October 1, 2012

Via Electronic Mail

Pleasant Partners
c/o Sares Regis Group of Northern California
Attn: Mr. Brett J. Leon
Development Project Manager
901 Mariners Island Blvd, Ste. 700
San Mateo, CA 94404

Re: Screening Level Cumulative Risk Analysis for the Proposed California Center Development, Pleasanton, California

Dear Mr. Leon:

Per your request, ENVIRON International Corporation (ENVIRON) conducted a preliminary screening evaluation of cumulative risks and hazards from offsite sources on potential new residents at the proposed California Center Development (formerly CarrAmerica) located in Pleasanton, California (herein referred to as the "Project" or the "Site"). This analysis is intended to address Mitigation Measure 4.B-4 of the City of Pleasanton Final Supplemental Environmental Impact Report (FSEIR) (Housing Element and Climate Action Plan) which aims at reducing exposure to toxic air contaminants (TACs) and improving indoor and outdoor air quality. It also requires a project-specific health risk assessment (HRA) to quantify project-specific health risks if the pollution source near the project exceeds the screening criteria levels.

Technical Approach

ENVIRON evaluated the health risks and hazards (including fine particulate matter or $PM_{2.5}$ concentrations[1]) imposed by existing sources (e.g. stationary sources and traffic) on the future sensitive receptors at the Project (i.e., residents in the development). This analysis was conducted both on an individual source basis as well as a cumulative basis, and the results were compared to 2011 Bay Area Air Quality Management District California Environmental Quality Act (BAAQMD CEQA) significance thresholds.

Consistent with BAAQMD CEQA Guidelines, this analysis evaluated a 1,000 foot buffer from the proposed Project, as shown in Figure 1. To evaluate nearby sources, ENVIRON used the BAAQMD's database of existing stationary sources (available for use in Google Earth) and the BAAQMD's surface street screening table for Alameda County. ENVIRON then applied refinements to the results from these tools to better represent the onsite risks based upon project-specific information. The results are summarized in Tables 1, 2 and 3.

On March 5, 2012 the Alameda County Superior Court issued a judgment, in California Building Industry Association v. Bay Area Air Quality Management District, finding that the BAAQMD had failed to comply with CEQA when it adopted its 2011 significance thresholds. The Court ruled that the adoption of the new significance thresholds (including new significance thresholds for TACs and $PM_{2.5}$) is considered a "project" under CEQA, and, thus, the BAAQMD should have

[1] PM_{10} and $PM_{2.5}$ refer to particulate matter with aerodynamic resistance diameters not exceeding 10 micrometers and 2.5 micrometers, respectively.

prepared the required CEQA review and documentation. The court issued a writ of mandate ordering the BAAQMD to set aside the 2011 significance thresholds and cease dissemination of them until the BAAQMD had complied with CEQA.

In view of the court's order, the District is no longer recommending that the significance thresholds be used as a generally applicable measure of a project's significant air quality impacts and is recommending that lead agencies will need to determine appropriate air quality thresholds of significance based on substantial evidence in the record. Lead agencies may rely on the District's CEQA Guidelines (including as updated May 2012[2], or the previous 1999 CEQA Guidelines) for assistance in calculating air pollution emissions, obtaining information regarding the health impacts of air pollutants, and identifying potential mitigation measures. Environ recognizes that the City has discretion in setting the appropriate threshold and recognizes that the City may choose to adopt a different approach. However, this report uses the 2011 significance thresholds because they represent the most conservative analysis. Environ notes that many of the assumptions in this analysis, including a 70 year exposure period, open windows, and age sensitivity factors, are very conservative and would tend to overestimate the risk to most residents.

Roadways

Impacts from nearby roadways were analyzed consistent with the BAAQMD CEQA Guidelines.[3] As a supplement to the guidelines, BAAQMD provides screening tools to assess the impact of roadways on nearby receptors. For the surface streets that were identified with greater than 10,000 vehicles per day, the cancer risk, chronic and acute HI, and $PM_{2.5}$ concentration was estimated using BAAQMD's surface street screening tables. The estimated cancer risk and $PM_{2.5}$ concentration from the roadways, obtained using the screening tool for surface streets, depends on the distance between the receptor and the nearest travel lane of the roadway, the average number of vehicles that travel on the roadway in a day, and the orientation of the roadway. The distance between the closest receptor along the property boundary and the roadway was determined using geographical information software (GIS)[4] and the average daily traffic (ADT) was obtained from data reported by the City of Pleasanton[5]. When the roadway ADT or distance between a receptor and a roadway is between two values in the screening tables, linear interpolation was performed to obtain the cancer risk and $PM_{2.5}$ concentration at the reported distance and ADT, as per BAAQMD Guidelines.

ENVIRON identified two roadways within the 1,000 foot zone of influence with daily traffic greater than 10,000 vehicles as shown in Figure 2. Table 1 shows the cancer risk, chronic and acute hazard index and annual $PM_{2.5}$ concentration from these two roadways at the closest receptor along the property boundary which are below BAAQMD individual source significance thresholds of 10, 1, 1 and 0.3 micrograms per cubic meter ($\mu g/m^3$) respectively.

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[2] BAAQMD. 2012. California Environmental Quality Act Air Quality Guidelines. May. Available online at: http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/BAAQMD%20CEQA%20Guidelines_Final_May%202012.ashx?la=en.

[3] BAAQMD. 2012. CEQA Air Quality Guidelines. May.

[4] GIS. Online at: http://www.esri.com/

[5] City of Pleasanton. 2011. Traffic Count Map. Available online at: http://www.ci.pleasanton.ca.us/services/traffic/traffic-counts-map.html

Offsite Stationary Sources Screening

BAAQMD has developed a Stationary Source and Risk Analysis Tool ("BAAQMD Risk Analysis Tool") for permitted sources within Alameda County[6] to identify offsite stationary sources of TACs. ENVIRON used the BAAQMD Risk Analysis Tool to compile a list of potential stationary sources to be evaluated within 1,000 feet of the Project boundary. Six stationary sources, consisting of five diesel generators and one auto body shop, were identified within 1,000 feet of the Project, as shown in Figure 3. For one stationary source (BAAQMD ID 8890) with a high screening cancer risk value, a stationary source inquiry form was submitted to BAAQMD to obtain additional source information and location, as shown in Attachment A. Four of the six identified diesel generators are located on the California Center Campus and have been permitted and operated by Pleasant Partners and Jones Lang LaSalle Americas [herein collectively referred to as the "Operator"]. For the four diesel generators located on the California Center Campus (BAAQMD ID 17575, 19368, 14838 and 18987), stack parameters and generator location information was provided by the Operator[7]. Cancer and noncancer HI impacts as well $PM_{2.5}$ concentrations from the aforementioned sources were estimated using a distance-based multiplier for diesel engines from the BAAQMD Diesel Internal Combustion (IC) Engine Distance Multiplier Tool[8]. Impacts from source with BAAQMD ID 7142 were not adjusted with the diesel IC engine distance multiplier tool since it is an auto body shop. Table 2 shows the maximum estimated cancer risk, chronic HI, and $PM_{2.5}$ concentration from the stationary sources to the closest point on the Project boundary.

For two sources which did not meet the individual source thresholds using the screening approach, refined analysis was performed to estimate risks and hazards at the closest onsite sensitive receptors conservatively placed along the Property boundary. To estimate air concentrations, ENVIRON used ISCST3[9], a Gaussian air dispersion model developed by the USEPA. ISCST3 incorporates variable emission rate data, source parameters and a full year of meteorological data collected at Pleasanton and provided by the BAAQMD to estimate air concentrations of inert pollutants. For source 8890, the emission rate was provided by the BAAQMD Stationary Source Inquiry Form as seen in Attachment A. For source 17575, since source specific information was not available, AP-42 emission factors were conservatively used. Modeled diesel particulate matter (DPM) emission factors are shown in Attachment B1. Modeled dispersion factors for DPM are combined with calculated emission rates to calculate pollutant ambient air concentrations as shown in Attachment B7. The modeled stack parameters are listed in Attachment B2. Building downwash was considered in the modeling and the buildings considered in the analysis can be seen in Attachment B3. Detailed assumptions regarding exposure and toxicity are shown in Attachment B4 to B6. Resulting cancer risks and supporting calculations are presented in Attachment B7.

The results of the stationary source screening analysis for four of the offsite generators/body shop and refined modeling analysis for two of the offsite generators are presented in Table 3 and compared to BAAQMD's individual source thresholds. The cancer risk, chronic HI and $PM_{2.5}$ concentration from the stationary source emissions are below BAAQMD individual source thresholds.

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[6] BAAQMD. 2012. Stationary Source Risk and Hazard Analysis Tool. Online at: http://www.baaqmd.gov/Home/Divisions/Planning%20and%20Research/CEQA%20GUIDELINES/Tools%20and%20Methodology.aspx

[7] Email correspondence with Mr. Brett Leon, Sares Regis Group of Northern California on August 28-29, 2012.

[8] BAAQMD 2012. Diesel Internal Combustion (IC) Engine Distance Multiplier Tool. June. Online at: http://baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/Multiplier%20Tools%20May%202012/Diesel%20IC%20Engine%20Multiplier%20Tool.ashx?la=en.

[9] ISCST3. Online at: http://www.epa.gov/scram001/dispersion_alt.htm

Cumulative Impacts from OffSite Sources on New OnSite Receptors

BAAQMD CEQA Guidelines require an evaluation of cumulative risks to assess the impact from existing offsite sources on new onsite sensitive receptors. This analysis was completed by summing the impacts from offsite stationary sources and nearby surface streets. As shown in Table 3, the cumulative cancer risk and chronic HI are less than the CEQA thresholds of 100 in a million and 10, respectively. The cumulative $PM_{2.5}$ concentration is also below the CEQA cumulative threshold of 0.8 $\mu g/m^3$.

Closing

Individual impact from the offsite stationary sources and roadway traffic on onsite sensitive receptors results in a lifetime cancer risk, chronic HI, and $PM_{2.5}$ concentration that is below the BAAQMD individual significance thresholds of 10, 1, and 0.3 $\mu g/m^3$, respectively. The cumulative impact of offsite stationary sources and nearby roadway traffic on onsite sensitive receptors results in a lifetime cancer risk, chronic HI, and cumulative $PM_{2.5}$ concentration that are below the BAAQMD cumulative significance thresholds of 100, 10, and 0.8 $\mu g/m^3$, respectively.

If you have any questions or need further information about this analysis, please contact Michael at 415.796.1934 or mkeinath@environcorp.com at your convenience. Thank you for the opportunity to assist you with this matter.

Sincerely,

Elizabeth Miesner, MS
Principal

Michael Keinath, PE
Senior Manager

Attachments:

Tables

Figure 1: Site Map
Figure 2: Roadways
Figure 3: Stationary Sources

Attachments A: BAAQMD Stationary Source Inquiry Form
Attachments B: Cancer Risk Calculations

ISCST3 Files (provided electronically)

Tables

Table 1
Surface Street Screening Analysis
California Center Development
Pleasanton, California

Roadway	AADT[1]	Direction of Roadway	Minimum distance from Project Boundary[2] [ft]	Lifetime Excess Cancer Risk[3] [in a million]	Chronic HI --	Acute HI --	$PM_{2.5}$ Concentration[3] [$\mu g/m^3$]
Owens Drive	18,200	North-South	32	4.69	< 0.03	< 0.03	0.19
Hacienda Drive	30,700	East-West	940	0.94	< 0.03	< 0.03	0.03
			Individual Source Threshold	10.0	1.0	1.0	0.3
			Exceeds Threshold?	No	No	No	No

Notes:
1. AADT is based on the City of Pleasanton's online traffic count map (City of Pleasanton 2011).
2. This is the minimum distance between the roadway and the closest point on the Project boundary. It is conservatively assumed that there are receptors all along the Project boundary.
3. The lifetime excess cancer risk and $PM_{2.5}$ concentration is linearly interpolated from the BAAQMD Roadway Screening Analysis tables for Alameda County for the given AADT and distance of the roadway from the closest point of the project boundary. Maximum chronic and acute HI values are obtained from BAAQMD Roadway Screening Analysis tables.

Abbreviations:
AADT: Annual Average Daily Trips
BAAQMD: Bay Area Air Quality Management District
ft: feet
HI: hazard index
PM: particulate matter with an aerodynamic diameter of 2.5 microns or less
ug/m^3: microgram per cubic meter

Sources:
City of Pleasanton. 2011. Traffic Count Map. Online at: http://www.ci.pleasanton.ca.us/services/traffic/traffic-counts-map.html

BAAQMD. 2012. Roadway Screening Analysis Tables. Available online at: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Tools-and-Methodology.aspx [Accessed September 22, 2012].

Table 2
Offsite Stationary Source Analysis
California Center Development
Pleasanton, California

BAAQMD Source ID	Facility Name[1]	Street Address	Minimum Distance from Project Boundary[2] [ft]	Analysis [Modeled / Screening][3]	Source of Data[4]	Multiplier Applied?[5]	Lifetime Excess Cancer Risk [in a million]	Chronic Hazard Index --	$PM_{2.5}$ Concentration [$\mu g/m^3$]
19368	Pleasant Partners, LLC	4420 Rosewood Dr	1,239	Screening	BAAQMD Tool	Yes	0.79	0.0003	0.001
14838	Pleasant Partners, LLC	4430 Rosewood Dr	1,033	Screening	BAAQMD Tool	Yes	0.59	0.0002	0.001
17575	Pleasant Partners, LLC	4440 Rosewood Dr	481	Modeled	BAAQMD Tool, Client Info, ISC, AP-42	No[6]	3.80	0.004	0.009
18987	Pleasant Partners, LLC	4460 Rosewood Dr	492	Screening	BAAQMD Tool	Yes	2.26	0.001	0.0005
7142	B & S Hacienda Body	3687 Old Sta Rita Rd	1,234	Screening	BAAQMD Tool	No	0	0.001	0
8890	Valleycare Medical Center	5555 W Las Positas	885	Modeled	BAAQMD Inquiry, ISC	Yes/No[7]	0.79	0.005	0.04
					Individual Source Threshold		10	1	0.3
					Exceeds Threshold?		No	No	No

Notes:

1. All facilities within 1,000 feet of the proposed project were identified, per BAAQMD's Stationary Source Screening Analysis Tool (BAAQMD 2012b) consistent with BAAQMD guidance (BAAQMD 2012a). If a source was just further than 1,000 feet, and the address associated with the source was within or close to the 1,000 feet, the source was conservatively included. Facility information obtained from the tool.
2. Approximate distance between source location and the closest receptor along the Project boundary was measured using Geographic Information System (GIS). If the source was expected to be closer to the Project boundary than the BAAQMD tool shows (as determined through a visual inspection of the area), the closer distance was used in this analysis.
3. Indicates whether the risks, hazard indices and $PM_{2.5}$ concentrations are obtained from BAAQMD's Stationary Source Screening tool ['Screening'] or from ISC Modeling ['Modeling']. For source 17575 and 8890, the cancer risk was initially calculated by using BAAQMD's Stationary Source Screening tool. Since it did not meet BAAQMD's individual source threshold using the screening method, a refined ISC modeling was performed to better estimate the cancer risk. However, the hazard indices and $PM_{2.5}$ concentrations were obtained from BAAQMD's Stationary Source Screening tool for all the sources.
4. For source 19368, 14838, 18987 and 7142 health impact information was obatined from BAAQMD's Tool [BAAQMD 2011b]. For source 17575, the BAAQMD tool was used for the hazard indices and $PM_{2.5}$ concentration. For cancer risk, the Operator provided generator location and stack parameter information was used along with ISC modeling. For source 8890 the cancer risk values from the BAAQMD database were well above the individual source thresholds and the location was unclear from BAAQMD's tool. For this source, the district was contacted to obtain health impact information and is indicated as "BAAQMD Inquiry" here. The values provided by BAAQMD are shown in Appendix A. ISC modeling was performed to better estimate cancer risk values.
5. BAAQMD provides a *Cancer Risk and Chronic Hazard Index Distance Adjustment Multiplier for Diesel IC Engines* to be used on long term health effects from diesel generators. If the source is known to be a diesel engine [such as source 19368, 14838, and 18987], the multiplier is applied to cancer risk, chronic HI, and $PM_{2.5}$ concentration reported in the BAAQMD tool. Source 7142 seems to be an auto body shop and hence we could not apply the distance multiplier which is applicable for diesel IC engines only.
6. The risk, chronic HI and $PM_{2.5}$ concentration values for source 17575 as reported in BAAQMD's tool are derived from an HRA and hence a multiplier cannot be used to scale the results.
7. For source 8890, the cancer risk values are based on ISC modeling but chronic HI and $PM_{2.5}$ concentrations are from the screening tool. Hence a multiplier was used to scale chronic HI and $PM_{2.5}$ values.

Abbreviations:

$\mu g/m^3$: microgram per cubic meter
BAAQMD: Bay Area Air Quality Management District
ft: feet
HI: Hazard Index
HRA: Health Risk Analysis
ISC: Industrial Source Complex
m: meter
$PM_{2.5}$: Particulate Matter with an aerodynamic diameter of 2.5 microns or less

Sources:

BAAQMD. 2012a. California Environmental Quality Act Air Quality Guidelines. May.

BAAQMD. 2012b. Stationary Source Screening Analysis Tool. May. Available online at: Available online at: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Tools-and-Methodology.aspx [Accessed September 22, 2012].

Table 3
Cumulative Analysis for Onsite Receptor
California Center Development
Pleasanton, California

Source	Risks or Hazards[1]		
	Cancer Risk [in a million][2]	**Chronic HI --**	**$PM_{2.5}$ [$\mu g/m^3$]**
Roadway traffic - Surface streets[3]	5.6	<0.06 [4]	0.22
Stationary Sources[3]	8.2	0.01	0.05
Cumulative Total	**14**	**<0.07**	**0.27**
BAAQMD Cumulative Risk Threshold	***100***	***10***	***0.8***
Exceeds Threshold?	***No***	***No***	***No***

Notes:
1. Cumulative impact is calculated by adding the maximum individual risk/hazard from each source, irrespective of location onsite.
2. Cancer risks are estimated as the upper-bound incremental probability that an individual will develop cancer over a lifetime as a direct result of exposure to potential carcinogens. The estimated risk is expressed as a unitless probability.
3. All surface street and stationary source results shown are screening-level risks and hazards based on the distance from the source to the closest point on the project boundary. For two stationary sources that exceeded the individual source threshold, refined modeling was performed as described in Appendix B and those values are included here. Surface street impacts were determined using BAAQMD 2012a, and stationary source impacts were determined using BAAQMD 2012b.
4. As a conservative measure, the detection limits were added for these sources.

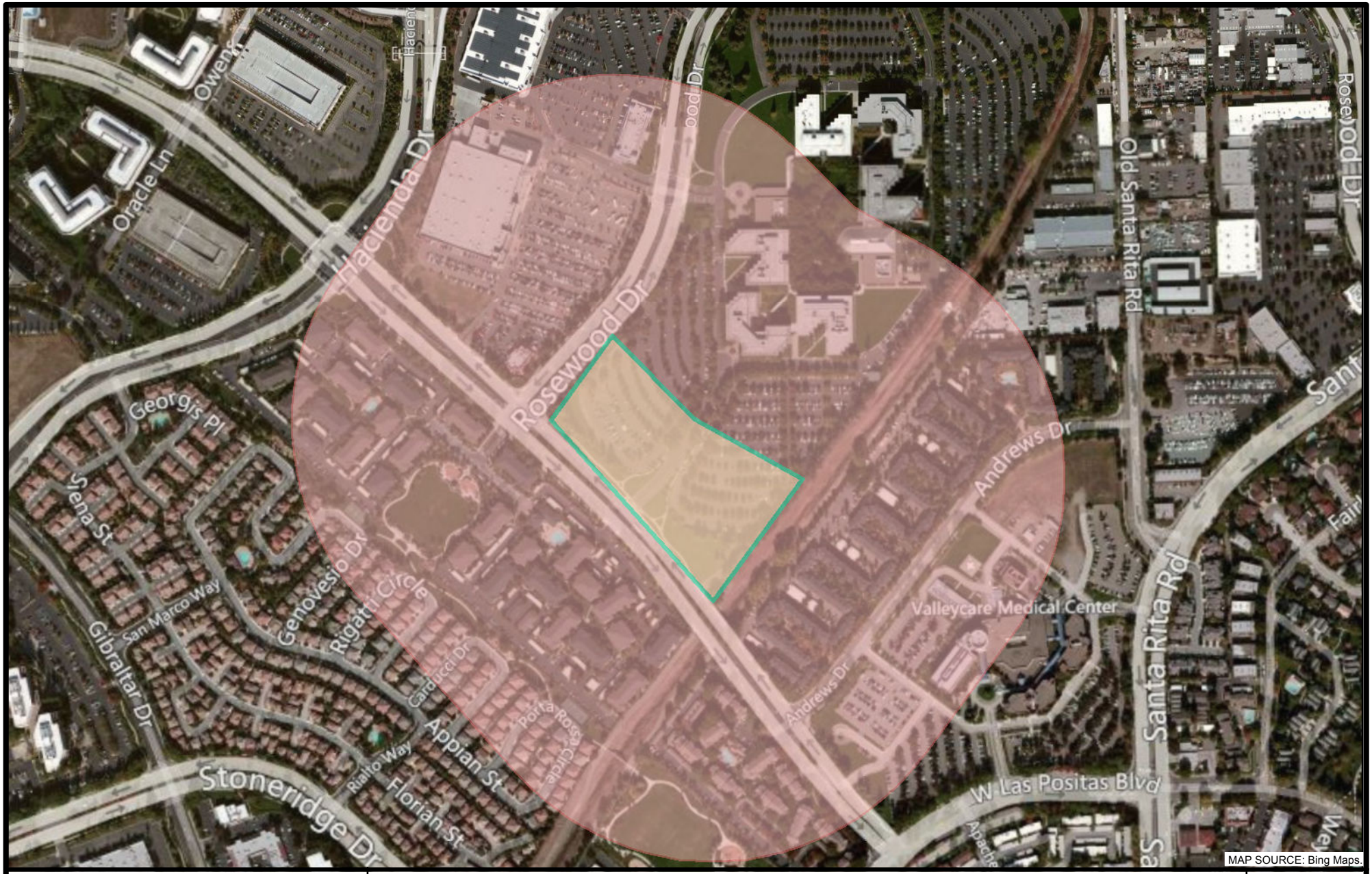
Abbreviations:
BAAQMD: Bay Area Air Quality Management District
HI: hazard index
$PM_{2.5}$: particulate matter with an aerodynamic diameter of 2.5 microns or less
$\mu g/m^3$: microgram per cubic meter

Sources:

BAAQMD. 2012a. Alameda County PM2.5 Concentrations and Cancer Risks Generated from Surface Streets. May. Available online at: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Tools-and-Methodology.aspx [Accessed September 22, 2012].

BAAQMD. 2012b. Stationary Source Risk & Hazard Analysis Tool. May. Available online at: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Tools-and-Methodology.aspx [Accessed September 22, 2012].

Figures



Site Map
California Center Development
Pleasanton, California

ENVIRON

Legend

- Project Boundary
- 1000 foot Buffer

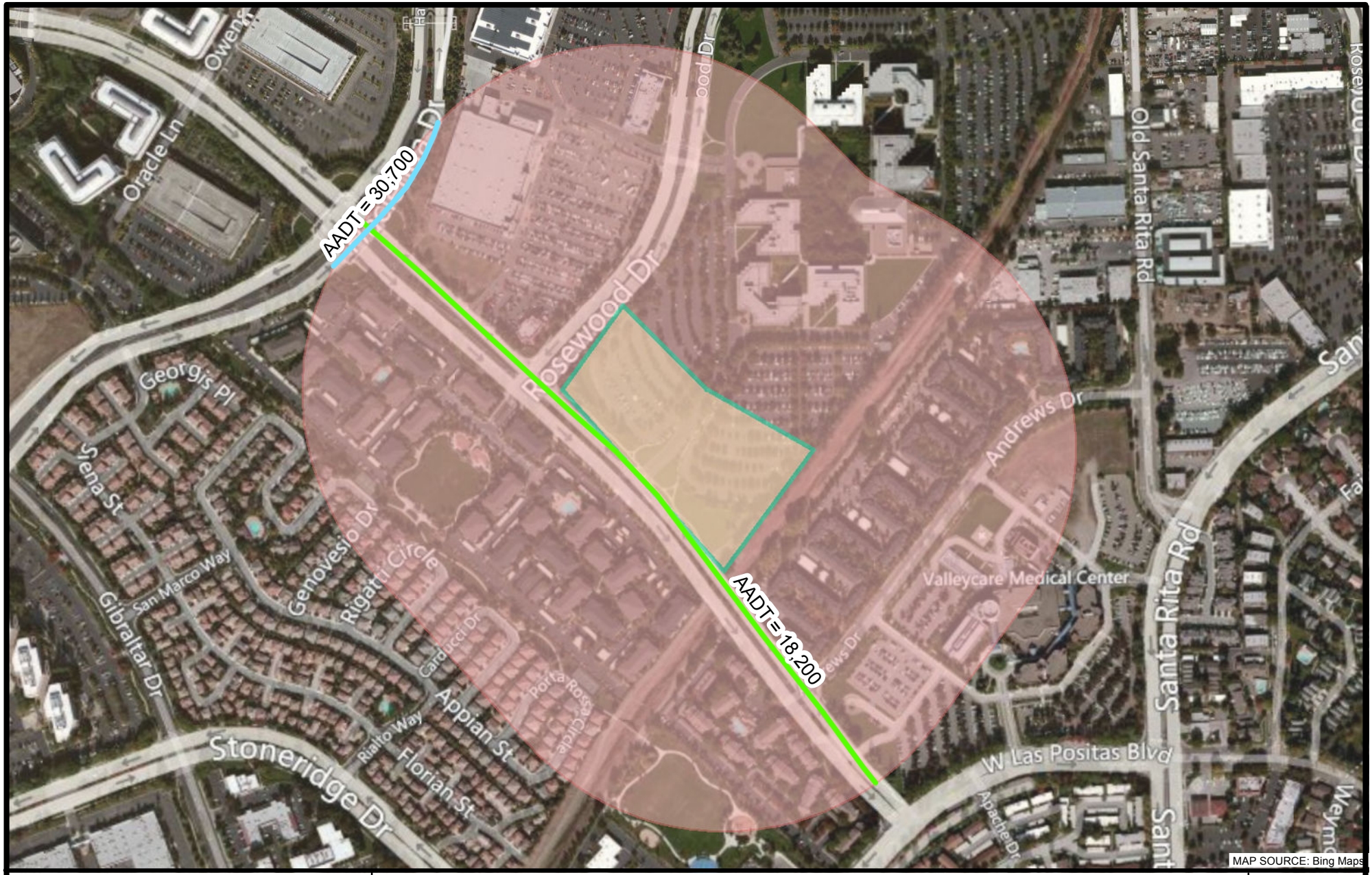
0 50 100 200 METER

0 250 500 1,000 FEET

N

Figure 1

Path: U:\Sares Regis Pleasanton\GIS\SR Carr America-Site Map.mxd



Roadways
California Center Development
Pleasanton, California

ENVIRON

Legend

- Owens Drive
- Hacienda Drive
- Project Boundary
- 1000 foot Buffer

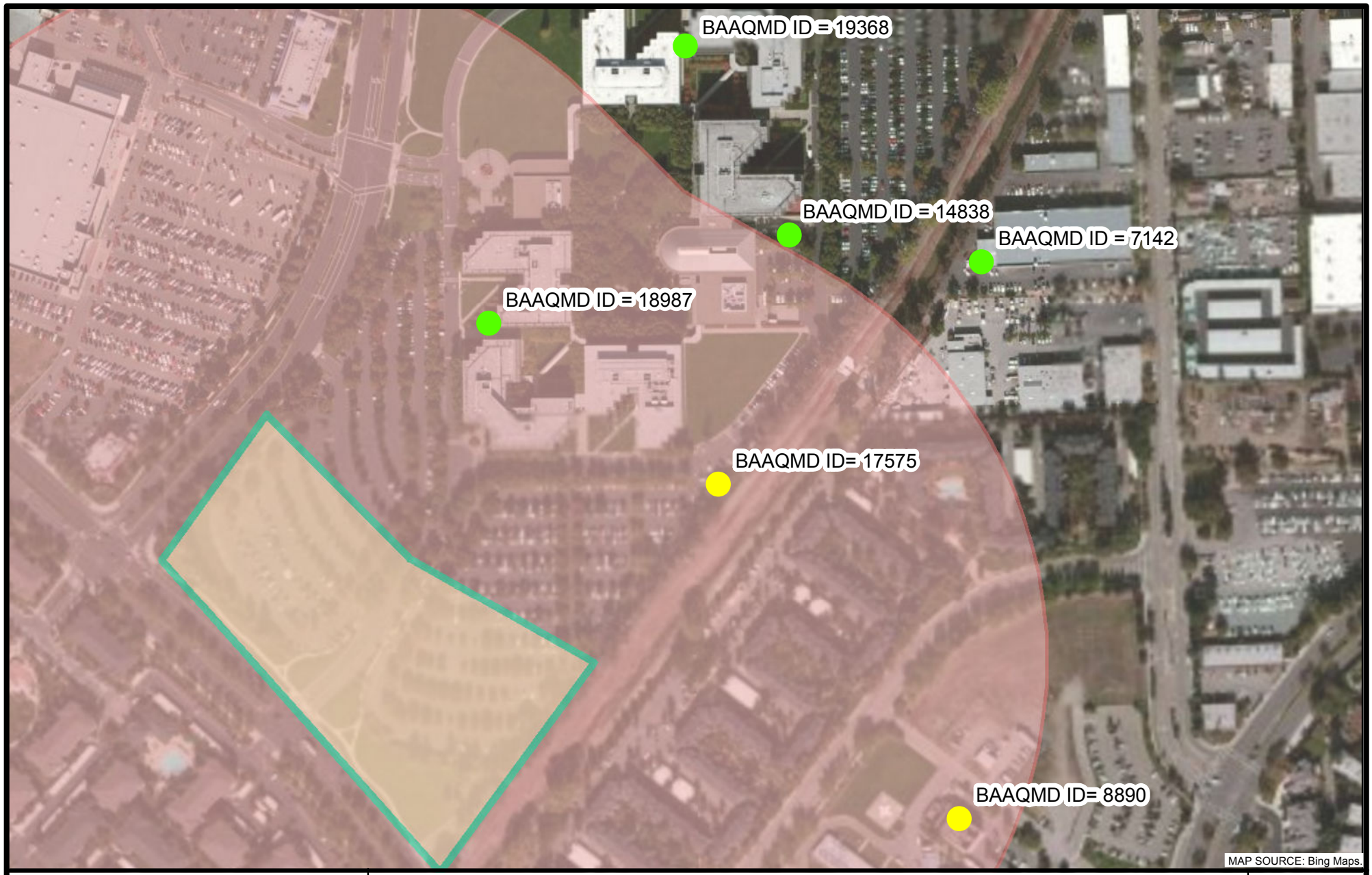
0 50 100 200 METER

0 250 500 1,000 FEET

N

Figure 2

Path: U:\Sares Regis Pleasanton\GIS\SR Carr America-Roadways.mxd



Stationary Sources
California Center Development
Pleasanton, California

ENVIRON

Legend

Stationary Source

- Screening
- Modeled
- Project Boundary
- 1000 foot Buffer

0 25 50 100 METER

0 100 200 400 FEET

N

Figure 3

Path: U:\Sares Regis Pleasanton\GIS\SR Carr America-Stationary Sources - modified.mxd

Attachments A

BAAQMD Stationary Source Inquiry Form

Bay Area Air Quality Management District
Risk & Hazard Stationary Source Inquiry Form
This form is required when users request stationary source data from BAAQMD. This form is to be used with the BAAQMD's Google Earth stationary source screening tables.
For guidance on conducting a risk & hazard screening, including for roadways & freeways, refer to the District's Risk & Hazard Analysis flow chart.

Also see the District's Recommended Methods for Screening and Modeling Local Risks and Hazards document.

Table A: Requestor Contact Information	
Contact Name:	Shweta Mehta
Affiliation:	ENVIRON
Phone:	415-426-5008
Email:	smehta@environcorp.com
Date of Request	8/31/2012
Project Name:	SR Carr America
Address:	5865 Owens Drive
City:	Pleasanton
County:	Alameda
Type (residential, commercial, mixed use, industrial, etc.):	mixed use
Project size (# of units, or building square feet):	
Comments:	
Source 8890: Source address is correct but point in KML file not at right location. I was interested in obtaining a breakdown of sources - fuel type, permits and or EF's at ID 8890 if available.	

Map B: Snapshot of Google Earth with Plant G8736 Information Table Selected Showing HRSA Values

Table B: Stationary Sources

Table B Section 1: Requestor fills out these columns based on Google Earth data | **Table B Section 2: BAAQMD returns form with additional information in these columns as needed**

Distance from Receptor (feet)	Plant # or Gas Dispensary #	Facility Name	Street Address	Screening Level Cancer Risk (1)	Screening Level Hazard Index (1)	Screening Level PM2.5 (1)	Permit #s (2)	Source #s (2)	Fuel Code (3)	Type of Source(s) (4)	HRSA Ap # (5)	HRSA Date (6)	HRSA Engineer (7)	HRSA Cancer Risk in a	Age Sensitivity	HRSA Adjusted Cancer	HRSA Chronic Health	HRSA PM2.5 Risk	Status/Comments
656	8890	Valleycare Medical Center	5555 W Las Positas, Pleasanton	254.78	0.096	0.811		2 steam boilers, 1 diesel generator										0	Use screening values or see "further info" sheet.
																		0	

Footnotes:

1. These Cancer Risk, Hazard Index, and PM2.5 columns represent the values in the Google Earth Plant
2. Each plant may have multiple permits and sources.
3. Fuel codes: 98 = diesel, 189 = Natural Gas.
4. Permitted sources include diesel back-up generators, gas stations, dry cleaners, boilers, printers, auto
5. If a Health Risk Screening Assessment (HRSA) was completed for the source, the application number will be listed
6. The date that the HRSA was completed.
7. Engineer who completed the HRSA. For District purposes only.
8. All HRSA completed before 1/5/2010 need to be multiplied by an age sensitivity factor of 1.7.
9. The HRSA "Chronic Health" number represents the Hazard Index.
10. Further information about common sources:
   a. Sources that only include diesel internal combustion engines can be adjusted using the BAAQMD's
   b. The risk from natural gas boilers used for space heating when <25 MM BTU/hr would have an estimated cancer risk of one in a million or less, and a chronic hazard index of 0.003 or less. To be conservative, requestor should assume the cancer risk is 1 in a million and the hazard index is 0.003 for these sources.
   c. BAAQMD Reg 11 Rule 16 required that all co-residential (sharing a wall, floor, ceiling or is in the same building as a residential unit) dry cleaners cease use of perc on July 1, 2010. Therefore, there is no cancer risk, hazard or PM2.5 concentrations from co-residential dry cleaning businesses in the BAAQMD.
   d. Non co-residential dry cleaners must phase out use of perc by Jan. 1, 2023. Therefore, the risk from these dry cleaners does not need to
   e. Gas stations can be adjusted using BAAQMD's Gas Station Distance Mulitplier worksheet.
   f. Unless otherwise noted, exempt sources are considered insignificant. See BAAQMD Reg 2 Rule 1 for a list of exempt sources.
   g. This spray booth is considered to be insignificant.

Date last updated: 5/30/12

Plant# 8890 Valleycare Medical Center
5555 W Las Positas
Pleasanton, CA 94588

[C]urrent, [A]rchive, or [F]uture? c
[P]lant, [S]ource, [A]bate. device, or [E]mis. Point? p

CURRENT Sources:

1 Steam Boiler
Boiler for Space Heat only, 14700K BTU/hr max, Diesel fuel, Natural gas
C1340098 no train
C1340189 no train

2 Steam Boiler
Boiler for Space Heat only, 14650K BTU/hr max, Diesel fuel, Natural gas
C1340098 no train
C1340189 no train

3 Emergency Stand-by Diesel Generator
Standby Diesel engine, 1356 hp, Caterpillar S/N 24203452, 3800 cu in
C22BG098 /,P1,

Valleycare Medical Center (P# 8890)

S#	SOURCE NAME	MATERIAL	SOURCE CODE	THROUGHPUT	DATE	POLLUTANT	CODE	LBS/DAY
1	Steam Boiler		C1340098			Benzene	41	9.86E-07
						Formaldehyde	124	3.02E-06
						Organics (part not spec el	990	5.08E-05
						Arsenic (all)	1030	3.18E-08
						Beryllium (all) pollutant	1040	1.86E-08
						Cadmium	1070	7.95E-08
						Chromium (hexavalent)	1095	1.64E-09
						Lead (all) pollutant	1140	6.74E-08
						Manganese	1160	1.06E-07
						Nickel pollutant	1180	1.29E-06
						Mercury (all) pollutant	1190	2.25E-08
						PAH's (non-speciated)	1840	1.68E-07
						Particulates (portion of t	1990	1.37E-04
						Nitrous Oxide (N2O)	2030	9.78E-06
						Nitrogen Oxides (part not	2990	9.86E-04
						Sulfur Dioxide (SO2)	3990	2.22E-03

Carbon Monoxide (CO) pollu 4990 2.74E-04
Carbon Dioxide, non-biogen 6960 1.22E+00
Methane (CH4) 6970 4.89E-05
C1340189
Benzene 41 6.58E-05
Formaldehyde 124 2.35E-03
Toluene 293 1.06E-04
Organics (part not spec el 990 1.79E-01
Particulates (portion of t 1990 9.39E-02
Nitrous Oxide (N2O) 2030 7.23E-03
Nitrogen Oxides (part not 2990 4.38E+00
Sulfur Dioxide (SO2) 3990 1.78E-02
Carbon Monoxide (CO) pollu 4990 1.10E+00
Carbon Dioxide, non-biogen 6960 3.83E+03
Methane (CH4) 6970 5.95E-02

2 Steam Boiler
C1340098
Benzene 41 9.86E-07
Formaldehyde 124 3.02E-06
Organics (part not spec el 990 5.08E-05
Arsenic (all) 1030 3.18E-08
Beryllium (all) pollutant 1040 1.86E-08
Cadmium 1070 7.95E-08
Chromium (hexavalent) 1095 1.64E-09
Lead (all) pollutant 1140 6.74E-08
Manganese 1160 1.06E-07
Nickel pollutant 1180 1.29E-06
Mercury (all) pollutant 1190 2.25E-08
PAH's (non-speciated) 1840 1.68E-07
Particulates (portion of t 1990 1.37E-04
Nitrous Oxide (N2O) 2030 9.78E-06
Nitrogen Oxides (part not 2990 9.86E-04
Sulfur Dioxide (SO2) 3990 3.97E-03
Carbon Monoxide (CO) pollu 4990 2.74E-04
Carbon Dioxide, non-biogen 6960 1.22E+00
Methane (CH4) 6970 4.89E-05
C1340189
Benzene 41 6.58E-05
Formaldehyde 124 2.35E-03
Toluene 293 1.06E-04
Organics (part not spec el 990 1.79E-01
Particulates (portion of t 1990 9.39E-02
Nitrous Oxide (N2O) 2030 7.23E-03
Nitrogen Oxides (part not 2990 4.38E+00
Sulfur Dioxide (SO2) 3990 1.78E-02
Carbon Monoxide (CO) pollu 4990 1.10E+00
Carbon Dioxide, non-biogen 6960 3.83E+03

Methane (CH4) 6970 5.95E-02

3 Emergency Stand-by Diesel Generator

C22BG098

Benzene 41 4.74E-03
Formaldehyde 124 3.92E-04
Organics (part not spec el 990 2.29E-01
Arsenic (all) 1030 4.13E-06
Beryllium (all) pollutant 1040 2.42E-06
Cadmium 1070 1.03E-05
Chromium (hexavalent) 1095 2.14E-07
Lead (all) pollutant 1140 8.76E-06
Manganese 1160 1.37E-05
Nickel pollutant 1180 1.67E-04
Mercury (all) pollutant 1190 2.92E-06
Diesel Engine Exhaust Part 1350 2.39E-01
PAH's (non-speciated) 1840 2.18E-05
Nitrous Oxide (N2O) 2030 1.27E-03
Nitrogen Oxides (part not 2990 3.34E+00
Sulfur Dioxide (SO2) 3990 1.55E-03
Carbon Monoxide (CO) pollu 4990 7.27E-01
Carbon Dioxide, non-biogen 6960 1.59E+02
Methane (CH4) 6970 6.35E-03

PLANT TOTAL:

lbs/day Pollutant

4.20E-06 Arsenic (all) (1030)
4.88E-03 Benzene (41)
2.46E-06 Beryllium (all) pollutant (1040)
1.05E-05 Cadmium (1070)
7.83E+03 Carbon Dioxide, non-biogenic CO2 (6960)
2.92E+00 Carbon Monoxide (CO) pollutant (4990)
2.17E-07 Chromium (hexavalent) (1095)
2.39E-01 Diesel Engine Exhaust Particulate Matter (1350)
5.10E-03 Formaldehyde (124)
8.90E-06 Lead (all) pollutant (1140)
1.40E-05 Manganese (1160)
2.97E-06 Mercury (all) pollutant (1190)
1.25E-01 Methane (CH4) (6970)
1.70E-04 Nickel pollutant (1180)
1.21E+01 Nitrogen Oxides (part not spec elsewhere) (2990)
1.58E-02 Nitrous Oxide (N2O) (2030)
5.87E-01 Organics (part not spec elsewhere) -- including Methane (990)
2.21E-05 PAH's (non-speciated) (1840)
1.88E-01 Particulates (portion of total not spec elsewhere) (1990)
4.33E-02 Sulfur Dioxide (SO2) (3990)
2.13E-04 Toluene (293)

Attachments B

Cancer Risk Calculations

Attachment B1
Diesel Particulate Matter Emissions from Emergency Generators
California Center Development
Pleasanton, California

BAAQMD Source ID[1]	Horsepower[2] [hp]	Annual hours of operation[3] [hr/yr]	Emission Factor[4]	Units	Modeled DPM Emission Factor[5] [g/s]
17575	1490	26	3.2E-01	[g/bhp-hr]	3.90E-04
8890	1356	--	2.4E-01	[lb/day]	1.25E-03

Notes:
1. Two offsite stationary sources were evaluated using refined modeling. Annual average DPM emission factor in grams per second for each generators is multiplied with the modeled dispersion factor to determine the DPM concentration at each receptor.
2. Horsepower for source 17575 is based on information provided by the Operator. Horsepower for source 8890 is provided from BAAQMD SSIF as shown in Appendix A.
3. Annual hours of operation for source 17575 are provided by the Operator.
4. Since source specific DPM emission factor was not available, the PM emission factor for source 17575 is obtained from Section 3.4 of AP-42 for 'Large Stationary Diesel Engines' with horsepower greater than 600 hp (USEPA 1996). DPM emission factor for source 8890 is based on BAAQMD Stationary Source Inquiry Form as shown in Appendix A.
5. Modeled DPM emission factors in grams per second are calculated for source 17575 based on the generator horsepower, annual hours of operation and emission factor. Emissions are spread over 24 hours a day, 365 days a year. Modeled DPM emission factors in grams per second for source 8890 are calculated from the emission factor and assumed to be spread evenly for all 24 hours of the day.

Abbreviations:
BAAQMD: Bay Area Air Quality District
DPM: Diesel Particulate Matter
g: gram
hp: horsepower
hr: hour
s: second
USEPA: United States Environmental Protection Agency
yr: year

Sources:
USEPA 1996. AP-42. October. Available online at: http://www.epa.gov/ttnchie1/ap42/

Attachment B2
Modeling Methodology
California Center Development
Pleasanton, California

BAAQMD Source ID[1]	Source	Source Type	UTMx [m]	UTMy [m]	Release Height[2] [m]	Exit Temperature[3] [K]	Exit Velocity[4] [m/s]	Exit Diameter[5] [m]
17575	Generator Emissions	Point	598,550.4	4,172,718.6	4.6	708	0.001	0.37
8890	Generator Emissions	Point	598,713.0	4,172,493.0	7.6	708	45.4	0.24

Notes:
1. Refined modeling was carried out on these two sources, since they did not meet the individual source threshold of increased cancer risk of 10 in a million using the BAAQMD screening tool.
2. Release height of source 17575 was obtained from the Operator. Since the release height for source 8890 was not available, average generator data from was used from STI, 2011.
3. For lack of source specific data, source parameters for the generator are based on average generator data in STI, 2011.
4. For source 17575, exit velocity is set at 0.001 m/s since based on the data inquiry form, the Operator indicated that this generator had a rain cap. According to LST methodology, exit velocity should be set to 0.001 m/s. For source 8890, for lack of source specific data, average generator exit velocity was used from STI, 2011.
5. Exit diameter for source 17575 is based on the data inquiry form as filled by the Operator. For source 8890, for lack of source specific information, average exit diameter values were used as per STI, 2011.

Abbreviations:
BAAQMD: Bay Area Air Quality Management District
ISC: Industrial Source Complex Model
K: Kelvin
LST: Local Significance Threshold
m: meter
s: second
SCAQMD: South Coast Air Quality Management District
STI: Sonoma Technology, Inc.
USEPA: United States Environmental Protection Agency

Sources:

United Sates Environmental Protection Agency (USEPA). 1995. User's Guide for the Industrial Source Complex (ISC3) Dispersion Models. Volume II - Description of Model Algorithms. September. Available at http://www.epa.gov/scram001/userg/regmod/isc3v2.pdf

Sonoma Technology, Inc. (STI). 2011. *Default modeling parameters for stationary sources*. April. Provided by the BAAQMD.

Modeled Buildings
California Center Development
Pleasanton, California

ENVIRON

Legend

- Modeled Building
- Project Boundary

0 25 50 100 METER

0 100 200 400 FEET

N

Figure
B3

Path: U:\Sares Regis Pleasanton\GIS\SR Carr America-Stationary Sources - modified _and Bldgs.mxd

Attachment B3
Surrounding Building Heights for Emergency Generator Modeling[1]
California Center Development
Pleasanton, California

Building Description[2]	Height[3] [m]
1	18.3
2	21.9
3	25.6
4	9.1
5	21.9
6	18.3
7	14.6
8	7.3
9	7.6
10	4.9

Notes:
1. Building dimensions were used to incorporate effects from building downwash while modeling the impacts from offsite emergency generators.
2. Please see figure in Appendix B3 for corresponding building locations. ENVIRON chose arbitrary building numbers for modeling purposes.
3. Building heights for buildings 1 - 8 were obtained from the Operator. Heights for the remaining buildings were estimated based on a visual view in Google Earth and the number of floors.

Abbreviations:
m: meter

Sources:
Google Earth: http://www.google.com/earth/index.html

Attachment B4
Exposure Parameters
California Center Development
Pleasanton, California

Exposure Parameter	Units	Residential Receptor
Daily Breathing Rate (DBR) [1]	[L/kg-day]	302
Exposure Time (ET) [2]	[hours/24 hours]	24
Exposure Frequency (EF) [3]	[days/year]	350
Exposure Duration (ED) [4]	[years]	70.00
Averaging Time (AT)	[days]	25550
Intake Factor, Inhalation (IF_{inh})	[m^3/kg-day]	0.29

Notes:
1. Daily breathing rate for resident reflects default breathing rate from BAAQMD 2010.
2. Exposure time for resident reflects default exposure time from BAAQMD 2010.
3. Exposure frequency for resident reflects default exposure frequency from BAAQMD 2010.
4. Exposure duration for resident reflects default exposure duration from BAAQMD 2010.

Calculation:
IF_{inh} = DBR * ET * EF * ED * CF / AT
Where: CF = 0.001 (m^3/L)

Abbreviations:
BAAQMD: Bay Area Air Quality Management District
L: liter
kg: kilogram
m^3: cubic meter

Source:
Bay Area Air Quality Management District (BAAQMD). 2010. Air Toxics NSR Program Health Risk Screening Analysis (HRSA) Guidelines. January.

Attachment B5
Age Sensitivity Factor
California Center Development
Pleasanton, California

Receptor	Age Sensitivity Factor (ASF)[1]
Resident[2]	1.7

Notes:
1. ASF based on recommendations by BAAQMD 2010.
2. A resident represents lifetime exposure.

Abbreviations:
BAAQMD: Bay Area Air Quality Management District
ASF: Age Sensitivity Factor

Sources:
Bay Area Air Quality Management District (BAAQMD). 2010. Air Toxics NSR Program Health Risk Screening Analysis (HRSA) Guidelines. January.

Attachment B6
Toxicity Values
California Center Development
Pleasanton, California

Source	Analysis	Chemical	CAS	Cancer Potency Factor[1] $[mg/kg\text{-}day]^{-1}$
Stationary Source	Cancer Risk	Diesel PM	9901	1.1

Notes:
1. Cancer Potency Factor was used to determine the cancer risk from source 8890 and 17575.

Abbreviations:
$[mg/kg\text{-}day]^{-1}$: per milligram per kilogram-day
PM: Particulate Matter
CAS: Chemical Abstracts Service

Source:
Cal/EPA. 2012. OEHHA/ARB Consolidated Table of Approved Risk Assessment Health Values. May 3. http://www.arb.ca.gov/toxics/healthval/contable.pdf

Attachment B7
Emergency Generator Risk
California Center Development
Pleasanton, California

BAAQMD Source ID	DPM Emission Rate[1] [g/s]	Annual Average Air Concentration[2] [µg/m^3]	Incremental Cancer Risk[3] [in a million]
17575	3.9E-04	7.0E-03	**3.80**
8890	1.3E-03	1.5E-03	**0.79**

Notes:
1. DPM emission rate corresponds to the average emissions over the year.
2. Based on ISC modeling results. DPM concentration is obtained by multiplying the maximum dispersion factor with the DPM emission rate.
3. Incremental Cancer Risk =C x CF x IF_{inh} x ASF x CPF, where:
   C = Exposure point concentration in air for DPM (µg/m^3)
   CF = Conversion Factor (mg/µg)
   IF_{inh} = Intake Factor for Inhalation (m^3/kg-day)
   ASF = Age Sensitivity Factor
   CPF = Cancer Potency Factor (mg chemical/kg body weight-day)$^{-1}$

Abbreviations:
BAAQMD: Bay Area Air Quality Management District
DPM: diesel particulate matter
g: gram
ug/m^3: microgram per cubic meter
s: second

Sources:
BAAQMD. 2010. Air Toxics NSR Program Health Risk Screening Analysis (HRSA) Guidelines. January.