SAT Initiative: Bright Kids Montessori Academy (Santa Anita Christian Academy) (El Monte, CA)

This document describes the analysis of air monitoring and other data collected under EPA's initiative to assess potentially elevated air toxics levels at some of our nation's schools. The document has been prepared for technical audiences (e.g., risk assessors, meteorologists) and their management. It is intended to describe the technical analysis of data collected for this school in clear, but generally technical, terms. A summary of this analysis is presented on the page focused on this school on EPA's website (www.epa.gov/schoolair).

I. Executive Summary

- Air monitoring has been conducted at Bright Kids Montessori Academy (formerly Santa Anita Christian Academy) as part of the EPA initiative to monitor specific air toxics in the outdoor air around priority schools in 22 states and 2 tribal areas.
- This school was selected for monitoring based on information indicating the potential for elevated ambient concentrations of acrolein, lead, and naphthalene in air outside the schoo1due to mobile source emissions. That information was obtained from EPA's 2002 National-Scale Air Toxics Assessment (NATA) model, which indicated potential elevated levels of lead and naphthalene from a nearby general aviation airport, and potential elevated levels of acrolein and naphthalene from mobile source emissions from Santa Anita Boulevard (6-8 lane boulevard). EPA's lead emission estimate for this airport does not exceed the inventory threshold that would have made it a candidate for lead monitoring to evaluate compliance with the NAAQS for lead (http://www.epa.gov/ttn/naaqs/pb/index.html).
- Leaded aviation gasoline is utilized in general aviation aircraft with piston engines, which are generally used for instructional flying, air taxi activities, and personal transportation. Lead is not used in jet fuel, the fuel utilized by most commercial aircraft. Information regarding lead emissions from piston-engine aircraft can be found at: www.epa.gov/otaq/aviation.htm.
- Air monitoring was performed from August 5, 2009 to February 28, 2010 for the following pollutants: acrolein and other volatile organic compounds (VOC), lead in total suspended particles (TSP), and naphthalene and other polycyclic aromatic hydrocarbons (PAH).
- Measured levels of naphthalene and associated longer-term concentration estimates are below the levels of concern that had been suggested by the 2002 NATA modeling information prior to sampling. The most recently available naphthalene emissions data for the general aviation airport source (NATA 2005) are lower than those relied upon in previous modeling analysis for this area (NATA 2002). Although they were below the levels of significant concern that had been suggested by the modeling information, these results indicate the influence of mobile source pollutants of concern that are the focus of EPA actions nationwide. Levels of lead, a pollutant for which there are national standards for ambient air, are below the level of the national standard for protection of public health.

- EPA remains concerned about mobile source emissions and continues to work to reduce those emissions across the country, through national rules and by providing information and suggestions to assist with reductions in local areas (http://www.epa.gov/schoolair/mobile.html).
- The levels of lead (TSP) and naphthalene measured in the outdoor air at this school indicate possible influence of nearby sources which include mobile sources and the general aviation airport.
- EPA will not use the acrolein data in evaluating the potential for health concerns from exposure to air toxics in outdoor air as part of the School Air Toxics Monitoring project (SAT). The Agency made this determination after results of a short-term laboratory study raised questions about the consistency and reliability of monitoring results of acrolein. Since that time, EPA has identified several steps that we believe will improve the accuracy of future acrolein sampling and continue to work towards a better method. (More information is available at http://www.epa.gov/schoolair/acrolein.html.)
- Results for other air toxics monitored do not indicate levels of concern.
- Based on the analysis described here, EPA will not extend air toxics monitoring at this school as all pollutant levels were below levels of concern. EPA's ongoing research and national air toxics monitoring programs (e.g., the National Air Toxics Trends Stations) will continue to collect information on mobile source impacts on outdoor air nationally.
- The South Coast AQMD will continue to oversee industrial facilities in the area through air toxic permits, inspection and monitoring programs, and the California Air Resources Board (CARB) will continue mobile source reduction programs for California.

II. Background on this Initiative

As part of an EPA initiative to implement Administrator Lisa Jackson's commitment to assess potentially elevated air toxics levels at some of our nation's schools, EPA and state and local air pollution control agencies monitored specific (key) air toxics in the outdoor air around priority schools in 22 states and 2 tribal areas (http://www.epa.gov/schoolair/schools.html).

- The schools selected for monitoring included some schools that are near large industries that are sources of air toxics, and some schools that are in urban areas, where emissions of air toxics come from a mix of large and small industries, cars, trucks, buses and other sources.
- EPA selected schools based on information available to us about air pollution in the vicinity of the school, including results of the 2002 National-Scale Air Toxics Assessment (NATA), results from a 2008 USA Today analysis on air toxics at schools, and information from state and local air agencies. The analysis by USA Today involved use of EPA's Risk Screening Environmental Indicators tool and Toxics Release Inventory (TRI) for 2005.
  - Available information had raised some questions about air quality near these schools that EPA concluded merited investigation. In many cases, the information indicated that estimated long-term average concentrations of one or

more air toxics were above the upper end of the range that EPA generally considers as acceptable (e.g., above 1-in-10,000 cancer risk for carcinogens).

- Monitors were placed at each school for approximately 60 days, and took air samples on at least 10 different days during that time. The samples were analyzed for specific air toxics identified for monitoring at the school (i.e., key pollutants).[1]
- These monitoring results and other information collected at each school during this initiative allow us to:
  - assess specific air toxics levels occurring at these sites and associated estimates of longer-term concentrations in light of health risk-based criteria for long-term exposures,
  - better understand, in many cases, potential contributions from nearby sources to key air toxics concentrations at the schools,
  - consider what next steps might be appropriate to better understand and address air toxics at the school, and
  - improve the information and methods we will use in the future (e.g., NATA) for estimating air toxics concentrations in communities across the U.S.

Assessment of air quality under this initiative is specific to the air toxics identified for monitoring at each school. This initiative is being implemented in addition to ongoing state, local and national air quality monitoring and assessment activities, including those focused on criteria pollutants (e.g., ozone and particulate matter) or existing, more extensive, air toxics programs.

Several technical documents prepared for this project provide further details on aspects of monitoring and data interpretation and are available on the EPA website (e.g., www.epa.gov/schoolair/techinfo.html). The full titles of these documents are provided here:

- *School Air Toxics Ambient Monitoring Plan*
- *Quality Assurance Project Plan For the EPA School Air Toxics Monitoring Program*
- *Schools Air Toxics Monitoring Activity (2009), Uses of Health Effects Information in Evaluating Sample Results*

Information on health effects of air toxics being monitored[2] and educational materials describing risk concepts[3] are also available from EPA's website.

III. Basis for Selecting this School and the Air Monitoring Conducted

This school was selected for monitoring in consultation with the local air agency, the South Coast Air Quality Management Division (South Coast AQMD). We were interested in evaluating the ambient concentrations of acrolein, lead (TSP), and naphthalene in air outside Bright Kids Montessori Academy (Santa Anita Christian Academy) because EPA's 2002 National-Scale Air Toxics Assessment (NATA) indicated potential elevated levels of lead and

[1] In analyzing air samples for these key pollutants, samples are also being analyzed for some additional pollutants that are routinely included in the analytical methods for the key pollutants.
[2] For example, http://www.epa.gov/schoolair/pollutants.html, http://www.epa.gov/ttn/fera/risk_atoxic.html.
[3] For example, http://www.epa.gov/ttn/atw/3_90_022.html, http://www.epa.gov/ttn/atw/3_90_024.html.

naphthalene from a nearby general aviation airport (Figure 1), and potential elevated levels of acrolein and naphthalene from on-road mobile sources such as Santa Anita Boulevard, a 6-8 lane boulevard.

Lead may come from several different sources. Some of the lead modeled for this study was based on lead emissions from leaded aviation gasoline utilized in general aviation aircraft with piston engines, which are generally used for instructional flying, air taxi activities, and personal transportation. Lead is not used in jet fuel, the fuel utilized by most commercial aircraft.

Monitoring commenced at this school on August 5, 2009 and continued through February 28, 2010. During this period, twelve valid samples of polycyclic aromatic hydrocarbons (PAH) were analyzed for naphthalene and a small standardized set of additional PAH. Additionally, twelve valid samples of airborne particles were collected and analyzed for lead (TSP). Eleven VOC results were invalidated due to an equipment malfunction (see EPA's technical document, Investigation and Resolution of Contamination Problems in the Collection of Volatile Organic Compounds, at http://www.epa.gov/schoolair/pdfs/VocTechdocwithappendix1209.pdf). Additional VOC samples were collected from October 22, 2009 through February 28, 2010 to ensure that a minimum of ten valid samples were available for analysis.

All VOC results with the exception of acrolein were evaluated for health concerns. EPA will not use the acrolein data in evaluating the potential for health concerns from exposure to air toxics in outdoor air as part of the SAT Monitoring project. The Agency made this determination after results of a short-term laboratory study raised questions about the consistency and reliability of monitoring results of acrolein. Since that time, EPA has identified several steps that we believe will improve the accuracy of future acrolein sampling and continue to work towards a better method. (More information is available at http://www.epa.gov/schoolair/acrolein.html.) All sampling methodologies are described in EPA's schools air toxics monitoring plan (http://www.epa.gov/schoolair/techinfo.html).[4]

IV. Monitoring Results and Analysis

A. Background for the SAT Analysis

The majority of schools being monitored in this initiative were selected based on modeling analyses that indicated the potential for annual average air concentrations of some specific (key) hazardous air pollutants (HAPs or air toxics)[5] to be of particular concern based on approaches that are commonly used in the air toxics program for considering potential for long-term risk. For example, such analyses suggested annual average concentrations of some air toxics were greater than long-term risk-based concentrations associated with an additional cancer risk greater

[4] South Coast AQMD staff operated the monitors and sent the canisters and filters to the analytical laboratory under contract to EPA.

[5] The term hazardous air pollutants (commonly called HAPs or air toxics) refers to pollutants identified in section 112(b) of the Clean Air Act which are the focus of regulatory actions involving stationary sources described by CAA section 112 and are distinguished from the six pollutants for which criteria and national ambient air quality standards (NAAQS) are developed as described in section 108. One of the criteria pollutants, lead, is also represented, as lead compounds, on the HAP list.

than 10-in-10,000 or a hazard index on the order of or above 10. To make projections of air concentrations, the modeling analyses combined estimates of air toxics emissions from industrial, motor vehicle and other sources, with past measurements of winds, and other meteorological factors that can influence air concentrations, from a weather station in the general area. In some cases, the weather station was very close (within a few miles), but in other cases, it was much further away (e.g., up to 60 miles), which may contribute to quite different conditions being modeled than actually exist at the school. The modeling analyses are intended to be used to prioritize locations for further investigation.

The primary objective of this initiative is to investigate - through monitoring air concentrations of key air toxics at each school over a 2-3 month period - whether levels measured and associated longer-term concentration estimates are of a magnitude, in light of health risk-based criteria, for which follow-up activities may need to be considered. To evaluate the monitoring results consistent with this objective, we developed health risk-based air concentrations (the long-term comparison levels summarized in Appendix A) for the monitored air toxics using established EPA methodology and practices for health risk assessment[6] and, in the case of cancer risk, consistent with the implied level of risk considered in identifying schools for monitoring. Consistent with the long-term or chronic focus of the modeling analyses, based on which these schools were selected for monitoring, we have analyzed the full record of concentrations of air toxics measured at this school, using routine statistical tools, to derive a 95 percent confidence interval[7] for the estimate of the longer-term average concentration of each of these pollutants. In this project, we are reporting all actual numerical values for pollutant concentrations including any values below method detection limit (MDL).[8] Additionally, a value of 0.0 is used when a measured pollutant has no value detected (ND). The projected range for the longer-term concentration estimate for each chemical (most particularly the upper end of the range) is compared to the long-term comparison levels. These long-term comparison levels conservatively presume continuous (all-day, all-year) exposure over a lifetime. The analysis of the air concentrations also includes a consideration of the potential for cumulative multiple

[6] While this EPA initiative will rely on EPA methodology, practices, assessments and risk policy considerations, we recognize that individual state methods, practices and policies may differ and subsequent analyses of the monitoring data by state agencies may draw additional or varying conclusions.

[7] When data are available for only a portion of the period of interest (e.g., samples not collected on every day during this period), statisticians commonly calculate the 95% confidence interval around the dataset mean (or average) in order to have a conservative idea of how high or low the "true" mean may be. More specifically, this interval is the range in which the mean for the complete period of interest is expected to fall 95% of the time (95% probability is commonly used by statisticians). The interval includes an equal amount of quantities above and below the sample dataset mean. The interval that includes these quantities is calculated using a formula that takes into account the size of the dataset (i.e., the 'n') as well as the amount by which the individual data values vary from the dataset mean (i.e., the "standard deviation"). This calculation yields larger confidence intervals for smaller datasets as well as ones with more variable data points. For example, a dataset including 1.0, 3.0, and 5.0}, results in a mean of 3.0 and a 95% confidence interval of 3.0 +/- ~5 (or -2.0 to 8.0). For comparison purposes, a dataset including 2.5, 3 and 3.5} results in a mean of 3.0 and a 95% confidence interval of 3.0 +/- ~1.2 (or 1.8 to 4.2). The smaller variation within the data in the second set of values causes the second confidence interval to be smaller.

[8] Method detection limit (MDL) is the minimum concentration of a substance that can be measured and reported with 99% confidence that the pollutant concentration is greater than zero and is determined from the analysis of a sample in a given matrix containing the pollutant.

pollutant impacts.[9] In general, where the monitoring results indicate estimates of longer-term average concentrations that are above the comparison levels - i.e., above the cancer-based comparison levels or notably above the noncancer-based comparison levels - we will consider the need for follow-up actions such as:

- → Additional monitoring of air concentrations and/or meteorology in the area,
- → Evaluation of potentially contributing sources to help us confirm their emissions and identify what options (regulatory and otherwise) may be available to us to achieve emissions reductions, and
- → Evaluation of actions being taken or planned nationally, regionally or locally that may achieve emission and/or exposure reductions. An example of this would be the actions taken to address the type of ubiquitous emissions that come from mobile sources.

We have further analyzed the dataset to describe what it indicates in light of some other criteria and information commonly used in prioritizing state, local and national air toxics program activities. State, local and national programs often develop long-term monitoring datasets in order to better characterize pollutants near particular sources. The 2-3 month dataset developed under this initiative will be helpful to those programs in setting priorities for longer-term monitoring projects. The intent of this analysis is to make this 2-3 month monitoring dataset as useful as possible to state, local and national air toxics programs in their longer-term efforts to improve air quality nationally. To that end, this analysis:

- → Describes the air toxics measurements in terms of potential longer-term concentrations, and, as available, compares the measurements at this school to monitoring data from national monitoring programs.
- → Describes the meteorological data by considering conditions on sampling days as compared to those over all the days within the 2-3 month monitoring period and what conditions might be expected over the longer-term (as indicated, for example, by information from a nearby weather station).
- → Describes available information regarding activities and emissions at the nearby source(s) of interest, such as that obtained from public databases such as TRI and/or consultation with the local air pollution authority.

B. Chemical Concentrations

We developed two types of long-term health risk-related comparison levels (summarized in Appendix A below) to address our primary objective. The primary objective is to investigate through the monitoring data collected for key pollutants at the school, whether pollutant levels measured and associated longer-term concentration estimates are elevated enough in comparison with health risk-based criteria to indicate that follow-up activities be considered. These comparison levels conservatively presume continuous (all-day, all-year) exposure over a lifetime.

[9] As this analysis of a 2-3 month monitoring dataset is not intended to be a full risk assessment, consideration of potential multiple pollutant impacts may differ among sites. For example, in instances where no individual pollutant appears to be present above its comparison level, we will also check for the presence of multiple pollutants at levels just below their respective comparison levels (giving a higher priority to such instances).

In developing or identifying these comparison levels, we have given priority to use of relevant and appropriate air standards and EPA risk assessment guidance and precedents.[10] These levels are based upon health effects information, exposure concentrations and risk estimates developed and assessed by EPA, the U.S. Agency for Toxic Substances and Disease Registry, and the California EPA. These agencies recognize the need to account for potential differences in sensitivity or susceptibility of different groups (e.g., asthmatics) or lifestages/ages (e.g., young children or the elderly) to a particular pollutant's effects so that the resulting comparison levels are relevant for these potentially sensitive groups as well as the broader population.

In addition to evaluating individual pollutants with regard to their corresponding comparison levels, we also considered the potential for cumulative impacts from multiple pollutants in cases where individual pollutant levels fall below the comparison levels but where multiple pollutant mean concentrations are within an order of magnitude of their comparison levels.

Using the analysis approach described above, we analyzed the chemical concentration data (Table 1 and Figures 2a-2b) with regard to areas of interest identified below.

Key findings drawn from the information on chemical concentrations and the considerations discussed below include:

- Measured levels of naphthalene and associated longer-term concentration estimates are below the levels of concern that had been suggested by the modeling information prior to sampling. Although they were below the levels of significant concern that had been suggested by the modeling information, these results indicate the influence of mobile source pollutants of concern that are the focus of EPA actions nationwide. Levels of lead, a pollutant for which there are national standards for ambient air, are below the level of the national standard for protection of public health.
- Results for other air toxics monitored do not indicate levels of concern.

<u>Lead (TSP), key pollutant:</u>

- Do the monitoring data indicate influence from a nearby source?
  - → The data collected include two lead (TSP) concentrations that were somewhat higher than some of the other measurements (see Table 2) indicating a possible influence from nearby sources which include mobile sources and the general aviation airport.
- Do the monitoring data indicate elevated levels that pose significant long-term health concerns?
  - → The monitoring levels of lead (TSP) are below the national ambient air quality standard for protection of public health for lead.

[10] The development of long-term comparison levels, as well as of individual sample screening levels, is described in detail in *Schools Air Toxics Monitoring Activity (2009), Uses of Health Effects Information in Evaluating Sample Results.*

- The estimate of longer-term lead (TSP) concentration (i.e., the upper bound of the 95 percent confidence interval on the mean of the dataset) is well below the long-term comparison level (Table 1).[11] The comparison level is the level of the national ambient air quality standard.

→ In summary, the monitoring data do not indicate concentrations above the national ambient air quality standard for protection of public health.

Naphthalene, key pollutant:

Naphthalene is one of several air toxics that EPA recognizes as a key pollutant nationally. A large number of people live in areas across the U.S. with elevated ambient concentrations of this pollutant due to mobile sources (cars, trucks, airplanes, etc).[12]

- Do the monitoring data indicate influence from a nearby source?

  → The monitoring data include several naphthalene concentrations that are higher than concentrations commonly observed in other locations nationally.[13]

- Do the monitoring data indicate elevated levels that pose significant long-term health concerns?

  → Measured naphthalene levels and associated longer-term concentration estimates at this school were not as high as suggested by the modeling information available prior to monitoring. Although they were below the levels of significant concern that had been suggested by the modeling information, these results indicate the ubiquitous nature and influence of mobile source pollutants of concern that are the focus of EPA actions nationwide.

  - The estimate of longer-term naphthalene concentration (i.e., the upper bound of the 95 percent confidence interval on the mean of the dataset) is below the long-term comparison levels (Table 1).[14] These comparison levels are based on consideration of continuous exposure concentrations (24 hours a day, all year, over a lifetime).
  - Further, the longer-term concentration estimate is more than tenfold lower than the cancer-based comparison level, indicating the longer-term estimate is below a continuous (24 hours a day, 7 days a week) lifetime exposure concentration associated with 1-in-100,000 additional cancer risk.

[11] The upper end of the interval is only 1.2 times the mean of the monitoring data and less than 11% of the noncancer-based long-term comparison level. This comparison value for lead is the level of the national ambient air quality standard, which is in terms of a rolling 3-month average level of lead in total suspended particles.
[12] Additional information on mobile sources of air toxics is available at http://www.epa.gov/schoolair/mobile.html
[13] For example, ten out of twelve concentrations at this site (Table 2) were higher than 75 percent of samples collected at the National Air Toxics Trends Stations (NATTS) from 2004-2008 (Appendix B). Because these NATTS sites are generally sited so as to not be influenced by specific nearby sources, EPA is using the 75th percentile point of concentrations at these sites as a benchmark of indicating potential influence from a source nearby to the school.
[14] The upper end of the interval is only 1.3 times the mean of the monitoring data and less than 8% of the long-term cancer-based comparison level.

→ Additionally, we did not identify any concerns regarding short-term exposures as each individual measurement is below the individual sample screening level for naphthalene (which is based on consideration of exposure all day, every day over a period ranging from a couple of weeks to longer for some pollutants).[10]

Other Air Toxics:

- Do the monitoring data indicate elevated levels of any other air toxics (or HAPs) that pose significant long-term health concerns?

  → The monitoring data show low levels of the other HAPs monitored. The longer-term concentration estimates from these monitoring data are below their long-term comparison levels (Appendix C). Additionally, each individual measurement for these pollutants is below the individual sample screening level[10] for that pollutant (Appendix D).

Multiple Pollutants:

- Do the data collected for the air toxics monitored indicate the potential for other monitored pollutants to be present at levels that in combination with the key pollutant levels indicate an increased potential for cumulative impacts of significant concern (e.g., that might warrant further investigation)?

  → Although the multiple air toxics monitored at this site were below the levels of significant concern for multi-pollutant cumulative risk that had been suggested by the modeling information, these results indicate the influence of multiple mobile source pollutants of concern that are the focus of EPA actions nationwide (Appendix C).[15]

C. Wind and Other Meteorological Data

At each school monitored as part of this initiative, we collected meteorological data, minimally for wind speed and direction, during the sampling period. Additionally, we identified the nearest National Weather Service (NWS) station at which a longer record is available.

In reviewing these data at each school in this initiative, we are considering if these data indicate that the general pattern of winds on our sampling dates are significantly different from those occurring across the full sampling period or from those expected over the longer-term. Additionally, we are noting, particularly for school sites where the measured chemical concentrations show little indication of influence from a nearby source, whether wind conditions on some portion of the sampling dates were indicative of a potential to capture contributions from the nearby "key" source in the air sample collected.

[15] We note that this initiative is focused on investigation for a school-specific set of key pollutants indicated by previous analyses (and a small set of others for which measurements are obtained in the same analysis). Combined impacts of pollutants or stressors other than those monitored in this project is a broader area of consideration in other EPA activities. General information on additional air pollutants is available at http://www.epa.gov/air/airpollutants.html.

The meteorological station at Bright Kids Montessori Academy (Santa Anita Christian Academy) collected wind speed and wind direction measurements beginning on July 28, 2009, continuing through the sampling period (August 5, 2009-February 28, 2010), and ending on April 1, 2010. As a result, on-site data for these meteorological parameters are available for all dates of sample collection and also for a period before and after the sampling period, producing a continuous record of approximately eight months of on-site meteorological data. The meteorological data collected at the school site on sampling days are presented in Table 2 and Figures 3a-3b.

The nearest NWS station is at El Monte Airport in El Monte, California. This station is approximately 0.3 miles west-southwest of the school. Measurements taken at that station include wind speed and wind direction. These are presented in Appendix E.

Key findings drawn from this information and the considerations discussed below include:

- Both the sampling results and the on-site wind data indicate that some of the air samples were collected on days when the nearby key sources were contributing to conditions at the school location.
- The wind patterns at the monitoring site across sampling dates are similar to those observed across the record of on-site meteorological data during the sampling period.
- Our ability to provide a confident characterization of the wind flow patterns at the monitoring site over the long-term is somewhat limited as the NWS station at El Monte Airport does not appear to represent the specific wind flow patterns at the school location.
- Although we lack long-term wind data at the monitoring site, the wind patterns at the NWS station during the sampling period are similar to the historical long-term wind flow patterns at that location. This suggests that, on a regional scale, the eight- month sampling period may be representative of year-round wind patterns.

- What is the direction of the key source of lead and naphthalene emissions in relation to the school location?
  - → The nearby sources of interest (the general aviation airport and Santa Anita Boulevard) emitting the key pollutants lead and naphthalene into the air (described in section III above) both lie west-southwest of the school (Figure 1).
  - → Using the property boundaries of the sources of interest (in lieu of information regarding the location of specific sources of lead and naphthalene emissions at the source), we have identified an approximate range of wind directions to use in considering the potential influence of these sources on air concentrations at the school.
  - → This general range of wind directions, from approximately 236-326 degrees, is referred to here as the expected zone of source influence (ZOI).

- On days the air samples were collected, how often did wind come from the direction of the key source?
  → The on-site wind data had a portion of the winds from the ZOI on all sampling days (Figures 3a-3b, Table 2).

- How do wind patterns on the air monitoring days compare to those across the complete sampling period and what might be expected over the longer-term at the school location?
  → Wind patterns across the air monitoring days appear to be similar to those observed over the record of on-site meteorological data during the sampling period.
  → We note that wind patterns at the El Monte Airport NWS station during the sampling period are not similar to on-site wind patterns at the school, but are similar those recorded at the NWS station over the long-term (2006-2008 period; Appendix E), supporting the idea that regional meteorological patterns in the area during the monitoring period were somewhat consistent with long-term patterns. There is some uncertainty as to whether the general wind patterns at the school location for longer periods would be similar to the general wind patterns at the El Monte Airport (see below).

- How do wind patterns at the school compare to those at the El Monte Airport NWS station, particularly with regard to prevalent wind directions and the direction of the key source?
  → During the sampling period for which data are available both at the school site and at the reference NWS station (approximately 8 months), prevalent wind patterns at the school site are predominantly from the southwest and west-southwest, while those at the NWS station are more from the south and south-southwest. The wind roses for the two sites during the sampling period (Figure 3a-3b and Appendix E) show differences in wind flow patterns.

- Are there other meteorological patterns that may influence the measured concentrations at the school monitoring site?
  → We did not observe other meteorological patterns that may influence the measured concentrations at the school monitoring site.

V. Other Monitoring in This Community

The Multiple Air Toxics Exposure Study III (MATES III) was a monitoring and evaluation study conducted in the South Coast Air Basin (Basin) as a follow up to previous air toxics studies (MATES I and II) conducted by South Coast Air Quality Management District (SCAQMD). The MATES III Study consisted of several elements including a monitoring program, an updated emissions inventory of toxic air contaminants, and a modeling effort to characterize risk across the Basin. The study focused on the carcinogenic risk from exposure to air toxics. It did not estimate mortality or other health effects from particulate exposures. The monitoring program measured 33 air toxic pollutants including metals in PM_{10}, $PM_{2.5}$, elemental and organic carbon, PAHs, and some VOCs. Monitoring was conducted from April 2004 through March 2006.

Results found a decreasing risk for air toxics exposure compared with the previous MATES studies. For additional information, the final report was posted in September 2008 (http://www.aqmd.gov/prdas/matesIII/matesIII.html).

VI. Key Source Information

- Was the source operating as usual during the monitoring period?
  → The most recently available lead and naphthalene emissions data for the general aviation airport source (NATA 2005) are lower than those relied upon in previous modeling analysis for this area (NATA 2002). It should also be noted that the school is parallel and away from the airport runway, and therefore not as impacted by the planes.

- Was mobile source activity typical during the monitoring period?
  → The most recently available county-level 1,3-butadiene and benzene emissions from on-road mobile sources are lower than those relied upon in previous modeling analyses for this area (2002 NATA).

VII. Integrated Summary and Next Steps

A. Summary of Key Findings

1. What are the key HAPs for this school?
   → Acrolein, lead and naphthalene are the key HAPs for this school, identified based on emissions information considered in identifying the school for monitoring. Acrolein concentrations were not considered in this analysis (see Section III).

2. Do the data collected at this school indicate an elevated level of concern, as implied by information that led to identifying this school for monitoring?
   → The levels measured and the associated longer-term concentration estimates for naphthalene and lead, while indicating potential influence from a nearby source, are below levels of concern for naphthalene and below the national ambient air standard for protection of public health for lead.
   → EPA will not use the acrolein data in evaluating the potential for health concerns from exposure to air toxics in outdoor air as part of the SAT Monitoring project. The Agency made this determination after results of a short-term laboratory study raised questions about the consistency and reliability of monitoring results of acrolein. Since that time, EPA has identified several steps that we believe will improve the accuracy of future acrolein sampling and continue to work towards a better method. (More information is available at http://www.epa.gov/schoolair/acrolein.html).

3. Are there indications, e.g., from the meteorological or other data, that the sample set may not be indicative of longer-term air concentrations? Would we expect higher (or lower) concentrations at other times of year?

→ The data we have collected appear to reflect air concentrations during the entire sampling period, with no indications from the on-site meteorological data that the sampling day conditions were inconsistent with conditions overall during this period.

→ Among the data collected for this site, we have none that would indicate generally higher (or lower) concentrations during other times of year. The wind flow patterns at the nearest NWS station during the sampling period appear to be representative of long-term wind flow at that site. The lack of long-term meteorological data at the school location, along with our finding that the wind patterns from the nearest NWS station are not similar to those at the school, however, limit our ability to confidently predict longer-term wind patterns at the school (which might provide further evidence relevant to concentrations during other times).

B. Next Steps for Key Pollutants

1. Based on the analysis described here, EPA will not extend air toxics monitoring at this school.
2. EPA actions regarding emissions from aircraft engines can be found at: www.epa.gov/otaq/aviation.htm. EPA's ongoing research and national air toxics monitoring programs will continue to collect information on mobile source impacts on outdoor air nationally. EPA will also continue to work toward reductions in mobile source emissions nationally and to facilitate reductions in local areas (http://www.epa.gov/schoolair/mobile.html).
3. The South Coast AQMD will continue to oversee industrial facilities in the area through air toxic permits, inspection and monitoring programs, and the California Air Resources Board (CARB) will continue mobile source reduction programs for California.

VII. Figures and Tables

A. Tables

1. Bright Kids Montessori Academy (Santa Anita Christian Academy) – Key Pollutant Analysis.
2. Bright Kids Montessori Academy (Santa Anita Christian Academy) Key Pollutant Concentrations (Lead (TSP) and Naphthalene) and Meteorological Data.

B. Figures

1. Bright Kids Montessori Academy (Santa Anita Christian Academy) and Source of Interest.

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Figure 1. Bright Kids Montessori Academy (Santa Anita Christian Academy) and Source of Interest.

Table 1. Bright Kids Montessori Academy (Santa Anita Christian Academy) - Key Pollutant Analysis.

Parameter	Units	Mean of Measurements	95% Confidence Interval on the Mean	Long-term Comparison Level[a]	
				Cancer-Based[b]	Noncancer-Based[c]
Lead (TSP)	ng/m^3	14.0 [d]	11.7 - 16.2	NA	150
Naphthalene	µg/m^3	0.177 [e]	0.124 - 0.230	2.9	3

µg/m^3 micrograms per cubic meter
ng/m^3 nanograms per cubic meter
NA Not applicable

[a] Details regarding these values are in the technical report, Schools Air Toxics Monitoring Activity (2009) Uses of Health Effects Information.

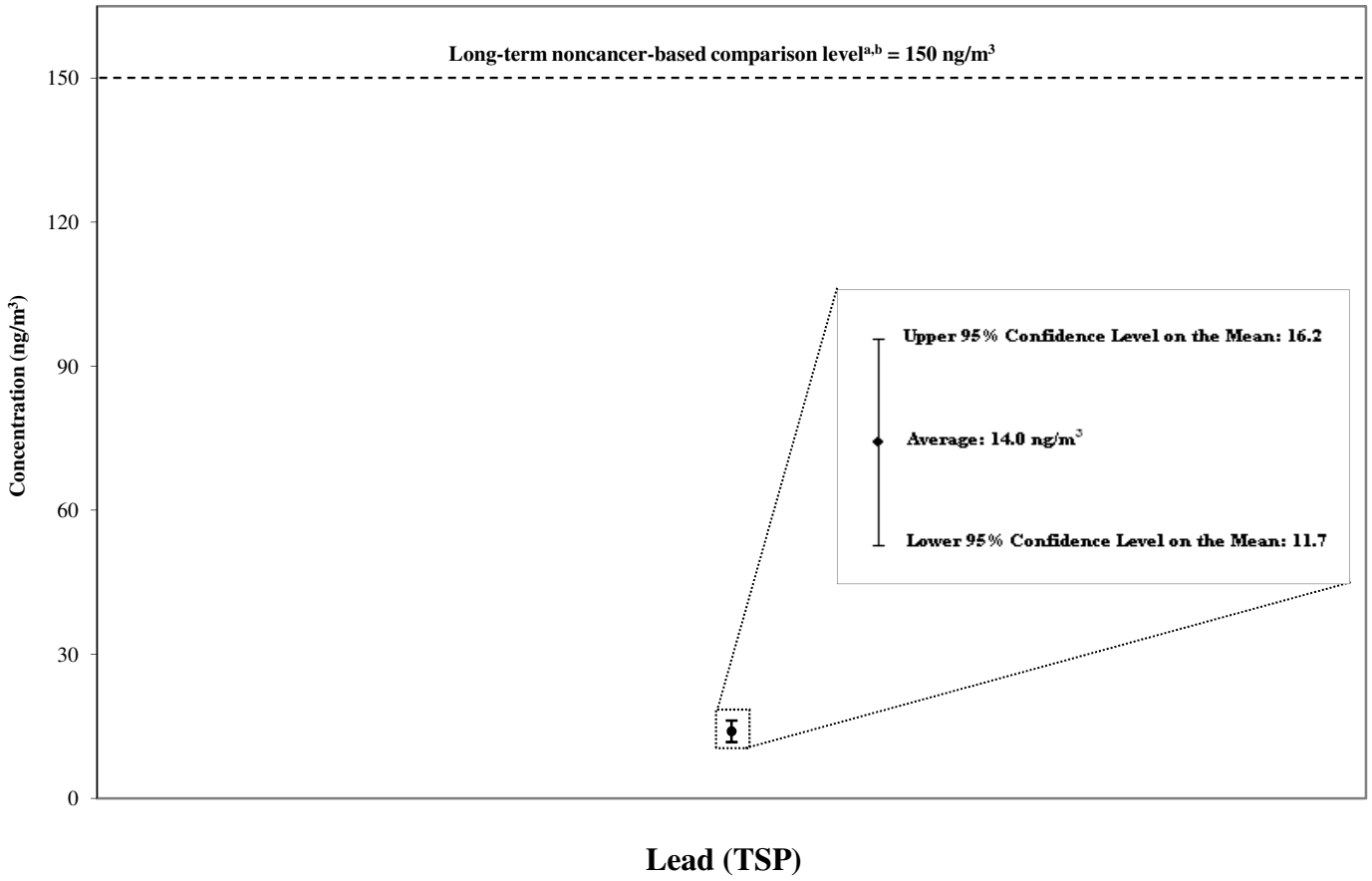
[b] Air toxics for which the upper 95% confidence limit on the mean concentration is above this level will be fully discussed in the text and may be considered a priority for potential follow-up activities, if indicated in light of the full set of information available for the site. Findings of the upper 95% confidence limit below 1% of the comparison level (i.e., where the upper 95% confidence limit is below the corresponding 1-in-1-million cancer risk based concentration) are generally considered a low priority for follow-up activity. Situations where the summary statistics for a pollutant are below this comparison level but above 1% of this level are fully discussed in the text of the report.

[c] Air toxics for which the upper 95% confidence limit on the mean concentration are near or below the noncancer-based comparison level are generally of low concern and will generally be considered a low priority for follow-up activity. Pollutants for which the 95% confidence limits extend appreciably above the noncancer-based comparison level are fully discussed in the school-specific report and may be considered a priority for follow-up activity, if indicated in light of the full set of information available for the site.

[d] The mean of measurements for lead (TSP) is the average of all sample results, which include twelve detections that ranged from 9.5 to 20.8 ng/m^3.

[e] The mean of measurements for naphthalene is the average of all sample results, which include twelve detections that ranged from 0.0363 to 0.356 µg/m^3.

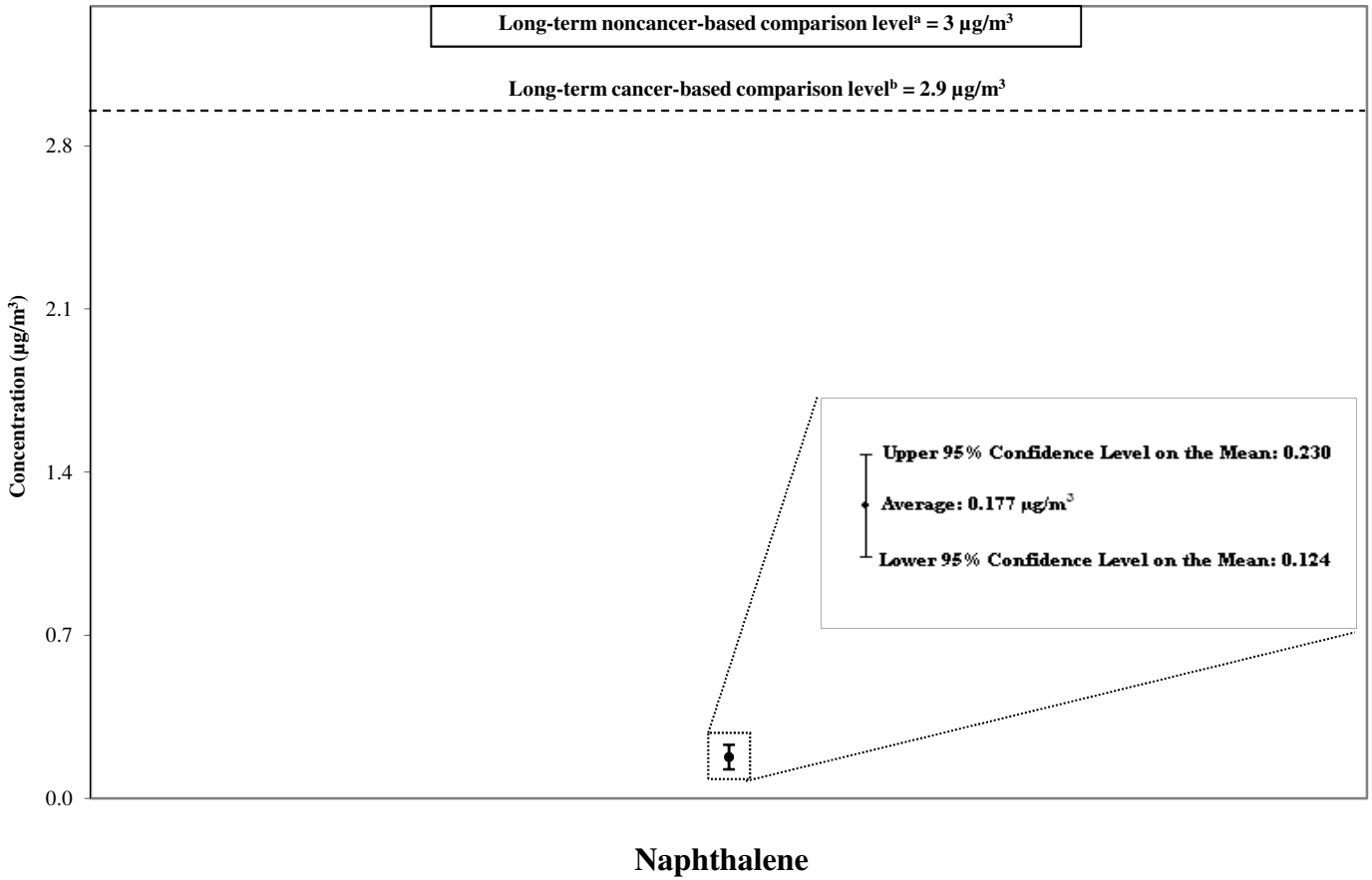
Figure 2a. Bright Kids Montessori Academy (Santa Anita Christian Academy) - Key Pollutant (Lead (TSP)) Analysis.



[a] Air toxics for which the upper 95% confidence limit on the mean concentration are near or below the noncancer-based comparison level are generally of low concern and will generally be considered a low priority for follow-up activity. Pollutants for which the 95% confidence limits extend appreciably above the noncancer-based comparison level are fully discussed in the school-specific report and may be considered a priority for follow-up activity, if indicated in light of the full set of information available for the site.

[b] This comparison value for lead is the level of the national ambient air quality standard, which is in terms of a rolling 3-month average level of lead in total suspended particles.

Figure 2b. Bright Kids Montessori Academy (Santa Anita Christian Academy) - Key Pollutant (Naphthalene) Analysis.



[a] Air toxics for which the upper 95% confidence limit on the mean concentration are near or below the noncancer-based comparison level are generally of low concern and will generally be considered a low priority for follow-up activity. Pollutants for which the 95% confidence limits extend appreciably above the noncancer-based comparison level are fully discussed in the school-specific report and may be considered a priority for follow-up activity, if indicated in light of the full set of information available for the site.

[b] Air toxics for which the upper 95% confidence limit on the mean concentration is above this cancer-based comparison level will be fully discussed in the text and may be considered a priority for potential follow-up activities, if indicated in light of the full set of information available for the site. Findings of the upper 95% confidence limit below 1% of the comparison level (i.e., where the upper 95% confidence limit is below the corresponding 1-in-1-million cancer risk based concentration) are generally considered a low priority for follow-up activity. Situations where the summary statistics for a pollutant are below this comparison level but above 1% of this level are fully discussed in the text of the report.

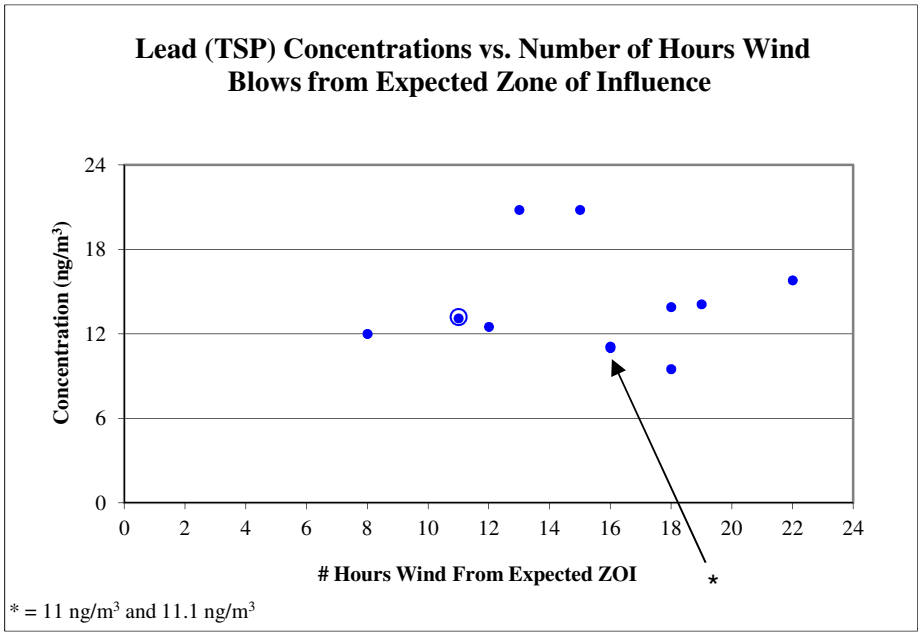
Table 2. Bright Kids Montessori Academy (Santa Anita Christian Academy) Key Pollutant Concentrations (Lead (TSP) and Naphthalene) and Meteorological Data.

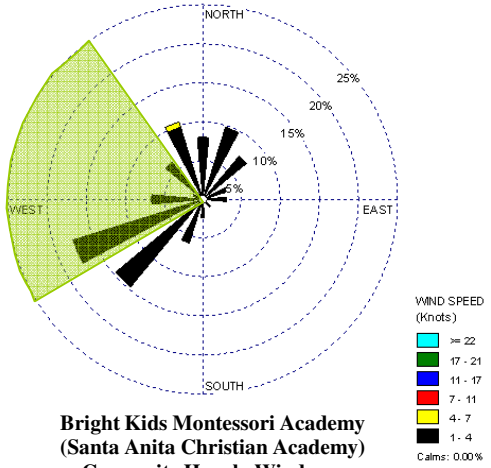
Parameter	Units	8/5/2009	8/11/2009	8/17/2009	9/4/2009	9/10/2009	9/16/2009	9/22/2009	9/28/2009	10/10/2009	10/16/2009	10/22/2009	10/28/2009
Lead (TSP)	ng/m^3	20.8	15.8	11	13.1	13.9	11.1	20.8	12.5	9.5	14.1	12.0	13.2
Naphthalene	$\mu g/m^3$	0.211	0.146	0.112	0.186	0.171	0.202	0.356	0.148	0.0887	0.278	0.194	0.0363
% Hours w/Wind Direction from Expected ZOI[a]	%	16.7	25.0	41.7	16.7	54.2	33.3	29.2	16.7	29.2	54.2	33.3	29.2
Wind Speed (avg. of hourly speeds)	mph	1.8	1.9	1.9	1.7	1.7	1.5	1.6	1.7	1.9	1.5	1.4	3.6
Wind Direction (avg. of unitized vector)[b]	deg.	359.9	258.6	283.8	3.8	340.7	210.3	254.8	276.3	257.0	359.9	161.5	283.8
% of Hours with Speed below 2 knots	%	66.7	62.5	66.7	79.2	75.0	79.2	75.0	83.3	91.7	75.0	79.2	91.7

[a] Based on count of hours for which vector wind direction is from expected zone of influence.

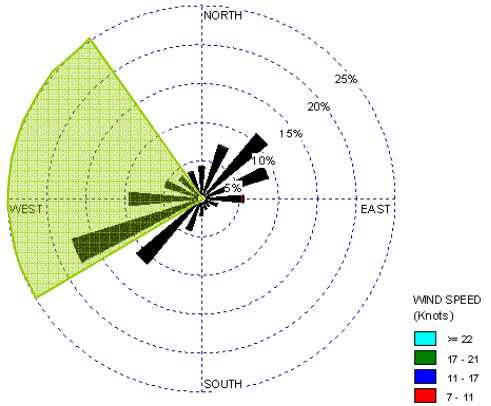
[b] Wind direction for each day is represented by values derived by scalar averaging of hourly estimates that were produced (by wind instrumentation's logger) as unitized vectors (specified as degrees from due north).

Figure 3a. Bright Kids Montessori Academy (Santa Anita Christian Academy) (El Monte, CA) Lead (TSP) Concentration and Wind Information.





Bright Kids Montessori Academy (Santa Anita Christian Academy) Composite Hourly Windrose on Sample Days (Aug. 5, 2009-Oct. 28, 2009)



Bright Kids Montessori Academy (Santa Anita Christian Academy) Composite Hourly Windrose Across Sampling Period (Aug, 5. 2009-Oct. 28, 2009)

Expected Zone of Source Influence

KEY

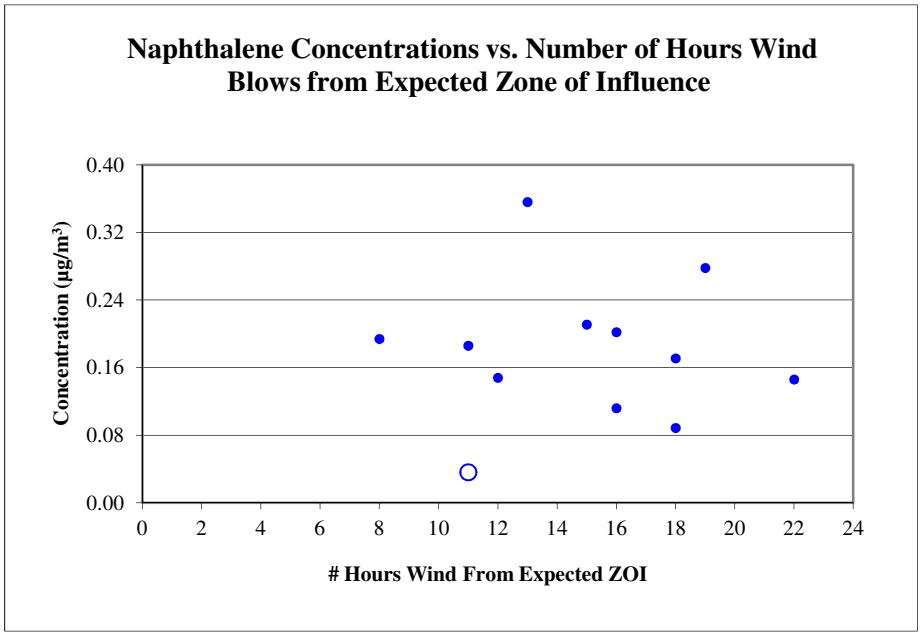
Pollutant: Lead (TSP)
Timeframe: August 5, 2009 - October 28, 2009

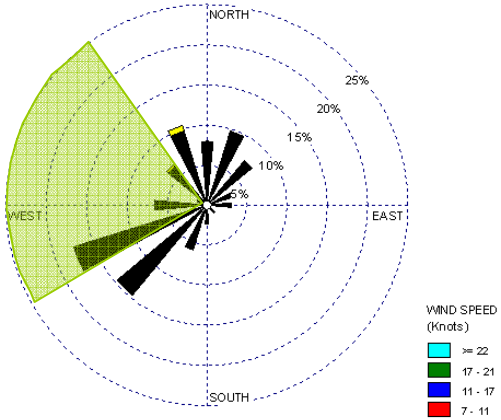
Wind Speed: 0.1-2.5 mph
Wind Speed: 2.5-5.0 mph
Wind Speed: > 5.0 mph

Note

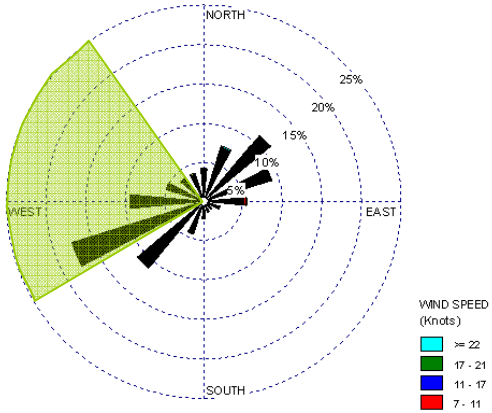
Each circle denotes a 24-hour collection of air for chemical analysis. The size of the circle indicates the magnitude of the wind speed for that day (wind data shown in Table 2). The expected zone of source influence is a rough approximation of the range of directions from which winds carrying chemicals emitted by the key source may originate.

Figure 3b. Bright Kids Montessori Academy (Santa Anita Christian Academy) (El Monte, CA) Naphthalene Concentration and Wind Information.





Bright Kids Montessori Academy (Santa Anita Christian Academy) Composite Hourly Windrose on Sample Days (Aug. 5, 2009-Oct. 28, 2009)



Bright Kids Montessori Academy (Santa Anita Christian Academy) Composite Hourly Windrose Across Sampling Period (Aug. 5, 2009-Oct. 28, 2009)

Expected Zone of Source Influence

KEY

Pollutant: Naphthalene
Timeframe: August 5, 2009 - October 28, 2009

Note

Each circle denotes a 24-hour collection of air for chemical analysis. The size of the circle indicates the magnitude of the wind speed for that day (wind data shown in Table 2). The expected zone of source influence is a rough approximation of the range of directions from which winds carrying chemicals emitted by the key source may originate.

- Wind Speed: 0.1-2.5 mph
- Wind Speed: 2.5-5.0 mph
- Wind Speed: > 5.0 mph

Appendix A. Summary Description of Long-term Comparison Levels

In addressing the primary objective identified above, to investigate through the monitoring data collected for key pollutants at the school whether levels are of a magnitude, in light of health risk-based criteria, to indicate that follow-up activities be considered, we developed two types of long-term health risk-related comparison levels. These two types of levels are summarized below.[16]

Cancer-based Comparison Levels

- For air toxics where applicable, we developed cancer risk-based comparison levels to help us consider whether the monitoring data collected at the school indicate the potential for concentrations to pose incremental cancer risk above the range that EPA generally considers acceptable in regulatory decision-making to someone exposed to those concentrations continuously (24 hours a day, 7 days a week) over an entire lifetime.[17] This general range is from 1 to 100 in a million.
- Air toxics with long-term mean concentrations below one one-hundredth of this comparison level would be below a comparably developed level for 1-in-a-million risk (which is the lower bound of EPA's traditional acceptable risk range). Such pollutants, with long-term mean concentrations below the Agency's traditional acceptable risk range, are generally considered to pose negligible risk.
- Air toxics with long-term mean concentrations above the acceptable risk range would generally be a priority for follow-up activities. In this evaluation, we compare the upper 95% confidence limit on the mean concentration to the comparison level. Pollutants for which this upper limit falls above the comparison level are fully discussed in the school monitoring report and may be considered a priority for potential follow-up activities in light of the full set of information available for that site.
- Situations where the summary statistics for a pollutant are below the cancer-based comparison level but above 1% of that level are fully discussed in Appendix C.

[16] These comparison levels are described in more detail *Schools Air Toxics Monitoring Activity (2009), Uses of Health Effects Information in Evaluating Sample Results.*

[17] While no one would be exposed at a school for 24 hours a day, every day for an entire lifetime, we chose this worst-case exposure period as a simplification for the basis of the comparison level in recognition of other uncertainties in the analysis. Use of continuous lifetime exposure yields a lower, more conservative, comparison level than would use of a characterization more specific to the school population (e.g., 5 days a week, 8-10 hours a day for a limited number of years).

Noncancer-based Comparison Levels

- To consider concentrations of air toxics other than lead (for which we have a national ambient air quality standard) with regard to potential for health effects other than cancer, we derived noncancer-based comparison levels using EPA chronic reference concentrations (or similar values). A chronic reference concentration (RfC) is an estimate of a long-term continuous exposure concentration (24 hours a day, every day) without appreciable risk of adverse effects over a lifetime.[18] This differs from the cancer risk-based comparison level in that it represents a concentration without appreciable risk *vs.* a risk-based concentration.
- In using this comparison level in this initiative, the upper end of the 95% confidence limit on the mean is compared to the comparison level. Air toxics for which this upper confidence limit is near or below the noncancer-based comparison level (i.e., those for which longer-term average concentration estimates are below a long-term health-related reference concentration) are generally of low concern and will generally be considered a low priority for follow-up activity. Pollutants for which the 95% confidence limits extend appreciably above the noncancer-based comparison level are fully discussed below and may be considered a priority for follow-up activity if indicated in light of the full set of information available for the pollutant and the site.
- For lead, we set the noncancer-based comparison level equal to the level of the recently revised national ambient air quality standard (NAAQS). It is important to note that the NAAQS for lead is a 3-month rolling average of lead in total suspended particles. Mean levels for the monitoring data collected in this initiative that indicate the potential for a 3-month average above the level of the standard will be considered a priority for consideration of follow-up actions such as siting of a NAAQS monitor in the area.

In developing or identifying these comparison levels, we have given priority to use of relevant and appropriate air standards and EPA risk assessment guidance and precedents. These levels are based upon health effects information, exposure concentrations and risk estimates developed and assessed by EPA, the U.S. Agency for Toxic Substances and Disease Registry, and the California EPA. These agencies recognize the need to account for potential differences in sensitivity or susceptibility of different groups (e.g., asthmatics) or lifestages/ages (e.g., young children or the elderly) to a particular pollutant's effects so that the resulting comparison levels are relevant for these potentially sensitive groups as well as the broader population.

[18] EPA defines the RfC as "an estimate (with uncertainty spanning perhaps an order of magnitude) of a continuous inhalation exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime. It can be derived from a NOAEL, LOAEL, or benchmark concentration, with uncertainty factors generally applied to reflect limitations of the data used. Generally used in EPA's noncancer health assessments." http://www.epa.gov/ncea/iris/help_gloss.htm#r

Appendix B. National Air Toxics Trends Stations Measurements (2004-2008).[a]

Pollutant	Units	# Samples Analyzed	% Detections	Maximum	Arithmetic Mean[b]	Geometric Mean	5th Percentile	25th Percentile	50th Percentile	75th Percentile	95th Percentile
Acetonitrile	µg/m^3	1,804	69%	542.30	3.55	0.72	ND	ND	0.27	0.76	8.60
Acrylonitrile	µg/m^3	3,673	31%	5.51	0.06	0.10	ND	ND	ND	0.03	0.33
Benzene	µg/m^3	6,313	94%	10.19	1.03	0.84	ND	0.48	0.80	1.31	2.81
Benzyl chloride	µg/m^3	3,046	9%	2.49	0.01	0.05	ND	ND	ND	ND	0.05
Bromoform	µg/m^3	2,946	4%	1.18	0.01	0.16	ND	ND	ND	ND	ND
Bromomethane	µg/m^3	5,376	61%	120.76	0.11	0.05	ND	ND	0.03	0.05	0.12
Butadiene, 1,3-	µg/m^3	6,427	67%	15.55	0.10	0.09	ND	ND	0.05	0.13	0.38
Carbon disulfide	µg/m^3	1,925	91%	46.71	2.32	0.25	ND	0.03	0.09	0.96	12.65
Carbon tetrachloride	µg/m^3	6,218	86%	1.76	0.52	0.58	ND	0.47	0.57	0.65	0.87
Chlorobenzene	µg/m^3	5,763	30%	1.10	0.02	0.04	ND	ND	ND	0.01	0.11
Chloroethane	µg/m^3	4,625	37%	0.58	0.02	0.04	ND	ND	ND	0.03	0.08
Chloroform	µg/m^3	6,432	73%	48.05	0.17	0.14	ND	ND	0.10	0.17	0.61
Chloromethane	µg/m^3	5,573	95%	19.70	1.17	1.20	ND	1.03	1.18	1.36	1.68
Chloroprene	µg/m^3	2,341	11%	0.17	<0.01	0.03	ND	ND	ND	ND	0.02
Dichlorobenzene, *p*-	µg/m^3	5,409	60%	13.65	0.19	0.16	ND	ND	ND	0.18	0.90
Dichloroethane, 1,1-	µg/m^3	5,670	16%	0.36	0.01	0.02	ND	ND	ND	ND	0.02
Dichloroethylene, 1,1-	µg/m^3	5,480	19%	0.44	0.01	0.02	ND	ND	ND	ND	0.04
Dichloromethane	µg/m^3	6,206	82%	214.67	0.59	0.34	ND	0.14	0.28	0.49	1.35
Dichloropropane,1,2-	µg/m^3	6,225	17%	1.80	0.01	0.03	ND	ND	ND	ND	0.04
Dichloropropylene, c*is* -1,3-	µg/m^3	4,705	18%	0.80	0.01	0.05	ND	ND	ND	ND	0.11
Dichloropropylene, *trans* -1,3-	µg/m^3	4,678	18%	1.13	0.02	0.05	ND	ND	ND	ND	0.11
Ethyl acrylate	µg/m^3	1,917	1%	0.08	<0.01	0.04	ND	ND	ND	ND	ND
Ethylbenzene	µg/m^3	6,120	84%	8.84	0.42	0.32	ND	0.10	0.29	0.53	1.33
Ethylene dibromide	µg/m^3	5,646	19%	4.15	0.01	0.05	ND	ND	ND	ND	0.05
Ethylene dichloride	µg/m^3	6,143	38%	4.49	0.03	0.05	ND	ND	ND	0.04	0.09
Hexachlorobutadiene	µg/m^3	3,727	20%	0.97	0.03	0.10	ND	ND	ND	ND	0.18
Methyl chloroform	µg/m^3	5,944	73%	3.17	0.09	0.10	ND	ND	0.08	0.11	0.20
Methyl isobutyl ketone	µg/m^3	2,936	60%	2.95	0.11	0.09	ND	ND	0.02	0.12	0.49
Methyl methacrylate	µg/m^3	1,917	9%	14.05	0.13	0.49	ND	ND	ND	ND	0.53
Methyl *tert*- butyl ether	µg/m^3	4,370	41%	20.50	0.28	0.12	ND	ND	ND	0.04	1.53

Appendix B. National Air Toxics Trends Stations Measurements (2004-2008).[a]

Pollutant	Units	# Samples Analyzed	% Detections	Maximum	Arithmetic Mean[b]	Geometric Mean	5th Percentile	25th Percentile	50th Percentile	75th Percentile	95th Percentile
Styrene	µg/m^3	6,080	70%	27.22	0.16	0.11	ND	ND	0.05	0.16	0.60
Tetrachloroethane, 1,1,2,2-	µg/m^3	5,952	20%	2.47	0.02	0.04	ND	ND	ND	ND	0.07
Tetrachloroethylene	µg/m^3	6,423	71%	42.12	0.28	0.20	ND	ND	0.13	0.27	0.88
Toluene	µg/m^3	5,947	95%	482.53	2.46	1.54	0.01	0.70	1.51	3.05	7.42
Trichlorobenzene, 1,2,4-	µg/m^3	4,301	21%	45.27	0.07	0.10	ND	ND	ND	ND	0.16
Trichloroethane,1,1,2-	µg/m^3	5,210	19%	5.89	0.01	0.04	ND	ND	ND	ND	0.05
Trichloroethylene	µg/m^3	6,410	46%	6.50	0.05	0.07	ND	ND	ND	0.05	0.22
Vinyl chloride	µg/m^3	6,284	18%	1.61	0.01	0.02	ND	ND	ND	ND	0.03
Xylene, *m/p-*	µg/m^3	4,260	90%	21.41	1.12	0.71	ND	0.26	0.69	1.43	3.65
Xylene, *o-*	µg/m^3	6,108	83%	9.21	0.41	0.30	ND	0.09	0.24	0.52	1.39
Benzo(a)anthracene (total tsp & vapor)	ng/m^3	1,122	73%	2.56	0.10	0.07	ND	ND	0.04	0.10	0.35
Benzo(a)pyrene (total tsp & vapor)	ng/m^3	1,111	58%	2.64	0.09	0.09	ND	ND	0.03	0.10	0.34
Benzo(b)fluoranthene	ng/m^3	1,110	86%	4.63	0.19	0.13	ND	0.04	0.10	0.21	0.67
Benzo(k)fluoranthene	ng/m^3	1,122	67%	1.28	0.05	0.05	ND	ND	0.02	0.06	0.20
Chrysene (total tsp & vapor)	ng/m^3	1,117	92%	3.85	0.22	0.15	ND	0.07	0.13	0.25	0.70
Dibenz(a,h)anthracene	ng/m^3	69	4%	0.08	<0.01	0.08	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	ng/m^3	69	51%	0.55	0.06	0.08	ND	ND	0.02	0.07	0.30
Naphthalene (total tsp & vapor)	µg/m^3	1,099	100%	0.54	0.08	0.05	<0.01	0.03	0.06	0.10	0.20

Key Pollutant

ND No results of this chemical were registered by the laboratory analytical equipment.

[a] The summary statistics in this table represent the range of actual daily HAP measurement values taken at NATTS sites from 2004 through 2008. These data were extracted from AQS in summer 2008 and 2009. During the time period of interest, there were 28 sites measuring VOCs, carbonyls, metals, and hexavalent chromium. We note that some sites did not sample for particular pollutant types during the initial year of the NATTS Program, which was 2004. Most of the monitoring stations in the NATTS network are located such that they are not expected to be impacted by single industrial sources. The concentrations typically measured at NATTS sites can thus provide a comparison point useful to considering whether concentrations measured at a school are likely to have been influenced by a significant nearby industrial source, or are more likely to be attributable to emissions from many small sources or to transported pollution from another area. For example, concentrations at a school above the 75th percentile may suggest that a nearby industrial source is affecting air quality at the school.

[b] In calculations involving non-detects (ND), a value of zero is used.

Appendix C. Analysis of Other (non-key) Air Toxics Monitored at the School and Multiple-pollutant Considerations.

At each school, monitoring has been targeted to get information on a limited set of key hazardous air pollutants (HAPs).[19] These pollutants are the primary focus of the monitoring activities at a school and a priority for us based on our emissions, modeling and other information. In analyzing air samples for these key pollutants, we have also obtained results for some other pollutants that are routinely included with the same test method. Our consideration of the data collected for these additional HAPs is described in the first section below. In addition to evaluating monitoring results for individual pollutants, we also considered the potential for cumulative impacts from multiple pollutants as described in the second section below (See Table C-1).

Other Air Toxics (HAPs)

- Do the monitoring data indicate elevated levels of any other air toxics or hazardous air pollutant (HAPs) that pose significant long-term health concerns?

  → The longer-term concentration estimates for the other HAPs monitored are below their long-term comparison levels.

  - Further, for pollutants with cancer-based comparison levels, the longer-term concentration estimates for all but two of these (benzene and 1,3-butadiene) is more than 10-fold lower and all but six of these (benzene, 1,3-butadiene, carbon tetrachloride, *p*-dichlorobenzene, ethylbenzene, and tetrachloroehylene) are more than 100-fold lower. [20]

  → Additionally, each individual measurement for these pollutants is below the individual sample (short-term) screening level developed for considering potential short-term exposures for that pollutant.[21]

Additional Information on Six HAPs:

- The first HAP mentioned above is benzene. The mean and 95 percent upper bound on the mean for benzene are approximately 13-17% of the cancer-based comparison level. A review of information available at other sites nationally shows that the mean concentration of benzene at this site is between the 75th and 95th percentile of samples

[19] Section 112(b) of the Clean Air Act identifies 189 hazardous air pollutants, three of which have subsequently been removed from this list. These pollutants are the focus of regulatory actions involving stationary sources described by CAA section 112 and are distinguished from the six pollutants for which criteria and national ambient air quality standards (NAAQS) are developed as described in section 108. One of the criteria pollutants, lead, is also represented as lead compounds on the HAP list.

[20] For pollutants with cancer-based comparison levels, this would indicate longer-term estimates below continuous (24 hours a day, 7 days a week) lifetime exposure concentrations associated with 10^{-5} and 10^{-6} excess cancer risk, respectively.

[21] The individual sample screening levels and their use is summarized on the website and described in detail in *Schools Air Toxics Monitoring Activity (2009), Uses of Health Effects Information in Evaluating Sample Results.*

collected from 2004 to 2008 (the most recently compiled period) at the NATTS sites (Appendix B).

- The second HAP mentioned above is 1,3-butadiene. The mean and 95 percent upper bound on the mean for 1,3-butadiene are approximately 8-11% of the cancer-based comparison level. A review of information available at other sites nationally shows that the mean concentration of 1,3-butadiene at this site is between the 75th and 95th percentile of samples collected from 2004 to 2008 (the most recently compiled period) at the NATTS sites (Appendix B).

- The third HAP mentioned above is carbon tetrachloride. The mean and 95 percent upper bound on the mean for carbon tetrachloride are approximately 4% of the cancer-based comparison level. A review of information available at other sites nationally shows that the mean concentration of carbon tetrachloride at this site is between the 75th and 95th percentile of samples collected from 2004 to 2008 (the most recently compiled period) at the NATTS sites (Appendix B). Carbon tetrachloride is found globally as a result of its significant past uses in refrigerants and propellants for aerosol cans and its chemical persistence. Virtually all uses have been discontinued. However, it is still measured throughout the world as a result of its slow rate of degradation in the environment and global distribution in the atmosphere.

- The fourth HAP mentioned above is *p*-dichlorobenzene. The mean and 95 percent upper bound on the mean for *p*-dichlorobenzene are approximately 3-5% of the cancer-based comparison level. A review of information available at other sites nationally shows that the mean concentration of *p*-dichlorobenzene at this site is between the 75th and 95th percentile of samples collected from 2004 to 2008 (the most recently compiled period) at the NATTS sites (Appendix B).

- The fifth HAP mentioned above is ethylbenzene. The mean and 95 percent upper bound on the mean for ethylbenzene are approximately 2-3% of the cancer-based comparison level. A review of information available at other sites nationally shows that the mean concentration of ethylbenzene at this site is between the 75th and 95th percentile of samples collected from 2004 to 2008 (the most recently compiled period) at the NATTS sites (Appendix B).

- The sixth HAP mentioned above is tetrachloroethylene. The mean and 95 percent upper bound on the mean for tetrachloroethylene are approximately 2% of the cancer-based comparison level. A review of information available at other sites nationally shows that the mean concentration of tetrachloroethylene at this site is equal to the 75th percentile of samples collected from 2004 to 2008 (the most recently compiled period) at the NATTS sites (Appendix B).

Multiple Pollutants

As described in the main body of the report and background materials, this initiative and the associated analyses are focused on investigation of key pollutants for each school that were

identified by previous analyses. This focused design does not provide for the consideration of combined impacts of pollutants or stressors other than those monitored in this project. Broader analyses and those involving other pollutants may be the focus of other EPA activities.[22]

In our consideration of the potential for impacts from key pollutants at the monitored schools, we have also considered the potential for other monitored pollutants to be present at levels that in combination with the key pollutant levels contribute to an increased potential for cumulative impacts. This was done in cases where estimates of longer-term concentrations for any non-key HAPs are within an order of magnitude of their comparison levels even if these pollutant levels fall below the comparison levels. This analysis is summarized below.

- Do the data collected for the air toxics monitored indicate the potential for other monitored pollutants to be present at levels that in combination with the key pollutant levels indicate an increased potential for cumulative impacts of significant concern (e.g., that might warrant further investigation)?

  → Although the multiple air toxics monitored at this site were below the levels of significant concern for multi-pollutant cumulative risk that had been suggested by the modeling information, these results do indicate the influence of multiple mobile source pollutants of concern that are the focus of EPA actions nationwide.

  - In addition to the key pollutant lead (TSP), the only other HAPs monitored whose longer-term concentration estimates are more than ten percent of their lowest comparison levels are benzene and 1,3-butadiene. The noncancer-based comparison level for lead (TSP) is based on noncancer effects considering several endpoints including development. The lowest comparison level for 1,3-butadiene is based on non-carcinogenic effects to the reproductive system, and the lowest comparison level for benzene is based on carcinogenic risk. Because these pollutants have different effects, cumulative health risk from these pollutants is unlikely.

[22] General information on additional air pollutants is available at http://www.epa.gov/air/airpollutants.html.

Table C-1. Bright Kids Montessori Academy (Santa Anita Christian Academy) - Other Monitored Pollutant Analysis.

Parameter	Units	Mean of Measurements[a]	95% Confidence Interval on the Mean	Long-term Comparison Level[b]	
				Cancer-Based[c]	Noncancer-Based[d]
Non-Key HAPs with mean greater than 10% of the lowest comparison level					
Benzene	µg/m^3	1.74	1.28 - 2.20	13	30
Butadiene, 1,3-	µg/m^3	0.26	0.17 - 0.35	3.3	2
Non-Key HAPs with mean lower than 10% of the lowest comparison level					
Carbon tetrachloride	µg/m^3	0.70	0.65 - 0.75	17	100
Dichlorobenzene, *p-*	µg/m^3	0.27	0.07 - 0.47	9.1	800
Xylene, *m/p-*	µg/m^3	2.16	1.41 - 2.92	NA	100
Ethylbenzene	µg/m^3	0.78	0.53 - 1.04	40	1000
Tetrachloroethylene	µg/m^3	0.27	0.17 - 0.36	17	270
Bromomethane	µg/m^3	0.06	0.04 - 0.08	NA	5
Chloromethane	µg/m^3	1.28	1.18 - 1.39	NA	90
Xylene, *o-*	µg/m^3	0.93	0.58 - 1.29	NA	100
Dichloromethane	µg/m^3	1.18	0.79 - 1.58	210	1000
Acetonitrile	µg/m^3	0.25	0.20 - 0.31	NA	60
Chloroform	µg/m^3	0.22	0.15 - 0.30	NA	98
Benzo(a)pyrene	ng/m^3	0.10	0.06 - 0.15	57	NA
Toluene	µg/m^3	5.81	3.58 - 8.05	NA	5000
Benzo(b)fluoranthene	ng/m^3	0.28	0.18 - 0.37	570	NA
Styrene	µg/m^3	0.24	0.17 - 0.32	NA	1000
Methyl isobutyl ketone	µg/m^3	0.46	0.33 - 0.58	NA	3000
Carbon disulfide	µg/m^3	0.08	0.04 - 0.12	NA	700
Chrysene	ng/m^3	0.36	0.24 - 0.49	5700	NA
Methyl chloroform	µg/m^3	0.11	0.08 - 0.14	NA	5000
Indeno(1,2,3-cd)pyrene	ng/m^3	0.13 [e]	0.05 - 0.21 [e]	570	NA
Benzo(a)anthracene	ng/m^3	0.08 [f]	0.04 - 0.12 [f]	570	NA
Benzo(k)fluoranthene	ng/m^3	0.06 [g]	0.01 - 0.10 [g]	570	NA
Chloroethane	µg/m^3	0.03 [h]	0.005 - 0.05 [h]	NA	10000
Non-Key HAPs with more than 50% ND results					
Acrylonitrile	µg/m^3	93% of results were ND[i]		1.5	2
Ethylene dichloride	µg/m^3	86% of results were ND[j]		3.8	2400
Chloroprene	µg/m^3	93% of results were ND[k]		NA	20
Trichloroethylene	µg/m^3	58% of results were ND[l]		50	600
Vinyl chloride	µg/m^3	86% of results were ND[m]		11	100
Methyl *tert-* butyl ether	µg/m^3	93% of results were ND[n]		380	3000
No other HAPs were detected in any samples					

µg/m^3 micrograms per cubic meter

ng/m^3 nanograms per cubic meter

NA Not applicable

ND No detection of this chemical was registered by the laboratory analytical equipment.

Table C-1. Bright Kids Montessori Academy (Santa Anita Christian Academy) - Other Monitored Pollutant Analysis.

[a] Mean of measurements is the average of all sample results which include actual measured values. If no chemical was registered, then a value of zero is used when calculating the mean

[b] Details regarding these values are in the technical report, Schools Air Toxics Monitoring Activity (2009) Uses of Health Effects Information.

[c] Air toxics for which the upper 95% confidence limit on the mean concentration is above this cancer-based comparison level will be fully discussed in the text and may be considered a priority for potential follow-up activities, if indicated in light of the full set of information available for the site. Findings of the upper 95% confidence limit below 1% of the comparison level (i.e., where the upper 95% confidence limit is below the corresponding 1-in-1-million cancer risk based concentration) are generally considered a low priority for follow-up activity. Situations where the summary statistics for a pollutant are below this comparison level but above 1% of this level are fully discussed in the text of the report.

[d] Air toxics for which the upper 95% confidence limit on the mean concentration are near or below the noncancer-based comparison level are generally of low concern and will generally be considered a low priority for follow-up activity. Pollutants for which the 95% confidence limits extend appreciably above the noncancer-based comparison level are fully discussed in the school-specific report and may be considered a priority for follow-up activity, if indicated in light of the full set of information available for the site.

[e] Indeno(1,2,3-cd)pyrene was detected in 8 of 12 samples, ranging from 0.0631 to 0.381 ng/m^3. The MDL range is 0.047 to 0.622 ng/m^3.

[f] Benzo(a)anthracene was detected in 8 of 12 samples, ranging from 0.0500 to 0.0190 ng/m^3. The MDL range is 0.0739 to 0.972 ng/m^3.

[g] Benzo(k)fluoranthene was detected in 7 of 12 samples, ranging from 0.040 to 0.210 ng/m^3. The MDL range is 0.067 to 0.907 ng/m^3.

[h] Chloroethane was detected in 8 of 14 samples, ranging from 0.02 to 0.16 µg/m^3. The MDL range is 0.005 to 0.032 µg/m^3.

[i] Acrylonitrile was detected in only 1 of 14 samples, a value of 0.391 µg/m^3. The MDL range is 0.033 to 0.059 µg/m^3.

[j] Ethylene Dichloride was detected in only 2 of 14 samples, ranging from 0.12 to 0.24 µg/m^3. The MDL range is 0.008 to 0.069 µg/m^3.

[k] Chloroprene was detected in only 1 of 14 samples, with a value of 0.33 µg/m^3. The MDL is range is 0.011 to 0.051 µg/m^3.

[l] Trichloroethylene was detected in only 6 of 14 samples, ranging from 0.054 to 0.22 µg/m^3. The MDL range is 0.011 to 0.091 µg/m^3.

[m] Vinyl Chloride was detected in only 2 of 14 samples,both values of 0.01 µg/m^3. The MDL range is 0.005 to 0.033 µg/m^3.

[n] Methyl-*tert*-Butyl Ether was detected in only 1 of 14 samples, with a value of 0.036 µg/m^3. The MDL range is 0.032 to 0.050 µg/m^3.

Appendix D. Bright Kids Montessori Academy (Santa Anita Christian Academy) Pollutant Concentrations.

Parameter	Units	8/5/2009	8/11/2009	8/17/2009	9/4/2009	9/10/2009	9/16/2009	9/22/2009	9/28/2009	10/10/2009	10/16/2009	10/22/2009	10/25/2009	10/28/2009	1/20/2010	1/23/2010	1/26/2010	1/29/2010	2/4/2010	2/7/2010	2/10/2010	2/16/2010	2/19/2010	2/25/2010	2/28/2010	Sample Screening Level[a]
Lead (TSP)	ng/m^3	20.8	15.8	11	13.1	13.9	11.1	20.8	12.5	9.5	14.1	12.0	--	13.2	--	--	--	--	--	--	--	--	--	--	--	150
Naphthalene	µg/m^3	0.211	0.146	0.112	0.186	0.171	0.202	0.356	0.148	0.0887	0.278	0.194	--	0.0363	--	--	--	--	--	--	--	--	--	--	--	30
Benzene	µg/m^3	--	--	--	--	--	--	--	--	--	--	2.46	2.55	0.790	1.02	1.60	1.92	2.65	1.53	0.767	1.85	3.42	0.742	1.67	1.45	30
Butadiene, 1,3-	µg/m^3	--	--	--	--	--	--	--	--	--	--	0.385	0.299	0.15	ND	0.243	0.266	0.421	0.18	0.044	0.354	0.619	0.13	0.288	0.226	20
Carbon tetrachloride	µg/m^3	--	--	--	--	--	--	--	--	--	--	0.69	0.61	0.71	0.88	0.82	0.63	0.63	0.63	0.69	0.69	0.69	0.64	0.69	0.82	200
Dichlorobenzene, *p*-	µg/m^3	--	--	--	--	--	--	--	--	--	--	0.35	0.31	0.20	0.12	ND	ND	0.36	0.24	ND	0.30	1.38	0.07	0.19	0.23	10000
Xylene, *m/p*-	µg/m^3	--	--	--	--	--	--	--	--	--	--	3.33	3.47	0.71	0.91	1.65	2.61	3.91	1.87	0.56	2.04	4.78	0.81	2.37	1.25	9000
Ethylbenzene	µg/m^3	--	--	--	--	--	--	--	--	--	--	1.00	1.11	0.24	0.35	0.61	1.00	1.39	0.74	0.26	0.78	1.74	0.32	0.90	0.54	40000
Tetrachloroethylene	µg/m^3	--	--	--	--	--	--	--	--	--	--	0.45	0.34	0.11	0.27	ND	0.48	0.41	0.20	0.20	0.20	0.54	0.11	0.30	0.12	1400
Bromomethane	µg/m^3	--	--	--	--	--	--	--	--	--	--	0.10	0.10	0.05	ND	ND	0.04	0.08	0.08	0.04	0.08	0.08	0.07	0.05	0.06	200
Chloromethane	µg/m^3	--	--	--	--	--	--	--	--	--	--	1.55	1.67	1.18	1.09	1.09	1.20	1.20	1.20	1.20	1.22	1.57	1.27	1.24	1.30	1000
Xylene, *o*-	µg/m^3	--	--	--	--	--	--	--	--	--	--	1.20	1.29	0.26	0.43	0.69	1.13	1.74	0.83	0.27	0.83	2.48	0.36	1.01	0.51	9000
Dichloromethane	µg/m^3	--	--	--	--	--	--	--	--	--	--	2.91	1.88	0.42	0.69	0.80	1.32	1.32	1.67	0.66	0.87	1.63	0.50	1.34	0.53	2000
Acetonitrile	µg/m^3	--	--	--	--	--	--	--	--	--	--	0.45	0.44	0.17	0.17	0.17	0.25	0.25	0.22	0.20	0.18	0.39	0.22	0.25	0.18	600
Chloroform	µg/m^3	--	--	--	--	--	--	--	--	--	--	0.56	0.29	0.18	0.20	0.15	0.24	0.20	0.20	0.15	0.24	0.34	0.11	0.25	ND	500
Benzo(a)pyrene	ng/m^3	0.230	0.130	0.040	0.060	0.110	0.080	0.140	0.220	0.070	0.010	0.120	--	0.040	--	--	--	--	--	--	--	--	--	--	--	6400
Toluene	µg/m^3	--	--	--	--	--	--	--	--	--	--	8.89	7.69	1.58	2.22	3.99	7.39	10.48	5.01	2.75	5.24	15.41	1.87	5.88	3.01	4000
Benzo(b)fluoranthene	ng/m^3	0.540	0.370	0.090	0.190	0.260	0.180	0.310	0.580	0.130	0.290	0.260	--	0.100	--	--	--	--	--	--	--	--	--	--	--	64000
Styrene	µg/m^3	--	--	--	--	--	--	--	--	--	--	0.23	0.16	0.04	0.26	0.21	0.30	0.34	0.26	0.17	0.21	0.60	0.16	0.30	0.16	9000
Methyl isobutyl ketone	µg/m^3	--	--	--	--	--	--	--	--	--	--	0.76	0.78	0.42	0.20	ND	0.53	0.66	0.57	0.25	0.49	0.37	0.63	0.39	0.34	30000
Carbon disulfide	µg/m^3	--	--	--	--	--	--	--	--	--	--	0.10	0.10	0.04	0.06	ND	0.06	0.06	0.06	0.25	0.03	0.19	0.04	0.14	0.04	7000
Chrysene	ng/m^3	0.840	0.420	0.170	0.430	0.420	0.320	0.440	0.520	0.190	0.150	0.320	--	0.120	--	--	--	--	--	--	--	--	--	--	--	640000
Methyl chloroform	µg/m^3	--	--	--	--	--	--	--	--	--	--	0.11	0.10	0.09	0.11	0.11	0.11	0.11	0.11	0.27	0.05	0.11	0.07	0.08	0.08	10000
Indeno(1,2,3-cd)pyrene	ng/m^3	0.381	0.248	ND	ND	ND	ND	0.187	0.315	0.063	0.149	0.128	--	0.074	--	--	--	--	--	--	--	--	--	--	--	64000
Benzo(a)anthracene	ng/m^3	ND	ND	ND	0.10	0.11	ND	0.13	0.19	0.07	0.15	0.14	--	0.05	--	--	--	--	--	--	--	--	--	--	--	64000
Benzo(k)fluoranthene	ng/m^3	0.210	0.100	ND	0.040	ND	ND	ND	0.150	0.040	0.090	ND	--	0.050	--	--	--	--	--	--	--	--	--	--	--	64000
Chloroethane	µg/m^3	--	--	--	--	--	--	--	--	--	--	0.03	0.05	0.02	ND	ND	0.03	0.05	ND	ND	ND	0.16	0.03	0.03	ND	40000
Acrylonitrile	µg/m^3	--	--	--	--	--	--	--	--	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.39	ND	ND	ND	200
Ethylene dichloride	µg/m^3	--	--	--	--	--	--	--	--	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.12	0.24	ND	ND	ND	270
Chloroprene	µg/m^3	--	--	--	--	--	--	--	--	--	--	ND	ND	ND	ND	ND	0.33	ND	ND	ND	ND	ND	ND	ND	ND	200
Trichloroethylene	µg/m^3	--	--	--	--	--	--	--	--	--	--	0.12	0.09	ND	ND	ND	0.11	ND	ND	ND	0.05	0.22	ND	0.11	ND	10000
Vinyl chloride	µg/m^3	--	--	--	--	--	--	--	--	--	--	ND	0.01	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1000
Methyl *tert*- butyl ether	µg/m^3	--	--	--	--	--	--	--	--	--	--	ND	ND	ND	ND	ND	0.04	ND	ND	ND	ND	ND	ND	ND	ND	7000
Benzyl chloride	µg/m^3	--	--	--	--	--	--	--	--	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	140
Bromoform	µg/m^3	--	--	--	--	--	--	--	--	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6400
Chlorobenzene	µg/m^3	--	--	--	--	--	--	--	--	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10000
Dibenz(a,h)anthracene	ng/m^3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	--	--	--	--	--	--	--	--	--	--	--	5800
Dichloroethane, 1,1-	µg/m^3	--	--	--	--	--	--	--	--	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4400
Dichloroethylene, 1,1-	µg/m^3	--	--	--	--	--	--	--	--	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	80
Dichloropropane, 1,2-	µg/m^3	--	--	--	--	--	--	--	--	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	200

Appendix D. Bright Kids Montessori Academy (Santa Anita Christian Academy) Pollutant Concentrations.

Parameter	Units	8/5/2009	8/11/2009	8/17/2009	9/4/2009	9/10/2009	9/16/2009	9/22/2009	9/28/2009	10/10/2009	10/16/2009	10/22/2009	10/25/2009	10/28/2009	1/20/2010	1/23/2010	1/26/2010	1/29/2010	2/4/2010	2/7/2010	2/10/2010	2/16/2010	2/19/2010	2/25/2010	2/28/2010	Sample Screening Level[a]
Dichloropropylene, *cis*- 1,3-	µg/m^3	--	--	--	--	--	--	--	--	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	40
Dichloropropylene, *trans*- 1,3-	µg/m^3	--	--	--	--	--	--	--	--	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	40
Ethyl Acrylate	µg/m^3	--	--	--	--	--	--	--	--	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7000
Ethylene dibromide	µg/m^3	--	--	--	--	--	--	--	--	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	12
Hexachlorobutadiene	µg/m^3	--	--	--	--	--	--	--	--	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	320
Methyl methacrylate	µg/m^3	--	--	--	--	--	--	--	--	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7000
Tetrachloroethane, 1,1,2,2-	µg/m^3	--	--	--	--	--	--	--	--	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	120
Trichlorobenzene, 1,2,4-	µg/m^3	--	--	--	--	--	--	--	--	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2000
Trichloroethane, 1,1,2-	µg/m^3	--	--	--	--	--	--	--	--	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	440

Key Pollutant

ng/m^3 nanograms per cubic meter

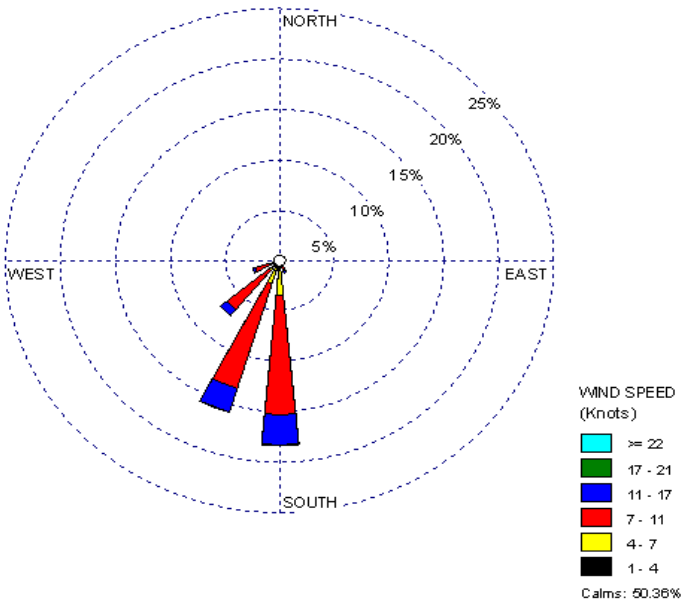
µg/m^3 micrograms per cubic meter

-- No sample was conducted for this pollutant on this day or the sample was invalid.

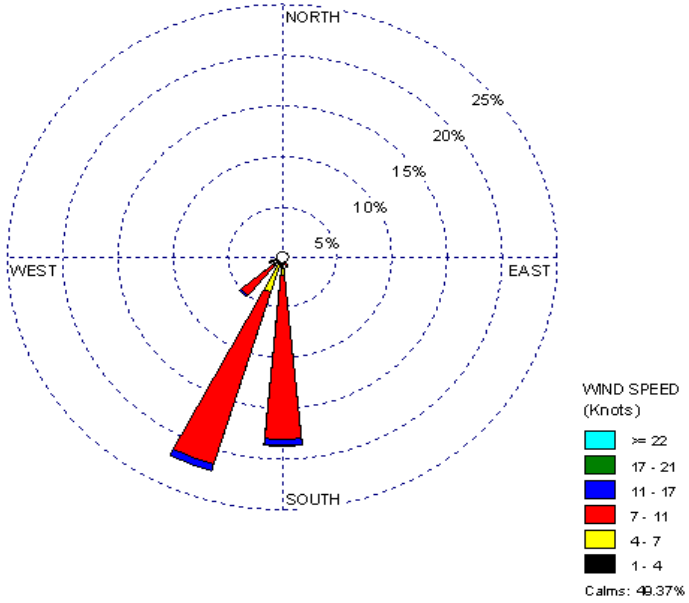
ND No detection of this chemical was registered by the laboratory analytical equipment.

[a] The individual sample screening levels and their use is summarized on the web site and described in detail in Schools Air Toxics Monitoring Activity (2009), "Uses of Health Effects Information in Evaluating Sample Results", see http://www.epa.gov/schoolair/pdfs/UsesOfHealthEffectsInfoinEvalSampleResults.pdf. These screening levels are based on consideration of exposure all day, every day over a period ranging up to at least a couple of weeks and longer for some pollutants.

Appendix E. Windroses for El Monte Airport NWS Station.



El Monte Airport NWS Station
(2006-2008)[1]



El Monte Airport NWS Station
Across Samling Period
(Aug. 5, 2009-Oct. 28, 2009)[1]

[1] El Monte Airport NWS Station (WBAN 03165) is 0.34 miles from Bright Kids Montessori Academy (Santa Anita Christian Academy).