



Initial Study - Appendix A

**AIR QUALITY AND GREENHOUSE GAS
EMISSIONS IMPACT ASSESSMENT**



HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard
Suite 200
La Mesa, CA 91942
619.462.1515 tel
619.462.0552 fax
www.helixepi.com



May 9, 2016

QIC-02

Omar Atayee
San Diego Association of Governments
401 B Street, Suite 800
San Diego, CA 92101

Subject: Air Quality and Greenhouse Gas Emissions Impact Assessment for the Bayshore Bikeway Segment 8B Project

Dear Mr. Atayee:

This letter summarizes the air quality and greenhouse gas (GHG) emissions analysis for the proposed Bayshore Bikeway Segment 8B Project (project). The San Diego Association of Governments (SANDAG) proposes to construct a Class I bikeway facility in the south San Diego Bay area. The proposed Class I facility, which is a path that provides a separated right-of-way for the exclusive use of people walking and riding bikes, is a portion of Segment 8B of the Bayshore Bikeway as described in the *Bayshore Bikeway Plan* dated March 17, 2006. The proposed project would extend a distance of approximately 0.25 mile adjacent to Bay Boulevard between Palomar Street in the City of Chula Vista and the main entrance to the South Bay Salt Works facility in the City of San Diego. The proposed project would help close the gap between two existing Class I facilities, Bayshore Bikeway Segment 8A and Bayshore Bikeway Segment 9, and would contribute to the vision of implementing the Bayshore Bikeway, which consists of a 24-mile regional bicycle facility around San Diego Bay to provide more transportation options and a scenic connection to employment centers, recreation facilities, and tourist destinations along the Bayfront.

The proposed project would extend southward along Bay Boulevard from Palomar Street over an existing drainage ditch near Palomar Street and continue over the drainage ditch adjacent to Bay Boulevard and just east of inactive railroad tracks previously part of the Coronado Belt Line to the main driveway of the South Bay Salt Works facility. The proposed bikeway would include an eight-foot-wide bike path with two to three-foot-wide shoulders. The bike path would cross over the drainage ditch near Palomar Street on a bridge structure. From Palomar Street to Ada Street, the bike path would be constructed as a cantilevered deck over the western side of the existing drainage ditch that runs adjacent to the west side of Bay Boulevard. South of Ada

Street, the bike path would be constructed at grade on disturbed land. Additional improvements would include installation of a new storm drain inlet and culvert just north of Palomar Street, curb and gutter, chain link fencing along the west side of the bike path, railing along the east side of the deck, lighting, minor grading, bike lane striping, utilities improvements and relocations, and other improvements as required by the cities of San Diego and Chula Vista and SANDAG.

Methodology

Emissions were quantified using the Road Construction Emissions Model (Roadway Model) Version, 7.1.5.1, developed by Sacramento Metropolitan Air Quality Management District (SMAQMD). The Roadway Model contains OFFROAD2011 emission factors and EMFAC2011 emission factors from the California Air Resources Board's (CARB's) models for off-road equipment and on-road vehicles, respectively. For modeling purposes, construction of the project is assumed to occur over the course of approximately seven months, starting in 2017 and project grading would require approximately 800 cubic yards of fill material to be imported. The quantity, duration, and the intensity of construction activity have an effect on the amount of construction emissions and their related pollutant concentrations that occur at any one time. As such, the emission forecasts provided herein reflect a specific set of conservative assumptions based on the expected construction scenario. Because of this conservative assumption, actual emissions could be less than those forecasted. If construction is delayed or occurs over a longer time period, emissions could be reduced because of (1) a more modern and cleaner burning construction equipment fleet mix, and/or (2) a less intensive buildout schedule (i.e., fewer daily emissions occurring over a longer time interval). A complete listing of the assumptions used in the analysis and model output is provided as Attachment A of this letter.

Air Quality

Consistency with Air Quality Plans

The project site is located within the San Diego Air Basin (SDAB). The San Diego Air Pollution Control District (SDAPCD) manages air quality in the SDAB. Air quality plans applicable to the SDAB include the San Diego Regional Air Quality Strategy (RAQS) and applicable portions of the State Implementation Plan (SIP). The RAQS and SIP outline the SDAPCD's plans and control measures designed to attain state and federal air quality standards. Projects that propose development consistent with the growth anticipated by the applicable general plan(s) are consistent with the RAQS and applicable portions of the SIP. The proposed project is included in Riding to 2050, the San Diego Regional Bicycle Plan (SANDAG 2010), which supports implementation of San Diego Forward: The Regional Plan (RP; SANDAG 2015), and is, therefore, accounted for in the RAQS and SIP. Emissions generated during project construction would not exceed applicable SDAPCD's Air Quality Impact Analysis (AQIA) Trigger Levels, as discussed below. Additionally, operation of the project would not generate substantial air quality emissions since the facility would be used for biking and walking. As a result, the project (construction and operation) would not conflict with or obstruct implementation of applicable air quality plans. Furthermore, the project would help reduce emissions and promote air quality policies by reducing the reliance on the automobile and encouraging alternative modes of transportation.

Conformance to Federal and State Air Quality Standards

Construction activities associated with the project would generate short-term emissions of reactive organic gas (ROG), oxides of nitrogen (NOx), carbon monoxide (CO), and particulate matter (including both PM₁₀, and PM_{2.5}). Emissions would originate from off-road diesel equipment exhaust, employee and material delivery vehicle exhaust, re-entrained paved road dust, fugitive dust from land clearing, and off-gassing from paving activities. Construction was assumed to occur during the calendar year 2017. Table 1 includes the assumed amount of equipment to be used during each activity of project construction. See Attachment A for additional model assumptions.

Table 1 CONSTRUCTION EQUIPMENT ASSUMPTIONS		
Equipment Type per Construction Activity	Number of Pieces¹	Horsepower²
Grubbing/Land Clearing		
Crawler Tractors	1	208
Excavators	1	163
Grading/Excavation/Import		
Crawler Tractors	1	208
Excavators	1	163
Rollers	1	81
Rubber Tired Loaders	1	200
Tractors/Loaders/Backhoes	1	98
Water Truck	1	NA
Drainage/Utilities/Subgrade/Retaining Walls		
Air Compressors	1	106
Cement and Mortar Mixers	1	10
Generator Sets	1	66
Grader	1	175
Plate Compactors	1	8
Pumps	1	53
Tractors/Loaders/Backhoes	2	98
Truck Mounted Crane	1	226
Paving		
Pavers	1	126
Paving Equipment	1	131
Rollers	1	81
Tractors/Loaders/Backhoes	1	98

Notes: ¹ Amount of equipment was received from Quality Infrastructure Corporation (pers. comm. 2016).

² Equipment horsepower contained in Roadway Model.

The proposed project would be required to comply with applicable SDAPCD emissions and fugitive dust standard Best Management Practices (BMPs), such as SDAPCD Rule 55 – Fugitive Dust Control which states that no dust and/or dirt shall leave the property line. Construction is assumed to last approximately seven months and require an average of 11 workers on site per day with activity occurring eight hours per day and five days per week. An estimate of the maximum daily emissions associated with construction of the proposed project is presented in Table 2. Emissions associated with the project were compared to SDAPCD’s “Air Quality Impact Analysis (AQIA) Trigger Levels” as contained within SDAPCD Regulation II, Rule 20.2. As shown in Table 2, criteria pollutant emissions associated with project construction would be below the applicable AQIA Trigger Levels.

Table 2					
ESTIMATED MAXIMUM DAILY CONSTRUCTION EMISSIONS					
Construction Activity	Pollutant Emissions (pounds per day)				
	ROG	NO_x	CO	PM₁₀	PM_{2.5}
Grubbing/Land Clearing	1.2	13.8	7.9	3.1	1.0
Grading/Excavation/Import	2.5	26.6	16.1	3.8	1.7
Drainage/Utilities/Sub-Grade/Retaining Wall	4.1	35.7	21.2	4.7	2.5
Paving	1.5	13.3	10.2	0.8	0.7
Maximum Daily Emissions	4.1	35.7	21.2	4.7	2.5
AQIA Trigger Levels	137	250	550	100	55

Source: Roadway Model emissions modeling by HELIX 2016 (output data is provided in Attachment A).

With the exception of the infrequent operation of maintenance vehicles along the bikeway, the proposed bicycle facility would not be used by motorized vehicles and no other operational emissions would be expected. Thus, operation of the proposed facility would not violate applicable air quality standards or substantially contribute to an existing or projected air quality violation.

Cumulatively Considerable Net Increase

The SDAB is currently classified as nonattainment for the federal- and state-designated criteria pollutants of ozone, PM₁₀, and PM_{2.5} (CARB 2015). As discussed above, emissions from project-related construction activities would be minimal, short-term, and localized. Project operation is anticipated to lower cumulative emissions by encouraging alternative modes of transportation such as walking and biking. The project would therefore not result in a cumulatively considerable net increase in criteria pollutants.

Sensitive Receptors

Sensitive receptors are facilities and structures where people live or spend considerable amounts of time, including hospitals, retirement homes, residences, schools, and childcare centers. The nearest school (Harborside Elementary School) is located approximately 0.4 mile to the east (across I-5) from the nearest proposed construction area and the next closest school is the Greater San Diego Academy Charter School located approximately 0.6 mile to the southeast. Other schools are located more than one mile from the project site. The nearest residence (single-family home) is located approximately 150 feet to the east of the nearest construction area along Stella Street. Approximately 30 additional single-family homes are located to the east and southeast along Stella Street, Ada Street, and West Frontage Road that are interspersed among commercial and industrial uses. However, as discussed above, project construction activities would be minimal, and comply with all SDAPCD emissions and fugitive dust standards. Additionally, as previously discussed, with the exception of the infrequent operation of maintenance vehicles along the bikeway, operation of the project would not generate direct air quality emissions and would therefore not impact sensitive receptors.

Odors

Project construction (specifically, the use of diesel construction equipment and vehicles) could generate odors associated with fuel combustion. However, these odors would dissipate into the atmosphere upon release, and would only temporarily remain in proximity to the construction equipment and vehicles. Potential odors would be temporary and localized within the immediate project vicinity. Such temporary odors may be detectable by the relatively small number of nearby residents (approximately 30 single-family homes along Stella Street, Ada Street, and West Frontage Road), as well as employees and customers of nearby commercial and industrial businesses. In addition, operation of the project would not generate objectionable odors, as fuel combustion would only occur through equipment used for occasional maintenance.

Greenhouse Gases

Global climate change refers to changes in average climatic conditions on Earth, as a whole, including temperature, wind patterns, precipitation, and storms. Global temperatures are moderated by naturally occurring atmospheric gases, including water vapor, carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O), as well as hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆). These gases, known as greenhouse gases (GHGs), allow solar radiation (sunlight) into the Earth's atmosphere, but prevent radiative heat from escaping, thus warming the Earth's atmosphere. GHGs are emitted by both natural processes and human activities. Concentrations of GHGs have increased in the atmosphere since the industrial revolution. Human activities that generate GHG emissions include combustion of fossil fuels (CO₂ and N₂O); natural gas generated from landfills, fermentation of manure and cattle farming (CH₄); and industrial processes such as nylon and nitric acid production (N₂O).

Regulations

Assembly Bill (AB) 32, the California Global Warming Solutions Act, established a stated goal of reducing GHG emissions to 1990 levels by the year 2020.

The primary SANDAG plan for GHG emissions is the RP, which includes the Sustainable Communities Strategy (SCS), prepared in accordance with SB 375, and shows how SANDAG will meet and exceed its GHG targets set by the CARB.

SANDAG also works with federal and state energy planning/regulating agencies to help the region attain its energy goals.

A report prepared by the California Air Pollution Control Officers Association (CAPCOA), titled CEQA & Climate Change (January 2008), identifies an annual generation rate of 900 metric tons (MT) of carbon dioxide equivalents (CO₂e) as a screening threshold to determine if additional GHG analysis should be conducted. If a project exceeds the annual 900 MT screening threshold, then a potentially significant GHG emissions impact could occur and preparation of a detailed quantitative GHG analysis would be necessary. The County of San Diego has used this screening level threshold in evaluating potential GHG emissions impacts. The CAPCOA annual 900 MT screening threshold is used in this analysis to assess the potential for GHG impacts to occur from the project.

GHG emissions associated with the project include those from construction and operations, as discussed below.

Emissions

Construction emissions would be associated with off-road diesel equipment exhaust, and from worker and truck trips to and from the project site. The primary emissions would be CO₂ from gasoline and diesel combustion, with more limited vehicle tailpipe emissions of N₂O and CH₄.

It was assumed that construction would occur during the year 2017. Guidance from SANDAG recommends amortizing construction emissions over a 50-year period to account for the annual contribution of GHG emissions over the project's lifetime. As shown in Table 3, amortized construction emissions would be substantially below the annual 900 MT CO₂e screening threshold.

Table 3 CONSTRUCTION GHG EMISSIONS (MT/yr)	
Construction Activity	CO₂e
Grubbing/Land Clearing	10
Grading/Excavation/Import	95
Drainage/Utilities/Sub-Grade/Retaining Wall	101
Paving	17
TOTAL	223
Amortized Construction Emissions ¹	5
Screening Threshold²	900

Source: Roadway Model emissions modeling by HELIX 2016 (output data is provided in Attachment A).

¹ Construction emissions are amortized over 50 years in accordance with SANDAG guidance.

² CAPCOA 2008

The project could result in operational emissions associated with production of energy consumed by potential lighting installed along the bikeway and the operation of maintenance vehicles along the bikeway. These emissions, however, would be very minor, as any lighting proposed for this project would be minimal and maintenance activities would be infrequent. Additionally, the project would encourage the use of bicycles and walking as alternatives to driving, and, thus, is anticipated to result in a net decrease in GHG emissions over the project’s lifetime.

Consistency with Applicable Plans

The proposed project would not constitute a significant source of GHG emissions, and would aid in the reduction of regional GHG emissions through encouraging alternative transportation. As such, and as discussed previously under *Consistency with Air Quality Plans*, the project would be consistent with the RP (including the Sustainable Communities Strategy), which is the regional planning document that includes future transportation projects (this project included) and addresses how the region will reduce GHG emissions to state-mandated levels over time. Implementation of the project would therefore not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

Summary

The project would result in construction emissions of criteria pollutants and GHGs; however emissions would not exceed applicable AQIA Trigger Levels or the GHG screening level threshold. Operational GHG emissions could result from proposed lighting and maintenance of the facility; however these emissions would be negligible, and would be offset by the project’s anticipated net decrease in emissions through encouraging alternative modes of transportation.

Letter to Mr. Omar Atayee
May 9, 2016

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As such, the project would support regional goals to improve air quality and reduce GHG emissions by reducing reliance on the automobile.

Sincerely,

A handwritten signature in black ink, appearing to read 'Joanne M. Dramko', with a stylized flourish at the end.

Joanne M. Dramko, AICP, GISP
Senior Air Quality Scientist

Attachment

Attachment A: Roadway Model Emissions

References

California Air Resources Board (CARB). 2015. *Area Designations: Activities and Maps*. Available: <http://www.arb.ca.gov/desig/adm/adm.htm>. Accessed January 2015.

California Air Pollution Control Officers Association (CAPCOA). 2008. *CEQA & Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act*. January. Available at: <http://www.capcoa.org/wp-content/uploads/2012/03/CAPCOA-White-Paper.pdf>.

Quality Infrastructure Corporation. 2016. Email communication between Bradbury, K. and Belzman, T. of HELIX Environmental Planning, Inc. March 11.

San Diego Association of Governments (SANDAG). 2015. *San Diego Forward: The Regional Plan*. Available at: <http://www.sdforward.com>.

2010. *Riding to 2050, the San Diego Regional Bicycle Plan*.

Attachment A

Road Construction Emissions Model, Version 7.1.5.1

Emission Estimates for -> Bayshore Bikeway Segment 8B				Total	Exhaust	Fugitive Dust	Total	Exhaust	Fugitive Dust	CO2 (lbs/day)
Project Phases (English Units)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	PM10 (lbs/day)	PM10 (lbs/day)	PM10 (lbs/day)	PM2.5 (lbs/day)	PM2.5 (lbs/day)	PM2.5 (lbs/day)	CO2 (lbs/day)
Grubbing/Land Clearing	1.2	7.9	13.8	3.1	0.6	2.5	1.0	0.5	0.5	1,692.0
Grading/Excavation	2.5	16.1	26.6	3.8	1.3	2.5	1.7	1.1	0.5	3,588.2
Drainage/Utilities/Sub-Grade	4.1	21.2	35.7	4.7	2.2	2.5	2.5	2.0	0.5	4,114.6
Paving	1.5	10.2	13.3	0.8	0.8	-	0.7	0.7	-	1,918.6
Maximum (pounds/day)	4.1	21.2	35.7	4.7	2.2	2.5	2.5	2.0	0.5	4,114.6
Total (tons/construction project)	0.2	1.2	2.0	0.3	0.1	0.2	0.1	0.1	0.0	249.9
Notes:	Project Start Year ->	2017								
	Project Length (months) ->	7								
	Total Project Area (acres) ->	0								
	Maximum Area Disturbed/Day (acres) ->	0								
	Total Soil Imported/Exported (yd ³ /day)->	14								
PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.										
Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I. Total PM2.5 emissions shown in Column J are the sum of exhaust and fugitive dust emissions shown in columns K and L.										
Emission Estimates for -> Bayshore Bikeway Segment 8B				Total	Exhaust	Fugitive Dust	Total	Exhaust	Fugitive Dust	CO2 (kgs/day)
Project Phases (Metric Units)	ROG (kgs/day)	CO (kgs/day)	NOx (kgs/day)	PM10 (kgs/day)	PM10 (kgs/day)	PM10 (kgs/day)	PM2.5 (kgs/day)	PM2.5 (kgs/day)	PM2.5 (kgs/day)	CO2 (kgs/day)
Grubbing/Land Clearing	0.5	3.6	6.3	1.4	0.3	1.1	0.5	0.2	0.2	769.1
Grading/Excavation	1.1	7.3	12.1	1.7	0.6	1.1	0.8	0.5	0.2	1,631.0
Drainage/Utilities/Sub-Grade	1.9	9.6	16.2	2.2	1.0	1.1	1.2	0.9	0.2	1,870.3
Paving	0.7	4.6	6.0	0.4	0.4	-	0.3	0.3	-	872.1
Maximum (kilograms/day)	1.9	9.6	16.2	2.2	1.0	1.1	1.2	0.9	0.2	1,870.3
Total (megagrams/construction project)	0.2	1.1	1.8	0.2	0.1	0.1	0.1	0.1	0.0	226.7
Notes:	Project Start Year ->	2017								
	Project Length (months) ->	7								
	Total Project Area (hectares) ->	0								
	Maximum Area Disturbed/Day (hectares) ->	0								
	Total Soil Imported/Exported (meters ³ /day)->	10								
PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.										
Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I. Total PM2.5 emissions shown in Column J are the sum of exhaust and fugitive dust emissions shown in columns K and L.										

**Road Construction Emissions Model
Data Entry Worksheet**

Version 7.1.5.1



Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells C10 through C25.

Input Type

Project Name	Bayshore Bikeway Segment 8B	
Construction Start Year	2017	Enter a Year between 2009 and 2025 (inclusive)
Project Type	1	1 New Road Construction 2 Road Widening 3 Bridge/Overpass Construction
Project Construction Time	6.70	months
Predominant Soil/Site Type: Enter 1, 2, or 3	2	1. Sand Gravel 2. Weathered Rock-Earth 3. Blasted Rock
Project Length	0.25	miles
Total Project Area	0.33	acres
Maximum Area Disturbed/Day	0.25	acres
Water Trucks Used?	1	1. Yes 2. No
Soil Imported	13.67	yd ³ /day
Soil Exported	0.00	yd ³ /day
Average Truck Capacity	12	yd ³ (assume 20 if unknown)

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

The remaining sections of this sheet contain areas that can be modified by the user, although those modifications are optional.

Note: The program's estimates of construction period phase length can be overridden in cells C34 through C37.

Construction Periods	User Override of	Program
	Construction Months	Calculated Months
Grubbing/Land Clearing	0.60	0.67
Grading/Excavation	2.70	3.02
Drainage/Utilities/Sub-Grade	2.50	2.01
Paving	0.90	1.01
Totals	6.70	6.70

2005	%	2006	%	2007	%
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

NOTE: soil hauling emissions are included in the Grading/Excavation Construction Period Phase, therefore the Construction Period for Grading/Excavation cannot be zero if hauling is part of the project.

Hauling emission default values can be overridden in cells C45 through C46.

Soil Hauling Emissions		User Override of					
User Input	Soil Hauling Defaults	Default Values					
Miles/round trip		30					
Round trips/day		1					
Vehicle miles traveled/day (calculated)			34.1827753				
Hauling Emissions	ROG	NOx	CO	PM10	PM2.5	CO2	
Emission rate (grams/mile)	0.15	7.43	0.65	0.16	0.09	1652.56	
Emission rate (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	
Pounds per day	0.01	0.56	0.05	0.01	0.01	124.43	
Tons per construction period	0.00	0.02	0.00	0.00	0.00	3.70	

Worker commute default values can be overridden in cells C60 through C65.

Worker Commute Emissions		User Override of Worker					
	Commute Default Values	Default Values					
Miles/ one-way trip		20					
One-way trips/day		2					
No. of employees: Grubbing/Land Clearing		4					
No. of employees: Grading/Excavation		16					
No. of employees: Drainage/Utilities/Sub-Grade		14					
No. of employees: Paving		10					
	ROG	NOx	CO	PM10	PM2.5	CO2	
Emission rate - Grubbing/Land Clearing (grams/mile)	0.133	0.172	1.555	0.047	0.020	443.765	
Emission rate - Grading/Excavation (grams/mile)	0.133	0.172	1.555	0.047	0.020	443.765	
Emission rate - Draining/Utilities/Sub-Grade (gr/mile)	0.133	0.172	1.555	0.047	0.020	443.765	
Emission rate - Paving (grams/mile)	0.133	0.172	1.555	0.047	0.020	443.765	
Emission rate - Grubbing/Land Clearing (grams/trip)	0.457	0.287	3.779	0.004	0.003	95.644	
Emission rate - Grading/Excavation (grams/trip)	0.457	0.287	3.779	0.004	0.003	95.644	
Emission rate - Draining/Utilities/Sub-Grade (gr/trip)	0.457	0.287	3.779	0.004	0.003	95.644	
Emission rate - Paving (grams/trip)	0.457	0.287	3.779	0.004	0.003	95.644	
Pounds per day - Grubbing/Land Clearing	0.051	0.062	0.576	0.016	0.007	148.199	
Tons per const. Period - Grub/Land Clear	0.000	0.000	0.004	0.000	0.000	0.978	
Pounds per day - Grading/Excavation	0.223	0.267	2.497	0.067	0.028	642.194	
Tons per const. Period - Grading/Excavation	0.007	0.008	0.074	0.002	0.001	19.073	
Pounds per day - Drainage/Utilities/Sub-Grade	0.188	0.226	2.113	0.057	0.024	543.395	
Tons per const. Period - Drain/Util/Sub-Grade	0.005	0.006	0.058	0.002	0.001	14.943	
Pounds per day - Paving	0.137	0.165	1.537	0.041	0.017	395.196	
Tons per const. Period - Paving	0.001	0.002	0.015	0.000	0.000	3.912	
tons per construction period	0.013	0.016	0.151	0.004	0.002	38.907	

Water truck default values can be overridden in cells C91 through C93 and E91 through E93.

Water Truck Emissions	User Override of	Program Estimate of	User Override of Truck	Default Values			
	Default # Water Trucks	Number of Water Trucks	Miles Traveled/Day	Miles Traveled/Day			
Grubbing/Land Clearing - Exhaust		1		40			
Grading/Excavation - Exhaust		1		40			
Drainage/Utilities/Subgrade		1		40			
	ROG	NOx	CO	PM10	PM2.5	CO2	
Emission rate - Grubbing/Land Clearing (grams/mile)	0.15	7.43	0.65	0.16	0.09	1652.56	
Emission rate - Grading/Excavation (grams/mile)	0.15	7.43	0.65	0.16	0.09	1652.56	
Emission rate - Draining/Utilities/Sub-Grade (gr/mile)	0.15	7.43	0.65	0.16	0.09	1652.56	
Pounds per day - Grubbing/Land Clearing	0.01	0.65	0.06	0.01	0.01	145.60	
Tons per const. Period - Grub/Land Clear	0.00	0.00	0.00	0.00	0.00	0.96	
Pound per day - Grading/Excavation	0.01	0.65	0.06	0.01	0.01	145.60	
Tons per const. Period - Grading/Excavation	0.00	0.02	0.00	0.00	0.00	4.32	
Pound per day - Drainage/Utilities/Subgrade	0.01	0.65	0.06	0.01	0.01	145.60	
Tons per const. Period - Drainage/Utilities/Subgrade	0.00	0.02	0.00	0.00	0.00	4.00	

Fugitive dust default values can be overridden in cells C110 through C112.

Fugitive Dust	User Override of Max	Default	PM10	PM10	PM2.5	PM2.5
	Acreage Disturbed/Day	Maximum Acreage/Day	pounds/day	tons/per period	pounds/day	tons/per period
Fugitive Dust - Grubbing/Land Clearing		0.25	2.5	0.0	0.5	0.0
Fugitive Dust - Grading/Excavation		0.25	2.5	0.1	0.5	0.0
Fugitive Dust - Drainage/Utilities/Subgrade		0.25	2.5	0.1	0.5	0.0

Off-Road Equipment Emissions

Grubbing/Land Clearing		Default	ROG	CO	NOx	PM10	PM2.5	CO2
Override of Default Number of Vehicles	Number of Vehicles	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
	<i>Program-estimate</i>							
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
	1	Crawler Tractors	0.71	4.47	9.06	0.35	0.32	825.49
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	1	Excavators	0.38	2.79	4.05	0.20	0.18	572.75
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
		Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
		Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Grubbing/Land Clearing	pounds per day	1.1	7.3	13.1	0.5	0.5	1398.2
	Grubbing/Land Clearing	tons per phase	0.0	0.0	0.1	0.0	0.0	9.2

Grading/Excavation	Default		ROG	CO	NOx	PM10	PM2.5	CO2
	Number of Vehicles	Type						
Override of Default Number of Vehicles	Program-estimate		pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
	0	Cranes	0.00	0.00	0.00	0.00	0.00	0.00
	1	Crawler Tractors	0.71	4.47	9.06	0.35	0.32	825.49
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
1.00	3	Excavators	0.38	2.79	4.05	0.20	0.18	572.75
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
1.00	2	Rollers	0.32	1.51	2.88	0.21	0.19	279.45
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
	1	Rubber Tired Loaders	0.50	3.12	6.05	0.21	0.19	662.79
0.00	2	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
1.00	2	Tractors/Loaders/Backhoes	0.33	1.57	3.06	0.23	0.21	335.52
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation	pounds per day	2.2	13.5	25.1	1.2	1.1	2676.0
	Grading	tons per phase	0.1	0.4	0.7	0.0	0.0	79.5

Drainage/Utilities/Subgrade Override of Default Number of Vehicles	Default Number of Vehicles <i>Program-estimate</i>		ROG	CO	NOx	PM10	PM2.5	CO2
			pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
	1	Air Compressors	0.63	3.41	4.13	0.33	0.31	507.95
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Cement and Mortar Mixers	0.07	0.35	0.42	0.02	0.02	57.88
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Cranes	0.67	3.01	7.64	0.34	0.31	601.86
		Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
	1	Generator Sets	0.47	2.97	3.65	0.25	0.23	487.07
	1	Graders	1.00	3.47	9.64	0.54	0.50	669.23
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	1	Plate Compactors	0.04	0.21	0.25	0.01	0.01	34.45
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
	1	Pumps	0.40	2.45	3.01	0.21	0.20	396.14
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
0.00	2	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
	2	Tractors/Loaders/Backhoes	0.67	3.14	6.11	0.46	0.42	671.04
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Drainage	pounds per day	3.9	19.0	34.9	2.2	2.0	3425.6
	Drainage	tons per phase	0.1	0.5	1.0	0.1	0.1	94.2

Paving	Default		ROG	CO	NOx	PM10	PM2.5	CO2
	Override of Default Number of Vehicles	Number of Vehicles <i>Program-estimate</i>						
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
		Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	1	Pavers	0.37	2.84	4.01	0.20	0.18	481.97
	1	Paving Equipment	0.29	2.69	3.18	0.16	0.15	426.45
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
1.00	3	Rollers	0.32	1.51	2.88	0.21	0.19	279.45
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
1.00	2	Tractors/Loaders/Backhoes	0.33	1.57	3.06	0.23	0.21	335.52
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Paving	pounds per day	1.3	8.6	13.1	0.8	0.7	1523.4
	Paving	tons per phase	0.0	0.1	0.1	0.0	0.0	15.1
Total Emissions all Phases (tons per construction period) =>			0.2	1.1	1.9	0.1	0.1	198.0

Equipment default values for horsepower and hours/day can be overridden in cells C289 through C322 and E289 through E322.

Equipment		Default Values Horsepower		Default Values Hours/day
Aerial Lifts		63		8
Air Compressors		106		8
Bore/Drill Rigs		206		8
Cement and Mortar Mixers		10		8
Concrete/Industrial Saws		64		8
Cranes		226		8
Crawler Tractors		208		8
Crushing/Proc. Equipment		142		8
Excavators		163		8
Forklifts		89		8
Generator Sets		66		8
Graders		175		8
Off-Highway Tractors		123		8
Off-Highway Trucks		400		8
Other Construction Equipment		172		8
Other General Industrial Equipment		88		8
Other Material Handling Equipment		167		8
Pavers		126		8
Paving Equipment		131		8
Plate Compactors		8		8
Pressure Washers		26		8
Pumps		53		8
Rollers		81		8
Rough Terrain Forklifts		100		8
Rubber Tired Dozers		255		8
Rubber Tired Loaders		200		8
Scrapers		362		8
Signal Boards		20		8
Skid Steer Loaders		65		8
Surfacing Equipment		254		8
Sweepers/Scrubbers		64		8
Tractors/Loaders/Backhoes		98		8
Trenchers		81		8
Welders		45		8

0

END OF DATA ENTRY SHEET