Bay Area Air Quality Management District
Summary and Analysis of Cupertino Air Monitoring Results
Updated July 14, 2014

The Air District's Cupertino Air Monitoring Station began operating on September 1, 2010. The monitoring station was located at Monta Vista Park, approximately one mile east of the Lehigh Cement Plant (see Figure 1) and was closed on December 31, 2013. After collecting three calendar years of data from 2011 through 2013, Air District staff reviewed the data and developed the following summary and analysis of the results.

CRITERIA POLLUTANTS

Criteria pollutants are air contaminants for which the U.S. Environmental Protection Agency (EPA) and/or the California Air Resources Board (CARB) have adopted health-based ambient air quality standards. Ambient air quality standards adopted by EPA are National Ambient Air Quality Standards (NAAQS), and standards adopted by CARB are State Ambient Air Quality Standards. Criteria pollutants include PM_{10}, $PM_{2.5}$, ozone, carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2) and lead. Ozone, CO, SO_2, and NO_2 are gases. PM_{10} is particulate matter with a diameter less than or equal to 10 microns, and $PM_{2.5}$ is particulate matter with a diameter less than or equal to 2.5 microns. Lead is a component of particulate matter.

Table 1 summarizes Cupertino monitoring results for all criteria pollutants, provides a comparison to applicable National and State ambient air quality standards, and specifies locations with similar air quality.

GASES: Based on three years (2011-2013) of monitoring data, Cupertino air quality easily met all applicable State and National Ambient Air Quality Standards for the gaseous criteria pollutants CO, SO_2, and NO_2. In general, Cupertino's levels of these criteria pollutants were in the middle of the distribution of Bay Area air monitoring sites, with some locations measuring levels higher and some locations measuring lower than Cupertino. NO_2 levels were similar to levels at other suburban locations, including Concord and Santa Rosa. SO_2 concentrations were somewhat higher, with measurements similar to West Oakland and Martinez, but still less than a fifth of the SO_2 NAAQS. CO measurements were among the lowest in the Bay Area, with only Bethel Island and Concord being lower. For ozone, levels at Cupertino were below the national standard and most similar to Los Gatos.

PARTICULATE MATTER: Ambient air quality standards have been established for $PM_{2.5}$ and PM_{10}. For both $PM_{2.5}$ and PM_{10}, there is a 24-hour standard based on daily concentrations, and an annual standard based on the average of all 24-hour concentrations over a one-year period. Cupertino PM levels have not exceeded the 24-hour $PM_{2.5}$ NAAQS nor the 24-hour PM_{10} NAAQS. Its peak 24-hour levels were similar to those at Concord and San Rafael. Cupertino's

annual average $PM_{2.5}$ levels were also below the NAAQS and the more stringent annual average State standards, with levels similar to Santa Rosa and Gilroy.

LEAD: Cupertino lead levels were less than 1% of the State standard, less than 10% of the recently revised national standard, and less than levels in San Francisco.

Table 1. Criteria Pollutants Measured at the Cupertino Monitoring Site Compared to State and National Ambient Air Quality Standards (2011-2013)

Pollutant	Averaging Time	State Standard	National Standard	Design Value [1]	Maximum Concentrations	Location(s) with Similar Air Quality
Ozone	1 Hour	0.09 ppm	N/A	N/A	0.09 ppm	Los Gatos
	8 Hour	0.070 ppm	0.075 ppm	0.062 ppm	0.077 ppm	
PM_{10}	24 Hour	50 $\mu g/m^3$	150 $\mu g/m^3$	Zero days over standard	42 $\mu g/m^3$	Concord, San Rafael
	Annual Average	20 $\mu g/m^3$	N/A	N/A	14.6 $\mu g/m^3$	
$PM_{2.5}$	24 Hour	N/A	35 $\mu g/m^3$	21 $\mu g/m^3$	39$\mu g/m^3$	Santa Rosa, Gilroy
	Annual Average	12 $\mu g/m^3$	12.0 $\mu g/m^3$	8.9 $\mu g/m^3$	10.7 $\mu g/m^3$	Santa Rosa, Gilroy
CO	8 Hour	9.0 ppm	9 ppm	Zero days over standard	1.3 ppm	Concord, San Pablo
	1 Hour	20 ppm	35 ppm	Zero days over standard	3.1 ppm	
NO_2	Annual Average	0.030 ppm	0.053 ppm	0.009 ppm	0.009 ppm	Concord, Santa Rosa
	1 Hour	0.18 ppm	0.100 ppm	0.038 ppm	0.045 ppm	
SO_2	Annual Average	N/A	N/A	N/A	0.001 ppm	Oakland West, Martinez
	24 Hour	0.04 ppm	N/A	N/A	0.007 ppm	
	1 Hour	0.25 ppm	0.075 ppm	0.013 ppm	0.035 ppm	
Lead	30 Day Average	1.5 $\mu g/m^3$	N/A	N/A	0.006 $\mu g/m^3$	San Francisco
	3 Month Rolling Average	N/A	0.15 $\mu g/m^3$ (Recently Revised)	0.005 $\mu g/m^3$	0.005 $\mu g/m^3$	

Table 1 Notes:
1. Design Values are used for comparison with the National Ambient Air Quality Standard (NAAQS).
2. For PM_{10} and CO, the Design Value is defined as the number of days in a calendar year that the location would be expected to exceed the NAAQS.
3. For $PM_{2.5}$, NO_2, SO_2 and Lead, Design Values below the NAAQS indicate that national air quality standards are being met.

TOXIC AIR CONTAMINANTS

Table 2 summarizes toxic air contaminant monitoring results for Cupertino. Sample durations were 24-hours for either a 6-day or 12-day interval schedule. Table 2 contains the maximum concentrations for the 24-hour samples and the results for all samples averaged over a 3-year period.

The Air District estimated health risks using the ambient monitoring data and health effect values [cancer potency factors and non-cancer Reference Exposure Levels (RELs)] established by Cal/EPA's Office of Environmental Health Hazard Assessment (OEHHA). Four health risk summary tables are provided as follows: cancer risk, chronic non-cancer risk, 8-hour chronic non-cancer risk, and acute non-cancer risk. Note that each health risk summary table lists only the measured toxic air contaminant compounds for which a corresponding cancer or non-cancer health effect value has been adopted by OEHHA. Health risks were based on the following exposure pathways, where applicable, under OEHHA health risk assessment guidelines: inhalation, dermal absorption, soil ingestion, mother's milk ingestion, and homegrown produce ingestion. Non-inhalation pathway exposures were estimated based on measured pollutant concentrations and conservative default exposure assumptions established in OEHHA guidelines.

Table 3 lists the estimated cancer risk associated with lifetime exposure to the measured levels of toxic air contaminants at the Cupertino and San Jose air monitoring sites (the latter is included for comparison purposes because of similar pollutant coverage). The estimated cancer risk includes an Age Sensitivity Factor to account for inherent increased susceptibility to carcinogens during infancy and childhood. The total cancer risk is based on the sum of the cancer risks determined for each individual compound. The compounds that contribute most significantly to cancer risk in Cupertino are diesel PM (70%), carbon tetrachloride (11%), benzene (5%), 1,3-butadiene (4%), formaldehyde (4%), and acrylonitrile (2%). These are also the compounds that contribute most to cancer risk for the San Jose air monitoring site. These pollutants are emitted primarily from mobile sources, with the exception of carbon tetrachloride and acrylonitrile. There are no known local sources of carbon tetrachloride due to the phase-out of this compound as a stratospheric ozone-depleting compound. Measured levels of carbon tetrachloride in Cupertino are consistent with global background levels observed at other monitoring sites. Known sources of acrylonitrile include certain chemical plants and landfills. A comparison of cancer risk at the Cupertino and San Jose monitoring sites is illustrated in Figure 2.

Table 4 indicates the estimated chronic non-cancer risk represented by hazard quotient and hazard index. A hazard quotient is the ratio of the observed concentration of a particular compound to the compound's REL. RELs are concentrations at or below which no adverse non-cancer health effects are anticipated to occur in the general human population, including sensitive individuals. The hazard index is taken as the sum of the hazard quotients for each compound that affects the same target organ system (e.g., respiratory system, nervous system, etc.). A hazard index at or below one indicates that no adverse effects would be anticipated to occur. The chronic hazard index is calculated using the annual average concentration. For the Cupertino air monitoring site the chronic hazard index is 3.0, and for the San Jose monitoring site the chronic hazard index is 3.2. The compound that contributes most to chronic hazard index

at both sites is acrolein (77% at Cupertino, 88% at San Jose). Acrolein is emitted mostly from mobile sources, and the chronic REL for acrolein incorporates a cumulative uncertainty ("safety") factor of 200. Other compounds with significant contributions to chronic hazard index at the Cupertino site are mercury (17%) and arsenic (10%). At the San Jose monitoring site, the arsenic level of detection was not nearly as sensitive as the Cupertino site, and mercury was not measured at all; for these reasons the San Jose monitoring site is not a good comparator to the Cupertino site for arsenic and mercury (this is also true for other Bay Area monitoring sites). However, based on a literature review, the arsenic and mercury concentrations measured at the Cupertino site appear to be within or lower than the range found for rural areas. The annual average concentration of arsenic measured at the Cupertino air monitoring site is 0.0001 $\mu g/m^3$. The range of arsenic air concentrations in remote areas is 0.001 to 0.003 $\mu g/m^3$ (ToxGuide for Arsenic As CAS# 7440-38-2, U.S. Department of Health and Human Services Public Health Service Agency for Toxic Substances and Disease Registry, October 2007, http://www.astsdr.cdc.gov/toxguides/toxguide-2.pdf). The annual average concentration of mercury measured at the Cupertino air monitoring site is 0.002 $\mu g/m^3$. The range of mercury concentrations in rural areas is 0.001 to 0.004 $\mu g/m^3$ (Mercury Study Report to Congress, Volume III: Fate and Transport of Mercury in the Environment, EPA-452/R-97-003 December 1997, Table 3-1 Summary of Measured Mercury Concentration in Air http://www.epa.gov/mercury/report.htm).

Table 5 lists the estimated 8-hour chronic non-cancer risk. The 8-hour hazard indices are based on concentrations for the normal 8-hour exposure period for workers, and for children at schools and daycare facilities, that are repeated over an annual period. Note that 8-hour monitoring data are not available, but these concentrations were conservatively estimated by assuming that the entire 24-hour sample was collected over a single 8-hour period (i.e., 8-hour concentrations were assumed to be three times the measured 24-hour concentration). The 8-hour chronic hazard index is 4.1 for the Cupertino monitoring site, and 4.9 for the San Jose monitoring site. Acrolein is the highest contributor to the 8-hour chronic hazard index at both sites (about 83%).

Table 6 lists the estimated acute non-cancer risk. The acute hazard indices are based on maximum concentrations for a 1-hour period. Note that 1-hour monitoring data are not available, but these concentrations were conservatively assumed to be 7.5 times the maximum 24-hour concentration (see table footnote for derivation of this adjustment factor). The acute hazard index is less than one for the Cupertino and San Jose air monitoring sites.

Table 2. Comparison of Cupertino and San Jose Maximum 24-hour Average and Annual Average Toxic Air Contaminant Ambient Air Monitoring Data 2011-2013						
Compound	% of Samples above MDL[1]		Maximum 24-hour Average Concentration[1], µg/m^3		Annual Average Concentration,[1] µg/m^3	
	Cupertino	San Jose	Cupertino	San Jose	Cupertino	San Jose
Acetaldehyde	100%	100%	4.7	4.8	1.1	1.7
Acrolein[2]	87	100%	0.044	0.042	0.79	0.96
Acrylonitrile	17%	21%	0.088	0.34	0.017	0.056
Arsenic	28%	0%	0.0011	<MDL	0.00012	<MDL
Benzene	99%	99%	1.2	4.2	0.46	1.0
1,3 Butadiene	43%	57%	0.25	0.95	0.050	0.13
Carbon Tetrachloride	100%	100%	1.4	1.3	0.62	0.64
Chloroform	89%	96%	0.53	0.95	0.14	0.17
Chromium (Total)	95%	72%	0.011	0.0073	0.0022	0.0038
Copper	100%	100%	0.023	0.040	0.0083	0.012
Elemental Carbon[3]	100%	100%	1.6	3.2	0.52	0.64
Diesel PM[3]	100%	100%	1.7	3.4	0.54	0.66
Ethylbenzene	68%	85%	0.69	2.3	0.16	0.53
Ethylene Dibromide	0%	0%	<MDL	<MDL	<MDL	<MDL
Ethylene Dichloride	26%	25%	0.54	0.53	0.11	0.11
Formaldehyde	100%	100%	4.3	4.8	1.8	2.3
Lead	91%	74%	0.022	0.013	0.0023	0.0031
Manganese	100%	98%	0.047	0.027	0.0086	0.0094
Mercury[4]	100%	N/A	0.0052	N/A	0.0022	N/A
Methyl Chloroform	31%	41%	0.17	0.22	0.053	0.062
Methylene Chloride	74%	97%	1.1	4.9	0.49	1.1
Methyl Ethyl Ketone	90%	97%	2.3	3.5	0.68	0.80
Nickel	84%	0%	0.0067	<MDL	0.0014	<MDL
Perchloroethylene	91%	99%	0.46	1.3	0.056	0.25
Selenium	75%	17%	0.0046	0.0045	0.00080	0.0011
Toluene	100%	100%	6.0	16	0.85	2.9
Trichloroethylene	14%	21%	0.20	0.17	0.035	0.040
Vanadium	91%	7%	0.011	0.0031	0.0023	<MDL
Vinyl chloride	1%	1%	<MDL	<MDL	<MDL	<MDL
M&P Xylene	97%	100%	2.1	9.1	0.49	1.9
O Xylene	81%	96%	0.70	3.0	0.22	0.72

Table 2 Notes:

1. MDL is the Method Detection Limit for the compound. <MDL indicates less than Method Detection Limit. When a sample is identified as <MDL, 1/2 the MDL is used to calculate the annual average concentration. When all samples except one were <MDL, the value listed for the maximum 24-hour average concentration is "<MDL." When only 10% or less of the sample values are above the MDL, the value listed for annual average concentration is "<MDL." Note that each compound MDL's are not the same for both monitoring sites. For example, the San Jose arsenic MDL was 0.0015 µg/m^3 compared with 0.0001 to 0.0002 µg/m^3 for Cupertino. Thus, having more arsenic values < MDL at San Jose does not necessarily mean that the concentrations are lower at the San Jose site than at the Cupertino site.
2. The concentrations presented here for Acrolein are for 2013. Although ambient air monitoring samples were collected and analyzed for Acrolein during the 2011-2012 period, the results did not meet quality assurance/quality control (QA/QC) standards. Due to the chemical properties of Acrolein, sample collection and analysis of this compound can have large associated errors and better sample collection analytical methods are currently being investigated. In 2013, more a more stable standard was utilized, allowing for better analytic accuracy that met QA/QC requirements.

3. San Jose elemental carbon (EC) is not strictly comparable to Cupertino EC: the former measurement is derived from a $PM_{2.5}$ filter, the latter from a PM_{10} filter, i.e., containing a larger size cut. Therefore, the San Jose EC and estimated diesel PM shown may be underestimated. Diesel PM is estimated from elemental carbon data using the MATES II factor of 1.04.
4. N/A is not available. Mercury was not one of the compounds tested at the San Jose monitoring site.

Table 3. Cancer Risk Based on Ambient Air Monitoring Data for Cupertino and San Jose

Compound	Unit Risk Values[1], $(\mu g/m^3)^{-1}$	Cancer Risk[2] (in a million)	
		Cupertino	San Jose
Acetaldehyde	2.9E-06	5.5	8.3
Acrylonitrile	2.9E-04	8.6	27.7
Arsenic	1.7E-02	3.5	<MDL
Benzene	2.9E-05	22.5	49.2
1,3 Butadiene	1.7E-04	14.8	38.0
Carbon Tetrachloride	4.3E-05	45.9	47.5
Chloroform	5.5E-06	1.3	1.6
Diesel PM	3.2E-04	293.0	358.0
Ethylbenzene	2.5E-06	0.7	2.3
Ethylene Dibromide	7.2E-05	<MDL	<MDL
Ethylene Dichloride	2.1E-05	3.8	3.7
Formaldehyde	6.1E-06	18.2	23.9
Lead	5.1E-05	0.2	0.3
Methylene Chloride	1.0E-06	0.9	1.9
Nickel	2.6E-04	0.6	<MDL
Perchloroethylene	6.1E-06	0.6	2.6
Trichloroethylene	2.0E-06	0.1	0.1
Vinyl chloride	7.8E-05	<MDL	<MDL
Total Cancer Risk:		**420**	**565**

Table 3 Notes:
1. All compounds were evaluated for the inhalation pathway. For Arsenic and Lead, which have multipathway impacts, the Unit Risk Values (URVs) represent the combined inhalation and noninhalation pathways (dermal, soil ingestion, mother's milk, homegrown produce ingestion); these URVs were derived using HARP and default exposure values.
2. Cancer risk is based on a residential exposure duration of 24 hours per day, 350 days per year over a 70-year lifetime and includes a cancer risk adjustment factor of 1.7 to account for the inherent greater susceptibility to carcinogens during infancy and childhood.
3. Cancer risks are not calculated for compounds where all samples are <MDL. Note that each compound MDL is not the same for both monitoring sites. For example, the San Jose arsenic MDL was 0.0015 $\mu g/m^3$ compared with 0.0001 to 0.0002 $\mu g/m^3$ for Cupertino. Thus, the arsenic < MDL at San Jose does not necessarily mean that the cancer risk due to arsenic concentrations are lower at the San Jose site than at the Cupertino site.

Table 4. Chronic Non-cancer Risk Based on Ambient Air Monitoring Data for Cupertino and San Jose				
Compound	Chronic REL, µg/m^3	Chronic Hazard Quotient		Target Organ System
		Cupertino	San Jose	
Acetaldehyde	140	0.0	0.0	Respiratory
Acrolein	0.35	2.3	2.8	Respiratory
Acrylonitrile	5	0.0	0.0	Respiratory
Arsenic	0.00037	0.3	<MDL	Cardiovascular, Reproductive/Developmental, Nervous, Respiratory, Skin
Benzene	60	0.0	0.0	Reproductive/Developmental, Hematologic, Nervous
1,3 Butadiene	2	0.0	0.1	Reproductive/Developmental
Carbon Tetrachloride	40	0.0	0.0	Alimentary, Reproductive/Developmental, Nervous
Chloroform	300	0.0	0.0	Alimentary, Reproductive/Developmental, Kidney
Diesel PM	5	0.1	0.1	Respiratory
Ethylbenzene	2000	0.0	0.0	Alimentary, Reproductive/Developmental, Endocrine, Kidney
Ethylene Dibromide	0.8	<MDL	<MDL	Reproductive/Developmental
Ethylene Dichloride	400	0.0	0.0	Alimentary
Formaldehyde	9	0.2	0.3	Respiratory
Manganese	0.09	0.1	0.1	Nervous
Mercury	0.0045	0.5	N/A	Reproductive/Developmental, Kidney, Nervous
Methyl Chloroform	1000	0.0	0.0	Nervous
Methylene Chloride	400	0.0	0.0	Cardiovascular, Nervous
Nickel	0.014	0.1	<MDL	Reproductive/Developmental, Hematologic, Respiratory
Perchloroethylene	35	0.0	0.0	Alimentary, Kidney
Selenium	20	0.0	0.0	Alimentary, Cardiovascular, Nervous
Toluene	300	0.0	0.0	Reproductive/Developmental, Nervous, Respiratory
Trichloroethylene	600	0.0	0.0	Eye, Nervous
M&P Xylene	700	0.0	0.0	Eye, Nervous, Respiratory
O Xylene	700	0.0	0.0	Eye, Nervous, Respiratory
Chronic Hazard Index:		**3.0**	**3.2**	**Respiratory**

Table 4 Notes:

1. A chronic inhalation hazard quotient (HQ) is the ratio of the annual average concentration to the chronic inhalation REL. A noninhalation HQ is the ratio of the estimated noninhalation dose to the oral REL. The HQ for each compound is the sum of the chemical specific inhalation HQ and non-inhalation HQ. A Hazard Index (HI) is the sum of the hazard quotients (HQ) for all compounds that affect a particular target organ system. The highest target organ specific HI is the overall HI.
2. Adverse health effects are not expected to occur, even for sensitive members of the population, for hazard indices less than one. An exceedance of one does not indicate that adverse effects will occur; rather, it is an indication of the erosion of the margin of safety, and that the likelihood of adverse health effects is increased.

3. Arsenic, Mercury, and Nickel have noninhalation pathways; the chronic RELs for these compounds were derived from HARP and included the impacts of the inhalation and noninhalation pathways: inhalation, dermal adsorption, soil ingestion, mother's milk ingestion and home grown produce ingestion pathways (urban area).
4. Chronic HQs are not calculated for compounds where all samples are <MDL. Note that each compound MDL is not the same for both monitoring sites. For example, the San Jose arsenic MDL was 0.0015 µg/m^3 compared with 0.0001 to 0.0002 µg/m^3 for Cupertino. Thus, the arsenic < MDL at San Jose does not necessarily mean that the chronic HQ due to arsenic concentrations are lower at the San Jose site than at the Cupertino site.

Table 5. 8-hour Chronic Non-cancer Risk Based on Ambient Air Monitoring Data for Cupertino and San Jose

Compound	8-hour Chronic Inhalation REL, µg/m^3	8-hour Chronic Hazard Quotient		Target Organ System
		Cupertino	San Jose	
Acetaldehyde	300	0.0	0.0	Respiratory
Acrolein	0.7	3.4	4.1	Respiratory
Arsenic	0.015	0.0	<MDL	Cardiovascular, Reproductive/Developmental, Nervous, Respiratory, Skin
1,3 Butadiene	9	0.0	0.0	Reproductive/Developmental
Formaldehyde	9	0.6	0.8	Respiratory
Manganese	0.17	0.2	0.2	Nervous
Mercury	0.06	0.1	N/A	Reproductive/Developmental, Kidney, Nervous
Nickel	0.06	0.1	<MDL	Immune, Respiratory
8-hour Chronic Hazard Index:		**4.1**	**4.9**	**Respiratory**

Table 5 Notes:
1. An 8-hr hazard quotient is calculated by dividing the 8-hour average concentration (e.g., for a worker or student or child at daycare that is repeated over an annual period) by the 8-hr REL. A hazard Index is the sum of the hazard quotients for all compounds that affect a particular target organ system. The greatest target organ HI is the overall HI.
2. Adverse health effects are not expected to occur, even for sensitive members of the population, for hazard indices less than one. An exceedance of one does not indicate that adverse effects will occur, rather, it is an indication of the erosion of the margin of safety and that the likelihood of adverse health effects is increased.
3. The maximum 8-hour chronic exposure was conservatively estimated based on the assumption that all the pollutants for a 24-hour sample were collected within an 8-hour period. Therefore, an adjustment factor of 3 (24 hr/8 hr) was applied to the annual average concentrations (averages of multiple 24-hr samples).
4. 8-hour Chronic HQs are not calculated for compounds where all samples are <MDL. Note that each compound MDL is not the same for both monitoring sites. For example, the San Jose nickel MDL was 0.009 µg/m^3 compared with 0.00003 to 0.00005 µg/m^3 for Cupertino. All of the Cupertino nickel values were less than the San Jose MDL for nickel. Thus, the nickel < MDL at San Jose does not necessarily mean that the 8-hour chronic HQ due to nickel concentrations are lower at the San Jose site than at the Cupertino site.

Table 6. Acute Non-cancer Risk Based on Ambient Air Monitoring Data for Cupertino and San Jose				
Compound	Acute Inhalation REL, µg/m^3	Acute Hazard Quotient		Target Organ System
		Cupertino	San Jose	
Acetaldehyde	470	0.1	0.1	Eye, Respiratory
Acrolein	2.5	0.1	0.1	Eye, Respiratory
Arsenic	0.2	0.0	<MDL	Cardiovascular, Reproductive/Developmental, Nervous
Benzene	1300	0.0	0.0	Reproductive/Developmental, Hematologic, Immune
1,3 Butadiene	660	0.0	0.0	Reproductive/Developmental
Carbon Tetrachloride	1900	0.0	0.0	Alimentary, Reproductive/Developmental, Nervous,
Chloroform	150	0.0	0.0	Reproductive/Developmental, Nervous, Respiratory
Copper	100	0.0	0.0	Respiratory
Formaldehyde	55	0.6	0.6	Eye
Mercury	0.6	0.1	N/A	Reproductive/Developmental, Nervous
Methyl Chloroform	68000	0.0	0.0	Nervous
Methylene Chloride	14000	0.0	0.0	Cardiovascular, Nervous
Methyl Ethyl Ketone	13000	0.0	0.0	Eye, Respiratory
Nickel	0.2	0.3	<MDL	Immune
Perchloroethylene	20000	0.0	0.0	Eye, Nervous, Respiratory
Toluene	37000	0.0	0.0	Reproductive/Developmental, Eye, Nervous, Respiratory
Vanadium	30	0.0	0.8	Eye, Respiratory
Vinyl chloride	180000	<MDL	<MDL	Eye, Nervous, Respiratory
M&P Xylene	22000	0.0	0.0	Eye, Nervous, Respiratory
O Xylene	22000	0.0	0.0	Eye, Nervous, Respiratory
Acute Hazard Index:		**0.8**	**0.9**	**sensory irritation: Eyes**

Table 6 Notes:

1. An acute hazard quotient is the value of the maximum one-hour average concentration divided by the acute REL. A hazard Index (HI) is the sum of the hazard quotients (HQ) for all compounds that affect a particular target organ system. The greatest target organ specific HI is the overall HI.
2. Adverse health effects are not expected to occur, even for sensitive members of the population, for hazard indices less than one. An exceedance of one does not indicate that adverse effects will occur, rather, it is an indication of the erosion of the margin of safety and that the likelihood of adverse health effects is increased.
3. Max. 1-hr concentrations were assumed to be 7.5 times the max. 24-hr concentration. This adjustment factor was determined by multiplying a 1-hr to 24-hr meteorological persistence factor of 1/0.4 = 2.5 ("Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, Revised, October 1992, EPA-454/R-92-019, page 4-16), by an emission rate scalar of 3 (24 hr/8 hr), that accounts for temporal differences in emissions over the 24-hour period. This technique was used for this report to adjust concentrations based on the 24 hour monitoring data in Table 2.
4. Acute HQs are not calculated for compounds where all samples are <MDL. Note that each compound MDL is not the same for both monitoring sites. For example, the San Jose nickel MDL was 0.009 µg/m^3 compared with 0.00003 to 0.00005 µg/m^3 for Cupertino. All of the Cupertino nickel values were less than the San Jose MDL for nickel. Thus, the nickel < MDL at San Jose does not necessarily mean that the Acute HQ due to nickel concentrations are lower at the San Jose site than at the Cupertino site.

Figure 1. Location of the Air District's Cupertino Air Monitoring Station

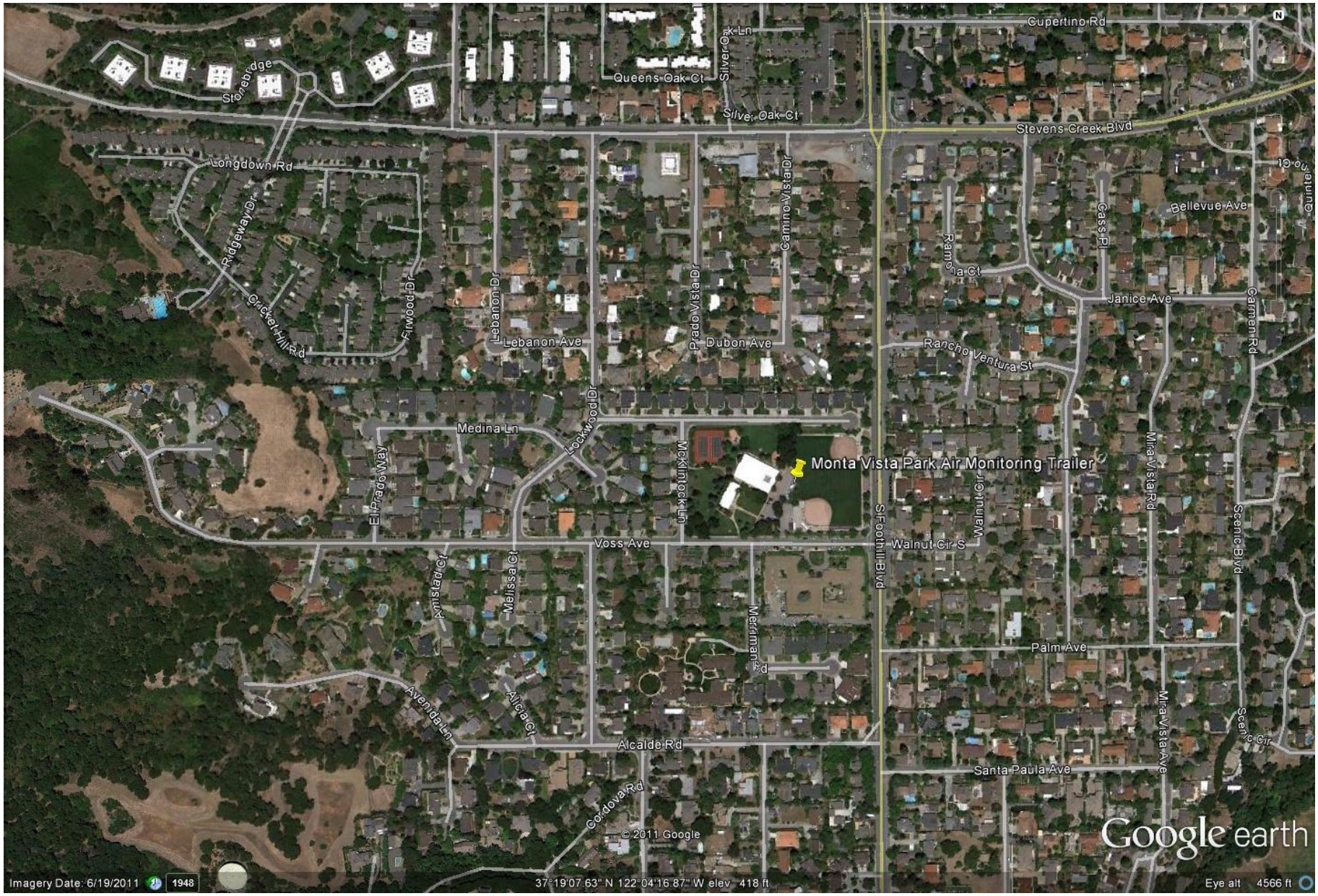

Figure 2. Cancer Risk Based on Ambient Air Monitoring Data