Approved: March 1, 2001
Date

MINUTES OF THE HOUSE COMMITTEE ON ENVIRONMENT.

The meeting was called to order by Chairperson Joann Freeborn at 3:30 p.m. on January 23, 2001 in Room 231-N of the Capitol.

All members were present except: Rep. Don Myers - excused

Committee staff present: Raney Gilliland, Kansas Legislative Research Department
Mary Torrence, Revisor of Statute's Office
Mary Ann Graham, Committee Secretary

Conferees appearing before the committee: Karl Mueldener, Director, Bureau of Water, Division of Environment, KDHE, Forbes 283, Topeka, KS 66620-0001
Jan Sides, Director, Air and Radiation, Division of Environment, Forbes 283, Topeka, KS 66620-0001

Others attending: See Attached Sheet

Representative Vaughn Flora, Ranking Minority Leader, called the meeting to order at 3:30 p.m. Chairperson Joann Freeborn was appearing in another committee and unable to open the meeting but returned in a short time. Representative Flora asked if there were any bill introductions.

Rep. Tom Sloan made a motion to introduce a bill concerning rural water districts; relating to the provisions for release of lands from the territory of a rural water district; establishing a procedure for hearing of the same; providing for appeal by dissatisfied property owners; and repealing the existing section. (See attachment 1) Rep. Dan Johnson seconded the motion. Motion carried.

Karl Mueldener, KDHE, requested a bill that would allow money in the water pollution control revolving fund to be used to make grants under two federal programs. Rep. Becky Hutchins made a motion the bill be introduced. Rep. Bill Light seconded the motion. Motion carried.

The Chair welcomed Karl Mueldener, Director, Bureau of Water, KDHE. He briefed the committee on proposed federal regulations for livestock feeding. (See attachment 2) The United States Environmental Protection Agency is proposing strict new controls to protect public health and the environment from one of the causes of water pollution, animal wastes from large, industrial feedlot operations. New requirements would apply to as many as 39,000 concentrated animal feeding operations across the country. Today, only an estimated 2,500 large and small livestock operations have enforceable permits under the Clean Water Act. One proposed definition could include livestock facilities with more than 500 cattle or other animal units. The other proposal would require operations with 300-1000 cattle to have a permit if meeting certain risk-based conditions. In addition to stricter permitting requirements, the proposal includes several new strict controls; (1) poultry, veal, and swine operations would be required to prevent all discharges from their waste storage pits and lagoons where wastes are collected; (2) the proposal eliminates potential exemptions from permits presently used in some states; as a result, EPA expects that all large livestock operations will now have to acquire permits; (3) under this proposal, EPA and the states will issue co-permits for corporations and contract growers to ensure financial resources exist to meet environmental requirements; (4) the spreading of manure on the land owned by livestock facilities would be limited to protect water ways. Committee discussion and questions followed.

Jan Sides, Director, Bureau of Air and Radiation, KDHE, was welcomed. He briefed the committee on the 1999 Air Quality Report. The report is issued by the Kansas Department of Health and Environment, Bureau of Air and Radiation, to inform the citizens of Kansas of air quality throughout the state in 1999. The air program in the state of Kansas is a coordinated effort of the Division of Environment and four local air pollution control authorities. The Bureau of Air and Radiation works closely with the local agencies to ensure that Kansas is meeting Federal Clean Air Act requirements in accordance with the Federal Environmental Protection Agency guidelines. The Bureau has been designated as the responsible agency to

obtain the statewide air quality monitoring data needed to determine the status of compliance with the National Ambient Air Quality Standards. The report presents the data that were EPA reportable in 1999. (See attachment 3) Committee questions followed.

Karl Mueldener, KDHE, was welcomed back to the committee and gave a briefing on the Kansas Water Pollution Control Revolving Fund. This fund provides low interest loans for wastewater collection and treatment facilities. He discussed points of interest; project funding by priority based on public health and environmental need; annual independent audit since 1995; loan program, not a grant; rate approximately 3.5%; large project needs drive leveraging bonds; priority to capture federal dollars and prompt payments to municipalities; and presently revising fund to be used for non-point source pollution. Also, legislative initiative; rural hardship assistance grants and wet weather water quality act of 2000. (See attachment 4)

Mr. Mueldener briefed the committee on the Kansas Public Water Supply Loan Fund, which provides low interest loans to municipal government to assist in construction of water works. Points of interest were; priorities for correction of violations; close coordination with the Kansas Department of Commerce and Housing, Kansas Water Office, and the Federal Rural Development Agency; rates approximately 4.4%; priority to capture federal funds and prompt payments to municipalities; reserve account leverage programs, $1 federal equals $4 in state loans; contract with rural water finance, unique and successful; staff shortages. (See attachment 5) Committee questions followed.

Chairperson Freeborn thanked Mr. Mueldener and Mr. Sides for their presentations. She brought the committee's attention to the "2001 Deadlines", Tuesday, January 30 will be the last day for members to request to have bills drafted in this committee. She announced that **HB2002**, concerning wildlife; relating to prohibition of certain birds from this state, will not be heard in this committee this year, it will be held over until next legislative session to provide more time for research. She reviewed the agenda for Thursday, January 25.

The meeting was adjourned at 5:20 p.m. The next meeting is scheduled for Thursday, January 25, 2001.

HOUSE ENVIRONMENT COMMITTEE GUEST LIST

DATE: January 23, 2001

NAME	REPRESENTING
RON APPLETOFT	WATER DIST NO 1 of JoCo
Jim Allen	Seaboard
Andy Shaw	Kearney Law Office
Jack Lacey	KS Co-op Council
JOHN IRWIN	WESTERN RESOURCES
EDWARD ROWE	League of Women Voters/KS
[illegible]	BOW - KDHE
KARL Mueldner	BOW - KDHE
JEAN SIDES	BAR - KDHE
Mike Jensen	Ks Pork Assoc.
Wendy Mathews	KAPA
Wesley Moses	KRMCA
Rod Geisler	KDHE - BOW
Mike Beam	Ks Lvstk. Assn.
Margaret Fast	Ks Water Office
Bill Fuller	Kansas Farm Bureau

BILL NO. _____

An Act Concerning Rural Water Districts;
Relating to the Provisions for Release of
Lands from the Territory of a Rural Water District;
Establishing a Procedure for Hearing of the Same;
Providing for Appeal by Dissatisfied Property Owners;
and Repealing the Existing Section

Be it enacted by the Legislature of the State of Kansas:

Section 1. If certain lands included within a district cannot be economically or adequately served by the facilities of the district, the owners of such lands may petition the board of directors of the district to release those lands from the district.

(a) The petition shall describe the lands requested to be released and be signed by at least 75% of the total number of the owners of the lands requested to be released. The board of directors may prescribe a fee to be collected from the petitioners for the purpose of offsetting costs reasonably expected to be incurred by the district in hearing the request for release. The petition for release, together with a verified list of the names and addresses of all owners of the land requested to be released, and the prescribed fee, shall be filed with the secretary of the district.

(b) If the board of directors of the district find the petition to be in proper form, the board shall conduct a hearing on the petition for release. Notice of the time and place of the hearing shall be mailed to all owners of land requested to be released not later than ten days before the hearing. The hearing may be continued from time to time without further notice to landowners. In considering the petition for release, the board shall consider whether the lands requested to be released cannot be economically or adequately served by the facilities of the district, and if such release would be in the best interests of the landowners and the district, based on the following factors:

(1) Whether the petitioners for release of lands have applied for one or more benefit units to serve the lands requested to be released, which applications have been denied.

(2) The length of time before the board of directors reasonably expect to make water service available to the lands requested to be released.

(3) Whether water service is available from another source if the lands are released from the district.

(4) If water service is available from the district to the lands requested to be released, the relative cost of obtaining such water service as determined by the

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district compared to the additional value of the lands after water service is made available.

(5) If water service is available from the district, the cost of obtaining such water service as determined by the district, compared to the cost of obtaining water from another source.

(6) Whether any applicable law will prevent any other water suppliers from serving the lands requested to be released.

(7) Whether the district's interest in maintaining the integrity of its territory is outweighed by the landowner's need to obtain a source of supply of water to the lands requested to be released.

The board may approve the release of all or part of the lands requested to be released, or may deny the request. The burden of proof shall be on the petitioners for release. The board of directors shall make a determination on the petition for release within 120 days of its receipt, shall record its findings in the minutes of the district, and shall mail a copy of such findings to petitioner within seven days.

(c) Any owner of land requested to be released from the district who is dissatisfied with the determination of the board of directors on the petition for release may bring an action in the district court of the county in which the district is located to determine if the board of directors of the district abused its discretion in making such determination. Such appeal shall be filed within thirty days of the final decision of the board.

(d) If the board of directors of the district approves the petition, or if the district court on appeal determines that the board abused its discretion in denying release, a copy of the board's action approving the release or of the district court's order on appeal, as the case may be, shall be transmitted to the chief engineer and to the county clerk, who shall note the change of such district's boundaries.

Section 2. K.S.A. 82a-630 is hereby repealed.

Section 3. This act shall take effect and be in force from and after its publication in the Kansas Register.

PROPOSED FEDERAL REGULATIONS FOR LIVESTOCK FEEDING

- Introduces Federal Government into feeding facilities below 1,000
- Provides national consistence in permitting
- Vertical integration permits
- 0 discharge for swine/poultry
- Retains 24hr-25yr storm control
- Formal controls on land application
- "P" basis for land application
- Testing and records required on application sites

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KDHE/BOW
01/10/2001

United States
Environmental Protection
Agency

Communications, Education,
And Media Relations
(1703A)

EPA

Environmental News

FOR RELEASE: FRIDAY, DEC. 15, 2000

EPA PROPOSES STRICT NEW CONTROLS TO REDUCE WATER POLLUTION FROM LARGE INDUSTRIAL FEEDLOT OPERATIONS

Robin Woods 202-564-7841

EPA today is proposing strict new controls to protect public health and the environment from one of the nation's leading causes of water pollution -- animal wastes from large, industrial feedlot operations.

EPA Assistant Administrator for Water, J. Charles Fox, said, "Wastes from large factory farms are among the greatest threats to our nation's waters and drinking water supplies. Today, EPA is taking action to protect public heal and the environment by significantly controlling pollution from animal feeding operations."

The livestock industry has undergone dramatic changes in the past 20 years, consolidating scattered, smaller facilities into fewer but vastly larger feeding operations that result in greater and more concentrated generation of wastes. An estimated 376,000 large and small livestock operations that confine animals generate approximately 128 billion pounds of manure each year. Typically these facilities confine beef and dairy cattle, hogs, and chickens.

Nationwide, nearly 40 percent of surveyed waters are too polluted for fishing or swimming. Some 60 percent of river pollution comes from all kinds of agricultural runoff, including livestock operations. Pollution from livestock associated with many types of waterborne disease, as well as problems like *pfiesteria* outbreaks which have plagued the Chesapeake Bay, red tides, algae blooms, and the dead zone in the Gulf of Mexico.

The new requirements would apply to as many as 39,000 concentrated animal feeding operations (CAFOs) across the country. Today, only an estimated 2,500 large and small livestock operations have enforceable permits under the Clean Water Act. A CAFO is currently defined as having 1,000 or more cattle or comparable "animal units of other livestock. Smaller operations may also be CAFOs if they are a threat to water quality. EPA today is co-proposing two options for a new CAFO definition. One proposed definition could include livestock facilities with more than 500 cattle or other animal units. The other proposal would require operations with 300-1000 cattle to have a permit if meet certain risk-based conditions.

In addition to stricter permitting requirements, the proposal includes several new strict controls: 1) poultry, veal and swine operations would be required to prevent all discharges from their waste storage pits and lagoons where wastes are collected; 2) the proposal eliminates potential exemptions from permits presently used in some states; as a result, EPA expects that all large livestock operations will now have to acquire permits; 3) under this proposal, EPA and the states will issue co-permits for corporations and contract growers to ensure financial resources exist to meet environmental requirements; 4) the spreading of manure on the land owned by livestock facilities would be limited to protect water ways.

In March 1999, EPA and the U.S. Department of Agriculture issued a Unified National Strategy for Animal Feeding Operations, in response to public concern about contamination of rivers, lakes, streams, coastal waters and

ground water from livestock manure. Today's proposal is an important step in that strategy.

EPA will take public comment for 120 days and will hold public meetings around the country on today's proposal. Additional information is available on EPA's Office of Water web site at: http://www.epa.gov/owm/afo.h

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R-192

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United States
Environmental
Protection Agency

Office of Water
Washington DC 20460

EPA 833-F-00-016
December 2000

EPA

Proposed Regulations to Address Water Pollution from Concentrated Animal Feeding Operations

Pollutants from agricultural sources, such as pesticides, fertilizers, and eroded soil, are the most common types of contaminants found in U.S. rivers and streams. Manure, dead animals, and other waste from livestock operations also contribute to this pollution problem.

Manure Accumulated in a Corral

Source: EPA Region 9

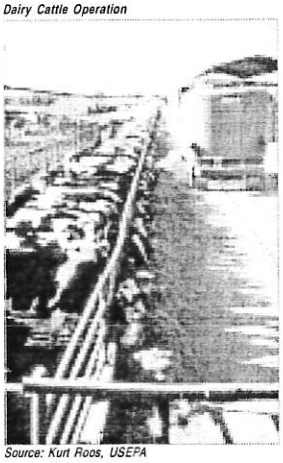
The U.S. Environmental Protection Agency (EPA) is proposing regulations to reduce the amount of water pollution from large livestock operations. Revisions to current Clean Water Act permit requirements and effluent guidelines for as many as 39,000 concentrated animal feeding operations or "CAFOs" will reduce pollution from one of the Nation's leading sources of water pollution—agriculture—and protect public health. This proposal will update regulations that are more than 20 years old and will result in more effective, nationally consistent regulations to protect water resources.

Why does EPA want to change the NPDES regulations and effluent guidelines for CA Os?

Nearly 40 percent of the Nation's surveyed waters are too polluted for fishing or swimming. According to the *1998 National Water Quality Inventory*, approximately 60 percent of this pollution in rivers and streams and 45 percent in lakes comes from agricultural sources. An estimated 376,000 livestock operations confine animals in the United States, generating approximately 128 billion pounds of manure each year. Concentrated animal feeding operations (CAFOs) are the largest of these livestock operations and are regulated under the Clean Water Act.

In response to public concern about contamination of rivers, lakes, streams, coastal waters, and ground water from livestock manure and other animal wastes from livestock operations, EPA and the U.S. Department of Agriculture developed the *Unified National Strategy for Animal Feeding Operations* in March 1999, as part of the *Clean Water Action Plan*. The strategy includes a national goal that all "AFOs should develop and implement technically sound, economically feasible, and site-specific comprehensive nutrient management plans (CNMPs) to minimize impact on water quality and public health." As part of this strategy, EPA announced that it would develop new approaches for improving existing regulations for the largest operations, CAFOs. EPA currently administers two Clean Water Act regulatory programs that pertain to CAFOs: National Pollutant Discharge Elimination System (NPDES) permits and effluent guidelines.

Dairy Cattle Operation



Source: Kurt Roos, USEPA

For more than 20 years, Clean Water Act NPDES permits and effluent guidelines for CAFOs have helped to improve the quality of our nation's waters. However, persistent reports of manure runoff and waste discharges from livestock operations show that the existing regulatory program for CAFOs does not adequately prevent water pollution.

Swine Operation

Source: USDA ARS Image Gallery

The livestock industry has undergone dramatic changes in the past 20 years. The continued trend toward fewer but larger operations, coupled with greater emphasis on more intensive production methods and specialization, is concentrating more manure and other animal waste constituents within some geographic areas. This trend has coincided with increased reports of large-scale discharges from these facilities, as well as continued runoff of nutrients that are contributing to the significant increase in pollution of many waterways. In addition, more and more of the larger livestock facilities are concentrated in non-agricultural areas where there is inadequate land to accommodate the useful application of the animal manure they produce.

Inconsistent interpretation of current regulations over the years by state and federal regulators has resulted in

Why is livestock waste a water quality concern?

Runoff from livestock operations enters water bodies when poor maintenance of waste lagoons, improper design of storage structures, improper storage of animal waste, and excessive rainfall result in spills and leaks of manure-laden water. Overapplication of manure to cropland is another source of animal waste runoff. When livestock manure and other animal waste spills or leaks into surface or ground water it can create an immediate threat to public health and water resources. This runoff has nutrients such as, nitrogen and phosphorus that in excess cause algae and other microorganisms to reproduce in waterways, creating unsightly and possibly harmful algal blooms. Explosive algae populations can lower the level of dissolved oxygen, which can cause fish and other aquatic organisms to die. Spills from ruptured waste lagoons and other faulty storage facilities have killed tens of thousands of fish. Animal waste runoff can also be a threat to the health of people who come into contact with affected waters because some of the microbes (bacteria, protozoa, and viruses) in animal waste can cause disease.

Algal Bloom

Source: USDA ARS Image

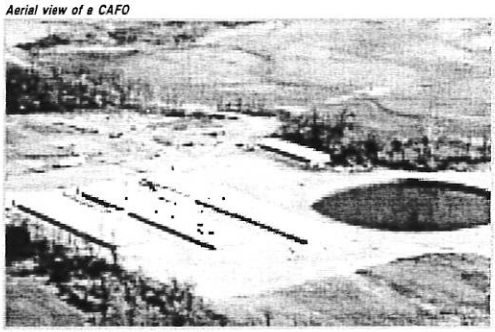
inadequate permitting and enforcement practices across the country. Public concern, changes in the livestock industry, persistent water quality problems, and public health risks have demonstrated the need for simpler, nationally consistent regulations that are more easily implemented and enforced to protect public health and water resources.

What are the **CURRENT** *CAFO regulations?*

Under the Clean Water Act, CAFOs are defined as point sources of pollution and are therefore subject to NPDES permit regulations. Under these regulations, CAFOs are defined as facilities with 1,000 or more animal units (AU). They are not considered CAFOs, however, if they discharge only during a 25-year, 24-hour storm. An animal feeding operation (AFO) that confines 300 to 1,000 AU is defined as a CAFO if it discharges pollutants through a man-made structure or if pollutants are discharged to waterways that run through the facility or come into contact with the confined animals. The authority that issues NPDES permits may also designate any AFO, including those with fewer than 300 AU, as a CAFO if it meets the definitions above and is a significant source of water pollution.

Although the NPDES regulation identifies who needs a permit, the effluent guidelines establish national requirements regarding the types and amount of pollutants a permitted CAFO with 1,000 AU or more is allowed to discharge. EPA established the effluent guidelines for feedlots in 1974 based on the best technology available that was economically feasible for the industry. The current effluent guidelines do not allow discharges of pollutants into the Nation's waters except when a chronic or catastrophic storm causes an overflow from a facility that has been designed to contain manure and runoff during a 25-year, 24-hour storm. Discharge limits for permitted facilities with fewer than 1,000 AU are established using the permit writer's best professional judgment.

Aerial view of a CAFO



Source: Hoosier Environmental Council

Proposed definitions for CAFOs

Animal Type	Two-Tier Structure	Three-Tier Structure	
	# of animals equal to 500 AU	# of animals equal to 1,000 AU	# of animals equal to 300 AU
Beef Cattle and Heifers	500	1,000	300
Veal Cattle	500	1,000	300
Dairy Cattle (mature milked or dry)	350	700	200
Swine (>55 lbs)	1,250	2,550	750
Immature Swine (≤55 lbs)	5,000	10,000	3,000
Turkeys	27,500	55,000	16,500
Chickens	50,000	100,000	30,000
Horses	250	500	150
Sheep or Lambs	5,000	10,000	3,000
Ducks	2,500	5,000	1,500

What **CHANGES** *is EPA proposing for the NPDES CAFO regulations?*

EPA is proposing several changes to the NPDES regulations that define which facilities are AFOs and which are CAFOs (that is, subject to the NPDES program) and includes specific requirements in NPDES permits for CAFO manure at both production and land application areas.

Definition of an animal feeding operation

- The proposed changes to this definition are intended to help permit writers and permit holders clearly distinguish between confined facilities and operations with only pasture or grazing land. Operations that maintain animals in confinement are considered AFOs.

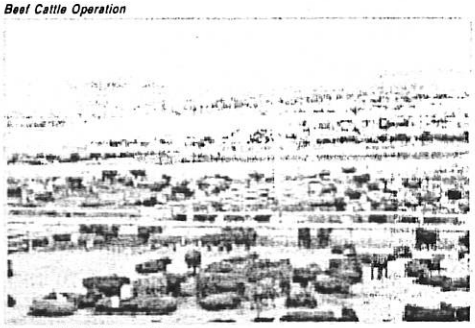
Definition of a concentrated animal feeding operation

- EPA is asking for comments on two alternative structures for defining CAFOs (see table above):
  - A three-tier structure in which an AFO is a CAFO if it has more than 1,000 AU, or if it has 300 to 1,000 AU and it meets certain conditions, or if the permit authority designates the facility. All facilities with 300 to 1,000 AU must either certify that they do not meet the conditions for being defined as a CAFO or must apply for a permit; or
  - A two-tier structure in which an AFO is a CAFO if it has 500 AU or more. Facilities with fewer than 500 AU may become CAFOs only if designated by the permit authority.
- Including new animal types in the NPDES program:
  - Dry manure handling poultry operations
  - Stand-alone immature swine and heifer operations
- Imposing a duty to apply for a permit on all CAFOs.
- Eliminating the 25-year, 24-hour storm permit exemption.
- Eliminating the "mixed animal type calculation."

Land application of CAFO manure

- Including the land application area in the CAFO definition.
- Requiring each CAFO to prepare and implement a site-specific permit nutrient plan (PNP), that is prepared or approved by a certified planner, that identifies the nutrients generated at the facility, determines the amount of nutrients needed by the planned crop rotation, and establishes agronomic rates of manure application.
- Clarifying that the agricultural storm water exemption is applicable only where CAFO manure is land-applied according to proper agricultural practices.
- Proposing two options for recipients of CAFO manure:
  - Recipents must certify they are land-applying at proper agronomic rates unless there is a state program for addressing excess manure.
  - No certification is required, but the CAFO operator must maintain records of manure transferred.

Beef Cattle Operation



Source: USDA ARS Image Gallery

Permit requirements

- Requiring processors that exercise substantial operational control over contract growers to be co-permitted.
- Requiring a CAFO to maintain a permit until the facility is properly closed, including proper closure of manure storage.
- Clarifying the NPDES requirements pertaining to discharges to ground water through a direct hydrological connection to surface water.
- Improving public access to information in the following ways:

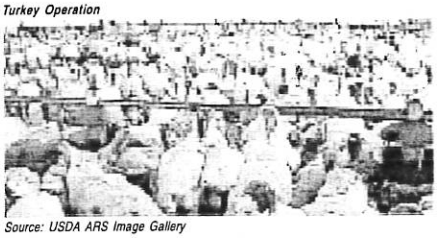
- Requiring the permit authority to publish quarterly a list of CAFOs covered under a general permit. (A general NPDES permit is written to cover a category of point sources with similar characteristics [such as CAFOs] for a defined geographic area.)
- Requiring permittees to submit a notice that they have developed or amended the PNP.
- Proposing the CAFO operator make the executive summary of the PNP publicly available upon request and considering making the entire PNP publicly available.
- Proposing that states must conduct a public process for determining when individual permits must be issued.

What regulatory **CHANGES** *is EPA proposing for the effluent guidelines?*

EPA is proposing several changes to the effluent guidelines for CAFOs, including guidelines concerning animal confinement and manure storage areas, and land application and off-site transfer of manure.

- Applying the effluent guidelines to all defined CAFOs including CAFOs with 1,000 AU.
- Clarifying that the effluent guidelines apply to layer and broiler operations using dry manure handling (consistent with revisions being proposed for the NPDES permit regulation).
- Eliminating the provisions that apply to operations with more than one animal type ("mixed operations").

Turkey Operation



Source: USDA ARS Image Gallery

- Revising the applicability of the rule to specifically include swine nurseries and heifer operations.
- Establishing a new subcategory that applies to veal operations.
- Establishing limitations and technical standards for all existing and new operations defined as a CAFO.

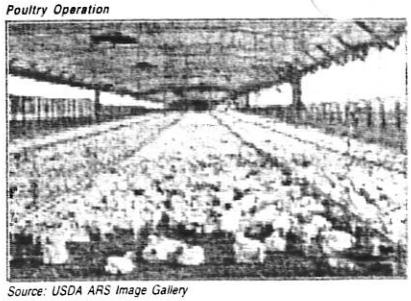
Animal confinement and manure storage areas

- Requiring all beef and dairy CAFOs and new swine, poultry, and veal CAFOs to perform an assessment to determine whether a hydrologic link exists from ground water beneath the feedlot and manure storage area to surface water.
- Adopting a zero discharge requirement with no overflow allowance for swine, veal, and poultry CAFOs.
- Requiring routine inspections of the production area to ensure that wastewater and manure handling and storage are functioning properly.
- Requiring installation of depth markers for liquid impoundments (e.g., lagoons, ponds, and tanks) that are open and capture precipitation.
- Requiring CAFOs to handle dead animals in ways that prevent contributing pollutants to waters.

Land application and off-site transfer of manure

- Requiring the CAFO operator to determine the nutrient needs of their crops based on realistic crop yields, to sample soil to determine nutrient content, and to prohibit operators from applying manure in quantities that exceed the land-application rate calculated using either Phosphorus Index, Phosphorus Threshold, or Soil Test Phosphorous Method (NRCS 590 Standard).
- Establishing setback requirements that would prohibit applying manure and wastewater within 100 feet of surface water.
- Requiring CAFOs to maintain records on the amount and destination of manure and wastewater transferred off-site.

Poultry Operation



Source: USDA ARS Image Gallery

What are the costs of the proposed regulations?

EPA estimates that the proposed regulations will result in compliance costs to CAFO operators of $850 million to $940 million per year, depending on which proposals are finalized.

How many CA Os will be regulated?

EPA's proposals would regulate between 26,000 and 36,000 AFOs or 5 to 10 percent of all AFOs, and would address 60 to 70 percent of all AFO manure.

When will the proposed regulations become final and be implemented?

EPA plans to take final action on these regulations by December 15, 2002 (published approximately by January 2003).

For newly defined CAFOs, permits will not be required until 3 years after final regulations are published (January 2006).

Once the proposed regulations are final, the new requirements are immediately in effect for new or reissued permits.

How to obtain a copy of the proposed regulations:

On December 15, 2000, Administrator Browner signed the proposed revisions to the NPDES regulations and effluent guidelines for CAFOs. The *Federal Register* will publish these proposed revisions. You can obtain a copy by going to the EPA Office of Wastewater Management's web site at http://www.epa.gov/owm/afo.htm.

How to comment on the proposed regulations:

EPA encourages all interested individuals and groups to comment on these proposed regulations. The public comment period begins on the day the regulations are published in the *Federal Register* and is open for comment for 120 days. You may send your comments to EPA in a number of ways.

- By e-mail: CAFOs.comments@epa.gov
- By postal service:

  Concentrated Animal Feeding Operation Proposed Rule
  USEPA Office of Water
  Engineering and Analysis Division (4303)
  1200 Pennsylvania Avenue, NW
  Washington, DC 20460

- By hand delivery:

  Concentrated Animal Feeding Operation Proposed Rule
  USEPA
  401 M Street, SW
  Room 611 West Tower
  Washington DC 20460

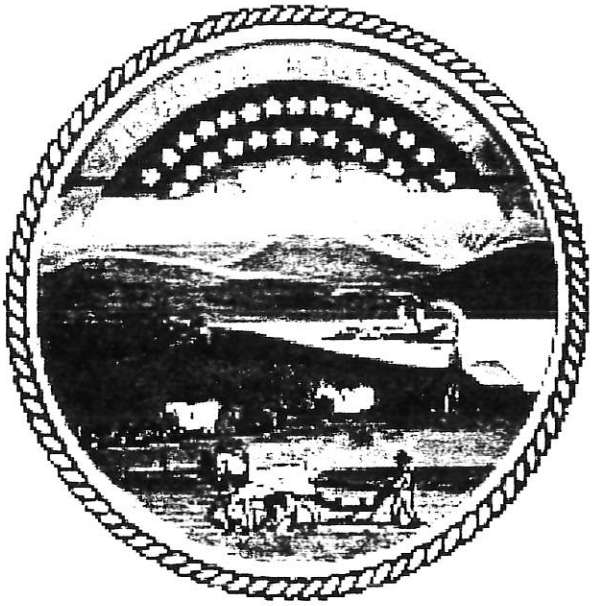
Please submit any references cited in your comments. Please submit an original and three copies of your written comments and enclosures.

EPA suggests that you contact organizations of which you are a member to find out if the organizations are commenting on the proposed regulations.

If you have any questions about this process, please call the CAFO HOTLINE at (202) 564-0766.

KANSAS

1999 ANNUAL AIR QUALITY REPORT



Kansas Department of Health and Environment
Division of Environment
Bureau of Air and Radiation
Air Monitoring Services Section
Topeka, Kansas 66620-0001
(785) 296-1593

Bill Graves, Governor

Clyde D. Graeber, Secretary

Ronald F. Hammerschmidt, Ph. D.
Director, Division of Environment

House Environment
1-23-01
Attachment 3

FOREWORD

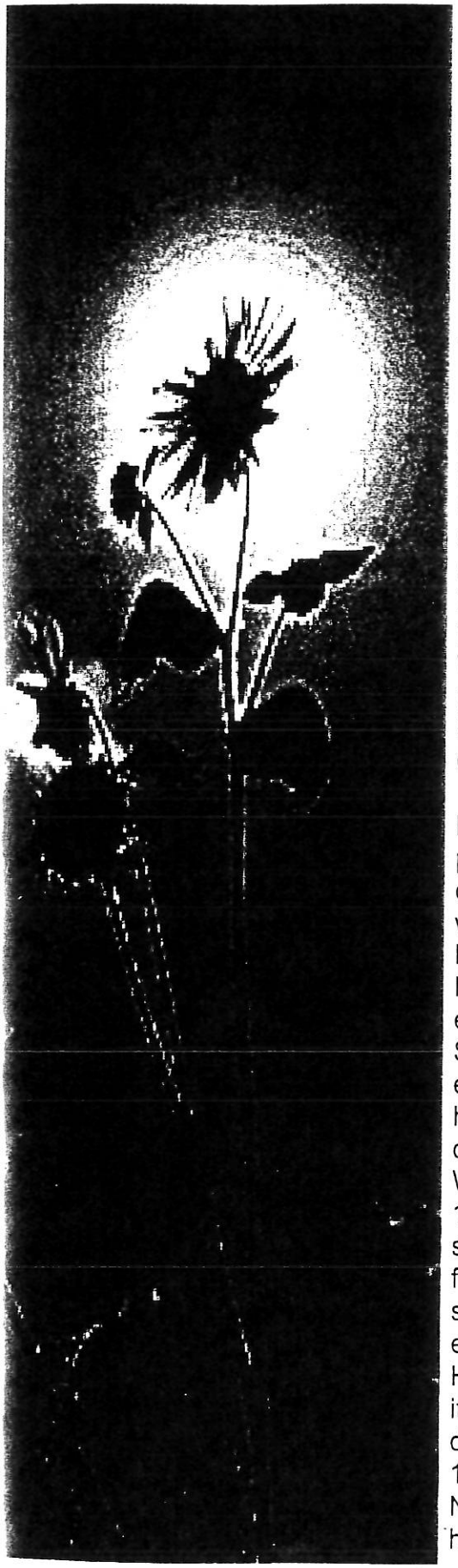
This report is issued by the Kansas Department of Health and Environment, Bureau of Air and Radiation, to inform the citizens of Kansas of air quality throughout the state in 1999. The air program in the state of Kansas is a coordinated effort of the Division of Environment and four local air pollution control authorities. The Bureau of Air and Radiation works closely with the local agencies to ensure that Kansas is meeting Federal Clean Air Act requirements in accordance with the Federal Environmental Protection Agency guidelines. The Bureau has been designated as the responsible agency to obtain the statewide air quality monitoring data needed to determine the status of compliance with the National Ambient Air Quality Standards (NAAQS).

This report presents the results of measurements of pollutant levels in the ambient air, that portion of the atmosphere near ground level and external to buildings or other structures. Legal limitations on pollutant levels allowed to occur in the ambient air, or ambient air quality standards, have been established for six pollutants, each of which is discussed in more detail in this report. The six pollutants, referred to as criteria pollutants, are carbon monoxide, lead, nitrogen dioxide, ozone, sulfur dioxide, and particulate matter (PM). Under Section 108 of the Clean Air Act, the Administrator of the U.S. Environmental Protection Agency (EPA) has determined that these six pollutants may reasonably be anticipated to endanger public health and/or welfare and has issued criteria upon which the ambient standards for each have been established.

An essential component of air quality management in the state is the identification of (1) areas where the ambient air quality standards are being violated and plans are needed to reach attainment, and (2) areas where the ambient standards are being met, but plans are needed to ensure maintenance of acceptable levels of air quality in the face of anticipated population and industrial growth. The end result of this attainment/maintenance analysis process is the development of local and statewide strategies of stationary source permitting, enforcement, and transportation/air quality planning.

This report presents the data that were EPA reportable in 1999. Inquiries concerning this document and data collection should be directed to:

Kansas Department of Health and Environment
Division of Environment
Bureau of Air and Radiation
Building 283, Forbes Field
Topeka, Kansas 66620-0001
(785) 296-1692



Historical Development

Monitoring of the state's ambient air quality (i.e., level of contaminants found in the atmosphere) is carried out by the cooperative efforts of the U.S. Environmental Protection Agency (EPA), the Kansas Department of Health and Environment (KDHE), Unified Government of Wyandotte County-Kansas City, Kansas Health Department, Johnson County Environmental Department, Wichita-Sedgwick County Department of Community Health, and the Shawnee County Health Agency.

Federal-local agency programs have been carried out in the state since 1956 when the first Federal National Air Sampling Network (NASN) station was established in Kansas City. Similar stations were established, and have been operated in Wichita since 1957 and Topeka since 1959. A fourth NASN station was established in Hays in 1957, but its operation was discontinued after 1959. These NASN stations have been principally operated to sample particulate matter (PM), but they have also been used to sample gaseous pollutants such as sulphur dioxide and nitrogen dioxide.

The first major sampling network was placed in operation in the Kansas City metropolitan area during 1966 and 1967 by the federal government in cooperation with local control agencies in both Kansas and Missouri.

In September 1969, a statewide sampling network was established in thirty cities throughout Kansas. Twenty of these stations were equipped with high volume monitors that included a glass fiber filter to capture particulate matter (PM). The remaining sites used dust fall jars.

Sampling Trailer (1973)

3-3

These stations, under a state contract, were installed by a private contractor who also initially provided the necessary support maintenance and laboratory services.

In September 1970, KDHE took over the responsibilities for servicing the network that included providing laboratory analysis (except Kansas City), and data analysis for all the stations. During 1970, the air monitoring network was expanded with equipment purchased by state and local agencies in Kansas City, Topeka, and Wichita. By 1978, sufficient data had been collected at several sites to warrant discontinuation of sampling at those sites. KDHE continued to monitor air pollutants at other sites across the state during the 1980's and early 90's.

$PM_{2.5}$ Monitors (Mine Creek, Linn County)

During 1998, KDHE reviewed and redesigned the entire state air monitoring system to accommodate the state's needs as well as meet the requirements specified by the EPA. A few monitors were relocated to new sites to operate in conjunction with the new $PM_{2.5}$ monitors. The current statewide network is designed to comply with federal requirements. In addition to equipment installed at permanent locations, KDHE also maintains eight sampling trailers that are moved to Special Purpose Monitoring sites as conditions warrant. These monitoring trailers are used at selected sites across the state to monitor air quality for special studies conducted by KDHE.

Although the overall quality of Kansas air in 1999 was good, KDHE and the people of Kansas face several challenges in the coming decades as population and industry in the state continue to grow.

1967 - State legislature adopted first air quality statute.

1970 - Environmental Protection Agency (EPA) formed.
- Federal Clean Air Act passed.

1971 - EPA establishes standards for criteria pollutants.

1974 - Kansas Dept. of Health and Environment formed.

1977 - Federal Clean Air Act is amended.

1981 - Kansas Air Quality Plan approved by EPA.

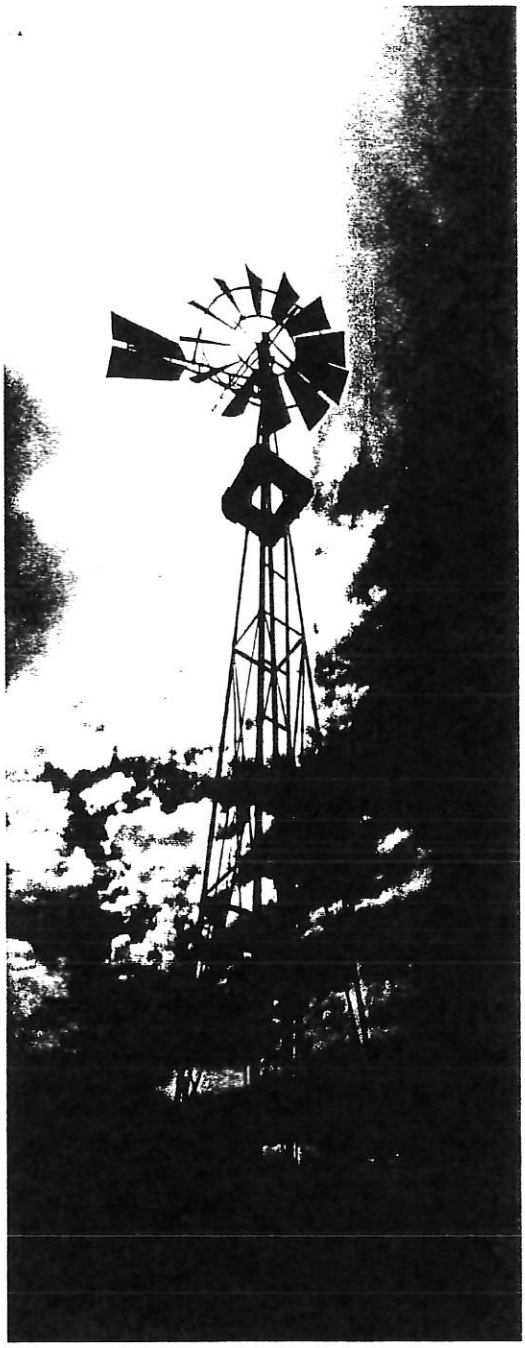
1987 - PM_{10} standard established to replace TSP.

1990 - 1990 Federal Clean Air Act Amendments became law.

1997 - EPA revises Ozone and Particulate standards.
- EPA establishes a new standard for $PM_{2.5}$.

1998 - Air monitoring system redesigned.

Kansas Weather



No discussion on the quality of Kansas air can be complete without talking about the effects the weather of Kansas has on our environment.

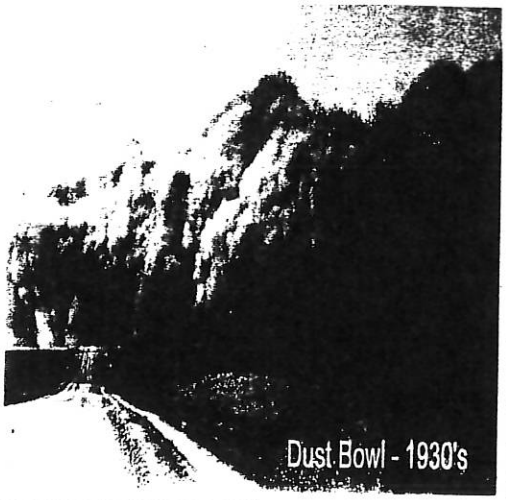
Because of the state's geographical location in the middle of the country, Kansans experience four distinct seasons. Cold winters and hot, dry summers are the norms for the state. The other constant in Kansas weather is the wind. Kansas ranks high in the nation in average daily wind speed. In 1999, the average wind speed across the state was a little over 11 miles per hour (mph). The predominant wind direction was from the south. These factors combine to affect the two major areas of air quality concern in the state, ozone and particulate matter.

The air pollution meteorology problem is a two-way street. The presence of pollution in the atmosphere may affect the weather and climate. At the same time the meteorological conditions greatly affect the concentration of pollutants at a particular location, as well as the rate of dispersion of pollutants.

The ground level ozone or smog problem develops in Kansas during the period from April through October. Ozone is formed readily in the atmosphere by the reaction of volatile organic compounds (VOC) and oxides of nitrogen (NO_x) in the presence of heat and sunlight, which are most abundant in the summer months. Kansas tends to see ozone episodes in the summer when high pressure systems stagnate over the area which leads to cloudless skies, high temperatures and light winds. Another element of these high pressure systems that contribute to pollution problems is the development of upper air inversions. This will typically "cap" the atmosphere near the surface and not allow the air to mix and disperse pollutants. Therefore, pollution concentrations may continue to increase near the ground from numerous pollution sources since the air is not mixing within and above the inversion layer.

The other pollutant of concern mentioned earlier is particulate matter. Kansas has a long history of particulate matter problems caused in part by our weather. The Great Dust Bowl of the

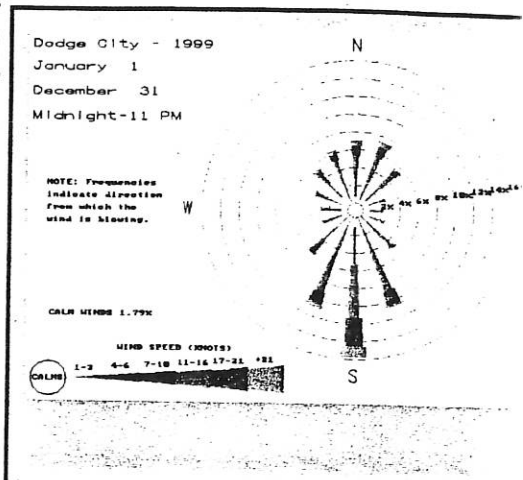
1930's was caused by many months of minimal rainfall and high winds. This natural source of PM pollution, although not as bad as in the 1930's, is still a concern today as varying weather conditions across the state from

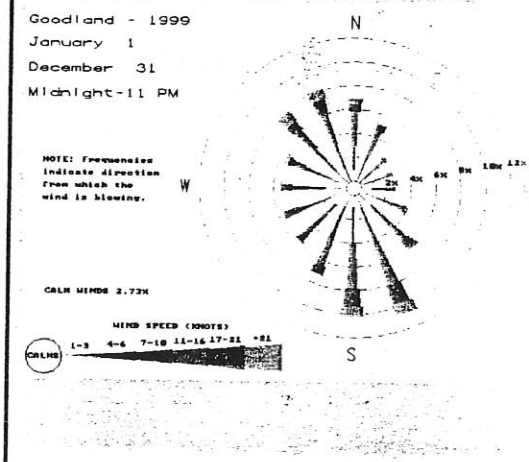


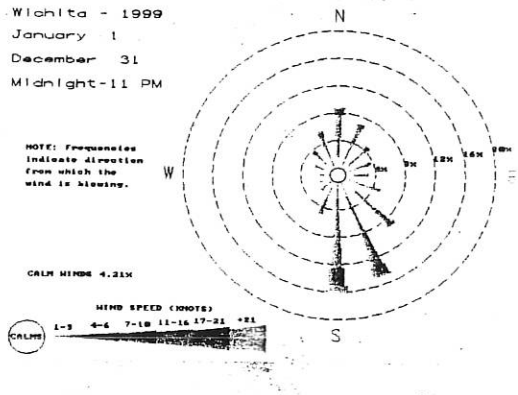
year to year cause soil to be carried into the air and create health problems for citizens of Kansas.

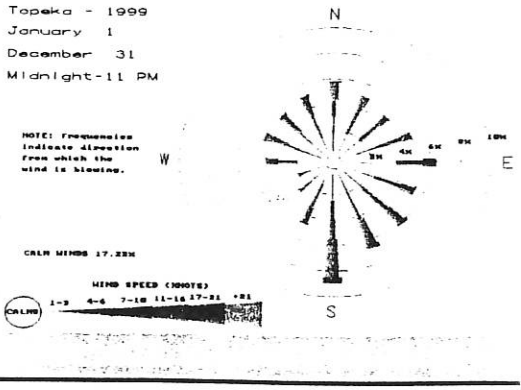
The four wind roses on the right are examples of wind conditions experienced at several National Weather Service sites across the state in 1999. These four sites from different parts of the state show a representation of the wind speeds and directions for 1999. The wind speeds on the graphs are reported in knots (1 knot = 1.15 miles per hour). The predominant wind direction across the state of Kansas in 1999 was from the south. This follows in step with Kansas' historical meteorological wind data.

Another source of PM pollution that will be discussed in more detail later in this report is anthropogenic - generated by processes that have been initiated by humans. These particles may be emitted directly by a source or formed in the atmosphere by the transformation of gaseous precursor emissions such as Sulfur Dioxide (SO_2) and NO_x. Meteorological conditions also affect how these man-made sources of PM form and disperse. One factor that is common in Kansas that can lead to high pollution episodes is a surface inversion. Like upper air inversions, warmer air just above the surface of the earth forms a surface inversion and caps all pollutants below it. These types are mainly caused by the faster loss of heat from the surface than the air directly above it. In Kansas, surface inversions are more common in the winter months, but can occur during any season and lead to pollution problems.





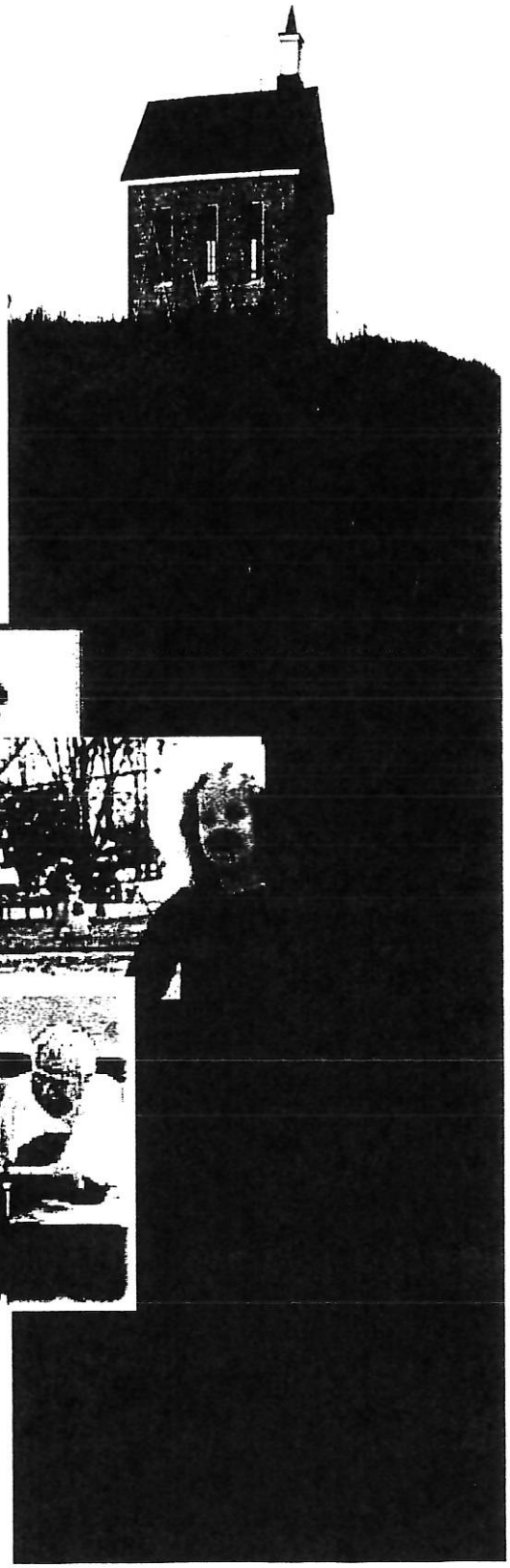




Ambient Air Quality Standards

The Clean Air Act of 1970 required the United States Environmental Protection Agency (EPA) to establish National Ambient Air Quality Standards (NAAQS) for each air pollutant anticipated to endanger public health or welfare. Pollutants in this category, termed criteria pollutants, included: total suspended particulate, lead, sulfur dioxide, carbon monoxide, ozone, and nitrogen dioxide.

In 1987, total suspended particulate (TSP) was replaced by particulate matter less than 10 microns (1/100 of a millimeter) in diameter (PM_{10}). On July 18, 1997, both the ozone and particulate standards were revised by the EPA. In addition, a new standard for particulate matter with a diameter of less than 2.5 microns ($PM_{2.5}$) was introduced. The current Air Quality Standards are summarized by pollutant in the table on page 6. As shown in the table, there are two types of air quality standards. The primary standard is designed to protect the public health with an adequate safety margin. Permissible levels were chosen to protect the health of the most susceptible individuals in a population, including children, the elderly, and those with chronic respiratory ailments. The secondary standard is designed to protect public health and welfare or ensure quality of life. Air quality conditions described by the secondary standard may be the same as the primary standard and are chosen to limit economic damage as well as harmful effects to buildings, plants, and animals.



Each standard is comprised of several parts that must be met in order to achieve compliance. Ambient levels must not be exceeded over various averaging times. Short averaging times, like the 1-hour maximum level of 35 ppm used for carbon monoxide, reflect the effects of acute, or short term toxic effects. The long-term averaging times, like the annual mean concentrations for PM_{10}, SO_2, and NO_2, are designed to protect against chronic effects.

National Ambient Air Quality Standards

Criteria Air Pollutant	Averaging Time	Primary Standard	Secondary Standard
Carbon Monoxide	One-hour maximum[a]	40 mg/m^3 [b] (35 ppm[c])	
	Eight-hour maximum[a]	10 mg/m^3 (9 ppm)	
Lead	Three-month Arithmetic Mean	1.5 µg/m^3 [d]	Same As Primary Standard
Nitrogen Dioxide	Annual Arithmetic Mean	100 µg/m^3 (0.05 ppm)	Same As Primary Standard
Ozone	One-hour average[a]	0.12 ppm (235 µg/m^3)	Same As Primary Standard
	Eight-hour average[e]	0.08 ppm (157 µg/m^3)	Same As Primary Standard
Particulate Matter (PM_{10})	Annual Arithmetic Mean 24-hour average[f]	50 µg/m^3 150 µg/m^3	Same As Primary Standard
Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean[g] 24-hour average[h]	15 µg/m^3 65 µg/m^3	Same As Primary Standard
Sulfur Dioxide	24-hour maximum[a]	365 µg/m^3 (0.14 ppm)	
	Annual Arithmetic Mean	80 µg/m^3 (0.03 ppm)	
	Three-hour Maximum[a]		1300 µg/m^3 (0.5 ppm)

a Not to be exceeded more than once a year for primary and secondary standards
b mg/m^3 = milligrams per cubic meter
c ppm = parts per million
d µg/m^3 = micrograms per cubic meter
e Established for a three-year average of the fourth highest daily maximum concentration
f Established for a three-year average of the 99th percentile of data
g Established for a three-year average
h Established for a three-year average of the 98th percentile of data

Ambient Air Monitoring Network

Within the Kansas Ambient Air Monitoring Network, certain sites have been designated by the United States Environmental Protection Agency (EPA) as National Air Monitoring Stations (NAMS) or State and Local Air Monitoring Stations (SLAMS). NAMS are considered a subset of SLAMS. Data obtained at NAMS locations are used by EPA to determine national air pollution trends. Data collected at both NAMS and SLAMS locations are compared to National Ambient Air Quality Standards (NAAQS), and used by the state of Kansas and EPA to determine attainment status for criteria pollutants. SLAMS sites are developed by KDHE and its local partner agencies to enhance monitoring to meet national, state, and local needs.

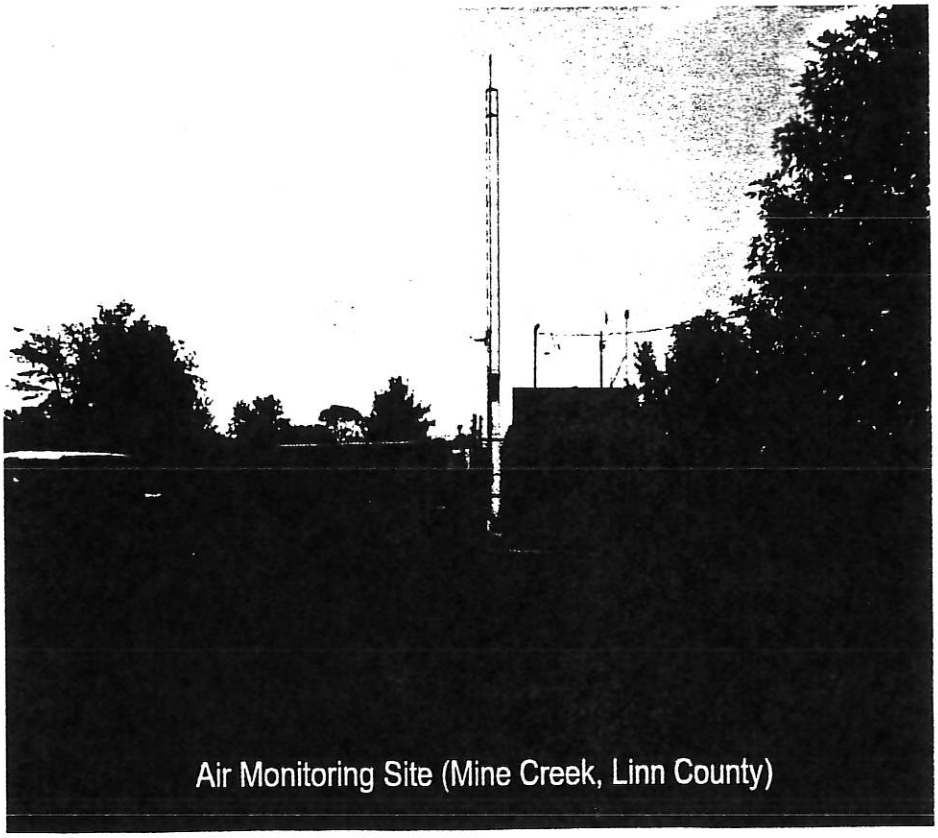
Ambient air monitoring sites are scattered throughout the state. Their placement is based upon clearly defined EPA siting criteria that consider attributes such as population densities and the degree to which data collected at the site accurately represent the air quality in Kansas. Data from monitoring sites are reported to the EPA and are used for the evaluation of air quality and for the regulatory decision making process.

The Kansas Ambient Air Monitoring Network for 1999 consisted of 24 sampling sites (**see map, Pg. 8**) at which specialized instruments were employed to measure the following criteria pollutants:

- PM_{10} at 13 sites
- $PM_{2.5}$ at 13 sites
- Sulfur dioxide (SO_2) at 4 sites
- Ozone (O_3) at 5 sites
- Carbon monoxide (CO) at 6 sites
- Nitrogen dioxide (NO_2) at 4 sites

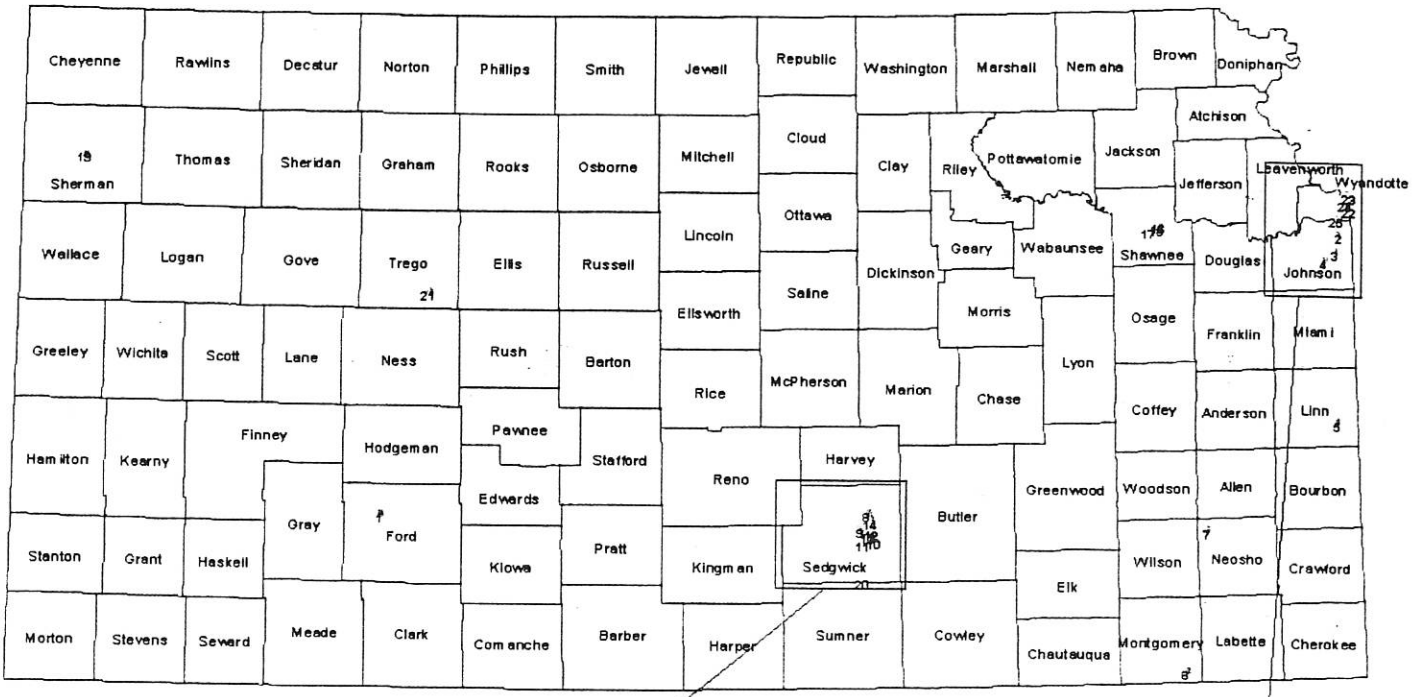
The composition of the Kansas Ambient Air Monitoring Network varies with changing federal and state requirements. A complete description of all long-term Kansas Ambient Air Monitoring sites operated by KDHE in 1999 and previous years are available from:

Kansas Department of Health and Environment
Division of Environment
Bureau of Air and Radiation
Forbes Field, Building 283
Topeka, KS 66620-0001
(785) 296-1692

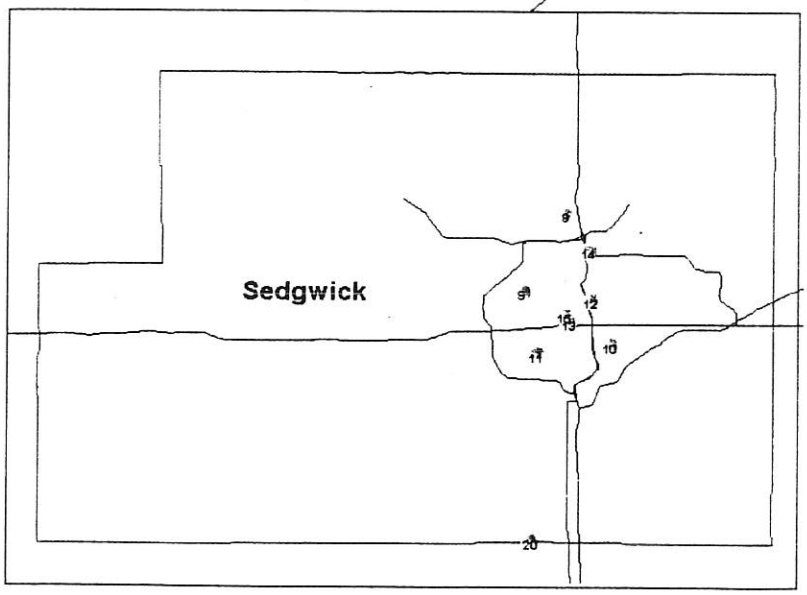


Air Monitoring Site (Mine Creek, Linn County)

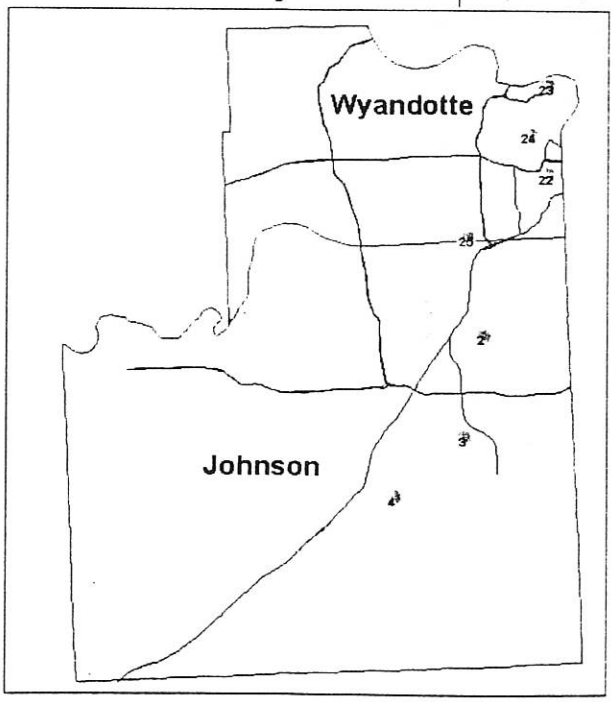
Kansas Air Quality Monitors



Wichita Area



Kansas City Area



Kansas Roads

Primary road with limited access

Kansas Monitors

County Lines

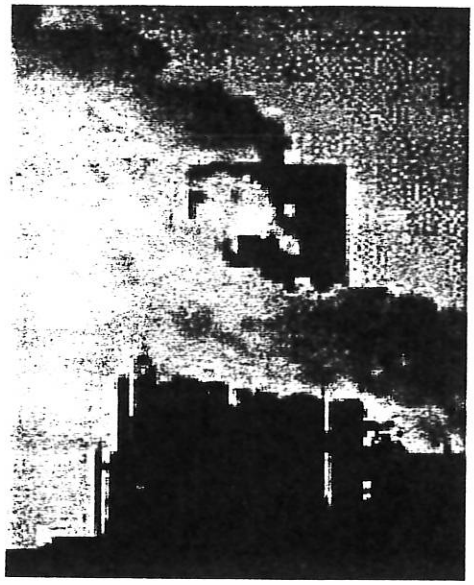
3-10

Monitoring Site Locations

Site #	AIRS ID	City/Co.	Address	TSP	PM_{10}	CPM_{10}	$PM_{2.5}$	$CPM_{2.5}$	CO	SO_2	O_3	NO_x
1	057-0001	Dodge City	2100 First		SPM							
2	091-0007	Overland Park	Overland Park Judicial Ctr. 85th & Antioch				SLAMS + Coll.					
3	091-0008	Overland Park	Oxford Middle School				SLAMS					
4	091-0009	Olathe	Black Bob Elem. School				SLAMS					
5	107-0002	Linn Co.	Mine Creek Historic Site				SLAMS (Trans.) + Coll.	SPM	SPM	SPM	SPM	SPM
6	125-0006	Coffeyville	Union & East North			SPM				SPM +H_2S		
7	133-0002	Chanute	1500 West 7th	SPM	SPM							
8	173-0001	Sedgwick Co.	200 East 53rd North								NAMS	
9	173-0007	Wichita	St. Paul & 13th		SLAMS							
10	173-0008	Wichita	G. Washington & Skinner		SLAMS		SLAMS					
11	173-0009	Wichita	Glenn & Pawnee			SLAMS	SLAMS					
12	173-0010	Wichita	1900 East Ninth Health Dept.			SPM	SLAMS +Coll.		SLAMS		NAMS	
13	173-1003	Wichita	Topeka & Lewis						SLAMS			
14	173-1012	Wichita	Coleman Co.		Coll.	NAMS						
15	173-1014	Wichita	Douglas & Main						SPM			
16	177-0010	Topeka	Robinson Middle School		SPM		SLAMS					
17	177-0011	Topeka	McClure Elem. School				SLAMS					
18	177-0012	Topeka	Washburn Univ.		SPM		SPM	SPM				
19	181-0001	Goodland	1010 Center		SPM							
20	191-0002	Sumner Co.	Peck Community Building				SLAMS (Trans)		SPM	SPM	SPM	SPM
21*	195-0001	Trego Co.	Cedar Bluff Resv.					SLAMS	SPM	SPM	SPM	SPM
22	209-0015	K.C.	420 Kansas		NAMS							
23	209-0020	K.C.	444 Kindelberger		NAMS +Coll.							
24	209-0021	K.C.	JFK Comm. Center				SLAMS +Coll.		SLAMS	NAMS	SLAMS	SPM
25	209-0022	K.C.	Highland Middle School				SLAMS					

All monitors generate data reported to EPA AIRS
SPM: Special Purpose Monitor
CPM_{10}: Continuous PM_{10}
$CPM_{2.5}$: Continuous $PM_{2.5}$

* - Site #21 at Cedar Bluff/Trego Co. will begin monitoring in 2000.
Coll.: Collocated
SLAMS: State and Local Air Monitoring Station
NAMS: National Air Monitoring Station



Criteria Air Pollutants

In 1997, the EPA revised the National Ambient Air Quality Standards (NAAQS) for ozone and particulate matter. The ozone NAAQS were changed from a 1-hour standard to a concentration-based 8-hour average standard. The NAAQS for particulate matter were expanded to include particulate matter with a diameter of less than 2.5 microns($PM_{2.5}$). $PM_{2.5}$ monitoring was initiated in January 1999.

As the result of a legal challenge, the revised standards for ozone and particulate matter were remanded to EPA by a panel of federal judges in May 1999. While this action did not affect ongoing development of a new $PM_{2.5}$ monitoring network and continuation of sampling, it prevented the new standards from taking effect as scheduled.

During 1999, the Kansas Ambient Air Monitoring Program measured five of the six criteria air pollutants. The sixth, lead monitoring, was phased out during 1998, due in large part to a shift at the national level toward monitoring point sources.

Statewide summaries for each of the five criteria pollutants measured in 1999 appear below. Information for each pollutant is included in the narratives that accompany the pollutant charts.

Sulfur Dioxide (SO_2)

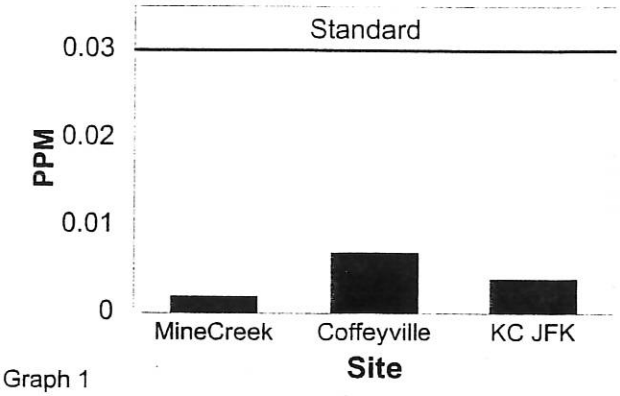
Sulfur dioxide (SO_2) is a colorless, nonflammable gas that enters the atmosphere primarily from the combustion of sulfur-laden fossil fuels such as coal and oil. Other man-made sources of SO_2 emissions include commercial production of sulfuric acid and fuel combustion in vehicles. Most naturally emitted SO_2 results from hydrogen sulfide (H_2S) produced during biological decay of organic matter.

Sulfur dioxide is a pulmonary irritant that generally affects the upper respiratory system. Exposure by inhalation to 1.5 ppm (3900 ug/m^3) of SO_2 for only a few minutes may produce a temporary inability for healthy persons to breathe. Absorption of SO_2 onto the surface of airborne particles allows this pollutant to be carried deep into the lung, where conditions favorable for the formation of sulfuric acid exist. Human and animal studies have shown that lung function is hindered to a much greater extent by sulfuric acid and metal sulfates than SO_2.

The association between long-term exposure to SO_2 and human health effects is less clear. Few epidemiologic studies have been able to adequately distinguish the

Sulfur Dioxide

1999 Average



Graph 1

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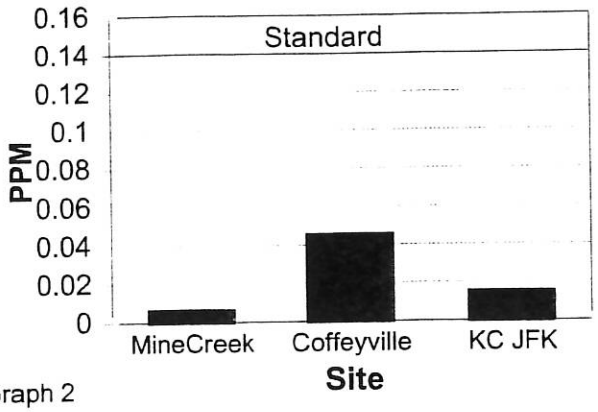
Sulfur Dioxide

1999 2nd High 24-Hour Average



Graph 2

effects of SO_2 from those of other airborne pollutants. Significant human health effects have been correlated with simultaneous long-term elevations of SO_2 and particulate matter in the atmosphere.

SO_2 can directly affect human health and the environment, or cause indirect effects upon conversion to sulfuric acid in the atmosphere. The leaves of many species of trees and other plants, including spinach, lettuce, and other leafy vegetables may be injured by SO_2 exposure. Acidification of ponds and lakes due, at least in part to the effects of sulfuric acid, can have major detrimental impact on aquatic life. Sulfuric acid also damages limestone, marble, roofing slate, and mortar.

In Kansas, transport of SO_2 beyond the vicinity of its sources is usually insignificant. Typically, SO_2 plumes are well dispersed and contribute only to background concentrations.

Sulfate particles formed by the oxidation of SO_2 are, however, subject to long-range transport in the atmosphere. In addition to their potential adverse health effects, these particles, generally less than 1.0 micron in diameter, are effective in scattering visible light, thus producing haze and reducing visibility.

RESULTS:

The primary air quality standard for SO_2 is expressed in two forms: an annual average value; and a 24-hour value not to be exceeded more than once per year. Graph number 1 shows the annual average value concentrations for the three sites where SO_2 was monitored in Kansas during 1999. Graph number 2 shows the 2nd highest 24-hour average results for the three sites. All three sites were well below the annual average standard and the 24-hour standard for SO_2.

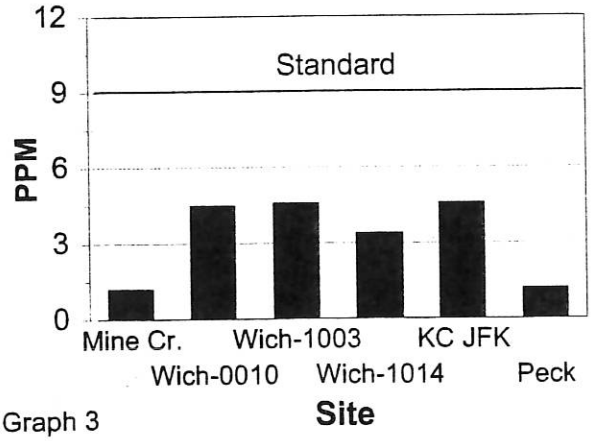
The Coffeyville site shows the highest concentration for both forms of the standard due to the proximity of the site to industrial sources of SO_2.

Carbon Monoxide (CO)

Carbon monoxide (CO) is a colorless, odorless, tasteless gas that is emitted into the atmosphere from both natural and man-made sources. The human health effects of CO relate to its strong affinity for hemoglobin, the oxygen carrying protein in red blood cells. Carbon monoxide binds with hemoglobin in the blood and displaces oxygen, thereby reducing the ability of the blood to deliver oxygen to cells throughout the body. Carbon monoxide is especially hazardous for persons with heart and circulatory problems. Symptoms of exposure to CO include dizziness, headache, and lethargy. Prolonged exposure

Carbon Monoxide

1999 2nd High 8-Hour Average



Graph 3

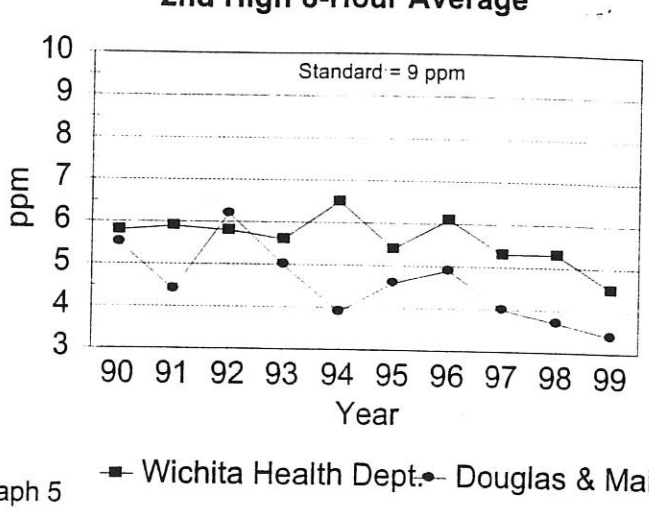
to high levels of CO causes severe physical and pathological changes, and ultimately death. When exposure to elevated levels of CO is discontinued, the process reverses, and CO that has combined with hemoglobin are slowly replaced with oxygen.

The major natural source of CO is oxidation of methane. Other natural sources include the oceans, plant synthesis and degradation, oxidation of terpenes (from certain plant species), and forest or prairie fires. On a global scale, natural sources account for nearly 90% of CO emissions.

Man-made CO is emitted chiefly as a product of combustion of gasoline, wood, natural gas, or coal. Elevated CO levels occur primarily in urban areas as a result of emissions from motor vehicles. Other sources include fuel combustion for industrial and utility boilers, industrial process losses, and open burning.

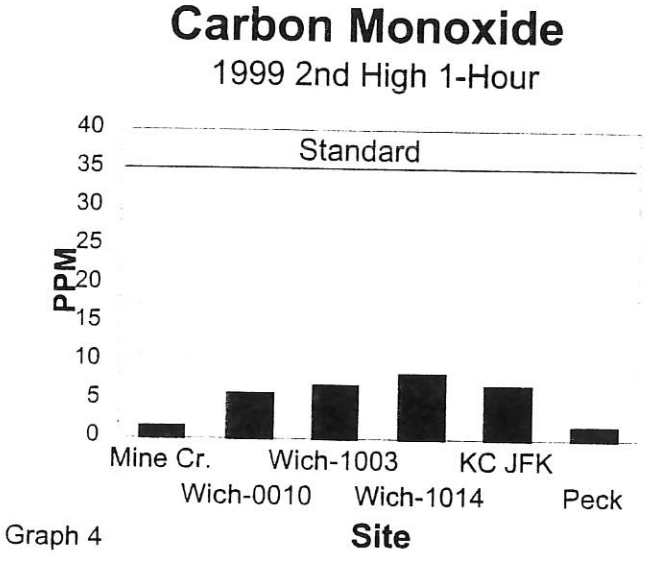
Carbon monoxide from combustion sources is formed by incomplete burning of carbon-based fuel. Motor vehicles operating at low idle speeds tend to emit the highest levels of CO. As vehicle speed increases, emission of CO generally decreases. In contrast, emission of oxides of nitrogen increase as vehicle speed increases.

Carbon monoxide emissions also vary with ambient air temperature; the lower the air temperature, the higher the CO emissions. Carbon monoxide emissions tend to disperse due to the widespread and individually small quantities emitted from motor vehicles. Transport is not, therefore, considered an important factor in the occurrence of elevated ambient air concentrations beyond urban source areas.



Graph 5

CO emissions can create localized problems in areas prone to traffic congestion. Consideration of air quality in transportation planning at the state and county levels is necessary to prevent harmful concentrations of CO from accumulating in such areas.



Graph 4

RESULTS:

The primary air quality standard for CO is expressed in two forms: an 8-hour average value; and a 1-hour average value. Both are not to be exceeded more than once per year. Graph number 3 shows the 2nd highest 8-hour average concentrations for the six sites where CO was monitored in Kansas during 1999. Graph number 4 shows the 2nd highest 1-hour results for the six sites. All six sites were well below both the 8-

hour and the 1-hour standards. Graph number 5 shows the ten-year trend for the two Wichita sites. The results show a moderate decline in CO values for both sites. All values are well below the 8-hour standard.

Nitrogen Dioxide (NO_2)

Nitrogen dioxide (NO_2) is one of the oxides of nitrogen that contribute to smog formation in urban areas. At a concentration of 1 ppm, NO_2 appears yellow-brown. In the atmosphere, NO_2 is partly converted to nitric acid and various particles that can also have adverse health and welfare effects.

In the atmosphere, NO_2 can react with moisture to form nitric acid, which can cause corrosion of metal surfaces. Nitric acid formed in the atmosphere is an important constituent of acid rain, which can damage trees and other vegetation and have significant detrimental impact on aquatic life in ponds and lakes.

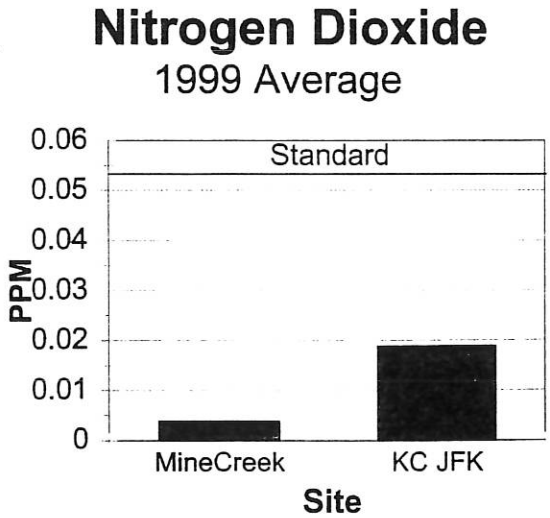
Nitrogen dioxide is a pulmonary irritant that generally affects the upper respiratory system. The primary danger presented by oxides of nitrogen at concentrations found in urban areas, however, is associated with their role in the photochemical reactions that lead to ozone formation.

Natural sources of NO_2 include biological processes in soil and atmospheric oxidation of ammonia. On a global scale, NO_2 emissions from natural sources are approximately 10 times greater than emissions from man-made sources. This has little relevance to the problem of NO_2 and ozone formation because natural and man-made sources are generally separated geographically, with man-made sources concentrated in more populated areas.

The major source of man-made NO_2 is fuel combustion in motor vehicle engines and utility and industrial boilers. Oxides of nitrogen are formed during high-temperature combustion by oxidation of atmospheric nitrogen, as well as (to a lesser extent) nitrogen in the fuel being burned. Most nitrogen oxides produced during the combustion process are in the form of NO. In the atmosphere, NO is oxidized to NO_2 at a rate dependent on the ambient concentrations of NO and ozone. In the presence of ozone, this conversion process is extremely rapid.

Nitrogen oxides emitted from motor vehicles are dispersed rapidly due to the widespread and individually small nature of the emissions. Dispersion occurs more slowly when oxides of nitrogen are emitted from large stationary sources such as power plants with tall stacks, since the plume of hot gases rises and undergoes a gradual spreading due to winds and turbulence. In urban areas, NO_2 emitted near ground level becomes involved in ozone formation.

Side reactions within photochemical smog can form particles that may be transported through the atmosphere. Nitrogen oxides emitted from both stationary and mobile sources can result in the long-range transport of nitric acid and particles.



Graph 6

RESULTS:

The primary air quality standard for NO_2 is expressed in the form of an annual arithmetic mean. Graph number 6 shows the monitoring results for the two

sites where NO_2 was monitored during 1999. Both sites were well below the primary air quality standard of 0.053 ppm. The annual average concentration recorded at the Kansas City monitoring site was higher than the Mine Creek site due to its location in a metropolitan area.

Ozone (O_3)

Ground-level ozone (the primary constituent of smog) continues to be a pervasive pollution problem throughout many areas of the United States, including Kansas. Ground-level ozone is not emitted directly into the air but is formed by an atmospheric reaction, usually during hot summer weather. Ozone also plays a positive role. Stratospheric ozone, often referred to as "the ozone layer," prevents the harmful portion of the sun's ultraviolet radiation from reaching the surface of the earth. In this context, ozone is beneficial and protective of life on earth.

Repeated exposures to ground level ozone can make people more susceptible to respiratory infection, resulting in lung inflammation, and aggravate respiratory diseases such as asthma. Other health effects attributed to ozone exposures include decreases in lung function and increased respiratory symptoms such as chest pain and cough. These effects generally occur while individuals are engaged in moderate or heavy exertion. Persons who are active outdoors during the summer when ozone levels are at their highest are most at risk of experiencing such effects. Other at-risk groups include adults who are active outdoors and individuals with pre-existing respiratory disease such as asthma and chronic obstructive lung disease.

Ozone also affects vegetation and ecosystems, leading to reductions in agricultural and commercial forest yields, reduced growth and survivability of tree seedlings, and increased plant susceptibility to disease, pests, and other environmental stresses (e.g., harsh weather). From the standpoint of crops critical to the Kansas economy, ongoing research indicates that ozone can cause significant

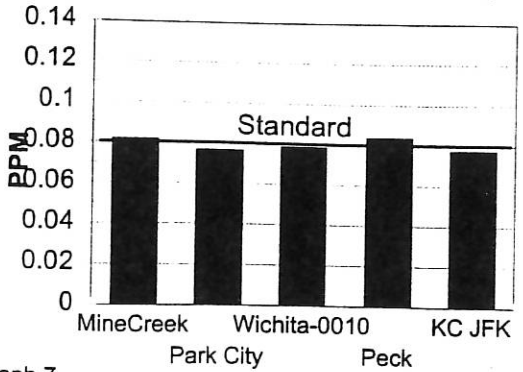
reduction in yields of crops such as wheat and soybeans.

Ozone is created by a complex series of chemical reactions in the atmosphere between NO_x and VOCs in the presence of sunlight. Man-made sources of oxides of nitrogen are emitted primarily from combustion sources. Man-made sources of VOCs include fuel combustion, fuel evaporation, painting, and industrial applications using solvents. Natural sources of ozone precursors include VOCs emitted by certain plants and natural decay of biota in marshlands.

The rate of ozone formation is dependent upon temperature and intensity of sunlight. Ozone presents the greatest problem in urban areas on calm, hot, sunny summer days. In Kansas, the "ozone season" is considered to last from April 1 through October

Ozone

1999 4th High 8-Hour Average



Graph 7

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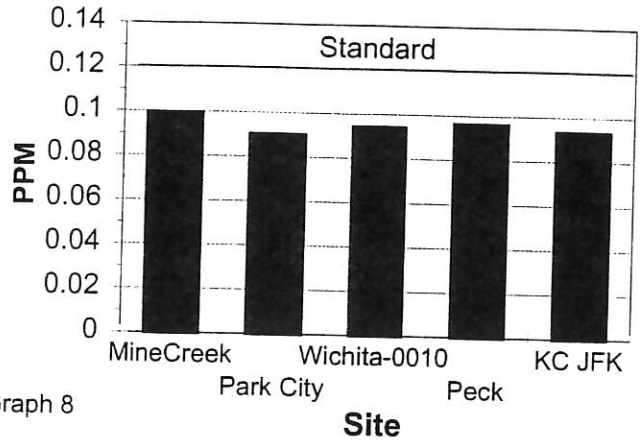


Graph 8

31. Recent studies have demonstrated that ozone and its precursors may be transported through the atmosphere to add to problems in locations relatively far from their origin.

RESULTS:

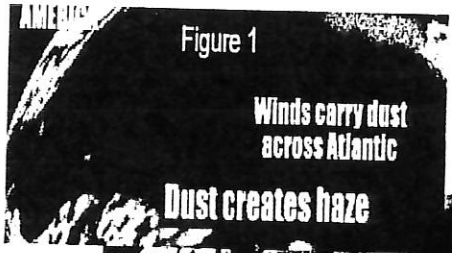
The primary air quality standards for ozone are concentrations over either 8-hour or 1-hour durations. The 8-hour standard is expressed in the form of the three-year average of each year's 4th highest concentration. The 8-hour standard is 0.08 ppm. The 1-hour standard is not to be exceeded more than once per year on average. The 1-hour standard is 0.12 ppm. The rule establishing the 8-hour standard has been challenged in a court case, so monitoring results are currently being evaluated against both standards.

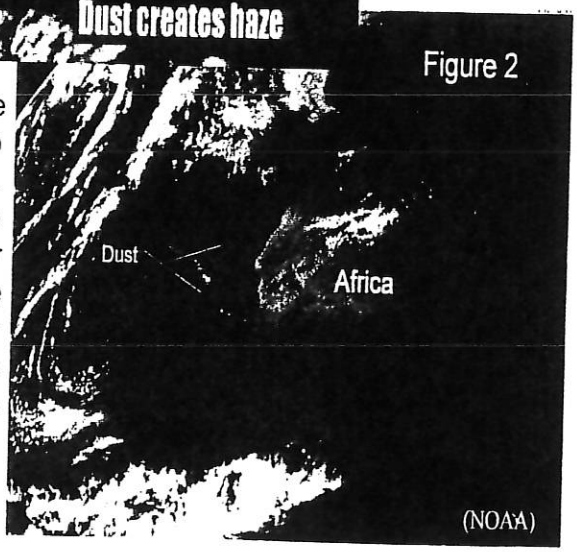
When evaluating ozone monitoring results, it is important to consider two points. First, monitoring results are rounded so a value can be slightly above the standard and not be considered a violation. Second, ozone values higher than the standard for one year do not always indicate a violation of the primary air quality standard. These determinations are made on the basis of three years of data.

Graph number 7 shows the 4th highest 8-hour average concentrations for the five sites where ozone was monitored in Kansas during 1999. The 8-hour results show that all of the monitors are very close to or above the standard. Graph number 8 shows the 2nd highest 1-hour concentrations for the same five sites. The 1-hour results are below the standard. All of the ozone monitoring results will be discussed in greater detail in the sections of this publication dedicated to the Kansas City and Wichita metropolitan areas.

Particulate Matter (PM)

Particulate matter (PM) is the term used for a mixture of solid particles and liquid droplets found in the air. These particles come in a wide range of sizes. Some are large or dark enough to be seen as soot or smoke. Others are so small they can be detected only with a microscope. Particulate matter originates from many different stationary and mobile sources as well as from natural sources. Airborne particulate matter is designated as either PM_{10} also referred to as "coarse," and $PM_{2.5,}$ also referred to as "fine" particulate matter. These designations are based on the diameter of the particles.





PM_{10} - Particulate matter with a diameter of less than or equal to 10 microns is designated as

3-17

PM_{10}. Burning of wood, diesel and other fuels, and open burning contribute particulate matter to the atmosphere, generally in the form of smoke and soot.

Certain industrial processes also generate PM_{10}. In addition, dust from agricultural operations, unpaved roads, and dust storms contains a significant proportion of PM_{10}. Some areas within the state of Kansas experience occasional severe episodes of blowing dust or dust storms.

Inhalation of PM_{10} can cause irritation of the nose and throat, bronchitis, and damage to lung tissue. Children, elderly persons, and individuals with impaired lung or heart function are especially susceptible to the adverse health effects associated with inhalation of airborne particulate matter.

Particulate matter suspended in the atmosphere also reduces visibility. Particulate matter can be transported great distances in the atmosphere. The smaller the particle, the greater the potential for aerial transport. During the "Dust Bowl Days" of the 1930s, dust clouds originating in Kansas and neighboring states were observed on the East Coast of the United States. Current studies indicate that very fine dust from seasonal storms in the Sahara Desert of Africa are transported at high altitudes westward across the Atlantic Ocean to Central and North America (See Figures 1 & 2).

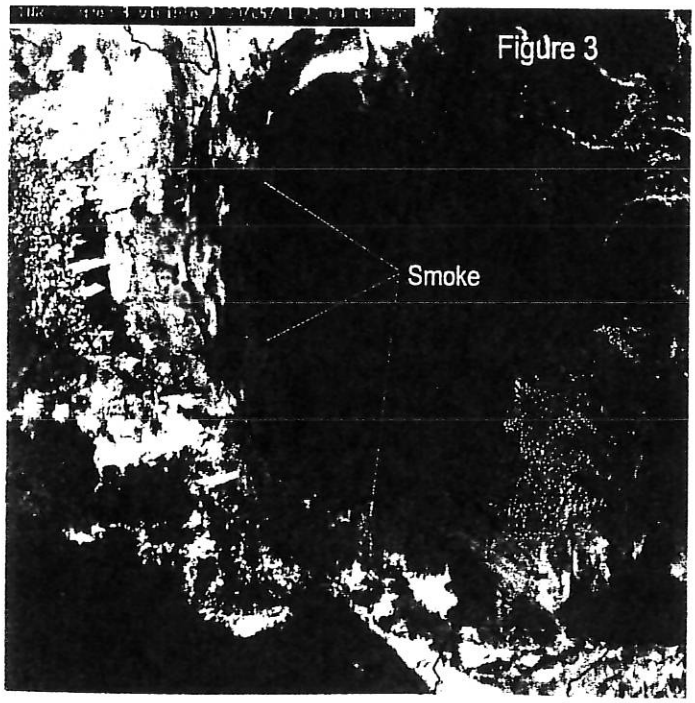
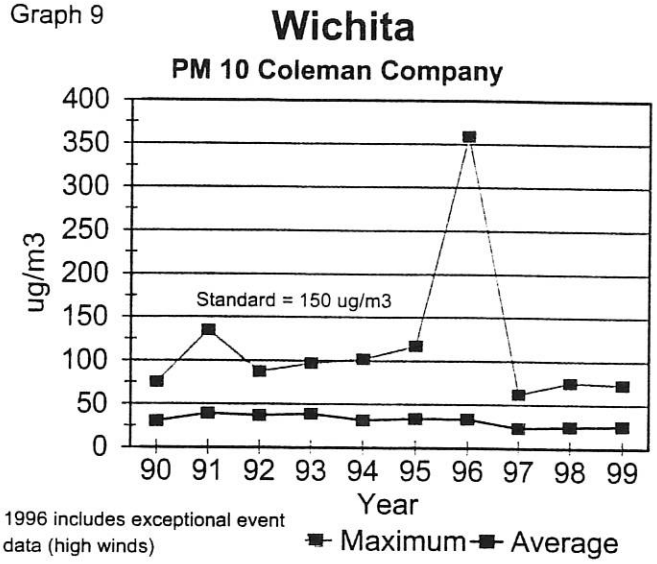


Figure 3

Also in recent years, dense smoke from fires burning in Mexico and Central America has been transported northward into the United States and caused elevated particulate matter readings (Figure 3).

Graph 9



1996 includes exceptional event data (high winds)

During the first calendar quarter of 1996, high winds coupled with extremely dry soil conditions caused exceedances of the air quality standard for PM_{10} in Morton and Sedgwick Counties.

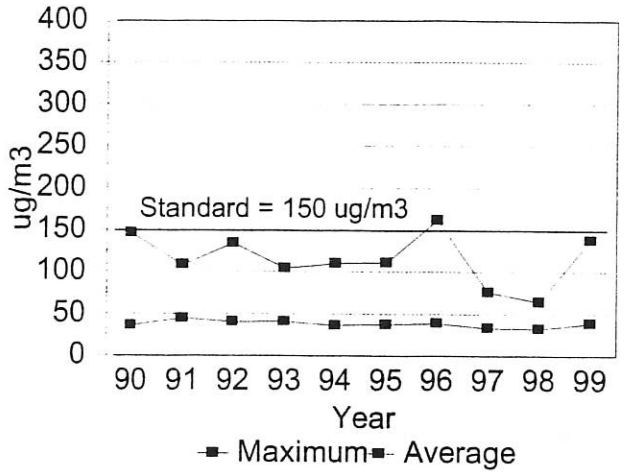
RESULTS:

Graph number 9 shows the 10-year trend for PM_{10} monitored at the Coleman site in Wichita. The annual average values have been stable over the ten-year period and well below the annual standard. The year 1996 shows a high 24-hour PM_{10} value due to extremely dry weather and high winds noted above.

Graph number 10 on the following page shows the 10-year trend for PM_{10} at 444 Kindelberger in Kansas City. The annual average values also have been stable over

3-18

PM10 Kansas City - 444 Kindelberger



1996 maximum was not a violation since the monitor was sampling every other day.

Graph 10

the ten-year period at this site. These values are also well below the annual standard. The year 1996 also shows an increase in PM values but they are not as pronounced as the values recorded at the Wichita site. Wind values were not as strong in the Kansas City area.

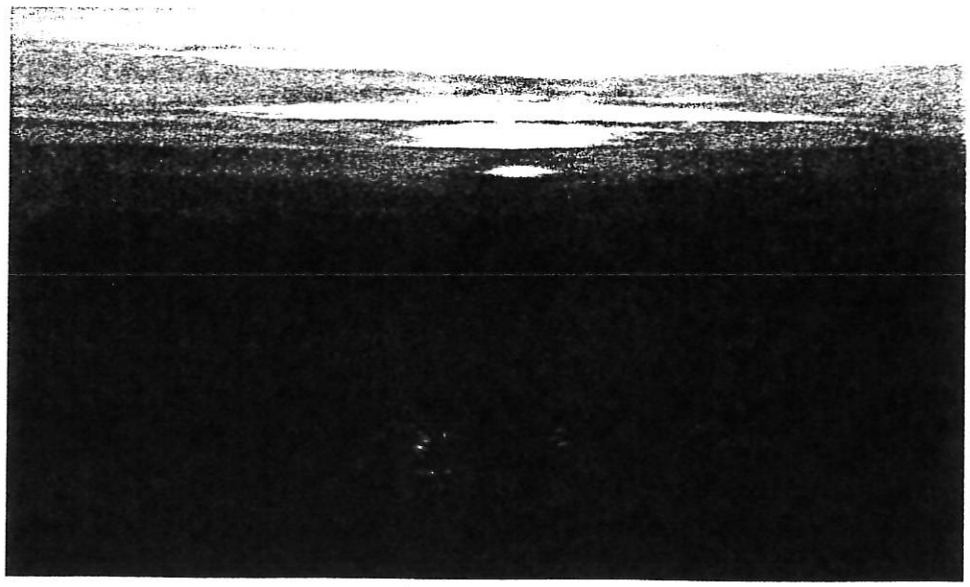
$PM_{2.5}$ - In 1997, EPA added a new particulate matter standard for particles with a diameter of less than or equal to 2.5 microns ($PM_{2.5}$). This change was based on concerns that smaller particles travel deep into the lungs and cause or aggravate respiratory problems such as asthma, and chronic bronchitis. Children, the elderly, and people with lung or heart disease are considered to be especially susceptible to the adverse health effects of airborne fine particulate matter.

Fine particles ($PM_{2.5}$) result from fuel combustion in motor vehicles, power generation, and industrial facilities, as well as from residential fireplaces and wood stoves. Research has shown that gases such as sulfur oxide and SO_2, NO_x, and VOC interact with other compounds in the air to form fine particles. The chemical and physical composition of fine particulate matter varies depending on location, time of year, and weather.

In response to the new standard, KDHE installed $PM_{2.5}$ samplers primarily in urban areas with the highest population densities in 1999. Sampling for background levels of fine particulate in rural areas will also be conducted.

RESULTS:

The $PM_{2.5}$ standards issued by EPA in 1997 were set for two time periods, an annual average and a 24-hour average. The annual average standard was set at 15 micrograms per cubic meter ($\mu g/m^3$), while the 24-hour average standard was set at 65 $\mu g/m^3$. The $PM_{2.5}$ monitoring data will be evaluated over a three-year period to determine whether problems exist. This three-year period began in January 1999. Initial indications are that many urban areas may exceed the annual $PM_{2.5}$ NAAQS. With only one year of $PM_{2.5}$ data complete, it is too early to gauge the impact the new standard will have on Kansas. The table on page 18 lists the values of PM_{10} and $PM_{2.5}$ that were recorded across the state in 1999.



1999 DATA

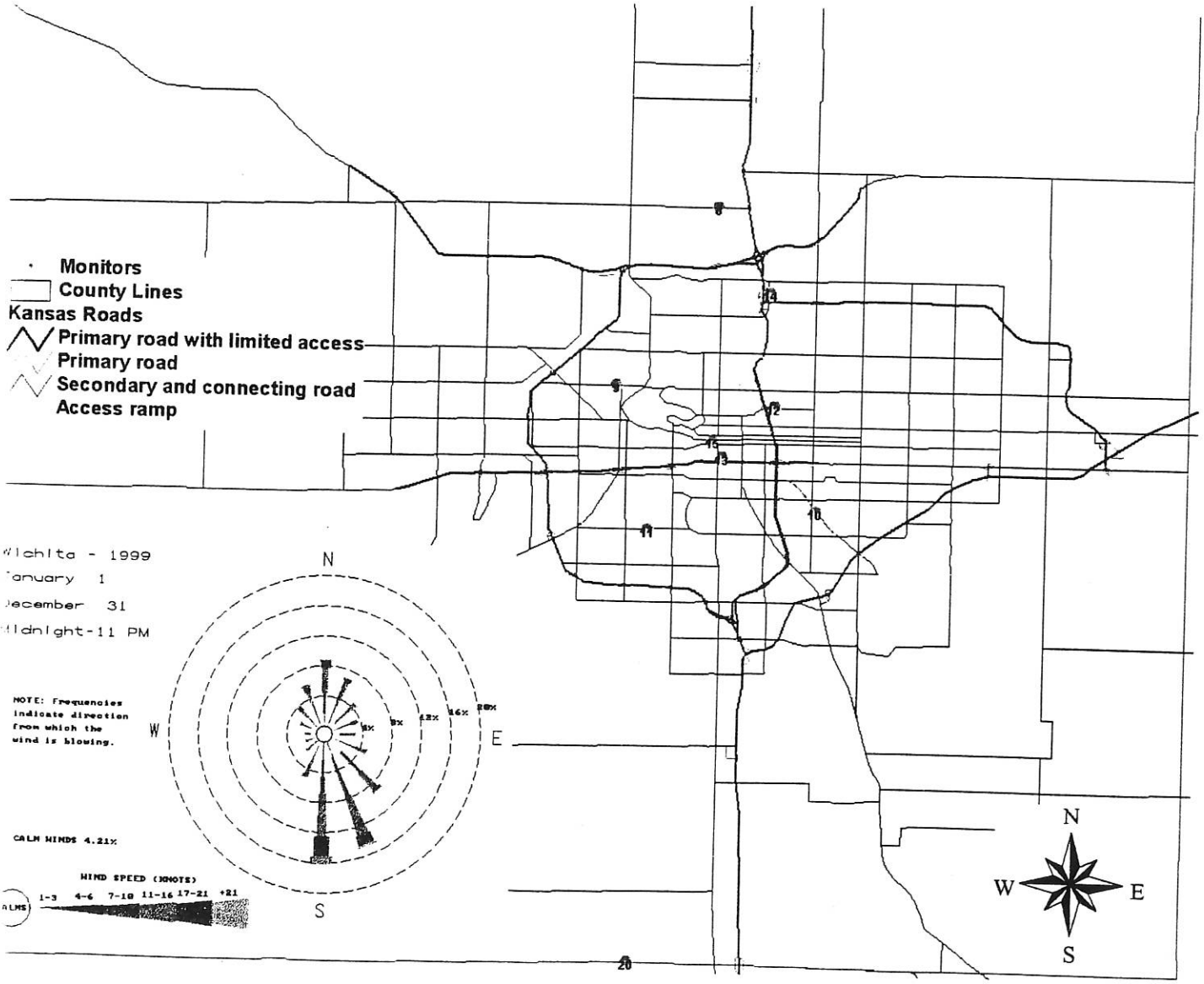
SITE	PM_{10}		$PM_{2.5}$	
	MAXIMUM (STD. = 150)	AVERAGE (STD. = 50)	98th PERCENTILE (STD. = 65)	AVERAGE (STD. = 15)
KANSAS CITY, KS / JOHNSON CO.				
420 KANSAS	109	40	N/A	N/A
FAIRFAX	138	39	N/A	N/A
JFK COMM. CENTER	N/A	N/A	34.2	14.5
HIGHLAND MIDDLE SCHOOL	N/A	N/A	28.6	13.2
OVERLAND PARK JUDICIAL CENTER	N/A	N/A	28.5	13.2
OXFORD MIDDLE SCHOOL	N/A	N/A	28.8	12.4
BLACK BOB ELEM. SCHOOL	N/A	N/A	25.4	11.6
WICHITA				
13th AND ST. PAUL	90	31	N/A	N/A
G. WASHINGTON & SKINNER	98	27	27.3	12.0
GLENN & PAWNEE	62	24	24.5	11.9
HEALTH DEPARTMENT	68	24	27.0	12.6
COLEMAN COMPANY	73	25	N/A	N/A
PECK (SUMNER CO.)*	N/A	N/A	17.4	8.8
TOPEKA				
ROBINSON MIDDLE SCHOOL	69	25	26.1	12.3
WASHBURN UNIVERSITY	76	27	24.8	13.0
MCCLURE ELEM. SCHOOL	N/A	N/A	27.4	12.5
OTHER SITES				
DODGE CITY	94	31	N/A	N/A
COFFEYVILLE	72	26	N/A	N/A
CHANUTE	99	35	N/A	N/A
GOODLAND	131	31	N/A	N/A
MINE CREEK (LINN CO.)	N/A	N/A	27.4	12.6

* - Peck started 17 Nov. 1999.

Wichita Ozone

The Wichita-Sedgwick County area has been experiencing a steady increase in monitored levels of ozone over the past decade. While the levels have not approached the 1-hour ozone standard of 120 parts per billion, the monitoring results are cause for concern when compared to the new 8-hour ozone standard of 80 parts per billion. The two graphs on page 20 show the ambient ozone monitoring trends for the two Wichita area monitoring sites that have been active for several years. KDHE recently added a site to monitor pollutants transported into the area just south of Sedgwick County in the town of Peck. The map below shows the location of the three ozone monitors as well as additional sites for other pollutants (#'s for each site correspond to the table on page 9).

Each graph shows the ozone values expressed in the form of the standard used to determine an exceedance, as well as the average of the daily maximums during the ozone season. The former values are important in evaluating how the area is



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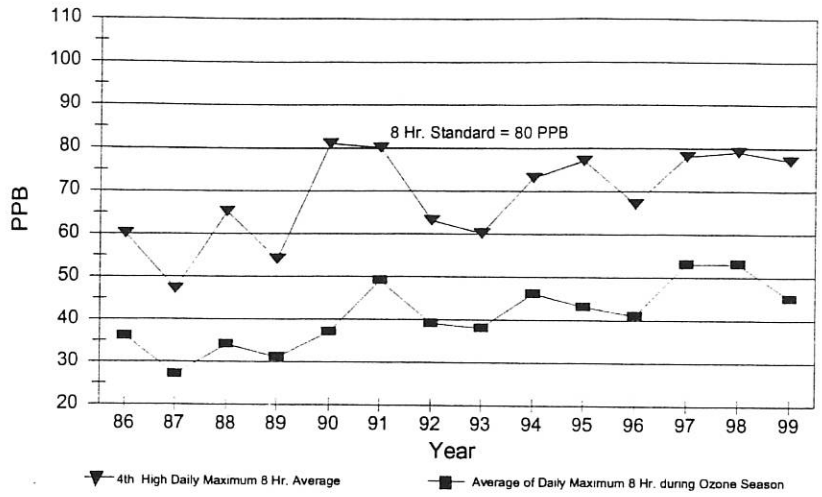
Park City - Ozone

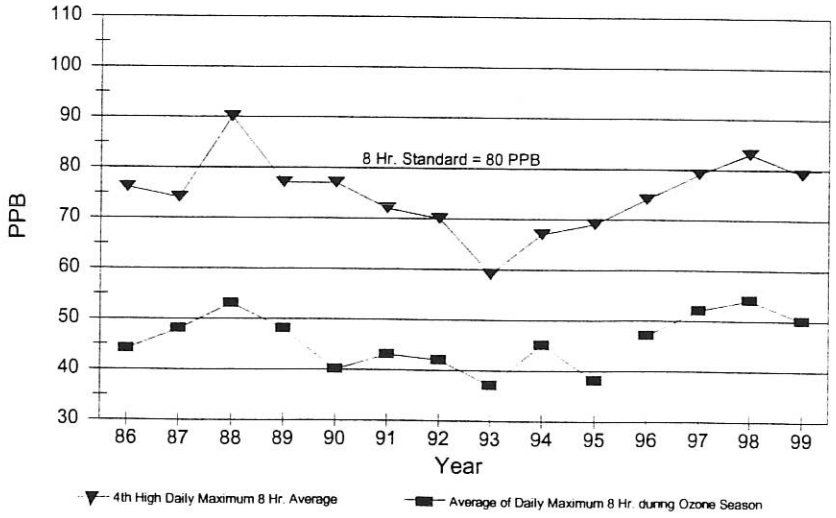


doing in regard to attainment of the National Ambient Air Quality Standard. The latter values are better indicators of how severe the ozone season was in a given year. The 8-hr values for the Wichita Health Department monitor for the last three years show how close Wichita is to an exceedance once the legal issues surrounding the 8-hour standard are resolved.

When EPA issued the 8-hour standard in July of 1997, local officials in Wichita-Sedgwick County recognized the need to take a proactive stance and agreed to participate in an EPA program known as the Voluntary Ozone Reduction Consortium. The purpose of the program is to develop voluntary ozone reduction strategies to attempt to stop the upward trend in ozone values for those cities across the country with ozone trends similar to those in Wichita. The social and economic impacts of an ozone nonattainment designation for a city like Wichita would be severe. The area would be required to develop a nonattainment plan addressing issues such as: additional regulations to provide for emission reductions from point sources; mobile source emission reductions; conduct an emissions inventory of all air pollution sources; and, ensuring that the transportation plan conforms with the air quality improvement plan.

Local officials, in 1999, formed a work group of individuals representing industry, government, education and the public to address the problem. The group has met monthly for approximately one year. Much of the first year has been spent educating group participants about ozone formation, monitoring and potential reduction strategies. The group is currently in the process of finalizing a preliminary report listing ozone reduction and education strategies that may be used in the area. KDHE is also working with local officials to have an area and mobile source emissions inventory conducted to better understand the sources of ozone precursors and to develop a baseline against which precursor reductions can be measured.

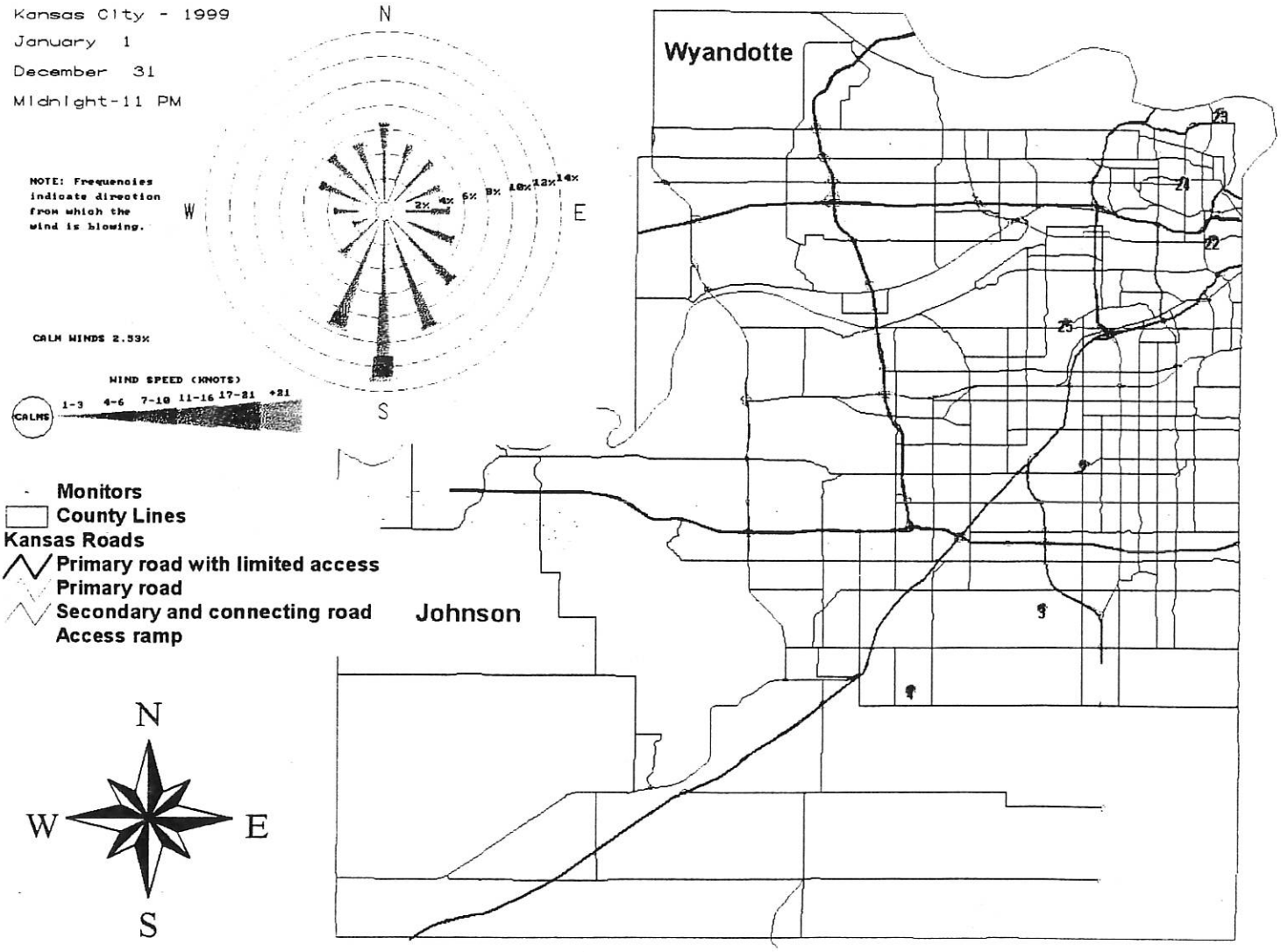
Wichita Health Dept. - Ozone



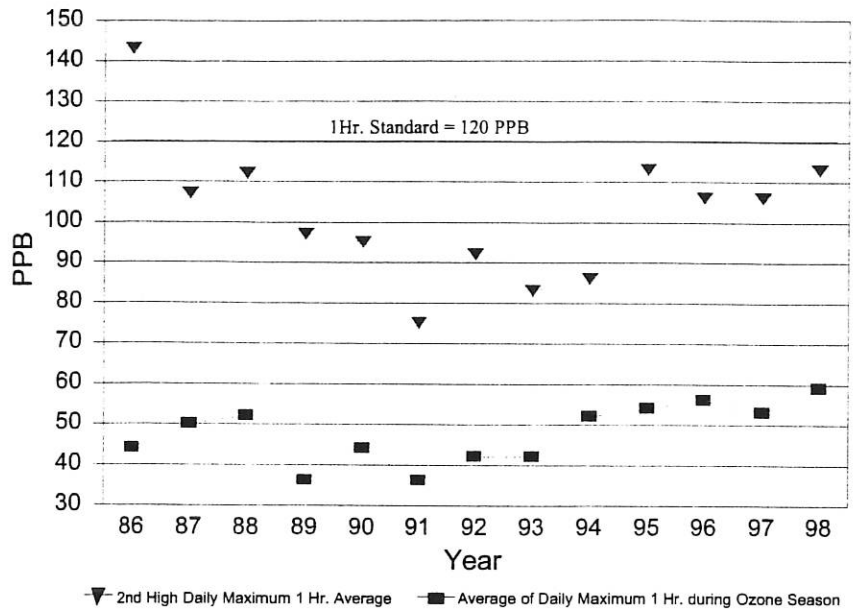
Kansas City Ozone

The federal Clean Air Act (CAA) requires the U.S. Environmental Protection Agency (EPA) to promulgate National Air Quality Standards (NAAQS) for six classes of criteria pollutants. The six criteria pollutants are: ozone, particulate matter, sulfur oxides, nitrogen oxides, carbon monoxide, and lead. The CAA further requires that if any area fails to attain the standard for any criteria pollutant, the respective state must develop and implement a State Implementation Plan (SIP). The map below shows the location of the ozone monitor in Kansas City, KS as well as additional sites for other pollutants (#'s for each site correspond to the table on page 9).

The Kansas City Metropolitan Area (KCMA) was determined to be in violation of the ozone NAAQS in the 1970's. Subsequently, the state of Kansas developed and implemented an ozone SIP for the Kansas side of the KCMA, which includes the counties of Johnson and Wyandotte. EPA approved the 1979 Kansas SIP, which



Kansas City - Ozone



projected that the KCMA would meet the ozone NAAQS by December 31, 1982. However, in calendar years 1983 and 1984, the ambient air monitor data for the region revealed that violations of the ozone NAAQS had occurred. These violations required the state to make revisions to the 1979 SIP.

Accordingly, the SIP was revised to include additional control measures for the region. With further reductions of volatile organic compound (VOC) emissions in the area, the new SIP projected the area would be in attainment of the ozone NAAQS by December 31, 1987. In November 1989, the SIP was fully approved by the EPA. However, efforts to redesignate the area to attainment were halted when the area experienced several exceedences of the ozone standard in 1988.

Kansas and Missouri continued monitoring for ozone in the area. At the end of 1991, sufficient monitoring data was available which demonstrated that the area had attained the standard. Under the provisions of the federal Clean Air Act Amendments of 1990, KDHE revised the Kansas Ozone Maintenance Plan portion of the SIP for the KCMA to reflect that the KCMA had achieved the ozone standard. This Maintenance Plan, which the EPA approved on June 23, 1992, contained documentation that supported the redesignation of the area to attainment and provided for contingency measures if violations of the ozone standard occurred in the future.

In the summer of 1995, the Midwest experienced a period of severe hot weather, with temperatures exceeding 100° for several days. During this hot spell, the KCMA recorded a violation of the ozone standard at the Liberty, Missouri monitoring site for the three-year period from 1993 to 1995. The recorded violation required KDHE to implement the contingency measures contained in the Maintenance Plan.

The contingency measures included 1) emissions offsets, 2) stage II vapor recovery or enhanced vehicle inspection and maintenance programs, 3) transportation control measures achieving a 0.5% of area wide VOC emissions reduction, and 4) an updated comprehensive emissions inventory for the Kansas City Metropolitan Area. In the weeks following the recorded exceedances, EPA was asked to provide guidance on the implementation of the contingency measures contained within the Maintenance Plan. The EPA responded by informing the states that they had flexibility in substituting other control measures beyond those specifically listed provided they resulted in equivalent emission reductions to those control measures contained in the plan.

To address the short-term

need to control emissions, Kansas promulgated a rule to limit the Reid Vapor Pressure (RVP) of the gasoline sold during the summer months in the KCMA to 7.2 pounds per square inch (psi). This regulation became effective May 2, 1997. To address the longer term need to reduce VOC and nitrogen oxide emissions, the Mid-America Regional Council's Air Quality Forum (AQF), comprised of representatives from local governments, business, health, and environmental organizations, agreed to examine various alternative control strategies and recommended the following measures: (1) expanding public education efforts; (2) low RVP gasoline; (3) motor vehicle inspection and maintenance; (4) seasonal no-fare public transit; (5) a voluntary clean fuel fleets program; and (6) additional transportation control measures.

In late July 1999, the governors of Kansas and Missouri petitioned the U.S. Environmental Protection Agency to allow the Kansas City area to opt into the reformulated gasoline (RFG) program to reduce automobile emissions and help the KCMA achieve the reductions in pollutants necessary to meet their obligations under the ozone plan. On January 4, 2000, a U.S. Court of Appeals ruled RFG could not be introduced into the Kansas City area because the area was not technically classified as non-attainment. According to the court, the introduction of RFG exceeded the EPA's authority under the federal Clean Air Act.

Now, the KCMA finds itself once again in a position of needing to devise another control strategy to reduce ozone-forming pollutants because of its past violations of the one-hour standard. At the same time, EPA has developed a more stringent eight-hour ozone standard for the country. Although this new standard is now being challenged in federal court, it is certain that if the Kansas City area continues its concentrations of ozone as in recent years, it will violate the new ozone standard, if and when it is implemented.

The graphs on page 22 and at the bottom of this page contain data from the ozone monitor that was located at the Unified Government Health Dept. through March of 1999. This monitor was relocated to the JFK Community Center in late March 1999 and began recording ozone readings on April 1, 1999. The following is a summary of the average ozone readings for the JFK site for the 1999 ozone season (April 1 - October 31):

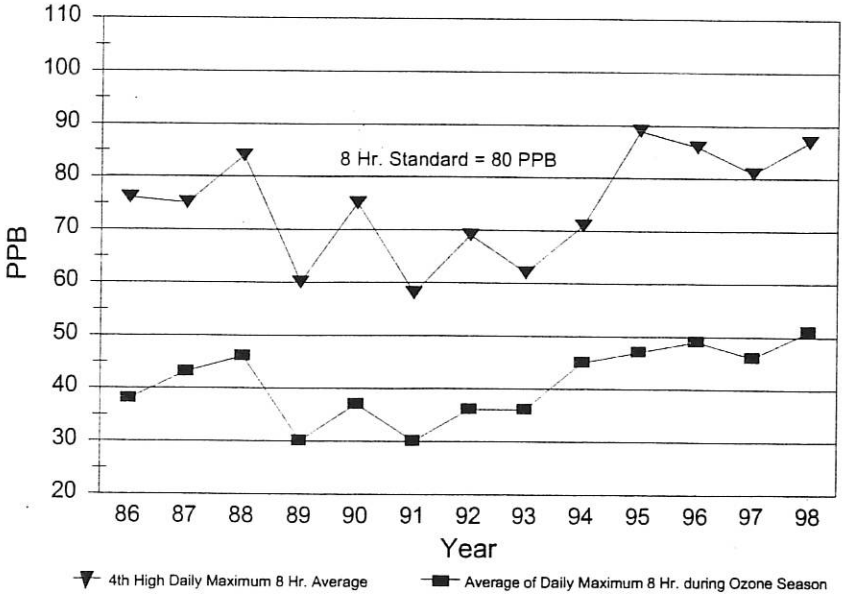
2nd High Daily Max. 1-hr Average – 94 ppb

Avg. of Daily Max. 1-hr during ozone season – 54 ppb

4th High Daily Max. 8-hr Average – 78 ppb

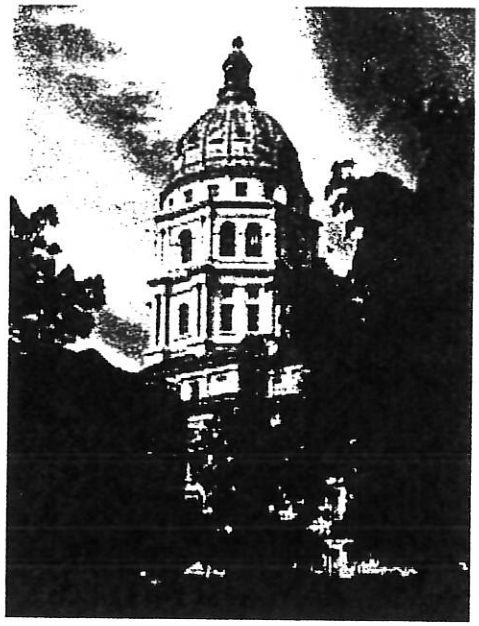
Avg. of Daily Max. 8-hr during ozone season – 47 ppb

Kansas City - Ozone



About the Bureau

The mission of KDHE's Bureau of Air and Radiation is to protect the public from the harmful effects of air pollution and conserve the natural resources of the state by preventing damage to the environment from releases of air contaminants. The bureau strives to achieve this mission through monitoring, permitting, planning, education, and compliance activities. These activities are conducted by four sections of the bureau and four local agencies.



Air Permit Section
Air Permit Section staff receive and review construction permit applications for new and modified emissions sources to ensure that they minimize the release of air contaminants and meet all requirements. The section also processes operating permits for the larger facilities. These include all applicable air quality requirements for a given facility in one permit in order to clarify for both the facility and the public what is required to comply with the air pollution regulations. The Unified Government Health Dept. assists in the permitting process by issuing all permits in Wyandotte county.

Compliance Section
The Compliance Section uses a combination of education, technical assistance and formal enforcement actions to ensure facilities subject to the air quality regulations comply with applicable requirements. Staff from KDHE's district offices and the four local agencies conduct inspections and forward the results to the compliance section for review and response. Section staff also oversee the testing of stack emissions, asbestos removal, and other sources of air pollution. When a source violates an air quality requirement, the staff works with the facility to correct the problem. In severe cases, they may take formal enforcement action to assess a penalty or direct compliance.

Air Monitoring Section
The Air Monitoring Section staff design and coordinate with the four local agencies to operate an air monitoring network. The network provides air quality data from 24 sites around the state. Some sites also contain meteorological stations. The collected data is analyzed using statistical tools to determine compliance with federal standards and to evaluate air quality trends. Staff members also conduct an annual emission inventory for the state that summarizes the emissions from all of the larger facilities in the state.

Planning Section
The Planning Section develops rules and regulations designed to protect Kansas' air quality while encouraging economic development. Public participation is a vital part of the regulation development process. Staff members work with businesses, interest groups, the public and government agencies, in many ways to ensure all viewpoints are heard in the process. The section also utilizes monitoring and emission inventory information to conduct air quality modeling. The modeling is used to evaluate the effectiveness of air pollution control strategies in areas such as the Kansas City metropolitan area.

Future Activities

Ozone Mapping

The Bureau of Air and Radiation is in the process of becoming involved in EPA's Ozone Mapping System (OMS). The OMS was developed by the Environmental Programs group at the North Carolina Supercomputing Center with support from the EPA as well as the Northeast States for Coordinated Air Use Management (NESCAUM), the Mid-Atlantic Region Air Managers Association (MARAMA) and the Ozone Transport Commission (OTC). The system includes an Automatic Data Transfer System (ADTS) and the Map Generator (MapGen) system that generates still-frame and animated ozone maps for use by states, television stations and others (Figures 4 and 5). The ozone maps and links to other air quality sites are available at www.epa.gov/airnow/ .

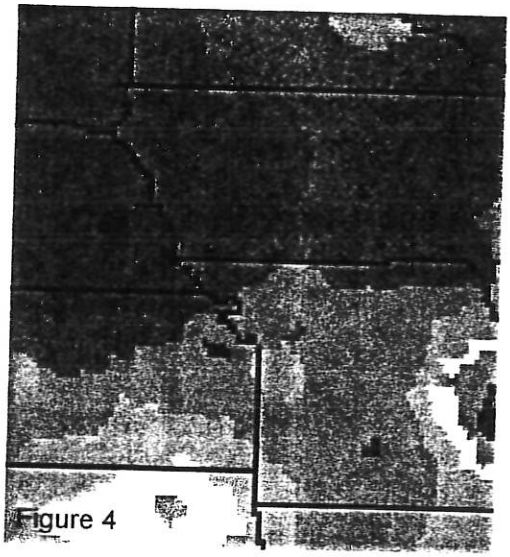
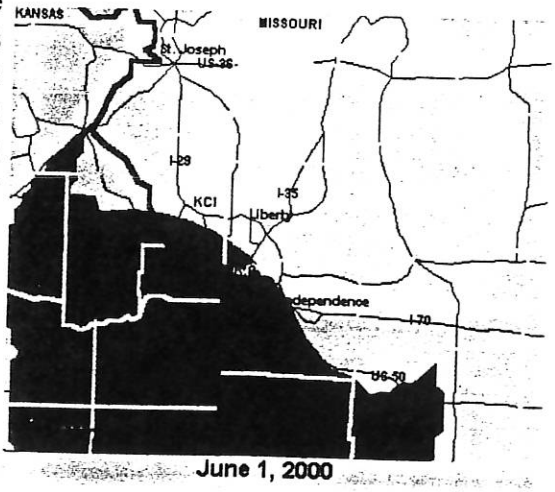


Figure 4

Government agencies have an obligation to inform the public about the potential health effects of air pollution and to communicate to the public when and where pollution levels may be unhealthy. One method used extensively in the past to communicate information about air quality to the public is the Air Quality Index (AQI). The AQI relates pollutant concentrations to potential health effects. It is calculated on a station by station basis but is normally reported as the highest value for an area. For this reason, the public may not relate to these reports of air quality because they do not consider the spatial and temporal extent of air pollution. A member of the public who experiences "good" air quality may be told, based on measurements taken tens of miles away, that the air quality is "unhealthy." The Ozone Mapping System presents a better way to communicate the geographical and temporal extent of air pollution and its potential health effects to the public.

For decades the program staffs of many air pollution agencies have produced air quality maps for internal use and some have developed automated Air Quality Mapping Systems (AQMS). More recently, software and standards have become available that allow for the animation of air quality maps. However, previous AQMS have been limited in utility because they did not incorporate information from nearby agencies. They also did not have the capability of producing these air quality maps in a form that could be readily disseminated to the public.

A regional AQMS improves the communication of air quality information to the public thereby allowing them to take steps to limit personal



June 1, 2000

3-27

exposure during periods of unhealthful pollution levels and to take voluntary actions to reduce pollution levels. A regional AQMS also helps gain support for clean air programs by educating the public about current air quality problems.

Because ground level ozone is a significant air quality problem in the United States and because ozone measurements are available at temporal and spatial resolutions suitable for mapping, the regional AQMS will continue to focus on ozone in 2000.

Meteorological Stations

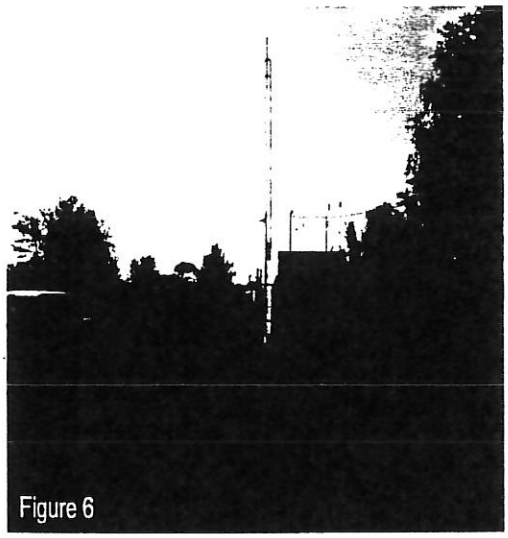


Figure 6

The Bureau will continue its efforts to develop meteorological stations at its monitoring sites throughout the state. At the end of 1999, one meteorological station had been established at the Mine Creek site in Linn County (Fig. 6). The following four sites should have stations by the end of 2000: (1) Cedar Bluff Reservoir, Trego Co., (2) Peck, Sumner Co., (3)Health Department, Sedgwick Co., and (4) JFK Community Center, Wyandotte Co. These stations will obtain data on temperature, wind speed and direction, barometric pressure and solar radiation and will allow staff to analyze conditions when exceedances occur at the monitoring sites.

DEPAWS

DEPAWS is an acronym for Dust Event Prediction and Warning System. The Bureau is currently considering a proposal from the Wind Erosion Research Unit (WERU) at Kansas State University to develop such a system.

Particulate matter smaller than 10 microns in diameter (PM_{10}) is regulated as a human health hazard with both 24-hour and average annual limits. When certain natural events are predicted to increase the potential for the particulate matter limits to be exceeded, the EPA Natural Events Policy requires a prior, public health warning of the event. In Kansas, dust events generated by wind erosion occasionally cause the 24-hour particulate matter limits to be exceeded. However, there is currently no reliable dust event prediction and warning system (DEPAWS) available to the Bureau to meet the Natural Events Policy warning requirements. Figures 7 and 8 show the effects of wind erosion across the state of Kansas.

WERU proposes to develop such a system with the assistance of the Bureau of Air and Radiation. This system would predict the temporal and areal coverage of both dust emission areas and resultant downwind PM_{10} concentrations from wind erosion. The output products of the DEPAWS would be two watch area maps, similar to those used in public warnings for other weather hazards. The wind erosion hazard map would alert land managers to initiate preventive measures to control wind erosion and travelers to watch for possible


Figure 7

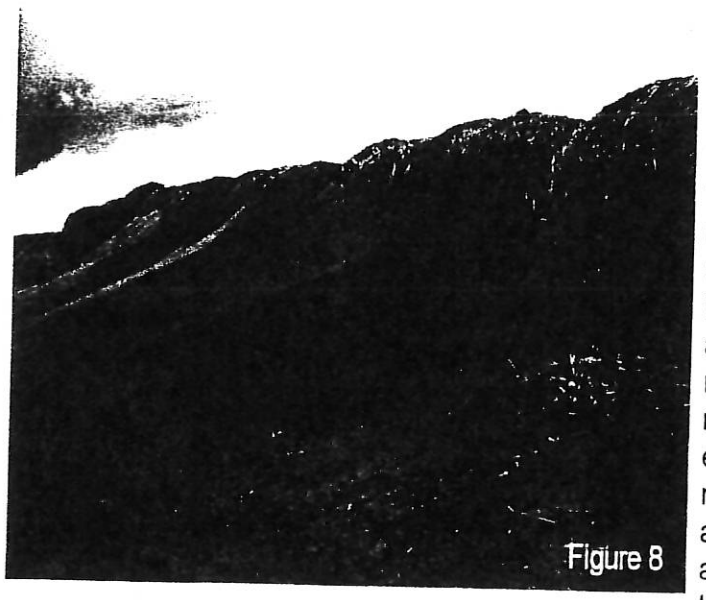


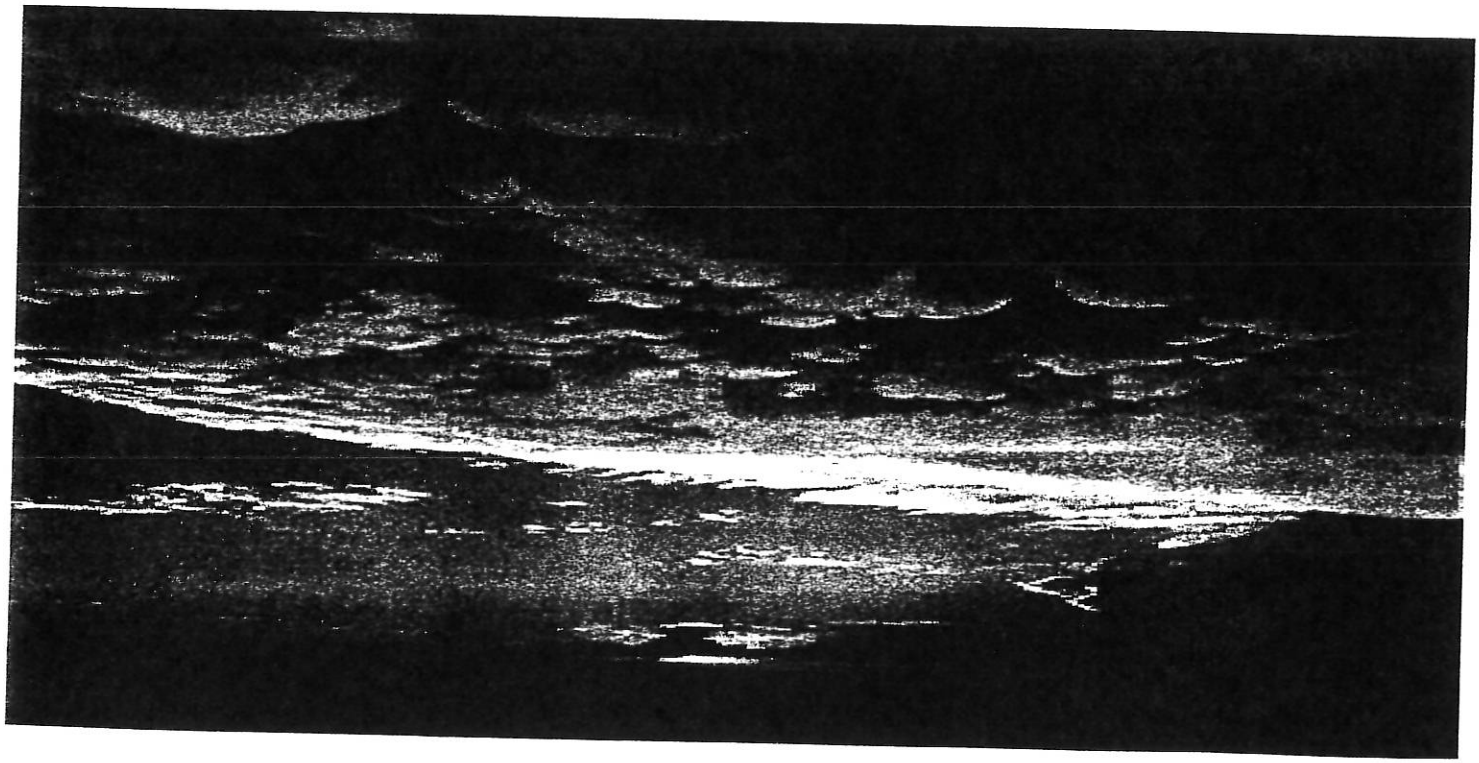
Figure 8

visibility hazards. A second map showing the downwind area affected by a PM hazard would alert the public to the health hazard from potential high levels of PM.

Kansas City

Kansas and Missouri, along with the Mid-America Regional Council, the EPA and various local agencies will be working to better understand ozone formation in the area. An atmospheric model will replicate emissions and meteorology for a multi-state area during three periods when local monitors detected high levels of ground level ozone. The effectiveness of various VOC and NO_x emissions reduction strategies and the transport of pollutants from other areas can then be evaluated in an effort to develop a comprehensive and effective program to reduce ground level ozone. Participation in this study by the regulated community, interest groups and the general public will be solicited as critical decisions begin to be made.

Also, during the next year, Kansas, Missouri, MARC, and the EPA will update the VOC, NO_x and carbon monoxide emissions inventories for the Kansas City area. This updated inventory will benefit from advancements in emission estimation techniques that have occurred since the last inventory. It will quantify VOC, NO_x and CO emissions from mobile sources; point sources, primarily major industrial and business sources; area sources, such as smaller industrial and business sources, consumer products and household sources; and biogenic sources, or plants.



Glossary

Air Quality Standards: The level of selected pollutants set by law that may not be exceeded in outside air. Used to determine the amount of pollutants that may be emitted by industry.

Attainment Area: An area considered to have air quality as good as or better than the national ambient air quality standards as defined in the Clean Air Act. An area may be an attainment area for one pollutant and a non-attainment area for others.

Carbon monoxide (CO): A poisonous gas that is odorless, colorless and tasteless. At low levels it causes impaired vision, loss of manual dexterity, weakness, and mental dullness. At high levels it may cause vomiting, fast pulse and breathing followed by a slow pulse and breathing, then collapse and unconsciousness.

Particulate matter (PM_{10} and $PM_{2.5}$): One of the "criteria pollutants," PM_{10} particles are 10 microns or smaller in diameter. The pollutant increases the likelihood of chronic or acute respiratory illness. It also causes difficulty in breathing, aggravation of existing respiratory or cardiovascular illness and lung damage. In addition it causes decreased ability to defend against foreign materials. New laws have just been passed regulating $PM_{2.5}$, an even smaller and more harmful class of fine particles less than 2.5 microns in diameter. Kansas is beginning to monitor its concentrations.

Inversion: An atmospheric condition caused by increasing temperature with elevation, resulting in a layer of warm air preventing the rise of cooler air trapped beneath. This condition prevents the rise of pollutants that might otherwise be dispersed. Trapping pollutants near the ground increases ozone to harmful levels.

Lead (Pb): Airborne lead appears as dust-like particles ranging from light gray to black. Low doses may damage the central nervous system of fetuses and children, causing seizures, mental retardation and behavioral disorders. In children and adults, lead causes fatigue, disturbed sleep and decreased fitness, and it damages the kidneys, liver and blood-forming organs. It is suspected of causing high blood pressure and heart disease. High levels damage the nervous system and cause seizures, comas and deaths.

National Ambient Air Quality Standards (NAAQS): Standards set by the U.S. Environmental Protection Agency (EPA) that limit the amount of six air pollutants allowed in outside air. These six are carbon monoxide, inhalable particles, lead, nitrogen dioxide, ozone and sulfur dioxide. The limits are based on what is considered safe for humans to breathe.

Nitrogen dioxide (NO_2): A poisonous, reddish-brown to dark brown gas with an irritating odor. It can cause lung inflammation and can lower resistance to infections bronchitis and pneumonia. It is suspected of causing a respiratory disease in children.

Nonattainment area: A region in which air monitors d more of a pollutant than is allowed by the National Ambie Quality Standards set by the U.S. EPA. The U.S. EPA designate a region as a "nonattainment area" for that pollu

Ozone (O_3): A colorless gas with a pleasant odor a concentrations. The layer of ozone in the stratosphere pro the earth from the sun's harmful rays. Ground-level ozon summertime hazard produced when hydrocarbons from exhaust and other fumes mix in the presence of sunlight oxides of nitrogen from power plants and other sources. O is more easily recognized in smog, a transparent summer that hangs over urban areas. The result is a gas aggravates respiratory illness, makes breathing difficult damages breathing tissues. Victims include people with disease, the elderly, children and adults who exercise out

Ozone Violation: One-Hour Standard - Four or exceedances of the federal ozone standard occurring three-year period at the same monitoring site. **Eight-H Standard** - Average (over the most recent three years) o annual fourth highest daily maximum 8-hour average o concentration is greater than 0.08 ppm.

Reformulated Gasoline (RFG): A fuel blend designe reduce air toxins and volatile organic compound (\ emissions by decreasing the amount of toxic compounds as benzene, lowering the evaporation rate and increasin amount of oxygenate blended with the fuel.

Smog: Dust, smoke, or chemical fumes that pollute the air make hazy, unhealthy conditions (literally, the word is a b of smoke and fog). Automobile, truck, bus, and other ve exhausts and particulates are usually trapped close to ground, obscuring visibility and contributing to a numb respiratory problems.

State Implementation Plan (SIP): A plan submitted by a or local agency to the Environmental Protection Agenc complying with national air quality standards.

Sulfur Dioxide (SO_2): A colorless gas with a str suffocating odor. Causes irritation of the throat and lungs difficulty in breathing. It also causes aggravation of exi respiratory or cardiovascular illness.

Kansas Water Pollution Control Revolving Fund (Clean Water SRF)*

Project Description:	Provides low interest loans for wastewater collection and treatment facilities.
Startup 1989	
Authorization:	Federal Clean Water Act (1987) K.S.A. 65-3321
EPA $:	166 Million
State Match Bond $:	33 Million (20% required)
State Leverage Bond $:	196 Million (over match)
Total Fund Assets	$412 Million
$ Loaned:	$397 Million
# Loans:	165
Rates:	Set by Regulation; 60% of 20 Bond Buyer Index

Points of Interest:

- Project funding by priority based on public health and environmental need.
- Annual independent audit since 1995.
- Loan program, not a grant.
- Rate approximately 3.5%.
- Large project needs drive leveraging bonds.
- Priority to capture federal dollars and prompt payments to municipalities.
- Presently revising fund to be used for nonpoint source pollution.

Legislative Initiative:

- Rural Hardship Assistance Grants - grant money from EPA passes through the Fund - $651,400.
- Wet Weather Water Quality Act of 2000 - grant money from EPA used in conjunction with low interest loans from the Fund - Est. $7 Million/year.

*Status as of 09/28/2000

KWM from RRG
KDHE/BOW – 01/18/2001

House Environment
1-23-01
Attachment 4

KANSAS WATER POLLUTION CONTROL REVOLVING FUND
LOANS MADE

PROJECT	LOAN AGREEMENT	PROJECT	LOAN AGREEMENT
JO. CO.-1	4,978,200.00	SN. CO.(HD)-2	2,801,200.00
MILFORD	313,000.00	K.C. PLT. #8-1	531,041.00
JO. CO.-2	4,018,700.00	MAIZE	2,385,000.00
JO. CO.-3	3,583,100.00	ELLIS	750,000.00
RENO CO. 202	400,000.00	CONWAY SPRINGS	470,000.00
JO. CO.-4	4,110,000.00	HOYT	485,000.00
JO. CO.-5	2,100,000.00	TOPEKA(WBR)-3	2,283,600.00
SN. CO. SD42-1	996,800.00	GARDNER-1	2,331,950.00
SILVER LAKE	351,500.00	CHETOPA	376,000.00
HOLTON	1,215,200.00	MARYSVILLE	2,775,000.00
SPRING HILL-1	872,000.00	GARNETT	384,511.00
MERIDEN	500,000.00	COUNCIL GROVE	811,840.00
LOUISBURG	795,700.00	K.C.(BRHTS)-2	2,468,960.00
EDNA	69,800.00	OLATHE(CC)-4	4,200,000.00
HAYS	6,080,000.00	FRONTENAC	2,400,000.00
TONGANOXIE	671,500.00	HIGHLAND	633,725.00
BALDWIN CITY-1	367,290.00	WINCHESTER	210,500.00
INDEPENDENCE-1	543,000.00	JO. CO.(BR)-7	11,191,300.00
CARBONDALE	693,320.00	K.C.(SOLHD)-3	7,516,000.00
OSWEGO	480,000.00	GREAT BEND	5,590,000.00
TOPEKA N. PLT.-1	28,300,000.00	PLAINVILLE	750,000.00
JO. CO.-6	47,190,000.00	MADISON	423,200.00
LEON	130,000.00	HUMBOLDT-1	1,200,000.00
LENORA	161,780.00	WILLIAMSBURG	260,000.00
EUREKA	2,446,000.00	WAKEFIELD	285,000.00
ASHLAND	574,000.00	WAVERLY	160,000.00
HILLSBORO-1	383,000.00	DEARING	150,000.00
WASHINGTON	750,000.00	DOUGLASS	721,500.00
SEDAN	226,000.00	MAYETTA	200,000.00
OSKALOOSA	413,400.00	OXFORD	380,000.00
SCRANTON	151,000.00	PRATT	1,909,000.00
MCPHERSON-1	1,200,000.00	ABILENE	850,000.00
PARSONS	1,100,000.00	CLAY CENTER	425,000.00
OLATHE(WP#1)-1	550,000.00	QUENEMO	306,400.00
MAPLE HILL	239,700.00	COFFEYVILLE-1	2,864,200.00
HUTCHINSON	1,330,000.00	TOPEKA(OAKDIS)-4	4,330,136.00
GIRARD	1,138,000.00	TOPEKA(WPSL)-5	9,331,562.00
S. HUTCHINSON	2,242,450.00	GARDEN CITY	14,661,000.00
BURLINGTON	633,630.00	LaHARPE	760,000.00
BELOIT	2,440,000.00	COFFEYVILLE-2	9,909,540.00
OLATHE(MC)-2	915,000.00	COFFEYVILLE-3	1,072,000.00
BALDWIN CITY-2	450,538.00	MINNEAPOLIS	460,000.00
LINDSBORG	1,000,000.00	OSAWATOMIE-2	2,665,400.00
RUSSELL	3,000,000.00	BALDWIN CITY-3	400,000.00
HILLSBORO-2	400,000.00	ALMA	400,000.00
INDEPENDENCE-2	469,880.00	SEDGWICK	232,859.00
OSAWATOMIE-1	642,000.00	RILEY CO.(UP)	200,000.00
CIMARRON	1,264,600.00	BASEHOR	3,160,551.00
ROSE HILL	538,000.00	EUDORA	4,000,000.00
OLATHE(UCC)-3	4,138,160.00	ELDORADO	1,200,000.00
ELLINWOOD	1,685,600.00	DICKINSON CO.SD#2	300,000.00
KENSINGTON	300,000.00	AUBURN	957,957.00
HIAWATHA	400,000.00	LECOMPTON	162,100.00
COLWICH	1,433,470.00	MCPHERSON-2	1,127,000.00
WINFIELD (PHI)	2,700,000.00	AUGUSTA	9,636,760.00
WAMEGO	2,229,106.00	CANEY	600,000.00
TOWANDA-1	776,778.00	GEUDA SPRINGS	105,000.00
DELPHOS	350,000.00	LANCASTER	200,000.00
TOPEKA(HD)-2	1,268,700.00	MORAN	450,000.00

KANSAS WATER POLLUTION CONTROL REVOLVING FUND
LOANS MADE

PROJECT	LOAN AGREEMENT	PROJECT	LOAN AGREEMENT
EMPORIA	2,910,104.00		
EFFINGHAM	218,300.00		
PERRY	607,800.00		
SEDAN	702,600.00		
EDWARDSVILLE	130,000.00		
BUCKLIN	166,436.00		
UDALL	423,500.00		
HUMBOLDT-2	1,098,800.00		
HALSTEAD	1,000,000.00		
BELLE PLAINE	3,307,696.00		
LAWRENCE	42,173,000.00		
POMONA	760,000.00		
ELBING	276,000.00		
BUHLER	450,450.00		
ARKANSAS CITY	2,990,300.00		
ADMIRE	235,000.00		
MCCUNE	248,715.00		
ANTHONY	1,536,200.00		
GODDARD	500,000.00		
ATWOOD	771,000.00		
GARDNER-2	18,500,000.00		
INDEPENDENCE-3	6,000,000.00		
BENNINGTON	600,000.00		
STRONG CITY	401,500.00		
DENISON	100,000.00		
PRESCOTT	189,500.00		
HOWARD	1,000,000.00		
LaCYGNE	403,245.00		
MANKATO	317,750.00		
MCLOUTH	1,702,238.00		
BAXTER SPRINGS	622,242.95		
HANOVER	269,900.00		
SPRING HILL-2	3,299,000.00		
CHENEY	1,675,000.00		
JUNCTION CITY	5,628,155.00		
TOWANDA-2	142,000.00		
FORT SCOTT	5,575,000.00		
KINGMAN	4,350,000.00		
ARMA	1,677,900.00		
ST. MARYS	2,700,000.00		
HARTFORD	235,000.00		
QUINTER	398,350.00		
VICTORIA	1,405,000.00		
YATES CENTER	1,100,000.00		
LINCOLN CENTER	800,000.00		
MELVERN	155,000.00		
HOLYROOD	322,252.00		

TOTAL $396,576,627.95

Kansas Public Water Supply Loan Fund*

Program Description:	Provides low interest loans to municipal government to assist in construction of water works.
Startup:	1998
Authorization:	Safe Drinking Water Act (1996) K.S.A. 65-163d (1994)
$ Loaned:	$87 Million
# Loans:	42
Rates:	80% of 20 Bond Buyer Index

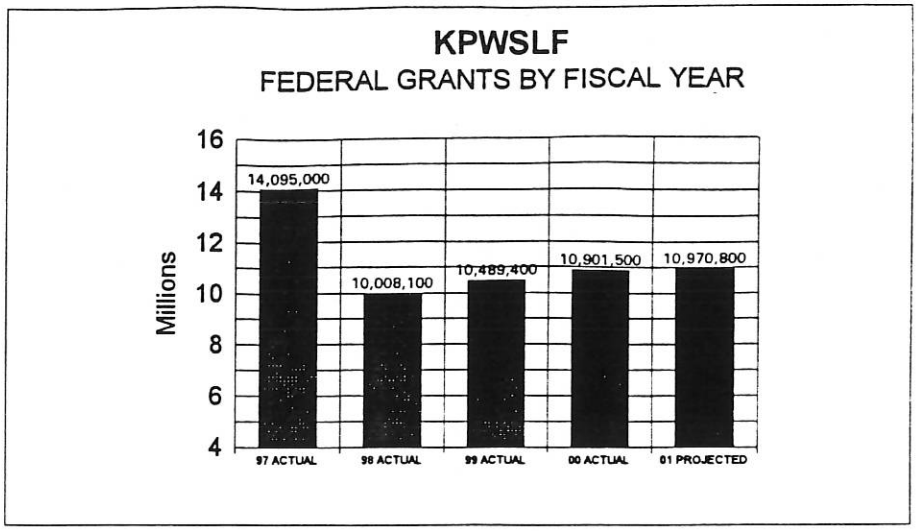
Points of Interest:

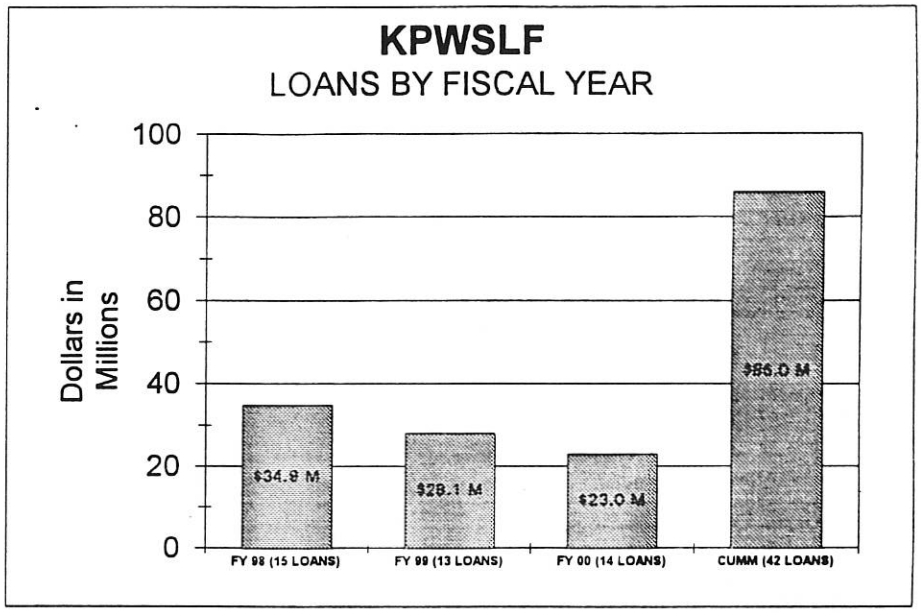
- Priorities for correction of violations.
- Close coordination with the Kansas Dept. of Commerce and Housing, Kansas Water Office, and the Federal Rural Development Agency.
- Rates approximately 4.4%.
- Priority to capture federal funds and prompt payments to municipalities.
- Reserve Account Leverage Programs - $1 federal equals $4 in state loans.
- Contract with Rural Water Finance, unique and successful.
- Staff shortages.

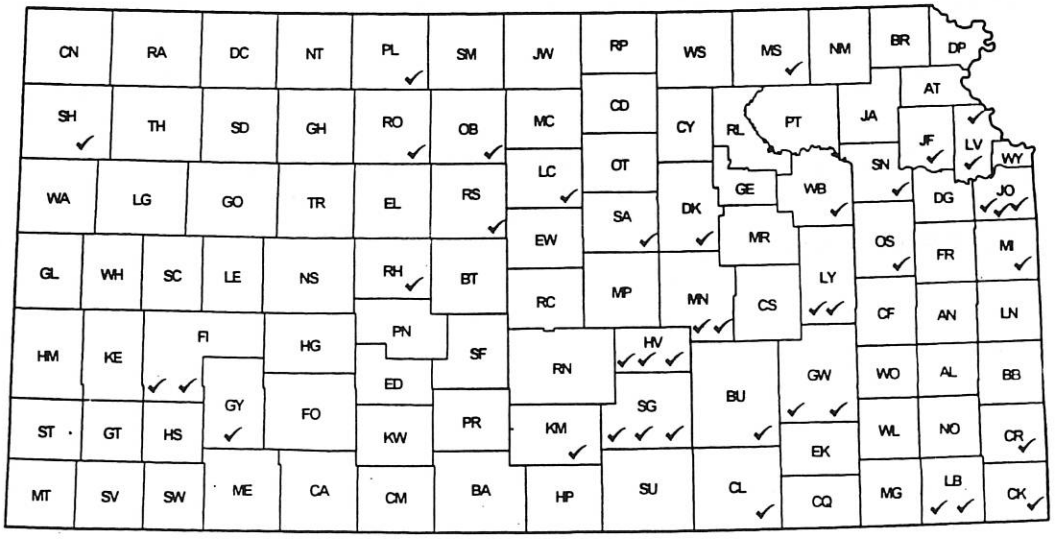
*Through June 2000

KWM
KDHE/BOW – 01/22/2001

House Environment
1-23-01
Attachment 5







KPWSLF
Projects Funded FY 2000
42 Projects - $87,229,055.49