

**Table A1
Wine Rock Quarry
Operational Emissions**

Operation	Emission Factor	Units	Equation Variables		Emissions				
			1	2	PM-10 lbs/day	ROG lbs/day	CO lbs/day	NOX lbs/day	SOX lbs/day
Excavation Equipment Exhaust Emissions			Pieces of Equipment	Operating Hours					
PM-10									
Excavator	0.014	lbs/hr	1	8	0.1				
Dozer	0.054	lbs/hr	1	8	0.4				
Generator Sets	0.012	lbs/hr	2	8	0.2				
Loader	0.018	lbs/hr	2	8	0.3				
Other Material Handling Equipment	0.019	lbs/hr	1	8	0.2				
Water Truck	0.011	lbs/hr	1	8	0.1				
ROG									
Excavator	0.065	lbs/hr	1	8		0.5			
Dozer	0.192	lbs/hr	1	8		1.5			
Generator Sets	0.034	lbs/hr	2	8		0.5			
Loader	0.066	lbs/hr	2	8		1.1			
Other Material Handling Equipment	0.081	lbs/hr	1	8		0.7			
Water Truck	0.051	lbs/hr	1	8		0.4			
CO									
Excavator	0.510	lbs/hr	1	8			4.1		
Dozer	0.735	lbs/hr	1	8			5.9		
Generator Sets	0.269	lbs/hr	2	8			4.3		
Loader	0.436	lbs/hr	2	8			7.0		
Other Material Handling Equipment	0.438	lbs/hr	1	8			3.5		
Water Truck	0.349	lbs/hr	1	8			2.8		
NOX									
Excavator	0.317	lbs/hr	1	8				2.5	
Dozer	1.361	lbs/hr	1	8				10.9	
Generator Sets	0.278	lbs/hr	2	8				4.5	
Loader	0.385	lbs/hr	2	8				6.2	
Other Material Handling Equipment	0.516	lbs/hr	1	8				4.1	
Water Truck	0.279	lbs/hr	1	8				2.2	
SOX									
Excavator	0.001	lbs/hr	1	8					0.0
Dozer	0.003	lbs/hr	1	8					0.0
Generator Sets	0.001	lbs/hr	2	8					0.0
Loader	0.001	lbs/hr	2	8					0.0
Other Material Handling Equipment	0.002	lbs/hr	1	8					0.0
Water Truck	0.001	lbs/hr	1	8					0.0
Total					1.3	4.7	27.5	30.4	0.1

Sources: Off-Road Mobile Source Emission Factors; SCAQMD 2022

Table A3
Wine Rock Quarry
Truck Movement Dust Emissions On-Site

Operation	Emission Factor	Units	Equation Variables		Emissions		
			1	2	PM-10 lbs/day Unmitigated	PM-10 lbs/day Mitigated	PM-2.5 lbs/day Mitigated
Truck Travel Onsite			# of trips/day	vmt			
Haul Trucks	1.76	lbs/vmt	8	0.30	4.2	1.1	0.2
Loader	1.76	lbs/vmt	8	0.30	4.2	1.1	0.2
					0.0	0.0	0.0
				Total	8.4	2.1	0.4

Note: PM10 mitigation assumed to reduce emissions 75 percent on roads per AP-42 and SCAQMD.
Includes watering, some gravel surface, and speed limits.

vmt = vehicle miles driven

Source of Emission Factor: SCAQMD Particulate Matter Emission Factors
and AP-42, Chapter 13.2.2

$$E = k * (s/12)^{0.7} * (W/3)^{0.45}$$

E = PM10 emissions/vmt

k = constant (for PM10 = 1.5)

S - silt content (for sand & gravel plant road = 4.8%)

W = mean vehicle weight (street legal haul truck is 15 tons empty and 25 tons loaded) (Mean wt. = 17.5 tons)

Dust related PM2.5 = 0.208 of PM10 (CEIDARS List).

**Table A4
Wine Rock Quarry
On-Road Haul Truck & Vehicle Exhaust Emissions Off-Site**

Operation	Emission Factor	Units	Equation Variables		Emissions								
			1	2	PM-10 lbs/day	PM-2.5 lbs/day	ROC lbs/day	CO lbs/day	NOX lbs/day	SOX lbs/day	CO2 lbs/day	CH4 lbs/day	
Vehicle Emissions Off-site			# of trips per day	vmt						Negl			
PM-10	Haul Trucks	0.0010	lbs/mile	8	20	0.155	0.143						
PM-2.5	Employee trips	0.0001	lbs/mile	20	20	0.039	0.036						
	Fuel Delivery Truck	0.0010	lbs/mile	0.4	50	0.019	0.018						
ROG	Haul Trucks	0.0010	lbs/mile	8	20			0.2					
	Employee trips	0.0005	lbs/mile	20	20			0.19					
	Fuel Delivery Truck	0.0010	lbs/mile	0.4	50			0.02					
CO	Haul Trucks	0.0048	lbs/mile	8	20				0.77				
	Employee trips	0.0040	lbs/mile	20	20				1.59				
	Fuel Delivery Truck	0.0048	lbs/mile	0.4	50				0.10				
NOX	Haul Trucks	0.0110	lbs/mile	8	20					1.76			
	Employee trips	0.0004	lbs/mile	20	20					0.14			
	Fuel Delivery Truck	0.0110	lbs/mile	0.4	50					0.22			
CO2	Haul Trucks	4.2152	lbs/mile	8	20						674		
	Employee trips	1.1102	lbs/mile	20	20						444		
	Fuel Delivery Truck	4.2152	lbs/mile	0.4	50						84		
CH4	Haul Trucks	0.00004	lbs/mile	8	20							0.01	
	Employee trips	0.00004	lbs/mile	20	20							0.02	
	Fuel Delivery Truck	0.00004	lbs/mile	0.4	50							0.00	
												0.00	
				Total		0.21	0.20	0.37	2.45	2.12	Negl	1,203	0.0245
				Total Tons/Year (2022)		0.03	0.02	0.05	0.31	0.26	Negl	137	0.08
												mtCO2e	mtCO2e

Emission Factors Source: SCAQMD On-Road Heavy Heavy Duty Diesel Trucks and On-Road Passenger Vehicles & Delivery Truck
Scenario Year 2022
PM2.5 fraction of PM10 Exhaust is 0.92 (CEIDARS List)
vmt = miles driven off-site

8 haul truck two-way trips/day for 250 days/year; 20 miles per one-way trip (average) to Barstow
Diesel delivery would occur once a week from Beck Oil Company located in Victorville. Every 3 days.
Annual CO2 and CH4 in metric tons CO2 equivalent (mtCO2e)
Employee vehicles est at 10 one-way trips per day / at an average distance of 20 miles (Barstow)

**Table A5
Wine Rock Quarry
GHG Emissions**

Operation	Emission Factor	Units	Equation Variables		GHG Emissions			
			1	2	CO2 lbs/day	CH4 lbs/day	N2O g/day	
Excavation Equipment Exhaust Emissions			Pieces of Equipment	Operating Hours				
CO2								
Excavator	120.0	lbs/hr	1	8	960.0			
Dozer	239.0	lbs/hr	1	8	1912.0			
Generator Sets	61.0	lbs/hr	2	8	976.0			
Loader	109.0	lbs/hr	2	8	1744.0			
Other Material Handling Equipment	141.0	lbs/hr	1	8	1128.0			
Water Truck	123.0	lbs/hr	1	8	984.0			
CH4				8				
Excavator	0.006	lbs/hr	1	8		0.0		
Dozer	0.018	lbs/hr	1	8		0.1		
Generator Sets	0.003	lbs/hr	2	8		0.1		
Loader	0.006	lbs/hr	2	8		0.1		
Other Material Handling Equipment	0.007	lbs/hr	1	8		0.1		
Water Truck	0.005	lbs/hr	1	8		0.0		
N2O*				Miles Per Day				
Excavator	0.202	g/mile	1	1			0.2	
Dozer	0.520	g/mile	1	1			0.5	
Generator Sets	0.050	g/mile	2	1			0.1	
Loader	0.080	g/mile	2	1			0.2	
Other Material Handling Equipment	0.492	g/mile	1	1			0.5	
Water Truck	0.246	g/mile	1	1			0.2	
					lbs/g per day	7704.00	0.44	1.72
					Total lbs/day	7704.00	0.44	0.00
					Total MTCO2e/day	3.49	0.01	0.00
					MTCO2e/Year	873.63	1.41	0.10
					Total MTCO2e/year	875.14		

CO2 GWP	1
CH4 GWP	28
N2O GWP	265

Sources: Off-Road Mobile Source Emission Factors; SCAQMD 2022

Source N2O: California Climate Action Registry General Reporting Protocol, 2009I;

Table A9-8-C SCAQMD Handbook; Climate Leaders EPA, Section 3, Table 2

Duration

(days): 250