Toxic Air Contaminant Control Program

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BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

Bay Area Air Quality Management District
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San Francisco, CA 94109

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EXECUTIVE SUMMARY

The Toxic Air Contaminant Control Program Annual Report is published to provide the public with information regarding the Bay Area Air Quality Management District's programs to identify and reduce ambient concentrations of toxic air contaminants (TACs). This report summarizes the status of the programs (as of the report publication date) that are used to identify and control ambient levels of TACs from stationary sources, and contains summaries of the TAC emissions inventory and ambient monitoring network for 2003.

Air Toxics New Source Review: New and modified source permit applications have been reviewed for air toxics concerns since 1987, in accordance with the Risk Management Policy (RMP) established at the request of the District's Board of Directors. A large increase in risk screening analyses has occurred in recent years due primarily to the removal of permit exemptions in District regulations for standby engines. Prior to 2000, the District completed risk screens for an average of about 175 permit applications per year. This number increased to 255 in 2000, to 440 in 2001, reached a peak of 602 in 2002, and declined to 430 in 2003. The District has replaced the RMP with Regulation 2, Rule 5: New Source Review of Toxic Air Contaminants, which was adopted by the District Board of Directors on June 15, 2005.

Regulation 2, Rule 5 changed the Air Toxics NSR Program by:

(1) adding a project risk limit for acute health risks (HI = 1.0);

(2) requiring TBACT for chronic non-cancer health risks (at HI > 0.20);

(3) using updated toxicity values and exposure assessment procedures (primarily from OEHHA Air Toxic Hot Spots Program Guidance Manual for Preparation of Health Risk Assessment);

(4) removing "special" project cancer risk limits for perchloroethylene dry cleaners; and

(5) eliminating discretionary risk authority for the APCO; all sources now limited to cancer risk of 10 in a million and non-cancer Hazard Index of 1.0.

Air Toxics Hot Spots Program: The Air Toxics Hot Spots (ATHS) Program involves the evaluation of health risks due to routine and predictable TAC emissions from industrial and commercial facilities. The District has established specific public notification measures for various levels of risk identified under the program (Levels 1, 2, and 3). In 1991, the first year of the risk assessment phase of the program, 30 facilities were identified with Level 1 health risks (cancer risk of 10 in a million or greater) that triggered public notification requirements. The number of facilities requiring public notification had steadily decreased over the first decade of the program as industries reduced toxic emissions and refined estimates of risk. There are currently no major facilities in the Bay Area that require public notification under the ATHS Program. In addition to public notification requirements, the ATHS Program requires facilities to reduce their health risks below levels determined by the air district to be significant within a certain timeframe. The District requires mandatory risk reduction measures for those facilities with health risks of Level 2 or greater (cancer risks of 100 in one million or greater). There are currently no facilities in the Bay Area that have risks identified as Level 2 or greater.

Although some dry cleaners and gasoline stations have Level 1 risks, they have not been included on the notification list because they are being considered in industry-wide risk assessments. The District plans to provide regional industry-wide notifications for dry cleaners and gasoline stations including publishing subject facilities on the District's website. In addition, the District plans to add diesel PM to the toxic inventory starting in 2007. Thousands of facilities operate diesel engines (primarily emergency generators) in the Bay Area and many of these facilities are likely to have Level 1 risks. The District plans to conduct regional notification for those facilities that only operate emergency generators.

The District is currently conducting a review of the AB2588 status for Pacific Steel Casting Company (Berkeley). The facility conducted an extensive source test program and prepared a revised toxic emission inventory report (February 2007) and a health risk assessment (July 23, 2007). After a preliminary review the District will provide the HRA to the Office of Environmental Health Hazard Assessment (OEHHA) and the public. The HRA indicates that Pacific Steel Casting Company will be subject to the public notification requirements of the Hot Spots Act.

Control Measures for Categories of Sources: The California Air Resources Board (CARB) has adopted seventeen Airborne Toxic Control Measures (ATCMs) for stationary sources which the District implements in the Bay Area. More recent ATCMs include residential waste burning (2003), stationary diesel engines (2004), portable diesel engines (2004), thermal metal spraying (2005), and formaldehyde from composite wood products (2007). CARB recently revised existing ATCMs for chrome plating and chromic acid anodizing operations and perchloroethylene dry cleaners (includes phase-out of Perchloroethylene by 2023).

National Emission Standards for Hazardous Air Pollutants (NESHAPs) developed by U.S. EPA in accordance with Title III of the 1990 federal Clean Air Act Amendments have also become an important source of air toxics control measures in California. These rules generally focus on larger "major source" facilities, and require that emissions be reduced using the Maximum Achievable Control Technology (MACT). Under State law, the District must implement and enforce all MACT Standards, or rules that are at least as stringent. U.S. EPA has already adopted a significant number of new MACT Standards. Table 3 shows the NESHAPs that have already been adopted. The focus of future NESHAP development under Title III has shifted to rules that apply to smaller "area source" facilities, e.g., EPA revised the Perchloroethylene Dry Cleaning MACT in July 2006.

Emissions Inventory: The 2003 emissions inventory continues to show decreasing emissions of many TACs in the Bay Area. The most dramatic emission reductions in recent years have been for certain chlorinated compounds that are used as solvents including 1,1,1-trichloroethane, perchloroethylene, and trichloroethylene. Additionally, in 2003, there were reductions in other organic TACs such as: toluene, xylene, butyl cellosolve, glycol ethers, methyl cellosolve, and methyl ethyl ketone.

Ambient Monitoring Network: Table 4 contains a summary of average ambient concentrations of TACs measured at monitoring stations in the Bay Area by the District in 2003. Table 5 and Figure 2 show the calculated cancer risks associated with lifetime exposure to average ambient concentrations of these measured TACs. Of the pollutants for which monitoring data are available, 1,3-butadiene and benzene (which are emitted primarily from motor vehicles) account for slightly over one half of the average calculated cancer risk.

Ambient benzene levels declined dramatically in 1996 with the advent of Phase 2 reformulated gasoline, with significant reductions in ambient 1,3-butadiene levels also occurring. Due largely to these observed reductions in ambient benzene and 1,3-butadiene levels, the calculated network average cancer risk has been significantly reduced in recent years. Based on 2003 ambient monitoring data, the calculated inhalation cancer risk is 143 in one million, which is 53 percent less than the 303 in one million risk that was observed in 1995. These figures do not include the risk resulting from exposure to diesel particulate matter or other compounds not monitored. Although not specifically monitored, recent studies indicate that exposure to diesel particulate matter may contribute significantly to a cancer risk (approximately 500-700 in a million) that is greater than all of the other measured TACs combined. CARB began monitoring for acrylonitrile mid-2003; ambient concentration data will be included for 2004 and in later reports.

Community Air Risk Evaluation (CARE): In 2004, the District began the development of the Community Air Risk Evaluation program with the main objectives of 1) producing a gridded diesel particulate and toxics emissions inventory, 2) conducting a pilot cumulative risk assessment for stationary sources within a selected community, and 3) developing and implementing toxic control measures for communities identified as having significant impacts. The program was redefined to include three distinct phases, however, mitigation measures are to be an important component of each phase. The gridded toxics emissions inventory of phase one was completed in 2006. The pilot cumulative risk assessment has been deferred and the District is collaborating with CARB and the port of Oakland to produce a comprehensive health risk assessment for the Port of Oakland and the surrounding West Oakland area.

INTRODUCTION

Since 1987, the Bay Area Air Quality Management District has had a program to describe, control, and where possible, eliminate public exposure to airborne toxic compounds. This report updates the status of program activities, and summarizes data collected during 2003.

The air toxics program is distinct from the District's efforts to control ambient levels of the "criteria pollutants" (e.g., carbon monoxide, nitrogen dioxide, ozone, particulate matter, and sulfur dioxide). The State and federal government have set health-based ambient air quality standards for criteria pollutants. The air toxics program was established as a separate and complementary program designed to evaluate and reduce adverse health effects resulting from exposure to toxic air contaminants (TACs).

The District works to understand and to control both locally elevated concentrations (i.e., "Hot Spots") and ambient background concentrations of TACs. Major elements of the District's air toxics program are:

- **Preconstruction review of new and modified sources** for potential health impacts, and the requirement for new/modified sources with TAC emissions, greater than de minimus levels, to use the Best Available Control Technology.
- **The Air Toxics Hot Spots Program**, designed to identify industrial and commercial facilities that may result in locally elevated ambient concentrations of toxic air contaminants, to report toxic emissions to the affected public, to analyze health risks, and to reduce significant health risks.
- **Control measures** designed to reduce emissions from source categories of TACs, including rules originating from the State Toxic Air Contaminant Control Act and the federal Clean Air Act.
- **The toxic air contaminant emissions inventory**, a database that contains information concerning routine and predictable emissions of TACs from permitted stationary sources.
- **Ambient monitoring** of toxic air contaminant concentrations at a number of sites throughout the Bay Area.
- **The Community Air Risk Evaluation (CARE) Program** began in 2004 and involves investigation of toxic emissions (e.g., diesel particulate) from stationary, mobile and area sources to determine impact at a community level, and development and implementation of toxic control measures for communities identified as having significant impacts.

This report describes elements of the District's air toxics program and discusses changes that have occurred during 2003. Appendices contain the District's 2003 annual air toxics emissions inventory and data from the District's air toxics monitoring network collected in 2003.

The urban background of toxic air contaminants is the combined result of many diverse human activities. In general, the stationary sources for which the District has primary regulatory jurisdiction contribute less significantly to health risks than do mobile sources. The District's program therefore focuses not only on strategies for reducing emissions from stationary sources, but also on promotion of similar strategies for mobile sources and other types of sources not directly influenced by District regulations and policies.

AIR TOXICS NEW SOURCE REVIEW

On June 15, 2005, the District adopted Regulation 2, Rule 5 New Source Review of Toxic Air Contaminants that superseded the District's Risk Management Policy (that had been in effect since 1987). The new Toxic NSR rule updated and enhanced program requirements primarily to increase conformity with updated State guidelines (e.g., new exposure factors and health effects values). District engineers evaluate permit applications for new and modified stationary sources of toxic air contaminants to ensure that the health risks are acceptable. In addition, net health risk benefits are realized when older, more highly polluting, sources are replaced or modified and must meet more stringent control requirements.

The requirements of Air Toxics New Source Review for a proposed project are based on the results of a Health Risk Screening Analysis (HRSA), an assessment that describes the possible adverse health effects which may result from public exposure to routine emissions of toxic air contaminants. HRSAs do not address adverse health effects that may result from accidental releases of toxic compounds. In California, review of industry's preparation for, and protection from, accidental releases is performed by Certified Unified Program Agencies or Administering Agencies (primarily at the county level).

Toxic emissions are estimated for all sources within a proposed project; if these emissions exceed the trigger levels of Table 2-5-1, a Health Risk Screening Analysis (HRSA) is required to determine risk from each source and total risk for the project (all sources in permit application plus related sources). District staff completes an HRSA using computer-modeled estimates of atmospheric dispersion. An HRSA may be a conservative screening-level analysis, or a more refined analysis involving the use of various site-specific data (e.g., the use of actual meteorological data and terrain elevations).

Where the predicted health risk from a proposed toxic source exceeds a cancer risk greater than 1.0 in one million (10 E-6), and/or a chronic hazard index greater than 0.20, the source must use Best Available Control Technology to minimize TAC emissions (TBACT).

The District denies Authority to Construct or a Permit to Operate for any new or modified source of TACs if the project risk exceeds a cancer risk of 10.0 in one million (10 E-6), a chronic hazard index of 1.0, or an acute hazard index of 1.0.

In the vast majority of cases of excess risk, the use of emissions control technology and other available risk reduction measures are successful in reducing the health risks associated with the proposed project's emissions to acceptable levels.

Prior to 2000, the District completed HRSAs for an average of about 175 permit applications per year. This number increased to 255 in 2000, to 440 in 2001, reached a peak of 602 in 2002, and declined to 430 in 2003. The large increase in the number of HRSAs completed in recent years is due primarily to the elimination of permit exemptions for certain sources, particularly diesel engines that are used to supply backup power in the event of an emergency.

AIR TOXICS HOT SPOTS PROGRAM

Assembly Bill 2588, the Air Toxics "Hot Spots" Information and Assessment Act, was enacted by the State legislature in 1987. AB-2588 requires companies throughout California to provide information to the public about emissions of TACs, and the impact that those emissions may have on public health. There are five steps to implementing the Air Toxics Hot Spots (ATHS) Program established under AB-2588: reporting of toxic emissions, prioritization, risk assessment, public notification, and risk reduction.

Air Toxic Emissions Inventory: Facilities subject to the ATHS program are required to report emissions of toxic compounds to the District. Air toxics emissions inventory is prepared for each facility in the Bay Area based upon information supplied to the District by the affected facility during the annual permit renewal process and reviewed by District engineers.

Prioritization: In the second step of the ATHS Program, the District prioritizes facilities for additional scrutiny. The prioritization procedure considers the quantity and toxicity of pollutants emitted, and the proximity of persons that may live or work nearby. Each facility is categorized as high, medium or low priority. High priority facilities are required to prepare a facility-wide Health Risk Assessment (HRA). The fact that a facility has been identified as high priority does not necessarily mean that nearby persons are exposed to significant risk from the facility's air emissions; rather, a designation of high priority indicates that the facility emissions need to be analyzed in more detail.

Risk Assessment: The ATHS Program provides this additional analysis by means of completion and review of comprehensive HRAs. HRAs are prepared in accordance with the ATHS Program Risk Assessment Guidelines. In 1992, the ATHS Program was amended with the passage of SB-1731, which directed OEHHA to prepare new risk assessment guidelines for use in the ATHS Program. These guidelines include sections for assessing the impacts of acute and chronic exposures, estimating risks due to carcinogens, and inclusion of stochastic modeling. The new Air Toxics Hot Spots Program Risk Assessment Guidelines were completed and adopted by OEHHA in October 2003. OEHHA occasionally revises or adopts new health effects values for toxic compounds: for example, a cancer potency factor for naphthalene was adopted in August 2004 and a chronic Reference Exposure Level for crystalline silica was adopted in February 2005. OEHHA is currently working to update the Air Toxics Hot Spots Program Risk Assessment Guidelines.

Public Notification: The ATHS Program requires that exposed persons be notified regarding the results of an HRA if, in the judgment of the District, the calculated risks warrant such notification. Affected facilities are required to notify their neighbors of the results of an HRA through direct mail to households and through public meetings in accordance with notification procedures developed by the District. The District established specific public notification measures for Level 1 or greater (cancer risk of 10 in one million or greater).

Risk Reduction: SB-1731 also requires facilities to implement measures to reduce risks below levels determined by the District to be significant within a certain timeframe. The District requires mandatory risk reduction measures under the authority of SB-1731 for facilities with health risks of Level 2 or greater (cancer risks of 100 in one million or greater).

History of District's ATHS Program: The first cycle of the District's ATHS Program was completed in January 1991, with the submission of risk assessment documents by the first group of high priority facilities identified during the inventory phase of the program. Of the 123 HRAs submitted, 30 were Level 1 or greater (maximum cancer risks greater than or equal to 10 in one million), and therefore were required to engage in the public notification. In 1992, the number of Level 1 or greater facilities was reduced to 16. All Level 2 or greater risks (100 in one million or greater) were reduced to Level 1 or lower by 1993.

Continued efforts to reduce emissions and to refine estimates of risk reduced the number of facilities requiring public notification to nine in 1993, to five in 1994, to two in 1995, and to one in 1999. The last facility requiring public notification under the ATHS Program in the Bay Area was removed at the end of 2001; a revised HRA indicated that risks had been reduced to Level 0. The current ATHS Program public notification list is given in Table 1.

Dry cleaning facilities were removed from the public notification list in 1994. These sources, as well as gasoline dispensing facilities, are being evaluated in "industry-wide" risk assessments on a statewide basis as a part of the ATHS Program. Risk assessments for these facilities indicate that many dry cleaners had Level 2 risks and some gasoline stations had Level 1 risks. The District plans to provide industry-wide notifications for dry cleaners and gasoline stations including publishing a list of subject facilities on the District's website. The District will also do regional public notification for operators of emergency diesel engines with no other sources.

In 1994, the District adopted Regulation 11, Rule 16, Perchloroethylene and Synthetic Solvent Dry Cleaning Operations, which incorporated the risk reduction requirements of SB-1731. Risk reduction measures required by the dry cleaning rule have been fully implemented, and the health risks from all permitted dry cleaners have been reduced to Level 1 or lower. There are currently no facilities in the Bay Area that have been identified as having Level 2 or greater risks that require further mandatory risk reduction measures under the ATHS Program. CARB revised the dry cleaning ATCM in January 2007 to phase out perchloroethylene as a dry cleaning solvent. About half of the dry cleaners in the Bay Area must remove their old Perc machines by 2010 and the remaining machines will be removed over the subsequent 13 years (phase-out to be complete in 2023).

The District is currently reviewing emissions of diesel particulate matter and some facilities with diesel engines may be subject to public notification (albeit, emission reductions mandated by the statewide ATCMs will reduce the risk from many facilities below the notification level).

The ATHS Program requires air districts to maintain toxics inventories, revising them on at least a quadrennial basis. In the Bay Area, emission inventories are updated annually for most sources of TACs through the District's ongoing permit renewal process. This annual update is used to re-prioritize the facilities in the program, thus allowing for identification of any new facilities or significant increases in emissions at existing facilities. In this way, an additional 16 facilities have been identified as high priority since the first cycle of health risk assessments were completed in 1991. The HRAs prepared for all of these facilities indicated that the maximum health risks are below the public notification thresholds.

The District is currently conducting a review of the AB2588 status for Pacific Steel Casting Company (Berkeley). The facility conducted an extensive source test program and prepared a revised toxic emission inventory report (February 2007) and a health risk assessment (July 23, 2007). After a preliminary review the District will provide the HRA to the Office of Environmental Health Hazard Assessment (OEHHA) and the public. The HRA indicates that Pacific Steel Casting Company will be subject to the public notification requirements of the Hot Spots Act.

Airborne Toxic Control Measures (ATCMs): The primary mechanism for the development of retrofit air toxics control measures in California has been through the Toxic Air Contaminant Act, which was enacted in 1983 with the passage of AB-1807. Under this legislation, Airborne Toxic Control Measures (ATCMs) adopted by the California Air Resources Board (CARB) are implemented and enforced by the local air districts. Eighteen statewide ATCMs for stationary sources have been implemented in the Bay Area including the following source categories: chrome plating and anodizing operations; cooling towers; commercial and hospital sterilizers; medical waste incinerators; surfacing applications that use serpentine materials; gasoline stations; perchloroethylene dry cleaners; non-ferrous metal melting operations; chlorinated TACs from automotive maintenance and repair activities; construction, grading, quarrying, and surface mining operations in areas with serpentine deposits; and motor vehicle and mobile equipment coating operations. An ATCM for residential waste burning was adopted by CARB in 2002, and went into effect on January 1, 2004. ATCMs for stationary and portable diesel engines were adopted by CARB in February 2004. The thermal spray ATCM, which limits emissions of chromium and nickel, was adopted in September of 2005 and became effective January 2006. CARB also adopted a new ATCM to reduce formaldehyde emissions from composite wood products in April 2007.
CARB recently revised existing ATCMs for chrome plating and chromic acid anodizing operations (December 2006) and perchloroethylene dry cleaners (January 2007), and has made several revisions to the diesel engine ATCMs. These recent actions are undergoing review by the Office of Administrative Law.

National Emission Standards for Hazardous Air Pollutants (NESHAPs): In addition to the ATCMs, another source of new air toxics control measures are the National Emission Standards for Hazardous Air Pollutants (NESHAPs) developed by the U.S. EPA. These federal rules are also commonly referred to as MACT Standards, because they reflect the Maximum Achievable Control Technology. The MACT Standards focus primarily on controlling emissions from facilities that are "major sources" of hazardous air pollutants (HAPs). A major source of HAPs is a facility that emits, or has the potential to emit, 10 tons per year or more of any individual HAP, or 25 tons per year or more of any combination of HAPs. Table 3 lists the MACT Standards that have been adopted by U.S. EPA. The District is required to implement and enforce all MACT Standards, or rules that are at least as stringent.

All of the listed MACT Standards were adopted by late 2004, after which the focus of the federal air toxics program shifted towards the development or revision of control measures that apply to “area sources” of HAPs. An area source of HAPs is a facility that emits one or more HAP, but in quantities less than the major source thresholds. The U.S. EPA has listed a total of 56 area source categories that are slated for NESHAP development.

AIR TOXICS EMISSIONS INVENTORY

The air toxics emissions inventory is a database that contains information concerning emissions of TACs from permitted stationary sources in the Bay Area. The inventory includes routine or predictable releases, and is not intended to describe the potential for acute hazards from accidental releases. Information submitted by industry is reviewed for accuracy by District staff prior to inclusion in the inventory. This inventory, and a similar inventory for mobile and area sources compiled by CARB, is used to plan strategies to reduce public exposure to TACs.

The detailed emissions inventory data for 2003 are provided in Volume II of this Report. The data are provided for each facility sorted by county and city (Appendix B-1), and alphabetically by pollutant (Appendix B-2). The total inventory for the Bay Area is provided by county (Appendix B-3), and by pollutant sorted in several different ways (Appendix B-4). These are the District's best estimates of TAC emissions, based on the information that facilities submitted in their most recent annual update reports that were entered into the District's Data Bank prior to December 31, 2003.

Emission thresholds above which emissions are reported have been established individually for each TAC based on relative toxicity. The reporting thresholds reflect the emission level that is estimated to result in a de minimus level of health risk based on a series of conservative risk assessment assumptions (e.g., lifetime exposure, screening modeling methods, low-level stack release located in close proximity to receptors). For carcinogens, the threshold reporting levels have been set at the emission level that corresponds to a maximum cancer risk of 1 in one million. Non-carcinogen trigger levels were set at the amount estimated to result in a maximum air concentration equal to the TAC's Reference Exposure Level (i.e., a hazard index of one). The District reduced some of the non-carcinogenic chronic trigger levels in 2005 in order to assure exposure would result in a hazard index of 0.2 or less (new TBACT standard in Regulation 2, Rule 5).

In recent years, the usage of a number of industrial and commercial solvents has changed due to regulatory controls, and these changes are reflected in the District's emissions inventories. For example, the 2003 emissions of perchloroethylene are 36 percent less than the emissions that were reported five years earlier. These emission reductions are primarily due to the efforts of Bay Area dry cleaners to comply with the District's perchloroethylene dry cleaning rule. Similarly, the emissions of methylene chloride, another heavily regulated solvent, have been reduced by 30 percent over the last five years. Reductions in 1,1,1-trichloroethane (TCA) emissions are even more dramatic over this five-year period, with emissions from permitted sources declining 60 percent. The production of TCA was banned on January 1, 1996, pursuant to national stratospheric ozone protection regulations.

Monitoring is considered the definitive method for establishing ambient pollutant concentrations. One limitation of air monitoring is that it is spatially limited to specific monitoring locations. This problem has been minimized to a great extent in the Bay Area by the operation of an extensive air toxics monitoring network. The locations of the air toxics monitoring sites operating in the Bay Area at the end of 2003 are shown in Figure 1.

The air-monitoring network operated by the District includes gaseous samples collected over 24-hour periods on a 12-day sampling frequency. The network began in 1986 with six sites, and has gradually been expanded to its present size of 20 sites. The sampling sites in the network are generally community oriented, and are most directly influenced by area wide sources. The network also includes a non-urban background site located at Fort Cronkhite on the Pacific Ocean coastline. The analytical protocol includes the following 20 gaseous compounds: acetone, benzene, 1,3-butadiene, carbon tetrachloride, chloroform, ethylbenzene, ethylene dibromide, ethylene dichloride, methylene chloride, methyl ethyl ketone, methyl tert-butyl ether (MTBE), perchloroethylene, toluene, trichloroethane, trichloroethylene, trichlorofluoromethane, 1,1,2-trichlorotrifluoroethane, vinyl chloride, m/p-xylene, and o-xylene.

The 2003 data for the District's ambient toxics monitoring network are presented in Volume II of this report. The data are sorted both by monitoring station (Appendix C-1) and by pollutant (Appendix C-2). The average 2003 TAC concentrations calculated from all of the measurements in the entire District monitoring network are given in Table 4. The data from the Fort Cronkhite background site were not used in calculating 2003 average levels.

CARB also conducts routine air toxics monitoring at several sites in the Bay Area as a part of their statewide toxics ambient monitoring network. The monitoring conducted by CARB includes several additional gaseous compounds (e.g., formaldehyde and acetaldehyde) as well as some particulate-based TACs (e.g., select toxic metals and several species of polycyclic aromatic hydrocarbons). In addition, CARB began monitoring for acrylonitrile in 2003. Toxics sampling was suspended at two of the five CARB ambient monitoring sites in the Bay Area (i.e., the Concord and San Pablo sites) at the end of February 2000. These sites were replaced by sites located at the Lockwood Elementary School in Oakland, and the John Swett High School in Crockett, which are part of the monitoring network required under the Children's Environmental Health Protection Program established under State law (SB-25, Escutia). Monitoring at these school sites began in late 2001 and ended in 2003.

Table 5 shows the lifetime cancer risks associated with exposure to annual average TAC concentrations measured in the Bay Area for the calendar year 2003. Figure 2 depicts these same data in graphic form. The total calculated lifetime cancer risk is 143 in one million. This cancer risk was calculated based on inhalation exposures using the Unit Risk Factors and exposure assumptions adopted by OEHHA for the ATHS Program. All of the carcinogenic TACs measured in the District and CARB monitoring networks in 2003 are included, except for ethylene dibromide, ethylene dichloride, and vinyl chloride, which were excluded because these compounds were not detected in any of the air samples taken. In calculating average concentrations for TACs, samples with concentrations less than the limit of detection (LOD) of the analytical method used were assumed to be equal to one half the LOD concentration. The total cancer risk resulting from exposure to the mixture of various measured TACs was assumed to be additive.

Of the pollutants for which monitoring data are available, 1,3-butadiene and benzene, which are primarily emitted from mobile sources, contribute most significantly to the inhalation cancer risk. These two pollutants together account for 51 percent of the total risk. Other pollutants with contributions to the average inhalation cancer risk of three percent or more are carbon tetrachloride, hexavalent chromium, and formaldehyde.

The average ambient levels of benzene dropped significantly in 1996 due to the widespread use of Phase 2 reformulated gasoline, which began in the Bay Area in the second quarter of 1996. The network average benzene level has continued to drop, and by the end of 2003, the benzene level had decreased to 36 percent of what was observed in 1995. A number of control measures already adopted by CARB should provide additional, although more gradual, reductions in mobile source related emissions of benzene and 1,3-butadiene in the future. These include the Low-Emission Vehicle/Clean Fuels (LEV) program and requirements for utility engines and off-road vehicles/engines.

Carbon tetrachloride accounts for 20 percent of the 2003 average calculated cancer risk. Carbon tetrachloride exists at background levels in the air of about 0.10 to 0.13 parts per billion nearly uniformly on a global basis. It is believed that the emissions from stationary sources have globally accumulated in the atmosphere due to this compound's very long residence time. The production of carbon tetrachloride in the United States was banned beginning in 1996.

Hexavalent chromium accounts for about 10 percent of the average cancer risk calculated for 2003. The Bay Area network average ambient hexavalent chromium concentration for the year 2003 is approximately the same as what was observed five years earlier. Over the past 10 years, the hexavalent chromium concentration had been decreasing until 1998, and since then, the concentration has remained fairly steady. The relatively uniform geographic distribution of ambient hexavalent chromium levels suggests that emissions occur primarily on an area wide, rather than a point source, basis.

Formaldehyde accounts for about 11 percent of the 2003 average calculated cancer risk for the Bay Area. Formaldehyde is emitted directly from vehicles and other combustion sources, and is also created during photochemical reactions in the atmosphere. The District-wide average formaldehyde concentration level for 2003 is about 20 percent higher than what was observed five years earlier.

There is growing evidence that indicates that exposure to emissions from diesel-fueled engines, about 95 percent of which come from diesel-fueled mobile sources, may result in cancer risks that exceed those attributed to other measured TACs. In 1998, OEHHA issued a health risk assessment that included estimates of the cancer potency of diesel particulate matter (PM). Because diesel PM cannot be directly monitored in the ambient air, however, estimates of cancer risk resulting from diesel PM exposure must be based on concentration estimates made using indirect methods (e.g., derivation from ambient measurements of a surrogate compound). Based on CARB estimates of the population-weighted average ambient diesel PM concentration for the Bay Area, and the best-estimate cancer potency factor adopted by OEHHA, the approximate cancer risk associated with exposure to diesel PM for 2003 is about 500 to 700 in one million.

One group of pollutants that have not been routinely monitored in ambient air is polychlorinated dioxins and furans (generally referred to as "dioxin"). In an effort to improve the understanding of the levels of dioxin in the ambient air in the Bay Area, and their deposition onto land and water surfaces, the District has begun an ambient air dioxin-monitoring program. Monitoring began at the first site in this network when sampling began at Ft. Cronkhite on November 22, 2000. The Ft. Cronkhite site has been established as part of the U.S. EPA's National Dioxin Air Monitoring Network (NDAMN). Six additional dioxin air-monitoring sites were also started up in 2001, with sites in Crockett, Livermore, Oakland, Richmond, San Jose, and San Francisco (the Crockett and Oakland locations were SB-25 monitoring sites that were shutdown in the first half of 2003). Based on monitoring data gathered during 2003, the calculated inhalation cancer risk associated with dioxin exposure in the Bay Area (using the OEHHA cancer potency factor) is about 1 in one million.

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TABLES & FIGURES

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Table 1 Bay Area Facilities with Health Risks Requiring Public Notification Under the Air Toxics Hot Spots Program

Facility	City	County	Maximum Cancer Risk (Chances in One million)
Level 3 Risks (Greater than 500 in one million)			
None	n/a	n/a	n/a
Level 2 Risks (Between 100 and 500 in one million)			
None	n/a	n/a	n/a
Level 1 Risks (Between 10 and 100 in one million)			
None (see notes)	n/a	n/a	n/a

NOTES:

Public notification requirements under the ATHS Program are based on the health risks associated with a facility's routine toxic air contaminant (TAC) emissions as determined in a Health Risk Assessment. The "individual cancer risk" is the likelihood that a person exposed to concentrations of TACs from a facility over a 70-year lifetime will contract cancer, based on the use of standard risk assessment methodology established for the ATHS Program. These cancer risks are based on "best estimates" of plausible cancer potencies, as determined by the Cal/EPA Office of Environmental Health Hazard Assessment. Risk assessments can have significant uncertainty and the actual degree of risk cannot be determined, and may approach zero for some listed compounds.

There are currently no facilities requiring public notification under the Air Toxics Hot Spots (ATHS) Program (AB-2588) in the Bay Area. Dry cleaners and gasoline stations are not included on this list because both of these source categories are being considered as industry-wide categories under the ATHS Program. The District plans to provide industry-wide notifications for dry cleaners and gasoline stations including publishing a list of subject facilities on the District's website. The District is reviewing emissions of diesel particulate matter from stationary engines; some facilities may be subject to public notification because of diesel PM emissions.

The District is currently conducting a review of the AB2588 status for Pacific Steel Casting Company (Berkeley). The facility conducted an extensive source test program and prepared a revised toxic emission inventory report (February 2007) and a health risk assessment (July 23, 2007). After a preliminary review the District will provide the HRA to the Office of Environmental Health Hazard Assessment (OEHHA) and the public. The HRA indicates that Pacific Steel Casting Company is a Level 1 facility and will be subject to the public notification requirements of the Hot Spots Act.

Table 2 Airborne Toxic Control Measures (ATCMs)

Number	ATCMs for Stationary Sources	Date Adopted or last amended
17 CCR 93101	Benzene ATCM for Retail Service Stations	05/13/1988
17 CCR 93102	Hexavalent Chromium ATCM for Decorative and Hard Chrome Plating and Chromic Acid Anodizing Operations.	02/18/1988 12/07/2006 *
17 CCR 93102.5	ATCM for Thermal Spraying	09/30/2005
17 CCR 93103	Chromate Treated Cooling Towers	03/09/1989
17 CCR 93104	Dioxins ATCM for Medical Waste Incinerators	07/13/1990
17 CCR 93105	Asbestos ATCM for Construction, Grading, Quarrying, and Surface Mining Operations	07/26/2001
17 CCR 93106	Asbestos ATCM for Surfacing Applications	07/20/1990 07/20/2000
17 CCR 93107	ATCM for Emissions of Toxic Metals from Non-Ferrous Metal Melting	01/14/1993
17 CCR 93108 17 CCR 93108.5	Ethylene Oxide ATCM for Sterilizers and Aerators Parts 1 & 2	05//21/1998
17 CCR 93109	ATCM for Emissions of Perchloroethylene from Dry Cleaning Operations	10/14/1993 01/25/2007 *
17 CCR 93110	Environmental Training Program Regulation for Perchloroethylene Dry Cleaning Operations	10/14/1993
17 CCR 93111	ATCM for Emissions of Chlorinated Toxic Air Contaminants from Automotive Maintenance and Repair Activities	04/27/2000
17 CCR 93112	ATCM for Emissions of Hexavalent Chromium and Cadmium from Motor Vehicle and Mobile Equipment Coatings	09/20/2001
17 CCR 93113	ATCM to Reduce Emissions of Toxic Air Contaminants from Outdoor Residential Waste Burning.	02/03/2003
17 CCR 93114	ATCM to Reduce Particulate Emissions from Diesel-Fueled Engines -- Standards for Nonvehicular Diesel Fuel	07/24/2003
17 CCR 93115	ATCM for Stationary Compression Ignition Engines	02/26/2004
17 CCR 93116	ATCM for Diesel Particulate Matter from Portable Engines Rated at 50 Horsepower and Greater	02/26/2004
OAL review	ATCM to Reduce Formaldehyde Emissions from Composite Wood Products	04/26/2007 *

* undergoing OAL review

Number	ATCMs for Mobile Sources	Dated Adopted
13 CCR Chapter 10 § 2480	ATCM to Limit School Bus Idling and Idling at Schools	12/12/2002
13 CCR 2020 13 CCR 2021	Diesel Particulate Matter Control Measure for On-Road Heavy-Duty Diesel Fueled Residential and Commercial Solid Waste Collection Vehicles	09/25/2003
13 CCR 2477 and Article 8	ATCM for In-Use Diesel-Fueled Transport Refrigeration Units (TRU) and TRU Generator Sets and Facilities Where TRUs Operate	02/26/2004
13 CCR Chapter 10 § 2485	ATCM to Limit Diesel-Fueled Commercial Motor Vehicle Idling	07/22/2004

Based on: http://www.arb.ca.gov/toxics/atcm/atcm.htm (updated January 17, 2007)

Table 3 National Emission Standards for Hazardous Air Pollutants

(MACT Standards Adopted Under Title III of the 1990 Amendments to the Federal Clean Air Act)

NESHAP (MACT) STANDARD Source Categories Affected	CFR Sub Parts	Final Federal Register Date & Citation	Compliance Date	Major or Area
Aerospace	GG	09/01/95 (60FR45948)	09/01/98	M
Asbestos	M	CFR 61.140		A
Asphalt Processing and Asphalt Roofing Manufacturing	LLLLL	04/29/03 (68 FR 22975)	5/1/06	M
Auto & Light Duty Truck (surface coating)	IIII	04/26/04 (69FR22601)	04/26/07	M
Benzene Waste Operations	FF	12/04/03 (68FR67931)	12/04/06	A
Boat Manufacturing	VVVV	8/22/01 (66FR44217)	8/22/04	M
Brick and Structural Clay Products Manufacturing Clay Ceramics Manufacturing	JJJJJ KKKKK	05/16/03 (68FR26689)	5/16/06	M
Cellulose Products Manufacturing • Miscellaneous Viscose Processes o Cellulose Food Casing o Rayon o Cellulosic Sponge o Cellophane • Cellulose Ethers Production o Caroxymethyl Cellulose o Methyl Cellulose o Cellulose Ethers	UUUU	06/11/2002 (67FR40043)	06/11/2005	M
Chromium Electroplating · • Chromic Acid Anodizing • Decorative Chromium Electroplating • Hard Chromium Electroplating	N	01/25/95 (60FR4948)	01/25/96	A
Clean Air Mercury Rule * (coal fired utility units > 25MWe)	Da, HHHH	05/18/05 (70 FR 28606)		*
Coke Ovens: Pushing, Quenching,& Battery Stacks	CCCCC	4/14/03 (68FR18007)	4/14/06	M
Coke Ovens: Charging, Top Side, and Door Leaks	L	10/27/93 (58FR57898)	contact EPA	M
Combustion Sources at Kraft, Soda, and Sulfite Pulp & Paper Mills (Pulp and Paper MACT II)	MM	01/12/01 (66FR3180)	01/12/04	A

Table 3 National Emission Standards for Hazardous Air Pollutants (cont.)

NESHAP (MACT) STANDARD Source Categories Affected	CFR Sub Parts	Final Federal Register Date & Citation	Compliance Date	Major or Area
Commercial Sterilizers	O	12/06/94 (59FR62585)	12/06/98	A
Degreasing Organic Cleaners • Halogenated Solvent Cleaners	T	12/02/94 (59FR61801)	12/02/97	A
Dry Cleaning · • Commercial drycleaning dry-to-dry • Commercial drycleaning transfer machines • Industrial drycleaning dry-to-dry • Industrial drycleaning transfer machines	M	09/22/93 (58FR49354)	09/23/96	A
Engine Test Cells/Stands (Combined with Rocket Testing Facilities)	PPPPP	05/27/03 (68FR28774)	see FR	M
Fabric Printing, Coating & Dyeing	OOOO	05/29/03 68FR32171	05/29/06	M
Ferroalloys Production	XXX	05/20/99 (64FR27450)	05/20/01	M
Flexible Polyurethane Foam Fabrication Operation	MMMM M	04/14/03 (68FR18061)	04/14/04	M
Flexible Polyurethane Foam Production	III	10/07/98 (63FR53980)	10/08/01	M
Friction Products Manufacturing	QQQQ Q	10/18/02 (67FR64497)	10/18/05	M
Gasoline Distribution (Stage 1)	R	12/14/94 (59FR64303)	12/15/97	M
General Provisions	A	*	*	
Generic MACT I-Acetal Resins	YY	6/29/99 (64FR34853)	06/29/02	M
Generic MACT I-Hydrogen Fluoride	YY	6/29/99 (64FR34853)	06/29/02	M
Generic MACT I-Polycarbonates Production	YY	6/29/99 (64FR34853)	06/29/02	M
Generic MACT I-Acrylic/Modacrylic Fibers	YY	6/29/99 (64FR34853)	06/29/02	M
Generic MACT II-Spandex Production	YY	7/12/02 (67FR46257)	07/12/05	M
Generic MACT II-Carbon Black Production	YY	7/12/02 (67FR46257)	07/12/05	M
Generic MACT II-Ethylene Processes	YY	7/12/02 (67FR46257)	07/12/05	M

Table 3 National Emission Standards for Hazardous Air Pollutants (cont.)

NESHAP (MACT) STANDARD Source Categories Affected	CFR Sub Parts	Final Federal Register Date & Citation	Compliance Date	Major or Area
Hazardous Waste Combustion · • Hazardous Waste Incinerators (A) • Hazardous Waste Incinerators (M)	Parts 63, 261 & 270	09/30/99 (64FR52827)	09/30/03	A/M
Hazardous Organic NESHAP (Synthetic Organic Chemical Manufacturing Industry)	F, G, H, & I	04/22/94 (59FR19402)	05/12/98	M
Hydrochloric Acid Production· • Fumed Silica Production	NNNNN	4/17/03 (68FR19075)	4/17/06	M
Industrial, Commercial and Institutional Boilers and Process Heaters	DDDDD	09/13/04 (69FR55217)	09/13/07	M
Industrial Cooling Towers	Q	09/08/94 (59FR46339)	03/08/95	M
Integrated Iron and Steel	FFFFF	5/20/03 (68FR27645)	5/20/06	M
Iron and Steel Foundries*	EEEEE	4/22/04 (69FR21905)	4/22/07	M
Large Appliances (surface coating)	NNNN	7/23/02 (67FR48253)	07/23/05	M
Leather Finishing Operations	TTTT	02/27/02 (67FR915510)	02/27/05	M
Lime Manufacturing	AAAAA	01/05/04 (69FR393)	01/05/07	M
Magnetic Tape (surface coating)	EE	12/15/94 (59FR64580)	12/15/96	M
Manufacturing Nutritional Yeast (formerly Bakers Yeast)	CCCC	5/21/01 (66FR27876)	5/21/04	M
Marine Vessel Loading Operations	Y	09/19/95 (60FR48388)	09/19/99	M
Mercury Cell Chlor-Alkali Plants	IIIII	12/19/03 (68FR70903)	12/19/06	M
Metal Can (surface coating)	KKKK	11/13/03 (68FR64431)	11/13/2006	M
Metal Coil (surface coating)	SSSS	06/10/2002 (67FR39793)	6/10/2005	M
Metal Furniture (surface coating)	RRRR	05/23/03 (68FR28605)	05/23/06	M
Mineral Wool Production	DDD	06/01/99 (64FR29489)	06/01/02	M
Misc. Coating Manufacturing	HHHHH	12/11/03 (68FR69163)	12/11/06	M
Misc. Metal Parts and Products (surface coating) • Asphalt/Coal Tar Application to Metal Pipes	MMMM	01/02/04 (69FR129)	01/02/07	M

Table 3 National Emission Standards for Hazardous Air Pollutants (cont.)

NESHAP (MACT) STANDARD Source Categories Affected	CFR Sub Parts	Final Federal Register Date & Citation	Compliance Date	Major or Area
Misc. Organic Chemical Production & Processes (MON) • Alkyd Resins Production • Ammonium Sulfate Production • Benzyltrimethylammonium Chloride Prod. • Carbonyl Sulfide Production • Chelating Agents Production • Chlorinated Paraffins Production • Ethyllidene Norbomene Production • Explosives Production • Hydrazine Production • Maleic Anhydride Copolymers Production • Manufacture of Paints, Coatings, & Adhesives • OBPA/1, 3-diisocyanate Production • Photographic Chemicals Production • Phthalate Plasticizers Production • Polyester Resins Production • Polymerized Vinylidene Chloride Prod. • Polymethyl Methacrylate Resins Prod. • Polyvinyl Acetate Emulsions Prod. • Polyvinyl Alcohol Production • Polyvinyl Butyral Production • Quaternary Ammonium Comp. Prod. • Rubber Chemicals Production • Symmetrical Tetrachloropyridine Production	FFFF	11/10/03 (68FR63851)	11/10/06	M
Municipal Solid Waste Landfills	AAAA	01/16/03 68FR2227	contact EPA	A

Table 3 National Emission Standards for Hazardous Air Pollutants (cont.)

NESHAP (MACT) STANDARD Source Categories Affected	CFR Sub Parts	Final Federal Register Date & Citation	Compliance Date	Major or Area
Natural Gas Transmission and Storage	HHH	06/17/99 (64FR32610)	06/17/02	M
Off-Site Waste Recovery Operations	DD	07/01/96 (61FR34140)	02/01/00	M
Oil & Natural Gas Production	HH	06/17/99 (64FR32609)	06/17/02	M
Organic Liquids Distribution (non-gasoline)	EEEE	02/03/04 (69FR5038)	02/03/07	M
Paper and Other Web (surface coating)	JJJJ	12/04/02 (67FR72329)	12/04/05	M
Pesticide Active Ingredient Production • 4-Chlror-2-Methyl Acid Production • 2,4 Salts & Esters Production • 4,6-dinitro-o-cresol Production • Butadiene Furfural Cotrimer • Captafol Production • Captan Production • Chloroneb Production • Chlorothalonil Production • Dacthal (tm) production • Sodium Pentachlorophenate Production • Tordon (tm) Acid Production	MMM	06/23/99 (64FR33549)	12/23/03	M
Petroleum Refineries	CC	08/18/95 (60FR43244)	08/18/98	M
Petroleum Refineries · • Catalytic Cracking • Catalytic Reforming • Sulfur Plant Units • Associated Bypass Lines	UUU	04/11/02 (67FR17761)	04/11/05	M
Pharmaceuticals Production	GGG	09/21/98 (63FR50280)	09/21/01	M
Phosphoric AcidPhosphate Fertilizers	AA BB	06/10/99 (64FR31358)	06/10/02	M
Plastic Parts (surface coating)	PPPP	4/19/04 (69FR20968)	4/19/07	M

Table 3 National Emission Standards for Hazardous Air Pollutants (cont.)

NESHAP (MACT) STANDARD Source Categories Affected	CFR Sub Parts	Final Federal Register Date & Citation	Compliance Date	Major or Area
Plywood and Composite Wood Products (formerly Plywood & Particle Board Manufacturing)	DDDD	7/30/04 (69FR45943)	xxxx	M
Polyether Polyols Production	PPP	06/01/99 (64FR29419)	06/01/02	M
Polymers & Resins I · • Butyl Rubber • Epichlorohydrin Elastomers • Ethylene Propylene Rubber • Hypalon (TM) Production • Neoprene Production • Nitrile Butadiene Rubber • Polybutadiene Rubber • Polysulfide Rubber • Styrene-Butadiene Rubber & Latex	U	09/05/96 (61FR46906)	07/31/97	M
Polymers & Resins II • Epoxy Resins Production • Non-Nylon Polyamides Production	W	03/08/95 (60FR12670)	03/03/98	M
Polymers & Resins III • Amino Resins • Phenolic Resins	OOO	01/20/2000 65FR3275	01/20/2003	M
Polymers & Resins IV • Acrylonitrile-Butadiene-Styrene • Methyl Methacrylate-Acrylonitrile+ • Methyl Methacrylate-Butadiene++ • Polystrene • Styrene Acrylonitrile • Polyethylene Terephthalate • Nitrile Resins	JJJ	09/12/96 (61FR48208)	07/31/97	M
Polyvinyl Chloride and Copolymers Production	J	7/10/02 (67FR45885)	7/10/05	M
Portland Cement Manufacturing	LLL	06/14/99 (64FR31898)	06/10/02	A
Primary Aluminum	LL	10/07/97 (62FR52384)	10/07/99	M
Primary Lead Smelting	TTT	06/04/99 (64FR30194)	05/04/01	M

Table 3 National Emission Standards for Hazardous Air Pollutants (cont.)

NESHAP (MACT) STANDARD Source Categories Affected	CFR Sub Parts	Final Federal Register Date & Citation	Compliance Date	Major or Area
Primary Copper	QQQ	06/12/02 (67FR40477)	06/12/05	M
Primary Magnesium Refining	TTTTT	10/10/03 (68FR58615)	10/10/04	M
Printing and Publishing (surface coating)	KK	05/30/96 (61FR27132)	05/30/99	M
Publicly Owned Treatment Works (POTW)	VVV	10/26/99 64FR57572	10/26/02	M
Pulp & Paper (non-combust) MACT	S	04/15/98 (63FR18504) 03/08/96 (61FR9383)	04/15/01 04/16/01	M
Reciprocating Internal Combustion Engines (RICE) (NESHAP/NSPS)	ZZZZ	6/15/04 (69FR33473)	6/15/07	M
Refractory Products Manufacturing	SSSSS	04/16/03 (68FR18729)	04/16/03	M
Reinforced Plastic Composites Production	WWWW	04/21/03 (68FR19375)	4/21/06	M
Rubber Tire Manufacturing	XXXX	7/9/02 (67FR45598)	7/11/2005	M
Secondary Aluminum	RRR	03/23/00 (65FR15689)	3/23/2000	A
Secondary Lead Smelters	X	06/23/95 (60FR32587)	06/23/97	A
Semiconductor Manufacturing	BBBBB	05/22/03 (68FR30848)	05/22/06	M
Shipbuilding & Ship Repair (surface coating)	II	12/15/95 (60FR64330)	12/16/96	M
Site Remediation	GGGG G	10/08/03 (68FR58171)	10/08/06	M
Solvent Extraction for Vegetable Oil Production	GGGG	4/12/2001 (66FR19006)	4/12/2004	M
Stationary Combustion Turbines*	YYYY	03/05/04 (69FR10511)	03/05/07	M
Steel Pickling-HCL Process	CCC	06/22/99 (64FR33202)	06/22/01	M
Taconite Iron Ore Processing	RRRRR	10/30/03 (68FR61867)	10/30/06	M

Table 3 National Emission Standards for Hazardous Air Pollutants (cont.)

NESHAP (MACT) STANDARD Source Categories Affected	CFR Sub Parts	Final Federal Register Date & Citation	Compliance Date	Major or Area
Tetrahydrobenzaldehyde Manufacture (Formerly Butadiene Dimers Production)	F	05/12/98 (63FR26078)	05/12/01	M
Wet Formed Fiberglass Mat Production	HHHH	04/11/02 (67FR17823)	04/11/05	M
Wood Building Products (surface coating) (formerly Flat Wood Paneling Products)	QQQQ	05/28/03 (68FR31746)	05/28/06	M
Wood Furniture (surface coating)	JJ	12/07/95 (60FR62930)	11/21/97	M
Wool Fiberglass Manufacturing	NNN	06/14/99 (64FR31695)	06/14/02	M

[http://www.epa.gov/ttn/atw/mactfnlalph.html] last updated: 6/06/07

NOTES:

Table 3 lists the MACT Standards that have been adopted by the U.S. EPA under Section 112(d) of the 1990 Amendments of the Clean Air Act as of June 6, 2007. "Major" means the MACT Standard applies only to major sources of hazardous air pollutants (HAPs). A major source of HAPs is a facility that emits, or has the potential to emit considering controls, 10 tons per year or more of any individual HAP or 25 tons per year or more of any combination of HAPs. "Area" means the rule applies to both major sources of HAPs and area sources as well (i.e., facilities with HAP emissions below the major source thresholds). Area sources are subject to MACT Standards if the U.S. EPA makes a finding that emissions from affected area sources present a threat of adverse effects to human health or the environment.

Table 4 Summary of 2003 BAAQMD Ambient Air Toxics Monitoring Data

Compound	LOD (ppb)	% of Samples < LOD	Maximum Conc. (ppb)	Minimum Conc. (ppb)	Mean Conc. (ppb)
Acetone	0.30	0	121.4	0.6	6.80
Benzene	0.10	1.78	2.4	0.5	0.401
1,3-butadiene	0.15	75.7	0.89	0.075	0.12
Carbon tetrachloride	0.01	0	0.16	0.09	0.108
Chloroform	0.02	62.5	1.47	0.01	0.024
Ethylbenzene	0.10	44.2	0.90	0.05	0.135
Ethylene dibromide	0.02	100	0.01	0.01	0.01
Ethylene dichloride	0.10	100	0.05	0.05	0.05
Methylene chloride	0.50	82.9	3.40	0.25	0.356
Methyl ethyl ketone	0.20	7.7	5.80	0.1	0.496
Methyl tert-butyl ether	0.30	32.9	4.80	0.15	0.532
Perchloroethylene	0.01	42.4	0.28	0.005	0.026
Toluene	0.10	0.2	6.0	0.05	1.062
1,1,1-Trichloroethane	0.05	72.3	2.47	0.025	0.084
Trichloroethylene	0.05	93.8	0.33	0.025	0.029
Trichlorofluoromethane	0.01	0	0.46	0.18	0.266
1,1,2-trichlorotrifluoroethane	0.01	0	1.16	0.06	0.077
Vinyl chloride	0.30	100	0.15	0.15	0.15
m/p-xylene	0.10	2.8	3.40	0.05	0.535
o-xylene	0.10	27.9	1.30	0.05	0.186

NOTES:

Table 4 summarizes the results of the BAAQMD gaseous toxic air contaminant monitoring network for the year 2003. These data represent monitoring results at 19 of the 20 separate sites at which samples were collected. Data from the Fort Cronkhite "clean-air" background site was not included. Data from the Oakland-Davie Stadium site was available from January through March.

(1) "LOD" is the limit of detection of the analytical method used.

(2) "% of samples < LOD" is the percent of the total number of air samples collected in 2003 that had pollutant concentrations less than the LOD.

(3) "Maximum Conc." is the highest daily concentration measured at any of the 19 monitoring sites.

(4) "Minimum Conc." is the lowest daily concentration measured at any of the 19 monitoring sites.

(5) "Mean Conc." is the arithmetic average of the air samples collected in 2003 at the 19 monitoring sites. In calculating the mean, samples with concentrations less than the LOD were assumed to be equal to one half the LOD concentration.

(6) Acrylonitrile data not available for full year and not reported.

Table 5 Cancer Risk Due to Average Ambient Concentrations of Toxic Air Contaminants Measured in the Bay Area in 2003

Gaseous TACs	Concentration		Unit Risk	Cancer Risk
	Ppb	$\mu g/m^3$	$(\mu g/m^3)^{-1}$	Chances in one million
1,3-Butadiene (1,3)	0.09	0.21	1.7E-04	36.0
Benzene (2)	0.40	1.30	2.9E-05	37.7
Carbon Tetrachloride (2)	0.11	0.70	4.2E-05	29.1
Formaldehyde (1)	2.18	2.72	6.0E-06	16.3
Acetaldehyde (1)	0.72	1.32	2.7E-06	3.6
Perchloroethylene (2)	0.03	0.18	5.9E-06	1.1
Methylene Chloride (2)	0.36	1.27	1.0E-06	1.3
MTBE (2)	0.53	1.95	2.6E-07	0.5
Chloroform (2)	0.02	0.12	5.3E-06	0.6
Trichloroethylene (1,3)	0.02	0.12	2.0E-06	0.2
Particulate TACs	ng/m^3	$\mu g/m^3$	$(\mu g/m^3)^{-1}$	Chances in one million
Chromium (hexavalent) (1)	0.10	1.00E-04	1.5E-01	14.4
Dioxin (4)	0.000025	2.50E-08	3.8E+01	1.0
Nickel (1)	3.30	3.30E-03	2.6E-04	0.8
PAHs (1,5)	0.47	4.70E-04	1.1E-03	0.5
Lead (1)	7.80	7.8E-03	1.2E-05	0.1
Total for all TACs				143

NOTES:

Table 5 summarizes the cancer risks associated with exposure to average ambient (outdoor) toxic air contaminant (TAC) levels measured at a number of sites in the Bay Area during 2003. Cancer risks are calculated for the inhalation pathway using the Unit Risk Factors adopted by Cal/EPA's Office of Environmental Health Hazard Assessment for the Air Toxics Hot Spots Program, and assuming 70-year continuous exposure. Risks are calculated for the carcinogenic TACs for which routine sampling was performed by the BAAQMD or CARB in 2003, except for ethylene dibromide, ethylene dichloride, and vinyl chloride, which were excluded because none of these were detected in any of the air samples taken. In calculating average concentrations, samples less than the limit of detection (LOD) was assumed to be equal to one half the LOD concentration.

(1) The concentration used is the mean of all daily samples taken for the three Bay Area sites in the CARB network in 2003 [Fremont, San Francisco – Arkansas St., and San Jose – Jackson St. sites. Note that CARB began sampling for acrylonitrile at these three sites in mid-2003; data are not included in cancer risk calculation for 2003 but will be available for 2004 and beyond.

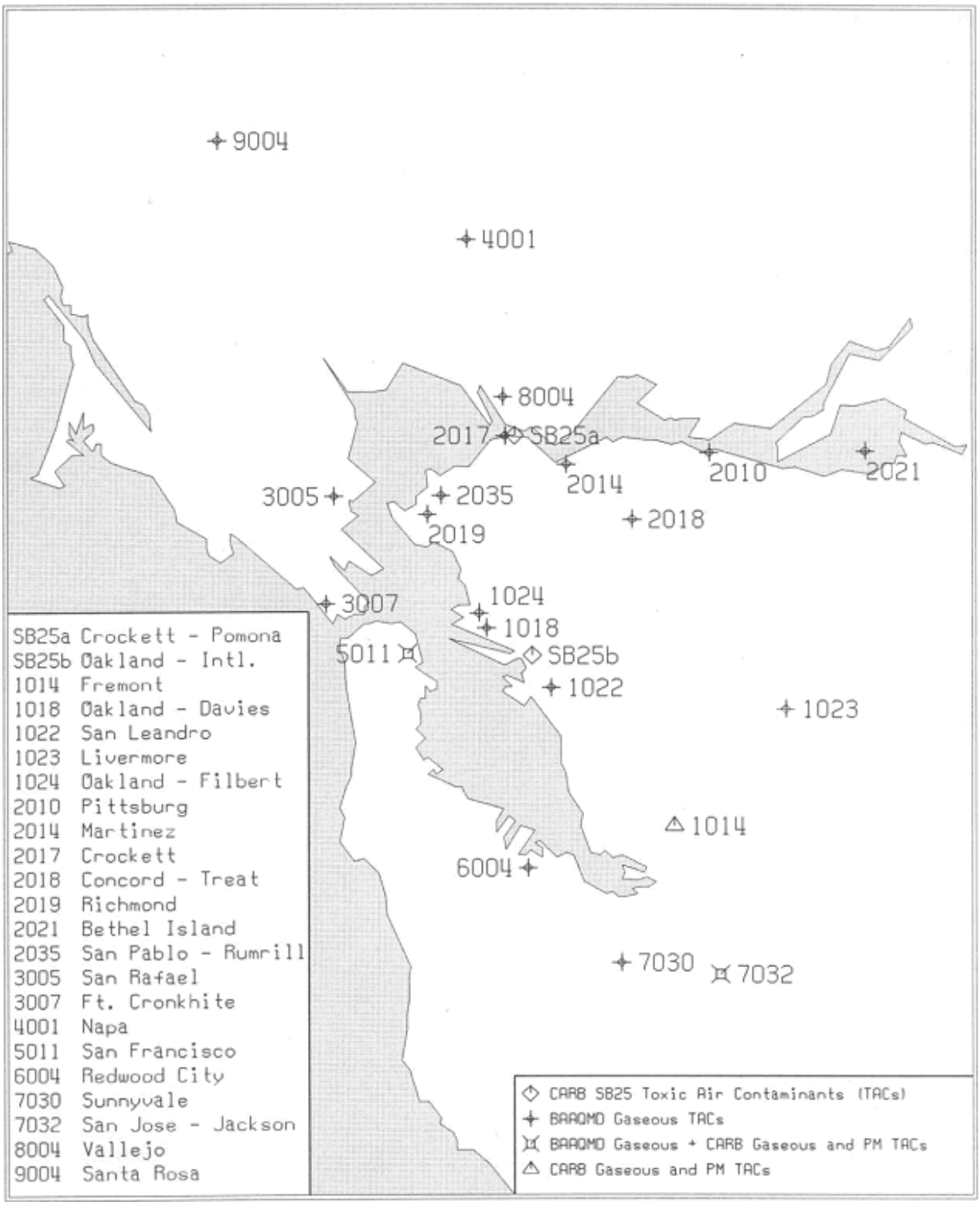
(2) The concentration used is the mean of all daily samples taken for the BAAQMD network in 2003, as specified in Table 4.

(3) CARB data are used for this TAC because an analytical method with a lower LOD was used by CARB.

(4) The dioxin concentration represents the average annual chlorinated dioxin and furan concentrations (expressed as 2,3,7,8-TCDD TEQs using WHO-97 TEFs) at the following CADAMP sites: Crockett, Livermore, Oakland, Richmond, and San Jose.

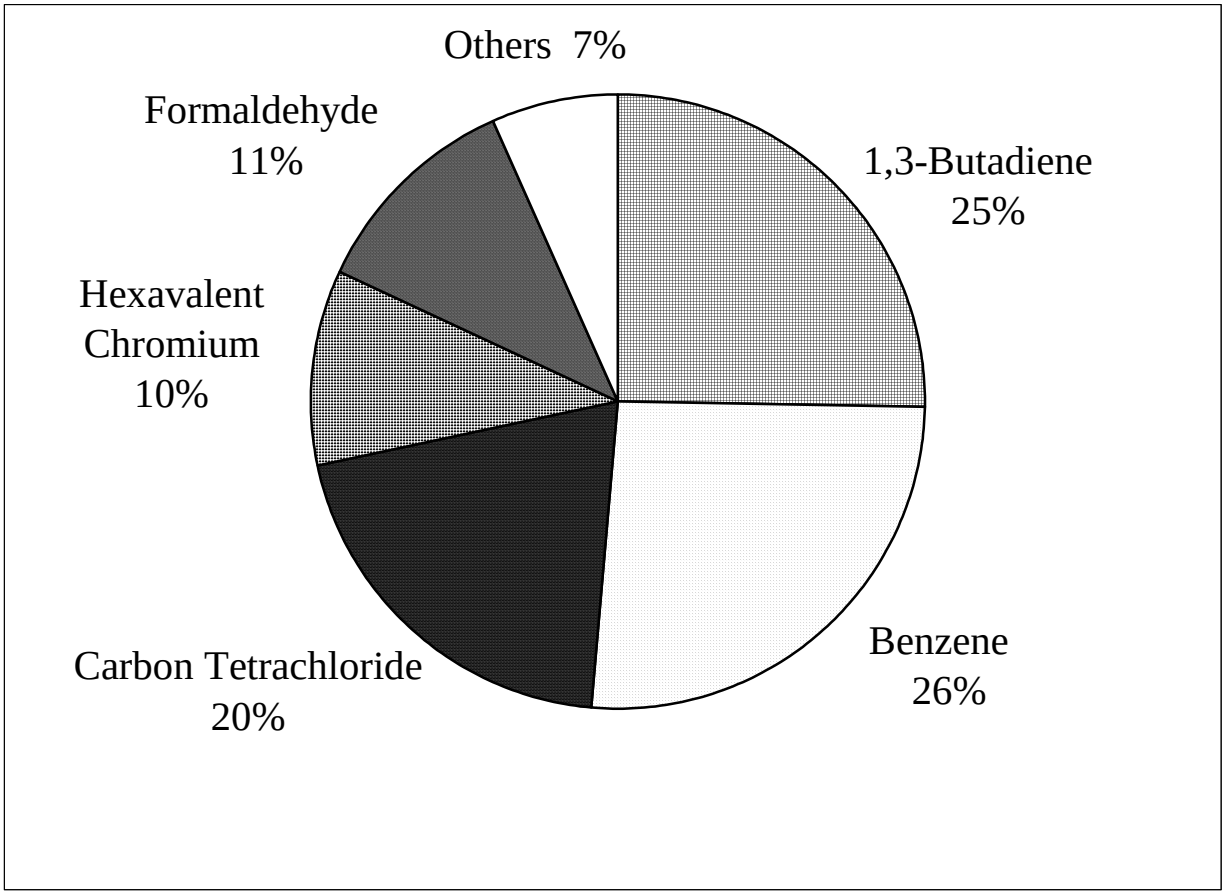
(5) The PAH concentration represents the sum of the following species collected as PM_{10}: benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene.

Figure 1 Bay Area Ambient Air Toxics Monitoring Network



Map reflects network status as of December 31, 2003

Figure 2 Pollutant Contribution to Cancer Risk Due to Average Ambient Concentrations of Toxic Air Contaminants Measured in the Bay Area in 2003



NOTES:

This chart summarizes the pollutant contribution to the cancer risk associated with inhalation exposure to average ambient toxic air contaminant levels measured at a number of sites in the Bay Area during 2003, based on data provided in Table 5. Cancer risks are calculated for the inhalation pathway using the Unit Risk Factors established by Cal/EPA's Office of Environmental Health Hazard Assessment for the Air Toxics Hot Spots Program, and assuming 70-year continuous exposure. The total average cancer risk for all of the measured TACs was 143 in one million for the inhalation pathway. "Others" are acetaldehyde, chloroform, methylene chloride, MTBE, lead, nickel, PAHs, perchloroethylene, trichloroethylene, and dioxin. Acrylonitrile data not available for full year and not reported. Diesel PM is not directly measured and is not included; however, based on CARB estimates of the population-weighted average ambient diesel PM concentration for the Bay Area, it's estimated that diesel PM may contribute approximately 80% of the ambient cancer risk.