

CALIFORNIA CROSSPOINT MIDDLE/HIGH SCHOOL TAC AND ASSESSMENT

***25500 Industrial Boulevard
Hayward, California***

March 28, 2016

Prepared for:

**Ed Ong
California Crosspoint High School**

Prepared by:

James A. Reyff

ILLINGWORTH & RODKIN, INC.
//// Acoustics • Air Quality ///
1 Willowbrook Court, Suite 120
Petaluma, CA 94954
(707) 794-0400

Project: 16-008

INTRODUCTION

This report summarizes the assessment of potential toxic air contaminant (TAC) impacts resulting from this school project, to be located at 25500 Industrial Boulevard in Hayward, California. The project proposes to convert the former Heald College campus into a middle and high school in three phases over a period of about five years. Phase 1 will utilize the existing facility, which contains more than 32 move-in ready classrooms, to host California Crosspoint's existing 200 high school students plus an additional 50 middle school students anticipated to attend in the fall of 2016. No major upgrades or renovation will be necessary to open the school for junior high school and high school students. Minor upgrades will include renovation of the former dental and medical tech labs to become laboratory classrooms and the construction of a perimeter fence. Phase 2 will construct a 42,000 square foot (sf) community center with gymnasium, fitness center, multipurpose assembly hall, commercial kitchen, and multi-use classrooms. Phase 3 will construct a student residence hall, dining hall, recreation room, and lounge area. A fourth phase (Phase 4) would potentially acquire adjacent land for the construction of outdoor athletic facilities and additional parking. Phase 4 is not assessed in this document. Full build-out of the project is anticipated to include 400 high school, 150 middle school and 50 preschool students (600 students) total along with 70 staff or workers.

This report is the assessment of potential community risk impacts resulting from the proposed school project and residence hall. Project impacts related to increased community risk can occur either by introducing a new sensitive receptor, such as a school or residential use, in proximity to an existing source of TACs. School students are considered sensitive receptors. The BAAQMD recommends using a 1,000-foot screening radius around a project site for purposes of identifying community health risk from siting a new sensitive receptor or a new source of TACs.

After moving on to the site and establishing the middle school and high school, California Crosspoint will then research and poll the surrounding businesses and area to see if there is an interest and support in having a preschool in the area. If there is, then California Crosspoint will assess whether it can accommodate a preschool. Based on our understanding, a preschool would include children ages 3 to 5. Because this study evaluates exposures for children that would attend the junior high and high school, a six-year exposure, impacts to preschoolers would be less.

Setting

The project is located in northern Alameda County, which is in the San Francisco Bay Area Air Basin. Ambient air quality standards have been established at both the State and federal level. The Bay Area meets all ambient air quality standards with the exception of ground-level ozone, respirable particulate matter (PM₁₀), and fine particulate matter (PM_{2.5}).

Toxic Air Contaminants

Toxic air contaminants (TAC) are a broad class of compounds known to cause morbidity or mortality (usually because they cause cancer) and include, but are not limited to, the criteria air pollutants. TACs are found in ambient air, especially in urban areas, and are caused by industry,

agriculture, fuel combustion, and commercial operations (e.g., dry cleaners). TACs are typically found in low concentrations, even near their source (e.g., diesel particulate matter [DPM] near a freeway). Because chronic exposure can result in adverse health effects, TACs are regulated at the regional, State, and federal level.

Diesel exhaust is the predominant TAC in urban air and is estimated to represent about three-quarters of the cancer risk from TACs (based on the Bay Area average). According to the California Air Resources Board (CARB), diesel exhaust is a complex mixture of gases, vapors, and fine particles. This complexity makes the evaluation of health effects of diesel exhaust a complex scientific issue. Some of the chemicals in diesel exhaust, such as benzene and formaldehyde, have been previously identified as TACs by the CARB, and are listed as carcinogens either under the State's Proposition 65 or under the Federal Hazardous Air Pollutants programs.

CARB has adopted and implemented a number of regulations for stationary and mobile sources to reduce emissions of DPM. Several of these regulatory programs affect medium and heavy duty diesel trucks that represent the bulk of DPM emissions from California highways. These regulations include the solid waste collection vehicle (SWCV) rule, in-use public and utility fleets, and the heavy-duty diesel truck and bus regulations. In 2008, CARB approved a new regulation to reduce emissions of DPM and nitrogen oxides from existing on-road heavy-duty diesel fueled vehicles.¹ The regulation requires affected vehicles to meet specific performance requirements between 2014 and 2023, with all affected diesel vehicles required to have 2010 model-year engines or equivalent by 2023. These requirements are phased in over the compliance period and depend on the model year of the vehicle.

The BAAQMD is the regional agency tasked with managing air quality in the region. At the State level, the CARB (a part of the California Environmental Protection Agency [EPA]) oversees regional air district activities and regulates air quality at the State level. The BAAQMD has recently published California Environmental Quality Act (CEQA) Air Quality Guidelines that are used in this assessment to evaluate air quality impacts of projects.²

Sensitive Receptors

There are groups of people more affected by air pollution than others. CARB has identified the following persons who are most likely to be affected by air pollution: children under 14, the elderly over 65, athletes, and people with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive receptors. Locations that may contain a high concentration of these sensitive population groups include residential areas, hospitals, daycare facilities, elder care facilities, elementary schools, and parks. The students attending the school and residing in the residence hall would be considered sensitive receptors.

1 Available online: <http://www.arb.ca.gov/msprog/onrdiesel/onrdiesel.htm>. Accessed: November 21, 2014.

2 Bay Area Air Quality Management District. 2011. BAAQMD CEQA Air Quality Guidelines. May.

Significance Thresholds

The Bay Area Air Quality Management District (BAAQMD) identified significance thresholds for exposure to TACs and PM_{2.5} as part of its May 2011 CEQA Air Quality Guidelines. The following are the significance criteria that are used to judge this project's impacts:

Single Source Impacts

If emissions of TACs or PM_{2.5} exceed any of the thresholds of significance listed below, the proposed project would result in a significant impact and mitigation would be required.

- An excess cancer risk level of more than 10.0 in 1 million, or a non-cancer (chronic or acute) hazard index greater than 1.0.
- An incremental increase of more than 0.3 micrograms per cubic meter (µg/m³) annual average PM_{2.5}.

Cumulative Source Impacts

A project would have a cumulatively considerable impact if the aggregate total of all past, present, and foreseeable future sources within a 1,000 foot radius of the fence line of a source or from the location of a receptor, plus the contribution from the project, exceeds the following thresholds:

- An excess cancer risk levels of more than 100 in one million or a chronic non-cancer hazard index (from all local sources) greater than 10.0.
- An incremental increase of more than 0.8 µg/m³ annual average PM_{2.5}.

BAAQMD's adoption of significance thresholds contained in the 2011 CEQA Air Quality Guidelines was called into question by an order issued March 5, 2012, in California Building Industry Association (CBIA) v. BAAQMD (Alameda Superior Court Case No. RGI0548693). The order requires BAAQMD to set aside its approval of the thresholds until it has conducted environmental review under CEQA. The ruling made in the case concerned the environmental impacts of adopting the thresholds and how the thresholds would indirectly affect land use development patterns. In August 2013, the Appellate Court struck down the lower court's order to set aside the thresholds. However, the California Supreme Court accepted a portion of CBIA's petition to review the appellate court's decision to uphold BAAQMD's adoption of the thresholds. The specific portion of the argument considered was whether CEQA requires consideration of the effects of the environment on a project (as contrasted to the effects of a proposed project on the environment). On December 17, 2015, the California Supreme Court ruled that CEQA generally does not require an analysis of the effects of existing environmental conditions (e.g., air quality) on a project unless the project would exacerbate those conditions somehow through its construction and/or operation. The City's General Plan, however, includes several air quality policies that address the exposure of sensitive receptors to existing sources of TACs and PM_{2.5}. Table 1 includes the General Plan policies that address community risk exposure to TACs and PM_{2.5}. The significance thresholds that address impacts to the project from the existing environment contained in the 2011 CEQA Air Quality Guidelines are applied to this project. This analysis evaluated the overall community risk impacts to the school, based on the exposure that students may have while attending the school, including those that reside in the residence hall.

Table 1 General Plan Policies Pertaining to Community Risk Impacts

NR-2.15 Community Risk Reduction Strategy. The City shall maintain and implement the General Plan as Hayward's community risk reduction strategy to reduce health risks associated with toxic air contaminants (TACs) and fine particulate matter (PM _{2.5}) in both existing and new development.)	NR-2.18 Exposure Reduction Measures for New Receptors. The City shall require development projects to implement all applicable best management practices that will reduce exposure of new sensitive receptors (e.g., hospitals, schools, daycare facilities, elderly housing and convalescent facilities) to odors, toxic air contaminants (TAC) and fine particulate matter (PM _{2.5}).
NR-2.16 Sensitive Uses. The City shall minimize exposure of sensitive receptors to toxic air contaminants (TAC), fine particulate matter (PM _{2.5}), and odors to the extent possible, and consider distance, orientation, and wind direction when siting sensitive land uses in proximity to TAC- and PM _{2.5} -emitting sources and odor sources in order to minimize health risk	NR-2.19 Exposure Reduction Measures for both Existing and New Receptors. The City shall work with area businesses, residents and partnering organizations to provide information about best management practices that can be implemented on a voluntary basis to reduce exposure of sensitive receptors to toxic air contaminants (TAC) and fine particulate matter (PM _{2.5}).
NR-2.17 Source Reduction Measures. The City shall coordinate with and support the efforts of the Bay Area Air Quality Management District, the California Air Resources Board, the U.S. Environmental Protection Agency, and other agencies as appropriate to implement source reduction measures and best management practices that address both existing and new sources of toxic air contaminants (TAC), fine particulate matter (PM _{2.5}), and odors.	
Source: 2040 Hayward General Plan, Policy Document: Part 3, Natural Resources Element	

Community Risk Impacts

The community risk thresholds primarily address chronic or long-term exposures that include lifetime cancer risk and annual concentrations of PM_{2.5}. A review of the area indicates that there are no sources that pose potentially significant acute exposures to TACs. BAAQMD screening tools that predict increased lifetime cancer risk, annual PM_{2.5} concentrations and non-cancer Hazard Index were used for this analysis. This analysis evaluated the overall community risk impacts to the project, based on the exposure that children age 12 to 17 years may have while attending the school. Two reasonable worst-case exposure scenarios were evaluated:

- (1) Students attend the Jr. High School and High School for a total period of 6 years, and
- (2) Students attend the Jr. High School and High School for a total period of 6 years AND reside in the residence hall continuously when school is not in session.

Typically, cancer risk and annual PM_{2.5} assessments assume almost continuous exposure to TAC sources. However, a school is different in that the sensitive receptors, i.e., students, do not reside at the project site. The predicted cancer risk and annual PM_{2.5} concentrations accounted for the exposure duration that students attending a Jr. High School and High School would experience. Students, ages 12 to 17, attending the project are assumed to be exposed for 8 hours per day, 5

days per week, 180 days per year and 6 years during a lifetime³. Since students are only present at the school for a relatively short portion of their life lifetime, annual exposures have to be adjusted.

It is possible that some students would attend the school and reside at the proposed Residence Hall. These students would have much greater exposures, but at different locations at the site. Screening cancer risk and annual PM_{2.5} exposures were predicted for both types of exposures. The exposures were based on screening level impacts for the portions of the project closest to TAC sources.

The screening level lifetime cancer risk and annual PM_{2.5} concentration were adjusted, based on the following assumptions:

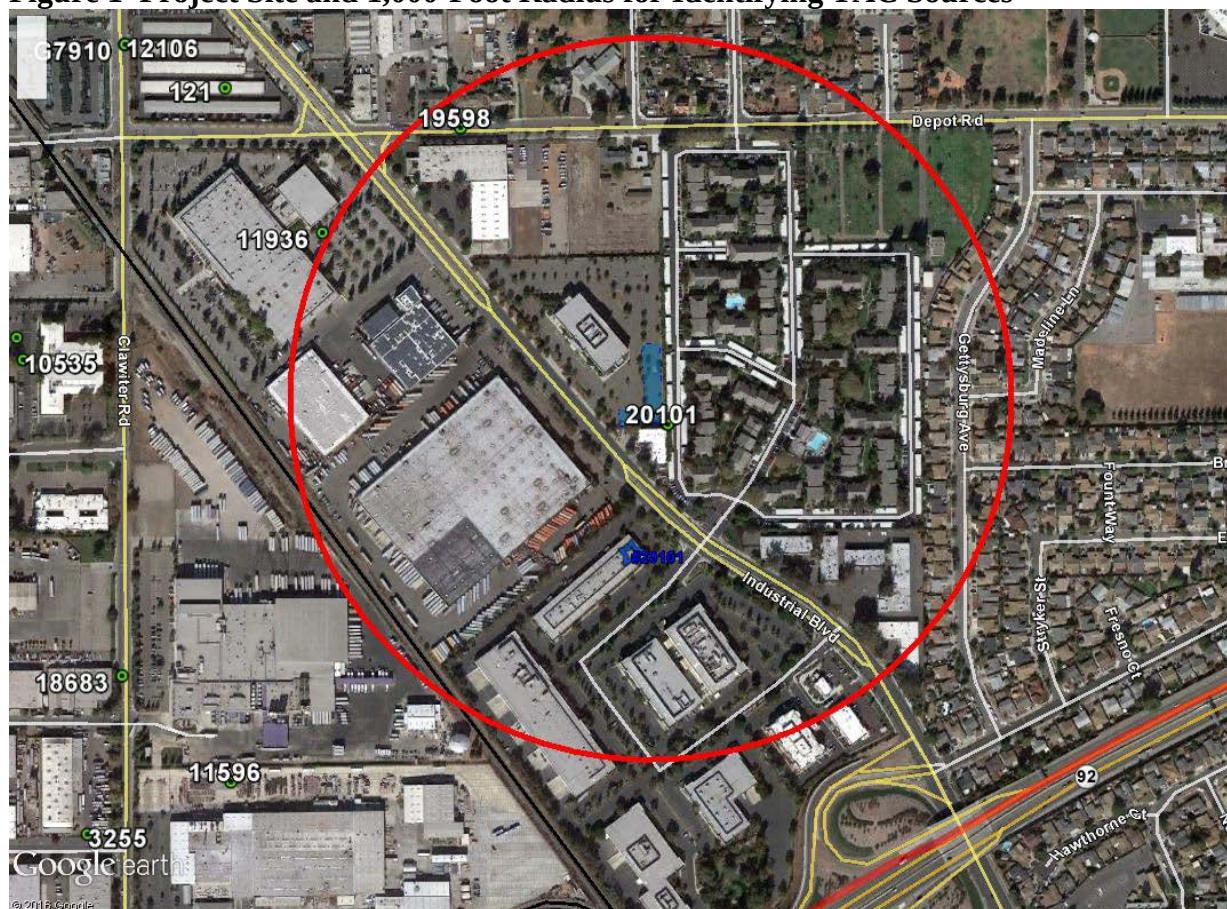
1. Age sensitivity applied to cancer risk calculations. BAAQMD screening data uses a factor of 1.7 for lifetime exposure. This was adjusted to a factor of 3 for children age 12 to 17 years, but conservatively used the OEHHA recommended breathing rate for a child age 2 to 16 years.
2. Daily exposure applied to cancer risk and annual PM_{2.5} calculations. Health risk assessments assume 24-hour per day exposure. Students attending the school would only be present for 8 hours per day. Students at the residence hall were assumed to be exposed there for 16 hours per day.
3. Annual exposure applied to cancer risk and annual PM_{2.5} calculations. Health risk assessments assume 350 days of exposure per year and students would attend the school 180 days per year. Students at the residence hall would be there 350 days per year.
4. Lifetime exposure applied to cancer risk calculations. Screening health risks provided in the BAAQMD tools assume a 70-year exposure. Students would attend the school for a maximum of 6 years.
5. Breathing rate applied to cancer risk calculations. The screening guidance was based on an overall breathing rate of 302 liters per kilogram body weight per day and new exposure parameters issued by the California Office of Environmental Health Hazards Assessment (OEHHA) suggest a rate of 572 liters per kilogram body weight per day.

³ Cancer risk computations take into account these exposure parameters, along with a higher breathing rate for children (based on weight) and an age sensitivity factor (ASF) based on 4 years at an ASF of 3, rather than a lifetime average that is 1.7. ASF accounts for the greater sensitivity of infants and children to cancer causing TACs.

TAC Sources Considered

A review of the project area (i.e., within 1,000 feet of the site) indicates that traffic on Industrial Boulevard, truck traffic associated with a distribution center across Industrial Boulevard, and one stationary source, permitted by BAAQMD, could adversely affect the project. Note that there is a Union Pacific Railroad about 950 feet west of the site. This rail line carries relatively light train traffic and is not anticipated to affect the site at this distance⁴. Figure 1 shows the project site and the sources of TACs near the site. Results of this assessment are shown in Table 2 for school students and Table 3 for students residing in the residence hall. Note that students residing in the Residence Hall would have the combined exposure for time at school and time at the Residence Hall. The results in Table 3 provide the combined exposures. The method to determine community risks from each source is described below. Note that no single source would pose a significant cancer risk, annual PM_{2.5} concentration or non-cancer Hazard Index that exceeds the thresholds.

Figure 1 Project Site and 1,000-Foot Radius for Identifying TAC Sources



⁴ According to the 2006 Bay Area Regional Rail Plan, this line only carries 2 Amtrak and 4 to 6 freight trains per day.

Local Roadways

BAAQMD provides the *Roadway Screening Analysis Calculator* that is used to assess potential excess cancer risk and annual PM_{2.5} concentrations from surface streets for each Bay Area county. The calculator requires the entries of: (1) County, (2) roadway orientation (north-south or east-west), (3) side of the roadway receptors is located, (4) distance between receptor and nearest through travel lane, and (5) average daily traffic (ADT) volume.

Traffic data for Industrial Boulevard indicates a peak PM-hour traffic volume of 2,203 vehicles for the “Cumulative-No Project-PM (2035)” with the “Project” trips added scenario at the Main Access. Assuming the peak-hour volume is 10 percent of the average daily traffic (ADT), Industrial Boulevard is assumed to have a worst-case ADT of 22,030 vehicles. The edge of this north-south roadway is approximately 120 feet west of the interior portions of the school building and further from outdoor areas. The roadway edge is 60 feet from the nearest potential habitable portion of the proposed residence hall. The excess cancer risk and annual PM_{2.5} concentration was computed based on 8 hours of exposure for students (Table 2) at the school and 16 hours exposure for residence hall occupants and 8 hours of exposure at the school (Table 3). The occupants were assumed to be present for 350 days of the year. As shown in Table 2 and Table 3, the cancer risk and annual PM_{2.5} concentration associated with the roadway is below the significance threshold. Note that BAAQMD has found that non-cancer hazards from all local roadways would be well below the BAAQMD thresholds. Cancer risk levels were adjusted for exposure duration, age, and new exposure guidance provided by OEHHA, as described above.

Distribution Center

There is a distribution center across Industrial Boulevard from the project site. This is a source of heavy-duty truck traffic that results in DPM and PM_{2.5} emissions. The truck traffic volume is unknown, but was conservatively estimated by assuming each truck bay at the building would produce two trips: one incoming and one outgoing. A cursory look at an aerial image of the site indicates about 100 to 150 possible truck bays, so 300 daily truck trips per day were estimated as a hypothetical worst-case scenario and assumed to occur 365 days per year. Truck PM_{2.5} emissions were estimated using the EMFAC2014 model, assuming 10 mile per hour travel speed and 0.25 miles of travel for each trip within 1,000 feet of the project site. PM_{2.5} emissions included exhaust and tire wear. The emissions were input to BAAQMD’s *Risk and Hazards Screening Model* and adjusted for distance. An emission point source located 270 feet from the school and 220 feet from the Residence Hall was used to represent this large area source. The contribution of this source (shown in Tables 2 and 3) would not exceed the thresholds.

Stationary Sources

There is one operational stationary source of TAC emissions that was identified within 1,000 feet of the project site using the BAAQMD *Stationary Source Screening Analysis Tool*.⁵ This tool provides screening levels of cancer risk, PM_{2.5}, and non-cancer risk for the identified sources. Plant 20101 at 25801 Industrial Boulevard is an emergency back-up diesel generator. This

5 See <http://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/ceqa-tools>, accessed November 13, 2015.

source is permitted to operate by the BAAQMD. Screening-level cancer risks, identified using the tool, were adjusted for the approximate 560-foot distance for the school and 360 feet for the Residence Hall using BAAQMD's *Diesel BUG Distance Multiplier*. Cancer risk levels were adjusted for exposure duration, age, and new exposure guidance provided by OEHHA, as described above.

Cumulative Sources

The combination of all sources affecting the site was considered. The cumulative cancer risk and annual PM_{2.5} concentrations were computed in Table 2 and 3 by summing the contribution from each source. These levels would be below the significance thresholds for cumulative community risk impacts

Table 2. Community Risk Impacts from Single and Cumulative Sources – School Exposures**California Crosspoint High School in Hayward, CA**

Screening Community Risk Assessment - Jr. and High School Exposures

Source	<u>BAAQMD Screening Tools</u>			<u>Adjusted for Exposure*</u>	
	Duration (hours)	Screening Risk (per million)	Screening PM2.5 (µg/m ³)	Risk (per million)	PM2.5 (µg/m ³)
Industrial Blvd (estimated ADT = 35,000)					
Roadway Screening Calculator 120 feet East	8	5.00	0.20		
Roadway Screening Calculator 120 feet north	8	4.87	0.19		
Average	8	4.94	0.19	0.35	0.05
Distribution Center					
Estimated 150 truck trips, 230 feet North	8	6.67	0.02	0.48	0.00
Plant 20101					
Millipore Corp, Generator, 560 feet South	8	1.56	0.00	0.11	0.00
Cumulative Levels				0.94	0.05

*** Adjustments**

Breathing rate adjustment (CR)	1.89 , where old lifetime risk = 302, new OEHHA = 572 L/kg-day
Age sensitivity factor (CR)	1.77 , lifetime risk = 1.7 and child = 3
Exposure duration (hrs/day) (CR & PM2.5)	0.33 , lifetime = 24 hours and school = 8 hours
Exposure duration (days/year) (CR & PM2.5)	0.72 , where lifetime risk = 350 days, school = 180 days open
Exposure duration (years) (CR only)	0.09 , where lifetime risk = 70 years, school = 6 years max.

**Table 3. Community Risk Impacts from Single and Cumulative Sources – School and Residence Hall Exposures
California Crosspoint High School in Hayward, CA**

Screening Community Risk Assessment - Residence Hall Exposures

Source	Duration (hours)	BAAQMD Screening Tools		Adjusted for Exposure*	
		Screening Risk (per million)	Screening PM2.5 (µg/m³)	Risk (per million)	PM2.5 (µg/m³)
Industrial Blvd (estimated ADT = ~19,000)					
Roadway Screening Calculator 60 feet East	16	7.04	0.28		
Roadway Screening Calculator 60 feet north	16	6.83	0.27		
Average	16, 24	6.94	0.27	2.07	0.27
Distribution Center					
Estimated 150 truck trips, 230 feet North	16, 24	6.67	0.02	2.12	0.02
Plant 20101					
Millipore Corp, Generator, 360 feet South	16, 24	2.81	0.00	0.81	0.00
Cumulative Levels				4.99	0.29

*** Adjustments**

Breathing rate adjustment (CR)	1.89	, where old lifetime risk = 302, new OEHHHA = 572 L/kg-day
Age sensitivity factor (CR)	1.77	, lifetime risk = 1.7 and child = 3
Exposure duration (hrs/day) (CR & PM2.5)	0.82	, lifetime = 24 hrs and residence hall = 16 hrs, school days 24 hrs non-school
Exposure duration (days/year) (CR & PM2.5)	1	, where lifetime risk = 350 days, assume 350 days
Exposure duration (years) (CR only)	0.09	, where lifetime risk = 70 years, school = 6 years max.
Added school exposure to get total exposure		

Attachment

Bay Area Air Quality Management District

Roadway Screening Analysis Calculator

County specific tables containing estimates of risk and hazard impacts from roadways in the Bay Area.

INSTRUCTIONS:

Input the site-specific characteristics of your project by using the drop down menu in the "Search Parameter" box. We recommend that this analysis be used for roadways with 10,000 AADT and above.

- County: Select the County where the project is located. The calculator is only applicable for projects within the nine Bay Area counties.
- Roadway Direction: Select the orientation that best matches the roadway. If the roadway orientation is neither clearly north-south nor east-west, use the highest values predicted from either orientation.
- Side of the Roadway: Identify on which side of the roadway the project is located.
- Distance from Roadway: Enter the distance in feet from the nearest edge of the roadway to the project site. The calculator estimates values for distances greater than 10 feet and less than 1000 feet. For distances greater than 1000 feet, the user can choose to extrapolate values using a distribution curve or apply 1000 feet values for greater distances.
- Annual Average Daily Traffic (ADT): Enter the annual average daily traffic on the roadway. These data may be collected from the city or the county (if the area is unincorporated).

When the user has completed the data entries, the screening level PM2.5 annual average concentration and the cancer risk results will appear in the Results Box on the right. Please note that the roadway tool is not applicable for California State Highways and the District refers the user to the Highway Screening Analysis Tool at: <http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Tools-and-Methodology.aspx>.

Notes and References listed below the Search Boxes

Search Parameters

County

Alameda

Roadway Direction

East-West

Side of the Roadway

North

Distance from Roadway

60

feet

Annual Average Daily Traffic (ADT)

22,000

Results

Alameda County

EAST-WEST DIRECTIONAL ROADWAY

PM2.5 annual average

0.265

(µg/m³)

Cancer Risk

13.65

(per million)

Industrial Boulevard

Adjusted for EMFAC2014 for 2018

6.83

(per million)

Note that EMFAC2014 predicts DSL PM2.5 aggregate rates in 2018 that are 46% of EMFAC2011 for 2014. TOG gasoline rates are 56% of EMFAC2011 year 2014 rates. This is for light- and medium-duty vehicles traveling at 30 mph for Bay Area

Data for Alameda County based on meteorological data collected from Pleasanton in 2005

Notes and References:

- Emissions were developed using EMFAC2011 for fleet mix in 2014 assuming 10,000 AADT and includes impacts from diesel and gasoline vehicle exhaust, brake and tire wear, and resuspended dust.
- Roadways were modeled using CALINE4 Cal3qhc air dispersion model assuming a source length of one kilometer. Meteorological data used to estimate the screening values are noted at the bottom of the "Results" box.
- Cancer risks were estimated for 70 year lifetime exposure starting in 2014 that includes sensitivity values for early life exposures and OEHA toxicity values adopted in 2013.

Appendix A

EMFAC2014 (v1.0.7) Emission Rates

Region Type: County DPM per day = 0.02028 lbs/day
 Region: Alameda PM2.5 per day = 0.02747 lbs/day
 Calendar Year: 2017 Aggregate DPM Rate = 0.1227 g/mi (10mph)
 Season: Annual Tire + Brake wear = 0.0436 g/mi

Vehicle Classification: EMFAC2011 Categories

Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HTSK and RUNLS, g/vehicle/day for IDLEX, RESTL and DIURN

2,510,954															
Region	CalYr	VehClass	MdlYr	Speed	Fuel	Population	VMT	Trips	PM2_5_RUNEX	PM2_5_IDLE	PM2_5_STRE	PM2_5_PMTW	PM2_5_PMBW		
Alameda	2017	T6 Ag	Aggregatec	Aggregatec	DSL	187.918365	3,470	0		0.274967	0	0.003	10.41	0.05586	193.85
Alameda	2017	T6 CAIRP heavy	Aggregatec	Aggregatec	DSL	20.3521167	1,133	0		0.005319	0	0.003	3.40	0.05586	63.31
Alameda	2017	T6 CAIRP small	Aggregatec	Aggregatec	DSL	54.3632186	3,479	0	See 10mph run	0.025923	0	0.003	10.44	0.05586	194.35
Alameda	2017	T6 instate construction hea	Aggregatec	Aggregatec	DSL	454.315348	29,270	0		0.038581	0	0.003	87.81	0.05586	1,635.01
Alameda	2017	T6 instate construction sma	Aggregatec	Aggregatec	DSL	849.528274	49,315	0		0.036421	0	0.003	147.95	0.05586	2,754.75
Alameda	2017	T6 instate heavy	Aggregatec	Aggregatec	DSL	3426.96131	190,615	0		0.006301	0	0.003	571.84	0.05586	#####
Alameda	2017	T6 instate small	Aggregatec	Aggregatec	DSL	8277.38219	492,069	0		0.038176	0	0.003	1,476.21	0.05586	#####
Alameda	2017	T6 OOS heavy	Aggregatec	Aggregatec	DSL	12.0300791	649	0		0.001903	0	0.003	1.95	0.05586	36.28
Alameda	2017	T6 OOS small	Aggregatec	Aggregatec	DSL	31.1480812	1,993	0		0.025923	0	0.003	5.98	0.05586	111.36
Alameda	2017	T6 Public	Aggregatec	Aggregatec	DSL	981.002355	16,520	0		0.014547	0	0.003	49.56	0.05586	922.80
Alameda	2017	T6 utility	Aggregatec	Aggregatec	DSL	158.1064	3,077	0		0.000127	0	0.003	9.23	0.05586	171.87
Alameda	2017	T6TS	Aggregatec	Aggregatec	GAS	1549.47801	80,677	31002		0	0.002554	0.003	242.03	0.05586	4,506.61
Alameda	2017	T7 Ag	Aggregatec	Aggregatec	DSL	243.003609	4,116	0		0.844403	0	0.009	37.04	0.02646	108.91
Alameda	2017	T7 CAIRP	Aggregatec	Aggregatec	DSL	1328.53145	276,440	0		0.174714	0	0.009	2,487.96	0.02646	7,314.61
Alameda	2017	T7 CAIRP construction	Aggregatec	Aggregatec	DSL	90.2810274	20,764	0		0.355056	0	0.009	186.87	0.02646	549.41
Alameda	2017	T7 NNOOS	Aggregatec	Aggregatec	DSL	1403.85501	342,786	0		0.066461	0	0.009	3,085.08	0.02646	9,070.13
Alameda	2017	T7 NOOS	Aggregatec	Aggregatec	DSL	536.021552	109,194	0		0.124504	0	0.009	982.75	0.02646	2,889.27
Alameda	2017	T7 other port	Aggregatec	Aggregatec	DSL	158.248409	29,795	0		0.004863	0	0.009	268.16	0.02646	788.38
Alameda	2017	T7 POAK	Aggregatec	Aggregatec	DSL	859.793452	111,980	0		0.007765	0	0.009	1,007.82	0.02646	2,962.98
Alameda	2017	T7 Public	Aggregatec	Aggregatec	DSL	700.934305	16,064	0		0.260593	0	0.009	144.58	0.02646	425.06
Alameda	2017	T7 Single	Aggregatec	Aggregatec	DSL	973.367286	81,978	0		0.207894	0	0.009	737.80	0.02646	2,169.13
Alameda	2017	T7 single construction	Aggregatec	Aggregatec	DSL	633.11074	53,713	0		0.145159	0	0.009	483.42	0.02646	1,421.25
Alameda	2017	T7 SWCV	Aggregatec	Aggregatec	DSL	684.213354	31,553	0		0.15431	0	0.009	283.97	0.02646	834.88
Alameda	2017	T7 tractor	Aggregatec	Aggregatec	DSL	3425.17267	507,879	0		0.027391	0	0.009	4,570.92	0.02646	#####
Alameda	2017	T7 tractor construction	Aggregatec	Aggregatec	DSL	487.329952	40,047	0		0.119379	0	0.009	360.42	0.02646	1,059.65
Alameda	2017	T7 utility	Aggregatec	Aggregatec	DSL	110.210645	2,520	0		0.001719	0	0.009	22.68	0.02646	66.68
Alameda	2017	T7IS	Aggregatec	Aggregatec	GAS	71.5814254	9,857	1432		0	0.003803	0.005	49.29	0.02646	260.83

EMFAC2014 (v1.0.7) Emission Rates

Region Type: County

Region: Alameda

Calendar Year: 2017

Season: Annual

Vehicle Classification: EMFAC2011 Categories

Units: miles/day for VMT, g/mile for RUNEX, PMBW and PMTW

Region	CalYr	VehClass	MdlYr	Speed	Fuel	90,862	VMT	0.122737
						g/mi	PM2_5_RUNEX	gm/mi (10mph)
Alameda	2017	LDA	Aggregatec	10	DSL	1,795	0.065193	117.0315
Alameda	2017	LDT1	Aggregatec	10	DSL	15	0.45657	6.998179
Alameda	2017	LDT2	Aggregatec	10	DSL	93	0.012499	1.158548
Alameda	2017	LHD1	Aggregatec	10	DSL	18,312	0.078643	1440.072
Alameda	2017	LHD2	Aggregatec	10	DSL	7,099	0.058159	412.8573
Alameda	2017	MDV	Aggregatec	10	DSL	541	0.021431	11.59744
Alameda	2017	MH	Aggregatec	10	DSL	255	0.340222	86.86108
Alameda	2017	Motor Coach	Aggregatec	10	DSL	434	0.101273	43.94433
Alameda	2017	SBUS	Aggregatec	10	DSL	220	0.206535	45.397
Alameda	2017	T6 Ag	Aggregatec	10	DSL	137	1.490168	204.467
Alameda	2017	T6 CAIRP heavy	Aggregatec	10	DSL	45	0.03811	1.707814
Alameda	2017	T6 CAIRP small	Aggregatec	10	DSL	138	0.150451	20.69655
Alameda	2017	T6 instate construction heavy	Aggregatec	10	DSL	1,157	0.180042	208.3594
Alameda	2017	T6 instate construction small	Aggregatec	10	DSL	1,950	0.257497	502.0802
Alameda	2017	T6 instate heavy	Aggregatec	10	DSL	7,537	0.052049	392.2707
Alameda	2017	T6 instate small	Aggregatec	10	DSL	19,456	0.276513	5379.727
Alameda	2017	T6 OOS heavy	Aggregatec	10	DSL	26	0.019345	0.4967
Alameda	2017	T6 OOS small	Aggregatec	10	DSL	79	0.150451	11.85834
Alameda	2017	T6 Public	Aggregatec	10	DSL	653	0.071593	46.76234
Alameda	2017	T6 utility	Aggregatec	10	DSL	122	0.00326	0.396612
Alameda	2017	T7 Ag	Aggregatec	10	DSL	56	2.496182	140.6633
Alameda	2017	T7 CAIRP	Aggregatec	10	DSL	3,785	0.058797	222.5327
Alameda	2017	T7 CAIRP construction	Aggregatec	10	DSL	284	0.084274	23.95729
Alameda	2017	T7 NNOOS	Aggregatec	10	DSL	4,693	0.020354	95.52568
Alameda	2017	T7 NOOS	Aggregatec	10	DSL	1,495	0.043121	64.46593
Alameda	2017	T7 other port	Aggregatec	10	DSL	1,436	0.045284	65.02319
Alameda	2017	T7 POAK	Aggregatec	10	DSL	5,397	0.051386	277.3094
Alameda	2017	T7 Public	Aggregatec	10	DSL	220	0.168616	37.08503
Alameda	2017	T7 Single	Aggregatec	10	DSL	1,122	0.250978	281.6902
Alameda	2017	T7 single construction	Aggregatec	10	DSL	735	0.206117	151.5778
Alameda	2017	T7 SWCV	Aggregatec	10	DSL	4,040	0.020186	81.55021
Alameda	2017	T7 tractor	Aggregatec	10	DSL	6,953	0.094957	660.2801
Alameda	2017	T7 tractor construction	Aggregatec	10	DSL	548	0.210724	115.5382
Alameda	2017	T7 utility	Aggregatec	10	DSL	35	0.005006	0.17271

Diesel BUG Distance Multiplier

Distance meters	Distance feet	Distance adjustment multiplier	Enter Risk or Hazard	Adjusted Risk or Hazard	Enter PM2.5 Concentration	Adjusted PM2.5 Concentration
25	82	0.85		0		0
30	98	0.73		0		0
35	115	0.64		0		0
40	131	0.58		0		0
50	164	0.5		0		0
60	197	0.41		0		0
70	230	0.31	21.5	6.665	0.053048429	0.016445013
80	262	0.28		0		0
90	295	0.25		0		0
100	328	0.22		0		0
110	361	0.18	15.6	2.808		0
120	394	0.16		0		0
130	426	0.15		0		0
140	459	0.14		0		0
150	492	0.12		0		0
160	525	0.1	15.6	1.56		0
180	590	0.09		0		0
200	656	0.08		0		0
220	722	0.07		0		0
240	787	0.06		0		0
260	853	0.05		0		0
280	918	0.04		0		0

Alameda_May_2012 823
 Alameda_May_2012 20101
 Alameda_May_2012 Millipore Corporation
 Alameda_May_2012 25801 INDUSTRIAL BLVD
 Alameda_May_2012 Hayward
 Alameda_May_2012 578218
 Alameda_May_2012 4165800
 Alameda_May_2012 15.6
 Alameda_May_2012 0.006
 Alameda_May_2012 0.004
 Alameda_May_2012 Generator

Distribution Center

DPM per day = 0.02028 lbs/day
 PM2.5 per day = 0.02747 lbs/day
 Aggregate DPM Rate = 0.12274 gram/mile - EMFAC2014 (10mph)
 Tire + Brake wear = 0.04357 gram/mile - EMFAC2014
 0.25 mile travel
 2017 year
 Aggregate HHDT DSL
 10 mph travel

Plant #:

G10858

Plant Name:

Gas and Shop

Number of Sources:

1

Pollutant Name	Emissions/lbs per day	Cancer Risk (in millions)
ACETALDEHYDE		0.00E+00
ACETAMIDE		0.00E+00
ACRYLAMIDE		0.00E+00
ACRYLONITRILE		0.00E+00
ALLYL CHLORIDE		0.00E+00
2-AMINOANTHRAQUINONE		0.00E+00
ANILINE		0.00E+00
ARSENIC AND COMPOUNDS (INORGANIC) ^{1,2}		0.00E+00
ASBESTOS ³		0.00E+00
BENZENE ¹		0.00E+00
BENZIDINE (AND ITS SALTS) values also apply to:		0.00E+00
Benzidine based dyes		0.00E+00
Direct Black 38		0.00E+00
Direct Blue 6		0.00E+00
Direct Brown 95 (technical grade)		0.00E+00
BENZYL CHLORIDE		0.00E+00
BERYLLIUM AND COMPOUNDS ²		0.00E+00
BIS(2-CHLOROETHYL)ETHER (Dichloroethyl ether)		0.00E+00
BIS(CHLOROMETHYL)ETHER		0.00E+00
POTASSIUM BROMATE		0.00E+00
1,3-BUTADIENE		0.00E+00
CADMIUM AND COMPOUNDS ²		0.00E+00
CARBON TETRACHLORIDE ¹ (Tetrachloromethane)		0.00E+00
CHLORINATED PARAFFINS		0.00E+00
4-CHLORO-O-PHENYLENEDIAMINE		0.00E+00
CHLOROFORM ¹		0.00E+00
PENTACHLOROPHENOL		0.00E+00
2,4,6-TRICHLOROPHENOL		0.00E+00
p-CHLORO-o-TOLUIDINE		0.00E+00
CHROMIUM 6+2		0.00E+00
Barium chromate2		0.00E+00
Calcium chromate2		0.00E+00
Lead chromate2		0.00E+00
Sodium dichromate2		0.00E+00
Strontium chromate2		0.00E+00
CHROMIC TRIOXIDE (as chromic acid mist)		0.00E+00
p-CRESIDINE		0.00E+00
CUPFERRON		0.00E+00
2,4-DIAMINOANISOLE		0.00E+00
2,4-DIAMINOTOLUENE		0.00E+00
1,2-DIBROMO-3-CHLOROPROPANE (DBCP)		0.00E+00
1,4-DICHLOROBENZENE		0.00E+00
3,3-DICHLOROBENZIDINE		0.00E+00
1,1,-DICHLOROETHANE (Ethylidene dichloride)		0.00E+00
DI(2-ETHYLHEXYL)PHTHALATE (DEHP)		0.00E+00
p-DIMETHYLAMINOAZOBENZENE		0.00E+00
2,4-DINITROTOLUENE		0.00E+00
1,4-DIOXANE (1,4-Diethylene dioxide)		0.00E+00
EPICHLOROHYDRIN (1-Chloro-2,3-epoxypropane)		0.00E+00
ETHYL BENZENE		0.00E+00
ETHYLENE DIBROMIDE (1,2-Dibromoethane)		0.00E+00
ETHYLENE DICHLORIDE (1,2-Dichloroethane)		0.00E+00
ETHYLENE OXIDE (1,2-Epoxyethane)		0.00E+00
ETHYLENE THIOUREA		0.00E+00
FORMALDEHYDE		0.00E+00
HEXACHLOROBENZENE		0.00E+00
HEXACHLOROCYCLOHEXANES (mixed or technical grade)		0.00E+00

alpha-HEXACHLOROCYCLOHEXANE		0.00E+00
beta- HEXACHLOROCYCLOHEXANE		0.00E+00
gamma-HEXACHLOROCYCLOHEXANE (Lindane)		0.00E+00
HYDRAZINE		0.00E+00
LEAD AND COMPOUNDS 2,4 (inorganic) values also apply to:		0.00E+00
Lead acetate2		0.00E+00
Lead phosphate2		0.00E+00
Lead subacetate2		0.00E+00
METHYL tertiary-BUTYL ETHER		0.00E+00
4,4'-METHYLENE BIS (2-CHLOROANILINE) (MOCA)		0.00E+00
METHYLENE CHLORIDE (Dichloromethane)		0.00E+00
4,4'-METHYLENE DIANILINE (AND ITS DICHLORIDE)		0.00E+00
MICHLER'S KETONE (4,4'-Bis(dimethylamino)benzophenone)		0.00E+00
N-NITROSODI-n-BUTYLAMINE		0.00E+00
N-NITROSODI-n-PROPYLAMINE		0.00E+00
N-NITROSODIETHYLAMINE		0.00E+00
N-NITROSODIMETHYLAMINE		0.00E+00
N-NITROSODIPHENYLAMINE		0.00E+00
N-NITROSO-N-METHYLETHYLAMINE		0.00E+00
N-NITROSOMORPHOLINE		0.00E+00
N-NITROSOPIPERIDINE		0.00E+00
N-NITROSOPYRROLIDINE		0.00E+00
NICKEL AND COMPOUNDS2 (values also apply to:)		0.00E+00
Nickel acetate2		0.00E+00
Nickel carbonate2		0.00E+00
Nickel carbonyl2		0.00E+00
Nickel hydroxide2		0.00E+00
Nickelocene2		0.00E+00
NICKEL OXIDE2		0.00E+00
Nickel refinery dust from the pyrometallurgical process2		0.00E+00
Nickel subsulfide2		0.00E+00
p-NITROSODIPHENYLAMINE		0.00E+00
PARTICULATE EMISSIONS FROM DIESEL-FUELED ENGINES	2.03E-02	2.15E-05
PERCHLOROETHYLENE (Tetrachloroethylene)		0.00E+00
PCB (POLYCHLORINATED BIPHENYLS) [low risk] 2,6		0.00E+00
PCB (POLYCHLORINATED BIPHENYLS) [high risk] 2,6		0.00E+00
POLYCHLORINATED DIBENZO-P-DIOXINS (PCDD)(AS 2,3,7,8-PCDD EQUIV) 2,7		0.00E+00
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN2,7		0.00E+00
POLYCHLORINATED DIBENZOFURANS (PCDF)(AS 2,3,7,8-PCDD EQUIV) 2,7		0.00E+00
2,3,7,8-TETRACHLORODIBENZOFURAN2,7		0.00E+00
POLYCYCLIC AROMATIC HYDROCARBON2 (PAH) (AS B(a)P-EQUIV)5		0.00E+00
BENZO(A)PYRENE2,5		0.00E+00
NAPHTHALENE		0.00E+00
1,3-PROPANE SULTONE		0.00E+00
PROPYLENE OXIDE		0.00E+00
1,1,2,2-TETRACHLOROETHANE		0.00E+00
THIOACETAMIDE		0.00E+00
Toluene diisocyanates		0.00E+00
TOLUENE-2,4-DIISOCYANATE		0.00E+00
TOLUENE-2,6-DIISOCYANATE		0.00E+00
1,1,2-TRICHLOROETHANE (Vinyl trichloride)		0.00E+00
TRICHLOROETHYLENE		0.00E+00
URETHANE (Ethyl carbamate)		0.00E+00
VINYL CHLORIDE (Chloroethylene)		0.00E+00
	TOTAL:	2.15E-05

--

Plant #:**Plant Name:****Number of Sources:**

Diesel PM Concentrations	Emissions (lbs/day)	12.5 Concentration (ug/m3)
	2.75E-02	0.053048429
		0
		0
		0
		0
		0
		0
		0
		0
		0
		0
		0
		0
		0
		0
TOTAL:		0.053048429