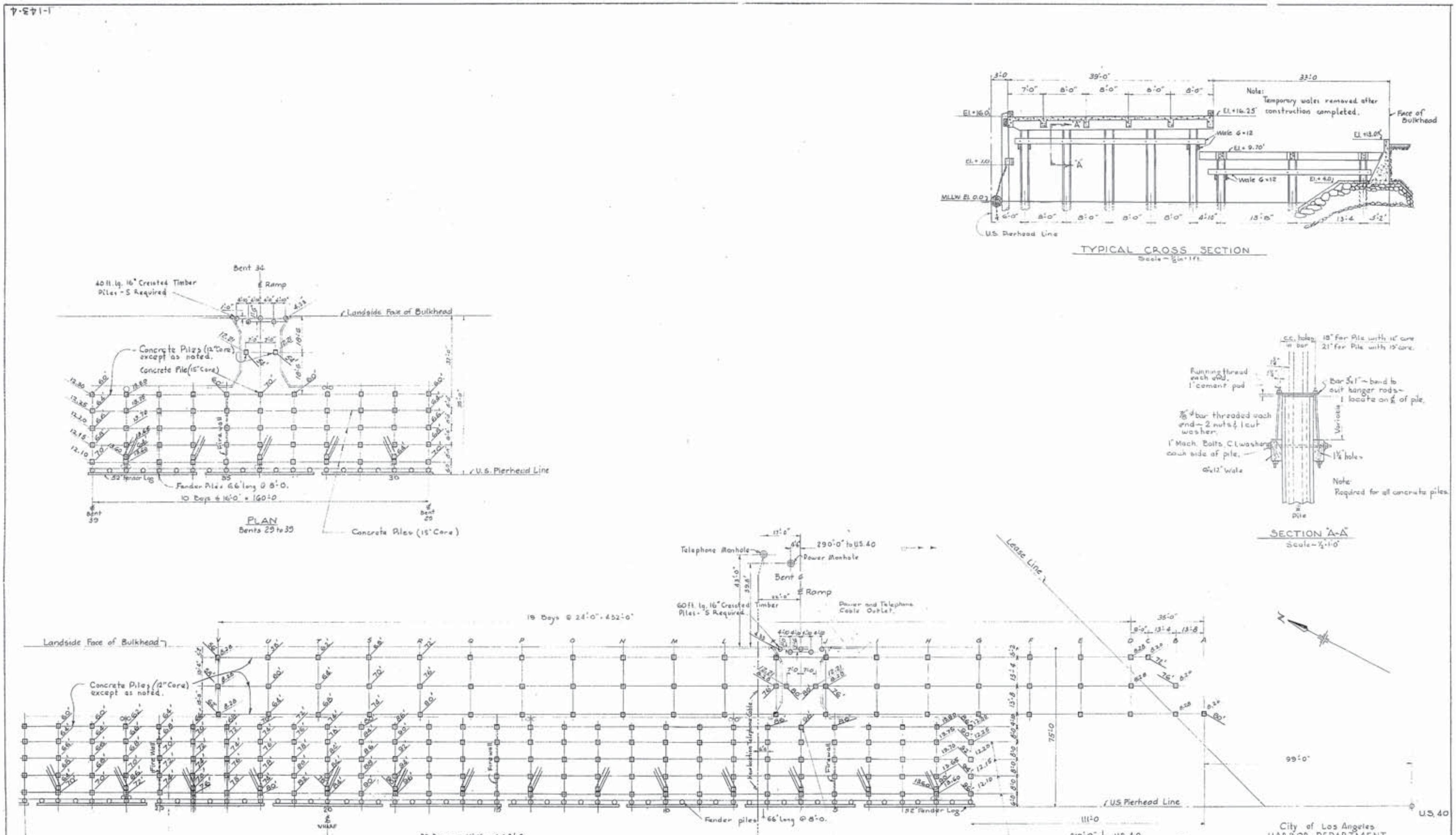


22811
1000.0' (LEASE)
82 - BAYS @ 10' = 820'-0"
125'-0"
55'-0"
70'-0" (EXTENSION)
24-BAYS @ 10' c-c = 240'-0" (ORIGINAL WHARF)
190'-0" (EXTENSION)
33-BAYS @ 10'-0" = 330'-0" (ORIGINAL WHARF)
B# 119
B# 118
LEASE LINE
FILL LINE
— GENERAL PLAN —
(SCALE: 1" = 30')
BITT STRAP-MK-S1
12-REQD
BITT STRAP-MK-S2
12-REQD
BITT STRAP DETAIL
(SCALE 3/4" = 1'-0")
10'-0" (C-C BAYS)
DETAIL PLAN AT BITTS
3"x12 DIAG. DECK'G.
DETAIL CROSS SECTION
DETAIL ELEVATION AT BITTS
(SCALE: 1/2" = 1'-0")
6"x8" GUARD
3" DECKING LAID DIAG.
12"x12" CAP @ 26'-0"
10'-0"
10'-0"
EXIST. MOORING PILES - TO BE CUT OFF AT DECK. (PER LOC. PLAN)
10"x10" GUARD
8"x10" CHOCK
12"x12" BREAKER
FEND. PILES (10' c-c)
EXIST'G FEND. CHAINS - "C"
3-NEW FEND. LOGS (PER PLAN ABOVE)
BRACE - PILE (AT ALT. BENTS)
10'-0" (C-C BENTS)
CUT EXISTING TIMBER GUARD AS SHOWN
5'-0"
5'-0"
C.S. CLEAT
FILL WITH HEAVY GRADE HOT ASPHALT
6-BOLTS 1 1/8" x 19 1/2"
"SB" — STRAP BOLTS — "SB"
FILL. PLANK 2"x12" x 8'(2)
3-1 1/8" x 17" BOLT
3 - M.I. WASH.
STRAP BOLT
24-REQD-MK-"SB"
LEGEND:
9- MOORING PILES TO BE CUT OFF FLUSH WITH DECK.
O - EXISTING MOORING PILES ALREADY CUT FLUSH WITH DECK.
12- C.S.- CLEATS 48" @ 900#
24-STRAPS S1, + PLS-P1 + P2
3- EXISTING CLEATS
3- FEND. LOGS TO BE REPLACED
LOCATION OF FEND. CHAINS FOR CONN. REPL. LOGS.
NOTE:
PAINT IRONWORK (S1-S2-SB)
ONE COAT RED LEAD AT SHOP AFTER FABRICATION,
" " APPROVED PAINT
MAKE REPAIRS TO 3" DECKING AS REQUIRED APPROX. 40 SMALL AREAS OVER ENTIRE WHARF AND 4 - APPROACHES.
DRG. REF: - ORIG. CONSTR. PLAN #8330
City of Los Angeles
HARBOR DEPARTMENT
Office of the Harbor Engineer
WHARF AT BERTH - 118 - 119.
MOORING CLEAT INSTALLATION
3-20-44
Scale: As Shown
Drawn
Checked
Reviewed
Approved
Office Engineer
Harbor Engineer
11822



Note:
Existing rip rap, old timber bulkhead, piling, dolphins, etc. along bank to be removed by contractor. Contractor to verify quantities to his own satisfaction before bidding.
Temporary barge pier and dolphins to be constructed, and later removed, by others.
147
FRUIT TERMINAL
WEST BASIN
New Concrete Wharf
New Concrete Bulkhead
U.S. Pierhead Line
148
149
Asphalt Pavement
FUTURE 7.25' DYKE WALL
New Leaching System
New Septic Tank
New location PORT CAFE (to be moved by others)
Existing location PORT CAFE
NEPTUNE AVE
7" Concrete Paving
West Street Line
FUTURE PUMP AREA
FUTURE SUB-STATION
PIER 'A' PLACE
R.R. Tracks
Trestle
Bridge Cable
New location Telephone Cables
Note:
Power and floodlight poles to be removed or relocated by others.
CABLE SCHEDULE
A.- Telephone #849
B.- (Lead sheet cable)
C.- Power Cables
I.- Telephone #798
J.- #834
City of Los Angeles
HARBOR DEPARTMENT
Office of the Harbor Engineer
WHARF at BERTH 148-149
GENERAL PLAN
Scale: 1in.=40ft.
4-8-55
Drawn: J.J.
Checked:
Reviewed:
Assistant Harbor Engineer
1-143


1-143-1
"A" SECTION thru WHARF and PIPEWAY
Scale: ¼ in. = 1 ft.
Existing rip rap to be removed. Drawings are indicative only of existence of rip rap rock, and must not be considered as delineating the extent or quantity of rip rap rock to be removed, it being necessary for the contractor to remove all rip rap rock that will interfere with the driving of piling or that will damage piling while being driven.
Approx. existing ground line. This line may vary widely from this drawing. Contractor must verify this line to his own satisfaction before bidding.
Approx. Trimming of slope required under Spec. #1257.
Approx. ground line after Channel dredging.
Approx. Area to be dredged by others
BULKHEAD LINE
3" Drain Holes - Location Dwg. No. 1-143-20.
FUTURE 7'-3" DYKE WALL
EARTH SUPPORTING FUTURE DYKE WALL NOT TO BE DISTURBED IF POSSIBLE.
FILL (BY OTHERS)
Contractor may fill to this line
RAIL AND FITTINGS DRAWING # 1-143-16
Concrete Piles (15" Cores)
Concrete Piles (12" Cores)
6" CONC. RAT PROOFING
RIP RAP
NEW LOCATION TELEPHONE CABLE
TELEPHONE VAULT
12x12 GUARD
EL 0.0' MLLW
U.S. Pierhead Line
Timber Fender Pile
Plan
Scale: 1 in. = 40 ft.
WHARF and PIPEWAY
PIPEWAY 18 Bays @ 24'-0 = 432'-0
Wharf 38 Bays @ 16'-0 = 608'-0
1060.6'
Existing 40'x75' Wharf to be removed by L.A.H.D.
End of Bulkhead Wall under Spec. #1257
Foot Bridge Relocation Drawing No. 1-143-24
Temporary barge pier and dolphins to be constructed, and later removed, by others.
Berth 148
Berth 149
Existing Wharf
Existing Ramp
Mooring Post - 4 Req. by others
Mooring Bitt - 12 Req.
Crane Support Drawing # 1-143-5
Lease Line
Bulkhead
City of Los Angeles
HARBOR DEPARTMENT
Office of the Harbor Engineer
WHARF at BERTH 148-149
LOCATION PLAN and SECTION
4-8-55
Scale - Noted
Drawn - JRT
Checked - EHR
Reviewed - RMS
Assistant Harbor Engineer
1-143-1



GENERAL NOTE:

1. Required safe bearing for conrete piles equals 30 tons per pile unless noted.
2. All piles to be driven to minimum penetration so that top of pile after driving will not be above elevation +16.0' for wharf and ramp piles and El.+10.0 for pipe support piles.
3. Cut-off elevation for each pile to be finally determined by engineer before driving operation commences.
4. Timber Piles denoted by O ; Concrete Piles denoted by □.

City of Los Angeles
HARBOR DEPARTMENT
Office of the Harbor Engineer

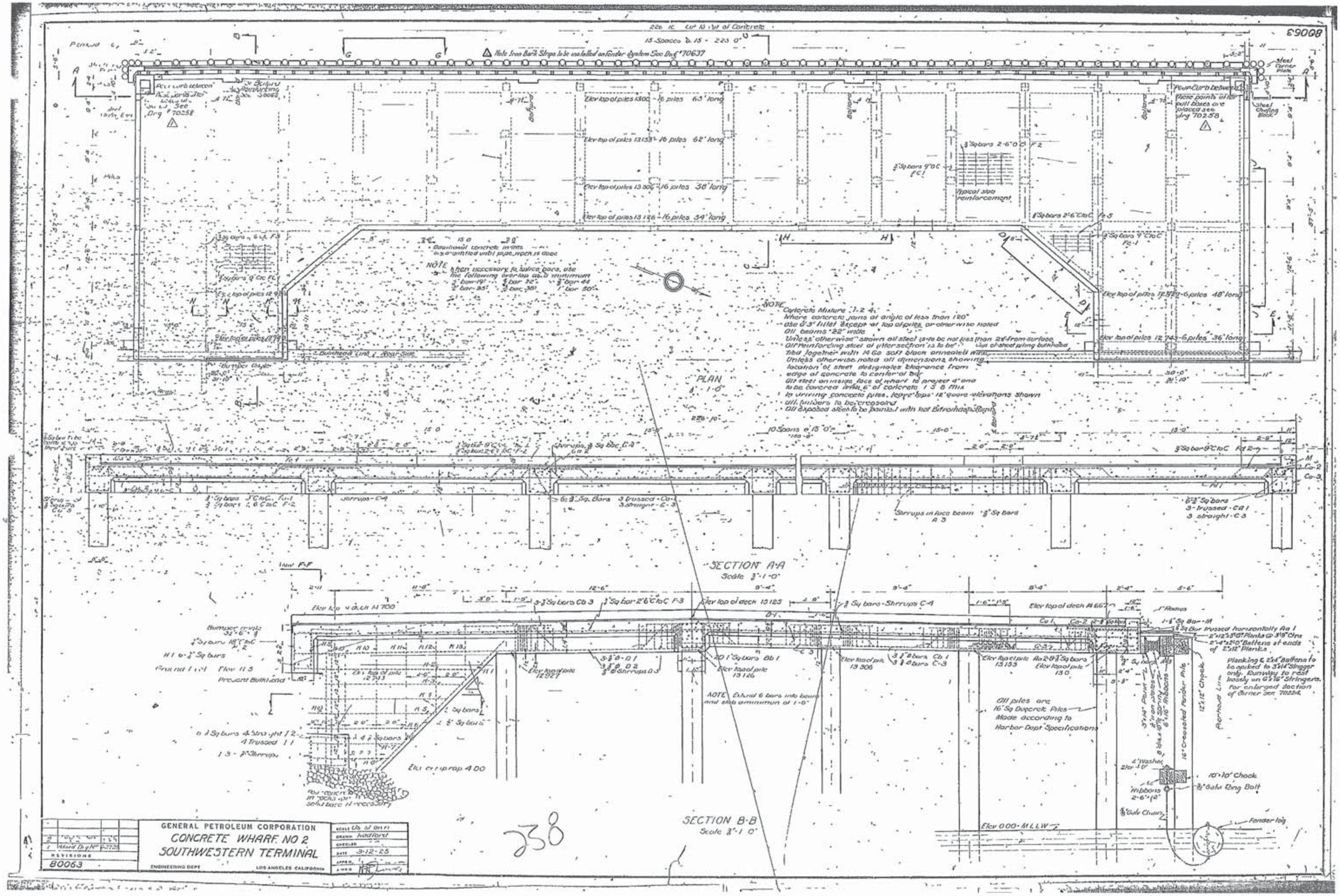
WHARF at BERTH 148-149
PILE PLAN and DETAILS

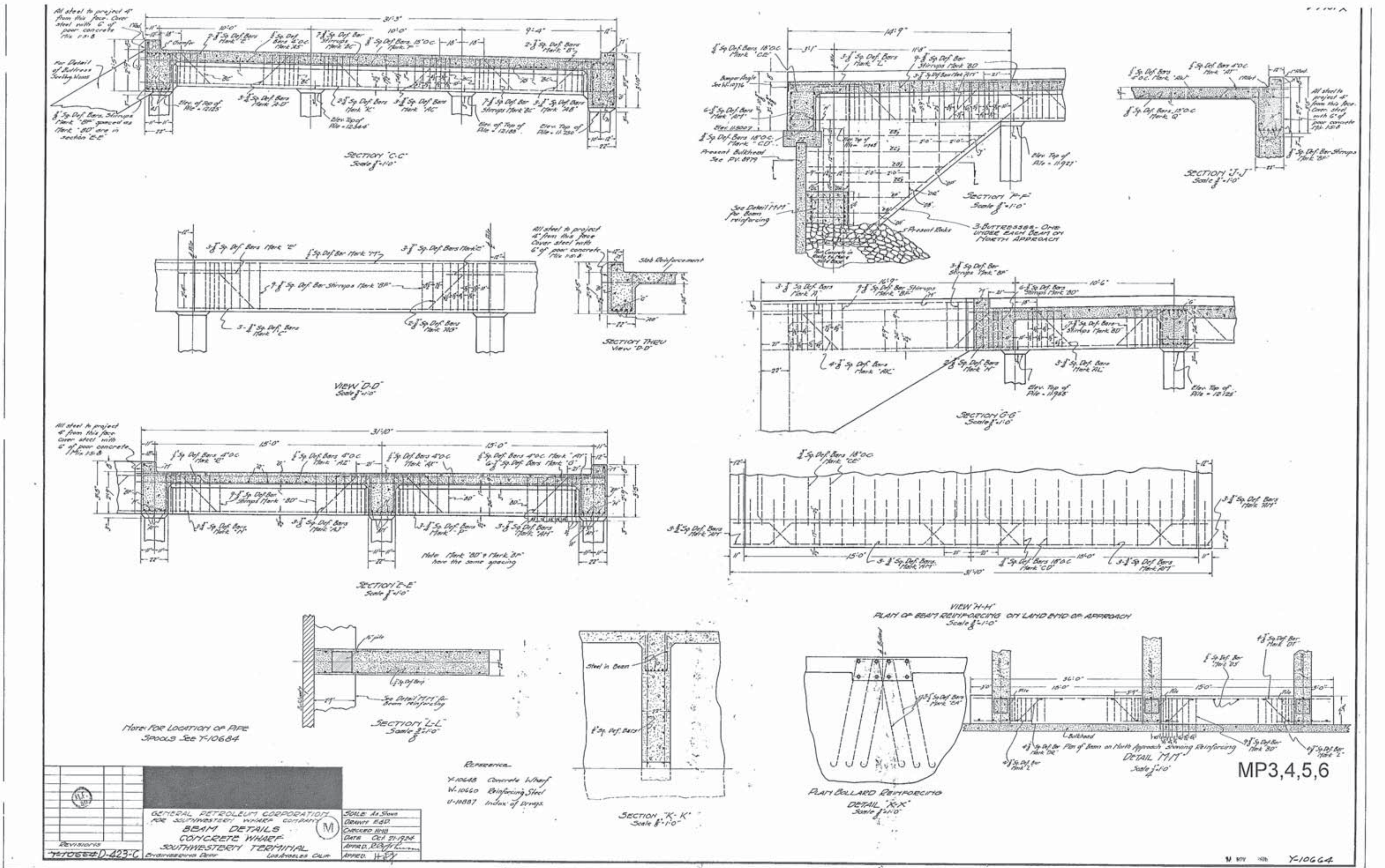
Scale - 1" = 20'
Drawn - jst
Checked - ene
Reviewed - OMd.

4-8-55

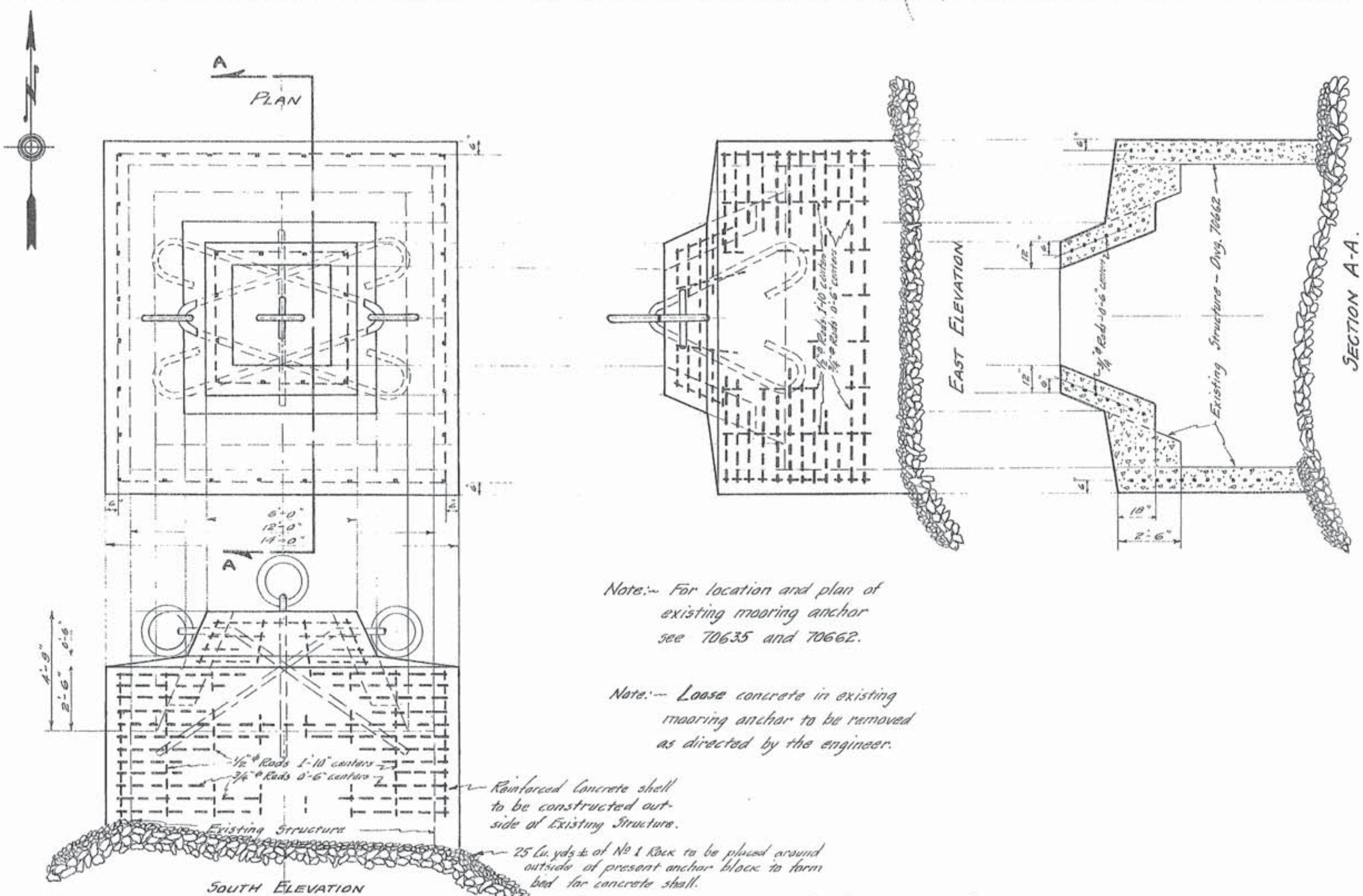
A.R. Martin
Assistant Harbor Engineer

1-143-4


80063
PLAN
$\frac{1}{8}$" - 1'-0"
SECTION A-A
Scale $\frac{3}{8}$" - 1'-0"
SECTION B-B
Scale $\frac{3}{8}$" - 1'-0"
NOTE
Concrete Mixture 1:2:4
Where concrete joins at angle of less than 120° use 3" fillet except at top of piles, or otherwise noted
All beams 22" wide
Unless otherwise shown all steel is to be not less than 2" from surface
All reinforcing steel at intersection is to be tied together with 14 Ga soft black annealed wire
Unless otherwise noted all dimensions showing location of steel designates clearance from edge of concrete to center of bar
All steel on inside face of wharf to project 4" and to be covered with 6" of concrete 1:3:6 mix
In driving concrete piles, leave tops 12" above elevations shown
All timbers to be creosoted
All exposed steel to be painted with hot Bitromastic
All piles are 16" Sq Concrete Piles Made according to Harbor Dept Specifications
Elev 0.00 - M.L.L.W.
GENERAL PETROLEUM CORPORATION
CONCRETE WHARF NO 2
SOUTHWESTERN TERMINAL
ENGINEERING DEPT
LOS ANGELES CALIFORNIA
REVISIONS
80063
238



SECTION "C-C"
Scale 3/8"=1'-0"
SECTION "P-P"
Scale 3/8"=1'-0"
3-BUTTRESSES - ONE UNDER EACH BEAM ON NORTH APPROACH
SECTION "J-J"
Scale 3/8"=1'-0"
VIEW "D-D"
Scale 3/8"=1'-0"
SECTION THRU VIEW "D-D"
SECTION "G-G"
Scale 3/8"=1'-0"
SECTION "E-E"
Scale 3/8"=1'-0"
Note: Mark "BD" & Mark "BF" have the same spacing
VIEW "H-H"
PLAN OF BEAM REINFORCING ON LAND END OF APPROACH
Scale 3/8"=1'-0"
SECTION "L-L"
Scale 3/8"=1'-0"
SECTION "K-K"
Scale 3/8"=1'-0"
PLAN BOLLARD REINFORCING
DETAIL "X-X"
Scale 3/8"=1'-0"
DETAIL "M-M"
Scale 1/4"=1'-0"
NOTE: FOR LOCATION OF PIPE SPOOLS SEE Y-10684
Reference
Y-10648 Concrete Wharf
W-10660 Reinforcing Steel
U-10887 Index of Drwgs.
[redacted]
GENERAL PETROLEUM CORPORATION FOR SOUTHWESTERN WHARF COMPANY
BEAM DETAILS
CONCRETE WHARF
SOUTHWESTERN TERMINAL
ENGINEERING DEPT LOS ANGELES CALIF
SCALE As Shown
DRAWN E.&D.
CHECKED H.H.B.
DATE Oct 21-1924
Revisions
Y-10664 D-423-C
MP3,4,5,6
Y-10664



Note:– For location and plan of existing mooring anchor see 70635 and 70662.

Note:– Loose concrete in existing mooring anchor to be removed as directed by the engineer.

Reinforced Concrete shell to be constructed outside of Existing Structure.

25 Cu. yds ± of No 1 Rock to be placed around outside of present anchor block to form bed for concrete shell.

Note:– Concrete to be 1-2-2½ mix – 7 sks per cu. yd.

1	Revised	4-13-31	[illegible]

REVISIONS

NUMBER 62302

B-279 C

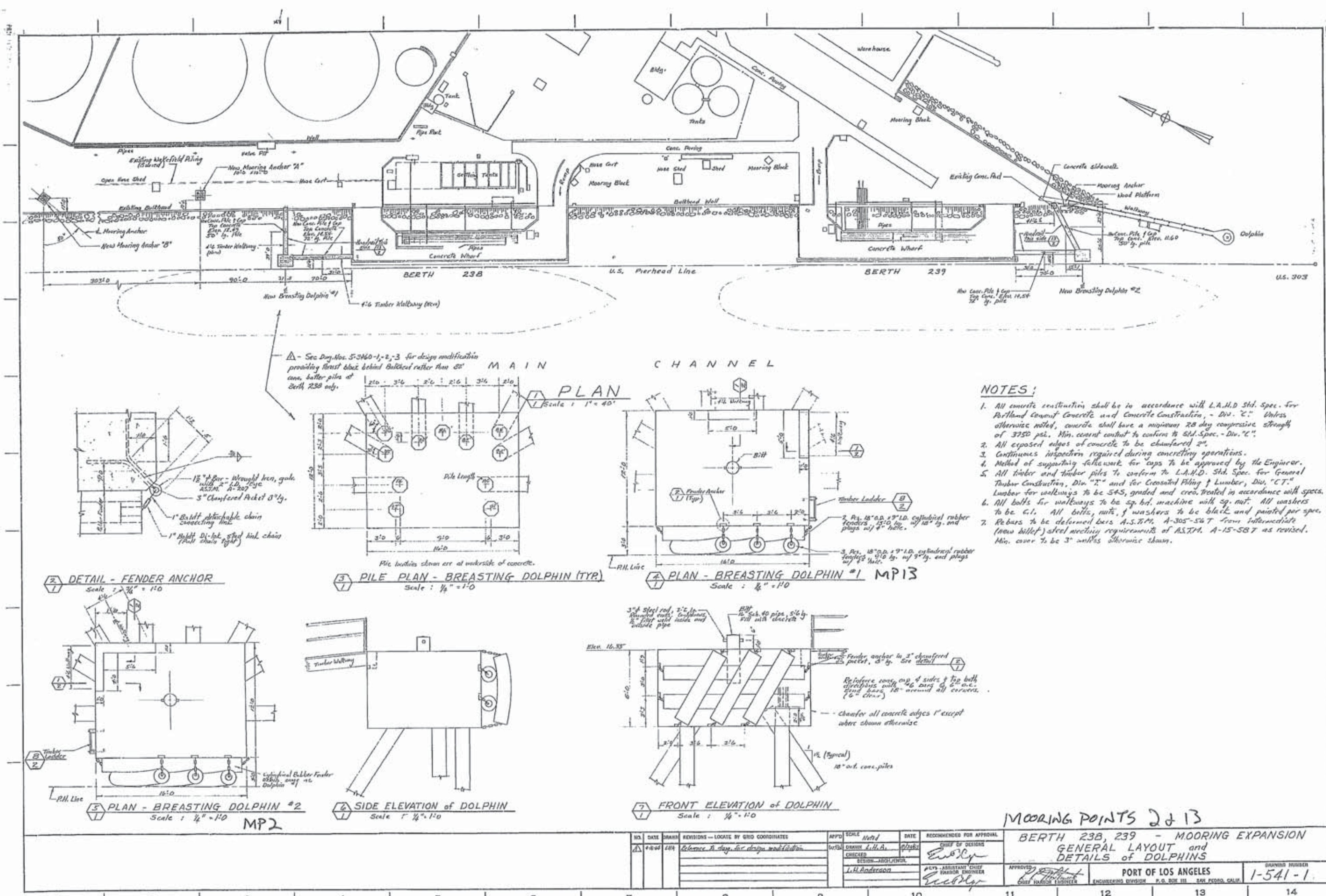
GENERAL PETROLEUM CORPORATION
OF CALIFORNIA

REINFORCED CONCRETE SHELL
FOR FIFTY TON CONCRETE MOORING ANCHOR
SOUTHWESTERN TERMINAL

ENGINEERING DEPT. LOS ANGELES, CALIFORNIA

SCALE	1/4" = 1'
DRAWN	F.O. Hart
CHECKED	[illegible]
DATE	March 9-1931.
APPR'D	[illegible signature]

List #5581.


MAIN CHANNEL
PLAN
Scale : 1" = 40'
BERTH 238
BERTH 239
U.S. Pierhead Line
U.S. 303
Warehouse
Tanks
Conc. Paving
Mooring Block
Concrete Wharf
Bulkhead Wall
Existing Bulkhead
New Mooring Anchor "A"
New Mooring Anchor "B"
New Breasting Dolphin #1
New Breasting Dolphin #2
Concrete sidewalk
Mooring Anchor
Wood Platform
Walkway
Dolphin
4'6 Timber Walkway (New)
See Dwg. Nos. 5-3160-1,-2,-3 for design modification providing thrust block behind Bulkhead rather than 20° cone. batter piles at Berth 238 only.
NOTES:
1. All concrete construction shall be in accordance with L.A.H.D Std. Spec. for Portland Cement Concrete and Concrete Construction, - Div. "C." Unless otherwise noted, concrete shall have a minimum 28 day compressive strength of 3750 psi. Min. cement content to conform to Std. Spec. - Div. "C".
2. All exposed edges of concrete to be chamfered 2".
3. Continuous inspection required during concreting operations.
4. Method of supporting falsework for caps to be approved by the Engineer.
5. All timber and timber piles to conform to L.A.H.D. Std. Spec. for General Timber Construction, Div. "T." and for Creosoted Piling & Lumber, Div. "CT." Lumber for walkways to be S4S, graded and creo. treated in accordance with specs.
6. All bolts for walkways to be sq. hd. machine with sq. nut. All washers to be C.I. All bolts, nuts, & washers to be black and painted per spec.
7. Rebars to be deformed bars A.S.T.M. A-305-56T from intermediate (new billet) steel meeting requirements of A.S.T.M. A-15-58T as revised. Min. cover to be 3" unless otherwise shown.
DETAIL - FENDER ANCHOR
Scale : 3/4" = 1'-0
PILE PLAN - BREASTING DOLPHIN (TYP.)
Scale : 1/8" = 1'-0
Pile butts shown are at waterside of concrete.
PLAN - BREASTING DOLPHIN #1
Scale : 1/4" = 1'-0
MP13
PLAN - BREASTING DOLPHIN #2
Scale : 1/4" = 1'-0
MP2
SIDE ELEVATION of DOLPHIN
Scale 1/4" = 1'-0
FRONT ELEVATION of DOLPHIN
Scale : 1/4" = 1'-0
Chamfer all concrete edges 1" except where shown otherwise
18" oct. conc. piles
MOORING POINTS 2 & 13
BERTH 238, 239 - MOORING EXPANSION
GENERAL LAYOUT and
DETAILS of DOLPHINS
PORT OF LOS ANGELES
ENGINEERING DIVISION P.O. BOX 111 SAN PEDRO, CALIF.
DRAWING NUMBER
1-541-1
REVISIONS — LOCATE BY GRID COORDINATES
Reference to dwg. for design modification
DRAWN L.H.A.
L.H. Anderson
RECOMMENDED FOR APPROVAL
CHIEF OF DESIGNS
ASSISTANT CHIEF HARBOR ENGINEER
APPROVED
CHIEF HARBOR ENGINEER

APPENDIX C
Consultation Letters

STATE OF CALIFORNIA Arnold Schwarzenegger, Governor

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-6251
Fax (916) 657-5390
Web Site www.nahc.ca.gov
ds_nahc@pacbell.net

February 11, 2010

Mr. Brad Brewster, Bay Area Cultural Resource Group Manager
Environmental Science Associates (ESA)
225 Bush Street, Suite 1700
San Francisco, CA 94104

Sent by FAX to: 415-896-0332
No. of Pages: 4

Re: Request for a Sacred Lands File Search and Native American Contacts List **for a Proposed "Historic Resources Survey & Evaluation of the Los Angeles Harbor Wharves at Berths 118-120, 148-151, 163-164, 187-191, and 238-239 for the Marine Oil Terminal Engineering Maintenance Standards (MOTEMS) Project"**; located in the City of Los Angeles; Los Angeles County, California

Dear Mr. Brewster:

The Native American Heritage Commission (NAHC), the State of California 'Trustee Agency' for the protection and preservation of Native American cultural resources (c.f. CA Public Resources Code §21070; also c.f. *Environmental Protection Information Center v. Johnson (1985) 170 Cal App. 3rd 604*), was able to perform a record search of its Sacred Lands File (SLF) for the affected project area (APE) requested. The California Environmental Quality Act (CEQA; CA Public Resources Code Section 21000 – 21177)) requires that any project that causes a substantial adverse change in the significance of an historical resource, that includes archaeological resources, is a 'significant effect' requiring the preparation of an Environmental Impact Report (EIR) per the California Code of Regulations §15064.5(b)(c)(f) CEQA guidelines). Section 15382 of the 2007 CEQA Guidelines defines a significant impact on the environment as "a substantial, or potentially substantial, adverse change in any of physical conditions within an area affected by the proposed project, including …objects of historic or aesthetic significance." The NAHC SLF search did not indicate the presence of Native American cultural resources within one-half - mile radius of the proposed project site (APE). However, there are Native American cultural resources in close proximity to the APE.

This letter includes state and federal statutes relating to Native American historic properties of religious and cultural significance to American Indian tribes and interested Native American individuals as 'consulting parties' under both state and federal law.

Early consultation with Native American tribes in your area is the best way to avoid unanticipated discoveries once a project is underway. Enclosed are the names of the nearest tribes and interested Native American individuals that the NAHC recommends as 'consulting parties,' for this purpose, that may have knowledge of the religious and cultural significance of the historic properties in the project area (e.g. APE). We recommend that you contact persons on the attached list of Native American contacts. Furthermore we suggest that you contact the California Historic Resources Information System (CHRIS) at the Office of Historic Preservation Coordinator's office (at (916) 653-7278, for referral to the nearest Information Center of which there are 10.

Consultation with tribes and interested Native American consulting parties, on the NAHC list, should be conducted in compliance with the requirements of federal NEPA (42 U.S.C. 4321-43351) and Section 106 and 4(f) of federal NHPA (16 U.S.C. 470 [f)]*et seq),* 36 CFR Part 800.3 (f) (2), the President's Council on Environmental Quality (CSQ; 42 U.S.C. 4371 *et seq.*) and NAGPRA (25 U.S.C. 3001-3013), as appropriate. .

Lead agencies should consider avoidance, as defined in Section 15370 of the California Environmental Quality Act (CEQA) when significant cultural resources could be affected by a project. Also, Public Resources Code Section 5097.98 and Health & Safety Code Section 7050.5 provide for provisions for accidentally discovered archeological resources during construction and mandate the processes to be followed in the event of an accidental discovery of any human remains in a project location other than a 'dedicated cemetery. Discussion of these should be included in your environmental documents, as appropriate.

The response to this search for Native American cultural resources is conducted in the NAHC Sacred Lands Inventory, established by the California Legislature (CA Public Resources Code §5097.94(a) and is exempt from the CA Public Records Act (c.f. California Government Code §6254.10) although Native Americans on the attached contact list may wish to reveal the nature of identified cultural resources/historic properties. Confidentiality of "historic properties of religious and cultural significance' may also be protected the under Section 304 of the NHPA or at the Secretary of the Interior' discretion if not eligible for listing on the National Register of Historic Places. The Secretary may also be advised by the federal Indian Religious Freedom Act (cf. 42 U.S.C, 1996) in issuing a decision on whether or not to disclose items of religious and/or cultural significance identified in or near the APE and possibly threatened by proposed project activity.

If you have any questions about this response to your request, please do not hesitate to contact me at (916) 653-6251.

Sincerely,

Dave Singleton

Dave Singleton
Program Analyst

Attachment: Native American Contacts List (NOTE: we further recommend that other forms of 'proof of mailing or proof of contact be utilized instead of 'Return Receipt Requested' Certified or Registered Mail.) Further, we suggest a follow-up telephone call to the contacts if the replies are not received or need clarification.

Native American Contacts
Los Angeles County
February 11, 2010

LA City/County Native American Indian Comm
Ron Andrade, Director
3175 West 6th Street, Rm.
Los Angeles, CA 90020
randrade@css.lacounty.gov
(213) 351-5324
(213) 386-3995 FAX

Gabrielino Tongva Nation
Sam Dunlap, Chairperson
P.O. Box 86908 Gabrielino Tongva
Los Angeles, CA 90086
samdunlap@earthlink.net

(909) 262-9351 - cell

TRAt Society
Cindi Alvitre
6515 E. Seaside Walk, #C Gabrielino
Long Beach, CA 90803
calvitre@yahoo.com
(714) 504-2468 Cell

Gabrielino Tongva Indians of California Tribal Council
Robert F. Doramae, Tribal Chair/Cultural
P.O. Box 490 Gabrielino Tongva
Bellflower, CA 90707
gtongva@verizon.net
562-761-6417 - voice
562-925-7989 - fax

Tongva Ancestral Territorial Tribal Nation
John Tommy Rosas, Tribal Admin.
, Gabrielino Tongva
tattnlaw@gmail.com
310-570-6567

Gabrielino-Tongva Tribe
Bernie Acuna
501 Santa Monica Blvd, # Gabrielino
Santa Monica CA 90401
(310) 587-2203
(310) 428-7720 - cell
(310) 587-2281

Gabrieleno/Tongva San Gabriel Band of Mission
Anthony Morales, Chairperson
PO Box 693 Gabrielino Tongva
San Gabriel, CA 91778
(626) 286-1262 -FAX
(626) 286-1632
(626) 286-1758 - Home
(626) 286-1262 Fax

Shoshoneon Gabrieleno Band of Mission Indians
Andy Salas, Chairperson
PO Box 393 Gabrieleno
Covina, CA 91723
gabrielenoindians@yahoo.
626-926-4131
(213) 688-0181 - FAX

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code. Also, federal National Environmental Policy Act (NEPA), National Historic Preservation Act, Section 106, and federal NAGPRA.

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed Historic Resources Survey and Evaluation of the Los Angeles Harbor Warves at Berths 118-120, 148-151, 163-164, 187-191, and 238-239 for the Marine Oil Terminal Engineering Maintenance Standards (MOTEMS) Project; City of Los Angeles; Los Angeles County, California.

Native American Contacts
Los Angeles County
February 11, 2010

Gabrielino-Tongva Tribe
Linda Candelaria, Chairwoman
1875 Century Park East, Suite 1500
Los Angeles , CA 90067 Gabrielino
(310) 587-2203
310-428-5767- cell
(310) 587-2281
lcandelaria1@gabrielinoTribe.org

This list is current only as of the date of this document.

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ESA

225 Bush St., Ste. 1700
San Francisco, CA 94104
415.896.5900 phone
415.896.0332 fax

www.esassoc.com

January 13, 2010

Bernie Acuna
Gabrielino-Tongva Tribe
501 Santa Monica Blvd. #500
Santa Monica, CA 90401

Sent via U.S. Mail

Subject: Marine Oil Terminal Engineering Maintenance Standards Project

Dear Mr. Acuna:

The Los Angeles Harbor Department has retained Environmental Science Associates (ESA) to conduct a historic resources survey and evaluation of wharves at Berths 118-120, 148-151, 163-164, 187-191, and 238-239 for the Marine Oil Terminal Engineering Maintenance Standards (MOTEMS) project, in the City of Los Angeles, Los Angeles County, California (see Figure 1, Location Map, and Figures 2-6 for site specific Area of Potential Effect [APE] locations). The project involves improvements to these wharves, including new fendering and dolphin systems to accommodate greater shipping loads.

The purpose of this letter is to request your input on potential or known historic resources or other cultural resources in the project area. In conformance with Section 106, we are in the initial phase, "identify[ing] historic properties potentially affected by the undertaking" (36 Code of Federal Regulations Part 880.9 a). In carrying out these responsibilities, previously identified sources of information on historic resources have been checked, including research at the Port of Los Angeles, the Los Angeles Public Library, and the South Central Coastal Information Center (SCCIC) at California State University at Fullerton.

A Historic Resources Evaluation Report is currently being prepared by ESA, however, it is acknowledged that some areas and properties may contain values not readily apparent and we would appreciate any such information you can provide. Please send notification, in writing, if you have information or potential or identified historical resources in the study area by no later than close of business, Monday, February 8, 2010. If a response is not received, follow up telephone calls will be made to ensure receipt of the letter to establish whether your organization has information relevant to the project.

Please contact Dennis Hagner, Environmental Management Division, Los Angeles Harbor Department with any applicable comments or questions:

Phone: 310-732-3682
E-mail: dhagner@portla.org
Street address: 425 S. Palos Verdes St., San Pedro, CA 90731

Thank you for your time and cooperation regarding this matter.

Sincerely,

Brad Brewster
Bay Area Cultural Resources Group Manager
Attachments

ESA
225 Bush St., Ste. 1700
San Francisco, CA 94104
415.896.5900 phone
415.896.0332 fax
www.esassoc.com

January 13, 2010

Cindi Alvitre
Ti'At Society
6515 E. Seaside Walk #C
Long Beach, CA 90803

Sent via U.S. Mail

Subject: Marine Oil Terminal Engineering Maintenance Standards Project

Dear Ms. Alvitre:

The Los Angeles Harbor Department has retained Environmental Science Associates (ESA) to conduct a historic resources survey and evaluation of wharves at Berths 118-120, 148-151, 163-164, 187-191, and 238-239 for the Marine Oil Terminal Engineering Maintenance Standards (MOTEMS) project, in the City of Los Angeles, Los Angeles County, California (see Figure 1, Location Map, and Figures 2-6 for site specific Area of Potential Effect [APE] locations). The project involves improvements to these wharves, including new fendering and dolphin systems to accommodate greater shipping loads.

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Sincerely,

Brad Brewster

Brad Brewster
Bay Area Cultural Resources Group Manager
Attachments

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www.esassoc.com

January 13, 2010

Ron Andrade, Director
Los Angeles City/County Native American Indian Commission
3175 West 6th Street, Rm. 403
Los Angeles, CA 90020

Sent via U.S. Mail

Subject: Marine Oil Terminal Engineering Maintenance Standards Project

Dear Mr. Andrade:

The Los Angeles Harbor Department has retained Environmental Science Associates (ESA) to conduct a historic resources survey and evaluation of wharves at Berths 118-120, 148-151, 163-164, 187-191, and 238-239 for the Marine Oil Terminal Engineering Maintenance Standards (MOTEMS) project, in the City of Los Angeles, Los Angeles County, California (see Figure 1, Location Map, and Figures 2-6 for site specific Area of Potential Effect [APE] locations). The project involves improvements to these wharves, including new fendering and dolphin systems to accommodate greater shipping loads.

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Thank you for your time and cooperation regarding this matter.

Sincerely,

Brad Brewster

Brad Brewster
Bay Area Cultural Resources Group Manager
Attachments

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415.896.0332 fax

www.esassoc.com

January 13, 2010

Robert Dorame, Tribal Chair/Cultural Resources
Gabrielino Tongva Indians of California Tribal Council
P.O. Box 490
Bellflower, CA 90707

Sent via U.S. Mail

Subject: Marine Oil Terminal Engineering Maintenance Standards Project

Dear Mr. Dorame:

The Los Angeles Harbor Department has retained Environmental Science Associates (ESA) to conduct a historic resources survey and evaluation of wharves at Berths 118-120, 148-151, 163-164, 187-191, and 238-239 for the Marine Oil Terminal Engineering Maintenance Standards (MOTEMS) project, in the City of Los Angeles, Los Angeles County, California (see Figure 1, Location Map, and Figures 2-6 for site specific Area of Potential Effect [APE] locations). The project involves improvements to these wharves, including new fendering and dolphin systems to accommodate greater shipping loads.

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January 13, 2010

Sam Dunlap, Tribal Secretary
Gabrielino Tongva Nation
P.O. Box 86908
Los Angeles, CA 90086

Sent via U.S. Mail

Subject: Marine Oil Terminal Engineering Maintenance Standards Project

Dear Mr. Dunlap:

The Los Angeles Harbor Department has retained Environmental Science Associates (ESA) to conduct a historic resources survey and evaluation of wharves at Berths 118-120, 148-151, 163-164, 187-191, and 238-239 for the Marine Oil Terminal Engineering Maintenance Standards (MOTEMS) project, in the City of Los Angeles, Los Angeles County, California (see Figure 1, Location Map, and Figures 2-6 for site specific Area of Potential Effect [APE] locations). The project involves improvements to these wharves, including new fendering and dolphin systems to accommodate greater shipping loads.

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January 13, 2010

Anthony Morales, Chairperson
Gabrielino/Tongva San Gabriel Band of Mission Indians
P.O. Box 693
San Gabriel, CA 91778

Sent via U.S. Mail

Subject: Marine Oil Terminal Engineering Maintenance Standards Project

Dear Mr. Morales:

The Los Angeles Harbor Department has retained Environmental Science Associates (ESA) to conduct a historic resources survey and evaluation of wharves at Berths 118-120, 148-151, 163-164, 187-191, and 238-239 for the Marine Oil Terminal Engineering Maintenance Standards (MOTEMS) project, in the City of Los Angeles, Los Angeles County, California (see Figure 1, Location Map, and Figures 2-6 for site specific Area of Potential Effect [APE] locations). The project involves improvements to these wharves, including new fendering and dolphin systems to accommodate greater shipping loads.

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Brad Brewster

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January 13, 2010

Andy Salas, Chairperson
Gabrieleno Band of Mission Indians
P.O. Box 393
Covina, CA 91723

Sent via U.S. Mail

Subject: Marine Oil Terminal Engineering Maintenance Standards Project

Dear Mr. Salas:

The Los Angeles Harbor Department has retained Environmental Science Associates (ESA) to conduct a historic resources survey and evaluation of wharves at Berths 118-120, 148-151, 163-164, 187-191, and 238-239 for the Marine Oil Terminal Engineering Maintenance Standards (MOTEMS) project, in the City of Los Angeles, Los Angeles County, California (see Figure 1, Location Map, and Figures 2-6 for site specific Area of Potential Effect [APE] locations). The project involves improvements to these wharves, including new fendering and dolphin systems to accommodate greater shipping loads.

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Brad Brewster
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415.896.0332 fax

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January 13, 2010

Linda Candelaria, Chairwoman
Gabrielino-Tongva Tribe
501 Santa Monica Blvd. #500
Santa Monica, CA 90401

Sent via U.S. Mail

Subject: Marine Oil Terminal Engineering Maintenance Standards Project

Dear Ms. Candelaria:

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Brad Brewster
Bay Area Cultural Resources Group Manager
Attachments

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San Francisco, CA 94104
415.896.5900 phone
415.896.0332 fax

www.esassoc.com

January 13, 2010

John Tommy Rosas
tattnlaw@gmail.com

Sent via email

Subject: Marine Oil Terminal Engineering Maintenance Standards Project

Dear Mr. Rosas:

The Los Angeles Harbor Department has retained Environmental Science Associates (ESA) to conduct a historic resources survey and evaluation of wharves at Berths 118-120, 148-151, 163-164, 187-191, and 238-239 for the Marine Oil Terminal Engineering Maintenance Standards (MOTEMS) project, in the City of Los Angeles, Los Angeles County, California (see Figure 1, Location Map, and Figures 2-6 for site specific Area of Potential Effect [APE] locations). The project involves improvements to these wharves, including new fendering and dolphin systems to accommodate greater shipping loads.

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Bay Area Cultural Resources Group Manager

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January 13, 2010

Ken Bernstein, Manager
City of Los Angeles
Office of Historic Resources, Department of City Planning
200 N. Spring Street, Room 620
Los Angeles, CA 90012

Sent via U.S. Mail

Subject: Marine Oil Terminal Engineering Maintenance Standards Project

Dear Mr. Bernstein:

The Los Angeles Harbor Department has retained Environmental Science Associates (ESA) to conduct a historic resources survey and evaluation of wharves at Berths 118-120, 148-151, 163-164, 187-191, and 238-239 for the Marine Oil Terminal Engineering Maintenance Standards (MOTEMS) project, in the City of Los Angeles, Los Angeles County, California (see Figure 1, Location Map, and Figures 2-6 for site specific Area of Potential Effect [APE] locations). The project involves improvements to these wharves, including new fendering and dolphin systems to accommodate greater shipping loads.

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January 13, 2010

Ann Shea, President
Los Angeles City Historical Society
P.O. Box 41046
Los Angeles, CA 90041

Sent via U.S. Mail

Subject: Marine Oil Terminal Engineering Maintenance Standards Project

Dear Ms. Shea:

The Los Angeles Harbor Department has retained Environmental Science Associates (ESA) to conduct a historic resources survey and evaluation of wharves at Berths 118-120, 148-151, 163-164, 187-191, and 238-239 for the Marine Oil Terminal Engineering Maintenance Standards (MOTEMS) project, in the City of Los Angeles, Los Angeles County, California (see Figure 1, Location Map, and Figures 2-6 for site specific Area of Potential Effect [APE] locations). The project involves improvements to these wharves, including new fendering and dolphin systems to accommodate greater shipping loads.

The purpose of this letter is to request your input on potential or known historic resources or other cultural resources in the project area. In conformance with Section 106, we are in the initial phase, "identify[ing] historic properties potentially affected by the undertaking" (36 Code of Federal Regulations Part 880.9 a). In carrying out these responsibilities, previously identified sources of information on historic resources have been checked, including research at the Port of Los Angeles, the Los Angeles Public Library, and the South Central Coastal Information Center (SCCIC) at California State University at Fullerton.

A Historic Resources Evaluation Report is currently being prepared by ESA, however, it is acknowledged that some areas and properties may contain values not readily apparent and we would appreciate any such information you can provide. Please send notification, in writing, if you have information or potential or identified historical resources in the study area by no later than close of business, Monday, February 8, 2010. If a response is not received, follow up telephone calls will be made to ensure receipt of the letter to establish whether your organization has information relevant to the project.

Please contact Dennis Hagner, Environmental Management Division, Los Angeles Harbor Department with any applicable comments or questions:

Phone: 310-732-3682
E-mail: dhagner@portla.org
Street address: 425 S. Palos Verdes St., San Pedro, CA 90731

Thank you for your time and cooperation regarding this matter.

Sincerely,

Brad Brewster

Brad Brewster
Bay Area Cultural Resources Group Manager

Attachments

ESA

225 Bush St., Ste. 1700
San Francisco, CA 94104
415.896.5900 phone
415.896.0332 fax

www.esassoc.com

January 13, 2010

Mike Buhler, Director of Advocacy
Los Angeles Conservancy
523 West Sixth Street, Suite 826
Los Angeles, CA 90014

Sent Via U.S. Mail

Subject: Marine Oil Terminal Engineering Maintenance Standards Project

Dear Mr. Buhler:

The Los Angeles Harbor Department has retained Environmental Science Associates (ESA) to conduct a historic resources survey and evaluation of wharves at Berths 118-120, 148-151, 163-164, 187-191, and 238-239 for the Marine Oil Terminal Engineering Maintenance Standards (MOTEMS) project, in the City of Los Angeles, Los Angeles County, California (see Figure 1, Location Map, and Figures 2-6 for site specific Area of Potential Effect [APE] locations). The project involves improvements to these wharves, including new fendering and dolphin systems to accommodate greater shipping loads.

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Brad Brewster

Brad Brewster
Bay Area Cultural Resources Group Manager

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San Francisco, CA 94104
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415.896.0332 fax

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January 13, 2010

Ms. Marifrances Trivelli, Director
Los Angeles Maritime Museum
Berth 84, Foot of 6th Street
San Pedro, CA 90731

Sent Via U.S. Mail

Subject: Marine Oil Terminal Engineering Maintenance Standards Project

Dear Ms. Trivelli:

The Los Angeles Harbor Department has retained Environmental Science Associates (ESA) to conduct a historic resources survey and evaluation of wharves at Berths 118-120, 148-151, 163-164, 187-191, and 238-239 for the Marine Oil Terminal Engineering Maintenance Standards (MOTEMS) project, in the City of Los Angeles, Los Angeles County, California (see Figure 1, Location Map, and Figures 2-6 for site specific Area of Potential Effect [APE] locations). The project involves improvements to these wharves, including new fendering and dolphin systems to accommodate greater shipping loads.

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Brad Brewster
Bay Area Cultural Resources Group Manager

Attachments

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San Francisco, CA 94104
415.896.5900 phone
415.896.0332 fax

www.esassoc.com

January 13, 2010

Patricia Adler-Ingram, Ph.D., Executive Director
Historical Society of Southern California
P.O. Box 93487
Pasadena, CA 91109

Sent Via U.S. Mail

Subject: Marine Oil Terminal Engineering Maintenance Standards Project

Dear Ms. Adler-Ingram:

The Los Angeles Harbor Department has retained Environmental Science Associates (ESA) to conduct a historic resources survey and evaluation of wharves at Berths 118-120, 148-151, 163-164, 187-191, and 238-239 for the Marine Oil Terminal Engineering Maintenance Standards (MOTEMS) project, in the City of Los Angeles, Los Angeles County, California (see Figure 1, Location Map, and Figures 2-6 for site specific Area of Potential Effect [APE] locations). The project involves improvements to these wharves, including new fendering and dolphin systems to accommodate greater shipping loads.

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Sincerely,

Brad Brewster
Bay Area Cultural Resources Group Manager

Attachments

ESA
225 Bush St., Ste. 1700
San Francisco, CA 94104
415.896.5900 phone
415.896.0332 fax
www.esassoc.com

January 13, 2010

Anne Hansford, Archivist
San Pedro Bay Historical Society
350 W. 5th Street #210
San Pedro, CA 90731

Sent Via U.S. Mail

Subject: Marine Oil Terminal Engineering Maintenance Standards Project

Dear Ms. Hansford:

The Los Angeles Harbor Department has retained Environmental Science Associates (ESA) to conduct a historic resources survey and evaluation of wharves at Berths 118-120, 148-151, 163-164, 187-191, and 238-239 for the Marine Oil Terminal Engineering Maintenance Standards (MOTEMS) project, in the City of Los Angeles, Los Angeles County, California (see Figure 1, Location Map, and Figures 2-6 for site specific Area of Potential Effect [APE] locations). The project involves improvements to these wharves, including new fendering and dolphin systems to accommodate greater shipping loads.

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E-mail: dhagner@portla.org
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Thank you for your time and cooperation regarding this matter.

Sincerely,

Brad Brewster

Brad Brewster
Bay Area Cultural Resources Group Manager

Attachments

ESA

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San Francisco, CA 94104
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415.896.0332 fax

www.esassoc.com

January 13, 2010

Jane Osterhoudt, President
Wilmington Historical Society
309 W. Opp Street
Wilmington, CA 90744

Sent Via U.S. Mail

Subject: Marine Oil Terminal Engineering Maintenance Standards Project

Dear Ms. Osterhoudt:

The Los Angeles Harbor Department has retained Environmental Science Associates (ESA) to conduct a historic resources survey and evaluation of wharves at Berths 118-120, 148-151, 163-164, 187-191, and 238-239 for the Marine Oil Terminal Engineering Maintenance Standards (MOTEMS) project, in the City of Los Angeles, Los Angeles County, California (see Figure 1, Location Map, and Figures 2-6 for site specific Area of Potential Effect [APE] locations). The project involves improvements to these wharves, including new fendering and dolphin systems to accommodate greater shipping loads.

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Phone: 310-732-3682
E-mail: dhagner@portla.org
Street address: 425 S. Palos Verdes St., San Pedro, CA 90731

Thank you for your time and cooperation regarding this matter.

Sincerely,

Brad Brewster
Bay Area Cultural Resources Group Manager

Attachments

ESA
225 Bush St., Ste. 1700
San Francisco, CA 94104
415.896.5900 phone
415.896.0332 fax
www.esassoc.com

February 24, 2010

San Pedro Bay Historical Archives
638 S. Beacon St.
Room 626
San Pedro, CA 9073

Sent Via Overnight Mail

Subject: Marine Oil Terminal Engineering Maintenance Standards Project

To Whom It May Concern:

The Los Angeles Harbor Department has retained Environmental Science Associates (ESA) to conduct a historic resources survey and evaluation of wharves at Berths 118-120, 148-151, 163-164, 187-191, and 238-239 for the Marine Oil Terminal Engineering Maintenance Standards (MOTEMS) project, in the City of Los Angeles, Los Angeles County, California (see Figure 1, Location Map, and Figures 2-6 for site specific Area of Potential Effect [APE] locations). The project involves improvements to these wharves, including new fendering and dolphin systems to accommodate greater shipping loads.

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Please contact Dennis Hagner, Environmental Management Division, Los Angeles Harbor Department with any applicable comments or questions:

Phone: 310-732-3682
E-mail: dhagner@portla.org
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Thank you for your time and cooperation regarding this matter.

Sincerely,

Brad Brewster
Bay Area Cultural Resources Group Manager

Attachments

ATTACHMENT C
UPDATED DPR FORMS FOR BERTHS 238-239

***Resource Name or #** (Assigned by recorder) Port of Los Angeles, Berths 238-239

Recorded By: Samantha Murray, Dudek ***Date:** 6/27/2017 ☐ Continuation ■ Update

On June 5, 2017, Dudek Senior Architectural Historian and Archaeologist Samantha Murray, MA, RPA, conducted a pedestrian survey of the PBF Energy site at Berths 238-239. Ms. Murray was accompanied by Erin Sheehy and Nicole Enciso from POLA, and all parties were escorted by Michael Chumley, Southwest Terminal Supervisor.

The built-environment survey entailed walking all portions of Berths 238 and 239 and documenting each building and all visible portions of the wharfs with notes and photographs. Each element was assessed for significant changes in condition since the 2010 ESA evaluation (see attached). Mr. Chumley confirmed that there have been no major changes (i.e., infrastructure removal/demolition or modifications) to the site since the 2010 evaluation.

As a result of the built environment survey, Ms. Murray concluded that there have been no significant or noteworthy changes to Berths 238-239 since the 2010 ESA evaluation. Further, Ms. Murray concurs with the 2010 findings that Berths 238-239 are not eligible for the NRHP, CRHR, or for listing as City HCM (status code 6Z) due to a lack of integrity of materials, design, and setting.

Update to historic context: On July 1, 2016, PBF Energy acquired Exxon-Mobil's California assets including the refinery in Torrance and the terminal at Berths 238-239 and related infrastructure, including pipelines, which provide access to sources of crude oil.

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code

Other Listings
Review Code   Reviewer   Date

***Resource Name or #:** Port of Los Angeles, Berths 238-239

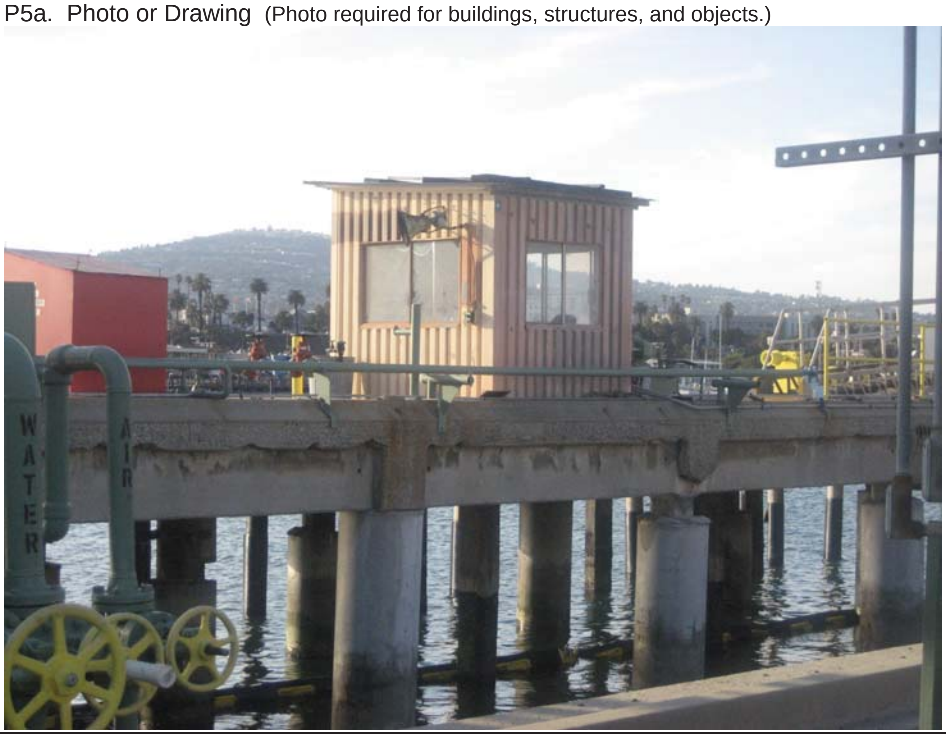
P1. Other Identifier:
***P2. Location:** ☐ **Not for Publication** ■ **Unrestricted**   ***a. County:** Los Angeles
and (P2b and P2c or P2d. Attach a Location Map as necessary.)
***b. USGS 7.5' Quad:** Long Beach, CA **Date:** 1981 **T** ; **R** ; **¼ of** **¼ of Sec** ; M.D. **B.M.**
c. Address: City: Zip:
d. UTM: Zone: 10 ; mE/ mN (G.P.S.)
e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate) Elevation:

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

Located to the east of Wharf Street, Berths 238-239 are two separate concrete wharves each approximately 225 feet long by 30 feet wide. Plans for these wharves, designed by the engineering department of the General Petroleum Corporation, are dated March 12, 1925. The wharves are supported by asphalt impregnated and reinforced concrete pilings that are square in plan, although many of the pilings on Berth 239 in particular have been encased in concrete to provide additional strength, giving them a wider circular plan. Each wharf can be approached by two concrete ramps constructed in the same manner at the wharves. The decking on both wharves and the ramps is concrete with exposed aggregate, with evidence of more recent concrete patches. Recently constructed concrete bullrails are located along the waterside of the wharves, and painted iron cleats are interspersed along the bullrails at regular intervals. The fendering system along the length of both wharves consists of newer wood piles and rubber blocks. A steel hose tower is located near the southern end of Berth 239 which supports numerous steel pipes and rubber hoses. The tower assembly and piping system appears to have been constructed in the 1960s. Both berths contain one corrugated steel dock house each with a shed roof, aluminum sliding windows, and a steel door. The dock houses also appear to have been added in the 1960s. The seawall opposite Berth 239 is constructed of horizontal board-formed concrete, and appears to be in original condition, while the seawall opposite Berth 238 has generally the same dimensions but has been covered in newer concrete. Evidence of the location of former oil pipelines leading from the land to the water is apparent in the Berth 239 seawall, but these
(see continuation sheet)

***P3b. Resource Attributes:** (List attributes and codes) HP 11 Engineering Structure, HP 4 Ancillary Building
***P4. Resources Present:** ■Building ■Structure ☐Object ☐Site ☐District ☐Element of District ☐Other (Isolates, etc.)

P5a. Photo or Drawing (Photo required for buildings, structures, and objects.)



P5b. Description of Photo: (View, date, accession #)
Looking northwest at Berth 238. 12/9/10

***P6. Date Constructed/Age and Sources:** ■Historic ☐Prehistoric ☐Both
1925

***P7. Owner and Address:**
Port of Los Angeles
425 Palos Verdes Street
San Pedro, CA 90733

***P8. Recorded by:** (Name, affiliation, and address)
Brad Brewster, ESA
225 Bush Street, Suite 1700
San Francisco, CA 94110

***P9. Date Recorded:** 12/4/09
***P10. Survey Type:** (Describe)
Intensive

***P11. Report Citation:** (Cite survey report and other sources, or enter "none.")
ESA. *Historic Resources Evaluation Report for Berths 118-120, 148-149, 187-191, and 238-239. Port of Los Angeles*. 2010.

***Attachments:** ☐NONE ■Location Map ☐Sketch Map ■Continuation Sheet ■Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

***Resource Name or #** (Assigned by recorder) Port of Los Angeles, Berth 238-239

***Recorded by:** Brad Brewster ***Date:** 12/14/09 ■ Continuation ☐ Update

openings have been sealed off with brick and concrete. One square, concrete breasting dolphin was added to the northern end of Berth 238, while a similar dolphin was added to the southern end of Berth 239, which essentially lengthened each berth by about 75 feet. Both dolphins are accessed from the berths by wood frame walkways. Engineering plans from the Port of LA Engineering Division date the construction of the dolphins to 1963.

Two timber pile wharves, Berths 240A and 240B, are located immediately west of and parallel to Wharf Street. These timber wharves are each about 230 feet by 40 feet wide, and are accessed by two ramps each. Constructed on top of Berth 240A is a large, wood framed warehouse about 160 feet long by 60 feet wide with a gable roof and wood siding. Aerial photos of this facility in 1925 show one long timber wharf with a large, gable-roofed transit shed, which by 1957, had been replaced by two smaller timber wharfs (Berths 240A and B) and a transit shed atop Berth 240B.

The tank farm is encircled by a spill containment wall about 25 feet high. The wall is constructed of horizontal board formed concrete which is angled inward slightly. The walls divide the tank farm into approximately seven sections. The tank farm consists of 19 tanks clustered to the northeast of Berth 238. Tanks are mostly riveted and welded steel construction, most of which are about 40 feet high and about 120 feet in diameter. Most of the tanks date to the mid-1920s and early 1930s, except for one which was added in the 1990s, according to the facility operator. Many of them appear altered with newer aluminum insulation siding and new roofs covered by geodomes which were added in the 1980s and 1990s to reduce emissions. A pipe valve field is located to the south and east of the tank farm, consisting of numerous painted steel valve wheels. Located to the southeast of the tank farm is a single-story control house with a rectangular plan, flat roof, and painted concrete block walls with a roman brick base. The building is about 35 feet by 45 feet in dimension. The north-facing elevation of this building has a series of large observatory windows consisting of fixed panes set in aluminum frames. Doors are steel. The control house appears to have been constructed in the early 1960s.

According to plans dated to 2007 from the Port of LA Engineering Division, numerous repairs occurred to Berth 238, including piling replacement, repair of the seawall, abandonment of the northern dolphin, fender system rehabilitation, sealing of topside deck surfaces, and installation of containment berms. Plans also indicate that repairs to the fendering system to Berth 239 was also completed at this same time.

Berth 238

Tank Farm (background) and Valve Field (foreground)

BUILDING, STRUCTURE, AND OBJECT RECORD

***NRHP Status Code** 6Z

***Resource Name or #** (Assigned by recorder) Port of Los Angeles, Berths 238-239

B1. Historic Name: Berths 238-139

B2. Common Name:

B3. Original Use: Transshipment of oil   B4. Present Use: Transshipment of oil

***B5. Architectural Style:** Utilitarian

***B6. Construction History:** (Construction date, alterations, and date of alterations)

(see continuation sheet)

***B7. Moved?** ■**No** ☐**Yes** ☐**Unknown** **Date:** **Original Location:**

***B8. Related Features:**

B9a. Architect: Los Angeles Harbor Engineer's Office   b. Builder: Los Angeles Harbor Department

***B10. Significance: Theme:** Shipping of oil   **Area:** Los Angeles, CA

Period of Significance: 1920 – 1950   **Property Type:** Wharves   **Applicable Criteria:** N/A

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

Berths 238-239 have been used continuously for the transshipment of oil since their original construction in the mid-1920s by the General Petroleum Corporation. The former General Petroleum Corporation facility is one of a few remaining oil terminals constructed at the Port of Los Angeles during the oil boom of the 1920s, a period which helped to establish the city as a major economic force in the region. As such, these berths may be eligible for listing in the NRHP Criteria A at the local level. However, while the original 1920s-era concrete wharf structures are generally intact, they have undergone various alterations over the years which have reduced their integrity. Changes which occurred in the 1960s, outside the facility's period of significance, include a newer tower assembly and piping system on Berth 239, two aluminum-clad dock houses (one on each wharf), and the addition of large, concrete breasting dolphins which essentially lengthened both wharves by about 75 feet each to accommodate larger ships. More recent changes include the encasement of the original square concrete pilings on Berth 239 with a wider, circular form, newer concrete bullrails along the waterside of both wharves, a newer fendering system along the length of both wharves consisting of replacement wood piles and rubber blocks, and alterations to the concrete seawall opposite Berth 238. Other changes to the setting have also occurred outside of this facility's period of significance, including alterations of many of the tanks with newer aluminum insulation siding and new roofs covered by geodomes which were added in the 1980s and 1990s. (see continuation sheet)

B11. Additional Resource Attributes: (List attributes and codes) HP 11 Engineering Structure, HP 4 Ancillary Building

***B12. References:**

See References in evaluation report.

B13. Remarks:

***B14. Evaluator:** Brad Brewster, ESA
225 Bush Street, Suite 1700
San Francisco, CA 94110

***Date of Evaluation:** December, 2009

(This space reserved for official comments.)

(Sketch Map with north arrow required.)

Other changes included the removal of a number of smaller facilities and three free-standing tanks just south of the tank farm (in the location of today's valve field), as well as the addition of a modern control house in the early 1960s. Alterations to adjacent Berths 240A and B are also apparent by 1957. The cumulative effect of these changes has resulted in a facility which looks significantly different from the one which operated in this location from the mid-1920s to 1950.

The wharves at Berths 238-239 would need to be evaluated as contributors to a terminal district to be considered eligible for listing in the NRHP. As described above, the integrity of the wharves at Berths 238-239 and their setting have been compromised to the extent that the facility no longer appears similar to when it was operated by the General Petroleum Corporation during the period of significance. No historical district can be formed because the integrity of materials, design, and setting has been substantially altered. Thus, the wharves at Berths 238-239 do not appear to be eligible for listing in the NRHP.

For similar reasons as described above, the wharves at Berths 238-239 to not appear eligible for listing in the CRHR, or as a City Monument.