

Air Pollution Control "101"



Fact Sheet

As its title suggests, this fact sheet serves as a brief and simple introduction to the complex world of air quality regulations. The purpose of this fact sheet is to eliminate some of the confusion that businesses may have regarding the various laws and rules that set limits on air emissions and the various governmental agencies that enforce compliance.

AIR POLLUTION: THE PROBLEM

Air is our most abundant and precious resource. It is essential to our existence. On average, a person breathes about 35 pounds of air every day. (This translates into many millions of cubic feet of air throughout a lifetime). We could only live for about five minutes without air. Our quality of life is dependent upon the quality of the air we breathe.

What Are Air Contaminants?

Clean air consists of constant proportions of oxygen (21 percent by volume), nitrogen (78 percent by volume), and other gases (1 percent by volume). Polluted air contains one or more chemical compounds at concentrations that can cause adverse effects. These chemical compounds, or air contaminants, come in the form of mists, dusts, vapors, and gases. Over the past three decades, the common or "criteria" air contaminants were identified as being the most significant air pollution problems in the nation. These contaminants include particulate matter, carbon monoxide, sulfur dioxide, nitrogen dioxide, ground level ozone, and lead. Ground-level ozone is created when volatile organic compounds (VOCs) and nitrogen oxides react with sunlight.

The U.S. Environmental Protection Agency (EPA) has established National Ambient Air Quality Standards (standards) for each of the criteria contaminants to protect human health and welfare. The standards are the maximum allowable concentration of air contaminants in outdoor air to protect the most sensitive people from adverse health effects. Regions of the country not meeting the standards are referred to as "nonattainment" areas.

Sources of Air Contaminants

Many outdoor air contaminants occur naturally in the earth's atmosphere. Lightning, volcanoes, and wildfires are some of the natural sources of air emissions. Human activities such as transportation and industrial processes release tremendous amounts of air contaminants. Hence,

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MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY



the term “air pollution” is generally thought of as the transfer of harmful amounts of natural and synthetic materials into the atmosphere by human activities. Emissions from motor vehicles, power plants, and factories are the main air polluters. Consumer products that emit volatile organic compounds and other air contaminants also contribute significantly to air pollution.

Effects of Air Pollution

The most serious consequence of polluted air is its effect on human health. Research has determined which concentrations of various air contaminants can have unhealthy effects on humans. The EPA maintains a long list of health problems caused by or aggravated by air contaminants. This list includes cardiopulmonary (heart and lung) diseases, cancer, eye irritation, diseases of the nervous system (which can cause brain damage), asthma, and even the common cold. Health effects also have economic consequences. The American Lung Association estimates that air pollution costs U.S. businesses at least \$40 billion annually in health care and lost productivity. Air pollution not only affects human, animal, and plant life, but can cause damage to personal property, such as homes and cars. Property and land values can be affected in heavily polluted areas. Agricultural crops, livestock, and vegetation can be destroyed. Air pollution decays rubber and nylon; it makes paint peel and discolor and blocks natural sunlight. Acid rain, one by-product of air pollution, is particularly corrosive to buildings, statues, and other structures.

What Needs to be Done

Over time it has become clear that many substances are being released into the air in addition to the criteria air contaminants. These

are identified as toxic and hazardous air pollutants. While we have done a good job controlling coarse particulate matter, lead, sulfur dioxide, and carbon monoxide throughout the state of Michigan, ground-level ozone, and fine particulate, along with air toxic issues, continue to present the most significant air pollution problems. Since there are thousands of chemicals used in industrial processes, efforts to identify and control these air contaminants have been, and will continue to be, very challenging.

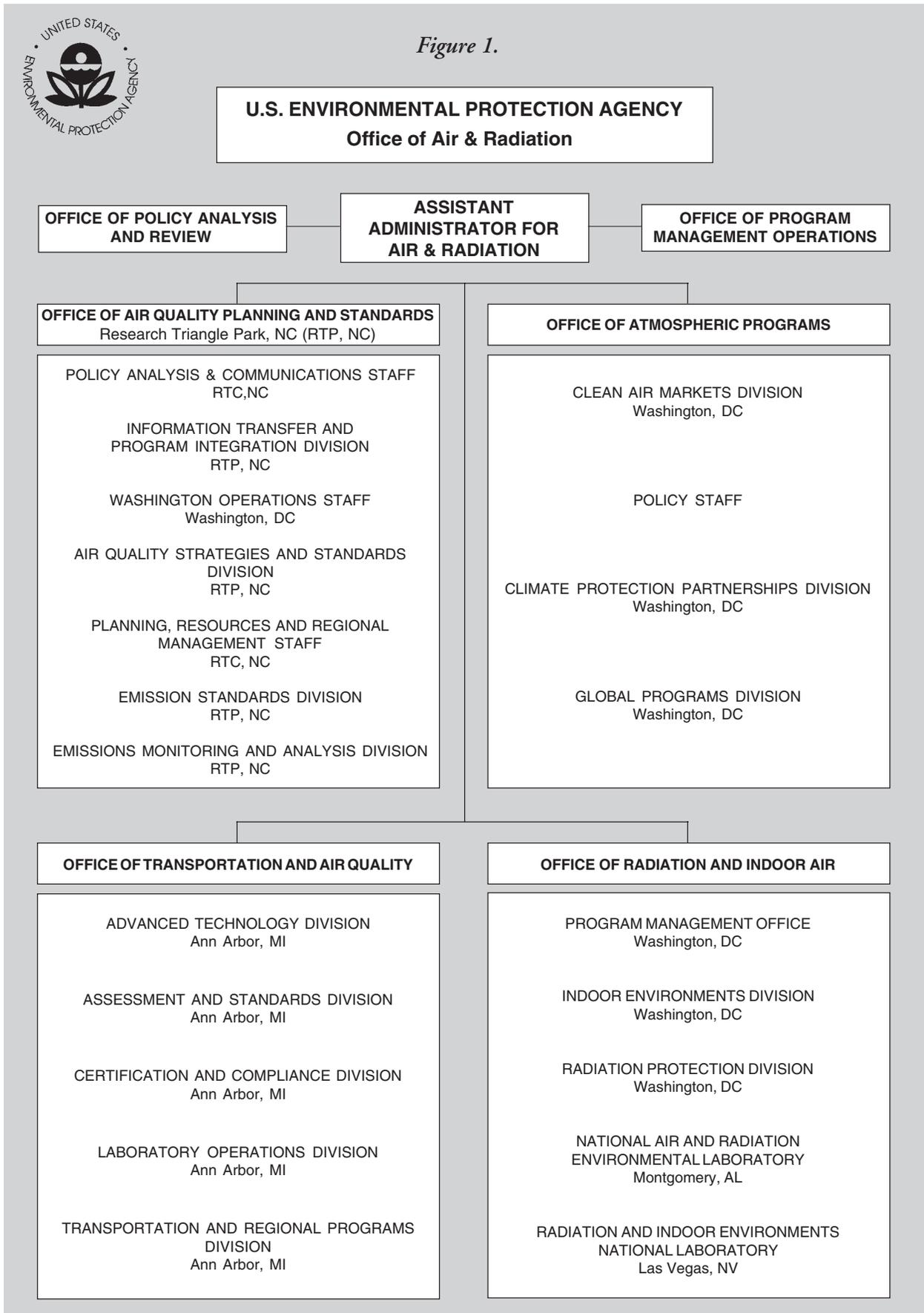
PUBLIC ENVIRONMENTAL AGENCIES: STRUCTURE AND FUNCTION

Two governmental agencies working cooperatively regulate the emission of air contaminants from Michigan facilities. These agencies are the U.S. Environmental Protection Agency and the Air Quality Division of the Michigan Department of Environmental Quality.

U.S. Environmental Protection Agency

In response to growing concerns about unhealthy air, polluted rivers, unsafe drinking water, endangered species, and waste disposal, the EPA was established as an independent agency in the Executive Branch of the U.S. Government in 1970. Congress gave EPA responsibility for implementing an ambitious set of federal environmental laws, including the federal Clean Air Act. EPA’s Office of Air & Radiation is responsible for overseeing the air activities of the agency, which include the development of national programs, technical policies, and regulations for air pollution control (see Figure 1). EPA provides coordination and

Figure 1.



support for anti-pollution activities conducted by state and local governments through its ten regional offices. Michigan, Illinois, Indiana, Minnesota, Ohio, and Wisconsin are located in EPA Region 5, which is headquartered in Chicago, Illinois.

Air Quality Division, Michigan Department of Environmental Quality

The Air Quality Division is located within the Michigan Department of Environmental

Quality. The division’s mission is to “regulate sources of air contaminants to minimize adverse impact on human health, the environment, and society.” To achieve this important mission, sections within the division perform a variety of functions. The Air Quality Division utilizes engineers, scientists, technicians, toxicologists and meteorologists to carry out its numerous air related programs. The division’s sections and respective functions are identified in Figure 2.

Figure 2.

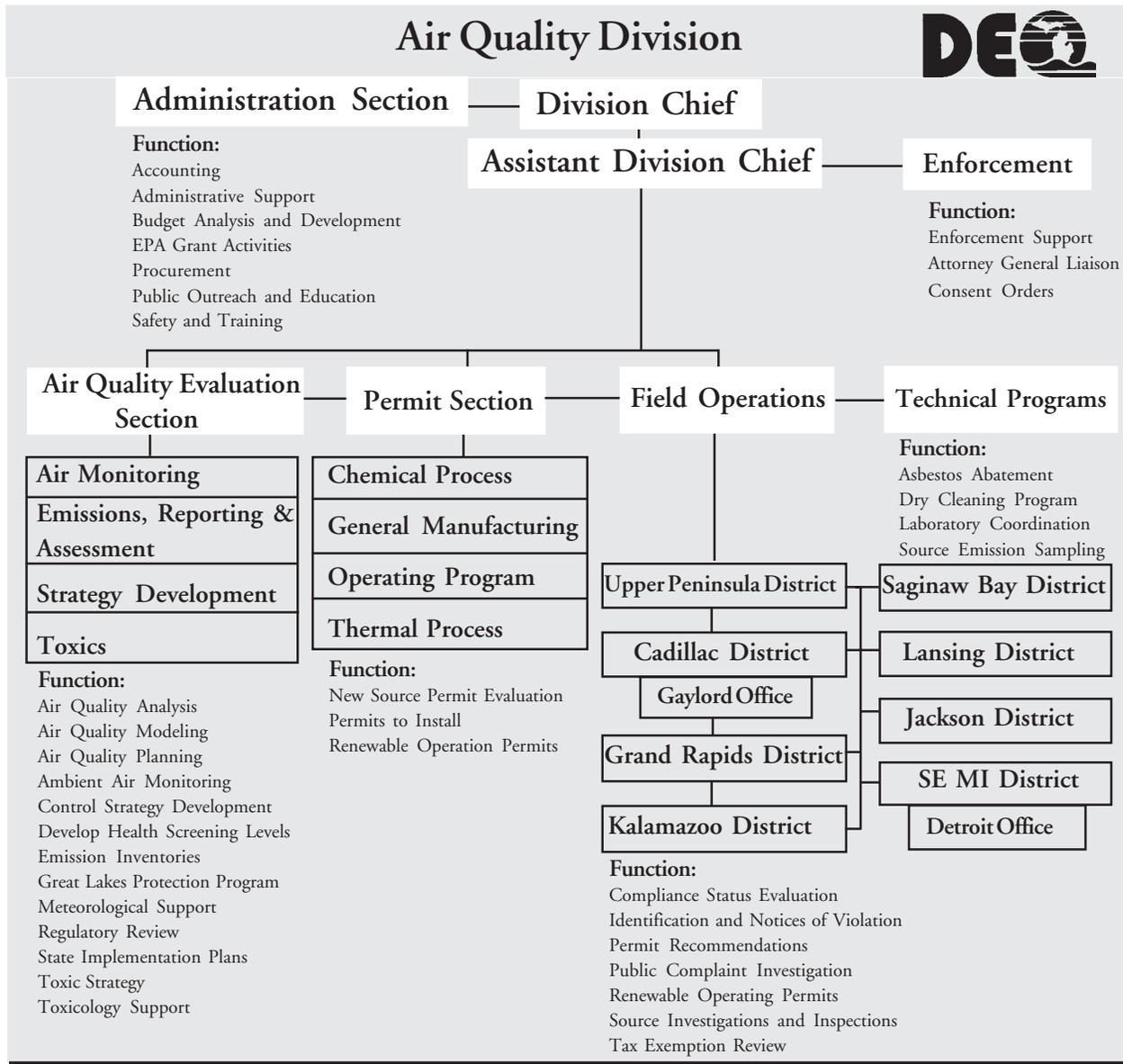
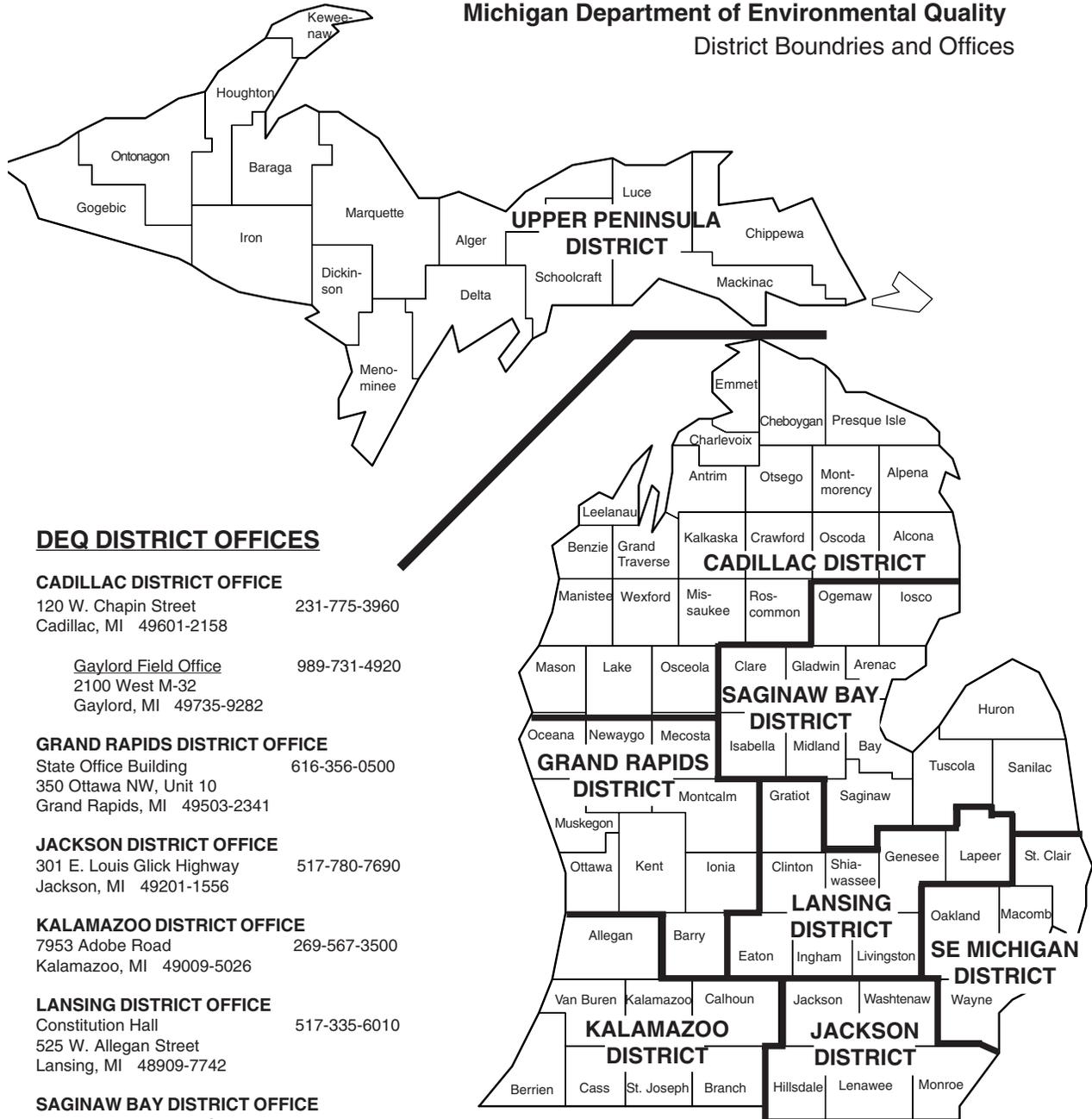


Figure 3.

**Michigan Department of Environmental Quality
District Boundries and Offices**



DEQ DISTRICT OFFICES

CADILLAC DISTRICT OFFICE

120 W. Chapin Street 231-775-3960
Cadillac, MI 49601-2158

Gaylord Field Office 989-731-4920
2100 West M-32
Gaylord, MI 49735-9282

GRAND RAPIDS DISTRICT OFFICE

State Office Building 616-356-0500
350 Ottawa NW, Unit 10
Grand Rapids, MI 49503-2341

JACKSON DISTRICT OFFICE

301 E. Louis Glick Highway 517-780-7690
Jackson, MI 49201-1556

KALAMAZOO DISTRICT OFFICE

7953 Adobe Road 269-567-3500
Kalamazoo, MI 49009-5026

LANSING DISTRICT OFFICE

Constitution Hall 517-335-6010
525 W. Allegan Street
Lansing, MI 48909-7742

SAGINAW BAY DISTRICT OFFICE

503 N. Euclid Avenue, Suite 1 989-686-8025
Bay City, MI 48706-2925

SOUTHEAST MICHIGAN DISTRICT OFFICE

27700 Donald Court 586-753-3700
Warren, MI 48092-2793

Detroit Field Office 313-456-4700
Cadillac Place
3058 West Grand Boulevard, Suite 2-300
Detroit, MI 48202-6058

UPPER PENINSULA DISTRICT OFFICE

420 5th Street 906-346-8300
Gwinn, MI 49841

ENVIRONMENTAL ASSISTANCE CENTER

(for general information):
Telephone: 800-662-9278
Fax: 517-241-0673

POLLUTION EMERGENCIES
Telephone: 800-292-4706

DEQ WEB PAGE
www.michigan.gov/deq

One very important function of the Air Quality Division is to enforce compliance with state air quality rules and regulations. Through authority delegated from EPA, the Air Quality Division also enforces compliance with many federal air quality regulations promulgated under the federal Clean Air Act.

The EPA enforces regulations pertaining to both indoor and outdoor air quality. The Air Quality Division enforces regulations that pertain to only outdoor air quality. MIOSHA of the Michigan Department of Labor and Economic Growth enforces regulations that pertain to indoor air quality issues.

To be more effective and accessible to the public, the Air Quality Division has grouped all Michigan counties into eight districts, each with a district supervisor and staff to respond to local air pollution concerns and complaints. Figure 3 lists the address and telephone number of each Air Quality Division district office.

LAWS AND RULES GOVERNING AIR QUALITY

A “rule” is a regulation written by an agency which implements or applies a law. There are procedures that govern the creation, processing, and publication of rules. These procedures include allowing public participation and comment. When rules are properly processed, they have the same force and effect as law.

Just as there are two levels of governmental agencies involved in regulating sources of air pollution, there are two levels of governmental rules:

1. Regulations promulgated under the federal Clean Air Act; and

2. Rules promulgated under the Michigan Natural Resources and Environmental Protection Act, 1994 P.A. 451.

Figure 4 illustrates the relationship between the federal and state rules. Many state air quality rules were developed in response to mandates of the federal Clean Air Act.

The Clean Air Act (passed in 1970 and amended in 1977 and 1990) and its administrative rules place most of the responsibility for achieving compliance with air quality standards on the state and local air programs. A State Implementation Plan, or SIP, is the blueprint the state uses to achieve compliance with the air quality standards.

Some of the major components of the federal and state air quality laws and rules follow.

The Federal Law and Rules

Federal Law

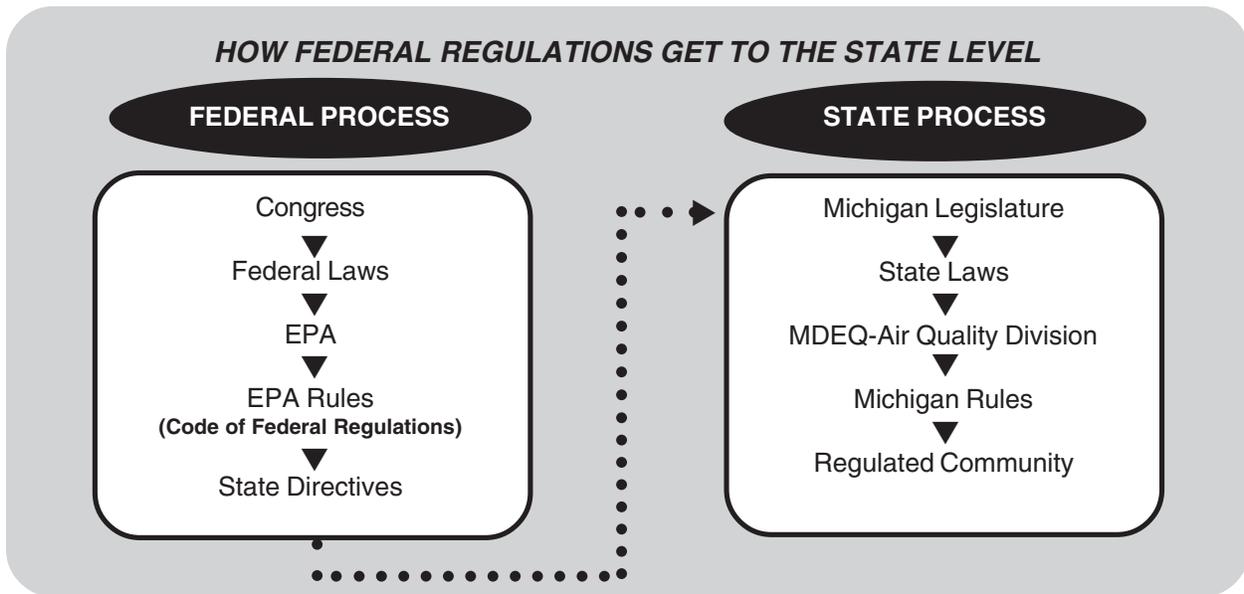
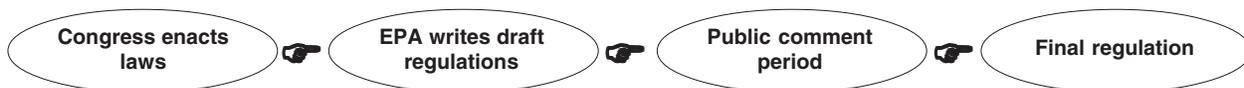
On November 15, 1990, Congress enacted major amendments to the Clean Air Act to curb acid rain, urban air pollution, and hazardous air pollutants. The 1990 Clean Air Act Amendments have 11 sections or titles. The first six titles contain the bulk of legislative issues. Following is a brief summary of those titles.

Title I - Provisions for Attainment and Maintenance of National Ambient Air Quality Standards - recognizes that major areas of the nation do not meet National Ambient Air Quality Standards for the criteria air contaminants. The standards were established to protect public health and are monitored across the nation. Areas not in compliance with the federal standards are considered “nonattainment areas.” The amendments require states with nonattainment areas to take specific emission reduction measures based on the extent of their air contaminant problem. The emission reductions are mandatory and include deadlines for reduction.

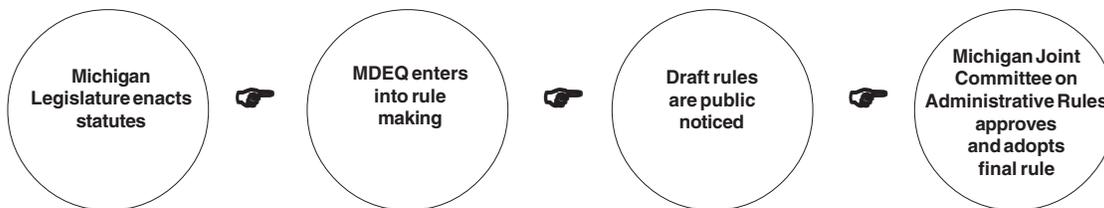
Figure 4.

Where Do The Requirements Come From?

FEDERAL REGULATIONS



STATE RULES



The State Implementation Plan (SIP)

Title I of the Clean Air Act places the responsibility for solving most air pollution problems and protecting air resources on the states. The major mechanism for implementing the variety of air programs to meet this responsibility is the State Implementation Plan (SIP). A SIP is a comprehensive analysis of air quality in each region of the state and the strategy or blueprint to achieve compliance and maintenance with the air quality standards. Michigan's SIP contains legally enforceable requirements to control emissions from various pollution sources within the boundaries of the state and is comprised of federal and state air quality environmental regulations, permits, enforcement orders, and agreements that have been approved by EPA.

Each amendment of the Clean Air Act adds further control requirements, and states are required to revise their SIP to incorporate the new requirements. States submit to EPA proposed revisions to the SIP. EPA may approve, conditionally approve, or disapprove elements of any state's submittal. The approved elements are integrated into the SIP and become federally enforceable.

While each state has only one SIP that covers all air contaminants and all control programs, the separate plan elements covering different nonattainment areas are frequently referred to as individual SIPs. If a state does not adopt an approvable plan, EPA is authorized to establish a Federal Implementation Plan (FIP) and impose it on the state.



Title I also contains the Prevention of Significant Deterioration (PSD) and Major Offset requirements. During the evaluation of permit to install applications for the proposed construction of major sources or major modifications of air pollution (referred to as new source review), permit engineers employed by the regulatory agencies determine the source's compliance with these important and complex requirements.

Title II - Provisions Relating to Mobile Sources - establish new, stringent, tail-pipe emission standards for automobiles and trucks. It also requires states with significant nonattainment areas to develop enhanced vehicle inspection and maintenance programs to ensure that cars and trucks operate at optimum emission efficiency.

Title III - Hazardous Air Pollutants - identifies 188 categories of air contaminants that are considered a significant threat to public health. The federal government previously regulated just seven hazardous air pollutants. The U.S. Environmental Protection Agency must develop emission requirements for industries that emit these hazardous air pollutants.

Title IV - Acid Deposition Control - requires electric utilities to reduce sulfur dioxide and nitrogen oxide emissions, which are major components of acid rain. Utilities with sulfur dioxide emissions below the federal regulations will be allowed to sell or trade their air quality reduction as an allowance to another utility. Industries may comply with federal requirements by switching to low sulfur coal, installing scrubbers, or purchasing allowances from other sources. Compliance with the nitrogen oxide reduction requirements can be achieved by installing low nitrogen oxide combustion technology.

Title V - Permits - mandates drastic changes in the way states enforce air quality control measures. Facilities that have permits to install may also need to apply for a renewable operating permit. All sources with emissions of a particular air contaminant in sufficient quantities must apply for a renewable operating permit. The permits must be tailored to individual sources and clearly specify emission limitations, testing procedures, reporting, and recordkeeping requirements. The permit will have a fixed term not to exceed five years. During the term of the permit, a facility must provide periodic proof of compliance with each condition established by the permit. The renewable operating permit will ensure that all of the source's obligations pertaining to air contaminants will be contained in one permit document. Federal law also requires the states to collect fees from industry to pay for the permit program.

Title VI - Stratospheric Ozone Protection - restricts the production of chemicals that deplete the upper (stratospheric) ozone layer, which protects the earth from harmful ultraviolet (UV-B) radiation, and regulates their use, emission, and disposal.

Federal Rules

The U.S. Environmental Protection Agency promulgates rules to implement or apply the Clean Air Act. All federal rules are published in the Code of Federal Regulations (CFR). The federal rules relating to environmental protection are contained in Title 40 of the CFR which is published once a year. Air quality rules are contained in Parts 50 to 99 of Title 40. Rules are updated throughout the year in the Federal Register.

State Laws and Rules

State Law

Part 55 of the Natural Resources and Environmental Protection Act, 1994 P.A. 451 is the state law that specifically addresses air quality issues in Michigan. Public Act 451 has been amended to implement new federal requirements.

There are seven other parts of the Natural Resources and Environmental Protection Act, 1994 P.A. 451 that relate to air quality. Parts 1 and 3 make up the general provisions of Public Act 451. Part 57 creates a Small Business Clean Air Ombudsman, a Small Business Clean Air Assistance Program, and Compliance Advisory Panel. The purpose of the three program elements is to assist small businesses in complying with state and federal air quality requirements. This publication is an example of the information available through the Small Business Clean Air Assistance Program. Part 59 exempts air pollution control equipment from certain taxes. Emissions from marine vessels are addressed in Part 61. Finally, Parts 63 and 65 of the Natural Resources and Environmental Protection Act address emission testing of motor vehicles.

State Rules

The administrative rules became effective on August 15, 1967, and have now been compiled under Public Act 451 of 1994. The *Michigan Administrative Rules for Air Pollution Control* are regulations written by the Air Quality Division that implement or apply Public Act 451. Just as the Michigan Air Pollution Control Act has been amended to implement new federal requirements, so have the administrative rules. The *Michigan Administrative Rules for Air Pollution Control* are divided into "parts." The bulk of the regulations are outlined in the following parts.

Part 1: General Provisions - contains definitions of key terms used throughout the rules. Referring back to the definitions will increase one's comprehension of the rules.

Part 2: Air Use Approval - requires a "permit to install" prior to the installation, modification, reconstruction, or relocation of a source of air pollution. Certain equipment and activities are exempt from permit to install requirements. The Part 2 rules also contain the requirements for sources locating in areas of the state in violation of National Ambient Air Quality Standards. In addition, Part 2 rules contain requirements for sources emitting toxic air contaminants (TACs). TACs are any chemical/substance which is or may become harmful to public health or the environment, except for 40 exempt chemicals [see R120(f)]. The regulation of chemicals at the state level is through the definition of a TAC, and at the federal level is through the list of HAP/s (page 8). The Part 2 rules include the requirements of the renewable operating permit program as mandated by Title V of the Clean Air Act.

Part 3: Particulate Matter - establishes particulate emission limitations for various process equipment. Open burning and the density of visible emissions from a vent or smokestack are regulated. Certain facilities may be required to develop plans to control fugitive dust emissions.

Part 4: Sulfur Bearing Compounds - establishes sulfur dioxide emission limitations on boilers and other fuel burning equipment. The sulfur content of fuels, such as coal and fuel oil, must fall within prescribed percentages.

Part 5: Extension of Sulfur Dioxide Compliance Dates - was rescinded in 1997.

Part 6: Existing Sources of Volatile Organic Compound Emissions - establishes volatile organic emission limitations and requirements for "existing" sources. The definition of "existing" source is dependent upon the type of process and the date it was placed into operation.

Part 7: New Sources of Volatile Organic Compound Emissions - establishes volatile organic emission limitations and requirements for "new" sources. A "new" source is defined as any process placed into operation on or after July 1, 1979, or for which an application for a permit to install is made on or after July 1, 1979, or both, except for any process that is defined as an existing source.

Part 8: Emission of Oxides of Nitrogen from Stationary Sources - establishes limitations on the emission of oxides of nitrogen from electric generating utilities, large stationary internal combustion engines, and cement manufacturing facilities.

Part 9: Miscellaneous - contains requirements that could pertain to any facility, regardless of the type(s) of air contaminant emitted. Air contaminants cannot be emitted in quantities that could have an injurious effect on human health or safety or cause unreasonable interference with the comfortable enjoyment of life and property. Facilities can be required to prepare written plans that will prevent, detect, and correct malfunctions of equipment resulting in the exceedance of an emission standard.

Part 10: Intermittent Testing and Sampling - gives the Michigan Department of Environmental Quality the authority to require facilities to quantify their air emissions to verify compliance with emission standards. The testing must be performed in accordance with established testing methods.

Part 11: Continuous Emission Monitoring - requires certain large emission sources to operate continuous emission monitoring equipment to verify compliance with applicable emission standards.

Part 12: Emission Averaging and Emission Reduction Credit Trading - outlines Michigan's voluntary emission averaging and emission reduction credit trading program. This program is designed to improve air quality, create market-based incentives for making emission reductions, and encourage early emission reductions and technological innovations to reduce and quantify emissions.

Part 13: Air Pollution Episodes - was rescinded May 28, 1997.

Part 14: Clean Corporate Citizen Program - outlines Michigan's voluntary Clean Corporate Citizen program. This program allows sources that have demonstrated environmental stewardship and a strong environmental ethic to receive public recognition and air quality permit processing benefits.

Part 15: - no rules were ever written under Part 15.

Part 16: Organization, Operation, and Procedures - identifies the procedures a person must follow to request a declaratory ruling regarding a statute, rule, order, or permit administered by the department. It includes a description of the time frames for the department to respond to such requests.

Part 17: Hearings - outlines the hearing process and time schedules for hearings and decisions on orders, voluntary agreements, performance contracts, stipulations, consent orders, and contested cases.

AIR CONTAMINATION: THE SOLUTION

Numerous regulations have been promulgated and many large organizations have been created to implement current air quality regulations. Control of air contaminants is a universal responsibility; it takes the cooperation of industry, government, and individual citizens to monitor the potential to pollute. If we work together, we can successfully comply with the regulations for clean air.

What can you do to maintain compliance with federal and state air quality regulations?

1. CONTACT YOUR AIR QUALITY DISTRICT OFFICE - Staff in the district offices of the Air Quality Division, Michigan Department of Environmental Quality, can answer questions regarding air quality regulations and/or the status of your facility's compliance with these requirements. See Figure 3 for the address and phone number of your district office.

2. CONTACT THE CLEAN AIR ASSISTANCE PROGRAM - Staff in this program can answer questions regarding air quality regulations and provide you with an update on outreach publications and workshops. Contact:

*Clean Air Assistance Program
Environmental Science & Services Division
Michigan Department of Environmental Quality
P.O. Box 30457
Lansing, MI 48909-7957
(800) 662-9278
Fax: (517) 335-4729*

3. GET A COPY OF THE RULES - You can obtain a current copy of the *Michigan Administrative Rules for Air Pollution Control* by contacting:

*Air Quality Division
Michigan Department of Environmental Quality
P.O. Box 30260
Lansing, MI 48909-7760
(517) 373-7023
Fax: (517) 335-6993*

(Note: There will be a charge for the rule book to cover printing and mailing costs. The rules are also available via the Internet [see below]).

4. INTERNET RESOURCES - Some of the agencies mentioned in this publication have a home page on the Internet that serves as a link to many useful documents including air quality rules, assistance fact sheets and guidebooks. Below are the addresses of the agencies' home pages:

*U.S. EPA
Office of Air Resources
www.epa.gov/oar*

*MDEQ - Air Quality Division
www.michigan.gov/deqair*

*MDEQ - Environmental Science & Services
Division
Clean Air Assistance Program
www.michigan.gov/deqair
and click on "Clean Air Assistance."*

5. PRACTICE POLLUTION PREVENTION - Last, but not least, continually evaluate all of your operations and activities for pollution prevention opportunities. Pollution prevention is the elimination of waste (air emissions included) at the source. Reduce air emissions at the source by changing to less toxic raw materials (e.g., replace petroleum solvent cleaners with aqueous cleaners), maintaining good operating practices (e.g., schedule maintenance to avoid malfunctions of processes), or changing technology (replace liquid coating operations with powder coating systems). These pollution prevention techniques will increase your operation's efficiency, lower raw material and disposal costs, and keep your facility in compliance with air quality regulations. For assistance in incorporating pollution prevention techniques into your operations, contact the:

*Pollution Prevention and Compliance Assistance Section
Environmental Science & Services Division
Michigan Department of Environmental Quality
P.O. Box 30457
Lansing, MI 48909-7957
(800) 662-9278
Fax: (517) 373-3675*

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