ATTACHMENT 1

THE AIR TOXICS "HOT SPOTS" PROGRAM
1999 ANNUAL REPORT

The Air Toxics "Hot Spots" Information and Assessment Act requires businesses and industries throughout the state to: 1) quantify and report their emissions of listed air toxics; 2) assess the possible health risks from their emissions; 3) notify members of the public who are exposed to significant risks attributable to their emissions; and, 4) take steps to reduce this risk. The California Health and Safety Code (HSC, Section 44363) requires air pollution control districts to prepare and publish an annual report, describing the status of the Air Toxics "Hot Spots" Program within that district. This annual report summarizes the implementation status of the Program in Santa Barbara County as of December 31, 1999.

This report is being presented to the Santa Barbara County Air Pollution Control District Board in a public meeting on March 16, 2000. Consistent with HSC requirements, this report is also being provided to Santa Barbara County Environmental Health Services officials and will be available to the public upon request. The report will also be available on the APCD's Website (www.sbcapcd.org).

HEALTH RISK

As used in this report, the term *health risk* addresses the likelihood that exposure to a given toxic air contaminant under a given set of conditions will result in an adverse health effect. The health risk is affected by several factors, such as: the amount, toxicity, and concentration of the contaminant; the meteorological conditions; the distance from emission sources to people; the distance between emission sources; the age, health, and lifestyle of the people living or working at a location; and, the length of exposure to the toxic air contaminant. Health effects are divided into cancer and non-cancer risks.

"Cancer risk" refers to the increased chance of contracting cancer as a result of an exposure, and is expressed as a probability: chances-in-a-million. The values expressed for cancer risk do not predict actual cases of cancer that will result from exposure to toxic air contaminants. Rather, they state a possible risk of contracting cancer over and above the background level.

For non-cancer health effects, risk is characterized by a "hazard index" (HI) which is obtained by dividing the predicted concentration of a Toxic Air Contaminant by a reference exposure level (REL) for that pollutant that has been determined by health professionals. RELs are used as indicators of the potential adverse effects of chemicals. A REL is the concentration at or below which no adverse health effects are anticipated for specific exposure duration. Thus, the HI is a measure of the exposure relative to a level of safety and is very protective of public health.

STATUS/RESULTS

Update Plans and Reports

Of the approximately 600 businesses (sources) initially subject to the "Hot Spots" Program, 10 percent emitted more than 10 tons per year of a single criteria pollutant and submitted an air toxic emission inventory plan and report to the APCD. From these reports, Health Risk Assessments (HRAs) were conducted for those sources that were prioritized as a high priority facility. Those sources that exceeded one or more of the *significant health risk* thresholds are required to prepare update plan and report documents every four years. These plans and reports take into consideration changes in measurement techniques, changes in equipment and process rates, revisions to the list of toxic compounds that must be quantified, and revisions to the toxicity of compounds. Non-significant risk sources are required to submit an emission inventory update summary form every four years. The remaining sources are categorized as small businesses and the APCD compiles their toxic inventories.

In 1999, 14 sources submitted update reports to the APCD for review (Table 1). The review of these update reports and subsequent updated HRAs will be completed in early 2000. No update summary forms were received in 1999.

TABLE 1

	Facility Name	**Update Report Received**
1.	Applied Magnetics Corp.	September 20, 1999
2.	Art Craft Paint Inc.	March 11, 1999
3.	McGhan Medical Corp. – Carpinteria*	June 10, 1999
4.	McGhan Medical Corp. – Goleta*****	June 3, 1999
5.	Greka Energy Corp. – Dominion/UCB Lease	June 24, 1999
6.	J.P. Oil – Russell Ranch Lease	October 22, 1999
7.	POPCO/Exxon – Las Flores Canyon*	July 12, 1999
8.	Greka Energy – Cat Canyon Lease*	July 2, 1999
9.	Greka Energy – North Orcutt Lease	June 24, 1999
10.	Santa Maria Refinery Company	July 9, 1999
11.	Vandenberg Air Force Base*	June 10, 1999
12.	Venoco Inc. – Ellwood Oil & Gas*	June 10, 1999
13.	Vintage Petroleum Inc. – Clark Ave. Lease*	June 8, 1999
14.	Vintage Petroleum Inc. – Zaca Lease*	June 9, 1999

*Significant Health Risk Source

Risk Assessments

In April 1999, a Health Risk Assessment was conducted for Art Craft Paint, Inc. using updated emissions information. The results indicated a cancer risk of 7.4 in a million, a non-cancer chronic Hazardous Index of 0.99 (respiratory system) and a non-cancer acute Hazardous Index of 0.25 (central nervous system). As a result of these revised risks, Art Craft Paint is no longer classified as a *significant health risk* source. Revised HRAs for other sources that submitted update reports in 1999 will be completed in year 2000. Table 2 lists the nine sources that currently exceed one or more of the *significant health risk* thresholds of cancer, chronic non-cancer, and acute non-cancer. The number of significant risk sources will likely decrease once the HRAs are completed.

TABLE 2

Cancer and Non-Cancer Risk Scores
For Businesses Exceeding
Significance Thresholds

Facility	Excess Lifetime Cancer Risk (Per Million)	Noncancer Hazard Indexes Chronic/Endpnt*	Acute/Endpnt*	Date HRA Prepared
Venoco - Carpinteria O&G	**14.00**	**8.00** RESP	0.90 EYE	04/25/97
McGhan - Carpinteria	9.90	1.30 CNS	**3.60 EYE**	05/07/96
McGhan - Goleta	**47.00**	0.60 CNS	.60 RESP	05/07/96
Venoco - Ellwood O&G	**47.00**	**2.10 CNS**	**26.00 RESP**	05/20/96
POPCO/Exxon	2.00	0.40 RESP	**3.70** RESP	05/15/96
Greka Energy - Cat Canyon Lease	**13.00**	**1.20 RESP**	**1.80** RESP	06/12/96
Vandenberg Air Force Base	4.60	0.18 RESP	**11.50 RESP**	11/09/98
Vintage - Clark Avenue Lease	**21.00**	0.01 CV	0.01 RESP	05/31/96
Vintage – Zaca Lease	**37.00**	0.50 RESP	**12.60 RESP**	05/31/96

*RESP – respiratory system CNS – central nervous system
CV – cardiovascular system EYE – eyes

Public Notifications

In 1999, 13 sources notified the affected public of the toxic risks to which they had been exposed. These sources are located in Santa Barbara, Santa Maria, Lompoc, Goleta and Carpinteria. Approximately 800 notification letters were mailed. The purpose of the notification letter was to explain the carcinogenic and/or non-cancer health risks that had been or may be attributable to a source's emissions. As a result of the comments and interest received from the notifications (26 inquires were received), the APCD determined that a public meeting was necessary for one source. A public meeting was held on October 13, 1999 at the Holiday Inn in Goleta to discuss risks from the Venoco Ellwood Oil and Gas Facility. The purpose of the meeting was to provide the notification letter recipients with more information about the facility's risk assessment results and to answer questions they had about Venoco's risk assessment. Eight members of the public attended the meeting.

Risk Reduction

On September 17, 1998, the APCD Board of Directors adopted risk reduction thresholds. These risk reduction thresholds were set at the same level as the public notification thresholds (≥ 10 per million for cancer risk and a Hazard Index of ≥ 1.0 for non-cancer risk). If the results of a facility's health risk assessment indicate a *significant health risk*, the facility operator is required to conduct an airborne toxic risk reduction audit and develop a plan to implement airborne toxic risk reduction measures. Implementation of these measures must reduce the risk, highlighted on Table 2, from facility emissions below the *significance health risk* level(s) within five years of the date the plan is submitted to the APCD. Table 3 lists the eight significant risk sources that submitted a Risk Reduction Audit and Plan (RRAP) in 1999. Two significant risk sources, Vintage Petroleum – Clark Ave. and Vandenberg Air Force Base, were not required to submit a RRAP because they did not have any individual exposed to a significant risk in the hazardous risk footprint. All the RRAPs are under review by the APCD.

TABLE 3

Risk Reduction Audits and Plans

	Facility Name	RRAP Received
1.	McGhan Medical Corporation – Carpinteria	June 25, 1999
2.	McGhan Medical Corporation – Goleta	June 3, 1999
3.	Vintage Petroleum Inc. – Clark Ave. Lease (voluntary submittal)	June 25, 1999
4.	Vintage Petroleum Inc. – Zaca Lease	June 25, 1999
5.	Venoco – Carpinteria Facility	July 1, 1999
6.	Venoco – Ellwood Oil & Gas Facility	July 1, 1999
7.	Greka Energy – Cat Canyon Lease	July 13, 1999
8.	POPCO/Exxon – Las Flores Canyon Facility	August 2, 1999

Industry-wide Sources

Of the approximately 600 businesses subject to the Hot Spots Program, over 80% are in the small business or "industry-wide" category. Each of these businesses emit less than 10 tons per year of criteria pollutants. For these sources, the APCD compiles their air toxics emissions inventory based on responses to surveys completed and submitted by the operator. Because risk assessments are used as a ruler to compare one source with another and to prioritize concerns, the APCD performs the health risk assessment for small businesses to provide consistency and fairness. Risk assessment methodologies have been developed by the California Air Pollution Control Officers Association (CAPCOA) in consultation with the state Office of Environmental Health Hazard Assessment (OEHHA) for three types of "industry-wide" businesses: gas stations, auto body shops and dry cleaners. Risk assessment guidelines for gas stations and auto body shops have been developed and undergone industry and public review. Draft guidelines for dry cleaners have been developed and will undergo industry and public review in 2000.

The APCD collected emission inventory information for gas stations and applied the risk assessment guidelines for gas stations using 1998 inventory data. Benzene is the pollutant of greatest concern with gas stations' toxic emissions and risk assessments. Five of the 230 gas

stations reviewed exceeded the *significant health risk* threshold for cancer of 10 in a million using the approved risk assessment guidelines for gas stations. Because these guidelines are conservative the APCD obtained precise site-specific data from each of the five stations and ran refined risk assessments. None of the five stations exceeded the *significant health risk* threshold using the more precise information. The APCD will again evaluate all gas stations in 2000 using 1999 inventory data.

The APCD will also apply the approved risk assessment guidelines to auto body shops in 2000 using 1999 inventory data. It is anticipated that most, if not all, of the auto body shops will be below the *significant health risk* threshold. If a shop exceeds the *significant health risk* threshold, a refined risk assessment will be conducted using site-specific data. If this assessment still indicates a significant risk, the facility will be required to notify the public and identify and implement measures to reduce that risk.

Risk assessments for dry cleaners will be initiated once the risk assessment guidelines for dry cleaners are final and public workshops have been conducted. The workshops are planned for April 2000. Using the draft guidelines, it is predicted that many of the large dry cleaners using perchloroethylene will exceed the *significant health risk* threshold for cancer and refined risk assessments will be required.

Diesel Particulate Exhaust

In August, 1998, after nine years of study, the California Air Resources Board (ARB) formally identified diesel particulate exhaust as a Toxic Air Contaminant. As such, the ARB is required by law to determine if there is a need for further control of diesel particulate exhaust. Since August, 1998, the following activities have been started: 1) preparation of a report on the need and appropriate degree of control – the Needs Assessment; and 2) preparation of Risk Assessment Guidelines for addressing emissions from new, modified, and existing diesel-fueled engines. An ARB-led committee with numerous subcommittees and more than 300 stakeholders is overseeing the development of the Needs Assessment and Risk Management Guidelines.

The OEHHA-approved unit risk factor for diesel particulate is approximately 10 times that of benzene, the primary toxic pollutant of gasoline, and 50 times that of perchloroethylene, commonly used in dry cleaning. Because of this high unit risk factor, even small diesel-fueled engines and large stand-by emergency engines can pose a *significant health risk* if operated full time near people exposed. Eventually, the Hot Spots program will likely require risk assessments of those diesel-fueled engines under the APCD's jurisdiction. During the calendar year 2000, the APCD will inventory the existing diesel engines in Santa Barbara County and will explore the development of a policy regarding the health risk assessment of new and existing stationary diesel-fueled engines.

In November 1999, the South Coast Air Quality Management District completed a comprehensive study of urban toxic air pollution. This study showed that motor vehicles and other mobile sources of air pollution are the predominant sources of cancer-causing air pollutants in the Los Angeles area. The study found that diesel particulate exhaust accounted for 71% of

the cancer risk and overall, motor vehicles and other mobile sources accounted for about 90% of the cancer risk. The study showed that the average cancer risk in the region, excluding diesel particulates, is 420 in a million. When diesel particulate is included, the average regional risk is about 1400 in a million. The results of this study continue to be analyzed by air regulatory agencies, and the APCD will keep the Board advised of any new developments.

SUMMARY

The implementation of the "Hot Spots" Program has resulted in significant reductions in the amount of air toxics emitted into the air in Santa Barbara County. Reductions in hazardous compounds from large and medium size sources subject to the "Hot Spots" Program have helped reduce the ambient air background cancer risk. In 1991, the *significant health risk* thresholds were exceeded by 51 large and medium sources. Currently, the *significant health risk* thresholds are exceeded by only 9 of these sources. This represents an 82% reduction. Table 2 summarizes the exceedances of the cancer and non-cancer risk thresholds by the nine sources. Many of these sources may also be below the *significant health risk* level, pending the results of their latest risk assessment generated from their 1999 Update Reports.

In 1999, the emphasis of the "Hot Spots" Program began to shift from large and medium size sources to small (industry-wide) sources. Risk assessments of gas stations were completed and none were found to exceed the *significant health risk* thresholds. In 2000, risk assessments for auto body shops will be completed. Risk assessments of dry cleaners and diesel-fueled engines will be completed after risk assessment guidelines have been developed, public workshops conducted and the guidelines for each approved by CAPCOA.

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APPENDIX

THE SANTA BARBARA COUNTY AIR TOXICS HOT SPOTS PROGRAM

BACKGROUND

Historically, the regulation of air pollution by federal, state, and local agencies has centered on six air pollutants: ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter, and lead. These six compounds, known as "criteria pollutants," are the only air pollutants for which national ambient air quality standards have been established. There are, however, many other contaminants routinely released into the atmosphere that are toxic or are known to cause cancer or other disease.

The first law to govern emissions of air toxics in California was AB 1807, also known as the "Tanner Process." This law takes a chemical-by-chemical approach for identifying and controlling toxic air contaminants. Since its passage in 1983, relatively few chemicals have been identified as toxic, due to the considerable time and resource demands of the AB 1807 program. In 1987, the California legislature signed into law the Air Toxics "Hot Spots" Information and Assessment Act (AB 2588) in order to speed up the process of identifying those chemicals that are truly a problem in California.

AB 2588, or the Hot Spots program, requires the reporting of air toxic emissions in California and assessment of the public health risk resulting from exposure to these toxic air contaminants. There are currently 729 toxic substances subject to these reporting and assessment requirements. The law requires businesses to inventory and report emissions of these air toxics. Of these businesses, those that present a significant risk to public health are required to notify affected individuals. The information generated by this process will also be used by the state to prioritize substances for AB 1807 review.

In 1992, AB 2588 was amended by the passage of Senate Bill (SB) 1731, which requires facilities that generate potentially significant health risk to plan and implement risk reduction measures. The measures implemented must ultimately reduce the risk from any facility such that it no longer poses a significant health threat. Businesses must reduce this risk as soon as possible, but they will be allowed up to five years to attain this goal. If extenuating circumstances exist, up to an additional five years may be allowed to attain the desired risk reduction. In addition, SB 1731 requires health risk assessments for the Hot Spots program be prepared to follow guidelines established by the state Office of Environmental Health Hazard Assessment (OEHHA). With the SB 1731 amendments, the Hot Spots Act has evolved into “right-to-know” legislation that requires the reduction of toxic emissions from facilities that may subject the public to significant risk.

Recent changes to the Act have streamlined the reporting requirements for businesses subject to the program. In 1996, AB 564 amended the Act to exempt facilities that are able to document, through the emission inventory plan and report process, a low potential for risk from their emissions.

The State of California, local districts, and industry all have roles and responsibilities under the Act. The mandated participants in the AB 2588 process include the California Environmental Protection Agency (CalEPA) in which both the California Air Resources Board (ARB) and the Office of Environmental Health Hazard Assessment (OEHHA) reside, the air pollution control districts, and the businesses that emit air toxics. The ARB adopts implementing regulations regarding what types of companies are subject to the law, what toxic chemicals are covered, and assessment of fees. OEHHA develops health risk assessment guidelines and reviews risk assessments. Local districts are responsible for: reviewing plans, reports and risk assessments; determining which companies must prepare risk assessments and which must notify the public and reduce risk; reviewing risk reduction audits and plans; preparing inventories for most small businesses; and, providing guidance to companies for complying with the law. Companies are required to submit information such as plans, reports, risk assessments, and risk reduction audits and plans to the district according to the schedule in the law, as well as reducing risk when required.

In addition to the above participants, the California Air Pollution Control Officers Association (CAPCOA), in conjunction with the ARB, provides guidance to local Hot Spots programs. This guidance promotes standardization throughout the state while allowing some flexibility for individual districts. The APCD has adhered to the methods and procedures prescribed by CAPCOA and the ARB and has directed efforts designed to lower the compliance costs for industry while meeting the mandates of state law.

LEVEL OF SIGNIFICANCE

The toxics response to a toxic substance depends on the dose (quantity of a substance received by an organism), degree of toxicity (ability to do harm), length of exposure (short or long term) and route of exposure (skin, mouth, lungs). By convention, there are two ways of numerically expressing health risk. For cancer-related cases, risk is usually expressed as the number of individuals affected in a hypothetical population of one million. Non-cancer-related illnesses are conveyed in terms of the Hazard Index (HI). Cancer unit risk factors and non-cancer exposure levels are established by health experts and are derived from scientific study of human and animal exposures.

Cancer

The incidence of cancer is influenced by lifestyle choices, diet, exposure to sunlight, stress and many other factors; some voluntary and involuntary. One of these factors is the air we breathe.
Carcinogens are believed to have the potential to cause cancer at any dose. Because of this, safety standards for carcinogens cannot be established offering zero risk of causing cancer. However, an acceptable safety level at which no adverse effect occurs is generally considered to be an additional lifetime (70 years) risk of one in a million. This risk is extremely small and virtually means no risk at all. *The values expressed for cancer risk do not predict actual cases that will result from exposure to toxic air contaminants. Rather, they state a possible risk of contracting cancer over and above the background level.* Excess cancer risk is determined by multiplying the annual average concentration of the compound at a given receptor by the unit risk factor for the compound.

Non-Cancer

For non-cancer health effects, the Hazard Index (HI) is used. Values for the HI denote the risk of experiencing an adverse non-cancer health effect from exposure to unacceptable concentrations of toxic air contaminants. The adverse effects range from eye and respiratory irritation to damage of vital organs. A HI of a hazardous compound is equal to the estimated exposure concentration divided by the reference exposure level (REL). RELs are used as indicators of the potential adverse effects of chemicals. It is the concentration level at or below which no adverse health effects are anticipated for specific exposure duration. A HI greater than one implies that the level of exposure is unacceptable and that an adverse health effect may occur. A HI less than one implies that the level of exposure is acceptable and no adverse health effect will occur. RELs are designed to protect the most sensitive individuals in a population by the inclusion of margins of safety. Exceeding the REL does not automatically indicate an adverse health impact. Thus, the HI is very protective of public health.

PUTTING RISK INTO PERSPECTIVE

Every day, Santa Barbara County residents are exposed to toxic air emissions from automobiles, homes, businesses, and natural sources. Many of these emissions can cause cancer. The ambient air background cancer risk is made up of risks from individual toxic emission sources, including automobiles, businesses, homes, and natural sources. This number is the sum of risks posed by various toxic air contaminants such as benzene, 1,3 butadiene, and perchloroethylene. It should be emphasized that these are conservative estimates of risk and not actual predictions for the number of new cancer cases. These risk values represent the highest number or worst case estimate. The risk from individual businesses is generally less than the background risk. This is because the health risk estimates for these facilities does not include background emissions (from automobiles, homes, other businesses, and natural sources), only emissions specific to that business. While this puts the risk from individual businesses in perspective, it does not imply that the risk from these individual businesses is acceptable or insignificant. Emissions from a particular business can create a "hot spot" where individuals can be exposed to risks over and above the background risk.

HOT SPOTS OVERVIEW

In summary, the Toxic Hot Spots Act consists of the following four steps:

1. Any company which emits toxics into the air must conduct a complete inventory of all of the toxic air pollution it generates. For smaller companies, which make up the

vast majority of businesses subject to the law, the local air pollution control district may prepare the inventory for them as a group;

2. Companies which have the potential to pose a 'significant health risk' are required to assess what the risk is;

3. Companies which actually pose a 'significant health risk' are required to notify the affected public; and

4. Companies which actually pose a 'significant health risk' are required to identify and implement measures which reduce that risk.

AB 2588 does not provide a definition for 'significant health risk'. Instead, the Act specifies that the local air pollution control district makes this determination. In deciding the level of significance, the APCD considered input from the Public Notification Committee, state guidelines, and comments received from the public during workshops. A 'significant health risk' was determined to be the level at which the public must be informed of potential adverse health impacts resulting from exposure to toxic air contaminants. This approach is consistent with the "right-to-know" intent of the legislation, but does not necessarily imply that there is an imminent and substantial endangerment to public health.

The Public Notification Procedures, adopted by the Santa Barbara County APCD Board of Directors on June 22, 1993, specify the levels of significant cancer and non-cancer health risk that trigger notification of the public by a business in Santa Barbara County. The levels of 'significant health risk' are as follows. If, according to the approved health risk assessment, it is determined that the public is being exposed to a risk equal to or greater than 10 excess cancer cases in a population of one million, the facility causing this potential risk is required to notify the public. For non-cancer health risk, businesses that potentially expose the public to a Hazard Index greater than one (1.0) are required to notify the public. These levels are consistent with public notification thresholds adopted by a majority of air pollution control districts throughout the state and Proposition 65 (The Safe Drinking Water and Toxics Enforcement Act of 1987) reporting requirements.

STEP 1 -- AIR TOXICS EMISSION INVENTORY

Preparation of an emission inventory of air toxics is the first step in understanding the risks posed by air toxics in California. Under the Hot Spots program, this inventory was accomplished as follows:

1. For homes, transportation sources and natural sources (wind-blown dust, wildfires, etc.), toxic emissions were quantified by the ARB.

2. For most small businesses, the APCD sent out a survey (the facility Permit to Operate - Annual Report Form) from which the required inventory was derived. This "industry-wide inventory" allows Hot Spots program objectives to be met while minimizing costs. These small businesses constitute the vast majority of the sources subject to the Hot Spots program.

3. For larger business, ARB guidelines required specific sampling or source testing applications to quantify emissions. Since emissions from these larger facilities cannot be easily quantified due to their complexity, these businesses prepared an emission inventory plan and report.

Small Business Sources

Of the approximately 600 businesses subject to the Hot Spots program, over 80% are in the small business or "industry-wide" category. For these sources, the APCD prepared the emissions inventory based on responses to surveys (the facility Permit to Operate - Annual Report Form) sent to these businesses.

Consistent with state guidelines and requirements, the APCD prepared industry-wide emission inventories for gas stations, auto body shops, and dry cleaners. The risk assessment methodology followed guidelines developed by subcommittees to the California Air Pollution Control Officers Association (CAPCOA) Toxics Committee in consultation with the Office of Environmental Health Hazard Assessment and the Air Resources Board. The APCD participated in each of these committees and will implement the guidelines after they get final approval by the CAPCOA Toxics Committee, industry, and the public.

Businesses Required to Prepare Emission Inventory Plans and Reports

All businesses emitting greater than 10 tons per year of TOG, NOx, SOx, or PM were required to submit emission inventory plans and reports to the APCD. This requirement also applied to certain sources, which emit less than 10 tons per year. Such sources included incinerators, electronics facilities, and medical device manufacturers. They are required to submit plans and reports because quantifying their emissions was more complex than those included in an industry-wide inventory category. The emission inventory plan serves as the "cookbook" that the facility must follow to calculate and quantify the air toxics to be documented in their emission inventory report. The plan had to be prepared consistent with the state document entitled, "Emission Inventory Criteria and Guidelines Regulation" (CGR).

After the emission inventory plan was approved by the APCD, each business developed an emission inventory of air toxics and organized it into a report format. The report contained the emission inventory of air toxics for the business, as well as all other pertinent information that was needed for performing a risk assessment.

The APCD was able to allow the industry-wide businesses to satisfy this requirement by submitting the necessary information in their permit-required annual report form. These reports enabled the APCD to compile the data into industry-wide inventories.

Quadrennial Updates

The CGR requires all significant risk facilities to prepare update plan and report documents every four years. The quadrennial update plans are due August 1 of the update year and include information regarding the previous operating year. These plans take into consideration changes in measurement techniques, changes in equipment and process rates, revisions to the list of toxic compounds that must be quantified, and revisions to the toxicity of compounds.

Revisions to the CGR resulted in further streamlining of the update reporting requirements for facilities whose risk did not exceed significant risk thresholds. Non-significant risk facilities are required to complete and submit a facility emission inventory update summary form every four years. This update summary form is sent to applicable facilities in January of the update year. Based upon review of the completed form, the APCD determines if submittal of an update plan and report document is warranted for each facility. If no plan or report documents are required, the summary form will fulfill the facility's update reporting requirements for that year. If plan and report documents are required (e.g., as a result of facility changes), then the update plan is to be submitted to the APCD by August 1 of that year. To date, the APCD has received update plans and reports from small, medium, and large facilities.

Amendments to the Hot Spots Act have further streamlined the requirements for businesses subject to the program. If a facility demonstrated through the plan and report process that their risk prioritization score for cancer and non-cancer health effects are both equal to or less than one, then the facility is exempt from further compliance with the Hot Spots program. Although changes in emission inventories are normally documented in the quadrennial update cycle, a facility operator and/or owner has the opportunity to submit an update to the APCD at any time in order to quantify changes in emissions from the facility.

STEP 2 -- SETTING PRIORITIES AND RISK ASSESSMENTS

Prioritization Procedures

After the toxic emission inventory was completed, each business was prioritized in terms of potential adverse effect on public health to determine if a formal risk assessment was needed. This prioritization was accomplished through computer "screening," taking into account the quantity and

type of emissions, meteorology, and distance from the point of emission to the property boundary of the business. Businesses that received a high or intermediate prioritization score were required to perform risk assessments. The APCD considered the following factors before developing specific prioritization procedures.

1. The quantity of toxic materials released from the facility;

2. The potency and toxicity of the released material; and

3. The proximity of the release point of emissions to the property boundary.

Based upon these factors, the prioritization procedure resulted in "toxic scores" for each business. These scores were used to categorize the businesses as high, intermediate, or low priority for performing risk assessments. The prioritization scores do not necessarily correlate with risk since they do not take into account all the factors that affect risk such as weather and terrain. These scores identify those businesses that are most likely to cause an air toxics 'hot spot'.

Risk Prioritization

The toxic scores for each business were derived from annual and peak one-hour emission rates of all of the 729 compounds specified in the Hot Spots law and the relative potency/toxicity of the emitted compounds. Separate toxic scores were calculated for carcinogenic (cancer-causing) and non-carcinogenic compounds. The toxic score for a facility was adjusted as follows:

· The toxic scores for pollutants with more than one route of exposure were increased by a factor of 10 to account for non-inhalation exposure. Examples of non-inhalation exposure pathways were ingestion (eating) and dermal (skin) contact. Pollutants affected by this approach included arsenic and inorganic arsenic compounds, beryllium, cadmium and cadmium compounds, hexavalent chromium, chlorinated dioxins and furans, lead and lead compounds, mercury and mercury compounds, nitrosamines, and polycyclic aromatic hydrocarbons.

· For businesses that submit data on the distance between the toxic emission source and the property boundary, the total toxic score was reduced to reflect dilution and dispersion of the toxic substance. Actual Santa Barbara County meteorological data (wind patterns, weather, etc.) was used in this analysis.

The final toxic score was the maximum of the facility carcinogen and non-carcinogen toxic scores. Scores and priority do not necessarily correlate to actual risk. Actual risk was determined by performing a risk assessment. After a final score was derived, the following criteria were used to designate a priority ranking to each business:

*High***:** A business with a score greater than or equal to 10.

Intermediate: A business with a score less than 10 but greater than or equal to 1.

Low: A business with a score less than 1 (Now exempt from the program).

The APCD developed computer programs to make the scoring and categorizing process consistent and efficient.

Risk Assessment

A Hot Spots risk assessment is an estimate of the human health risk attributable to toxic air emissions from a business. It is a study that quantifies the possible adverse health effects which may result from exposure to routine emisions of toxic air contaminants. A health risk assessment does not address the possibility of, or adverse health risks resulting from, an accidental release. The health risk assessment cannot predict health effects; it only describes the increased possibility of adverse health effects. A risk assessment quantifies the probability of developing cancer and/or other disease from exposure to toxic air contaminant emissions. It is a key step in the Hot Spots program because it lays the groundwork for the public notification and risk reduction process. Risk assessment results are used to determine which companies will be subject to the Hot Spots program notification requirements. Prior to public notification, each risk assessment is forwarded to the state Office of Environmental Health Hazard Assessment for further review and approval. The state must review the Hot Spots risk assessments before they can be considered final.

The health risk assessment does not predict actual health effects; it only anticipates the increased possibility of adverse health effects such as cancer or respiratory disease due to a source's emissions. The risk assessment process is intended to be conservative so as not to understate the risk. Risk estimates generated by a risk assessment should not be construed as the expected rates of disease in the exposed population but are merely estimates of risk, based on current knowledge and a large number of assumptions. A risk assessment makes assumptions about the toxic or harmful health effects of certain chemicals and the length or duration of personal exposure to these chemicals. Because the simplified assumptions are intended to err on the side of public health protection, the results from a risk assessment can be viewed as a reasonable worst case estimate of risk to those persons exposed.

Risk assessments are best used as a ruler to compare one source with another and prioritize concerns. The Hazard Index (HI) is the measurement used in comparing non-cancer risks at different sources. Thus, consistency in the assumptions and models used are necessary. The APCD has strived to be consistent. The APCD performed the risk assessment for almost all of the affected businesses. All model inputs and results, including operating parameters, assumptions, and calculations, were checked for completeness and accuracy. The majority of this review was performed with the aid of computer programs that screen the many variables used to develop the risk assessment. Risk assessment calculations were performed using the ACE 2588 computer model. The completed risk assessment was then returned to the business. This afforded industry an opportunity to view the results of their specific risk assessment.

Once this review was completed, the risk assessment was forwarded to OEHHA for final review. OEHHA reviewed the risk assessment for completeness and consistency with state guidelines and proper scientific application of risk assessment techniques. They maintain a staff of toxicologists and public health officials to accomplish this review and approval. The final review of risk assessments by OEHHA results in statewide standardization and consistency among air pollution control districts in California.

Since an off-the-shelf computer model consistent with state guidelines was not available to perform risk assessments, the APCD developed a risk assessment model for use by Santa Barbara County businesses. This model strictly followed the state risk assessment guidelines. The resulting use of a standardized model allowed for a fair and equitable comparison of risk among businesses in Santa Barbara County.

Risk Assessment Uncertainty

There is a great deal of uncertainty associated with the process of risk assessment. Sources of uncertainty that may either overestimate or underestimate risk include: extrapolation of toxicity data in animals to humans, uncertainty in the air dispersion models, and in the estimation of emissions. Risk assessments use simplifying assumptions to account for uncertainties. These assumptions are designed to err on the side of public health protection and typically use reasonable worst case estimates to document risk. These assumptions include:

- A conservative or upper estimate of the potency of cancer-causing compounds (the estimates of cancer potency in humans contain many sources of uncertainty including metabolism, diet, genetics and immunological responses within human populations);

- Compounds that are shown to be toxic in animal studies are estimated to be a factor of 10 times more toxic to humans. This assumption is made since testing of such compounds on humans is not possible; and

- An individual is exposed to the toxic pollutant for 70 years, 365 days/year.

Generally, the public can have confidence that the published scores report the upper limit of risk from exposure to the toxic air contaminants. However, there are at least two features of the risk assessment that can understate risk. First, data on the harmful effects of some toxic compounds is limited. These compounds may not be included in the risk evaluation, but will be considered once toxicity data for these chemicals are available. Second, the risk assessments do not take into account that some toxic compounds may act together or be synergistic to pose risks greater than those calculated by simply adding their individual risks.

STEP 3 -- RISK NOTIFICATION

The most sensitive step of the Hot Spots process is notifying the affected public of the risks to which they are being exposed. Following state guidelines, the APCD developed Public Notification Procedures. The drafting of these procedures included considerable public input, including four public workshops and formation of an ad hoc Public Notification Committee comprised of representatives from industry, environmental and health organizations, and citizens groups. The committee assisted the APCD in the development and review of the notification procedures. On June 22, 1993, the county Board of Supervisors approved and adopted the Public Notification Procedures.

In addition to establishing notification procedures, the APCD is responsible for specifying the threshold which triggers notification ("significance level"), identifying businesses which must notify the surrounding community, and ensuring that notifications are consistent with the suggested procedures and are performed in a timely manner. In adopting the procedures, the significant risk level was established at ten (10) in a million for cancer risk. If the public is exposed to a cancer risk greater than or equal to this level, notification is required. For non-cancer risk, businesses that potentially expose the public to a Hazard Index greater than one (1.0) are required to notify.

According to the Notification Procedures, businesses that expose the public to significant health risks are required to inform individual residents and businesses by letter. This letter, mailed to residences and business in the exposure area, will include such information as to why the notice is being sent, the location and name of the facility emitting toxic air contaminants, the substance emitted, the risk associated with their exposure, steps taken to reduce the risk, and how to get further information.

The APCD's role in notification is to:

- establish notification procedures that businesses are required to follow.
- specify criteria for triggering notification (significance levels).
- identify businesses subject to the notification requirements (based on approved risk assessments).
- ensure that notifications are consistent with the APCD's procedures and occur in a timely manner.

Once the reviewed risk assessment is received back from the state, necessary revisions will be made, and the APCD will determine the area extent of each facility's "hot spot" or hazard footprint. This information will then be integrated into a computerized map containing the addresses of businesses and residences. If the map indicates that there is a potential exposure of individuals, the APCD will inform the facility of their notification responsibilities required by the Hot Spots program. All information generated by the APCD will be shared with the facility.

Notification Procedures

The method of notification detailed in the Public Notification Procedures specifies that letters be sent to individual residences and workplaces, and public meetings be used to inform the public of Air Toxics "Hot Spots" risk assessment results that exceed the APCD's established notification threshold (significance level). The advantage of this type of notification is that it: 1) simplifies the notification process by establishing only one notification threshold for carcinogens; and 2) specifies one consistent format for all notifications.

The purpose of the notification letter is to explain the carcinogenic and/or noncancer health risks that may be attributable to a particular facility's emissions as detailed in the approved health risk assessment, and answer basic questions such as:

- why the notice was sent;
- the identity and location of the facility emitting the pollutants;
- the substance(s) emitted and, if appropriate, what the substance is used for;
- the risk associated with exposure;
- general assumptions used to estimate the risk;
- steps taken to reduce the risk (when applicable); and
- how to get more information.

This one page letter is prepared by the APCD, placed on APCD letterhead, and made available to the facility operator for printing and distribution. The back of the letter includes information on calculated cancer risk based on measurements at different sites in the county to help put the facility risk into perspective. The APCD provides the facility with APCD envelopes to be used for distribution of the notification materials.

This procedure also provides businesses with the opportunity to describe their operation as well as put the results of the risk assessment into their own words. A separate one-page letter from the facility may be included along with the letter from the APCD. In addition to these letters, the notification package includes a one page (double-sided) reprint from the Environmental Protection Agency (EPA) that explains simply the risk assessment process and helps puts risk into perspective.

Also included in the notification package, along with the letters and EPA reprint, is a returnable postcard addressed to the APCD that allows the recipient to request more information and involvement. The recipient can return the postcard or call the APCD to request that a public meeting be held to further explain the contents of the letter. Based on the response, a public meeting held by the facility may be necessary. The purpose of the public meeting is to provide the notification letter recipients with more information about the facility's risk assessment results and allow concerns to be expressed and hopefully addressed by the facility and/or the APCD.

According to the procedures, notification will take place on a biennial basis, corresponding with the original biennial update requirements of the Air Toxics "Hot Spots" Law. However, the APCD may determine that more frequent notifications should be made, depending on the risk potential posed to surrounding populations. A business may choose to notify more often or hold more frequent public meetings as well.

STEP 4 -- RISK REDUCTION

On September 29, 1992, Governor Wilson signed into law Senate Bill 1731 (Calderon), entitled "Facility Toxic Air Contaminant Risk Reduction Audit and Plan." This bill significantly amends the Hot Spots law in two important ways. First and foremost, it requires facilities that cause significant health risks attributable to their routine toxic air emissions to reduce that risk as soon as possible within a five year time limitation. Secondly, SB 1731 requires health risk assessments to be prepared in accordance to guidelines established by the state Office of Environmental Health Hazard Assessment.

This amendment to the Hot Spots law requires facility operators to conduct an airborne toxic risk reduction audit and develop a plan to implement airborne toxic risk reduction measures if the results of the facility's risk assessment indicate a significant health risk. Implementation of these measures must reduce the risk from facility emissions below the significant risk level within five years of the date the plan is submitted to the APCD. According to the new amendment, the facility operator's risk reduction audit plan must include, at a minimum, the following:

- The name and location of the facility.
- The Standard Industrialized Classification (SIC) code for the facility.
- The chemical name and the generic classification of the chemical.
- An evaluation of the Airborne Toxics Risk Reduction Measures (ATRRMs) available to the operator.
- The specification of, and rationale for, the ATRRMs that will be implemented by the operator. The audit and plan shall document the rationale for rejecting ATRRMs that are identified as infeasible or too costly.
- A schedule for implementing the ATRRMs in the required time frame.
- The audit and plan shall be reviewed and certified by a Registered Engineer, Registered Environmental Assessor, or by an individual who is responsible for the processes and operations of the site.

A significant risk facility is required to submit an Air Toxic Risk Reduction Audit and Plan (RRAP) within six months after approval of their risk assessment. Upon submittal by the facility,

the APCD will review the RRAP for completeness within three months. Plans should demonstrate appropriate technology in order to achieve emission reduction goals as soon as possible. Air Toxic Risk Reduction Measures may include the following:

- Feedstock modification
- Product reformulation
- Production system modifications
- System enclosure, emissions control, capture, or conversion
- Operational standards and practices modification

If a plan is determined to be incomplete, the facility is required to submit a revised audit and plan addressing the deficiencies within 90 days. Progress reports on implementation of the plan shall be submitted to the APCD as part of the facility biennial update requirement. If implementation of the plan results in an unreasonable economic burden on the facility, the APCD may lengthen the implementation period up to five years, providing that emissions from the facility do not pose an unreasonable health risk. However, the period to implement a plan may be shortened if the APCD finds that it is technically feasible and economically practicable to reduce emissions below the significant risk level within a shorter time frame.

The ARB prepared a guideline document to assist businesses and the local districts in implementation of this portion of the Hot Spots program. The guidelines are sent to facilities that require RRAPs.

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