

ATTACHMENT 20

REFINED PROJECT CALEEMOD RUNS

Table 3 Notes:

- ¹ Land use types for the refined project are summarized in Table R1.
- ² Construction emissions for Project and WWTP, as well as operational emissions from Area, Energy, Mobile, Stationary, Waste and Water source categories are estimated using CalEEMod 2016.3.2. Construction emissions also conservatively include emissions from the Bay Trail construction within the Project site even though construction of the Bay Trail has already been approved.
- ³ Project construction emissions in lbs/day are calculated by dividing the total emissions (in tons) by the actual number of project construction days (2,859 days). Construction emissions were conservatively estimated assuming soil exported from the Project site will be hauled by trucks. The Project may also export soil using barges (pulled by tug boats). A comparison of emissions from haul trucks and tug boats are provided in Air Quality Appendix Table A3, showing total emissions from tug boats would be lower than haul trucks.
- ⁴ WWTP construction emissions in lbs/day are calculated by dividing the total-emissions (in tons) by the actual number of treatment plant construction days (6 days).
- ⁵ Sum totals may not add up exactly due to rounding.
- ⁶ Area emissions assume that 600 natural gas fireplaces will be installed with the Project, and that landscaping will be required for 10 acres of city park, as provided by the Project Sponsor. The consumer product VOC emission factor is specific to Contra Costa County for 2017. The emission factor is determined based on the following methodology - first, a reduction efficiency for VOC emissions for Contra Costa County was calculated based on the percent difference for Contra Costa County relative to the 2008 VOC per capita emission factor for the entire state; the 2017 county specific emission factor was then calculated by applying this reduction to the 2017 statewide VOC emission factor, assuming that building square footage roughly scales with population and the percent reduction per capita stays the same (as in 2008). Further details regarding VOC emission factors can be found in Air Quality Appendix Table A13.
- ⁷ Energy and Natural Gas usage for unmitigated emissions incorporate the 2019 Title 24 standards as a Project design feature. This includes the installation of solar panels on all single family and condo/townhouse units, equivalent to offset the expected annual electricity usage. Historical energy use rates are utilized in emission calculations for all historical buildings. Further details on operational energy use rates, including CalEEMod energy intensity inputs, can be found in Table R2.
- ⁸ Vehicle emissions estimated from CalEEMod are based on the Transportation Impact Analysis memo in the Draft Environmental Impact Report. Trip rates provided in the TIA already account for a 20% internal trip reduction and a 10% reduction in trips due to TDM measures. Pass-by trips for retail and restaurant land uses in CalEEMod were set to zero and re-assigned to primary and diverted trips since the TIA already accounts for a reduction in pass-by trips for these two land use types. Vehicle trip rates for the Refined project are summarized in Table R3. For paved road
- ⁹ Stationary source emissions are shown in Air Quality Appendix Table A10. Stationary sources for the case with an on-site wastewater treatment plant include two lift pumps and one emergency generator.
- ¹⁰ Solid waste generation rates are based on CalRecycle waste generation factors of 12.23 pounds per household per day for residences and 5 pounds per 1,000 sq. ft. per day for commercial, retail and restaurant space, as provided in the Project Description. For city park and ferry terminal land uses, CalEEMod default waste generation rates were assumed. Inputs used for CalEEMod solid waste generation rates are shown in Table R4.
- ¹¹ Unmitigated ferry emissions are estimated using Tier 2 emission factors for all pollutants. Mitigated ferry emissions assume Tier 4 engine emission factors for ROG, NO_x, CO and PM. See Air Quality Appendix Table A6 for additional details.
- ¹² Operational emissions for the WWTP are estimated using CalEEMod, in addition to outside data sources. The WWTP system is defined as a 'General Light Industry' land use type in CalEEMod. However, the WWTP is not expected to have any area emissions from Consumer products and architectural coating; thus this value in the CalEEMod output table is not included here. Mobile emissions from brine trucks are estimated using EMFAC 2017 emission factors for HHDT, as shown in Table A7. VOC emissions from the WWTP are estimated using MDAQMD's default emission factor for activated sludge treatment systems, as shown in Table A8. Emissions from hauling sewage with trucks is included in Air Quality Appendix Table A9.

Abbreviations:

BAAQMD - Bay Area Air Quality Management District	lbs - pounds	PM - Particulate Matter	WWTP - Waste Water Treatment Plant
CalEEMod - California Emissions Estimator MODeI	MDAQMD - Mojave Desert Air Quality Management District		
CO - Carbon Monoxide	MT - Metric Tons	ROG - reactive organic gases	
HHDT - Heavy Heavy Duty Trucks	NO _x - oxides of nitrogen	SO ₂ - Sulfur dioxide	

References:

California Air Resources Board Non-road Diesel Engine Certification Tier Chart. Available online at: <https://ww2.arb.ca.gov/resources/documents/non-road-diesel-engine-certification-tier-chart>

CalEEMod® 2016.3.2 Available Online at: <http://www.caleemod.com>

Mojave Desert Air Quality Management District. Emissions Inventory Program. Available online at: <http://www.mdaqmd.ca.gov/home/showdocument?id=790>

South Coast Air Quality Management District. Super-Compliant Architectural Coatings. Available online at: <http://www.aqmd.gov/home/rulescompliance/compliance/vocs/architectural-coatings/super-compliant-coatings>

Table R1
Project Land Uses -Refined Project
Point Molate
Richmond, CA

Land Use Type ¹	Amount (New)	Amount (Existing or Historical)	Unit	Lot Size (acre)	
Residential (Planning Area A-D): Condos/Townhouses, medium density	213	--	DU	80.00	
Residential (Planning Area A-D): Condos/Townhouses, medium density	28	--	DU		
Residential (Planning Area A-D): Mid-Rise, low density	291	--	DU		
Residential (Planning Area E): Mid-Rise, high density	300	--	DU		
Residential: (Planning Area F-H): Mid-Rise, high density	435	--	DU		
Residential: (Planning Area A-D): Single family units, medium density	138	--	DU		
Residential: (Planning Area F-H): Single family units, medium density	28	19	DU		
Retail: (Planning Area F-H): Regional Shopping Center	10,000	10,000	sq ft		
Retail: (Planning Area A-E): Regional Shopping Center (Neighborhood Retail)	15,000				
Recreational: (Planning Area F-H): Quality Restaurant	10,000	10,000	sq ft		
Commercial: (Planning Area F-H): General Office Building	31,194	352,580	sq ft		
Civic: Police and Fire Station	--	10,000	sq ft		
Recreational: City Park		30	acres		30.00
Recreational: Bay Trail Development		118,800	sq ft		2.73
Parking Lot	2,636	--	spaces	23.72	
Terminal on existing Pier	--	5,000	sq ft	0.00	
Terminal Parking Structure	--	100	spaces		

Notes:

¹: Land use types and unit amounts are used as inputs to CalEEMod® and are provided by the Project Sponsor. Land use types which include a mixture of historical building re-use and new building development are split into separate land use rows, as each building type involves different construction and operational characteristics within CalEEMod®.

Abbreviations:

CalEEMod® - California Emissions Estimator Model

DU - Dwelling Unit

sq ft - square feet

References:

CalEEMod® 2016.3.2 Available Online at: <http://www.caleemod.com>

**Table R3
Trip Generation Rates - Refined Project
Point Molate
Richmond, CA**

Transportation Impact Analysis Data and CalEEMod Default Trip Rates

Land Use	Size	Units	ADT ¹	Trips/Day/Unit Size	Units	Adjusted ADT after accounting for Reductions ²	Adjusted Trips/Day/Unit Size	Units
Retail	35	KSF	1,761	32.0	Trips/KSF	1,268	23.1	Trips/KSF
Restaurant	20	KSF			Trips/KSF			Trips/KSF
Office	384	KSF	3,139	8.2	Trips/KSF	2,260	5.9	Trips/KSF
Single Family Units	185	DU	1,776	9.6	Trips/DU	1,279	6.9	Trips/DU
Condo/TownHouses	241	DU	1,808	7.5	Trips/DU	1,301	5.4	Trips/DU
Mid-Rise Apartments	1026	DU	5,592	5.45	Trips/DU	4,026	3.92	Trips/DU
Public Ferry Parking	100	spaces	281	2.81	Trips/space	202	2.02	Trips/space
Subtotal			14,357					
Internal Trip Reduction (20%)			2,871					
TDM Trip Reduction (10%)			1,149					
Net new Project Trips			10,337					

Project-Specific Trip Generation

Land Use Type	Land Use Amount		Adjusted Trip Rates		
	Size	Units	Weekday Trips	Saturday Trips ⁴	Sunday Trips ⁴
			(rate/size/day)	(rate/size/day)	(rate/size/day)
Residential (Planning Area A-D): Condos/Townhouses, medium density (new)	213	Dwelling Unit	5.40	5.27	4.50
Residential: (Planning Area F-H): Condos/Townhouses, medium density (new)	28	Dwelling Unit	5.40	5.27	4.50
Residential (Planning Area A-D): Mid-Rise, low density (new)	291	Dwelling Unit	3.92	3.77	3.46
Residential (Planning Area E): Mid-Rise, high density (new)	300	Dwelling Unit	3.92	3.77	3.46
Residential: (Planning Area F-H): Mid-Rise, high density (new)	435	Dwelling Unit	3.92	3.77	3.46
Residential: (Planning Area A-D): Single family units, medium density (new)	138	Dwelling Unit	6.91	7.20	6.26
Residential: (Planning Area F-H): Single family units, medium density (new)	28	Dwelling Unit	6.91	7.20	6.26
Residential: (Planning Area F-H): Single family units, medium density (historic building)	19	Dwelling Unit	6.91	7.20	6.26
Commercial: (Planning Area A-E): Neighborhood Retail (New)	15,000	sq ft	23.06	26.98	13.63
Commercial: (Planning Area F-H): General Office Building (New)	31,194	sq ft	5.89	1.31	0.56
Commercial: (Planning Area F-H): General Office Building (Historic building)	352,580	sq ft	5.89	1.31	0.56
Retail: (Planning Area F-H): Regional Shopping Center (historic building)	10,000	sq ft	23.06	26.98	13.63
Retail: (Planning Area F-H): Regional Shopping Center (new)	10,000	sq ft	23.06	26.98	13.63
Recreational: (Planning Area F-H): Quality Restaurant (historic building)	10,000	sq ft	23.06	26.98	13.63
Recreational: (Planning Area F-H): Quality Restaurant (new)	10,000	sq ft	23.06	26.98	13.63
Civic Uses	10,000	sq ft	0.00	0.00	0.00
Off-street Parking	2,636	spaces	0.00	0.00	0.00
Recreational: City Park	30.0	acres	1.89	22.75	16.74
Recreational: Bay Trail Development	2.73	acres	1.89	22.75	16.74
Terminal on existing Pier	5,000	sq ft	0.00	0.00	0.00
Terminal Parking Structure	100	spaces	2.02	2.02	2.02

Table R3
Trip Generation Rates - Refined Project
Point Molate
Richmond, CA

Notes:

- ¹. Average Daily Traffic (ADT) was provided in the Project's Transportation Impact Analysis (TIA).
- ². Adjusted ADT is calculated by accounting for a 20% internal trip reduction and an additional 10% reduction due to Transportation Demand Management (TDM) measures, per the Project TIA.
- ³. Default CalEEMod® trip rates are obtained from CalEEMod Appendix D (Default Data Tables).
- ⁴. Adjusted Saturday and Sunday trip rates are estimated by scaling the weekday trip rate based on CalEEMod® default Saturday and Sunday trip rates for each land use.

Abbreviations:

ADT - average daily traffic

CalEEMod® - California Emissions Estimator Model

DU - dwelling units

ksf - thousand square feet

sq ft - square feet

TDM - Transportation Demand Management

References:

CalEEMod® version 2016.3.2, Default Data Tables (Appendix D). Available online at: <http://www.caleemod.com/>

