Pico Power Project

Appendix 8.1-B
Modeling Analysis

October 2002

October 1, 2002

Mr. Rob DeMandel, Manager
Bay Area Air Quality Management District
939 Ellis Street
San Francisco, CA 94109

Subject: Modeling Protocol for the Pico Power Project

Dear Mr. DeMandel:

In October of this year, the City of Santa Clara will apply to the BAAQMD for an Authority to Construct and a Determination of Compliance for a nominal 120 MW power generating facility to be sited on property owned by the City of Santa Clara, located southeast and adjacent to the intersection of Duane Ave., and Lafayette St., Santa Clara County. The project will be a major new source as defined by the District's Siting Regulations, and will be subject to District requirements for air quality modeling analyses. Attached for your review and approval is a description of the analytical approach that will be used to comply with District modeling requirements for the project. We intend to file the application with the District in October 2002 and request approval of the attached modeling protocol by October 2002.

We would be pleased to meet with you and your staff to discuss this protocol if such a meeting would be useful. We look forward to working with you. If you have any questions, please do not hesitate to call me at (805) 569-6555. Thank you for your attention in this matter.

Sincerely,
RTP Environmental Associates, Inc.

Gregory Darvin
Associate

cc: Glen Long, BAAQMD
Joe Loyer, CEC
Richard Booth, FWENC

PICO POWER PROJECT
MODELING PROTOCOL

The City of Santa Clara, through its municipal electrical department, intends to develop, construct, and operate a base load power plant near the intersection of Duane Ave., and Lafayette St., in the City of Santa Clara, within Santa Clara County. The proposed project, called the Pico Power Project (PPP), will consist of two (2) natural gas-fired combustion turbine-generators (CTs) with supplementary fired heat recovery steam generators (HRSGs) and one steam turbine-generator (STG), with a total nominal net generating capacity of 120 MW. The combustion turbines are expected to be GE LM6000 PC Sprint machines. A 3-cell wet cooling tower will also be installed to provide cooling water for the steam turbine condenser. No additional auxiliary equipment such as emergency generators or engine-driven fire pumps will be installed at the site.

The proposed project will be a minor new source under Bay Area Air Quality Management District (BAAQMD) regulations.

The applicant will submit air quality impact analyses to both the BAAQMD and the California Energy Commission (CEC). The modeling analysis will include impact evaluations for those pollutants shown in Table 1 and the CEC requirements for evaluation of project air quality impacts. The purpose of this document is to establish the procedure for meeting the BAAQMD and CEC air quality modeling requirements for the proposed project.

Table 1
BAAQMD PSD Significant Emissions Thresholds

Pollutant	Cumulative Increase (tons/yr)
NO_x	100
SO_2	100
CO	100
PM_{10}	100

The project is not expected to result in emissions that will exceed BAAQMD PSD significance thresholds for oxides of nitrogen (NO_x), carbon monoxide (CO), and fine particulate matter (PM_{10}). Furthermore, emissions of sulfur dioxide (SO_2) are expected to be below the significance levels. The project may also trigger CEC modeling requirements for cumulative and construction-based impacts.

Emissions from the proposed project are not expected to exceed the BAAQMD thresholds defining a major source for purposes of New Source Review (NSR) or PSD. The project will trigger the BAAQMD offset requirements for NOx as emissions of other criteria pollutants are below the offset trigger levels. As part of the minor source permit application, an air quality, toxics, and cumulative impacts analysis is required. Modeled ambient impacts are expected to be below the levels at which preconstruction monitoring is required. The results of these analyses will be presented in detail in the AFC and the application for a Determination of Compliance.

As part of the application process and in accordance with the BAAQMD requirements ("*Permit Modeling Guidance,*" August, 2001), a modeling protocol is required. This modeling protocol outlines the proposed use of air dispersion modeling techniques that will be used to assess impacts from the proposed source, and has been prepared by RTP Environmental Associates and Foster Wheeler Environmental Corporation on behalf of the PICO Power Project. This protocol also follows modeling guidance provided by the U.S. Environmental Protection Agency (USEPA) in its "*Guideline on Air Quality Models*" (including supplements), the National Park Service's "*Permit Application Guidance for New Air Pollution Sources*" (Bunyak, 1993), the Federal Land Managers' "*Air Quality Related Values Workgroup (FLAG) Draft Phase I Report*" (October 1999), and the "*Interagency Workgroup on Air Quality Modeling (IWAQM) Phase II Recommendations*" (1998), as well as BAAQMD modeling guidance.

Impacts from operation of the facility will be compared to the following:

Air Quality Criteria	NO_2	PM_{10}	CO	SO_2
PSD Significant Impact Levels	x	x	x	x[a]
PSD Monitoring Exemption Levels				
PSD Increments				
Ambient Air Quality Standards	x[b]	x[b]	x[b]	x[a,b]
Class I and Class II Visibility	x	x		x[a]
Impacts to Soils and Vegetation	x	x		x[a]
Class I Area Acid Deposition	x	x		x[a]

Project Location

The proposed project site is located on property adjacent to and southeast of the intersection of Duane Ave., and Lafayette St., in the City of Santa Clara, in Santa Clara County. The site is approximately 0.06 mile south of Bayshore Freeway (101), and approximately 0.4 miles west-northwest of the San Jose Airport complex. The UTM coordinates of the site (SW corner) are 1962887.976 meters northing, 6139912.431 meters easting (latitude 37 deg 22' 35.979",

longitude -121 deg 57' 5.487"). The nominal site elevation is approximately 30 feet above mean sea level. See Figure 1.

Proposed Emission Sources

The primary emission sources at the Pico Project will be two (2) natural gas-fired turbine electric generators, each equipped with a supplementary-fired HRSG that will have the potential to fire up to ~137 MMBtu/hour. The project will also consist of one 3-cell cooling tower. The turbines, and HRSG duct burners will be fired with pipeline quality natural gas only. The turbines/HRSGs will utilize advanced combustion designs and emission controls to limit emissions of NO_x to 2.5 ppmvd (3-hour average), while limiting emissions of CO to 4 ppmvd (3-hour average). Emissions of PM_{10} and SO_2 will be kept to a minimum through the exclusive use of natural gas. Additionally, high-efficiency drift eliminators will minimize emissions of PM_{10} from the cooling tower.

Existing Meteorological and Air Quality Data

Meteorological data to be used in the air quality impacts assessment was derived from the San Jose Airport data set for the following years: 1992-1995, and 1997. This data has been approved for use by the BAAQMD.

Several SLAMS/NAMS air quality monitoring stations exist in the regional vicinity of the proposed facility site. Data from these stations, as follows, will be used to establish background air quality levels for the proposed project:

Name	CARB ID#	Pollutants Monitored
San Jose 4th St.	4300382	Ozone, NO2, CO, PM10
San Jose Piedmont	4300392	Ozone, PM10
Mountain View	4300387	Ozone
San Jose Moorpark	4300377	Sulfates
San Francisco-Arkansas St.	9000306	SO_2

Terrain in the vicinity of the project site is as follows.

- Within several miles of the project site the terrain is essentially flat with elevations ranging from sea level to 100 ft. amsl.
- Significant terrain features (above stack height) occur as follows:
  - To the north > 10 miles
  - To the northeast 6 miles
  - To the east 5 miles
  - To the southeast 7.5 miles
  - To the south 3.5 miles
  - To the southwest 3.5 miles
  - To the west 5 miles

- To the northwest > 10 miles

All terrain data was derived from USGS 7.5 min topographic and Digital Elevation Model (DEM) maps.

Air flow patterns in the region can be characterized by season as follows.

Spring (March through May) – Flow across the proposed site and the southeaster portion of San Francisco Bay is from the west-northwest.

Summer (June through August) – Flow across the site and the southeastern portion of San Francisco Bay is from the west-northwest.

Fall (September through November) – Flow across the site and the southeastern portion of San Francisco Bay shows a more northwesterly orientation.

Winter (December through February) – Flow across the site and the southeastern portion of San Francisco Bay is predominantly northwesterly, with an easterly and southeasterly component.

Table 2 delineates the wind flow regime data.

Figure 1 Site Location

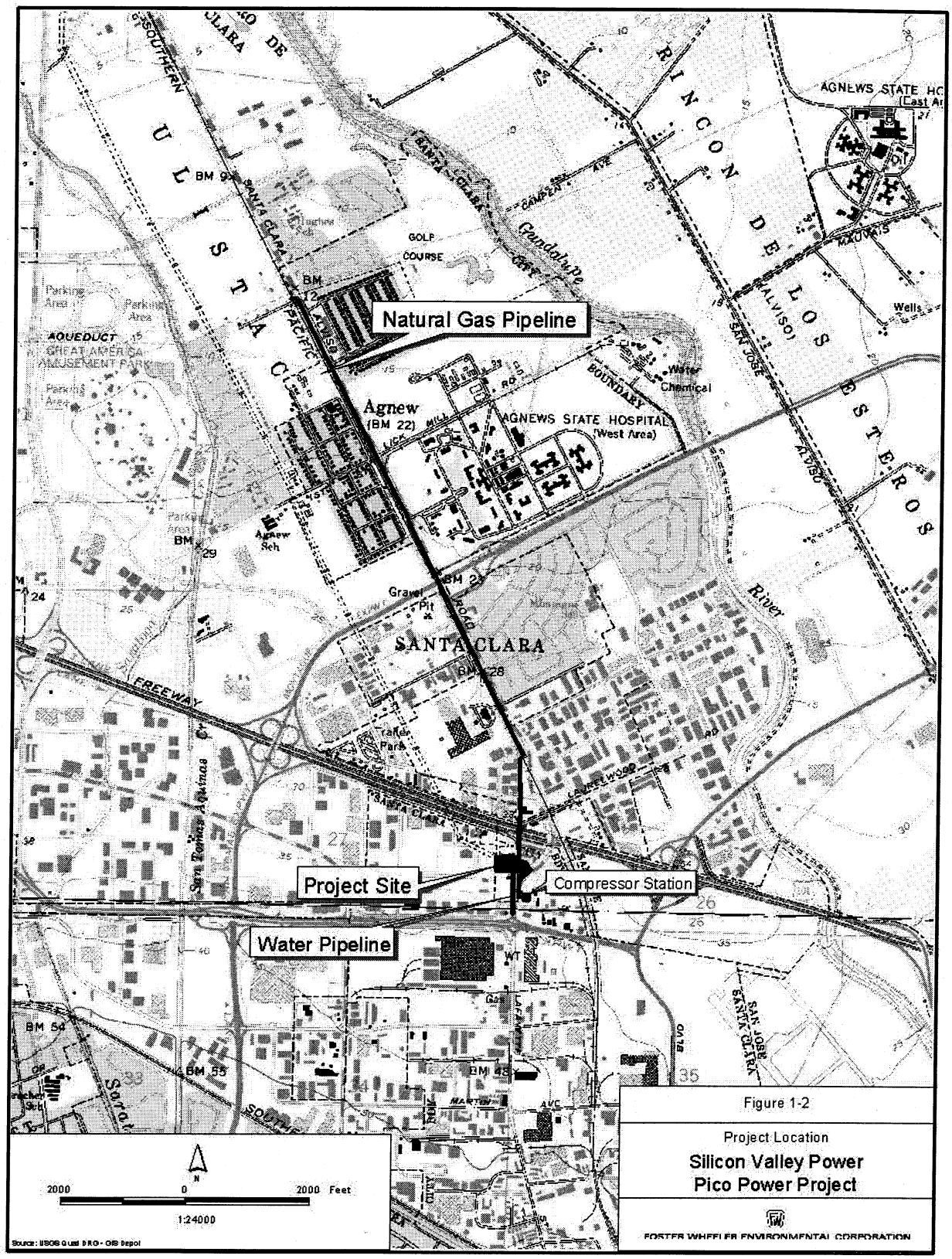
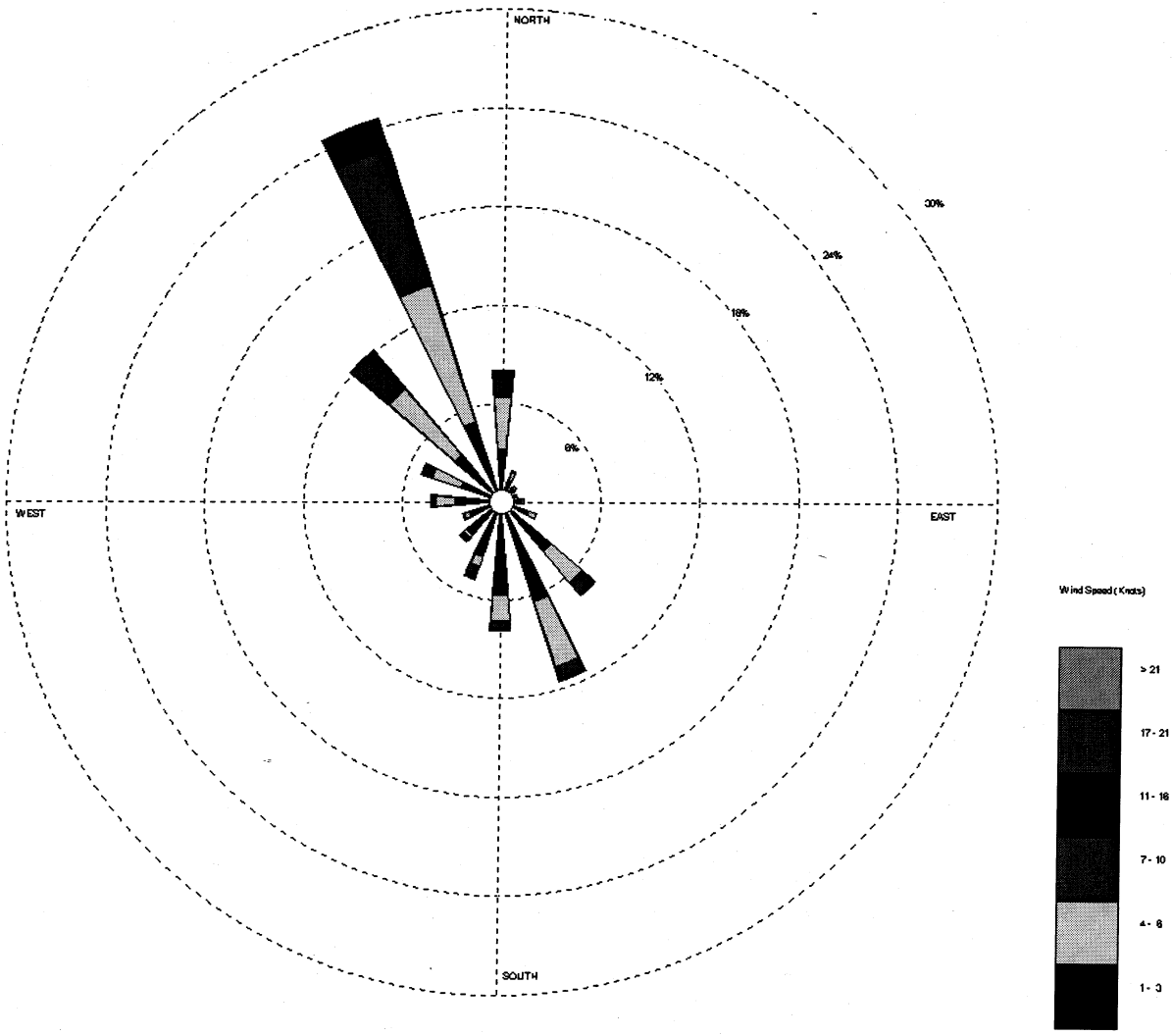


Figure 2

Wind Rose for San Jose Airport
Cumulative 1992-1995, 1997



Preliminary background air quality data for the project site is delineated in Table 3.

Table 3. Maximum background concentrations (1999-2001).[a]

Pollutant	Averaging Time	1999	2000	2001
San Jose 4th St,:				
NO_2 pphm	1-Hour	13	11	11
	Annual	2.6	2.5	ND
CO ppm	1-Hour	9.0	8.9	7.6
	8-Hour	6.28	7.03	5.10
PM^{10} ug/m^3	24-Hour	114	76	77
	Annual AM	28.7	26.7	28.0
	Annual GM	25.3	23.8	25.0
San Jose 4th St, Mountain View, and San Jose Piedmont:				
Ozone ppm	Max 1-Hour	.176	.096	.095
	3 Station Avg Max 1-Hour Values	.132	.083	.092
San Francisco-Arkansas St.:				
SO_2 ppm	1-Hour	.03	.02	ND
	24-hour	.007	.008	ND
	Annual	.002	.002	.003*

Notes:
[a] Highest value from all stations for each year
* Data through October 2001

Site Representation

USEPA defines the term "on-site data" to mean data that would be representative of atmospheric dispersion conditions at the source and at locations where the source may have a significant impact on air quality. Specifically, the meteorological data requirement originates in the Clean Air Act at section 165(e)(1). Section 165(e)(1) defines on-site meteorology as the collection "of the ambient air quality at the proposed site and in areas which may be affected by emissions from such facility for each pollutant subject to regulation under [the Act] which will be emitted from such facility."

This definition and USEPA's guidance on the use of on-site monitoring data are also outlined in the "*On-Site Meteorological Program Guidance for Regulatory Modeling Applications*" (1987). The representativeness of the data is dependent upon (a) the proximity of the meteorological monitoring site to the area under consideration, (b) the complexity of the topography of the area, (c) the exposure of the meteorological sensors, and (d) the period of time during which the data are collected. As discussed below, we believe the meteorological data from the San Jose Airport monitoring station data satisfy the definition of on-site data.

Situated between the western and eastern portions of the Coast Range, this region is protected from the direct effects of the marine airflow. Marine air entering through the Golden Gate is forced to split into northerly and southerly paths due to the blocking effect of the east bay hills. The southern flow is directed southeasterly down the bay, parallel to the hills, where eventually it passes over northwestern Santa Clara County. These sea breezes are strongest in the afternoon. The further from the ocean the marine air travels, the more it is modified. Thus, although the climate in this region is affected by sea breezes, it is affected less so than the regions closer to the Golden Gate, to the north. The climate of northwestern Santa Clara County is also modified by its close proximity to the San Francisco Bay. During periods of flat pressure gradients, the bay can generate its own circulation system, which pushes cool air onshore during the daytime and draws air from the land offshore at night. Bay breezes are common in the morning, before the sea breeze begins.

Winds are predominantly out of the northwest in this region, particularly during summer months. In the winter, winds are equally likely out of the east. Cold air over land areas creates high pressure to the east, which forces air toward the west. Annual average wind speeds close to the bay are about 5.1 mph.

The attached windrose (Figure 2) for the San Jose Airport monitoring site indicates a good level of consistency of northwest winds as well as reinforcing the general seasonal wind patterns discussed earlier. Thus, use of the 10-meter San Jose Airport monitoring station to represent the project site wind speed, wind direction, and temperature would be considered representative with respect to the calculation of potential impacts from the project.

The area surrounding the project site can be characterized as urban. Areas within three (3) kilometers of the project site are predominately densely developed commercial and industrial sites. In accordance with the Auer land use classification methodology (USEPA's "*Guideline on Air Quality Models*"), land use within the area circumscribed by a three km radius around the modified facility is greater than 50 percent urban. Therefore, in the modeling analyses supporting the permitting of the facility, urban coefficients will be assigned.

Representativeness has also been defined in the "*Workshop on the Representativeness of Meteorological Observations*" (Nappo et. al., 1982) as "the extent to which a set of measurements taken in a space-time domain reflects the actual conditions in the same or different space-time domain taken on a scale appropriate for a specific application." Judgments of representativeness should be made only when sites are climatologically similar, as the project site and San Jose Airport monitoring station clearly are. Representativeness has also been defined in the PSD Monitoring Guideline as data that characterize the air quality for the general area in which the proposed project would construct and operate. The same large-scale topographic features that influence the San Jose Airport monitoring station also influence the proposed project site in the same manner.

In determining the representativeness of the San Jose Airport monitoring station relative to the project site, the following considerations were addressed.

Aspect ratio of terrain, which is the ratio of height to width of hill at base - There are no major terrain features either near the proposed project site or the San Jose Airport monitoring station that would modify (influence) the prevailing wind pattern that is characteristic of the close proximity to the Bay. The elevations of the project site and the San Jose Airport monitoring station are essentially the same.

Slope of terrain - Terrain in the immediate vicinity of the project site and the San Jose Airport monitoring station are relatively flat.

- ***Ratio of terrain height to stack/plume height*** –Terrain above the stack height is located at least 3.5 miles or more from the project site towards the south and southwest. Terrain above the stack height is located in excess of 5 miles or more from the project site towards the north, northeast, southeast, west, and northwest.

Final plume height (stack height plus plume rise) was calculated for D stability and a wind speed of 5 meter/second (m/s) to be about 210 meters. While complex and/or intermediate terrain occurs at significant distances from the project site, impacts in these areas are expected to be minimal. Based upon the flat terrain surrounding the project site, along with most maximum impact(s) being driven by downwash, terrain will not drive the final modeling results. Thus, it is expected that no impacts in complex or intermediate terrain will be identified.

Correlation of terrain features to prevailing meteorological conditions - As discussed earlier, the orientation and aspect of terrain in the project area correlates well with the prevailing wind fields as identified by the San Jose Airport windrose, with little to no apparent influence by local terrain perturbations (such as small land outcroppings or the water-land interface). Wind flow at the San Jose Airport monitoring station would therefore be nearly identical to the project site.

Thus, it is our assessment that the meteorological data collected at the San Jose Airport monitoring station are identical to the dispersion conditions at the project site and to the regional area. The windroses do not indicate any overwhelming effects on the potential dispersion of pollutants from the project site on a regional scale from influences other than the surface of the San Francisco Bay. Because of the distances to the complex terrain features, it is likely that all short-term and annual impacts will occur in the immediate vicinity of the project site. Thus, the data set would satisfy the definition of on-site data, as defined in the PSD Monitoring Guidelines (1990) and the On-site Meteorological Program Guidance for Regulatory Modeling Applications (1987).

The five (5) years of meteorological data for San Jose Airport monitoring station were obtained from the BAAQMD for the years 1992-1995, and 1997. The data set includes all the necessary parameters required for the ISCST3 dispersion modeling analyses (i.e., wind speed and direction, temperature, stability, and mixing height which is set to 600 meters). The data will not be modified in anyway.

As described above, recent maximum air quality data from the surrounding SLAMS/NAMS monitoring stations will be used to represent ambient concentrations of O_3, NO_x, NO_2, CO, SO_2, PM_{10}, and sulfates. These data are expected to be conservative for estimating baseline concentrations in the project vicinity, since they are taken from locations closer to emission sources than is the project site. For state and federal attainment pollutants with maximum modeled ground-level impacts greater than USEPA-defined significance levels, modeled concentrations will be added to these representative maximum background concentrations to determine compliance with the CAAQS and NAAQS.

Air Quality Dispersion Models

Overview

Several USEPA dispersion models are proposed for use to quantify pollutant impacts on the surrounding environment based on the emission sources operating parameters and their locations. The models proposed for use are Building Profile Input Program (BPIP, current version 95086), Industrial Source Complex - Short Term (ISCST3, current version 02035), ISC-PRIME (Plume Rise Model Enhancements, version 98069), CTSCREEN (current version 94111), SCREEN3, and Calpuff (version 5.4). These models, along with options for their use and how they are used, are discussed below. These models will be used for the following:

- Comparison of impacts to significant impact levels;
- Comparison of impacts to monitoring significance thresholds;
- Compliance with AAQS;
- Cumulative impacts analysis; and
- Impacts to Air Quality Related Values in Class I and Class II areas.

Simple, Complex, and Intermediate Terrain Impacts

For modeling the project in simple, complex, and intermediate terrain, the ISCST3 model will be used with five (5) years of hourly meteorological data from the San Jose Airport monitoring station for 1992-1995, and 1997. The ISCST3 model is a steady-state, multiple-source, Gaussian dispersion model designed for use with stack emission sources situated in terrain where ground elevations can exceed the stack heights of the emission sources. The ISCST3 model requires hourly meteorological data consisting of wind vector, wind speed, temperature, stability class, and mixing height. The model assumes that there is no variability in meteorological parameters over a 1-hour time period, hence the term steady-state. The ISCST3 model allows input of

multiple sources and source groupings, eliminating the need for multiple model runs. Complex phenomena such as building-induced plume downwash are treated in the ISCST3 model.

The ISCST3 model was selected due in part to the flat terrain surrounding the project site, and is one of several models that are recommended by the USEPA for such evaluations. The ISCST3 model is capable of calculating pollutant concentrations in intermediate terrain. Intermediate terrain is defined as terrain between stack top and final plume height. In calculating pollutant concentrations in intermediate terrain, the model will select the higher of the simple and complex terrain calculations on an hour-by-hour, source-by-source, and receptor-by-receptor basis. As discussed earlier, intermediate and complex terrain features are present but at distances that range from 5-12 miles from the project site. In addition, the ISCST3 model is preferred for this application because it incorporates algorithms for the simulation of aerodynamic downwash induced by buildings. These effects are of importance because many of the emission points may be below Good Engineering Practice (GEP) stack height.

Technical options selected for the ISCST3 model are listed below. Use of these options follows the USEPA's (1986, 1987, 1990, and 1994) modeling guidance, BAAQMD guidance, and/or sound scientific practice. An explanation of these options and the rationale for their selection is provided below.

- Gradual plume rise (BAAQMD requirement)
- Stack tip downwash
- Default option for temperature gradients, wind profile exponents, and calm processing
- Anemometer height = 10 m;
- Rural dispersion parameters; and
- Elevated receptor terrain heights option.

Final plume rise option does not consider the possible effects of gradual plume rise on ambient concentrations during the rising phase of the plume downwind transport. Gradual plume rise is recommended by USEPA (1986, 1987, 1990, 1994) when there is significant terrain close to the stacks. Significant terrain does not occur until about 3.5-10+ miles from the source. Buoyancy-induced dispersion, which accounts for the buoyant growth of a plume caused by entrainment of ambient air, will be included because of the relatively warm exit temperature and subsequent buoyant nature of the exhaust plumes. Stack-tip downwash, which adjusts the effective stack height downward following the methods of Briggs (1972) for cases where the stack exit velocity is less than 1.5 times the wind speed at stack top, will be selected per USEPA guidance.

As previously mentioned, based on the land use classification procedure of Auer (1978), land use within the area circumscribed by a three-km radius around the modified facility is greater than 50 percent urban. Therefore, in the modeling analyses supporting the permitting of the facility, urban coefficients will be assigned.

The calm processing option allows the user to direct the program to exclude hours with persistent calm winds in the calculation of concentrations for each averaging period. This option is generally recommended by the USEPA (1986, 1987, 1990, 1994) for regulatory applications. The ISCST3 model recognizes a calm wind condition as a wind speed less than or equal to 1 meter per second and a wind direction equal to that of the previous hour (a wind speed of 0 m/sec is used in the ASCII meteorological data file). The calm processing option in the ISCST3 model will then exclude these hours from the calculation of concentrations.

PRIME Dispersion Model

EPRI sponsored a study to develop and evaluate new, improved plume rise and building downwash algorithms. The downwash algorithms in the existing ISC3 model, currently recommended for regulatory application, were largely developed with data that represented neutral stability, moderate to high wind speeds, winds perpendicular to the building face, and non-buoyant or low buoyancy plumes. Some of the limitations of the ISC3 downwash algorithms are: (1) the location of the stack is not considered; (2) streamline deflection is not considered; (3) there is no linkage between plume material captured by the near wake and far wake concentrations; and (4) large concentrations predicted by ISC3 during light wind speed, stable conditions are not supported by observations. Proper treatment of all of the above factors is considered essential for an improved building downwash model.

The central approach used in ISC-PRIME is to explicitly treat the trajectory of the plume near the building, and to use the position of the stack and plume relative to the building to calculate interactions with the building wake. ISC-PRIME calculates the local slope of the mean streamlines as a function of projected building shape, and coupled with a numerical plume rise model, determines the change in plume centerline location with downwind distance. This incorporates the descent of the air containing the plume material, and rise of the plume relative to the streamlines due to buoyancy or momentum effects. The ISC-PRIME plume rise is computed using a numerical solution of the mass, energy and momentum conservation laws. A key feature of the plume rise calculation is the ability to include vertical wind shear effects, which are important for many buoyant releases from short stacks. Additionally, the wind speed deficit induced by the building is modified as a function of downwind distance from the building. The deficit also leads to increased plume rise from short stacks.

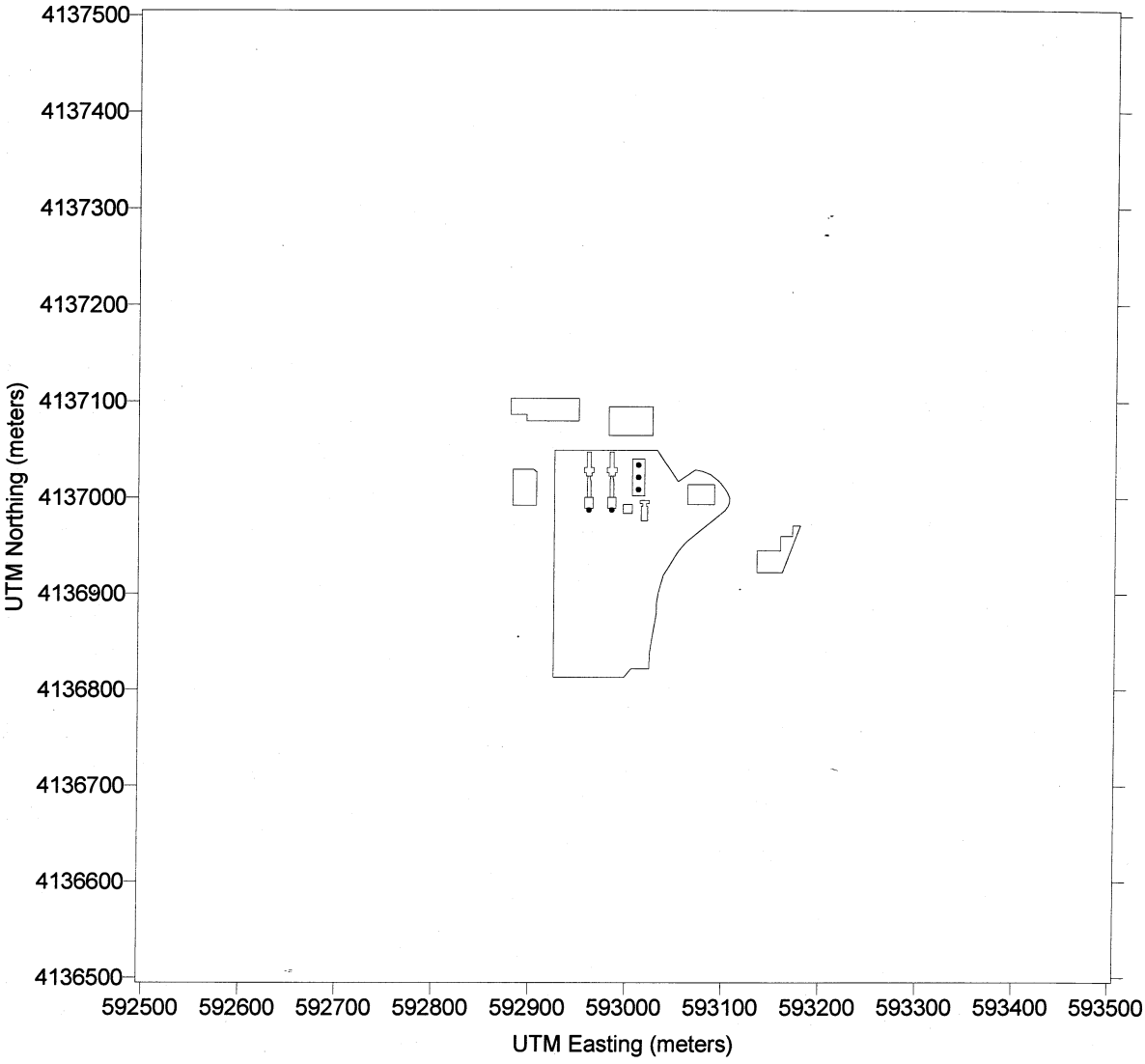
ISC-PRIME calculates enhanced turbulence intensity and velocity deficit values within the wake region. These values are a maximum at the lee wall of the building and decay with the two-thirds power downwind through the wake. Ambient turbulence intensity is inferred from the Briggs dispersion coefficient formulas for rural and urban locations. If the plume is released upwind of the wake, the plume initially grows at the ambient rate, and then plume dispersion in the wake and near field is determined using the enhanced turbulence and velocity deficits. As observed in wind-tunnels, both the horizontal and vertical dispersion coefficients are enhanced in

the building wake (this virtually eliminates the suspiciously large predictions by ISC3 during light wind speed, stable conditions which are caused by only enhancing the vertical dispersion coefficient when the stack height is more than 20% higher than the building height). When the turbulence intensity within the wake has decayed to the ambient rate, a virtual source technique is used to transition to the ISC3 dispersion curves.

An additional limitation of ISCST3 is that the model is only valid for the far wake (defined in ISCST3 as the area beyond the lesser of three building heights or building widths). A separate EPA model, SCREEN3, is recommended by EPA for near wake concentrations. However, ISC-PRIME predicts concentrations in both the near and far wakes. The fraction of the plume captured by the near wake is well-mixed within the near wake. That plume mass is then re-emitted to the far wake as a volume source and added to the uncaptured primary plume. A transition zone between the near and far wakes is used to represent the unsteadiness of the near wake/far wake interface.

ISC-PRIME is proposed for the calculation of 24-hour PM_{10} concentration(s). Initial modeling with ISCST3 indicates that, with a 95-foot tall stack, the 24-hour PM_{10} significance level of 5 ug/m^3 will be exceeded due solely to downwash. In most cases where downwash is driving the impact analysis, simply raising the stack upwards usually solves the problem. Because the site is situated within the approach zone of the San Jose International Airport, the stack height cannot be raised above 95 feet. Thus, ISC-PRIME is proposed for use because the stack height must be limited to 95 feet. Analysis of the structures driving the downwash impacts indicates that it is the off-site structures, as indicated in Figure 3 below, that are causing the 24-hour PM_{10} significance level to be exceeded. As the offsite buildings constitute a large structure, stack locations become important in determining downwash impacts, especially for sources located away from the offsite buildings. The advantage in using ISC-PRIME in this situation is that ISC-PRIME explicitly treats the trajectory of the plume near the building and uses the position of the stack and plume relative to the building to calculate interactions with the building wake.

The use of the ISC-PRIME model was discussed with Mr. Glen Long of the BAAQMD. Mr. Long is the Senior Air Quality Engineer and is responsible for reviewing this modeling protocol as well as reviewing the modeling assessments/methodologies on all BAAQMD projects. Mr. Long indicated that, conceptually, he would not question the use of this model in the calculation of 24-hour PM_{10} concentration(s).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CTSCREEN Dispersion Model

If the ISCST3 model calculates exceedances of AAQS, increments or significance levels in intermediate or complex terrain, the CTSCREEN model will be used to refine the modeling analysis. The CTSCREEN model, the screening mode of CTDMPLUS, is a refined point source Gaussian air quality model for use in all stability conditions for complex terrain applications. Because the model accounts for the dimensional nature of the plume and terrain interaction, the model requires digitized terrain of the nearby topographical features. The mathematical representation of terrain is accomplished by the terrain preprocessors, FITCON and HCRIT. The wind direction used in CTSCREEN is based on the source-terrain geometry, resulting in computation of the highest impacts likely to occur. Other meteorological variables are chosen from possible combinations from a set of predetermined values. CTSCREEN provides maximum concentration estimates that are similar to, but on the conservative side of, those that would be calculated from the CTDMPLUS model with a full year of on-site meteorological data.

As well as calculating maximum 1-hour concentrations at all receptors, the CTSCREEN model is designed to provide conservative estimates of worst-case 3-hour, 24-hour, and annual impacts. Scaling factors are used to convert calculated 1-hour concentrations to 3-hour, 24-hour, and annual estimates. A workgroup study found the ratios to convert 1-hour concentrations to 3-hour, 24-hour, and annual concentrations to be 0.7, 0.15, and 0.03, respectively.

CTSCREEN is appropriate for the following applications:

- Elevated point sources;
- Terrain elevations above stack top;
- Rural areas; and
- One-hour to annual averaging time periods.

Ambient Ratio Method and Ozone Limiting Method

Annual NO_2 concentrations will be calculated using the Ambient Ratio Method (ARM), adopted in Supplement C to the Guideline on Air Quality Models (USEPA, 1994). The Guideline allows a nationwide default conversion rate of 75% for annual NO_2/NO_x ratios.

Should NO_2 concentrations need to be examined in a more rigorous manner, the Ozone Limiting Method (OLM) will be used. Hourly ozone data collected at the San Jose 4th St. monitoring station during 1992-1995, and 1997, are proposed for use in the Ozone Limiting Method to calculate hourly NO_2 concentrations from hourly NO_x concentrations. These years were chosen due to the concurrent nature with respect to the San Jose Airport met data for the same years. The Ozone Limiting Method involves an initial comparison of the estimated maximum NO_x concentration and the ambient O_3 concentration to determine which is the limiting factor to NO_2 formation. If the O_3 concentration is greater than the maximum NO_x concentration, total conversion is assumed. If the NO_x concentration is greater than the O_3 concentration, the formation of NO_2 is limited by the

ambient O_3 concentration. In this case, the NO_2 concentration is set equal to the O_3 concentration plus a correction factor that accounts for in-stack and near-stack thermal conversion.

EPA's ISC-OLM model will be used to calculate the NO_2 concentration based upon the OLM method. ISC-OLM will be implemented on a plume-by-plume basis (i.e., individual plume). However, for some receptors, a demonstration of plume merging may be made to allow use of the combined source analysis. Plume merging will be demonstrated as follows. The horizontal dispersion of each individual plume, as a function of downwind distance, will be identified using EPA's SCREEN3 dispersion model at the distance to the receptor of interest, under the appropriate meteorology. This value will be compared with half the distance between sources proposed for plume merging. If the horizontal dispersion at the distance to the receptor exceeds half the distance between the sources proposed for merging, then the plumes are assumed to have merged by the time they are transported to the receptor of interest.

Fumigation

The SCREEN3 model will be used to evaluate inversion breakup and shoreline fumigation impacts for all short-term averaging periods (24 hours or less). The methodology outlined in BAAQMD Modeling Guidance and EPA 454/R-92-019 (Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, Revised) will be followed for this analysis. Combined impacts for all sources under fumigation conditions will be evaluated, based on BAAQMD modeling guidelines.

Good Engineering Practice Stack Height and Downwash

ISCST3 can account for building downwash effects. Stack locations and heights and building locations and dimensions will be input to BPIP. The first part of BPIP determines and reports on whether a stack is being subjected to wake effects from a structure or structures. The second part calculates direction-dependent "equivalent building dimensions" if a stack is being influenced by structure wake effects. The BPIP output is formatted for use in ISCST3 input files. For ISC-PRIME, the BPIPPRIME input program will be used.

Receptor Selection

Receptor and source base elevations will be determined from USGS Digital Elevation Model (DEM) data using the 7½-minute format (i.e., 10-meter spacing between grid nodes). All coordinates will be referenced to UTM North American Datum 1927 (NAD27), zone 10. The ISC receptors from the DEM files will be placed exactly on the DEM nodes. Every effort will be made to maintain receptor spacing across DEM file boundaries.

Cartesian coordinate receptor grids will be used to provide adequate spatial coverage surrounding the project area for assessing ground-level pollution concentrations, to identify the extent of significant impacts, and to identify maximum impact locations. A 180-meter resolution coarse receptor grid will be developed and will extend outwards at least 10 km (or more as necessary to

calculate the significant impact area). The maximum extent of the significant impact isopleth for any pollutant that triggers PSD review will be used to represent the impact radius.

For the full impact analyses, a nested grid will be developed to fully represent the significance area(s) and maximum impact area(s). This grid will have 10-meter resolution along the facility fenceline and out to one (1) km from the fenceline and 180 meter resolution outwards to 10 kilometers from the site. When maximum or maximum second-highest impacts occur in the 180 meter spaced area, additional refined receptor grids with 10-meter resolution will be placed around the maximum coarse grid impacts and extended out 1,000 meters in all directions. Concentrations within the facility fenceline will not be calculated.

Modeling Scenarios

Pollutant emissions to the atmosphere from the proposed facility will occur from combustion of natural gas in each of two (2) identical combustion turbines/HRSGs. Emission rates will be provided by the Pico Project and are based on vendor data and additional conservative assumptions of turbine and HRSG performance. Turbine/HRSG emissions and stack parameters, such as flow rate and exit temperature, exhibit some variation with ambient temperature and operating load. In order to calculate the worst-case air quality impacts, a screening analysis will be performed to evaluate each operating scenario (based on operating load with and without HRSG firing and atmospheric conditions) to predict the worst-case facility configuration on a pollutant-specific basis.

In the modeling analysis, maximum impacts will be predicted for maximum (100%) and reduced load conditions. In addition, different ambient temperatures will be evaluated for each load condition. Each of these conditions has unique performance characteristics that affect plume dispersion and thus predicted impacts. This analysis is most relevant to analyses for short-term impacts. Annual impacts will be evaluated based on expected turbine performance at an ambient temperature representative of the project site. The temperatures and humidity levels selected for the short-term screening analyses will closely reflect the range of possible site characteristics. The results of this screening analysis will be used to select the worst-case operational scenarios for the modeling analyses in order to provide maximum operating flexibility. Refined modeling for the permit application will be based on these worst-case scenarios.

The screening modeling will use one complete year of meteorological data and the nested receptor grid described above to determine the worst-case source configuration (i.e., configuration that produces maximum facility impacts). This worst-case source configuration will then be executed with all five (5) years of meteorological data and, if necessary, coarse grid impacts will be refined with fine grid receptors spaced 10 meters apart.

Ambient Air Quality Impact Analyses

In evaluating the impacts of the proposed project on ambient air quality, the Pico Project will model the ambient impacts of the project, add those impacts to background concentrations, and compare the results to the state and federal ambient standards for SO_2, NO_2, PM_{10}, and CO.

In accordance with EPA guidance (40 CFR part 51, Appendix W, Sections 11.2.3.2 and 11.2.3.3), the highest modeled concentration will be used to demonstrate compliance with annual standards, while the highest second-highest modeled concentrations will be used to demonstrate compliance with standards based on averaging periods of 24 hours or less.

Preconstruction Monitoring Requirements

Section 2-2-414.3 of the BAAQMD rules requires an applicant's air quality analysis to contain preconstruction ambient air quality monitoring data for purposes of establishing background pollutant concentrations in the impact area of the proposed facility. However, according to Rule 2-2-111, an applicant may be exempted from the requirement for preconstruction monitoring if the predicted air quality impacts of the facility do not exceed the specified *de minimis* levels listed in Table 5. An applicant may also, at the APCO's discretion, rely on

Table 4
PSD Ambient Significance Levels

Pollutant/ Avg. Period	Significance Level ($\mu g/m^3$)	Class I Increment ($\mu g/m^3$)	Class II Increment ($\mu g/m^3$)
- Annual	1	2	20
- 24-hour	5	5	91
SO_2 - 3-hour	25	25	512
- Annual	1	4	17
PM_{10} - 24-hour	5	8	30
NO_2 - Annual	1	–	–
- 1-hour	19	2.5	25

Table 5 Preconstruction Monitoring Thresholds	
CO: 8-hr average	575 $\mu g/m^3$
PM_{10}: 24-hr average	10 $\mu g/m^3$
NO_2: annual average	14 $\mu g/m^3$
SO_2: 24-hr average	13 $\mu g/m^3$

existing continuous air quality monitoring data collected at District-approved monitoring stations to satisfy the requirement for preconstruction monitoring.

Additional Impacts Analysis

For those pollutants emitted in significant amounts, the applicant will prepare additional impacts analysis for growth, soils and vegetation, and visibility.

Impacts on Class I Areas

As the proposed project is a minor source under the BAAQMD rules, Regulation 2-2-308, the applicant does not have to prepare an analysis to determine whether the proposed project will result in emissions that would have an adverse impact on air quality related values, including visibility, acidic deposition, and regional haze, in Class I areas. However, an analysis will be conducted to determine the proposed project impact on visibility (regional haze) at Point Reyes National Seashore and Pinnacles National Monument, the nearest Class I areas. In order to assess Class I impacts, the Calpuff model will be used in a screening mode.

Regulation 2-2-308 also requires a demonstration that emissions from a project located within 10 km (6.2 miles) of a Class I area will not cause or contribute to the exceedance of any national ambient air quality standard or any PSD increment there. Because the nearest Class I area, Point Reyes National Seashore, is greater than 10 km from the project site, this requirement is not applicable to the proposed project.

Additional Analyses Required by the CEC

Additional analyses that are required by the CEC are a cumulative air quality impacts analysis and an analysis of construction impacts. The procedures to be used in evaluating construction impacts are discussed below.

Cumulative Impacts – Pursuant to discussions with CEC staff, a cumulative impacts analysis will be required and must consider the additional impacts of the following sources located within 8 miles of the project site.

- Sources with impacts on existing air quality that are not reflected in the ambient air quality data used to establish background. These sources are generally those which have received permits authorizing construction but are not yet in operation and sources which have commenced operations subsequent to the data used to establish background air quality levels. Data derived from the BAAQMD, CARB, and the EPA AIRS data system indicates that air quality data for the project region is available up to the end of year 2000. As such the cumulative analysis will concentrate on the above types of sources permitted or becoming operational after January 1, 2002.

Construction Impacts Analysis - The potential ambient impacts from air pollutant emissions during the construction of the PICO project will be evaluated by air quality modeling that will account for the construction site location and the surrounding topography; the sources of emissions during construction, including vehicle and equipment exhaust emissions; and fugitive dust.

Site Description - The dispersion modeling analyses will include a description of the physical setting of the facility and surrounding terrain. A map showing the plant location, fence lines, and model receptors will be included, as well as a plot plan of the plant site indicating heights of nearby structures above a common reference point.

Types of Emission Sources - Construction of the proposed PICO project will be divided into three main construction phases: (1) site preparation; (2) construction of foundations; and (3) installation and assembly of mechanical and electrical equipment. The construction impacts analysis will include a schedule for construction operation activities. Site preparation is expected to include site excavation, excavation of footings and foundations, and backfilling operations. After site preparation is finished, the construction of the foundations will begin. Once the foundations are finished, the installation and assembly of the mechanical and electrical equipment will begin.

Fugitive dust emissions from the construction of the project result from (1) dust entrained during excavation and grading at the construction site; (2) dust entrained during onsite travel on paved and unpaved roads and across the unpaved construction site; (3) dust entrained during aggregate

and soil loading and unloading operations; (4) dust entrained from raw material transfer to and from material stockpiles; and (5) wind erosion of areas disturbed during construction activities. Heavy equipment exhaust emissions result from (1) exhaust from the heavy equipment used for excavation, grading, and construction of onsite structures; (2) exhaust from a water truck used to control construction dust emissions; (3) exhaust from Diesel welding machines, gasoline-powered generators, air compressors, and water pumps; and (4) exhaust from gasoline-powered pickup trucks and Diesel flatbed trucks used onsite to transport workers and materials around the construction site. Diesel and gasoline truck exhaust emissions will result from transport of mechanical and electrical equipment to the project site and transport of rubble and debris from the site to an appropriate landfill. Diesel exhaust emissions may also result from transport of raw materials to and from stockpiles.

Emissions from a worst-case day will be calculated for each of the three main construction phases and only the phase with the highest emissions will be modeled. As the construction impacts are expected to occur for a relatively short time compared with the lifetime of the project, only short-term averaging periods (24 hours or less) will be included in the construction modeling analysis.

Existing Ambient Levels - Ambient NO_2, SO_2, CO, and PM_{10} concentrations are monitored at several locations in the vicinity of the proposed site: San Jose, Mountain View, and San Francisco. These sites are believed to be representative of the site and are being proposed for use in the analysis.

Model Type - The EPA-approved ISCST3 model will be used to estimate ambient impacts from construction emissions. The modeling options and meteorological data described above will be used for the modeling analysis.

The construction site will be represented as an area source in the modeling analysis. Emissions will be divided into two categories: exhaust emissions and dust emissions. For exhaust emissions, a plume height of 4.6 meters (15 feet) will be used. Plume height refers to the distance measured from ground level to the centerline of the emissions plume. For dust emissions, a release height of two meters will be used due to the ambient plume temperatures and negligible plume velocities.

For the construction modeling analysis, the receptor grid will begin at the property boundary and will extend approximately one kilometer in all directions. Receptor spacing will be 30 meters.

Final Modeling Submittal

In accordance with BAAQMD modeling guidance, the final modeling analyses will also include the following materials:

- US Geological Survey (USGS) 7½-minute (1:24,000) map(s) showing the facility

- Completed "*Air Quality Modeling Checklist*";
- Modeling summaries of maximum impacts for each air quality model showing meteorological conditions and receptor location and elevation;
- All modeling outputs (including BPIP and meteorological files) on diskette, together with a description of all filenames;
- Plot plan showing emission points, nearby buildings (including dimensions), cross-section lines, property lines, fencelines, roads, and UTM coordinates; and
- Table showing the building identifiers in the BPIP run(s) and plot plan.

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Table 8.1B-1 Building Dimension and Coordinate Data

				Scale(ft/map"):		20	20	0.083333	0.083333
		-----Layout 1-----		------Model------		-------Layout 1-------		--------Model--------	
		X(map")	Y(map")	X(map")	Y(map")	X(m)	Y(m)	X(m)	Y(m)
Monum#2		5.867106	25.933656	12034.44	14823.37	592924.711	4137047.518	592924.711	4137047.518
Monum#1		5.923625	14.369618	12048.00	12048.00	592925.056	4136977.024	592925.055	4136977.024
						592925.322	4136977.035		
Scale Bar									
	0'	32.006552	1.124440			593084.057	4136896.281		
	60'	35.006552	1.124440			593102.345	4136896.281		
W.Turb		11.573628	15.969615	13404.00	12432.00	592959.498	4136986.777	592959.498	4136986.777
E.Turb		15.473628	15.969615	14340.00	12432.00	592983.272	4136986.777	592983.272	4136986.777
N.Cool		19.974	23.670			593010.707	4137033.719		
C.Cool		19.974	21.570			593010.707	4137020.917		
S.Cool		19.974	19.470			593010.707	4137008.116		
W.Turb		11.236	25.832			592957.440	4137046.898		
	Turbine	11.236	23.261			592957.440	4137031.225		
		10.744	23.261			592954.441	4137031.225		
		10.744	22.364			592954.441	4137025.757		
		11.059	22.364			592956.361	4137025.757		
		11.059	21.757			592956.361	4137022.057		
		12.088	21.757			592962.634	4137022.057		
		12.088	22.364			592962.634	4137025.757		
		12.403	22.364			592964.554	4137025.757		
		12.403	23.261			592964.554	4137031.225		
		11.911	23.261			592961.555	4137031.225		
		11.911	25.832			592961.555	4137046.898		
		11.236	25.832			592957.440	4137046.898		

W.Turb		11.399	21.757	592958.433	4137022.057
	Duct	11.399	21.669	592958.433	4137021.521
		11.258	20.869	592957.574	4137016.644
		11.258	18.106	592957.574	4136999.801
		11.889	18.106	592961.420	4136999.801
		11.889	20.869	592961.420	4137016.644
		11.749	21.669	592960.567	4137021.521
		11.749	21.757	592960.567	4137022.057
		11.399	21.757	592958.433	4137022.057
W.Turb		10.869	18.106	592955.203	4136999.801
	HRSG	10.869	16.220	592955.203	4136988.304
		12.280	16.220	592963.804	4136988.304
		12.280	18.106	592963.804	4136999.801
		10.869	18.106	592955.203	4136999.801
W.Turb		11.0736	17.9311	592956.450	4136998.734
	N.Cyl	11.0736	17.5811	592956.450	4136996.601
		12.0736	17.5811	592962.546	4136996.601
		12.0736	17.9311	592962.546	4136998.734
		11.0736	17.9311	592956.450	4136998.734
W.Turb		11.0736	16.9811	592956.450	4136992.943
	S.Cyl	11.0736	16.6311	592956.450	4136990.810
		12.0736	16.6311	592962.546	4136990.810
		12.0736	16.9811	592962.546	4136992.943
		11.0736	16.9811	592956.450	4136992.943

E.Turb		15.811	25.832	592985.331	4137046.898
	Turbine	15.811	23.261	592985.331	4137031.225
		16.303	23.261	592988.330	4137031.225
		16.303	22.364	592988.330	4137025.757
		15.988	22.364	592986.410	4137025.757
		15.988	21.757	592986.410	4137022.057
		14.959	21.757	592980.137	4137022.057
		14.959	22.364	592980.137	4137025.757
		14.644	22.364	592978.217	4137025.757
		14.644	23.261	592978.217	4137031.225
		15.136	23.261	592981.216	4137031.225
		15.136	25.832	592981.216	4137046.898
		15.811	25.832	592985.331	4137046.898
E.Turb		15.648	21.757	592984.337	4137022.057
	Duct	15.648	21.669	592984.337	4137021.521
		15.789	20.869	592985.196	4137016.644
		15.789	18.106	592985.196	4136999.801
		15.158	18.106	592981.350	4136999.801
		15.158	20.869	592981.350	4137016.644
		15.298	21.669	592982.203	4137021.521
		15.298	21.757	592982.203	4137022.057
		15.648	21.757	592984.337	4137022.057
E.Turb		16.178	18.106	592987.568	4136999.801
	HRSG	16.178	16.220	592987.568	4136988.304
		14.767	16.220	592978.966	4136988.304
		14.767	18.106	592978.966	4136999.801
		16.178	18.106	592987.568	4136999.801
E.Turb		15.9737	17.9311	592986.321	4136998.734
	N.Cyl	15.9737	17.5811	592986.321	4136996.601
		14.9737	17.5811	592980.225	4136996.601
		14.9737	17.9311	592980.225	4136998.734
		15.9737	17.9311	592986.321	4136998.734

E.Turb		15.9737	16.9811	592986.321	4136992.943
	S.Cyl	15.9737	16.6311	592986.321	4136990.810
		14.9737	16.6311	592980.225	4136990.810
		14.9737	16.9811	592980.225	4136992.943
		15.9737	16.9811	592986.321	4136992.943
E.Bld		28.391	20.327	593062.017	4137013.340
		28.391	16.935	593062.017	4136992.662
		32.949	16.935	593089.802	4136992.662
		32.949	20.327	593089.802	4137013.340
		28.391	20.327	593062.017	4137013.340
W.Bld		17.447	16.915	592995.302	4136992.540
		17.447	15.415	592995.302	4136983.396
		18.947	15.415	593004.446	4136983.396
		18.947	16.915	593004.446	4136992.540
		17.447	16.915	592995.302	4136992.540
Cool.Twr		18.924	24.720	593004.306	4137040.120
		18.924	18.420	593004.306	4137001.715
		21.024	18.420	593017.107	4137001.715
		21.024	24.720	593017.107	4137040.120
		18.924	24.720	593004.306	4137040.120
	ElecTurb	20.268	17.588	593012.499	4136996.643
		20.268	17.071	593012.499	4136993.491
		20.739	17.071	593015.370	4136993.491
		20.739	16.620	593015.370	4136990.742
		20.495	16.620	593013.883	4136990.742
		20.495	14.148	593013.883	4136975.673
		21.595	14.148	593020.588	4136975.673
		21.595	16.620	593020.588	4136990.742
		21.352	16.620	593019.107	4136990.742
		21.352	17.071	593019.107	4136993.491
		21.823	17.071	593021.978	4136993.491
		21.823	17.588	593021.978	4136996.643
		20.268	17.588	593012.499	4136996.643

Fenceline

NW	5.724	26.170	12000.00	14880.00	592923.839	4137048.959	592923.836	4137048.956
	23.224	26.170			593030.519	4137048.959		
	26.758	20.868			593052.062	4137016.638		
	29.681	22.882			593069.880	4137028.915		
	30.984	22.584			593077.824	4137027.098		
	32.207	22.057			593085.279	4137023.886		
	33.437	21.132			593092.777	4137018.247		
	34.062	20.519			593096.587	4137014.510		
	34.610	19.836			593099.928	4137010.347		
	35.131	19.043			593103.104	4137005.513		
	35.322	18.650			593104.268	4137003.117		
	35.463	18.203			593105.128	4137000.392		
	35.463	17.274			593105.128	4136994.729		
	35.377	16.931			593104.603	4136992.638		
	35.242	16.594			593103.780	4136990.583		
	34.719	15.901			593100.592	4136986.359		
	28.247	10.574			593061.139	4136953.886		
	27.601	9.853			593057.201	4136949.490		
SE(edge)	26.702	8.690			593051.721	4136942.401		
			16567.78	9926.93	593039.858	4136923.148		
			16474.12	9759.40	593037.479	4136918.893		
			16272.16	9033.56	593032.349	4136900.457		
			16226.37	8757.30	593031.186	4136893.440		
			16200.00	8478.72	593030.516	4136886.364		
			16200.00	8178.88	593030.516	4136878.748		
			16045.80	7301.83	593026.600	4136856.471		
			15934.89	6590.92	593023.782	4136838.414		
			15900.00	5934.73	593022.896	4136821.747		
			15180.01	5934.73	593004.608	4136821.747		
SE			14880.02	5574.71	592996.989	4136812.602		
SW			12000.00	5574.71	592923.839	4136812.602		
NW			12000.00	14880.00	592923.839	4137048.959		

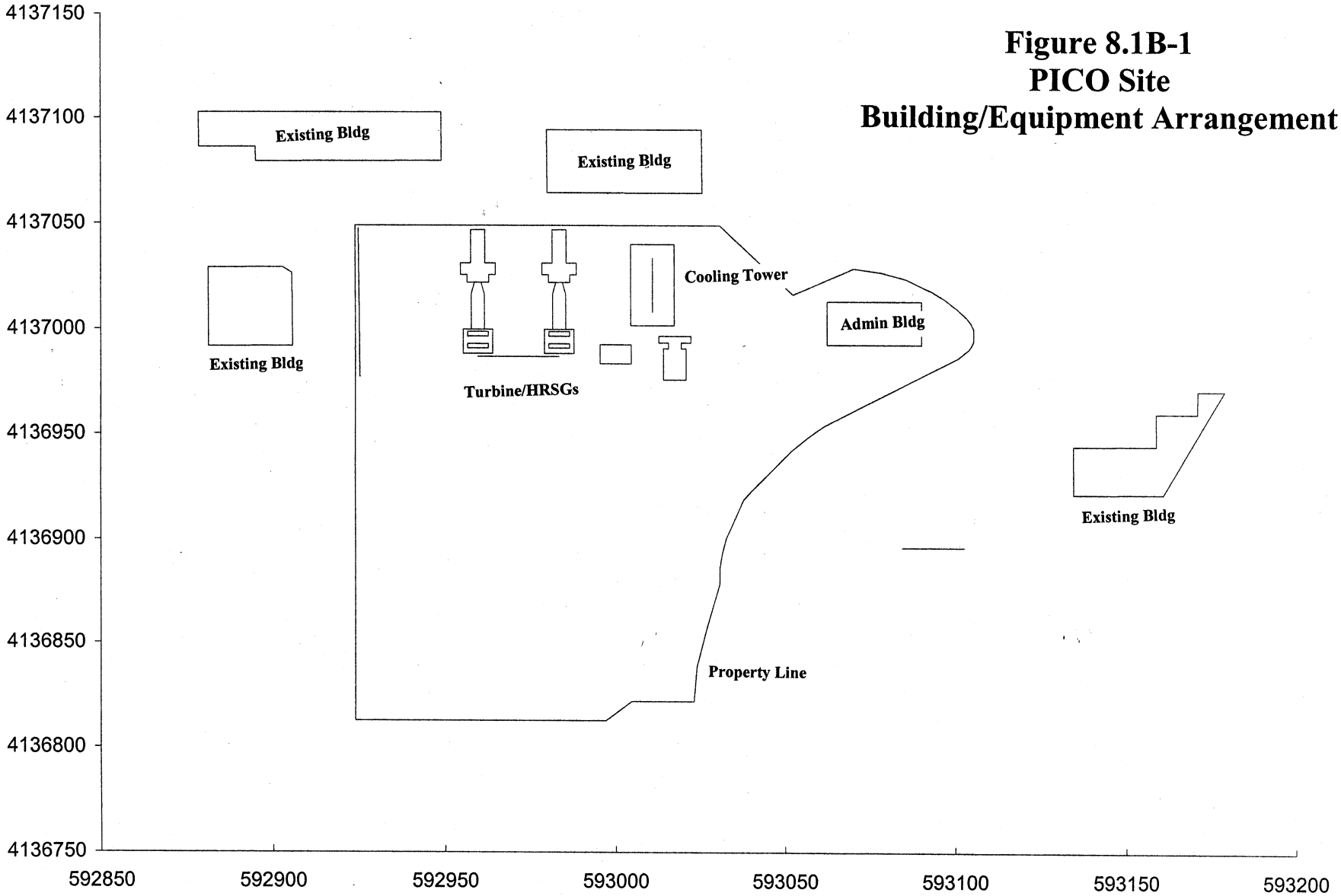
Offsite Buildings

W.Bld	10321.91	12629.46	592881.213	4136991.793
70.8	10321.82	14098.71	592881.210	4137029.112
	11168.94	14102.29	592902.727	4137029.203
	11275.37	13996.40	592905.431	4137026.513
	11281.23	12633.58	592905.579	4136991.897
	10321.91	12629.46	592881.213	4136991.793
NW.Bld	10211.01	16994.71	592878.396	4137102.670
52.4	12982.94	16994.76	592948.803	4137102.671
	12987.12	16089.33	592948.909	4137079.673
	10863.15	16079.53	592894.960	4137079.424
	10861.92	16346.47	592894.929	4137086.205
	10213.92	16344.37	592878.470	4137086.151
	10211.01	16994.71	592878.396	4137102.670
NE.Bld	14196.46	16658.06	592979.626	4137094.119
74.4	15990.26	16658.06	593025.189	4137094.119
	15995.67	15486.48	593025.326	4137064.361
	14201.84	15491.72	592979.763	4137064.494
	14196.46	16658.06	592979.626	4137094.119
E.Bld	21317.42	9871.68	593160.499	4136921.745
73.3	20285.02	9868.12	593134.276	4136921.655
	20281.93	10764.77	593134.197	4136944.430
	21241.17	10768.08	593158.562	4136944.514
	21239.10	11367.94	593158.509	4136959.750
	21718.59	11372.06	593170.688	4136959.855
	21719.15	11790.85	593170.703	4136970.492
	22030.07	11791.93	593178.600	4136970.519
	21317.42	9871.68	593160.499	4136921.745

Table 8.1B-2 Building Dimension Data

GEP Stack Height Analysis	Height (m)	Length (m)	Width (m)
West Turbine			
Turbine	13.31	24.841	10.113
Duct	10.74	22.256	3.846
HRSG	17.32	11.497	8.601
N.Cyl	21.11	6.096	2.133
S.Cyl	21.11	6.096	2.133
East Turbine			
Turbine	13.31	24.841	10.113
Duct	10.74	22.256	3.846
HRSG	17.32	11.497	8.602
N.Cyl	21.11	6.096	2.133
S.Cyl	21.11	6.096	2.133
Onsite Structures			
East Bld/#2	9.14	27.785	20.678
West Bld/#5	12.19	9.144	9.144
Cool Tower	15.85	38.405	12.801
Elec Turb/#3	6.91	20.970	9.479
Offsite Buildings			
West Bld/#1	21.58	37.410	24.369
NW Bld/#2	15.97	70.513	23.247
NE Bld/#3	22.68	172.374	45.700
East Bld/#4	22.34	48.864	44.403

Figure 8.1B-1
PICO Site
Building/Equipment Arrangement



Land Use/Land Cover within 3 km of Project Site

LEGEND

- Residential
- Commercial Services
- Industrial
- Transportation, Communications
- Industrial and Commercial
- Other Urban
- Cropland or Pasture
- Orchards, Groves, Vineyards, Nurseries
- Herbaceous Rangeland
- Transitional Areas

Figure 8.1B-2

Land Use within 3 Km of Site

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Table 8.1B-3
Gas Turbines: Parameters for Screening Modeling

Case	Ambient Temp, deg F	Load, %	Exhaust Temp, deg K	Diameter, m	Exhaust Velocity, m/s	NOx, g/s	SO2, g/s	CO, g/s	PM10, g/s	Stack Temp, deg F	Stack Diam, ft	Exhaust Velocity, ft/sec	NOx, lb/hr	SO2, lb/hr	CO, lb/hr	PM10, lb/hr
2	33	70%, no DB, no Chiller	378.00	3.048	20.15	0.403	0.029	0.098	0.378	221	10	66.10	3.20	0.230	0.78	3.00
3	33	30%, no DB, no Chiller	368.56	3.048	13.78	0.227	0.016	0.055	0.378	204	10	45.20	1.80	0.130	0.44	3.00
6	61	30%, no DB, no Chiller	366.33	3.048	13.23	0.227	0.016	0.055	0.378	200	10	43.40	1.80	0.130	0.44	3.00
8	94	70%, no DB, no Chiller	373.00	3.048	17.40	0.365	0.026	0.089	0.378	212	10	57.10	2.90	0.210	0.71	3.00
9	94	30%, no DB, no Chiller	364.67	3.048	12.56	0.227	0.016	0.055	0.378	197	10	41.20	1.80	0.130	0.44	3.00
10	33	100%, DB, no Chiller	379.67	3.048	23.65	0.706	0.0517	0.6867	0.5418	224	10	77.60	5.6	0.41	5.45	4.3
12	94	100%, DB, Chiller	385.22	3.048	23.71	0.707	0.0517	0.6892	0.5418	234	10	77.80	5.61	0.41	5.47	4.3
11 (Annual)	**61**	**100%, DB, Chiller**	**382.44**	**3.048**	**23.53**	**0.707**	**0.0517**	**0.6892**	**0.5418**	**229**	**10**	**77.2**	**5.61**	**0.41**	**5.47**	**4.3**

Table 8.1B-4

	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9	Case 10	Case 11	Case 12
GENERAL DATA: (each GT/HRSG)												
GT Model	LM6000	LM6000	LM6000	LM6000	LM6000	LM6000	LM6000	LM6000	LM6000	LM6001	LM6000	LM6000
Ambient Temperature, F	33	33	33	61	61	61	94	94	94	33	61	94
Relative humidity, RH %	80	80	80	70	70	70	25	25	25	80	70	25
Load, %	100.0	70.0	30.0	100.0	70.0	30.0	100.0	70.0	30.0	100.0	100.0	100.0
Chiller	off	off	off	on	off	off	on	off	off	off	on	on
Duct Burner	off	off	off	off	off	off	off	off	off	on	on	on
GT Heat Input, MMBTU/hr HHV	473.7	344.2	193.6	472.7	345.8	193.5	472.7	316.7	194.4	473.7	472.7	472.7
Duct Burner Fuel Input, MMBTU/hr HHV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	136.9	132.4	132.0
Total Fuel Input, MMBTU/hr HHV	473.7	344.2	193.6	472.7	345.8	193.5	472.7	316.7	194.4	610.6	605.1	604.7
Stack Exit Flow, klb/hr	1,100	947	664	1,086	928	641	1,086	828	612	1,106	1,092	1,092
Stack Exit Temperature, F	228	221	204	230	220	200	234	212	197	224	229	234
Stack Exit Velocity, fps	77.6	66.1	45.2	76.9	64.8	43.4	77.3	57.1	41.2	77.6	77.2	77.8
Stack Exit Composition, volume %												
Ar	0.8665	0.8810	0.8971	0.8622	0.8725	0.8893	0.8622	0.8701	0.8851	0.8580	0.8530	0.8532
N2	72.6288	72.8147	75.131.	72.2749	73.1139	74.4849	72.2749	72.9176	74.1450	71.9400	71.5160	71.5160
O2	13.0636	14.3624	15.7654	12.9037	14.0585	15.4479	12.9037	13.9614	15.1291	11.0700	10.9800	10.9800
CO2	3.3390	2.8340	2.2937	3.3730	2.8945	2.3685	3.3730	2.9692	2.4860	4.2400	4.2400	4.2400
H2O	10.0955	8.1024	5.9089	10.5805	9.0563	6.8064	10.5805	9.3777	7.3519	11.8700	12.2900	12.2900
Stack Emissions												
NOx, ppmvd @ 15% O2	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
NOx, lb/hr as NO2	4.40	3.20	1.80	4.30	3.20	1.80	4.30	2.90	1.80	5.60	5.61	5.61
CO, ppmvd @15% O2	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
CO, lb/hr	4.29	0.78	0.44	1.05	0.78	0.44	1.05	0.71	0.44	5.45	5.47	5.47
VOC, ppmvd @ 15% O2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
VOC, lb/hr as CH4	1.2	0.9	0.5	1.2	0.9	0.5	1.2	0.8	0.5	1.6	1.6	1.6
PM10, lb/hr (Front + Back Half)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.3	4.3	4.3
SO2, lb/hr	0.32	0.23	0.13	0.32	0.23	0.13	0.32	0.21	0.13	0.41	0.41	0.41
H2SO4, lb/hr	0.49	0.36	0.20	0.49	0.36	0.20	0.49	0.33	0.20	0.63	0.63	0.63
NH3 slip, ppmvd @ 15% O2	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
NH3 slip, lb/hr	6.5	4.7	2.7	6.4	4.7	2.7	6.4	4.3	2.7	8.3	8.3	8.3
Cooling tower perromance												
Stack exit velocity, fps										31.12	31.18	22.78
Stack exit temperature, F										94	105	103
Stack volume flow, acfs (each cell)										20,975	21,015	15,352
Water circulation rate, mmlb/hr										17,482,788	17,482,788	17,482,788
Water TDS, ppm										5,880	5,880	5,880
Stack diameter, Ft										29.3	29.3	29.3
Drift, pps (@0.0005%) (each cell)										29.13798	29.13798	29.13798

Notes:

1. All values shown above are estimated, not guaranteed.
2. Stack velocity shown is based on a stack diameter of 10.0 feet.
3. SO2 and PM10 values are based on a fuel sulfur content of 4 ppmv.
4. Duct burner emissions are based on the following emission rates:
   NOX emission = 0.080 LB/MBTU (HHV)
   CO emission =0.080 LB/MBTU (HHV)
   VOC emission = 0.015 LB/MBTU (HHV)
   PM10 emission = 0.010 LB/MBTU (HHV) (Front & back half excluding all inorganic compounds.)
   THC as CH4 = 0.025 lb/Mbtu (HHV)

Table 8.1B-5
Emission Rates and Stack Parameters for Modeling

				Emission Rates, g/s			
	Stack Diam, m	Temp, deg K	Exhaust Velocity, m/s	NOx	SO2	CO	PM10
Averaging Period: One hour							
Turbine 1/HRSG	3.048	382.44	23.53	0.707	0.052	0.689	n/a
Turbine 2/HRSG	3.048	382.44	23.53	0.707	0.052	0.689	n/a
Cooling Tower (each cell)	8.931	312.44	6.94	n/a	n/a	n/a	n/a
Averaging Period: Three hours							
Turbine 1/HRSG	3.048	382.44	23.53	n/a	0.052	n/a	n/a
Turbine 2/HRSG	3.048	382.44	23.53	n/a	0.052	n/a	n/a
Cooling Tower (each cell)	8.931	312.44	6.94	n/a	n/a	n/a	n/a
Averaging Period: Eight hours							
Turbine 1/HRSG	3.048	379.67	23.65	n/a	n/a	1.312	n/a
Turbine 2/HRSG	3.048	379.67	23.65	n/a	n/a	1.312	n/a
Cooling Tower (each cell)	8.931	312.44	6.94	n/a	n/a	n/a	n/a
Averaging Period: 24 hours							
Turbine 1/HRSG	3.048	379.67	23.65	0.935	0.052	n/a	0.542
Turbine 2/HRSG	3.048	379.67	23.65	0.935	0.052	n/a	0.542
Cooling Tower (each cell)	8.931	312.44	6.94	n/a	n/a	n/a	0.0022
Averaging Period: Annual							
Turbine 1/HRSG	3.048	382.44	23.53	0.739	0.052	n/a	0.542
Turbine 2/HRSG	3.048	382.44	23.53	0.739	0.052	n/a	0.542
Cooling Tower (each cell)	8.931	312.44	6.94	n/a	n/a	n/a	0.0022

Note: Cooling tower is 3 cell design.

Table 8.1B-6 Gas Turbines Parameters for Screening Modeling

Case	Ambient Temp (°F)	Load, %	Stack Height (m)	Exhaust Temp (Kelvins)	Exhaust Vel (m/s)	Stack Diam (m)	NO_x (g/s/tur)	SO_2 (g/s/tur)	CO (g/s/tur)	PM_{10} (g/s/tur)
2	33	70%, no DB, no Chiller	28.956	378.00	20.15	3.048	0.4032	0.0290	0.0983	0.3780
3	33	30%, no DB, no Chiller	28.956	368.56	13.78	3.048	0.2268	0.0164	0.0554	0.3780
6	61	70%, no DB, no Chiller	28.956	366.33	13.23	3.048	0.2268	0.0164	0.0554	0.3780
8	94	70%, no DB, no Chiller	28.956	373.00	17.40	3.048	0.3654	0.0265	0.0895	0.3780
9	94	30%, no DB, no Chiller	28.956	364.67	12.56	3.048	0.2268	0.0164	0.0554	0.3780
10	33	100%, DB, no Chiller	28.956	379.67	23.65	3.048	0.7056	0.0517	0.6867	0.5418
11 (Ann)	61	100%, DB, Chiller	28.956	382.44	23.53	3.048	0.7069	0.0517	0.6892	0.5418
12	94	100%, DB, Chiller	28.956	385.22	23.71	3.048	0.7069	0.0517	0.6892	0.5418

Normalized ISCST3 Results for Screening Modeling (i.e., ug/m^3 at 1 g/s/tur) with URBAN Dispersion

Case	Ambient Temp (°F)	Load, %	1-Hour	3-Hour	8-Hour	24-Hour	Annual
2	33	70%, no DB, no Chiller	58.14220	53.28287	42.51404	21.19574	#N/A
3	33	30%, no DB, no Chiller	71.39542	66.91482	50.58697	25.77882	#N/A
6	61	70%, no DB, no Chiller	73.36108	68.58309	51.56740	26.37949	#N/A
8	94	70%, no DB, no Chiller	62.95844	59.18045	45.98799	23.07264	#N/A
9	94	30%, no DB, no Chiller	75.36926	70.33115	52.60770	27.03498	#N/A
10	33	100%, DB, no Chiller	52.12713	49.33196	39.18684	19.44754	#N/A
11 (Ann)	61	100%, DB, Chiller	52.22044	49.35843	38.83670	19.27669	0.73570
12	94	100%, DB, Chiller	51.67185	48.96370	38.25100	18.98397	#N/A

Final ISCST3 Screening Results for Criteria Pollutants (ug/m^3) with URBAN Dispersion

Case	Ambient Temp (°F)	Load, %	1-Hour NO_x	Annual NO_x	1-Hour SO_2	3-Hour SO_2	24-Hour SO_2	Annual SO_2	1-Hour CO	8-Hour CO
2	33	70%, no DB, no Chiller	23.44	#N/A	1.6861	1.5452	0.6147	#N/A	5.72	4.18
3	33	30%, no DB, no Chiller	16.19	#N/A	1.1709	1.0974	0.4228	#N/A	3.96	2.80
6	61	70%, no DB, no Chiller	16.64	#N/A	1.2031	1.1248	0.4326	#N/A	4.06	2.86
8	94	70%, no DB, no Chiller	23.01	#N/A	1.6684	1.5683	0.6114	#N/A	5.63	4.12
9	94	30%, no DB, no Chiller	17.09	#N/A	1.2361	1.1534	0.4434	#N/A	4.18	2.91
10	33	100%, DB, no Chiller	36.78	#N/A	2.6950	2.5505	***1.0054***	#N/A	35.80	***26.91***
11 (Ann)	61	100%, DB, Chiller	***36.91***	***0.520***	***2.6998***	***2.5518***	0.9966	***0.0380***	***35.99***	26.77
12	94	100%, DB, Chiller	36.53	#N/A	2.6714	2.5314	0.9815	#N/A	35.61	26.36

Final ISC-PRIME Refined Results for PM_{10} (ug/m^3) with URBAN Dispersion

Case	Ambient Temp (°F)	Load, %	w/o Cool.Twr 24-Hour PM_{10}	w/o Cool.Twr Annual PM_{10}	with Cool.Twr 24-Hour PM_{10}	with Cool.Twr Annual PM_{10}
2	33	70%, no DB, no Chiller	8.01	#N/A	#N/A	#N/A
3	33	30%, no DB, no Chiller	9.74	#N/A	#N/A	#N/A
6	61	70%, no DB, no Chiller	9.97	#N/A	#N/A	#N/A
8	94	70%, no DB, no Chiller	8.72	#N/A	#N/A	#N/A
9	94	30%, no DB, no Chiller	10.22	#N/A	#N/A	#N/A
10	33	100%, DB, no Chiller	***4.42***	#N/A	***4.46***	#N/A
11 (Ann)	61	100%, DB, Chiller	10.44	***0.399***	#N/A	***0.889***
12	94	100%, DB, Chiller	10.29	#N/A	#N/A	#N/A

Final ISCST3 Emissions (g/s/turbine) and Calc'd Refined Results for non-PM_{10} Pollutants (ug/m^3) with URBAN Dispersion

Case	Ambient Temp (°F)	Load, %	1-Hour NO_x	Annual NO_x	1-Hour SO_2	3-Hour SO_2	24-Hour SO_2	Annual SO_2	1-Hour CO	8-Hour CO
Emissions (g/s/turbine)										
10	33	100%, DB, no Chiller	#N/A	#N/A	#N/A	#N/A	0.052	#N/A	#N/A	1.312
11 (Ann)	61	100%, DB, Chiller	0.707	0.739	0.052	0.052	#N/A	0.052	0.689	#N/A
Unitized Impacts (ug/m3)										
10	33	100%, DB, no Chiller	#N/A	#N/A	#N/A	#N/A	19.44754	#N/A	#N/A	39.18684
11 (Ann)	61	100%, DB, Chiller	52.22044	0.73570	52.22044	49.35843	#N/A	0.73570	52.22044	#N/A
Pollutant Impacts (ug/m3)										
10	33	100%, DB, no Chiller	#N/A	#N/A	#N/A	#N/A	1.01127	#N/A	#N/A	51.41313
11 (Ann)	61	100%, DB, Chiller	36.91985	0.54368	2.71546	2.56664	#N/A	0.03826	35.97988	#N/A

	NOx 1 Hr		CO 1 Hr	
Turbine Startup	**193.42**		**393.99**	
Turbine Commissioning	**89.7878**		**224.4696**	
Fumigation	**3.73**	**0.27**	**3.63**	

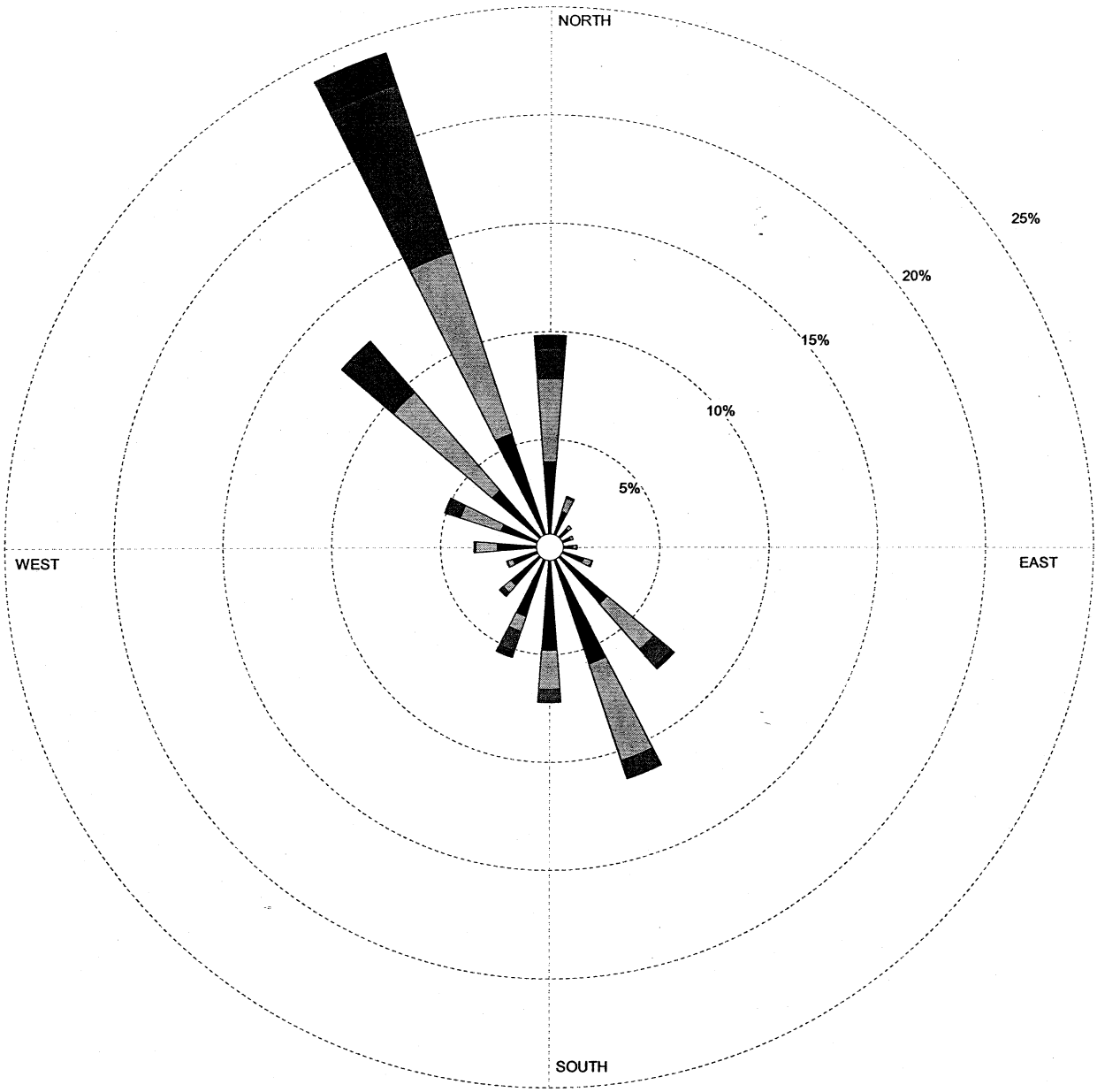
Table 8.1B-7 Modeling Inputs/Results for Pico Power Construction Impacts (Combustion=7.32m StkHt w/ Plume Rise)

Short Term Impacts (24 hrs and less)					Long Term Impacts (annual)				
	NOx	CO	SOx	PM10		NOx	CO	SOx	PM10
Combustion (lbs/day)	239.88	106.53	22.35	15.46	Combustion (tons/yr)	5.48	2.28	0.49	0.33
					Combustion (days/yr)	264	264	264	264
Combustion (hrs/day)	8	8	8	8	Combustion (hrs/day)	8	8	8	8
Combustion (lbs/hr)	29.99	13.32	2.79	1.93	Combustion (lbs/hr)	5.19	2.16	0.46	0.31
Combustion (g/sec)	3.78E+00	1.68E+00	3.52E-01	2.43E-01	Combustion (g/sec)	6.54E-01	2.72E-01	5.85E-02	3.94E-02
Construction Dust (lbs/day)				11.040	Construction Dust (tons/yr)				1.4573
					Construction Dust (days/yr)				264
Construction Dust (hrs/day)				8	Construction Dust (hrs/day)				8
Construction Dust (lbs/hr)				1.38	Construction Dust (lbs/hr)				1.38
Construction Dust (g/sec)				1.74E-01	Construction Dust (g/sec)				1.74E-01
Windblown Dust (lbs/day)				0.00	Windblown Dust (tons/yr)				0.00
					Windblown Dust (days/yr)				365
Windblown Dust (hrs/day)				24	Windblown Dust (hrs/day)				24
Windblown Dust (lbs/hr)				0.00	Windblown Dust (lbs/hr)				0.00
Windblown Dust (g/sec)				0.00E+00	Windblown Dust (g/sec)				0.00E+00
ISCST3 Inputs	**29840 m2**								
Combustion (g/s/m2)	1.266E-04	5.623E-05	1.180E-05	8.160E-06	Combustion (g/s/m2)	2.191E-05	9.117E-06	1.959E-06	1.320E-06
Construction Dust (g/s/m2)				5.827E-06	Construction Dust (g/s/m2)				5.827E-06
Windblown Dust (g/s/m2)				0.000E+00	Windblown Dust (g/s/m2)				0.000E+00
ISCST3 Results (ug/m3)									
Combustion Only					Combustion Only				
1-hour Max	1688.942	750.054	157.361	108.85047					
3-hour Max			90.639	62.69704					
8-hour Max		324.313		47.06538					
24-hour Max			22.680	15.68846	Annual	13.563		1.213	0.81677
All Particulate Sources					All Particulate Sources				
24-hour Max				46.39791	Annual				10.68246
1-hour NO2 w/ OLM	212.659	for Avg 8a-4p O3(ppm)		0.0233	Annual NO2 w/ ARM	10.172	based on ARM Ratio of:		75%
Background					Background				
1-hour Max	244	10350	78.6						
3-hour Max			44.2						
8-hour Max		7811							
24-hour Max			21	114	Annual	49		8	28.7
Total + Background					Total + Background				
1-hour Max	456.7	11100	236.0						
3-hour Max			134.8						
8-hour Max		8135							
24-hour Max			43.7	160	Annual	59.2		9.2	39.4

Table 8.1B-8 Standards Comparison for Pico Power Construction Impacts									
Pollutant	Averaging Time	Impacts (ug/m3) Construction Only	Impacts (ug/m3) Construction+ Background	Standards (ug/m3) National	Standards (ug/m3) California	Construction Only % of Standards National	Construction Only % of Standards California	Construction+Background % of Standards National	Construction+Background % of Standards California
NOx	1-Hr	212.7	456.7	-	470	-	45%	-	97%
	Annual	10.2	59.2	100	-	10%	-	59%	-
CO	1-Hr	750	11100	40000	23000	2%	3%	28%	48%
	8-Hr	324	8135	10000	10000	3%	3%	81%	81%
SOx	1-Hr	157.4	236.0	-	655	-	24%	-	36%
	3-Hr	90.6	134.8	1300	-	7%	-	10%	-
	24-Hr	22.7	43.7	365	105	6%	22%	12%	42%
	Annual	1.2	9.2	80	-	2%	-	12%	-
PM10	24-Hr	46.4	160.4	150	50	31%	93%	107%	321%
	Annual	10.7	39.4	50	30	21%	36%	79%	131%

WIND ROSE PLOT

Station #7902 - San Jose Airport, CA



Wind Speed (m/s) > 11.06 8.49 - 11.06 5.40 - 8.49 3.34 - 5.40 1.80 - 3.34 0.51 - 1.80	MODELER	DATE **5/31/2002**	COMPANY NAME
	DISPLAY **Wind Speed**	UNIT **m/s**	COMMENTS
	AVG. WIND SPEED **2.31 m/s**	CALM WINDS **0.07%**	
	ORIENTATION **Direction (blowing from)**	PLOT YEAR-DATE-TIME **1992** **Jan 1 - Dec 31** **Midnight - 11 PM**	PROJECT/PLOT NO.

WRPLOT View 3.5 by Lakes Environmental Software - www.lakes-environmental.com

Station ID: 7902

RUN ID: San Jose Airport

Year: 1992

Date Range: Jan 1 - Dec 31

Time Range: Midnight - 11 PM

Frequency Distribution

(Count)

Wind Direction (Blowing From) / Wind Speed (m/s)

	0.51 - 1.80	1.80 - 3.34	3.34 - 5.40	5.40 - 8.49	8.49 - 11.06	> 11.06	Total
N	349	337	124	53	0	0	863
NNE	153	56	8	0	0	0	217
NE	101	15	0	0	0	0	116
ENE	88	12	0	0	0	0	100
E	93	15	1	0	0	0	109
ESE	144	32	5	0	0	0	181
SE	307	245	92	15	0	0	659
SSE	504	413	78	1	0	0	996
S	423	157	48	8	0	0	636
SSW	300	62	84	30	0	0	476
SW	207	39	15	6	0	0	267
WSW	157	22	4	0	0	0	183
W	212	85	8	0	0	0	305
WNW	207	172	63	3	0	0	445
NW	308	526	271	4	0	0	1109
NNW	488	774	716	138	0	0	2116
Total	4041	2962	1517	258	0	0	

Frequency of Calm Winds : 6

Average Wind Speed : 2.31 m/s

Station ID: 7902

RUN ID: San Jose Airport

Year: 1992

Date Range: Jan 1 - Dec 31

Time Range: Midnight - 11 PM

Frequency Distribution
(Normalized)

Wind Direction (Blowing From) / Wind Speed (m/s)

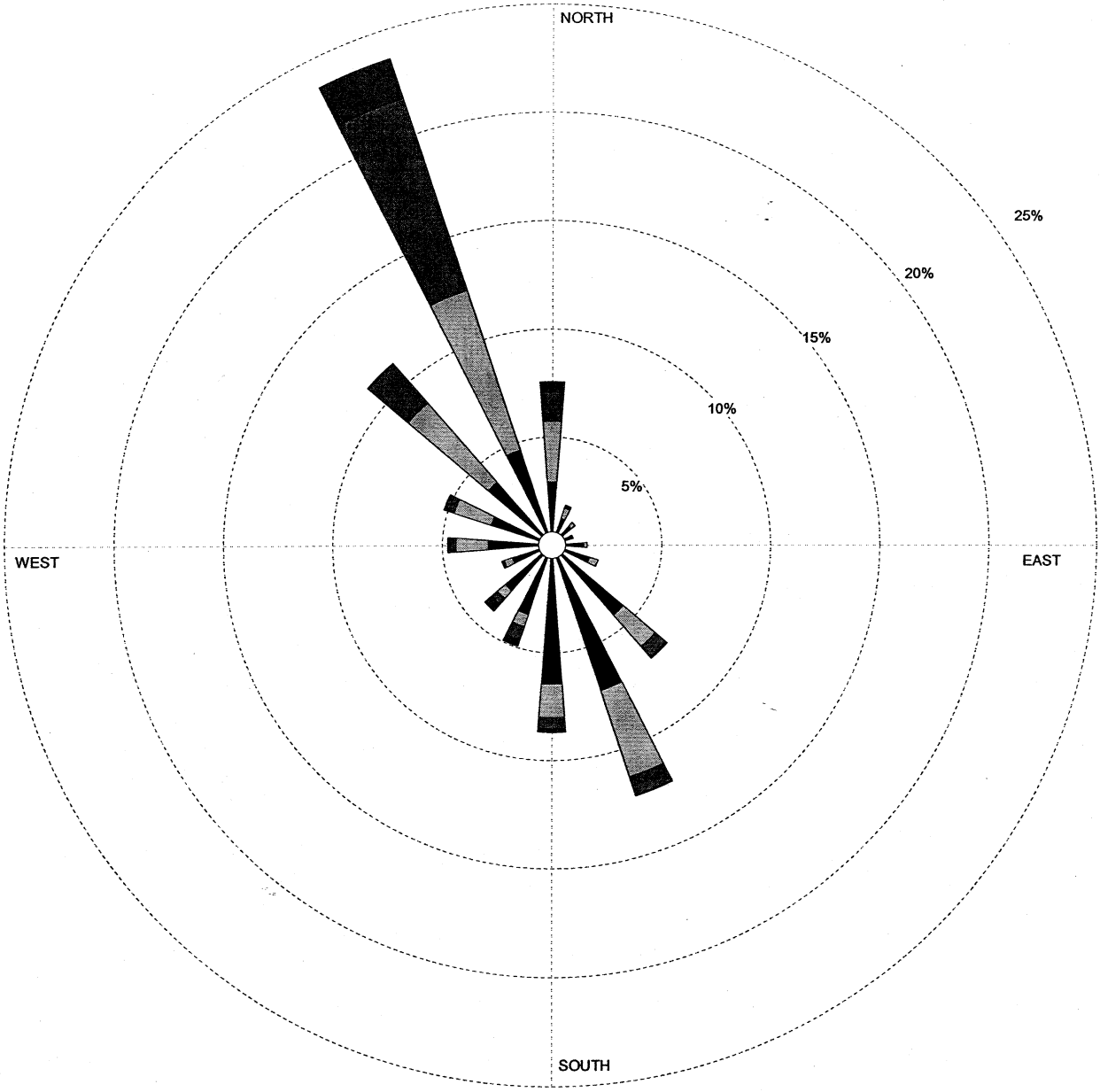
	0.51 - 1.80	1.80 - 3.34	3.34 - 5.40	5.40 - 8.49	8.49 - 11.06	> 11.06	Total
N	0.039731	0.038365	0.014117	0.006034	0.000000	0.000000	0.098247
NNE	0.017418	0.006375	0.000911	0.000000	0.000000	0.000000	0.024704
NE	0.011498	0.001708	0.000000	0.000000	0.000000	0.000000	0.013206
ENE	0.010018	0.001366	0.000000	0.000000	0.000000	0.000000	0.011384
E	0.010587	0.001708	0.000114	0.000000	0.000000	0.000000	0.012409
ESE	0.016393	0.003643	0.000569	0.000000	0.000000	0.000000	0.020606
SE	0.034950	0.027892	0.010474	0.001708	0.000000	0.000000	0.075023
SSE	0.057377	0.047017	0.008880	0.000114	0.000000	0.000000	0.113388
S	0.048156	0.017873	0.005464	0.000911	0.000000	0.000000	0.072404
SSW	0.034153	0.007058	0.009563	0.003415	0.000000	0.000000	0.054189
SW	0.023566	0.004440	0.001708	0.000683	0.000000	0.000000	0.030396
WSW	0.017873	0.002505	0.000455	0.000000	0.000000	0.000000	0.020833
W	0.024135	0.009677	0.000911	0.000000	0.000000	0.000000	0.034722
WNW	0.023566	0.019581	0.007172	0.000342	0.000000	0.000000	0.050660
NW	0.035064	0.059882	0.030852	0.000455	0.000000	0.000000	0.126252
NNW	0.055556	0.088115	0.081512	0.015710	0.000000	0.000000	0.240893
Total	0.460041	0.337204	0.172700	0.029372	0.000000	0.000000	

Frequency of Calm Winds : 0.07%

Average Wind Speed : 2.31 m/s

WIND ROSE PLOT

Station #7902 - San Jose Airport, CA



Wind Speed (m/s)

- > 11.06
- 8.49 - 11.06
- 5.40 - 8.49
- 3.34 - 5.40
- 1.80 - 3.34
- 0.51 - 1.80

MODELER	DATE **5/31/2002**	COMPANY NAME
DISPLAY **Wind Speed**	UNIT **m/s**	COMMENTS
AVG. WIND SPEED **2.28 m/s**	CALM WINDS **0.18%**	
ORIENTATION **Direction (blowing from)**	PLOT YEAR-DATE-TIME **1993** **Jan 1 - Dec 31** **Midnight - 11 PM**	PROJECT/PLOT NO.

Station ID: 7902

RUN ID: San Jose Airport

Year: 1993

Date Range: Jan 1 - Dec 31

Time Range: Midnight - 11 PM

Frequency Distribution

(Count)

Wind Direction (Blowing From) / Wind Speed (m/s)

	0.51 - 1.80	1.80 - 3.34	3.34 - 5.40	5.40 - 8.49	8.49 - 11.06	> 11.06	Total
N	257	245	119	41	1	0	663
NNE	114	43	7	4	3	0	171
NE	102	19	0	1	0	0	122
ENE	85	4	0	0	0	0	89
E	127	13	0	0	0	0	140
ESE	158	34	2	0	0	0	194
SE	377	168	59	5	0	0	609
SSE	624	368	79	4	0	0	1075
S	567	134	46	15	0	0	762
SSW	299	50	58	26	0	0	433
SW	245	41	30	36	2	0	354
WSW	167	34	10	0	0	0	211
W	255	130	30	3	0	0	418
WNW	257	156	41	1	0	0	455
NW	337	424	207	6	0	0	974
NNW	407	679	817	171	0	0	2074
Total	4378	2542	1505	313	6	0	

Frequency of Calm Winds : 16

Average Wind Speed : 2.28 m/s

Station ID: 7902

RUN ID: San Jose Airport

Year: 1993

Date Range: Jan 1 - Dec 31

Time Range: Midnight - 11 PM

Frequency Distribution

(Normalized)

Wind Direction (Blowing From) / Wind Speed (m/s)

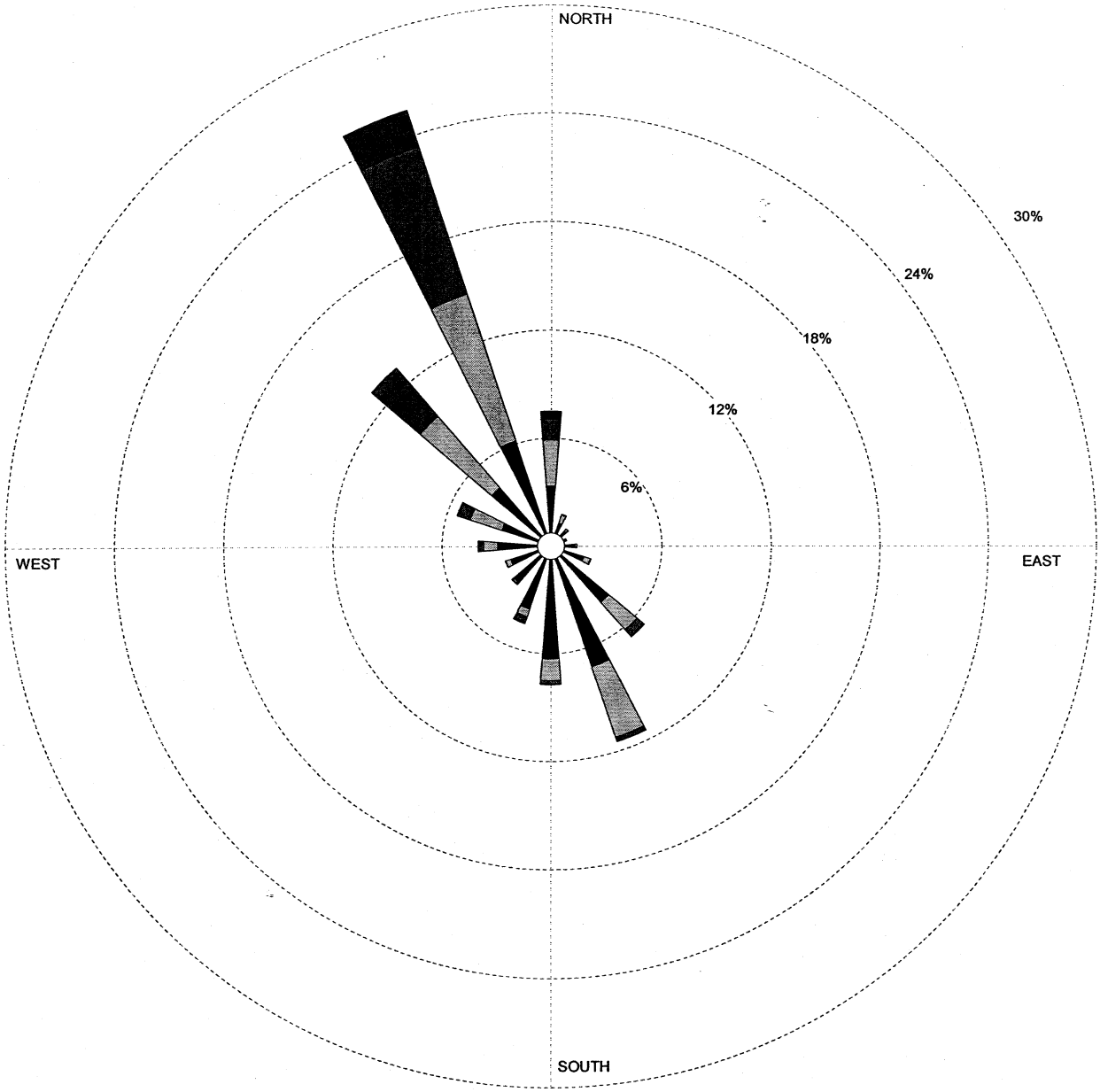
	0.51 - 1.80	1.80 - 3.34	3.34 - 5.40	5.40 - 8.49	8.49 - 11.06	> 11.06	Total
N	0.029338	0.027968	0.013584	0.004680	0.000114	0.000000	0.075685
NNE	0.013014	0.004909	0.000799	0.000457	0.000342	0.000000	0.019521
NE	0.011644	0.002169	0.000000	0.000114	0.000000	0.000000	0.013927
ENE	0.009703	0.000457	0.000000	0.000000	0.000000	0.000000	0.010160
E	0.014498	0.001484	0.000000	0.000000	0.000000	0.000000	0.015982
ESE	0.018037	0.003881	0.000228	0.000000	0.000000	0.000000	0.022146
SE	0.043037	0.019178	0.006735	0.000571	0.000000	0.000000	0.069521
SSE	0.071233	0.042009	0.009018	0.000457	0.000000	0.000000	0.122717
S	0.064726	0.015297	0.005251	0.001712	0.000000	0.000000	0.086986
SSW	0.034132	0.005708	0.006621	0.002968	0.000000	0.000000	0.049429
SW	0.027968	0.004680	0.003425	0.004110	0.000228	0.000000	0.040411
WSW	0.019064	0.003881	0.001142	0.000000	0.000000	0.000000	0.024087
W	0.029110	0.014840	0.003425	0.000342	0.000000	0.000000	0.047717
WNW	0.029338	0.017808	0.004680	0.000114	0.000000	0.000000	0.051941
NW	0.038470	0.048402	0.023630	0.000685	0.000000	0.000000	0.111187
NNW	0.046461	0.077511	0.093265	0.019521	0.000000	0.000000	0.236758
Total	0.499772	0.290183	0.171804	0.035731	0.000685	0.000000	

Frequency of Calm Winds : 0.18%

Average Wind Speed : 2.28 m/s

WIND ROSE PLOT

Station #7902 - San Jose Airport, CA



Wind Speed (m/s)

- > 11.06
- 8.49 - 11.06
- 5.40 - 8.49
- 3.34 - 5.40
- 1.80 - 3.34
- 0.51 - 1.80

MODELER	DATE **5/31/2002**	COMPANY NAME
DISPLAY **Wind Speed**	UNIT **m/s**	COMMENTS
AVG. WIND SPEED **2.18 m/s**	CALM WINDS **0.80%**	
ORIENTATION **Direction (blowing from)**	PLOT YEAR-DATE-TIME **1994** **Jan 1 - Dec 31** **Midnight - 11 PM**	PROJECT/PLOT NO.

Station ID: 7902

RUN ID: San Jose Airport

Year: 1994

Date Range: Jan 1 - Dec 31

Time Range: Midnight - 11 PM

Frequency Distribution

(Count)

Wind Direction (Blowing From) / Wind Speed (m/s)

	0.51 - 1.80	1.80 - 3.34	3.34 - 5.40	5.40 - 8.49	8.49 - 11.06	> 11.06	Total
N	294	222	103	38	0	0	657
NNE	119	41	4	0	0	0	164
NE	97	14	0	0	0	0	111
ENE	76	2	1	0	0	0	79
E	115	9	0	0	0	0	124
ESE	166	33	1	2	0	0	202
SE	364	175	44	3	0	0	586
SSE	623	359	24	0	0	0	1006
S	552	103	18	5	0	0	678
SSW	324	38	27	10	0	0	399
SW	237	7	3	2	0	0	249
WSW	204	24	3	0	0	0	231
W	257	69	26	0	0	0	352
WNW	249	162	62	4	0	0	477
NW	378	457	306	4	0	0	1145
NNW	543	746	753	188	0	0	2230
Total	4598	2461	1375	256	0	0	

Frequency of Calm Winds : 70

Average Wind Speed : 2.18 m/s

Station ID: 7902

RUN ID: San Jose Airport

Year: 1994

Date Range: Jan 1 - Dec 31

Time Range: Midnight - 11 PM

Frequency Distribution

(Normalized)

Wind Direction (Blowing From) / Wind Speed (m/s)

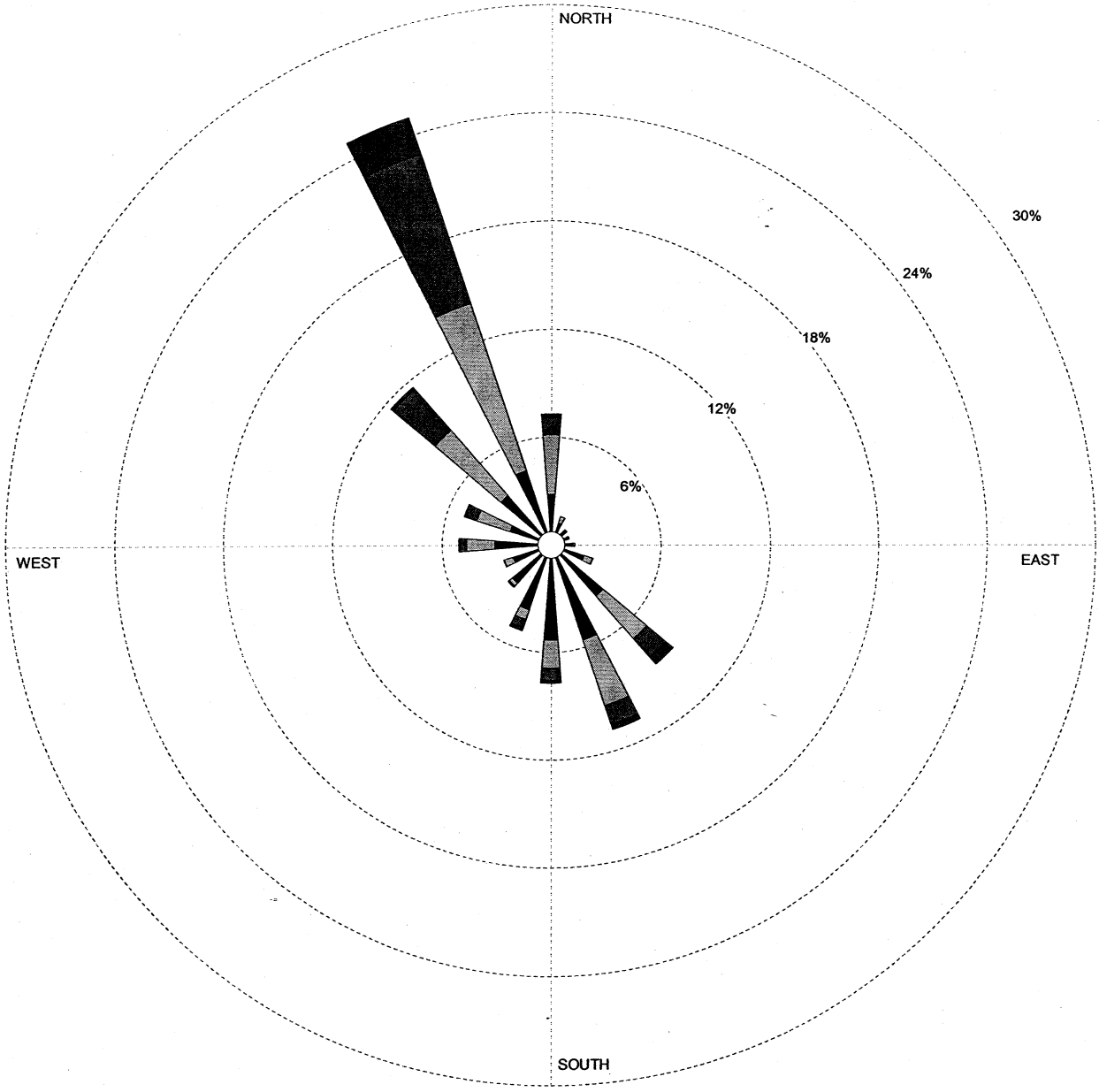
	0.51 - 1.80	1.80 - 3.34	3.34 - 5.40	5.40 - 8.49	8.49 - 11.06	> 11.06	Total
N	0.033562	0.025342	0.011758	0.004338	0.000000	0.000000	0.075000
NNE	0.013584	0.004680	0.000457	0.000000	0.000000	0.000000	0.018721
NE	0.011073	0.001598	0.000000	0.000000	0.000000	0.000000	0.012671
ENE	0.008676	0.000228	0.000114	0.000000	0.000000	0.000000	0.009018
E	0.013128	0.001027	0.000000	0.000000	0.000000	0.000000	0.014155
ESE	0.018950	0.003767	0.000114	0.000228	0.000000	0.000000	0.023059
SE	0.041553	0.019977	0.005023	0.000342	0.000000	0.000000	0.066895
SSE	0.071119	0.040982	0.002740	0.000000	0.000000	0.000000	0.114840
S	0.063014	0.011758	0.002055	0.000571	0.000000	0.000000	0.077397
SSW	0.036986	0.004338	0.003082	0.001142	0.000000	0.000000	0.045548
SW	0.027055	0.000799	0.000342	0.000228	0.000000	0.000000	0.028425
WSW	0.023288	0.002740	0.000342	0.000000	0.000000	0.000000	0.026370
W	0.029338	0.007877	0.002968	0.000000	0.000000	0.000000	0.040183
WNW	0.028425	0.018493	0.007078	0.000457	0.000000	0.000000	0.054452
NW	0.043151	0.052169	0.034932	0.000457	0.000000	0.000000	0.130708
NNW	0.061986	0.085160	0.085959	0.021461	0.000000	0.000000	0.254566
Total	0.524886	0.280936	0.156963	0.029224	0.000000	0.000000	

Frequency of Calm Winds : 0.80%

Average Wind Speed : 2.18 m/s

WIND ROSE PLOT

Station #7902 - San Jose Airport, CA



Wind Speed (m/s)	MODELER	DATE	COMPANY NAME
> 11.06 8.49 - 11.06 5.40 - 8.49 3.34 - 5.40 1.80 - 3.34 0.51 - 1.80		**5/31/2002**	
	DISPLAY **Wind Speed**	UNIT **m/s**	COMMENTS
	AVG. WIND SPEED **2.33 m/s**	CALM WINDS **0.10%**	
	ORIENTATION **Direction (blowing from)**	PLOT YEAR-DATE-TIME **1995** **Jan 1 - Dec 31** **Midnight - 11 PM**	PROJECT/PLOT NO.

Station ID: 7902

RUN ID: San Jose Airport

Year: 1995

Date Range: Jan 1 - Dec 31

Time Range: Midnight - 11 PM

Frequency Distribution

(Count)

Wind Direction (Blowing From) / Wind Speed (m/s)

	0.51 - 1.80	1.80 - 3.34	3.34 - 5.40	5.40 - 8.49	8.49 - 11.06	> 11.06	Total
N	248	288	83	20	0	0	639
NNE	112	33	1	0	0	0	146
NE	91	8	0	0	0	0	99
ENE	84	8	0	0	0	0	92
E	106	9	0	0	0	0	115
ESE	168	41	1	2	0	0	212
SE	331	274	121	44	0	0	770
SSE	491	336	98	26	0	0	951
S	467	134	63	13	0	0	677
SSW	336	48	42	16	0	0	442
SW	247	18	7	2	0	0	274
WSW	193	44	2	0	0	0	239
W	272	136	31	8	0	0	447
WNW	208	170	62	2	0	0	442
NW	319	420	264	14	0	0	1017
NNW	383	857	763	186	0	0	2189
Total	4056	2824	1538	333	0	0	

Frequency of Calm Winds : 9

Average Wind Speed : 2.33 m/s

Station ID: 7902

RUN ID: San Jose Airport

Year: 1995

Date Range: Jan 1 - Dec 31

Time Range: Midnight - 11 PM

Frequency Distribution
(Normalized)

Wind Direction (Blowing From) / Wind Speed (m/s)

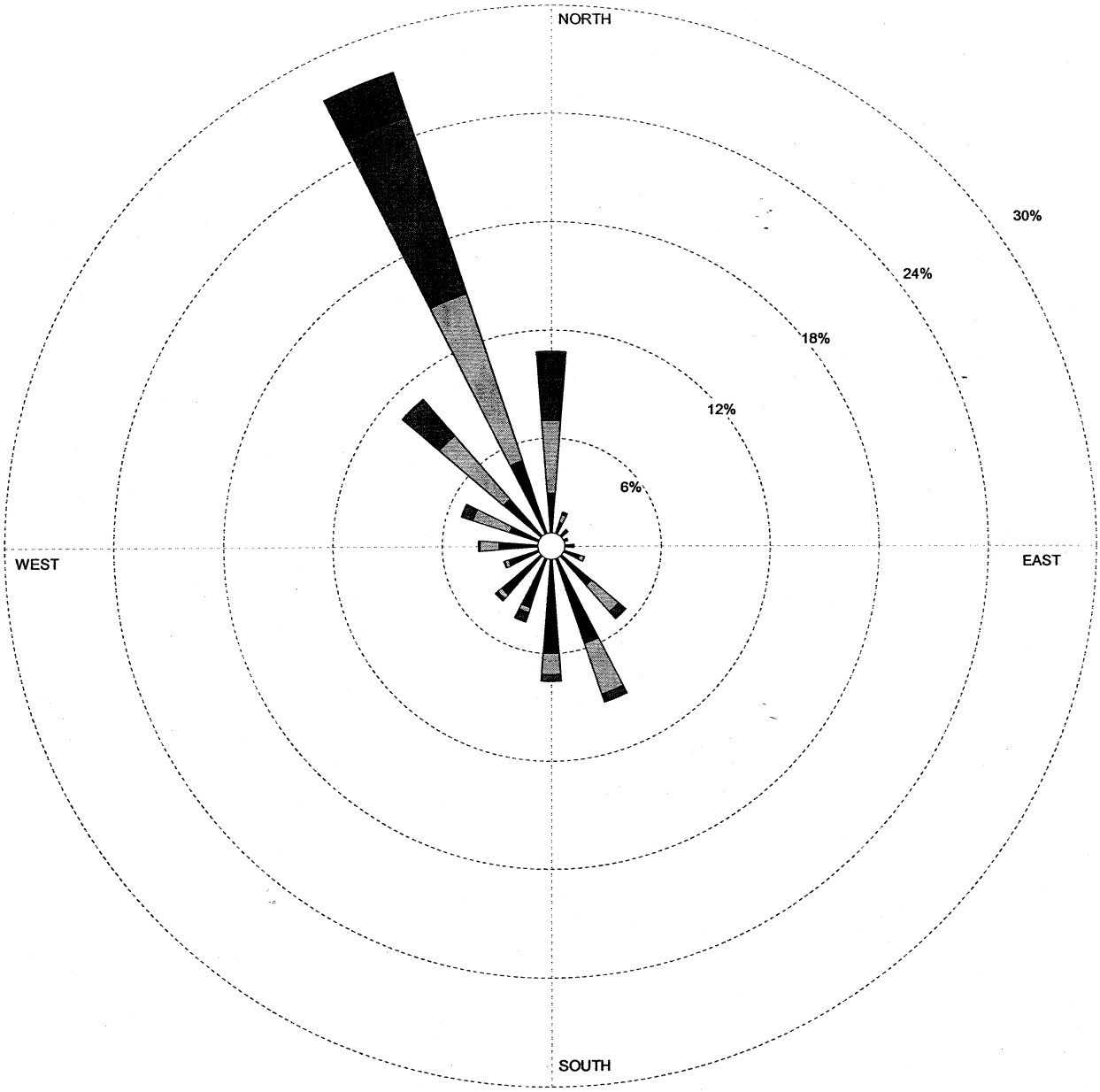
	0.51 - 1.80	1.80 - 3.34	3.34 - 5.40	5.40 - 8.49	8.49 - 11.06	> 11.06	Total
N	0.028311	0.032877	0.009475	0.002283	0.000000	0.000000	0.072945
NNE	0.012785	0.003767	0.000114	0.000000	0.000000	0.000000	0.016667
NE	0.010388	0.000913	0.000000	0.000000	0.000000	0.000000	0.011301
ENE	0.009589	0.000913	0.000000	0.000000	0.000000	0.000000	0.010502
E	0.012100	0.001027	0.000000	0.000000	0.000000	0.000000	0.013128
ESE	0.019178	0.004680	0.000114	0.000228	0.000000	0.000000	0.024201
SE	0.037785	0.031279	0.013813	0.005023	0.000000	0.000000	0.087900
SSE	0.056050	0.038356	0.011187	0.002968	0.000000	0.000000	0.108562
S	0.053311	0.015297	0.007192	0.001484	0.000000	0.000000	0.077283
SSW	0.038356	0.005479	0.004795	0.001826	0.000000	0.000000	0.050457
SW	0.028196	0.002055	0.000799	0.000228	0.000000	0.000000	0.031279
WSW	0.022032	0.005023	0.000228	0.000000	0.000000	0.000000	0.027283
W	0.031050	0.015525	0.003539	0.000913	0.000000	0.000000	0.051027
WNW	0.023744	0.019406	0.007078	0.000228	0.000000	0.000000	0.050457
NW	0.036416	0.047945	0.030137	0.001598	0.000000	0.000000	0.116096
NNW	0.043721	0.097831	0.087100	0.021233	0.000000	0.000000	0.249886
Total	0.463014	0.322374	0.175571	0.038014	0.000000	0.000000	

Frequency of Calm Winds : 0.10%

Average Wind Speed : 2.33 m/s

WIND ROSE PLOT

Station #7902 - San Jose Airport, CA



Wind Speed (m/s)	MODELER	DATE	COMPANY NAME
> 11.06 8.49 - 11.06 5.40 - 8.49 3.34 - 5.40 1.80 - 3.34 0.51 - 1.80		**5/31/2002**	
	DISPLAY **Wind Speed**	UNIT **m/s**	COMMENTS
	AVG. WIND SPEED **2.37 m/s**	CALM WINDS **0.74%**	
	ORIENTATION **Direction (blowing from)**	PLOT YEAR-DATE-TIME **1997** **Jan 1 - Dec 31** **Midnight - 11 PM**	PROJECT/PLOT NO.

WRPLOT View 3.5 by Lakes Environmental Software - www.lakes-environmental.com

Station ID: 7902

RUN ID: San Jose Airport

Year: 1997

Date Range: Jan 1 - Dec 31

Time Range: Midnight - 11 PM

Frequency Distribution

(Count)

Wind Direction (Blowing From) / Wind Speed (m/s)

	0.51 - 1.80	1.80 - 3.34	3.34 - 5.40	5.40 - 8.49	8.49 - 11.06	> 11.06	Total
N	258	353	207	115	16	0	949
NNE	123	37	6	9	0	0	175
NE	100	5	2	0	0	0	107
ENE	75	9	1	0	0	0	85
E	103	7	0	0	0	0	110
ESE	143	24	1	1	0	0	169
SE	256	168	46	1	0	0	471
SSE	503	259	42	0	0	0	804
S	527	100	33	2	0	0	662
SSW	319	22	43	6	1	0	391
SW	316	22	10	7	0	0	355
WSW	216	20	3	0	0	0	239
W	252	90	8	0	0	0	350
WNW	212	185	54	4	0	0	455
NW	304	406	229	8	0	0	947
NNW	440	853	903	228	2	0	2426
Total	4147	2560	1588	381	19	0	

Frequency of Calm Winds : 65

Average Wind Speed : 2.37 m/s

Station ID: 7902

RUN ID: San Jose Airport

Year: 1997

Date Range: Jan 1 - Dec 31

Time Range: Midnight - 11 PM

Frequency Distribution
(Normalized)

Wind Direction (Blowing From) / Wind Speed (m/s)

	0.51 - 1.80	1.80 - 3.34	3.34 - 5.40	5.40 - 8.49	8.49 - 11.06	> 11.06	Total
N	0.029452	0.040297	0.023630	0.013128	0.001826	0.000000	0.108333
NNE	0.014041	0.004224	0.000685	0.001027	0.000000	0.000000	0.019977
NE	0.011416	0.000571	0.000228	0.000000	0.000000	0.000000	0.012215
ENE	0.008562	0.001027	0.000114	0.000000	0.000000	0.000000	0.009703
E	0.011758	0.000799	0.000000	0.000000	0.000000	0.000000	0.012557
ESE	0.016324	0.002740	0.000114	0.000114	0.000000	0.000000	0.019292
SE	0.029224	0.019178	0.005251	0.000114	0.000000	0.000000	0.053767
SSE	0.057420	0.029566	0.004795	0.000000	0.000000	0.000000	0.091781
S	0.060160	0.011416	0.003767	0.000228	0.000000	0.000000	0.075571
SSW	0.036416	0.002511	0.004909	0.000685	0.000114	0.000000	0.044635
SW	0.036073	0.002511	0.001142	0.000799	0.000000	0.000000	0.040525
WSW	0.024658	0.002283	0.000342	0.000000	0.000000	0.000000	0.027283
W	0.028767	0.010274	0.000913	0.000000	0.000000	0.000000	0.039954
WNW	0.024201	0.021119	0.006164	0.000457	0.000000	0.000000	0.051941
NW	0.034703	0.046347	0.026142	0.000913	0.000000	0.000000	0.108105
NNW	0.050228	0.097374	0.103082	0.026027	0.000228	0.000000	0.276941
Total	0.473402	0.292237	0.181279	0.043493	0.002169	0.000000	

Frequency of Calm Winds : 0.74%

Average Wind Speed : 2.37 m/s

Cumulative Wind Rose Statistics
(1992-1995, 1997)

Station ID: 7902 RUN ID: San Jose Airport

Year: 1992 1993 1994 1995 1997

Date Range: Jan 1 - Dec 31

Time Range: Midnight - 11 PM

Frequency Distribution
(Normalized)

Wind Direction (Blowing From) / Wind Speed (m/s)

	0.51 - 1.80	1.80 - 3.34	3.34 - 5.40	5.40 - 8.49	8.49 - 11.06	> 11.06	Total
N	0.032083	0.032973	0.014513	0.006093	0.000388	0.000000	0.086049
NNE	0.014170	0.004792	0.000593	0.000297	0.000068	0.000000	0.019921
NE	0.011204	0.001392	0.000046	0.000023	0.000000	0.000000	0.012664
ENE	0.009310	0.000799	0.000046	0.000000	0.000000	0.000000	0.010154
E	0.012413	0.001209	0.000023	0.000000	0.000000	0.000000	0.013645
ESE	0.017776	0.003742	0.000228	0.000114	0.000000	0.000000	0.021860
SE	0.037308	0.023503	0.008260	0.001552	0.000000	0.000000	0.070623
SSE	0.062637	0.039590	0.007325	0.000707	0.000000	0.000000	0.110259
S	0.057868	0.014330	0.004746	0.000981	0.000000	0.000000	0.077925
SSW	0.036008	0.005020	0.005796	0.002008	0.000023	0.000000	0.048855
SW	0.028569	0.002898	0.001483	0.001209	0.000046	0.000000	0.034205
WSW	0.021381	0.003286	0.000502	0.000000	0.000000	0.000000	0.025169
W	0.028478	0.011637	0.002350	0.000251	0.000000	0.000000	0.042716
WNW	0.025853	0.019282	0.006435	0.000319	0.000000	0.000000	0.051889
NW	0.037559	0.050954	0.029139	0.000821	0.000000	0.000000	0.118474
NNW	0.051593	0.089198	0.090179	0.020788	0.000046	0.000000	0.251803
Total	0.484210	0.304605	0.171664	0.035163	0.000570	0.000000	

Frequency of Calm Winds : 0.38%

Average Wind Speed : 2.29 m/s

Cumulative Wind Rose Statistics
(1992-1995, 1997)

Station ID: 7902 RUN ID: San Jose Airport

Year: 1992 1993 1994 1995 1997

Date Range: Jan 1 - Dec 31

Time Range: Midnight - 11 PM

Frequency Distribution

(Count)

Wind Direction (Blowing From) / Wind Speed (m/s)

	0.51 - 1.80	1.80 - 3.34	3.34 - 5.40	5.40 - 8.49	8.49 - 11.06	> 11.06	Total
N	1406	1445	636	267	17	0	3771
NNE	621	210	26	13	3	0	873
NE	491	61	2	1	0	0	555
ENE	408	35	2	0	0	0	445
E	544	53	1	0	0	0	598
ESE	779	164	10	5	0	0	958
SE	1635	1030	362	68	0	0	3095
SSE	2745	1735	321	31	0	0	4832
S	2536	628	208	43	0	0	3415
SSW	1578	220	254	88	1	0	2141
SW	1252	127	65	53	2	0	1499
WSW	937	144	22	0	0	0	1103
W	1248	510	103	11	0	0	1872
WNW	1133	845	282	14	0	0	2274
NW	1646	2233	1277	36	0	0	5192
NNW	2261	3909	3952	911	2	0	11035
Total	21220	13349	7523	1541	25	0	

Frequency of Calm Winds : 166

Average Wind Speed : 2.29 m/s

Local Air Quality Classifications

Pollutant	State Designation	Federal Designation
NO_2	Attainment	Attainment
CO	Attainment	Attainment
PM_{10}	Nonattainment	Attainment
SO_2	Attainment	Attainment
Ozone	Nonattainment	Nonattainment

BAAQMD Attainment Pollutant
Maximum Ambient Concentrations (ppm)

Pollutant	Averaging Time	1993	1994	1995	1996	1997	1998	1999	Limiting AAQS
CO	8-hour	7.88	8.75	5.84	7	6.11	6.27	6.28	**9**
	1 hour	14	12	10.1	8.8	10.7	8.7	9	**20**
NO_2	Annual	0.027	0.028	0.027	0.025	0.025	0.025	0.026	**0.053**
	1 hour	0.12	0.107	0.116	0.108	0.118	0.098	0.128	**0.25**
SO_2	24-hour	0.0125	0.0123	0.0117	0.0144	0.0141	0.0159	0.0382	**0.04**
	1 hour	0.11	0.074	0.047	0.063	0.099	0.062	0.098	**0.25**

Source: California Air Resources Board

BAAQMD PM10 Maximum 24-hour Average Concentrations and Number of Measurement Periods (6-day periods) In Violation with the State AAQS

Station	PM10	1993	1994	1995	1996	1997	1998	1999	2000
Marin County Summary	24-Hour High Avg. (g/m^3)	69	72.4	74.2	50.3	72	52.4	75.6	39.5
	State Violations	1	4	1	0	2	1	2	0
SF County Summary	24-Hour High Avg. (g/m^3)	69	93	49.9	70.9	81	52.4	77.9	63.2
	State Violations	5	6	0	2	3	1	6	2
Alameda County Summary	24-Hour High Avg. (g/m^3)	84	96.9	51.7	71.1	64.7	62.7	87.9	71.2
	State Violations	4	4	2	1	2	2	3	2
Contra Costa County Summary	24-Hour High Avg. (g/m^3)	81	87	72.7	75.6	77.8	66.8	100.6	62.0
	State Violations	7	6	4	1	3	2	7	1
Santa Clara County Summary	24-Hour High Avg. (g/m^3)	101	92.6	59.7	76.1	95	92	114.4	76.1
	State Violations	9	9	4	2	3	3	7	7
San Jose 4th Street	24-Hour High Avg. (g/m^3)	92	92.6	59.7	76.1	78	92	114.4	76.1
	State Violations	8	7	4	2	3	3	5	7
San Jose Piedmont Road	24-Hour High Avg. (g/m^3)	NA	NA	57.4	58.7	55.3	54.4	NA	NA
	State Violations	NA	NA	1	2	1	1	NA	NA
San Jose Moorpark Avenue	24-Hour High Avg. (g/m^3)	76	66.6	54.5	58.4	60.7	42.5	NA	NA
	State Violations	3	4	1	1	3	0	NA	NA
San Jose Tully Road	24-Hour High Avg. (g/m^3)	101	90.2	48.6	66.8	95	88.5	96.5	68.5
	State Violations	7	7	0	1	3	1	4	2
Basin Wide Summary	24-Hour High Avg. (g/m^3)	101	96.9	74.2	76.1	95	92	114.4	76.1
	State Violations	11	10	7	3	4	5	12	7

Source: California Air Resources Board

State 24-Hour Ambient Air Quality Standard for PM10: 50 g/m^3
Federal 24-Hour Ambient Air Quality Standard for PM10: 150 g/m^3
NA = PM10 data is not available for these years at these sites.

Maximum Concentration of O_3 (Ozone) and Number of Days in which the State Ozone Standard was Violated

Station	Ozone	1993	1994	1995	1996	1997	1998	1999	2000
Marin County Summary	Highest 1 hour Average (ppm)	0.080	0.089	0.088	0.105	0.106	0.074	0.102	0.071
	State Violations	0	0	0	2	1	0	2	0
SF County Summary	Highest 1 hour Average (ppm)	0.080	0.055	0.088	0.071	0.068	0.053	0.079	0.058
	State Violations	0	0	0	0	0	0	0	0
Alameda County Summary	Highest 1 hour Average (ppm)	0.13	0.129	0.155	0.138	0.114	0.146	0.146	0.137
	State Violations	8	7	21	23	6	22	15	5
Contra Costa County Summary	Highest 1 hour Average (ppm)	0.130	0.121	0.152	0.137	0.108	0.147	0.156	0.138
	State Violations	10	6	12	15	4	16	8	2
Santa Clara County Summary	Highest 1 hour Average (ppm)	0.130	0.130	0.145	0.129	0.114	0.147	0.125	0.113
	State Violations	14	8	22	24	3	22	12	4
Gilroy	Highest 1 hour Average (ppm)	0.11	0.101	0.13	0.121	0.095	0.135	0.105	NA
	State Violations	6	3	10	15	1	10	3	NA
Los Gatos	Highest 1 hour Average (ppm)	0.13	0.118	0.141	0.129	0.097	0.133	0.117	0.080
	State Violations	8	2	13	10	1	5	4	0
Mountain View	Highest 1 hour Average (ppm)	0.11	0.084	0.116	0.106	0.114	0.097	0.114	NA
	State Violations	2	0	2	3	1	2	7	NA
San Jose 4th Street	Highest 1 hour Average (ppm)	0.11	0.112	0.134	0.11	0.094	0.147	0.109	0.073
	State Violations	3	2	14	5	0	4	3	0
San Jose Piedmont Road	Highest 1 hour Average (ppm)	0.11	0.116	0.145	0.118	0.095	0.129	0.116	0.096
	State Violations	5	3	15	5	1	5	2	1
San Martin	Highest 1 hour Average (ppm)	NA	0.13	0.128	0.115	0.091	0.144	0.125	0.113
	State Violations	NA	5	14	18	0	15	7	4
Basin Wide Summary	Highest 1 hour Average (ppm)	0.130	0.130	0.155	0.138	0.114	0.147	0.156	0.152
	State Violations	19	13	28	34	8	29	20	12

Source: California Air Resources Board

State 1 hour Ambient Air Quality Standard for Ozone: 0.09 ppm (180 g/m^3)
Federal 1 hour Ambient Air Quality Standard for Ozone: 0.12 ppm (235 g/m^3)
NA = Ozone data is not available for these years at these sites.

aqdweb
<aqdweb@arb.ca.gov>
06/19/2002 01:00 PM

To: RBooth@fwenc.com
cc: rweller@arb.ca.gov, helpline@arb.ca.gov, rrothack@arb.ca.gov
Subject: Re: Air monitoring data request

To: Richard Booth
Foster Wheeler Environmental Corp.

This is in response to your e-mail note to *aqdweb@arb.ca.gov* in which you requested summary information for several locations in the San Francisco Bay Area Air Basin. Please note that we do not have a complete year of hourly data for 2001 from the S.F. Bay Area air monitoring stations (through October).

o - The 2001 annual average NO2 concentration at San Jose-4th Street is not available because we only have hourly NO2 data through October 2001 at any of the S.F. Bay Area air monitoring stations at this time.

o - The maximum hourly CO concentrations at San Jose-4th Street are: **8.6 ppm** for 1998, **9.0 ppm** for 1999, **8.9 ppm** for 2000, and **7.6 ppm** through October 2001.

o - There are no suspended lead data for San Jose-4th Street in 2000 or 2001.

o - Note that the Total Suspended Particulate sampling in the area ended in June 1998. The maximum daily total suspended sulfate data at San Jose-Moorpark Avenue and San Jose-4th Street for January - June 1998 were **4.7 ug/m3** and **4.7 ug/m3**, respectively.

Through the Air Quality Data home page, www.arb.ca.gov/aqd/aqd.htm, you can obtain the **California Air Quality Data on compact disc** (CAQD-CD), www.arb.ca.gov/aqd/aqdcd/aqdcd.htm, which contains the air quality data from the ARB's Aerometric Data Analysis Management (ADAM) system database for the period from 1980 through 2000. Please send your request by e-mail to aqdcd@arb.ca.gov. You can also download ASCII formatted data files from 1980 through 2000 from the **California Air Quality Data - Selected Data Available for Downloads** web page, www.arb.ca.gov/aqd/aqdcd/aqdcddld.htm. If you have any questions concerning the data files in the CAQD-CD's, please contact Bob Weller at rweller@arb.ca.gov.

If you have any questions or need information concerning the ambient air quality summary data for California, please contact me by e-mail at aqdweb@arb.ca.gov. If you have any general questions concerning the subject of air pollution in California, please contact the ARB Helpline at helpline@arb.ca.gov.

Dwight Oda
Air Quality Data Section
Planning and Technical Support Division

cc: Bob Weller, PTSD

Ron Rothacker, PTSD
ARB Helpline

SUMMARY OF AIR POLLUTION IN THE BAY AREA - 1993

MONITORING STATIONS	OZONE				CARBON MONOXIDE		NITROGEN DIOXIDE		SULFUR DIOXIDE		PM10		
	MAX HR	FED D-O-S*	CAL D-O-S	3-YR AVG	MAX 8-HR	FED D-O-S	MAX HR	CAL D-O-S	MAX 24-HR	CAL D-O-S	ANN GEO MEAN	FED D-O-S	CAL D-O-S
North Counties	(pphm)				(ppm)		(pphm)		(ppb)		(mg/m^3)		
Santa Rosa	8	0	0	0.0	3.7	0	9	0	-	-	-	-	-
Napa	12	0	2	0.0	4.4	0	8	0	-	-	22.6	0	3
Vallejo	11	0	3	0.0	7.9	0	7	0	8	0	-	-	-
Fairfield	13	1	3	0.3	-	-	-	-	-	-	-	-	-
Sonoma	8	0	0	0.0	-	-	-	-	-	-	-	-	-
Central Bay	(pphm)				(ppm)		(pphm)		(ppb)		(mg/m^3)		
San Francisco	8	0	0	0.0	5.0	0	8	0	9	0	25.1	0	5
San Rafael	8	0	0	0.0	3.8	0	8	0	-	-	21.3	0	1
Richmond	12	0	2	0.0	3.4	0	8	0	10	0	22.5	0	3
Oakland	11	0	1	0.0	4.8	0	-	-	-	-	-	-	-
San Leandro	12	0	3	0.0	-	-	-	-	-	-	18.1	0	1
Peninsula	(pphm)				(ppm)		(pphm)				(mg/m^3)		
Redwood City	10	0	1	0.0	5.9	0	9	0	-	-	22.9	0	5
Mountain View	11	0	2	0.0	-	-	-	-	-	-	-	-	-
East Contra Costa	(pphm)				(ppm)		(pphm)		(ppb)		(mg/m^3)		
Concord	13	2	7	0.7	4.9	0	10	0	12	0	19.3	0	2
Pittsburg	13	1	5	0.3	2.9	0	8	0	8	0	-	-	-
Bethel Island	11	0	3	0.0	1.7	0	7	0	8	0	19.4	0	6
Southern Alameda	(pphm)				(ppm)		(pphm)				(mg/m^3)		
Livermore	13	1	7	0.7	3.9	0	11	0	-	-	20.9	0	3
Fremont	13	1	5	0.3	3.2	0	10	0	-	-	22.3	0	3
Hayward	9	0	0	0.3	-	-	-	-	-	-	-	-	-
Santa Clara Valley	(pphm)				(ppm)		(pphm)				(mg/m^3)		
San Jose, 4th Street	11	0	3	0.0	6.6	0	12	0	-	-	26.9	0	10
Alum Rock, San Jose	11	0	5	0.3	-	-	-	-	-	-	-	-	-
Burbank, San Jose	13	1	4	0.3	6.5	0	11	0	-	-	24.0	0	5
Moorpark, San Jose	-	-	-	-	-	-	-	-	-	-	19.6	0	3
Tully Road, San Jose	-	-	-	-	-	-	-	-	-	-	22.8	0	7
Los Gatos	13	1	8	0.7	-	-	-	-	-	-	-	-	-
Gilroy	11	0	6	0.3	3.0	0	-	-	-	-	-	-	-
District Calendar Days Over Standard		3	19			0		0		0		0	10

* Days Over Standard

HEALTH-BASED AMBIENT AIR QUALITY STANDARDS

	CALIFORNIA STANDARD	FEDERAL STANDARD
OZONE	9 parts per hundred million averaged over 1 hour	12 parts pphm (1 hour avg.)
CARBON MONOXIDE	9 parts per million (8-hour avg.); 20 ppm (1-hour avg.)	9 ppm (8-hour avg.); 35 ppm (1-hour avg.)
NITROGEN DIOXIDE	25 parts per hundred million (1-hour avg.)	5.3 pphm (annual avg.)
SULFUR DIOXIDE	50 parts per billion (24-hour avg.)	140 ppb (24-hour avg.); 30 ppm (annual avg.)
PARTICULATES <10 MICRONS	30 mg/m^3 (ann. avg.); 50 mg/m^3 (24-hour avg.)	50 mg/m^3 (ann. avg.); 150 mg/m^3 (24-hour avg.)

SUMMARY OF AIR POLLUTION IN THE BAY AREA - 1994

MONITORING STATIONS	OZONE				CARBON MONOXIDE		NITROGEN DIOXIDE		SULFUR DIOXIDE		PM_{10}		
	MAX HR	NAT'L DAYS*	CAL DAYS*	3-YR AVG	MAX 8-HR	NAT'L DAYS*	MAX HR	CAL DAYS*	MAX 24-HR	CAL DAYS*	ANN GEO MEAN	NAT'L DAYS*	CAL DAYS*
North Counties	(pphm)				(ppm)		(pphm)		(ppb)		(mg/m^3)		
Santa Rosa	8	0	0	0.0	3.4	0	8	0	-	-	**	0	1
Napa	9	0	0	0.0	4.6	0	7	0	-	-	21.2	0	2
Vallejo	10	0	2	0.0	6.5	0	7	0	7	0	**	0	1
Fairfield	11	0	2	0.3	-	-	-	-	-	-	-	-	-
Sonoma	9	0	0	0.0	-	-	-	-	-	-	-	-	-
Central Bay	(pphm)				(ppm)		(pphm)		(ppb)		(mg/m^3)		
San Francisco	6	0	0	0.0	4.4	0	9	0	5	0	24.7	0	6
San Rafael	9	0	0	0.0	3.0	0	8	0	-	-	21.6	0	4
Richmond	9	0	0	0.0	2.9	0	8	0	10	0	22.0	0	3
Oakland	6	0	0	0.0	5.6	0	-	-	-	-	-	-	-
San Leandro	9	0	0	0.0	-	-	-	-	-	-	18.7	0	1
Peninsula	(pphm)				(ppm)		(pphm)				(mg/m^3)		
Redwood City	8	0	0	0.0	5.4	0	11	0	-	-	21.9	0	6
Mountain View	8	0	0	0.0	-	-	-	-	-	-	-	-	-
East Contra Costa	(pphm)				(ppm)		(pphm)		(ppb)		(mg/m^3)		
Concord	12	0	4	0.7	4.2	0	8	0	7	0	20.2	0	4
Pittsburg	11	0	3	0.3	3.3	0	8	0	8	0	-	-	-
Bethel Island	11	0	5	0.0	1.6	0	7	0	5	0	19.6	0	3
Southern Alameda	(pphm)				(ppm)		(pphm)				(mg/m^3)		
Livermore	13	2	5	1.0	3.4	0	8	0	-	-	22.1	0	4
Fremont	12	0	4	0.3	3.9	0	10	0	-	-	21.7	0	3
Hayward	10	0	1	0.3	-	-	-	-	-	-	-	-	-
Santa Clara Valley	(pphm)				(ppm)		(pphm)				(mg/m^3)		
San Jose, 4th Street	11	0	2	0.0	8.1	0	11	0	-	-	26.5	0	7
Alum Rock, San Jose	12	0	3	0.3	-	-	-	-	-	-	-	-	-
Burbank, San Jose	10	0	1	0.3	6.6	0	10	0	-	-	25.0	0	6
Moorpark, San Jose	-	-	-	-	-	-	-	-	-	-	20.3	0	4
Tully Road, San Jose	-	-	-	-	-	-	-	-	-	-	22.9	0	7
Los Gatos	12	0	2	0.7	-	-	-	-	-	-	-	-	-
Gilroy	10	0	3	0.0	2.6	0	-	-	-	-	-	-	-
San Martin	13	1	5	1.0	-	-	-	-	-	-	-	-	-
District Calendar Days Over Standard		2	13			0		0		0		0	9

* Days Over Standard pphm = parts per hundred million ppm = parts per million ppb = parts per billion

* * Monitoring installed during 1994, complete year's data not available

HEALTH-BASED AMBIENT AIR QUALITY STANDARDS

	CALIFORNIA STANDARD	NATIONAL STANDARD
OZONE	9 pphm (1-hour avg.)	12 pphm (1-hour avg.)
CARBON MONOXIDE	9 ppm (8-hour avg.); 20 ppm (1-hour avg.)	9 ppm (8-hour avg.); 35 ppm (1-hour avg.)
NITROGEN DIOXIDE	25 pphm (1-hour avg.)	5.3 pphm (annual avg.)
SULFUR DIOXIDE	50 ppb (24-hour avg.)	140 ppb (24-hour avg.); 30 ppm (annual avg.)
PARTICULATES <10 MICRONS	30 mg/m^3 (annual avg.); 50 mg/m^3 (24-hour avg.)	50 mg/m^3 (annual avg.); 150 mg/m^3 (24-hour avg.)

SUMMARY OF AIR POLLUTION IN THE BAY AREA - 1995

MONITORING STATIONS	OZONE				CARBON MONOXIDE		NITROGEN DIOXIDE		SULFUR DIOXIDE		PM_{10}		
	MAX HR	NAT'L DAYS*	CAL DAYS*	3-YR AVG	MAX 8-HR	NAT'L DAYS*	MAX HR	CAL DAYS*	MAX 24-HR	CAL DAYS*	ANN GEO MEAN	NAT'L DAYS**	CAL DAYS**
North Counties	(pphm)				(ppm)		(pphm)		(ppb)		(mg/m^3)		
Santa Rosa	10	0	1	0.0	2.8	0	7	0	-	-	13.9	0	0
Napa	13	1	4	0.3	3.5	0	6	0	-	-	17.9	0	1
Vallejo	13	1	6	0.3	5.3	0	7	0	5	0	16.4	0	1
Fairfield	13	1	10	0.7	-	-	-	-	-	-	-	-	-
Sonoma	7	0	0	0.0	-	-	-	-	-	-	-	-	-
Central Bay	(pphm)				(ppm)		(pphm)		(ppb)		(mg/m^3)		
San Francisco	9	0	0	0.0	4.4	0	9	0	7	0	22.1	0	0
San Rafael	9	0	0	0.0	3.2	0	6	0	-	-	19.2	0	1
Richmond	9	0	0	0.0	2.4	0	7	0	7	0	19.3	0	1
Oakland	11	0	0	0.0	3.8	0	-	-	-	-	-	-	-
San Leandro	15	3	6	1.0	-	-	-	-	-	-	16.9	0	0
Peninsula	(pphm)				(ppm)		(pphm)				(mg/m^3)		
Redwood City	14	1	5	0.3	3.9	0	8	0	-	-	18.7	0	0
Mountain View	12	0	2	0.0	-	-	-	-	-	-	-	-	-
East Contra Costa	(pphm)				(ppm)		(pphm)		(ppb)		(mg/m^3)		
Concord	15	3	9	1.7	2.9	0	9	0	7	0	17.2	0	1
Pittsburg	12	0	8	0.3	2.8	0	8	0	10	0	-	-	-
Bethel Island	13	1	6	0.3	1.7	0	6	0	5	0	19.4	0	3
Southern Alameda	(pphm)				(ppm)		(pphm)				(mg/m^3)		
Livermore	16	7	20	3.3	2.3	0	8	0	-	-	19.4	0	1
Fremont	15	2	10	1.0	2.9	0	9	0	-	-	19.2	0	1
Hayward	15	2	7	0.7	-	-	-	-	-	-	-	-	-
Santa Clara Valley	(pphm)				(ppm)		(pphm)				(mg/m^3)		
San Jose, 4th Street	13	1	14	0.3	5.4	0	12	0	-	-	22.0	0	4
Alum Rock, San Jose	15	3	15	1.0	-	-	-	-	-	-	-	-	-
Moorpark, San Jose	-	-	-	-	-	-	-	-	-	-	16.7	0	1
Tully Road, San Jose	-	-	-	-	-	-	-	-	-	-	19.8	0	0
Los Gatos	14	4	13	1.7	-	-	-	-	-	-	-	-	-
Gilroy	13	1	10	0.3	-	-	-	-	-	-	-	-	-
San Martin	13	1	14	0.7	-	-	-	-	-	-	-	-	-
District Calendar Days Over Standard		**11**	**28**			**0**		**0**		**0**		**0**	**7**

* Days Over Standard pphm = parts per hundred million ppm = parts per million ppb = parts per billion

** PM_{10} is sampled every sixth day. *Actual* days over standard can be estimated as six times the number shown.

HEALTH-BASED AMBIENT AIR QUALITY STANDARDS

	CALIFORNIA STANDARD	NATIONAL STANDARD
OZONE	9 pphm (1-hour avg.)	12 pphm (1-hour avg.)
CARBON MONOXIDE	9 ppm (8-hour avg.)	9 ppm (8-hour avg.)
NITROGEN DIOXIDE	25 pphm (1-hour avg.)	
SULFUR DIOXIDE	50 ppb (24-hour avg.)	140 ppb (24-hour avg.)
PARTICULATES <10 MICRONS	30 mg/m^3 (ann. geo. mean); 50 mg/m^3 (24-hour avg.)	150 mg/m^3 (24-hour avg.)

SUMMARY OF AIR POLLUTION IN THE BAY AREA - 1996

MONITORING STATIONS	OZONE				CARBON MONOXIDE		NITROGEN DIOXIDE		SULFUR DIOXIDE		PM_{10}		
	MAX HR	NAT'L DAYS*	CAL DAYS*	3-YR AVG	MAX 8-HR	NAT'L DAYS*	MAX HR	CAL DAYS*	MAX 24-HR	CAL DAYS*	ANN GEO MEAN	NAT'L DAYS**	CAL DAYS**
North Counties	(pphm)				(ppm)		(pphm)		(ppb)		(mg/m^3)		
Santa Rosa	8	0	0	0.0	3.0	0	6	0	-	-	15.3	0	0
Napa	9	0	0	0.3	3.8	0	8	0	-	-	18.2	0	1
Vallejo	11	0	5	0.3	4.9	0	7	0	7	0	15.2	0	0
Fairfield	11	0	5	0.3	-	-	-	-	-	-	-	-	-
Sonoma	9	0	0	0.0	-	-	-	-	-	-	-	-	-
Coast & Central Bay	(pphm)				(ppm)		(pphm)		(ppb)		(mg/m^3)		
San Francisco	7	0	0	0.0	3.7	0	8	0	8	0	21.4	0	2
San Rafael	11	0	2	0.0	4.0	0	7	0	-	-	20.0	0	0
Richmond	8	0	0	0.0	2.6	0	9	0	13	0	18.6	0	0
Richmond (7th St)	-	-	-	-	-	-	-	-	8	0	-	-	-
Oakland	9	0	0	0.0	3.9	0	-	-	-	-	-	-	-
Eastern District	(pphm)				(ppm)		(pphm)		(ppb)		(mg/m^3)		
Concord	13	1	11	1.3	2.9	0	8	0	5	0	16.1	0	1
Pittsburg	12	0	5	0.0	2.9	0	7	0	10	0	-	-	-
Bethel Island	14	1	6	0.7	1.4	0	6	0	6	0	18.8	0	1
Martinez	-	-	-	-	-	-	-	-	7	0	-	-	-
Livermore	14	8	22	5.7	2.5	0	9	0	-	-	19.9	0	1
South Central Bay	(pphm)				(ppm)		(pphm)				(mg/m^3)		
Fremont	10	0	2	0.7	3.4	0	9	0	-	-	20.5	0	1
Hayward	11	0	2	0.7	-	-	-	-	-	-	-	-	-
Mountain View	11	0	3	0.0	-	-	-	-	-	-	-	-	-
Redwood City	10	0	1	0.3	3.6	0	9	0	-	-	19.2	0	0
San Leandro	11	0	2	1.0	-	-	-	-	-	-	18.6	0	1
Santa Clara Valley	(pphm)				(ppm)		(pphm)				(mg/m^3)		
San Jose, 4th Street	11	0	5	0.3	6.5	0	11	0	-	-	22.1	0	2
San Jose East	11	0	5	1.0	-	-	-	-	-	-	18.5	0	2
Moorpark, San Jose	-	-	-	-	-	-	-	-	-	-	18.1	0	1
Tully Road, San Jose	-	-	-	-	-	-	-	-	-	-	17.8	0	1
Los Gatos	13	1	10	1.7	-	-	-	-	-	-	-	-	-
Gilroy	12	0	15	0.3	-	-	-	-	-	-	-	-	-
San Martin	12	0	18	0.7	-	-	-	-	-	-	-	-	-
District Calendar Days Over Standard		**8**	**34**			**0**		**0**		**0**		**0**	**3**

* Days Over Standard pphm = parts per hundred million ppm = parts per million ppb = parts per billion

** PM_{10} is sampled every sixth day. *Actual* days over standard can be estimated as six times the number shown.

HEALTH-BASED AMBIENT AIR QUALITY STANDARDS

	CALIFORNIA STANDARD	NATIONAL STANDARD
OZONE	9 pphm (1-hour avg.)	12 pphm (1-hour avg.)
CARBON MONOXIDE	9 ppm (8-hour avg.)	9 ppm (8-hour avg.)
NITROGEN DIOXIDE	25 pphm (1-hour avg.)	
SULFUR DIOXIDE	50 ppb (24-hour avg.)	140 ppb (24-hour avg.)
PARTICULATES <10 MICRONS	30 mg/m^3 (ann. geo. mean); 50 mg/m^3 (24-hour avg.)	150 mg/m^3 (24-hour avg.)

SUMMARY OF AIR POLLUTION IN THE BAY AREA - 1997

MONITORING STATIONS	OZONE				CARBON MONOXIDE		NITROGEN DIOXIDE		SULFUR DIOXIDE		PM_{10}		
	MAX HR	NAT'L DAYS*	CAL DAYS*	3-YR AVG	MAX 8-HR	NAT'L DAYS*	MAX HR	CAL DAYS*	MAX 24-HR	CAL DAYS*	ANN GEO MEAN	NAT'L DAYS**	CAL DAYS**
North Counties	(pphm)				(ppm)		(pphm)		(ppb)		(mg/m^3)		
Napa	11	0	0	0.3	3.9	0	8	0	-	-	16.6	0	3
San Rafael	11	0	1	0.0	2.8	0	6	0	-	-	20.3	0	2
Santa Rosa	9	0	0	0.0	3.1	0	6	0	-	-	16.5	0	2
Vallejo	10	0	1	0.3	4.9	0	7	0	6	0	15.6	0	3
Coast & Central Bay	(pphm)				(ppm)		(pphm)		(ppb)		(mg/m^3)		
Oakland	8	0	0	0.0	3.6	0	-	-	-	-	-	-	-
Richmond (7th St)	-	-	-	-	-	-	-	-	11	0	-	-	-
San Francisco	7	0	0	0.0	4.2	0	7	0	6	0	22.5	0	0
San Pablo	11	0	1	0.0	-	-	-	-	-	-	-	-	-
Eastern District	(pphm)				(ppm)		(pphm)		(ppb)		(mg/m^3)		
Bethel Island	10	0	1	0.7	1.5	0	5	0	6	0	19.9	0	2
Concord	10	0	2	1.3	3.0	0	8	0	7	0	17.5	0	2
Fairfield	9	0	0	0.3	-	-	-	-	-	-	-	-	-
Livermore	11	0	3	5.0	2.5	0	8	0	-	-	22.0	0	2
Martinez	-	-	-	-	-	-	-	-	7	0	-	-	-
Pittsburg	8	0	0	0.0	3.2	0	7	0	7	0	-	-	-
South Central Bay	(pphm)				(ppm)		(pphm)				(mg/m^3)		
Fremont	11	0	2	0.7	3.0	0	9	0	-	-	21.8	0	1
Hayward	11	0	2	0.7	-	-	-	-	-	-	-	-	-
Mountain View	10	0	1	0.0	-	-	-	-	-	-	-	-	-
Redwood City	9	0	0	0.3	3.8	0	8	0	-	-	22.3	0	2
San Leandro	10	0	3	1.0	-	-	-	-	-	-	15.9	0	1
Santa Clara Valley	(pphm)				(ppm)		(pphm)				(mg/m^3)		
Gilroy	10	0	1	0.3	-	-	-	-	-	-	-	-	-
Los Gatos	11	0	1	1.7	-	-	-	-	-	-	-	-	-
San Jose, 4th Street	7	0	0	0.3	5.8	0	12	0	-	-	23.7	0	3
San Jose East	9	0	1	1.0	-	-	-	-	-	-	19.3	0	0
San Jose, Moorpark	-	-	-	-	-	-	-	-	-	-	18.4	0	3
San Jose, Tully Road	-	-	-	-	-	-	-	-	-	-	21.3	0	3
San Martin	11	0	0	0.3	-	-	-	-	-	-	-	-	-
District Calendar Days Over Standard		**0**	**8**			**0**		**0**		**0**		**0**	**4**

* Days Over Standard pphm = parts per hundred million ppm = parts per million ppb = parts per billion

** PM_{10} is sampled every sixth day. *Actual* days over standard can be estimated as six times the number shown.

HEALTH-BASED AMBIENT AIR QUALITY STANDARDS

	CALIFORNIA STANDARD	NATIONAL STANDARD
OZONE	9 pphm (1-hour avg.)	12 pphm (1-hour avg.)
CARBON MONOXIDE	9 ppm (8-hour avg.)	9 ppm (8-hour avg.)
NITROGEN DIOXIDE	25 pphm (1-hour avg.)	
SULFUR DIOXIDE	50 ppb (24-hour avg.)	140 ppb (24-hour avg.)
PARTICULATES <10 MICRONS	30 mg/m^3 (ann. geo. mean); 50 mg/m^3 (24-hour avg.)	150 mg/m^3 (24-hour avg.)

SUMMARY OF AIR POLLUTION IN THE BAY AREA - 1998

MONITORING STATIONS	OZONE				CARBON MONOXIDE		NITROGEN DIOXIDE		SULFUR DIOXIDE		PM_{10}		
	MAX HR	NAT'L DAYS	CAL DAYS	3-YR AVG	MAX 8-HR	NAT'L DAYS	MAX HR	CAL DAYS	MAX 24-HR	CAL DAYS	ANN GEO MEAN	NAT'L DAYS	CAL DAYS
North Counties	(pphm)				(ppm)		(pphm)		(ppb)		($\mu g/m^3$)		
Napa	13	1	3	0.3	3.9	0	6	0	-	-	15.6	0	1
San Rafael	7	0	0	0.0	3.3	0	6	0	-	-	18.7	0	1
Santa Rosa	7	0	0	0.0	3.2	0	6	0	-	-	16.6	0	1
Vallejo	12	0	3	0.0	5.3	0	6	0	6	0	15.0	0	1
Coast & Central Bay													
Oakland	6	0	0	0.0	4.6	0	-	-	-	-	-	-	-
San Francisco	5	0	0	0.0	4.0	0	8	0	6	0	20.1	0	1
San Pablo	7	0	0	0.0	2.4	0	6	0	8	0	-	-	0
Eastern District													
Bethel Island	12	0	10	0.3	1.6	0	5	0	9	0	17.5	0	2
Concord	15	2	13	1.0	3.8	0	7	0	9	0	16.6	0	1
Fairfield	12	0	9	0.0	-	-	-	-	-	-	-	-	-
Livermore	15	6	21	4.7	2.4	0	7	0	-	-	19.4	0	2
Martinez	-	-	-	-	-	-	-	-	7	0	-	-	-
Pittsburg	10	0	4	0.0	2.7	0	6	0	14	0	-	-	-
South Central Bay													
Fremont	12	0	7	0.0	2.8	0	10	0	-	-	20.2	0	1
Hayward	10	0	4	0.0	-	-	-	-	-	-	-	-	-
Mountain View	10	0	2	0.0	-	-	-	-	-	-	-	-	-
Redwood City	7	0	0	0.0	4.1	0	6	0	-	-	20.7	0	0
San Leandro	11	0	2	0.0	-	-	-	-	-	-	-	0	0
Santa Clara Valley													
Gilroy	14	2	10	0.7	-	-	-	-	-	-	-	-	-
Los Gatos	13	1	5	0.7	-	-	-	-	-	-	-	-	-
San Jose, 4th Street	15	1	4	0.3	6.0	0	8	0	-	-	22.5	0	3
San Jose East	13	1	5	0.3	-	-	-	-	-	-	-	0	1
San Jose, Tully Road	-	-	-	-	-	-	-	-	-	-	19.6	0	1
San Martin	14	3	15	1.0	-	-	-	-	-	-	-	-	-
Bay Area Calendar Days over Standard		8	29			0		0		0		0	5

Explanation of Terms

MAX HR / MAX 8-HR / MAX 24-HR
The highest average contaminant concentration over a one-hour period, an eight-hour period, or a 24-hour period.

NAT'L DAYS
The number of days during the year for which the monitoring station recorded contaminant concentration levels in excess of the national standard.

CAL DAYS
The number of days during the year for which the station recorded contaminant levels in excess of the California standard.

3-YR AVG
The average number of days per year in excess of the national ozone standard, based on the previous three-year period. *An average higher than 1.0 means the region will be considered out of attainment by the EPA.*

PM_{10}
Particulate matter under ten microns in size. (PM_{10} is only sampled every sixth day. *Actual* days over standard can be estimated as six times the number shown.)

ANN GEO MEAN
The annual geometric mean concentration level for PM_{10}.

Concentrations

ppm = parts per million
pphm = parts per hundred million
ppb = parts per billion
$\mu g/m^3$ = micrograms per cubic meter

HEALTH-BASED AMBIENT AIR QUALITY STANDARDS

	California Standard	National Standard
Ozone	9 pphm (1-hour avg.)	12 pphm (1-hour avg.)
Carbon Monoxide	9 ppm (8-hour avg.)	9 ppm (8-hour avg.)
Nitrogen Dioxide	25 pphm (1-hour avg.)	—
Sulfur Dioxide	50 ppb (24-hour avg.)	140 ppb (24-hour avg.)
Particulates < 10 microns	30 $\mu g/m^3$ (ann. geo. mean) 50 $\mu g/m^3$ (24-hour avg.)	— 150 $\mu g/m^3$ (24-hour avg.)

BAY AREA AIR POLLUTION SUMMARY — 1999

—See notes of explanation on back of this sheet

MONITORING STATIONS	OZONE							CARBON MONOXIDE			NITROGEN DIOXIDE			SULFUR DIOXIDE			PM_{10}				
	Max 1-Hr	Nat Days	Cal Days	3-Yr Avg	Max 8-Hr	Nat Days	3-Yr Avg	Max 1-Hr	Max 8-Hr	Nat Days	Max 1-Hr	Ann Avg	Cal Days	Max 24-Hr	Ann Avg	Cal Days	Ann Geo Mean	Ann Avg	Max 24-Hr	Nat Days*	Cal Days*
North Counties	(pphm)				(pphm)			(ppm)			(pphm)			(ppb)			($\mu g/m^3$)				
Napa	12	0	4	0.3	9	1	6.6	5.5	4.2	0	9	1.4	0	-	-	-	16.3	18.6	66	0	2
San Rafael	10	0	2	0.0	8	0	5.1	5.6	2.9	0	9	1.8	0	-	-	-	19.5	22.0	76	0	2
Santa Rosa	10	0	1	0.0	8	0	5.4	5.7	3.5	0	7	1.4	0	-	-	-	19.6	21.4	54	0	1
Vallejo	11	0	4	0.0	9	1	6.2	6.6	5.5	0	8	1.4	0	7	1.4	0	16.4	19.5	84	0	3
Coast & Central Bay																					
Oakland	8	0	0	0.0	6	0	4.0	6.4	5.2	0	-		-	-	-	-	-	-	-	-	-
San Francisco	8	0	0	0.0	6	0	4.5	5.4	3.7	0	10	2.1	0	7	2.0	0	22.7	26.4	78	0	6
San Pablo	10	0	1	0.0	7	0	5.0	3.9	2.4	0	7	1.4	0	8	2.2	0	-	-	-	-	-
Eastern District																					
Bethel Island	13	1	5	0.3	10	5	8.0	1.8	1.4	0	5	1.1	0	8	1.4	0	21.2	25.4	101	0	6
Concord	16	2	8	1.4	12	6	8.4	4.9	3.1	0	8	1.8	0	12	1.7	0	18.2	20.9	64	0	3
Crockett	-	-	-	-	-	-	-	-	-	-	-	-	-	34	3.0	0	-	-	-	-	-
Fairfield	13	1	9	0.3	10	4	8.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Livermore	15	2	14	2.7	12	5	8.6	5.2	2.9	0	9	2.0	0	-	-	-	22.7	25.7	87	0	3
Martinez	-	-	-	-	-	-	-	-	-	-	-	-	-	8	1.7	0	-	-	-	-	-
Pittsburg	10	0	2	0.0	9	1	6.8	7.8	3.3	0	9	1.5	0	9	1.8	0	-	-	-	-	-
South Central Bay																					
Fremont	13	1	3	0.3	9	1	6.5	5.6	3.1	0	11	2.2	0	-	-	-	21.9	24.3	88	0	2
Hayward	12	0	4	0.0	9	1	7.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mountain View	11	0	7	0.0	9	1	6.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Redwood City	8	0	0	0.0	6	0	4.9	8.0	3.8	0	10	1.9	0	-	-	-	22.4	25.1	85	0	3
San Leandro	11	0	3	0.0	8	0	6.2	-	-	-	-	-	-	-	-	-	-	-	-	0	-
Santa Clara Valley																					
Gilroy	11	0	3	0.7	8	0	7.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Los Gatos	12	0	4	0.3	10	1	7.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
San Jose, 4th Street	11	0	3	0.3	8	0	6.5	8.8	5.9	0	13	2.6	0	-	-	-	25.3	28.7	114	0	5
San Jose East	12	0	2	0.3	8	0	6.2	-	-	-	-	-	-	-	-	-	-	-	-	0	-
San Jose, Tully Road	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21.7	25.4	97	0	4
San Martin	13	1	7	1.7	10	3	8.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Bay Area Days over Standard		3	20			9				0			0			0				0	12

*Since PM_{10} is only sampled every sixth day, *actual* days over standard can be estimated to be six times the numbers shown.

NOTES

This year we have expanded the Bay Area Air Pollution Summary to include measurements for a more complete set of federal and California time-averaged pollutant standards.

Most significantly, we've added columns for the new EPA eight-hour average ozone standard, proposed in 1997. This standard currently awaits a Supreme Court hearing to determine its final legal status.

Explanation of Terms

State and federal excesses occur when pollutant concentrations surpass the indicated standards, with values in most cases rounded to the same number of decimal places.

MAX HR / MAX 8-HR / MAX 24-HR
The highest average contaminant concentration over a one-hour period, an eight-hour period, or a 24-hour period.

NAT DAYS
The number of days during the year for which the monitoring station recorded contaminant concentration levels in excess of the national standard.

CAL DAYS
The number of days during the year for which the station recorded contaminant levels in excess of the California standard.

3-YR AVG (1-hr ozone standard)
The average number of days per year in excess of the national ozone standard, based on the most recent three-year period. *An average higher than 1.0 means the region will be considered out of attainment by the EPA.*

3-YR AVG (8-hr ozone standard)
The average of the fourth highest 8-hour average ozone concentration for each monitoring station, based on the most recent three-year period. *A concentration greater than 8.5 means that the region will be considered out of attainment by the EPA.*

ANN AVG
The yearly average (arithmetic mean) of the readings taken at a given monitoring station.

ANN GEO MEAN
The annual geometric mean concentration level (used for PM_{10}). The geometric mean of *n* positive numbers is the *n*th root of their product.

PM_{10}
Particulate matter under ten microns in size. (PM_{10} is only sampled every sixth day. *Actual* days over standard can be estimated to be six times the number shown.)

TOTAL BAY AREA DAYS OVER STANDARD is not a sum of excesses at individual stations, but rather of the number of days for which excesses occurred at anyone or more stations.

HEALTH-BASED AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Std	National Std
Ozone	1 Hour	9 pphm	12 pphm
	8 Hour	—	8 pphm
Carbon Monoxide	1 Hour	20 ppm	35 ppm
	8 Hour	9.0 ppm	9 ppm
Nitrogen Dioxide	1 Hour	25 pphm	—
	Annual	—	5.3 pphm
Sulfur Dioxide	24 Hour	40 ppb	140 ppb
	Annual	—	30 ppb
Particulates < 10 microns	24 Hour	50 $\mu g/m^3$	150 $\mu g/m^3$
	Annual	—	50 $\mu g/m^3$
	Annual Geometric Mean	30 $\mu g/m^3$	—

Concentrations | **ppm** parts per million | **pphm** parts per hundred million | **ppb** parts per billion | **$\mu g/m^3$** micrograms per cubic meter

TEN-YEAR BAY AREA AIR QUALITY SUMMARY

YEAR	OZONE			CARBON MONOXIDE				Nitrogen Dioxide	Sulfur Dioxide		PM_{10}	
	1-Hr		8-Hr*	1-Hr		8-Hr		1-Hr	24-Hr		24-Hr	
	Nat	Cal	Nat	Nat	Cal	Nat	Cal	Cal	Nat	Cal	Nat**	Cal**
1990	2	14	-	0	0	2	4	0	0	0	1	15
1991	2	23	-	0	0	4	5	0	0	0	2	18
1992	2	23	-	0	0	0	0	0	0	0	0	18
1993	3	19	-	0	0	0	0	0	0	0	0	10
1994	2	13	-	0	0	0	0	0	0	0	0	9
1995	11	28	-	0	0	0	0	0	0	0	0	7
1996	8	34	-	0	0	0	0	0	0	0	0	3
1997	0	8	-	0	0	0	0	0	0	0	0	4
1998	8	29	16	0	0	0	0	0	0	0	0	5
1999	3	20	9	0	0	0	0	0	0	0	0	12

*EPA promulgated the 8-Hr standard in mid-1997

**PM_{10} is sampled every sixth day—*actual* days over standard can be estimated to be six times the numbers listed.

BAY AREA AIR POLLUTION SUMMARY — 2000

—See notes of explanation on back of this page

MONITORING STATIONS	OZONE							CARBON MONOXIDE			NITROGEN DIOXIDE			SULFUR DIOXIDE			PM_{10}				
	Max 1-Hr	Nat Days	Cal Days	3-Yr Avg*	Max 8-Hr	Nat Days	3-Yr Avg**	Max 1-Hr	Max 8-Hr	Nat/Cal Days	Max 1-Hr	Ann Avg	Nat/Cal Days	Max 24-Hr	Ann Avg	Nat/Cal Days	Ann Geo Mean	Ann Avg	Max 24-Hr	Nat Days***	Cal Days***
North Counties	(pphm)				(pphm)			(ppm)			(pphm)			(ppb)			($\mu g/m^3$)				
Napa	8	0	0	0.3	6	0	6.9	4.7	2.8	0	5	1.2	0	-	-	-	14.7	16.2	45	0	0
San Rafael	7	0	0	0.0	6	0	5.0	4.2	2.3	0	6	1.6	0	-	-	-	18.2	19.5	40	0	0
Santa Rosa	8	0	0	0.0	6	0	5.5	4.5	3.1	0	5	1.3	0	-	-	-	15.9	17.5	46	0	0
Vallejo	8	0	0	0.0	6	0	6.1	6.5	5.1	0	6	1.3	0	5	1.5	0	13.0	15.0	53	0	1
Coast & Central Bay																					
Oakland	7	0	0	0.0	5	0	4.1	5.4	3.4	0	-	-	-	-	-	-	-	-	-	-	-
San Francisco	6	0	0	0.0	4	0	4.4	5.5	3.2	0	7	2.0	0	8	2.4	0	21.7	24.0	63	0	2
San Pablo	8	0	0	0.0	7	0	4.7	2.8	1.9	0	7	1.4	0	7	2.0	0	-	-	-	-	-
Eastern District																					
Bethel Island	12	0	1	0.3	9	1	8.4	2.3	1.5	0	4	1.0	0	7	1.6	0	17.5	20.0	62	0	1
Concord	14	1	2	1.7	9	1	8.4	4.5	2.7	0	7	1.6	0	4	1.6	0	16.2	17.8	54	0	1
Crockett	-	-	-	-	-	-	-	-	-	-	-	-	-	24	2.5	0	-	-	-	-	-
Fairfield	10	0	1	0.3	8	0	8.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Livermore	15	2	7	3.3	11	2	8.7	4.5	2.7	0	7	1.7	0	-	-	-	19.4	21.8	71	0	2
Martinez	-	-	-	-	-	-	-	-	-	-	-	-	-	5	1.1	0	-	-	-	-	-
Pittsburg	11	0	1	0.0	8	0	7.2	4.9	2.7	0	5	1.3	0	7	1.7	0	13.9	16.4	56	0	2
South Central Bay																					
Fremont	10	0	2	0.3	8	0	6.3	4.6	2.7	0	8	2.0	0	-	-	-	19.4	21.5	58	0	1
Hayward	11	0	1	0.0	8	0	6.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mountain View[1]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Redwood City	8	0	0	0.0	6	0	4.7	9.8	4.4	0	7	1.8	0	-	-	-	19.1	21.2	53	0	1
San Leandro	10	0	1	0.0	6	0	5.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Santa Clara Valley																					
Gilroy[1]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Los Gatos	8	0	0	0.3	7	0	7.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
San Jose, 4th Street	7	0	0	0.3	6	0	6.2	8.4	6.3	0	11	2.5	0	-	-	-	23.8	26.7	76	0	7
San Jose East	10	0	1	0.3	7	0	6.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
San Jose, Tully Road	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18.4	21.5	69	0	2
San Martin	11	0	4	1.3	10	1	8.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Bay Area Days over Standard		3	12			4				0			0			0				0	7

[1] Out of service in 2000 (see Notes on back)

*Average number of days of exceedence (see Notes on back)

**Average of the fourth highest concentration (see Notes on back)

***PM_{10} measurements are based on a one in every six days sampling schedule, for a total of approximately 60 samples per year.

NOTES

The annual Bay Area Air Pollution Summary summarizes measurements for the national and California time-averaged pollutant standards.

The national eight-hour average ozone standard, proposed in 1997, was remanded by the US Supreme Court to EPA in April 2001 pending the development of a new ozone implementation policy.

The Mountain View station was closed on November 30, 1999. It was replaced by a new monitoring station in Sunnyvale in 2001. The Gilroy station was closed for the year 2000 due to construction activity, but was reactivated in 2001.

Explanation of Terms

State and national excesses occur when pollutant concentrations surpass the indicated standards, with values in most cases rounded to the same number of decimal places.

MAX HR / MAX 8-HR / MAX 24-HR
The highest average contaminant concentration over a one-hour period, an eight-hour period, or a 24-hour period.

NAT DAYS
The number of days during the year for which the monitoring station recorded contaminant concentration levels in excess of the national standard.

CAL DAYS
The number of days during the year for which the station recorded contaminant levels in excess of the California standard.

3-YR AVG (1-hr ozone standard)
The average number of days per year in excess of the national ozone standard, based on the most recent three-year period. *An average higher than 1.0 means the region will be considered out of attainment by the EPA.*

3-YR AVG (8-hr ozone standard)
The average of the fourth highest 8-hour average ozone concentration for each monitoring station, based on the most recent three-year period. *A concentration greater than 8.5 means that the region will be considered out of attainment by the EPA.*

ANN AVG
The yearly average (arithmetic mean) of the readings taken at a given monitoring station.

ANN GEO MEAN
The annual geometric mean concentration level (used for PM_{10}). The geometric mean of *n* positive numbers is the *n*th root of their product.

PM_{10}
Particulate matter ten microns or smaller in size. PM_{10} measurements are based on a one in every six days sampling schedule, for a total of approximately 60 samples per year.

TOTAL BAY AREA DAYS OVER STANDARD is not a sum of excesses at individual stations, but rather of the number of days for which excesses occurred at any one or more stations.

HEALTH-BASED AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Std	National Std
Ozone	1 Hour	9 pphm	12 pphm
	8 Hour	—	8 pphm
Carbon Monoxide	1 Hour	20 ppm	35 ppm
	8 Hour	9.0 ppm	9 ppm
Nitrogen Dioxide	1 Hour	25 pphm	—
	Annual	—	5.3 pphm
Sulfur Dioxide	24 Hour	40 ppb	140 ppb
	Annual	—	30 ppb
Particulates < 10 microns	24 Hour	50 $\mu g/m^3$	150 $\mu g/m^3$
	Annual	—	50 $\mu g/m^3$
	Annual Geometric Mean	30 $\mu g/m^3$	—

Concentrations | **ppm** parts per million | **pphm** parts per hundred million | **ppb** parts per billion | **$\mu g/m^3$** micrograms per cubic meter

TEN-YEAR BAY AREA AIR QUALITY SUMMARY

YEAR	OZONE			CARBON MONOXIDE				Nitrogen Dioxide	Sulfur Dioxide		PM_{10}	
	1-Hr		8-Hr*	1-Hr		8-Hr		1-Hr	24-Hr		24-Hr	
	Nat	Cal	Nat	Nat	Cal	Nat	Cal	Cal	Nat	Cal	Nat**	Cal**
1991	2	23	-	0	0	4	5	0	0	0	2	18
1992	2	23	-	0	0	0	0	0	0	0	0	18
1993	3	19	-	0	0	0	0	0	0	0	0	10
1994	2	13	-	0	0	0	0	0	0	0	0	9
1995	11	28	-	0	0	0	0	0	0	0	0	7
1996	8	34	-	0	0	0	0	0	0	0	0	3
1997	0	8	-	0	0	0	0	0	0	0	0	4
1998	8	29	16	0	0	0	0	0	0	0	0	5
1999	3	20	9	0	0	0	0	0	0	0	0	12
2000	3	12	4	0	0	0	0	0	0	0	0	7

*EPA proposed the 8-Hr standard in mid-1997 and it was remanded by the Supreme Court in 2001.

**PM_{10} measurements are based on a one in every six days sampling schedule, for a total of approximately 60 samples per year.

SAN JOSE, CALIFORNIA

Station Metadata

From NCDC Station Historical Listing for NWS Cooperative Network
ObsTyp: t-Temperature-1, p-Daily precip-2, w-(blank), s-(blank), e-Evap-5
h-Hourly precip - 6 0.01" Universal, or - 7 0.10" Fisher-Porter
U - Observed, but beginning date is uncertain

Count	Number (Coop)	Station Name (From NCDC listing)	Lat ddmm	Long dddmm	Elev ftx10	Start yy mm	ObsTyp t p w s e h	End yy mm
2507	047821-4	SAN JOSE	3720	12153	0010	31 01		33 07
2508	047821-4	SAN JOSE	3720	12153	0010	49 05		58 04
2509	047821-4	SAN JOSE	3721	12154	0007	58 04	1 2	6 64 10
2510	047821-4	SAN JOSE	3721	12154	0007	64 10	1 2	6 83 09
2511	047821-4	SAN JOSE	3721	12154	0007	83 09	1 2	7 99 99

SAN JOSE, CALIFORNIA (047821)

Period of Record Monthly Climate Summary

Period of Record : 7/ 1/1948 to 12/31/2001

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	57.9	62.0	65.3	69.9	74.3	79.2	82.1	81.8	80.7	74.6	65.1	58.0	70.9
Average Min. Temperature (F)	41.3	44.1	45.6	47.5	51.1	54.6	56.7	56.8	56.0	51.8	45.9	41.5	49.4
Average Total Precipitation (in.)	3.06	2.49	2.31	1.06	0.40	0.09	0.04	0.09	0.21	0.73	1.73	2.28	14.49
Average Total SnowFall (in.)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Average Snow Depth (in.)	0	0	0	0	0	0	0	0	0	0	0	0	0

Percent of possible observations for period of record.
Max. Temp.: 98.2% Min. Temp.: 98% Precipitation: 98.5% Snowfall: 98.6% Snow Depth: 98.6%
Check Station Metadata or Metadata graphics for more detail about data completeness.

Western Regional Climate Center, wrcc@dri.edu

SAN JOSE, CALIFORNIA

Period of Record General Climate Summary - Temperature

Station:(047821) SAN JOSE

From Year=1948 To Year=2000

	Monthly Averages			Daily Extremes				Monthly Extremes				Max. Temp.	
	Max.	Min.	Mean	High	Date	Low	Date	Highest Mean	Year	Lowest Mean	Year	>= 90 F	<= 32
	F	F	F	F	dd/yyyy or yyyymmdd	F	dd/yyyy or yyyymmdd	F	-	F	-	# Days	# Da
January	57.9	41.3	49.6	79	08/1962	24	11/1949	54.5	86	42.6	49	0.0	0
February	62.0	44.1	53.1	81	26/1986	26	07/1989	59.0	63	48.5	49	0.0	0
March	65.3	45.6	55.4	84	31/1966	30	03/1966	59.5	93	51.4	85	0.0	0
April	69.9	47.5	58.7	95	09/1989	35	11/1965	63.9	89	50.9	67	0.4	0
May	74.3	51.1	62.6	101	27/1984	37	04/1952	69.7	97	58.2	77	1.5	0
June	79.2	54.6	66.9	109	14/2000	42	02/1966	72.2	81	62.8	52	3.6	0
July	82.1	56.7	69.4	108	14/1972	47	05/1955	73.6	96	65.5	55	4.1	0
August	81.8	56.8	69.3	105	01/1993	47	22/1973	74.4	98	65.5	54	3.9	0
September	80.7	56.0	68.3	104	14/1971	42	26/1948	72.9	97	64.9	65	3.9	0
October	74.6	51.8	63.2	101	05/1987	36	20/1949	67.2	92	59.1	71	1.1	0
November	65.1	45.9	55.5	85	03/1950	21	16/1976	60.7	50	50.2	94	0.0	0
December	58.0	41.5	49.7	79	12/1958	19	22/1990	55.7	58	43.9	90	0.0	0
Annual	70.9	49.4	60.2	109	20000614	19	19901222	63.0	97	58.1	75	18.4	0
Winter	59.3	42.3	50.8	81	19860226	19	19901222	54.4	96	46.0	49	0.0	0
Spring	69.8	48.1	58.9	101	19840527	30	19660303	63.8	97	55.5	67	1.8	0
Summer	81.1	56.0	68.5	109	20000614	42	19660602	72.1	96	65.9	55	11.6	0
Fall	73.4	51.2	62.3	104	19710914	21	19761116	65.0	95	59.5	75	5.0	0

Table updated on Jun 4, 2001

For monthly and annual means, thresholds, and sums:
Months with 5 or more missing days are not considered
Years with 1 or more missing months are not considered
Seasons are climatological not calendar seasons

Winter = Dec., Jan., and Feb. Spring = Mar., Apr., and May

Summer = Jun., Jul., and Aug. Fall = Sep., Oct., and Nov.

SAN JOSE, CALIFORNIA

Period of Record General Climate Summary - Precipitation

Station:(047821) SAN JOSE

From Year=1948 To Year=2000

	Precipitation											Total Snowfall		
	Mean	High	Year	Low	Year	1 Day Max.		>= 0.01 in.	>= 0.10 in.	>= 0.50 in.	>= 1.00 in.	Mean	High	Year
	in.	in.	-	in.	-	in.	dd/yyyy or yyyymmdd	# Days	# Days	# Days	# Days	in.	in.	-
January	3.06	8.66	95	0.17	84	3.60	30/1968	10	6	2	1	0.0	0.0	49
February	2.49	10.23	98	0.02	53	2.23	03/1998	9	6	2	0	0.0	0.5	76
March	2.31	6.85	95	0.05	55	1.91	09/1995	9	6	1	0	0.0	0.1	69
April	1.06	3.90	83	0.00	49	1.46	28/1983	5	3	1	0	0.0	0.0	49
May	0.40	2.38	90	0.00	62	1.62	27/1990	3	1	0	0	0.0	0.0	49
June	0.09	0.84	95	0.00	49	0.79	16/1995	1	0	0	0	0.0	0.0	49
July	0.04	0.75	80	0.00	48	0.75	02/1980	0	0	0	0	0.0	0.0	48
August	0.09	1.96	68	0.00	48	1.92	21/1968	0	0	0	0	0.0	0.0	48
September	0.21	2.04	59	0.00	48	2.00	18/1959	1	1	0	0	0.0	0.0	48
October	0.73	4.59	62	0.00	54	3.22	13/1962	3	2	0	0	0.0	0.0	48
November	1.73	6.18	70	0.00	56	2.42	29/1970	7	4	1	0	0.0	0.0	48
December	2.28	9.26	55	0.04	89	1.90	22/1955	9	5	2	0	0.0	0.0	48
Annual	14.49	32.57	83	6.12	53	3.60	19680130	58	33	9	2	0.0	0.5	76
Winter	7.83	16.89	98	1.84	76	3.60	19680130	28	17	5	1	0.0	0.5	76
Spring	3.77	10.45	83	0.58	72	1.91	19950309	18	10	2	0	0.0	0.1	69
Summer	0.21	1.96	68	0.00	50	1.92	19680821	2	1	0	0	0.0	0.0	49
Fall	2.67	8.27	72	0.05	95	3.22	19621013	11	6	2	0	0.0	0.0	48

Table updated on Jun 4, 2001

For monthly and annual means, thresholds, and sums:
Months with 5 or more missing days are not considered
Years with 1 or more missing months are not considered
Seasons are climatological not calendar seasons

Winter = Dec., Jan., and Feb. Spring = Mar., Apr., and May

Summer = Jun., Jul., and Aug. Fall = Sep., Oct., and Nov.

SAN JOSE, CALIFORNIA

NCDC 1971-2000 Monthly Normals

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Monthly
Mean Max. Temperature (F)	59.3	63.4	67.0	72.1	76.7	81.8	84.3	84.0	82.2	75.9	65.3	58.9	72.6
Highest Mean Max. Temperature (F)	63.2	67.9	72.3	78.0	82.5	88.0	88.9	89.0	88.1	79.5	70.3	63.1	89.0
Year Highest Occurred	1986	1988	1988	1987	1997	1981	1984	1998	1984	1992	1995	1999	1998
Lowest Mean Max. Temperature (F)	55.4	59.3	60.9	66.0	69.1	75.7	80.3	80.0	77.5	72.2	58.7	54.3	54.3
Year Lowest Occurred	1985	1998	1999	1975	1998	1982	1987	1991	1986	2000	1994	1972	1972
Mean Temperature (F)	50.5	54.0	56.7	60.2	64.3	68.6	70.9	70.9	69.5	64.1	55.5	50.0	61.3
Highest Mean Temperature (F)	55.1	57.5	60.2	64.7	69.7	73.4	74.2	74.4	73.0	67.7	59.9	54.7	74.4
Year Highest Occurred	1986	1991	1993	1989	1997	1981	1984	1998	1984	1992	1995	1983	1998
Lowest Mean Temperature (F)	46.2	50.3	52.2	54.4	59.3	65.0	68.3	68.6	66.1	59.9	50.2	44.4	44.4
Year Lowest Occurred	1985	1989	1985	1975	1977	1982	1987	1973	1986	1971	1994	1990	1990
Mean Min. Temperature (F)	41.7	44.6	46.4	48.3	51.8	55.4	57.5	57.7	56.7	52.3	45.6	41.0	49.9
Highest Mean Min. Temperature (F)	48.8	48.8	50.5	52.3	56.9	58.8	60.9	61.0	60.2	56.7	50.5	48.4	61.0
Year Highest Occurred	1995	1996	1993	1992	1997	1981	1995	1990	1997	1987	1981	1983	1990
Lowest Mean Min. Temperature (F)	36.3	39.6	42.1	42.7	48.1	52.7	54.5	53.2	53.6	46.6	41.7	34.0	34.0
Year Lowest Occurred	1976	1974	1985	1975	1974	1980	1975	1975	1975	1971	1994	1990	1990
Mean Precipitation (in.)	3.03	2.84	2.69	1.02	0.44	0.10	0.06	0.07	0.23	0.87	1.73	2.00	15.08
Highest Precipitation (in.)	8.66	10.23	6.85	3.90	2.38	0.84	0.75	0.71	1.04	2.22	5.48	4.71	10.23
Year Highest Occurred	1995	1998	1995	1983	1990	1995	1980	1976	1982	1973	1972	1995	1998
Lowest Precipitation (in.)	0.17	0.14	0.06	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.04	0.00
Year Lowest													

Occurred	1984	1997	1988	1977	1992	1998	2000	1999	1997	1995	1995	1989	1992
Heating Degree Days (F)	450.	308.	267.	170.	95.	24.	4.	2.	13.	82.	289.	467.	2171.
Cooling Degree Days (F)	0.	0.	9.	25.	72.	131.	188.	183.	146.	54.	3.	0.	811.

Western Regional Climate Center, wrcc@dri.edu

SANTA CLARA UNIVERSITY, CALIFORNIA

Station Metadata

From NCDC Station Historical Listing for NWS Cooperative Network
ObsTyp: t-Temperature-1, p-Daily precip-2, w-(blank), s-(blank), e-Evap-5
h-Hourly precip - 6 0.01" Universal, or - 7 0.10" Fisher-Porter
U - Observed, but beginning date is uncertain

Count	Number (Coop)	Station Name (From NCDC listing)	Lat ddmm	Long dddmm	Elev ftx10	Start yy mm	ObsTyp t	p	w	s	e	h	End yy mm
2577	047912-4	SANTA CLARA UNIVERSITY	3721	12156	0009	31 01	U	U					76 07

SANTA CLARA UNIVERSITY, CALIFORNIA (047912)

Period of Record Monthly Climate Summary

Period of Record : 1/ 3/1931 to 5/31/1976

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	58.2	62.1	65.8	70.1	74.9	79.2	82.0	81.8	81.3	75.1	66.0	58.6	71.3
Average Min. Temperature (F)	38.7	41.5	42.9	44.7	48.6	51.7	54.1	53.8	52.4	48.4	42.9	40.0	46.6
Average Total Precipitation (in.)	2.78	2.45	2.09	1.14	0.33	0.06	0.01	0.05	0.13	0.70	1.57	2.72	14.04
Average Total SnowFall (in.)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Average Snow Depth (in.)	0	0	0	0	0	0	0	0	0	0	0	0	0

Percent of possible observations for period of record.
Max. Temp.: 97.4% Min. Temp.: 97.3% Precipitation: 98.9% Snowfall: 60.4% Snow Depth: 60.4%
Check Station Metadata or Metadata graphics for more detail about data completeness.

Western Regional Climate Center, wrcc@dri.edu

SANTA CLARA UNIVERSITY, CALIFORNIA

Period of Record General Climate Summary - Temperature

Station:(047912) SANTA CLARA UNIVERSITY

From Year=1931 To Year=1976

	Monthly Averages			Daily Extremes				Monthly Extremes				Max. Temp.	
	Max.	Min.	Mean	High	Date	Low	Date	Highest Mean	Year	Lowest Mean	Year	>= 90 F	<= 32
	F	F	F	F	dd/yyyy or yyyymmdd	F	dd/yyyy or yyyymmdd	F	-	F	-	# Days	# Da
January	58.2	38.7	48.5	79	23/1948	19	09/1937	53.3	70	41.2	49	0.0	0
February	62.1	41.5	51.8	89	20/1972	24	02/1950	58.0	63	47.6	56	0.0	0
March	65.8	42.9	54.4	88	16/1972	29	02/1953	60.3	34	50.3	45	0.0	0
April	70.1	44.7	57.4	94	20/1931	31	09/1933	62.2	66	51.4	75	0.2	0
May	74.9	48.6	61.7	102	12/1976	36	03/1933	65.6	70	56.9	33	1.6	0
June	79.2	51.7	65.4	108	02/1960	40	02/1933	69.9	60	61.8	33	2.9	0
July	82.0	54.1	68.0	109	14/1972	43	07/1935	70.5	72	65.3	47	3.7	0
August	81.8	53.8	67.8	102	11/1937	42	14/1938	71.0	67	65.0	49	3.1	0
September	81.3	52.4	66.9	106	09/1944	38	30/1950	70.2	67	63.8	33	4.2	0
October	75.1	48.4	61.8	96	05/1933	30	28/1946	65.4	59	56.8	75	1.0	0
November	66.0	42.9	54.5	87	10/1955	24	07/1946	59.2	50	50.4	47	0.0	0
December	58.6	40.0	49.3	78	07/1934	20	13/1932	53.8	69	44.6	32	0.0	0
Annual	71.3	46.6	59.0	109	19720714	19	19370109	60.7	70	56.3	75	16.7	0
Winter	59.7	40.1	49.9	89	19720220	19	19370109	54.2	70	44.8	49	0.0	0
Spring	70.3	45.4	57.8	102	19760512	29	19530302	61.4	34	54.8	75	1.8	0
Summer	81.0	53.2	67.1	109	19720714	40	19330602	69.6	61	64.9	75	9.7	0
Fall	74.2	47.9	61.0	106	19440909	24	19461107	64.5	67	57.1	75	5.1	0

Table updated on Jun 4, 2001

For monthly and annual means, thresholds, and sums:
Months with 5 or more missing days are not considered
Years with 1 or more missing months are not considered
Seasons are climatological not calendar seasons

Winter = Dec., Jan., and Feb. Spring = Mar., Apr., and May

Summer = Jun., Jul., and Aug. Fall = Sep., Oct., and Nov.

SANTA CLARA UNIVERSITY, CALIFORNIA

Period of Record General Climate Summary - Precipitation

Station:(047912) SANTA CLARA UNIVERSITY

From Year=1931 To Year=1976

	Precipitation											Total Snowfall		
	Mean	High	Year	Low	Year	1 Day Max.		>= 0.01 in.	>= 0.10 in.	>= 0.50 in.	>= 1.00 in.	Mean	High	Year
	in.	in.	-	in.	-	in.	dd/yyyy or yyyymmdd	# Days	# Days	# Days	# Days	in.	in.	-
January	2.78	6.29	52	0.11	47	3.79	30/1968	10	6	2	0	0.0	0.0	49
February	2.45	6.83	73	0.08	53	1.88	09/1962	9	6	2	0	0.0	0.0	49
March	2.09	6.24	37	0.00	34	2.72	21/1937	8	5	1	0	0.0	0.0	49
April	1.14	4.04	58	0.00	49	1.43	04/1941	5	3	1	0	0.0	0.0	49
May	0.33	1.19	57	0.00	35	0.92	24/1931	3	1	0	0	0.0	0.0	49
June	0.06	0.44	34	0.00	32	0.24	02/1936	1	0	0	0	0.0	0.0	49
July	0.01	0.21	66	0.00	31	0.21	30/1966	0	0	0	0	0.0	0.0	48
August	0.05	0.66	68	0.00	31	0.65	18/1975	0	0	0	0	0.0	0.0	48
September	0.13	2.34	59	0.00	31	2.26	18/1959	1	0	0	0	0.0	0.0	48
October	0.70	4.16	62	0.00	32	3.42	13/1962	3	2	0	0	0.0	0.0	48
November	1.57	6.03	70	0.00	33	2.12	29/1970	6	4	1	0	0.0	0.0	48
December	2.72	10.85	55	0.18	75	3.29	23/1955	9	6	2	0	0.0	0.0	48
Annual	14.04	25.34	41	6.65	53	3.79	19680130	55	32	9	2	0.0	0.0	49
Winter	7.95	16.22	41	1.83	76	3.79	19680130	28	17	5	1	0.0	0.0	49
Spring	3.55	9.38	58	0.46	72	2.72	19370321	16	9	2	1	0.0	0.0	49
Summer	0.13	0.82	75	0.00	32	0.65	19750818	1	0	0	0	0.0	0.0	49
Fall	2.41	8.64	72	0.43	32	3.42	19621013	10	6	2	0	0.0	0.0	48

Table updated on Jun 4, 2001

For monthly and annual means, thresholds, and sums:
Months with 5 or more missing days are not considered
Years with 1 or more missing months are not considered
Seasons are climatological not calendar seasons

Winter = Dec., Jan., and Feb. Spring = Mar., Apr., and May

Summer = Jun., Jul., and Aug. Fall = Sep., Oct., and Nov.