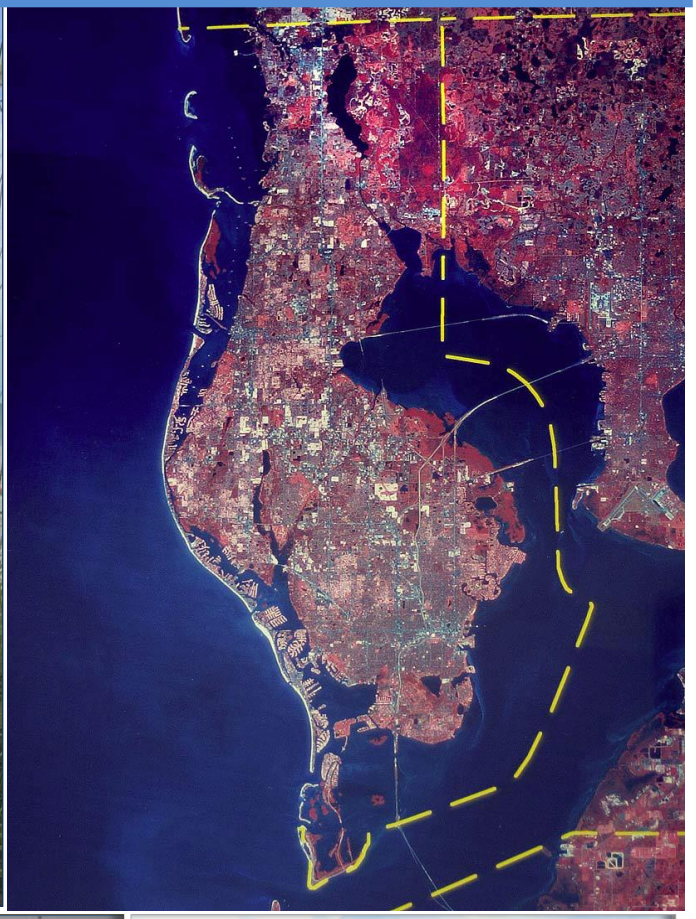
Pinellas County Air Quality Division
2011 Annual Air Quality Report



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Executive Summary

The Air Quality Division implements program elements in keeping with its mission to protect, preserve and enhance the air quality within Pinellas County. A well-developed air monitoring network collects air samples for Criteria Pollutants and many Hazardous Air Pollutants (HAPs), primarily in response to EPA monitoring program data requirements and needs. The Air Monitoring Environmental Laboratory analyzes most of these samples in-house. The Permitting and Compliance Program enforces the County's Comprehensive Air Quality Ordinance and oversees stationary sources of air pollution. The Emission Inventory, Analysis & Outreach (EIA&O) Program verifies and estimates emissions of regulated County air pollutants; provides analysis of regulatory, programmatic and project proposals and alternatives; and provides program, technical and outreach information to the public. Special projects are also conducted in response to impending regulatory or programmatic issues or to air pollution events. The Division must also meet key administrative and operational needs, including budgeting and federal grant management, program and policy development, interagency coordination, media relations and clerical support. Division activities and overall net costs specific to 2011 are briefly summarized below.

- The Monitoring Program maintained all existing pollutant monitoring but removed a sulphur dioxide monitor as part of an EPA reprioritization of monitored pollutants.
- The Permitting and Compliance Program maintained its regulatory profile as a few large regulated facilities shut-down operations.
- The EIA&O Program evaluated the 2008 EPA National Emissions Inventory data release.

The EPA National Emission Inventory (NEI) data indicate that the total amount of annual air pollutant emissions have continuously declined in Pinellas County since 2002. Pinellas HAP emissions have continuously declined since 1999 and have decreased 59% from 1999 to 2008. Cancer risk is evaluated on an individual HAP basis and evaluated with respect to the EPA cancer risk benchmark of concern at one excess incidence of cancer per million permanent lifetime residents. The sum of EPA National Air Toxics Assessment (NATA) 2005 cancer risks associated with each Pinellas HAP was 45 per million, 10% lower than the average US county total cancer risk. And the NATA 2005 Pinellas total cancer risk was 3rd lowest of 22 US counties with a population within 10% of Pinellas. The 2005 NATA Pinellas total cancer risk was 20% lower than NATA 2002 and 25% lower than NATA 1999. Pinellas HAP monitoring data confirm the decline in Pinellas HAP emissions and the associated decline in cancer risk.

The EPA considers a situation in which cancer risk for a HAP exceeds the 1 per 1,000,000 benchmark of concern to warrant further review. Pinellas has had seven HAPs above this benchmark in NATA 1999, 2002 and 2005. Six of these HAPs and one additional HAP were also above this benchmark per Pinellas County monitoring data collected in 2002, 2005, 2008 and 2011. But the 2011 monitoring cancer risk for 6 of the 7 HAPs above the benchmark of concern were lower than any previous year. There were nine HAPs above the benchmark of concern in NATA 2005, but cancer risk for six of these was lower than any previous NATA risk. A cancer risk of 1 per 100,000 for a HAP is considered by EPA to warrant action to reduce the potential for adverse health effects. Formaldehyde has had NATA modeled and Pinellas County monitored cancer risks above this level since 2002. The 2008 NEI estimated that over 90% of

Pinellas County formaldehyde emissions were from mobile sources. The annual increase in the percentage of vehicles with up-to date pollution control technology is expected to result in continuing decreases in formaldehyde emissions and air concentrations.

The hazard associated with individual HAPs that can cause harmful non-cancer effects is evaluated with respect to EPA reference concentrations (RfCs), which are equivalent to a zero risk. One HAP, acrolein, has been above the EPA non-cancer reference concentration (RfC) in NATA 1999, NATA 2002 and NATA 2005, decreasing from 5 times the RfC in 1999 NATA to 2 times the RfC in 2005 NATA. No other Pinellas HAP has ever been estimated in NATA higher than 15% of its RfC. Pinellas County 2008 monitoring indicated acrolein concentrations at 15 times the RfC. Pinellas acrolein emissions are dominated by car and truck exhaust and have steadily declined since 1999, dropping 49% from 1999 to 2008.

Pinellas County Criteria Pollutant emissions decreased steadily since 2002, including steady decreases in emissions of each Criteria Pollutant and from each source category. There was a 45% decrease in these emissions from 2002 to 2008, including a 40% decrease in carbon monoxide, nitrogen oxides, VOCs and fine particulate matter, along with an 85% decrease in sulphur dioxide and a 20% decrease in particulate matter. Mobile sources have always accounted for at least 3 times more Pinellas Criteria Pollutant emissions than stationary sources. By 2008, mobile sources accounted for approximately six times more Criteria Pollutant emissions – this change was driven by a larger reduction in stationary source emissions compared to mobile source emissions. Pinellas County has not violated a National Ambient Air Quality Standard (NAAQS) for any Criteria Pollutant since the old ozone standard was violated in the 1980s. The Air Quality Index (AQI) is the EPA measure of air quality with respect to Criteria Pollutants – as AQI values increase, air quality decreases. Compared to other US metropolitan areas and counties since 1999, Pinellas has consistently had lower AQI values, many more Good AQI days, and many fewer AQI days in other AQI categories worse than Good.

Air Pollution – Cause and Effects

Some substances, when present in the air in sufficient quantities and/or for enough time, can be harmful to human health and/or welfare, to ecosystems and natural areas, or to property. These substances are considered air pollutants, which are introduced into the air from natural and man-made sources. Human exposure to air pollutants occurs in outdoor and indoor environments.

Sources of Air Pollution

Air pollution that causes the most harm comes primarily from anthropogenic or man-made activities. Combustion of fossil fuels, primarily through transportation-related uses, is the source of most man-made air pollution and most adverse health effects. These fuels are usually derived from non-renewable natural resources like oil and coal. Thus, as we increase our demands for energy, air pollution tends to increase without proper management, alternative fuels, or additional pollution controls. Industrial and commercial facilities also emit a substantial amount of air pollution, through fossil fuel combustion and other processes. These facilities emit more harmful air pollutants than transportation-related sources, but the amounts of pollutants emitted are smaller and the potential for harmful effects is smaller overall.

Human Health and Economic Effects

The human health effects of air pollution vary by pollutant, by length of exposure, and by the sensitivity of the individual exposed. Air pollutants cause two general types of human health effects, cancer and non-cancer effects. Non-cancer effects are varied and range from life-threatening to relatively mild, such as respiratory irritation. The most common health-effect associated with air pollution is the aggravation of existing respiratory and cardiovascular diseases. In most cases, air pollution affects those least prepared to protect themselves, namely children and the elderly.

Studies performed by a variety of governmental agencies and private organizations estimate that the total human health cost of air pollution lies in the range of tens of billions of dollars per year for the total population of the United States. The major economic impact from air pollution is associated with human health, particularly the costs of medical treatments, increased morbidity and reduced productivity. However, there are also substantial costs associated with efforts to reduce air pollution, such as removal of asbestos in buildings, spill cleanup and control of pollutant emissions from industrial and commercial facilities. And air pollution also results in property damage, primarily through surface discoloration and accelerated surface deterioration.

Human Welfare and Aesthetic Effects

Human welfare and aesthetic effects include many intangible factors that cannot be easily quantified. Air pollution can result in foul odors that may result in public distress and may reduce the desirability of an area for residential or commercial use. Air pollution can also result in impaired visibility, causing decreased enjoyment of scenic vistas, natural areas and recreational activities.

Climatology and Meteorology

Climate, weather patterns, and associated topography can play an important role in the formation and distribution of air pollution. In particular, temperature, rainfall, wind patterns, and barriers to air circulation such as mountains or high pressure systems, can each play a significant role in the amount of air pollution in the air at a given time. Sunlight drives temperature and is itself an important component regulating the rate of formation and breakdown of some air pollutants.

The warm sub-tropical climate of Pinellas County is characterized by a relatively small range of seasonal and daily temperatures compared to most of the US. This situation minimizes cold air inversions in which heavy cold air traps air pollution near the ground. Such inversions limit air circulation, circulation that typically reduces the amount of air pollution in this area substantially. Pinellas County circulation is reduced very little by topography due to the flat terrain. Pinellas County air circulation is driven primarily by afternoon heating that typically causes air over the land to rise high into the atmosphere, which in turn results in the flow of air onshore from the Gulf of Mexico in the form of sea breezes. These conditions tend to reduce air pollution in Pinellas County overall, but at times these same sea breezes can bring air pollution that has traveled offshore over the Gulf of Mexico back over the county. However, Pinellas air quality also benefits from a relatively high amount of rainfall, commonly associated with thunderstorms. Rain and storm related winds increase circulation and the rain itself serves to remove certain pollutants from the air.

High pressure systems, common to most of the US, are the primary cause of reduces air circulation and stagnation in Pinellas County. These systems, when centered in the southeast US, are often associated with northeast winds that may carry some air pollutants from distant metropolitan areas to Pinellas County. These systems are most likely to affect Pinellas in the relatively dry Spring and Fall seasons.

Air Pollution Regulation

Under the US Clean Air Act (CAA), the Environmental Protection Agency (EPA) establishes outdoor air quality standards and pollution control requirements to protect public health and welfare. In keeping with these CAA standards and requirements, the EPA in association with other US and international agencies, through research and testing, has established a list of air pollutants subject to regulation via emission control and/or ambient (outside) air concentration limits. The EPA is responsible for implementing the CAA and does so in partnership with state, local and tribal governments. The CAA pertains to emissions of all regulated air pollutants from stationary and mobile sources of air pollution. Stationary sources include industrial, commercial and institutional facilities. Mobile sources include on-road and non-road vehicle emissions from cars, trucks, motorcycles, locomotives (trains), airplanes, marine vessels, and lawn and garden equipment.

Air Pollutant Groups

As scientific data from accidents and incidences involving chemicals and other substances has been compiled, and as evidence for associated human and environmental harm has mounted, the EPA has found that different pollutants affected health in different ways and caused different types of health issues. These differences apply to airborne exposures to many such pollutants and drive different approaches to controlling the harmful effects from exposure to air pollutants. As such, the EPA breaks air pollutants into two general groups, Hazardous Air Pollutants (HAPs), otherwise known as air toxics, and Criteria Pollutants. There are 187 HAPs and 6 Criteria Pollutants.

Hazardous Air Pollutants

The EPA list of 187 HAPs contains the air pollutants that are known or suspected to cause cancer or other serious adverse health effects to humans, or adverse environmental effects (http://www.epa.gov/ttn/atw/orig189.html). Stationary source total HAP and HAP-specific emissions are regulated primarily through facility air permits that may specify control technology or operational and material use requirements & limitations. There were 173 facilities in Pinellas County with CAA facility permits in 2011. Most HAP regulations apply to stationary sources, but EPA regulation of mobile source emissions is also well developed and critical considering that most HAP emissions come from mobile sources. Mobile sources emit more than twice the amount of HAPs as stationary sources in Pinellas County, with on-road vehicles dominating mobile source HAP emissions. The EPA mobile source-related regulations mandate vehicle emission control technologies and petroleum industry fuel standards.

Specific regulatory emission limits apply to stationary sources of seven HAPs based on facility type or based on processes or activities that may emit radionuclides, asbestos, benzene, vinyl chloride, beryllium, arsenic, or mercury. These specific emissions limits for these seven HAPs are health-based standards and are sometimes exclusively referred to as the National Emissions Standards for Hazardous Air Pollutants (NESHAPs). Health-based standards apply to some Pinellas County sources of asbestos emissions. Difficulty in determining health-based emission

standards due to uncertainties inherent in health risk determinations led EPA to regulate HAPs using technology-based standards.

Criteria Pollutants

There are six other common air pollutants known as Criteria Pollutants that have health-based standards in the form of ambient concentration limits: particulates, ozone, nitrogen dioxide, sulfur dioxide, carbon monoxide and lead. Among these six pollutants, only lead is a HAP. Exposure to Criteria Pollutants may produce respiratory and associated heart problems, but Criteria Pollutant emissions also result in creation of acid gases and particles that result in acid deposition (acid rain). Criteria Pollutant health effects typically result from aggravation of a health condition that existed prior to exposure.

The ambient concentration limits for the six Criteria Pollutants are known as the National Ambient Air Quality Standards (NAAQS). The NAAQS include primary and secondary standards. Primary standards provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings. The only Criteria Pollutant with a secondary standard different from its primary standard is sulphur dioxide.

The NAAQS are enforced by the EPA geographically in EPA-defined airsheds that are typically associated with a specific metropolitan area. If any such airshed is not in compliance with NAAQS, corrective actions are required and penalties are possible, including loss of monies provided by the US Department of Transportation. At the minimum, such an airshed is required to take particular actions to bring the airshed back into compliance in a specified time frame.

Criteria Pollutants are emitted in large quantities by mobile sources and are also emitted by large industrial sources like power plants. Non-road vehicles, and to a lesser extent on-road vehicles dominate Criteria Pollutant emissions in Pinellas County. To support attainment of the NAAQS, Criteria Pollutant emissions, like HAP emissions, are regulated through mobile source emission control technologies and stationary source facility permits.

Ambient concentrations of the Criteria Pollutants, with the exception of lead, have EPA-assigned hierarchical health threat levels corresponding to potential health effects (given enough exposure and sensitivity). Ambient concentrations of each of these pollutants correspond to an EPA Air Quality Index (AQI) value with breakpoints at several levels of threat. Each level has corresponding recommended actions for the public to minimize exposure and potential effects.

<u>Ozone and Nitrogen Dioxide</u>

Ozone (O3) is a colorless form of oxygen associated with the presence of smog. The highly reactive nature of ozone can cause health problems by damaging biological tissues and cells. High ambient levels of ozone can result in impaired breathing, coughing, nausea and pulmonary congestion. High levels of ozone can also cause noticeable foliar and ecosystem damage, reduce agricultural crop yields, and degrade paints, dyes and rubber products. Among the Criteria

Pollutants, ozone is responsible for the most widespread health problems, as it is produced by the atmospheric reaction of sunlight with the similarly widespread emission of nitrogen oxides and volatile organic compounds (VOCs), particularly in urban areas.

Nitrogen dioxide is regulated primarily due to its role in ozone creation. Nitrogen oxides are formed from nitrogen oxide (NO) released during high temperature fuel combustion. Primary sources of nitrogen oxide and nitrogen dioxide (NO2) are coal and oil-fired electric utility plants, and motor vehicles. Nitrogen oxides have also recently become a regulatory concern due to their potential to act as or lead to the formation of greenhouse gases that cause atmospheric warming. Volatile organic carbons (VOCs) account for the vast majority of air pollutants, are emitted from mobile and stationary sources, and account for the vast majority of EPA hazardous air pollutants (HAPs). Notwithstanding their role in ozone creation, the primary health concerns associated with VOCs are the toxic effects of VOC HAPs.

Particulate Matter

The characteristics, sources, and potential health effects of relatively large or "coarse" particles (2.5 to 10 micrometers in diameter) and smaller or "fine" particles (less than 2.5 micrometers in diameter) are very different. Coarse particles (PM10) come from sources such as windblown dust from agricultural fields, grinding operations, and dust kicked up on unpaved roads by vehicle traffic. Fine particles (PM2.5) are generally emitted from activities such as industrial and residential fuel and waste combustion, open burning of trash and garbage, and vehicle exhaust. Fine particles are also formed in the atmosphere when gases such as sulfur dioxide, nitrogen oxides and volatile organic compounds, emitted by combustion activities, are transformed by chemical reactions in the air.

Coarse particles can accumulate in the respiratory system and aggravate health problems such as asthma. Fine particulates are a health threat because of their ability to penetrate deep into the lungs, causing premature mortality and increased hospital admissions. These fine particles are so small that several thousand of them could fit on the period at the end of a sentence. The elderly, children, asthmatics and individuals with pre-existing heart or lung disease are most at risk from particulate matter exposure.

The same fine particles linked to serious health effects are also a major cause of visibility impairment in many parts of the US, causing the visual range to be reduced up to 70% from natural conditions. Fine particles can remain suspended in the air and travel long distances. Emissions from diesel trucks on I-95 can travel to and settle onto the beaches of the Gulf Coast. Nitrogen oxides and sulphur dioxide also contribute greatly to haze and reduced visibility. EPA rules like the Clean Air Interstate Rule and the Regional Haze Rule contain state-wide emission caps and target improvement of visibility in National Parks and other scenic areas.

Other Criteria Pollutants

Carbon Monoxide (CO) is a by-product of the incomplete combustion of fuels. Transportation-related sources account for the majority of all CO pollution. Carbon monoxide exposure can disrupt the delivery of oxygen to the body's organs and tissues. The health threat from CO is greater for those individuals who suffer from cardiovascular disease. Sulfur Dioxide (SO2) is

emitted primarily from electric power plants that burn sulfur-containing fossil fuels such as coal and oil. Asthmatics and others with respiratory diseases such as bronchitis, influenza and emphysema can be at risk when exposed to high ambient concentrations of sulfur dioxide. The amount of lead emitted in the US is currently low, except in localized areas with sources such as battery plants. Due to these remaining emissions hotspots, and because children are particularly susceptible to lead exposure and effects, including brain and internal organ damage, lead remains a Criteria Pollutant.

Pinellas County Air Quality Program

The Pinellas County Air Quality Division implements a variety of program elements in keeping with its mission and associated objectives.

Mission

The Air Quality Division is dedicated to protect, preserve and enhance the air quality within Pinellas County. The Division will accomplish its mission by providing and maintaining for the citizens and visitors of Pinellas County standards that will minimize the threat of air pollution to public health and welfare.

Objectives

Continued attainment of the National Ambient Air Quality Standards (NAAQS) will be achieved through the implementation of air pollution control strategies consistent with authorization of the Clean Air Act Amendments of 1990.

- Maintain programs to protect the public from air pollutant sources that pose a high health risk.
- Maintain programs that prevent degradation of air quality where standards are being met.
- Continue to develop programs and partnerships that protect air quality and educate the public concerning air pollution issues.

Program Elements

The Air Quality Division program includes a wide of range of elements implemented in the office, in the field and in the laboratory. These efforts require advanced scientific methodology and analyses, as well as a good working relationship with those served in the regulated community and in the general public.

Air Monitoring

The framework for a well developed air quality management strategy begins with a balanced ambient monitoring network. A fully approved monitoring network must comply with uniform criteria for network design, measurement methodology, instrument siting and spatial representation, as defined in the Code of Federal Regulations in support of the Clean Air Act.

The County's EPA-approved air monitoring network has been in operation since 1975 and sampling for HAPs has been performed since 1991. The monitoring of ambient air quality in Pinellas County is conducted through a system of periodic and continuous sampling stations throughout the county. The data collected from these stations make it possible to evaluate the overall effectiveness of air pollution control strategies, including individual facility air permits, and indicate the level of health threat from air pollutants. These stations are part of what is

known as the National Ambient Monitoring Stations (NAMS) and the State and Local Air Monitoring Stations (SLAMS). The County is a US leader in air quality monitoring, selected to participate in EPA's most cutting-edge monitoring programs, including the National Air Toxics Trends Sites (NATTS) program.

Air pollutants from all sources are monitored in County areas where pollutant concentrations are expected to be typical of residential areas, and in areas where pollutant concentrations are expected to be unusually high, as in industrial areas or near roadways. All monitoring data are subjected to a rigorous quality assurance program to ensure that the data are valid, representative, complete, precise and accurate. The Air Monitoring Program is subject to federal (EPA) and state (Florida Department of Environmental Protection) audits.

Pollutants, Sampling Locations, Equipment and Procedures

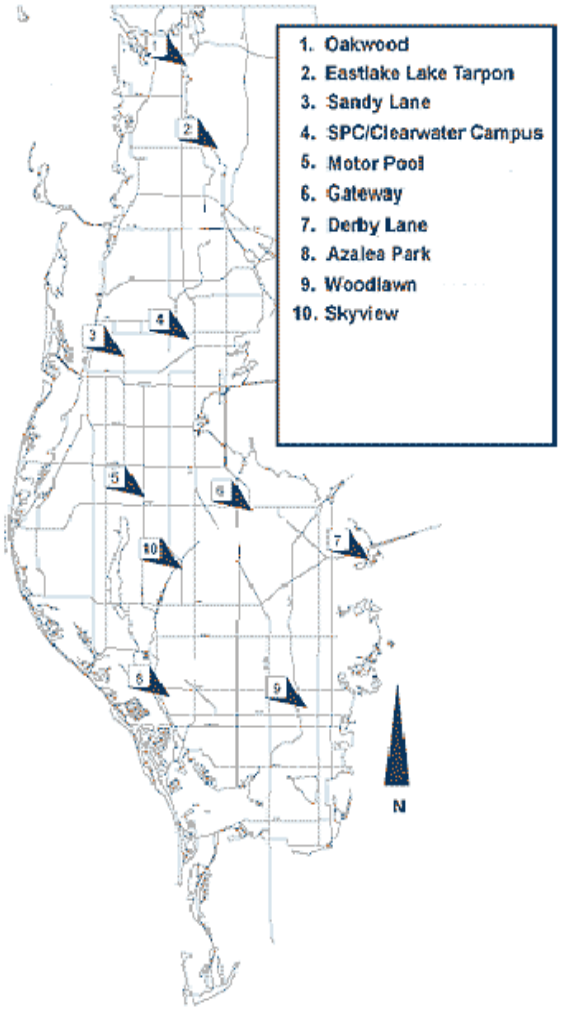


Figure 1 - Air Sampling Station Locations

The County air monitoring network currently collects air samples for Criteria Pollutants and many HAPs. The HAP samples include VOCs and non-VOC HAPs. The non-VOC HAPs include semi-volatile organic compounds (SVOCs/PAHs), several toxic metals including chromium VI, and carbonyls (aldehydes). Sampling for Criteria Pollutants is currently performed at monitoring stations located throughout the County and sampling for HAPs is performed at two sites (Azalea and Skyview). Elemental carbon is sampled at one station in support of Criteria Pollutant sampling. Elemental carbon indicates particulate contributions from diesel exhaust. Pinellas County air sampling station locations are shown in **Figure 1** -- corresponding addresses and pollutants sampled are listed in **Table 1**.

All Criteria Pollutants are sampled using devices that provide automatic ambient concentration data that is electronically sent to the Air Quality Division office, with an onsite computer drive back-up. These data include ozone and particulate readings that are used by the Air Quality Division to provide the daily Air Quality Index (AQI) forecast to the public. Ambient concentrations of VOCs, SVOCs/PAHs, toxic metals and carbonyls are determined through analysis of air samples in environmental laboratories. Most particulate samples also undergo laboratory analysis.

Air samples are collected by various devices but all samples are collected through the creation of a vacuum, via a pump, to draw air into the sampling device. Pollutant-specific sampling methods are summarized in **Table 1**. Particulate air samples are collected on quartz fiber filters using high volume samplers with size selective inlets and these samples are analyzed for particulate and toxic metals concentrations. Carbonyl samples are collected in DNPH cartridges, SVOCs/PAHs are collected using polyurethane foam filters, chromium VI samples are collected using bicarbonate filters, and VOC air samples are collected using lined metal canisters. All HAP samples are collected over a 24 hour period, every six days.

Table 1 - Analytical Techniques, Site Locations and Pollutants

POLLUTANT	SAMPLING METHOD	ANALYTICAL TECHNIQUE
PM10	SSI-High Volume Sampler	Gravimetric
Sulfur Dioxide	Continuous Sampler	Fluorescence
Oxides of Nitrogen	Continuous Sampler	Chemiluminescence
Ozone	Continuous Sampler	Ultraviolet Photmetry
Carbon Monoxide	Continuous Sampler	Infrared Gas Filter Correlation
Toxic VOCs	Canister Sampler	GC-MS
PM2.5	Sequential Sampler and	Gravimetric
SITE NAME	**NEAREST INTERSECTION LOCATION**	**POLLUTANT MONITORED**
East Lake Tarpon	John A. Chestnut Sr. Park	O3, PM10, PM2.5
SPC/Clearwater Campus	Clearwater Campus	O3
Motor Pool	100th St & Ulmerton Road	PM10
Derby Lane	San Martin Blvd. & 98th Ave.	SO2
Azalea Park	72nd St. & 22nd Ave. N.	O3, PM10, Air Toxics, PM2.5
Woodlawn	19th St. & 13th Ave. N.	PM10
Gateway	34th St. N. & Ulmerton Rd.	CO
Oakwood	US Hwy. 19N & Oakwood St.	SO2
Sandy Lane	1360 Sandy Lane	PM2.5
Skyview	8601 60th St. N	Air Toxics, Black Carbon, PM2.5

The only change to the County air monitoring network in 2011 was the removal of a sulphur dioxide monitor as part of an EPA reprioritization of monitored pollutants.

Laboratory Analysis of Samples

The Air Monitoring Environmental Laboratory performs analyses of building and construction materials for the presence of lead and asbestos to identify the need to apply health-based standard emission control requirements at demolition and construction sites. Ambient concentrations of relatively large particulates (PM10) are also determined by the Pinellas lab. But the primary role of the Pinellas Environmental Monitoring Lab is to perform sample and associated quality assurance analyses to determine particulate and volatile organic compound (VOC) concentrations. All VOC and some particle analysis is performed in the Pinellas lab. The 41 VOCs analyzed (EPA Method TO-15) by the Pinellas laboratory include many HAPs

(including acrolein, an SVOC HAP). Pinellas VOC analysis is accomplished using gas chromatograph/mass spectrometer (GC/MS) technology.

After the large particle samples are analyzed by the Pinellas lab they are sent to the Hillsborough County Environmental Protection Commission (HCEPC) laboratory, which performs toxic metals extraction & analysis (EPA Method IO-3.5 using Inductively Coupled Plasma technology). Carbonyl samples are sent to the Eastern Research Group (ERG) laboratory, which performs carbonyl extraction & analysis (EPA Method TO-11A using liquid chromatography). The SVOC/PAH samples are also extracted & analyzed ((EPA Method TO-13A using GC/MS) by ERG, as are chromium VI samples (CARB Method 039 using ion chromatography). Relatively small particulates (<2.5 microns) are sent to and analyzed by the Research Triangle Institute (RTI) laboratory. All these laboratories have EPA-approved analytical programs and quality assurance plans. Laboratory analytical techniques are summarized by pollutant and sampling method in **Table 1**.

Permitting and Compliance

The Permitting and Compliance Program enforces the County's Comprehensive Air Quality Ordinance and oversees permitted and unpermitted stationary sources of air pollution in Pinellas County. State (FDEP) permit applications are reviewed to ensure a comprehensive accounting of air pollution sources and ensure compliance with permit conditions and applicable State rules. Reviews are conducted for major & minor air operating permits, and for General Permits.

A major (Title V) facility is generally one that has the potential to emit 100 tons/year of any regulated air pollutant, 25 tons/year of HAPs or 10 tons/year of any single HAP, with permits that usually require active emission control technology. A minor facility is one with potential emissions, or permitted emission limits, below Title V thresholds. Facilities in some industries can be regulated via FDEP General Permits, which require only a registration form and compliance with applicable State codes. In 2011, there were 15 major facilities in Pinellas County with Title V permits, 53 minor facilities with air operation permits and 105 facilities with General Permits.

Facility inspections are performed on electrical power plants, gasoline stations, paint and coating operations, and other sources that emit regulated pollutants. Citizen's complaints are also investigated and facility compliance tests and periodic reports are reviewed. Many facility inspections and complaint responses are carried out specifically related to sources of asbestos emissions, such as demolition and renovation projects for which proper removal and disposal of asbestos material is mandated. Citizen's complaint information for 2011 is listed in **Table 2**.

Compliance activities resulted in the processing of 105 advisory, warning and notice of violation letters in 2011. There were 45 consent orders processed in 2011. Consent orders are an enforcement action that requires the facility to make corrective changes and/or pay a penalty. Information on additional compliance activities for 2011 is listed in **Table 3**. Total penalties collected in fiscal year (FY) 2011 were $73,520. Penalty revenues are deposited into the County Air Pollution Recovery Trust Fund and are used only for Division programs related to the control

Table 2 - 2011 Citizen's Complaints

Type	Quantity
Asbestos	9
Fugitive Dust	14
Miscellaneous	28
Odor	126
Open Burning & Smoke	30
Paint Fumes	25
Sandblasting	2
VOC Fumes	8
Mobile Sources	1
Total Complaints	202

Table 3 - 2011 Compliance Activities

Type	Quantity
Asbestos Removal/Demolition Projects	319
Asbestos Project Inspections	281
Asbestos Surveillance Inspections	101
Compliance Inspections (Unpermitted)	738
Compliance Inspections (Permitted)	255
Gasoline Service Station Inspections	385
Gasoline Tanker Drops	0
Test Report Reviews	107
Consent Orders	56
Warning Letters	121
Penalties Collected FY 2011	$ 73,520

of emissions, air quality monitoring, facility inspections, and other such purposes related to the Permitting and Compliance program.

The Permitting and Compliance Program annually receives stationary source air pollutant emissions figures from permitted facilities that are required to submit an Annual Operating Report (AOR). These AORs include information on operations & product use, any emissions monitoring data, and an accounting of specified emissions. The AQD reviews the AORs for accuracy and completeness, facilitates and makes necessary corrections or additions, then submits the inventory data to the State (FDEP).

Emissions Inventory and Program Analysis & Outreach

The Pinellas County AORs provide the stationary point source data that is used in the EPA National Emissions Inventory (NEI), a large effort that produces estimates of all US HAP and Criteria Pollutant emissions. The other primary emissions categories in the NEI are stationary area sources and mobile sources. Stationary area source emissions are estimated for industrial and commercial sectors based on activity data such as materials use, and on associated surrogate data such as population and employment. Mobile source emissions are estimated by inputting vehicle type, population data, vehicle miles traveled data, and road type data into computer models that account for varying starting, idling and running mode emission rates.

A new, updated NEI data set is generated by EPA every three years, the minimum time needed to complete the inventory. The NEI emissions are quantified to the county level for all US counties. The Pinellas County portion of these inventories are reviewed and edited by the County Air Quality Division, in cooperation with the EPA, to maximize the accuracy of the emissions estimates. The County NEI data set is comprehensive, consistent and robust. It provides a quality estimate of air pollutant emissions and is a valuable tool for tracking emissions trends across source types and time. A Pinellas County NEI Report is completed and provided to the public after each EPA NEI effort.

In the EPA National Air Toxics Assessment (NATA), NEI data serves as the primary input to EPA computer models that are used to estimate ambient concentrations of pollutants and associated human health threats. The NATA effort is performed every three years on a county by county basis for all US counties. The Pinellas County portion of this EPA assessment is reviewed by the County Air Quality Division to evaluate the potential health impacts of local air pollutant emissions and associated ambient concentrations. The ambient concentrations estimated in NATA allow for the estimation of cancer risk and non-cancer hazard using EPA or EPA-approved HAP-specific toxicity values. These toxicity values are expressed as a specific level of cancer risk or non-cancer hazard associated with a specific ambient concentration. The EPA establishes HAP toxicity values through animal testing, and through other research based on evaluation of human health effects associated with incidents of exposure to airborne HAPs. A written Pinellas County NATA Report is completed and provided to the public after each set of EPA NATA data is released.

Other analytical and programmatic tasks and projects typically performed by the County Air Quality Division include, but are not limited to:

- annual reports on Division operations prepared for and provided to the public;
- analysis of federal, state and local air pollution related policies, rules and codes;
- air monitoring station siting analysis;
- reports analyzing EPA air pollutant emission and health threat data;
- analysis of projects or incidents that may pose an air pollutant related health threat;
- air monitoring data analysis for compliance with NAAQS;
- coordination of the Division's public education and outreach program; and .
- air quality transportation analysis in support of NAAQS and associated Federal Department of Transportation requirements.

The Division also supports various regulatory agencies and governmental bodies including the Board of County Commissioners, Metropolitan Planning Organization (MPO) and the FDEP. Program staff provides technical information and testimony, as needed, at various workshops and public meetings.

Public Outreach and Education

The Air Quality Division's Public Outreach and Education Program involves networking and partnership with other agencies to protect air quality, and increasing awareness of air quality issues in the public and private sectors through use of an efficient and cost-effective multi-media approach. Air quality-related information is presented through public speaking engagements, educational programs and printed materials. Air Quality Division staff provides interviews and information for the County Communication television station, as well as local news media outlets. Air Quality personnel speak at workshops, training sessions, and events organized for public awareness. As a result our message of promoting clean air activities and practices is sent to various environmental agencies, civic groups, county employees, and other interested parties.

The Pinellas County Speakers Bureau has requested speakers from the Division on numerous occasions. The Air Quality Division participates in organizations such as the National Association of Clean Air Agencies (NACAA) and Metro 4 (an association of local air agencies in EPA Region 4). Public education and outreach conducted in 2011 included promotion and participation in Clean Air Month (May), and public outreach partners continued to include the University of South Florida (USF) and the Pinellas County School Board. The Clean School Bus Program continued with the Pinellas County School Board in 2011, to reduce student and general public exposure to emissions from diesel school buses.

Throughout the year, various air quality issues and policies come before our elected and appointed officials on the Board of County Commissioners and the MPO. In these instances, the Division provides technical support and expertise at meetings, workshops and public hearings. Our purpose is to provide a clear understanding of the issues and their potential impact on Pinellas County.

Administration

The Pinellas Air Quality Division must meet key administrative and operational needs, including budgeting and federal grant management, program and policy development, interagency coordination, media relations and clerical support. **Figure 2** shows 2011 revenues and **Table 4** shows 2011 expenses. The Air Quality program remains fully funded without General Fund support. The difference between revenues and expenditures is covered by Air Quality Division program trust fund reserves.

Figure 2 - Program Revenues Fiscal Year 2011

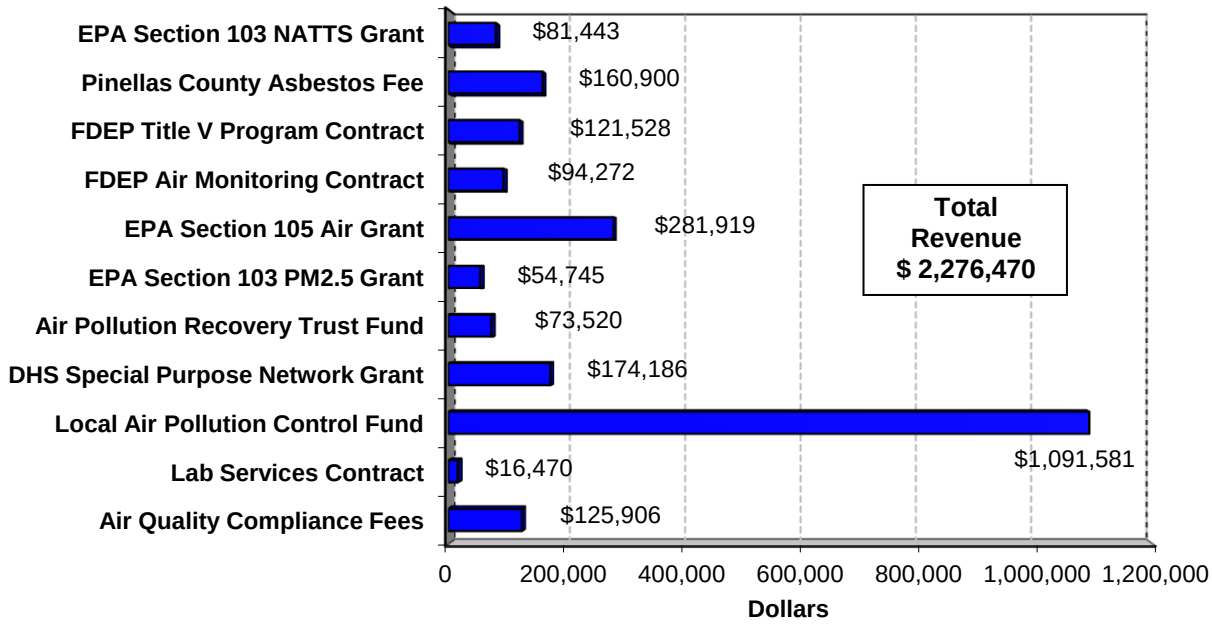


Table 4 - Fiscal Year 2011 Expenses

	2011
Local Air Pollution Control Fund (License Plate Fee)	
Personnel Services	$ 857,244
Operating Expense	$ 253,821
Capital Outlay	$ 0
Subtotal	$1,111,065
Air Pollution Recovery Fund	
Personnel Services	$ 517,027
Operating Expense	$ 58,805
Capital Outlay	$ 0
Grants & Aid	$ 0
Subtotal	$ 575,832
Air Quality General Fund	
Personnel Services	$ 676,050
Operating Expense	$ 10,219
Capital Outlay	$ 0
Subtotal	$ 686,269
TOTAL EXPENSES	$2,373,166

Air Quality Status and Trends

The EPA NEI data indicate that the total amount of annual air pollutant emissions have continuously declined in Pinellas County since 2002. Clean Air Act (CAA) programs have driven large reductions in US air pollutant emissions in the last decade or more, and implementation of these programs by the Pinellas County Air Quality Division have driven large reductions in Pinellas County emissions of air pollutants. Advances in technological implementation associated with CAA programs made much of this success possible. Implementation of mobile source air pollution control technologies has been a major factor in reductions of CAP and HAP emissions nationwide and in Pinellas County. Stationary source air pollution control technologies, combined with materials & fuels substitution and process changes, have driven stationary source CAP and HAP emissions reductions nationwide and in Pinellas. The air quality in Pinellas County is better than the average US county as measured by the cancer risk associated with ambient HAP concentrations and by the relatively low ambient concentrations of Criteria Pollutants.

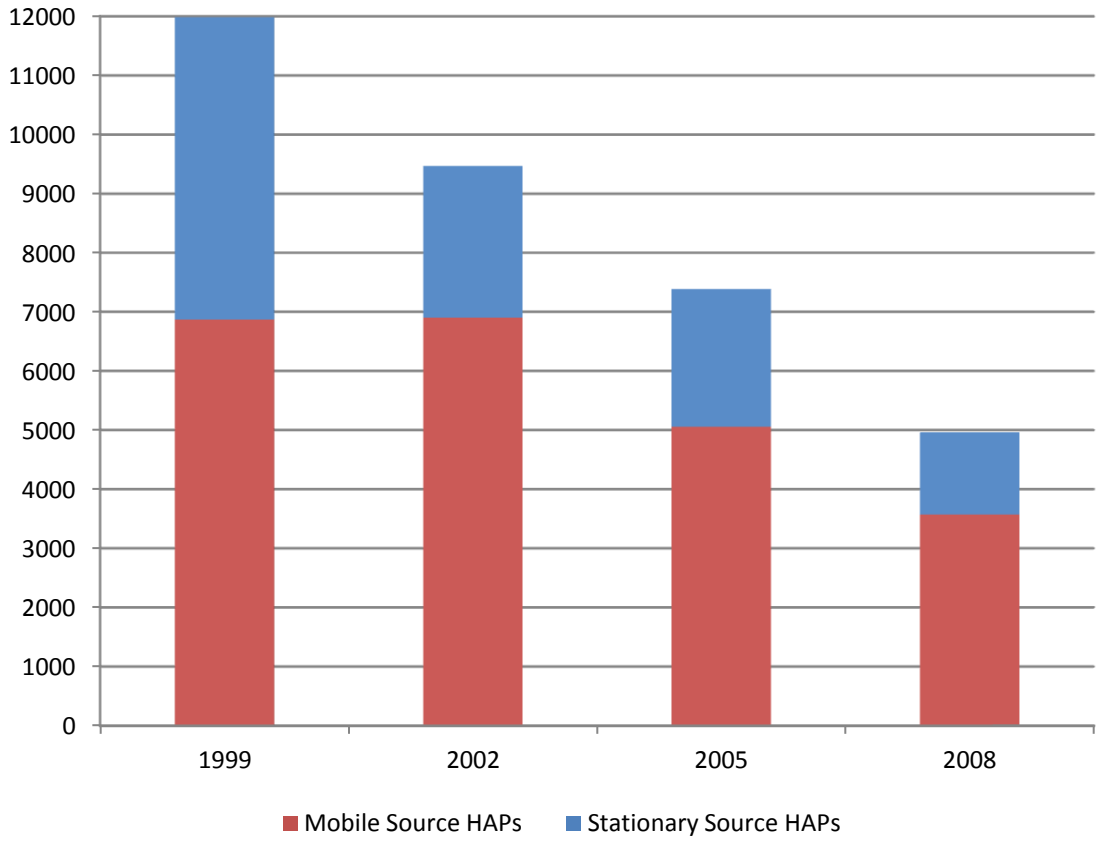
Hazardous Air Pollutant Emissions and Cancer Risk

Pinellas County annual HAP emissions have continuously declined since 1999. **Figure 3** depicts the 59% decrease in Pinellas County HAP emissions from 1999 to 2008, including the contributions from decreases in mobile and stationary source HAP emissions. Stationary source HAP emissions decreased 73% from 1999 to 2008, while mobile source HAP emissions decreased 48% during this time frame. Comparing the absolute amounts (tons) that stationary and mobile source HAP emissions decreased from 1999 to 2008, the stationary source HAP emissions decrease was 12% greater.

Cancer risk is evaluated on an individual HAP basis in the EPA NATA effort and this risk is evaluated with respect to the EPA cancer risk benchmark of concern that coincides with a risk of one excess incidence of cancer per million permanent lifetime residents. The NATA effort is performed every three years, as it relies on EPA NEI data that is generated every three years. It takes approximately three years to complete each NEI effort and at least another two years to complete each NATA effort, so NATA data is not released until five or six years after the year the NEI emissions data were collected.

The sum of the NATA 2005 cancer risks associated with the ambient concentrations of each Pinellas County HAP was 45 per million. This NATA 2005 Pinellas total cancer risk was 10% lower than the NATA 2005 average US county total cancer risk of 50 per million. And the NATA 2005 Pinellas total cancer risk was 3rd lowest of 22 US counties with a population within 10% or Pinellas, despite the fact that Pinellas had the 8th highest population among these 22 counties. The NATA Pinellas total cancer risk has also been lower than the NATA US county average in 1999 and 2002, and was 4th lowest among US counties with a population within 10% of Pinellas in 1999 and 2002. The 2005 NATA Pinellas total cancer risk was 20% lower than NATA 2002 and 25% lower than NATA 1999. Pinellas County HAP monitoring data confirm the decline in Pinellas HAP emissions and the associated decline in cancer risk, as shown in **Table 5** for the HAPs with the highest Pinellas cancer risks.

Figure 3 - Pinellas County Hazardous Air Pollutant (HAP) Emissions (Tons)



Emissions & Cancer Risk Trends for HAPs with Risk Above Benchmark

The EPA considers a situation in which a HAP cancer risk exceeds the 1 per 1,000,000 benchmark of concern, to warrant further review. Appropriate review includes additional study and review of the HAP for elevated ambient concentrations at the neighborhood or census tract level and for localized sensitive populations, such as children, the elderly, or groups with compromised health. Considering that Pinellas County has ambient concentrations of some HAPs above the benchmark of concern, the Air Quality Division recently performed a screening study to locate any Pinellas County census tracts with an unusually high cancer risk, or populations of sensitive individuals. As of 2005, Pinellas had a 3% higher population of children plus elderly than the average US county, but the percentage of Pinellas census tracts with a relatively high population of children or elderly was lower than the average US county. The Division screening involved identification of the overlap between census tracts with relatively high NATA 2002 cancer risk compared to the Pinellas average, and census tracts with relatively high NATA 2002 child or elderly populations compared to the Pinellas average. Of the 209 Pinellas County census tracts, 30 census tracts (14%) had a relatively high cancer risk, and only 8 census tracts (4%) had a relatively high cancer risk and a relatively high child or elderly population. Moreover, the highest NATA 2005 cancer risk in any Pinellas County census tract was equal to the NATA 2005 average US county census tract cancer risk. The relatively low

Pinellas county-wide NATA cancer risk increases only to average US NATA cancer risk levels in the Pinellas census tracts with the highest cancer risks.

Table 5 lists the 11 HAPs with NATA modeled or Pinellas County monitored ambient concentrations that indicate cancer risk above the benchmark of concern in 2002 or 2005 or with monitored cancer risk above this benchmark in 2002, 2005, 2008 or 2011. Pinellas County NEI emissions data associated with these HAPs are also incorporated into this table. Emissions decreased from 2002 to 2005 and from 2005 to 2008 for 8 of the 11 HAPs in **Table 5**, and for 5 of 8 HAPs with cancer risk above the benchmark of concern per monitoring data or NATA data.

Of the 11 HAPs in **Table 5**, 9 were above the cancer risk benchmark of concern in at least one NATA year. The top seven HAPs listed in this table were above the cancer risk benchmark of concern in 1999 NATA, 2002 NATA and 2005 NATA. The 2005 NATA cancer risk decreased from 2002 NATA for 6 of the 9 HAPs above the benchmark of concern in 2005 NATA, resulting in the lowest NATA cancer risk on record for these 6 HAPs.

Of the 11 HAPs in **Table** 5, 10 have been included in the Pinellas County HAP monitoring program since at least 2002 - 9 of these had a monitored cancer risk above the benchmark of concern in 2002 and 2005, 8 had a monitored cancer risk above this benchmark in 2008, and 7 remained above this benchmark in 2011. The monitored cancer risk decreased steadily from 2002 to 2011 for 5 of the 7 HAPs remaining above the benchmark of concern in 2011, and the 2011 monitored cancer risk for all 7 of these HAPs was lower than any previous year. Monitored cancer risk for 1,4-dichlorobenzene, one of the two HAPs with monitored cancer risk values that did not steadily decline from 2002 through 2008, was much lower in 2008 and 2011 than in previous years. Cancer risk estimated using ambient monitoring data, is considered more accurate than NATA modeled data if done according to approved quality assurance plans.

A cancer risk of 1 per 100,000 for a HAP is considered by EPA to warrant action to reduce the potential for adverse health effects. Formaldehyde has had NATA modeled and Pinellas County monitored cancer risks above this level since 2002, as shown in **Table 5**. Acrylonitrile monitoring cancer risk was also above this level in 2002 and 2005, but dropped below this level by 2008 and remains below the benchmark of concern in 2011. The 2008 NEI estimated that over 90% of Pinellas County formaldehyde emissions were from mobile sources. And NATA 2005 estimated that Pinellas County formaldehyde emissions account for only 22% of formaldehyde cancer risk, with the other 78% from secondary formation of formaldehyde in the atmosphere. This secondary formation results from interactions between many different types of compounds, with major impact from volatile organic compounds and other compounds associated with fossil fuel production, handling and combustion. Nitrogen oxides are a product of fossil fuel combustion and are primary actors in this secondary formation. The 2008 NEI estimated that over 80% of nitrogen oxides emissions were from mobile sources. Clean Air Act mobile source air pollution control technology requirements have significantly decreased emissions of nitrogen oxides and other mobile source pollutants. The annual increase in the percentage of vehicles with up-to date pollution control technology is expected to result in continuing decreases in emissions of nitrogen oxides and other mobile source pollutants.

Table 5 – Cancer Risk & Emissions Trends for HAPs Above EPA's Benchmark of Concern

Hazardous Air Pollutant (HAP)	Cancer Risk (per million)								Cancer Risk Reduction				NEI Emission Reduction Percentages	
	1999		2002		2005		2008	2011	2002 to 2005		2005 to 2008	2008 to 2011	2002 to 2005	2005 to 2008
	NATA	County Monitor	NATA	County Monitor	NATA	County Monitor	County Monitor	County Monitor	NATA	County Monitor	County Monitor	County Monitor		
formaldehyde	20	NM	23	52	20	24	39	24	3	28	-15	15	27%	14%
benzene	11	9.2	12	9.1	8.5	6.0	4.6	3.4	3.5	3.1	1.4	1.2	20%	24%
acetaldehyde	3.1	NM	3.8	4.6	2.9	5.4	2.6	4.6	0.9	-0.8	2.8	-2.0	24%	-12%
carbon tetrachloride	7.2*	5.8	7.1	7.3	2.9	3.3	2.3	2.3	4.2	4.0	1.0	0	0%	-2300%
arsenic	1.5*	NM	2.0	2.9	2.2	2.5	2.2	2.1	-0.2	0.4	0.3	0.1	-22%	12%
1.3-butadiene	3.8	NM	3.1	5.5	2.0	5.4	1.9	1.5	1.1	0.1	3.5	0.4	25%	26%
naphthalene	1.7	NM	1.4	NM	1.3	NM	NM	NM	0.1	NM	NM	NM	16%	32%
chromium	1.6*	NM	0.65	2.9	1.2	2.1	0.11	0.03	-0.55	0.8	2.0	0.08	-550%	63%
nickel	0.14	BB	1.1	BB	1.1	BB	BB	BB	0	BB	BB	BB	14%	77%
acrylonitrile	BB	NM	BB	20	BB	24	4.6	1.7	BB	-4.0	19.4	2.9	2%	38%
1,4-dichloben.	BB	1.9	BB	5.7	BB	4.4	1.1	0.47	BB	1.3	3.3	0.63	1%	92%

*figures updated using 2002 NATA background values NM = not monitored BB = below benchmark

nickel above benchmark in NATA modeling only *acrylonitrile & 1,4-dichlorobenzene* above benchmark in monitoring only

NOTES: 1. negative numbers and negative percentages indicate emissions increases
2. monitoring data from Azalea monitor (data from this monitor collected during the entire time span included in the table)
3. secondary formation of formaldehyde in the air may be poorly accounted in NATA modeling and may fluctuate, significantly affecting ambient concentrations
4. EPA reduced carbon tetrachloride toxicity by approximately 60% in 2005; background concentrations account for 99% of carbon tetrachloride cancer risk
5. NATA models are not yet well suited for estimation of metals cancer risk
6. nickel NEI area source emissions inflated in 2002 & 2005 (coal fuel combustion) - not corrected in NEI
7. no known acrylonitrile source - a higher background estimate would not likely account for most risk - long-range transport into Pinellas may be occurring
8. EPA landfill emissions estimation appears to have underestimated actual landfill emissions of 1,4-dichlorobenzene
9. This table does not list four HAPs with monitoring cancer risks above benchmark. hexachlorobutadiene (2 per million) , ethylene dibromide (13 per million), ethylene dichloride (1 per million) and 1,1,2,2-tetrachloroethane (2 per million). Over 90% of the monitoring concentrations for each were below the laboratory method detection limit and prone to excessive error. Furthermore, quality assurance analyses suggest analytical concentrations are from laboratory contamination.

Emissions & Hazard Trends for HAPs with Non-Cancer Hazard Above RfC

The hazard associated with HAPs that can cause harmful non-cancer effects is evaluated with respect to EPA HAP-specific reference concentrations (RfCs). These RfCs are equivalent to a zero risk of harmful non-cancer effects. Exposure to airborne concentrations of HAPs above their RfCs may result in harmful non-cancer effects – any concentration above an RfC simply indicates that such effects are possible. A HAP with a higher RfC relative to another HAP is considered to be more likely to cause a non-cancer adverse health effect, but the risk or probability of this harmful effect occurring is not provided by the RfC estimation process.

Only one HAP, acrolein, has been above the EPA non-cancer reference concentration (RfC) in any NATA effort. This HAP has been above the RfC in NATA 1999, NATA 2002 and NATA 2005. The NATA modeled acrolein concentration for Pinellas County was 5 times higher than the RfC in 1999, 4 times the RfC in 2002, and 1.5 times the RfC in 2005. No other HAP has ever been estimated in NATA with Pinellas County concentrations higher than 15% of their RfC. Modeling acrolein concentrations is complicated by secondary atmospheric formation of acrolein from 1,3-butadiene, a primary HAP in vehicle exhaust.

Pinellas County began monitoring for acrolein in 2007. The Pinellas 2008 monitoring concentration of acrolein was approximately 15 times higher than the RfC and the Pinellas 2011 monitoring concentration of acrolein was down to approximately 11 times the RfC. Exposure to acrolein above the RfC can cause respiratory congestion and irritation.

Acrolein emissions in Pinellas County are dominated by car and truck exhaust. Pinellas NEI acrolein emissions have steadily declined since 1999, and by 2008, emissions were reduced to approximately half (51%) of the amount emitted in 1999. Pinellas NEI 1,3-butadiene emissions have steadily declined since 2002, and by 2008, emissions were reduced to approximately 55% of the amount emitted in 1999.

Criteria Pollutant Emissions and Health Threat

Pinellas County emissions of the six Criteria Pollutants, including total particulate matter of all sizes, peaked in 2002 when NEI emissions were 6% higher than their previously recorded high in 1999. As shown in **Table 6**, Pinellas County Criteria Pollutant emissions have decreased steadily since 2002, including steady decreases in the emissions of each Criteria Pollutant and in the emissions from each source category. Pinellas County Criteria Pollutant emissions decreased by 18% from 2002 to 2005 and by another 33% from 2005 to 2008. There was a 45% decrease from 2002 to 2008, amounting to approximately 188,000 tons. From 2002 to 2008, there was a 40% decrease in emissions of carbon monoxide, nitrogen oxides, VOCs and fine particulate matter, along with an 85% decrease in sulphur dioxide and a 20% decrease in particulate matter of all sizes. The Pinellas County 2008 NEI Criteria Pollutant emissions were at a historic low, including historic lows for all source sectors and for all individual Criteria Pollutant emissions except lead. Pinellas lead emissions are associated with aircraft fuel use at airports. Pinellas County airport lead emissions do not result in ambient lead concentrations that approach the NAAQS. These lead emissions were not estimated by EPA prior to the 2008 NEI.

Table 6 – Pinellas Criteria Pollutant NEI Emissions By Pollutant, Year & Source Category

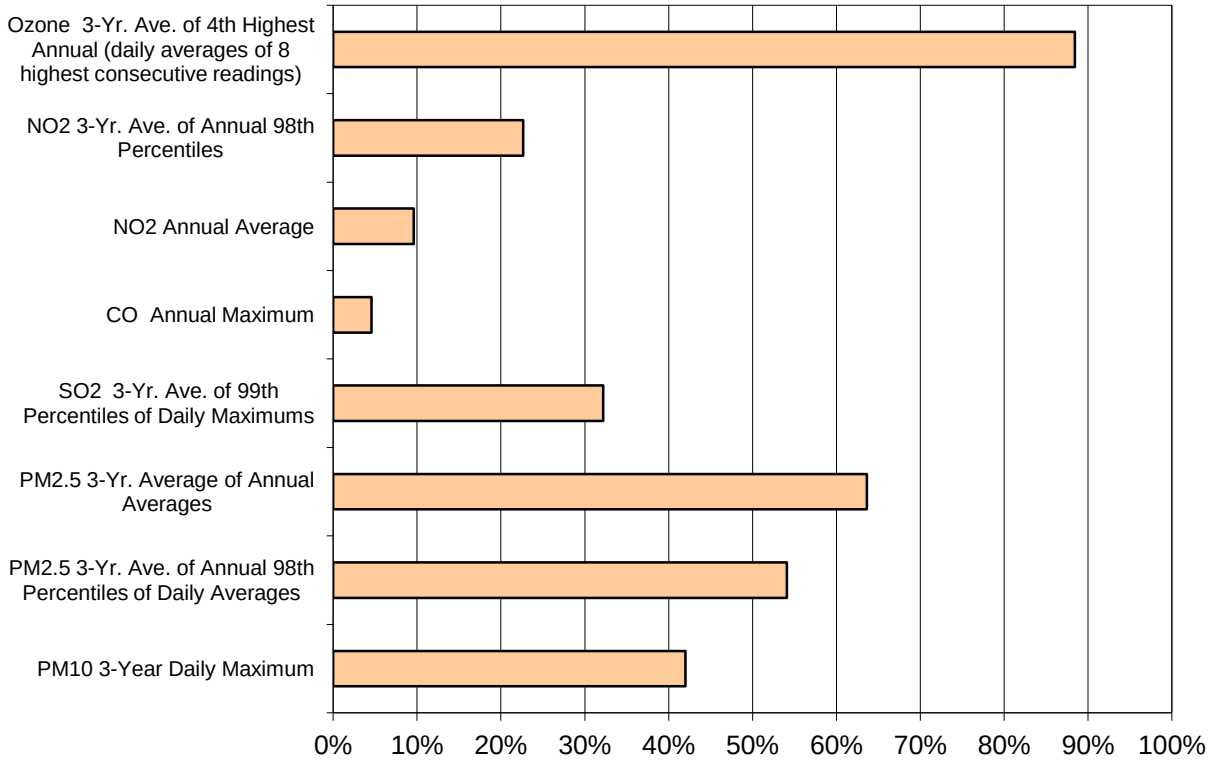
Criteria Air Pollutaat (CAP)	Source Category				Total 2008 (tons)	Total 2005 (tons)	Total 2002 (tons)	Total 1999 (tons)
	Area	Non-Road Mobile	On-Road Mobile	Point				
Carbon Monoxide (CO)	1008	52478	104231	1509	159226	207041	265496	261487
Lead	0.003			1.044	1.047			
Nitrogen Oxides (NOX)	530	3771	14910	3761	22972	34915	37997	38495
Particulate Matter - fine	608	329	296	492	1725	2341	2887	4605
Particulate Matter - total	5956	346	473	668	7443	8680	9350	12639
Sulphur Dioxide (SO2)	112	68	155	7389	7724	43969	52699	31217
Volatile Organic Compounds	10756	5230	11896	765	28646	42944	48221	45079
Total 2008 (tons)	18362	61892	131664	14093	226011			
Total 2005 (tons)	62760	76279	174433	25306	338778			
Total 2002 (tons)	62760	85442	232778	33936	414915			
Total 1999 (tons)	44132	102029	204187	39926	390273			

Also shown in **Table 6**, mobile source emissions have always, at a minimum, accounted for approximately 3 times more Pinellas County Criteria Pollutant emissions than stationary sources. By 2008, mobile sources accounted for approximately six times more Pinellas County Criteria Pollutant emissions than stationary sources. The amount of the Pinellas County mobile source Criteria Pollutant emissions decrease from 2002 to 2008 was nearly six times the amount of the decrease in stationary source emissions, but stationary source emissions decreased by 62% compared to a mobile source decrease of 39%.

Pinellas County has consistently met Criteria Pollutant NAAQS and has not violated NAAQS standards since the old ozone standard was violated in the 1980's. **Figure 4** shows 2011 Pinellas County Criteria Pollutant concentrations as a percentage of the applicable NAAQS. Ozone is the only Criteria Pollutant which approaches its NAAQS.

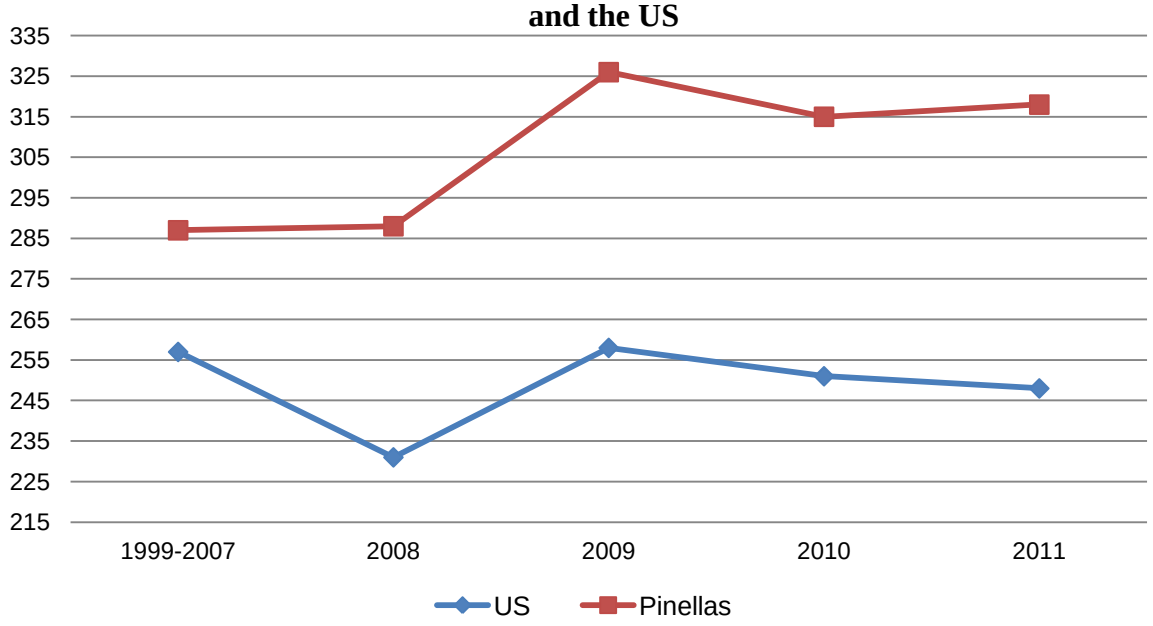
Pinellas County AQI data provides another indication of the favorable air quality in Pinellas. The number of annual Good AQI days in Pinellas County is depicted in **Figure 5**. The AQI categories and their respective cautionary statements are shown in **Table 7**. Pinellas County and US daily AQI categories and associated primary pollutants are summarized by year in **Table 8**. The US data in **Figure 5** and **Table 8** prior to 2008 is from 307 US metropolitan areas. More recent data is from the 22 US counties with a 2010 population within 10% of Pinellas County. Compared to other US metropolitan areas and counties, Pinellas has consistently had lower AQI values, many more Good AQI days, and many fewer AQI days in other AQI categories worse than Good. No Unhealthy AQI days have occurred in Pinellas County since 2007. Ambient ozone concentrations result in the highest AQI value on most days in Pinellas County, with fine particulate matter resulting in the highest AQI value on nearly all other days. Ozone and fine particulate matter are the dominant pollutants in other US metropolitan areas and counties also, with particulates more significant compared to Pinellas County.

Figure 4 - Criteria Pollutant Concentrations as Percentage of National Ambient Air Quality Standards (NAAQS) in 2011



NOTES: 1. Continuous hourly data was used to calculate all concentrations to determine NAAQS compliance.
2. CO also has an 8-hr. standard = 9 ppm. 3. SO2 has the only secondary standard = 500 ppb..

Figure 5 - Good Air Quality Index (AQI) Days By Year in Pinellas and the US



Note – data taken from Table 8.

Table 7 – AQI Categories with Numerical Value Ranges and Cautionary Statements

Air Quality Index Category	Numerical Value	Cautionary Statement
Good	0-50	Air quality is considered satisfactory, and air pollution poses little or no risk.
Moderate	51-100	Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people unusually sensitive to air pollution.
Unhealthy for Sensitive Groups	101-150	Members of sensitive groups may experience health effects. The general public is not likely to be affected.
Unhealthy	151-200	Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects.
Very Unhealthy	201-300	Health alert: everyone may experience more serious health effects.
Hazardous	> 300	Health warnings of emergency conditions. The entire population is more likely to be affected.

Table 8 – AQI Category Days in Pinellas County and Other US Metro Areas & Counties

Time Period	Location	Air Quality Index (AQI) Category (days/yr)				Primary Pollutant (days/yr)				Median AQI Value
		Good	Moderate	Unhealthy For Sensitive Groups	Unhealthy	Ozone	PM2.5	SO2	NO2	
1999 - 2007	Pinellas	287	70	7	1	229	130	6		39
	US MSAs	257	88	17	3	230	157	27		44
2008	Pinellas	288	72	6	0	164	148	46	8	39
	US Counties	231	100	17	7	152	153	18	37	45
2009	Pinellas	326	37	2	0	202	144	14	5	36
	US Counties	258	89	12	8	154	164	7	37	42
2010	Pinellas	315	50	0	0	231	126	6	2	38
	US Counties	251	96	12	5	175	143	8	43	43
2011	Pinellas	318	45	2	0	229	130	4	2	36
	US Counties	248	91	16	5	176	145	10	37	42

Acronyms: yr = year, PM = particulate matter, SO2 = sulfur dioxide, NO2 = nitrogen dioxide, US MSAs = all US Metropolitan Statistical Areas pop. 50,000 or more, US Counties = 22 US counties with a 2010 population within 10% of Pinellas 2010 population.

NOTES: 1. AQI days/yr figures are all averages over the time period indicated, except single year figures, which are annual averages & totals.
2. Minimum of 340 AQI days for county inclusion in table. 3. Pinellas County Unhealthy days have resulted from smoke from wildfires.
4. Median AQI figures are averages of annual medians over the time period indicated, except single year figures, which are average annual medians.
5. Pinellas population was 921,482 in 2000 compared to the 647,512 US average population for US MSAs with AQI data in 2000.

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