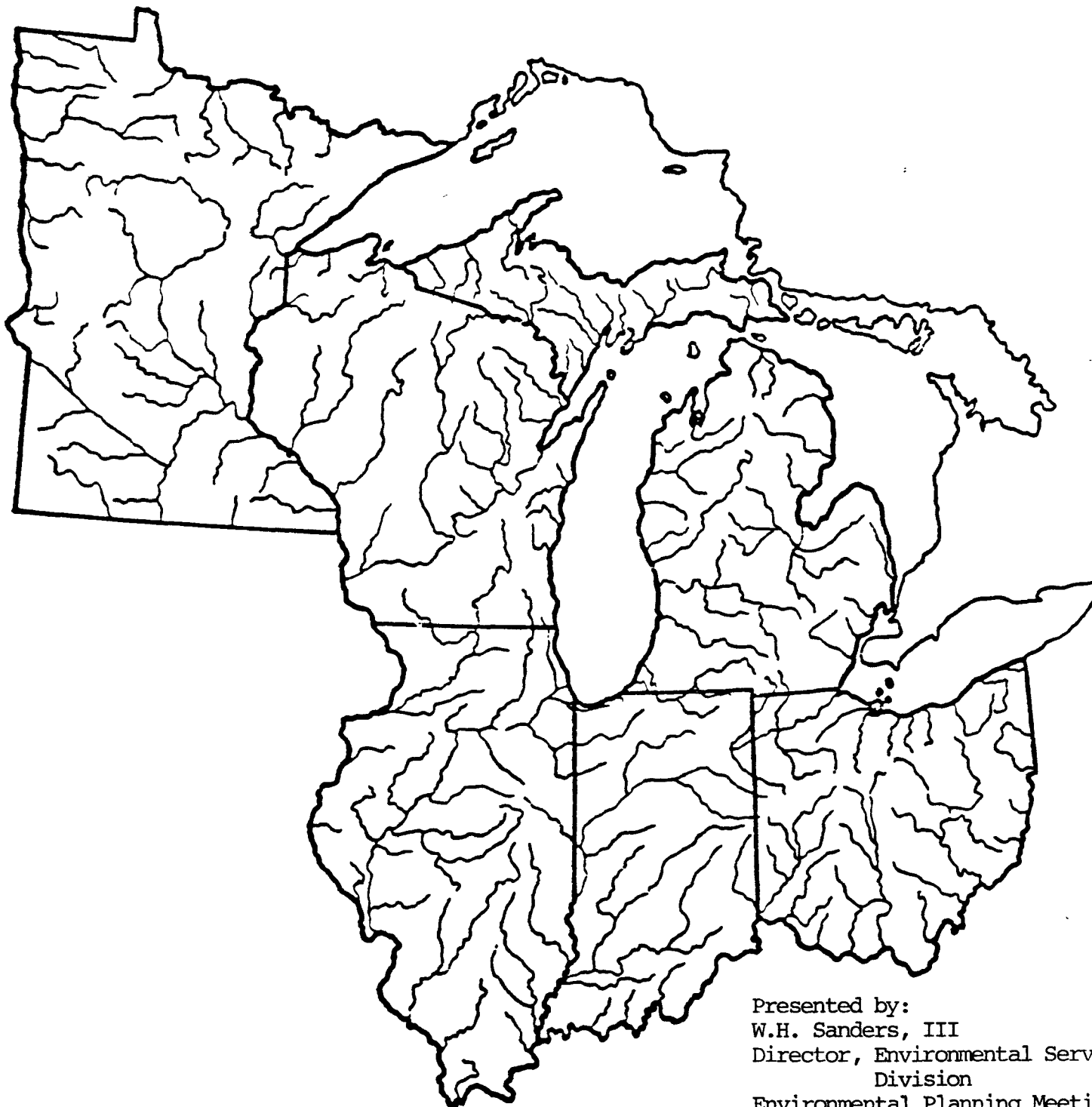




ASSESSMENT OF REGION 5

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Presented by:
W.H. Sanders, III
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Division
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BRIEFING
STATE OF THE ENVIRONMENT - REGION V
THE MIDWEST

Presented at Region V
Senior Management Retreat
Lake Geneva, Wisconsin
February 22, 1982

Introduction

We begin with a satellite view of the earth, not because we are going to address world pollution problems, but rather because it affords us an opportunity to present a concept that was conceived a few years back by a previous administrator -- that is the view of the world, and our pollution problems, as a biosphere. The biosphere concept is useful to us here as a way to put into proper perspective the connection between the air, water and waste and the fact that we need to think of the others as we address concerns in any one media. If we want to dredge the Chicago River, we must now be acutely aware of organic contamination of the dredged material so that, eg., it is placed in a secure landfill and does not become a source of pollution at that landfill. Building incinerators with tall stacks may adequately handle the sludge disposal problem at Detroit, but what about the resulting air pollution. And as we bring on line more secondary, advanced secondary, and AWT facilities, how do we ensure that the resulting increased amount of sludge, sometimes contaminated, is properly disposed of? In East Chicago, the solids have been recycled through the facility and discharged to the river. That situation has recently improved.

1 - Earth

But the point is, we are now much more keenly aware of the intermedia impacts of pollutants. We talk in terms of fate of pollutants, pathways to exposure, population at risk, etc. The problem in putting together a total, if you will, waste disposal "manifest", for the biosphere, are the differences amongst the many environmental programs in terms of program maturity, the unique aspects of each medium, the ability to monitor cause/effect relationships, our desire to do so, etc.

2 - 4 Source
Types

It may be useful to digress just a moment to talk conceptually. Whatever the program, there are a series of levels that we move through. We can think of those levels as a continuum. At the one end of the continuum, we have actions taken by the programs, be it an enforcement order, issuing a permit, awarding a grant, or whatever. That action begets, hopefully, installation of pollution equipment at the next level, which results in reductions observed

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in source/emission monitoring. Those source reductions precede an ambient environmental impact, measured by our monitoring systems as standard exceedances/ violations. Beyond this level, we are interested in the effect on flora and fauna and, ultimately, the effect on human health and welfare as the furthest extreme on the continuum.

The further away you move from the program action end of the continuum, the more difficult it becomes to relate cause and effect. It is often extremely difficult to relate program actions to human health effects. The programs that we conduct are at various levels on this continuum of environmental accountability. The programs furthest along, somewhere at the ambient effects stage, are the Great Lakes, Air and Water Programs. None of the waste programs have reached this level eg., there is no ambient land monitoring network. At this point, depending on the program, we can only measure program actions, or assess the magnitude of contamination cleaned up on a case by case basis.

I went through that conceptual discussion to better explain what this presentation will cover. It is essentially the genesis of the task we faced in preparing for this presentation. We can perhaps talk about ambient air and water data, the latter both in stream and for the Great Lakes, and somehow attempt to tie our efforts to improvements. But what do you do with waste? There is no ambient land monitoring program. What does it mean to decertify a pesticide; to remove asbestos from a grade school; to permit a PCB destruction operation; to provide Interim Status Standards to allow a hazardous waste facility to continue operating; or to clean up an abandoned hazardous waste site having actually or even potentially degraded groundwater or surface waters.

The fact is that much of our activities are largely inferential, that is, we perceive the grossness of the overall problem, we take specific actions, and we measure our success primarily by those success stories. And that is essentially what we have prepared for this presentation, which by the way results from a paring down of an awful lot of relevant material provided by the program staff. I must explain that not all of the most significant accomplishments will be discussed. The driving thrust behind this is actual environmental accomplishment that we can see, taste, and smell.

Our approach here is to provide a general discussion of where we are, environmentally for each medium moving within each from the general to the specific, but always focusing upon regional concerns, and significant trends. I'll cover Air, Water (the Great Lakes as a unique and important aspect of the Water Medium) and Waste Programs. We

will provide general information to give you a perspective on the current environmental quality, where we have the institutional ability to do so (ie., air and water), and then focus on specific stories where our activities have resulted in environmental clean up -- success stories. I'll conclude with a presentation on the Chicago metropolitan area that I hope will be of interest to you, not only from the standpoint of your program accomplishments in this geographic area, but most importantly, as local residents whose lives and families are directly affected by pollution in this area. I do want to caution you that the length and detail of any individual medium presentation reflects more where we are on the measurement continuum, than on the amount of work and success you have accomplished for the individual medium.

THE GREAT LAKES

For more than a century, many of the Midwest's largest and most successful cities and industries have depended on the fresh water of the Great Lakes as a vital element in their growth. In return, billions of gallons of sewage and industrial and agricultural chemicals have been discharged into these lakes because it was the most economic and convenient way to dispose of the wastes. These discharges have prematurely aged portions of the lakes, caused fish kills and forced closings of many bathing beaches. Because the lakes act in many respects as a closed system - less than 1% of the pollutants entering the Great Lakes system leave the St. Lawrence in any single year -- they are an especially sensitive indicator of the effectiveness of environmental protection programs, as the accumulated pollutants often show their first effects (particularly chronic effects) in this vast interconnected lake system. Furthermore, since the Great Lakes basin includes more than 40% of the population, land areas and rivers in Region V, the responses of the lakes are a significant indicator of the success of remedial programs in place in the Region.

4 - Great
Lakes

Shown is a summary of the trophic status of the Laurentian Great Lakes. Problem areas are most evident in Green Bay, Saginaw Bay, Western Lake Erie and portions of Lake Ontario. Additional problem areas are generally found in the more shallow waters (shoreline of Lake Michigan, most of Lake Erie and the southeastern shoreline of Lake Ontario).

5 - Summary
Trophic
Status

While in the early 70's, the condition of Lake Erie became notorious, parts of Lake Michigan, Huron and Ontario were also becoming seriously polluted. Although problems are less severe in Lake Superior and northern Lake Huron, even these bodies of water have some pollution problems. For years, the tailings from taconite processing near Silver Bay, Minnesota were dumped into Lake Superior eventually leading to contamination of the Duluth water supply with asbestos like fibers. Dumping of the tailings ceased in April, 1980 as a result of a court order to initiate land disposal. However, the Duluth water supply is still being filtered prior to use. Analysis by the Duluth lab confirms the need for this.

However, the seriousness of the lake problems crystalize in Lake Erie. The next slide depicts a 47 year history of oxygen depletion in the lake. The rapidly deteriorating condition of the lake began to turn around after 1973. It was at this time that a concerted EPA, State and Canadian effort to halt pollution to the lake was initiated. In the most severely polluted lakes -- Erie, Ontario

6 - 6 time
views

and Michigan, major pollution ills still exist, but progress is being made. More than 5.25 billion dollars has been spent by EPA and the States in the last decade to help clean up the Great Lakes. Additional monies have been spent by local governments and industries in this effort.

The environmental impact of this concerted effort is, perhaps, nowhere more obvious than in the news article on the Lake Erie commercial fisherman who was quoted as stating that the 1981 season was the best sports fishing that he had seen in 29 years.

A 1978 survey of people who live and work along the lakes found that nearly all of them noted visual improvements in the lakes. Recreation industries -- boating and vacation resorts in addition to sports fishing - have been very active and several beaches long closed to swimmers have been re-opened. A survey on beach closings during 1980 is reported in the next slide. Of 520 beaches surveyed, 64 were partially closed or had restricted use because of degraded water quality. Beaches reported in the survey included all public beaches and many private beaches. Caution should be used in drawing conclusions on water quality based on coliform counts. The information is presented to illustrate impact of water quality on recreation.

7 - Beach
Closings

Two of the significant problems, eutrophication and contaminants, will now be discussed in more detail.

A. Eutrophication

Programs to control eutrophication through control of phosphorus inputs, particularly in the lower lakes, have been the cornerstone of the joint Canadian American agreement over the long term. The lakes have responded to these control programs in the following manner.

Efforts to remove phosphorus at major municipal treatment facilities in the Lower Lakes Basin has resulted in the virtual achievement of an average phosphorus effluent limitation of 1.0 mg/l at each facility. This constitutes the achievement of a major milestone for phosphorus control and is best illustrated in municipal loadings to Lake Erie. This achievement has come about because some of the largest plants that were formerly not expected to achieve this goal until 1986 - for example, Detroit - have advanced their phosphorus removal schedule and are now achieving their goal. The result is that total and soluble phosphorus concentrations declined significantly in the Detroit River between 1968 and 1979. Total phosphorus loads to Lake Erie were reduced from over 90,000 kg/day in 1968 to approximately 14,000 kg/day in 1979 (a decrease of 84%) due largely to the implementation of the phosphorus control programs in Detroit.

8 - Lake
Erie P

9 - Detroit
WWTP P

Correlated with these phosphorus loading reductions, there have been possible species change in the phytoplankton of Lake Erie, as oligotrophic indicator species have become more abundant, while populations of eutrophic species of plankton have declined.

10 - Seasonal
Abundance

Programs to limit discharge of phosphorus to 1 mg/l at municipal plants in the Upper Lakes are also underway. Significant declines of municipal phosphorus discharges into all three upper lakes have been observed. But a number of facilities on Lake Michigan have not yet achieved the desired level of phosphorus removal. When these facilities achieve 1.0 mg/l effluent limitation, further significant reductions in phosphorus loads to the lake will be effected.

When municipal point source control programs are completely in place, municipal inputs will contribute only 20% of the phosphorus load to the Lake Erie Basin, while nonpoint sources, primarily from agricultural land in the western basin of Lake Erie, will account for 60% of the phosphorus input.

B. CONTAMINANTS

Contamination of the Great Lakes by persistent toxic substances of anthropogenic origin currently represents the major environmental problem in the basin. With a history of commercial fishery bans, health advisories and the continued identification of new compounds in the Great Lakes, there is ample support for these concerns.

Until recently no major implications on human health were directly related to the water quality of the Great Lakes. However, current research indicates a direct linear correlation between PCB contamination in Lake Michigan fish and levels of PCBs in the blood of sport fishing families in the 18 Michigan counties bordering Lake Michigan.

Restrictions or bans on the use or manufacture of chemicals deemed to represent environmental hazards are the major remedial efforts of Canada and the United States. Both countries are developing legislative controls. As many of the toxics problems encountered to date are historic in nature, control of human exposure to these materials has resulted in many restrictions on sport fisheries and bans on commercial fisheries.

Most organic contaminants, because of their diffuse atmospheric input and because of their persistence, have become basinwide problems. Because of the widespread usage of pesticides, such as DDT and herbicides, and organochlorines such as PCB, there

is a strong tendency for these contaminants to cause systemwide problems. For example, in 1978 the Water Quality Board notified the International Joint Commission of the presence of dioxin in fish in Saginaw Bay. Follow-up studies examining dioxin levels in the eggs of herring gulls found dioxin levels between 9-14 nanograms/kg. in Lakes Superior, Huron, Erie and Michigan. Elevated levels were found in eggs from gull colonies in Saginaw Bay and from colonies throughout Lake Ontario. As shown on this slide, these elevated levels are considered to be the result of historic releases in that dioxin levels in Lake Ontario herring gulls have decreased from more than 700 nanograms/kg in 1971 to 68 nanograms/kg in 1980. General indications of declines of PCB, DDT and DDE have also been found in fish and gull populations throughout the basin, indicative of decreased exposure of the biological community.

11 - Dioxin
in
Herring

There has been a substantial decrease in the concentrations of organochlorine residues in a variety of species of small fish of Lakes Ontario and Erie. Declines in PCB concentrations have ranged between 22% and 89% in Lake Ontario fish samples. The general nature of this decrease in a variety of fish species implies a decrease in input of organochlorides to the system. Similarly PCB, DDT and mirex residues declined in herring gull eggs from both lower lakes during 1979. Declines are also reported for Lake Huron and Lake Michigan, although declines in Lake Superior were not as significant as in the other lakes. These declines also represent decreased inputs of contaminants to the Great Lakes.

Sediments are a natural historic data bank, representing past and present conditions of the Great Lakes. Generally speaking the highest levels of organic contaminants are found in the top few centimeters of the surfaces. Sediment organic contaminant concentrations, particularly PCBs and DDTs, tended to increase up to 1974-76. They have generally decreased since then due to imposition of manufacturing bans.

Metals of concern in the Great Lakes are primarily those which can bioaccumulate. They represent a potential threat to human health and the general ecological community. Mercury, tin, cadmium, copper, zinc and lead are the primary concerns for whole lake problems because of elevated levels and/or the ability to bioaccumulate. As shown in the next slide, the major routes of metals entering the Great Lakes are reported to be from loadings from rivers, streams and erosion which were found to be more significant than from point sources.

12 - Trace
Elements

WATER QUALITY

To illustrate the current quality of our review and streams, four of the traditional water parameters will be discussed. These are bacteria, dissolved oxygen, phosphorus and inorganic toxics (metals). These parameters were selected because of the availability of both historic and current data in STORET as well as being important parameters in judging stream quality. Bacteria and dissolved oxygen tell us the usefulness of the streams and whether the streams are alive or not. Inorganics (as well as organics) are of current interest across all media; especially as related to waste disposal sites. Phosphorus is of continuing interest in this Region, particularly with respect to the Great Lakes.

13 - General
WQ

The current status of each parameter will be displayed graphically using a slide based on 1978 data. These data were used in the 1979 Environmental Profile. Using 1980 data, I will update the slides verbally to give you the general current status of each parameter and will highlight significant changes in water quality where they are indicated.

Since the data base was not as well developed in 1978 some subjective judgement was used based on the States input for the 1979 Environmental Profile. As the use of STORET has expanded since 1978 the current data gives us a more accurate picture of stream quality.

The first parameter is bacteria. The bacteria levels improved generally in Illinois, Michigan and Minnesota streams from 78 to 80. In Illinois only the Chicago and Calumet Rivers remain unimproved. The most significant change in Michigan is the Grand River upstream of Jackson, which has gone from poor to good water quality. The Flint River has also shown significant improvement East of Flint. The one deteriorating stream is the Clinton River. In Minnesota generally improving water quality with respect to bacteria is seen. The most notable improvement is the Mississippi except at the Twin Cities where it remains poor.

14 - Bacteri

Indiana, Ohio and Wisconsin show that we have either no change or deteriorating water quality with respect to bacteria as follows: Portions of the Kankakee, White and Maumee Rivers in Indiana all show deteriorating conditions.

The slide you've been viewing shows all profiled rivers in Ohio to be poor water quality with respect to bacteria. The 1980 data indicates that there is NO change in those conditions.

Wisconsin lacks 1980 data in STORET for several rivers. However the 1980 data for the Black, Wisconsin, Fox and Oconto Rivers which is in STORET shows generally deteriorating conditions. The Mississippi, Rock and Sheboygan remain unchanged.

We can now move on to discuss the Dissolved Oxygen (D.O.) status for 1980. The slide again shows the 1978 data. The 1980 data shows improvements in the concentrations of D.O. throughout most States in the Region. Illinois had significant exceedances of the D.O. criteria on the Sangamon below Decatur but it improved above Decatur. The Mississippi showed severe and frequent exceedances of D.O. at several stations and the Kaskaskia displayed some isolated problems.

15 - D.O.

In Indiana the good water quality with respect to D.O. showed little change in 1980.

For Michigan we show no change in the basically good water quality denoted by the blue color with two exceptions. Data recorded for 1980 showed a couple of D.O. exceedances on the Tittabawasee above Midland, and, downstream of Owosso on the Shiawassee. Improvements were indicated on the Kalamazoo, on the Grand River except above and below Jackson, Michigan, and on the Flint River.

The water quality in Minnesota and Wisconsin with respect to D.O. remains good, with significant improvement on the Wisconsin River.

1980 data also showed improvement in the rivers of Southern Ohio. Improvements occurred on the Scioto River; the Gt. Miami, Little Miami and Muskingum River. The Mahoning and Maumee Rivers both deteriorated to poor water quality.

Phosphorus levels are depicted in the next slide. In 1978 we lacked phosphorus data for many rivers in Illinois and Indiana. The current data for Illinois rivers shows that the water quality is fair to poor in the Illinois, Fox and DesPlaines Rivers. We do show some improvement in the Sangamon and Kaskaskia Rivers from 1978 data.

16 - Phosphorus

The 1980 Indiana data on the major streams shows the quality as fair. The exceptions occur on the Kankakee River in Lake County. The exceedances at this downstream station reflect poor water quality. The Kankakee River receives very few wastewater discharges, therefore the high exceedances for phosphorus can probably be attributed to agriculture runoff. The East Fork of the White River in Lawrence County shows very high phosphorus exceedances which is also probably due to agricultural runoff.

Michigan data for 1980 clearly shows improvements in total phosphorus. The most significant improvement is the Detroit River but we also see improvements in the Kalamazoo and the Grand River.

In Minnesota we see a decline in water quality for phosphorus in portions of the Red River, the Mississippi, near the mid point of the upper Mississippi Basin at the Twin Cities, and the Cannon River. The quality change is from good to fair in all instances and can probably be attributed to urban runoff, combined sewer overflows and point source discharges.

Ohio continues to show high phosphorus concentrations throughout the State with one notable exception being some improvement in portions of the Great Miami River.

Wisconsin streams generally remain rated as good water quality for phosphorus.

The fourth pollutant is inorganic toxicants. The metals considered are arsenic, cadmium, copper, chromium, lead, mercury and zinc. The water quality based on the 1980 data reflects significant changes.

17 - Inorgan.
Toxicant

Deteriorating conditions are reflected for the Mississippi River in Illinois, and Minnesota, especially for exceedances of the mercury standard. Mercury exceedances were common for other rivers throughout the Region. These include the Wabash, White, Kankakee and St. Josephs in Indiana, the Detroit River in Michigan, almost all of the rivers in Minnesota and the Black, Little Miami and Mahoning Rivers in Ohio.

The Fox River in Illinois, by contrast, showed no exceedances for any of these metals and has shown improvement from poor to good.

Other rivers which showed improvement include the Grand River in Michigan, the Great Miami below Dayton and the Maumee, both in Ohio.

Grand River, Michigan

The Grand River in Michigan showed improvement of all four pollutants. This reflects a concerted effort on the part of the Regional Office, the State and the local communities along the river and provides an interesting success story.

The river has its headwaters in Jackson County and flows north and west to Lake Michigan at Grand Haven, draining about 400 square miles of land along the mainstream. Four major communities are situated along the river: Jackson, Lansing, Grand Rapids and Grand Haven. Beginning in the 1800s, man's continued impact on the river through agricultural runoff, municipal and industrial wastewater discharges and residential development caused degradation until in the 20th century many of the high quality aquatic species were replaced by more pollution tolerant species. By 1970 the area downstream of the Lansing wastewater treatment plant appeared uninhabitable for nearly all forms of aquatic life.

18 - North
Lansing
Dam and
Spillwa

Water quality problems including dissolved oxygen deficits, high total phosphorus values and elevated suspended solids from combined sewer overflows, industrial discharges and primary wastewater treatment discharges had decimated aquatic populations. There were major fish kills in both 1967 and 1968 from cyanide discharges.

Beginning in 1968 and continuing through today, a combination of factors, events and people have drastically turned this around. Plans were developed to upgrade wastewater treatment plants to secondary treatment. It should be noted that the East Lansing STP received an O&M award in 1979 and the Grand Rapids STP in 1981.

Ordinances were established to control the discharges of industries, especially in Grand Rapids. In 1973 and 1974 secondary treatment plants began to appear in the Basin. By 1974, although bottom sediments remained polluted with heavy metals, industry had decreased its discharges of metals by 90 percent. With these measures taken, fish began to reappear leading to the Izaak Walton League sponsoring a trout fishing contest.

Now almost every plant along the Grand provides secondary treatment. As a result, the water quality along the Grand has improved steadily each year from 1970 until present. Dams and fish ladders have been built along the river to enhance fish populations. This next slide shows the fish ladder during construction.

19 - Fish
Ladder
Con-
structi

The latest of these activities began in 1977 when five fish passage ways and support facilities were installed from Lyons to Lansing. The facilities are now complete. The last facility at Lansing was dedicated on October 2, 1981. The very next day, a fourteen year old boy was the first person to catch a salmon at the Lansing Dam - a 17-pound, 6-ounce Chinook salmon. Improved water quality and structural modification have made it possible for the Grand River to support active fishing and other forms of water recreation in the Lansing area.

20 - Fish
Ladder
Comple

Grand River, Ohio

Significant improvements have also occurred on the Grand River near Painsville, Ohio.

21 - WQS

Fish have returned to the lower Grand River. Local marinas and the Ohio Department of Natural Resources report fisherman have recently begun catching salmon, walleye, and small mouth bass in the lower Grand River. Brown trout have been stocked in the river the past few years, and are scheduled to begin returning to the river to spawn.

As recently as 1975 the lower Grand River was void of fish. Water quality in the lower portions of the river was characterized by low dissolved oxygen and high concentrations of chlorides, dissolved solids, phenols, cadmium, mercury and lead. Water quality standards

were routinely exceeded during low flow periods. The major contributors to the pollution problems of the Grand River were the Painesville and Fiarport Harbor STPs, Diamond Shamrock Corporation - Painesville Works, Clyco Chemicals, Uniroyal Chemical and Calhio Chemicals. Upstream of the industrialized areas of Painesville the water quality was good.

Region V conducted an intensive field investigation of the river in 1973 and subsequently developed a Waste Load Allocation Report for the basin in 1974. Implementation of the recommendations and the shut down of the Diamond Shamrock plant has resulted in a dramatic improvement in stream quality. The slide shows that when the recommended tertiary treatment plant at Painesville came on-line in 1979, dissolved oxygen standard violations downstream of the plant dropped to zero. Prior to 1979, the minimum standard was violated 10 to 75 days each summer. It should be noted that Painesville was a candidate for a Region, U.S. EPA O&M aware in 1981.

22 - Grand
River
D.O.

Industrial pollutant loadings have been substantially reduced as treatment has been installed and as process flows were tied into the adjacent Lake County-Mentor sewage system.

23 - EPA Sta
on Rive

The one remaining threat to a balanced biological community in the lower Grand River is the continuing leaching of hexavalent chromium into the river from an abandoned Diamond Shamrock landfill and the potential threat from other waste sites on Diamond Shamrock property. The landfills contribution of hexavalent chromium causes gross exceedances in the river's water quality for this pollutant.

Lower Fox River, Wisconsin

The 40 mile stretch of the lower Fox River from Lake Winnebago to Green Bay as colored coded on the next slide is heavily used for waste assimilation. Prior to 1975, the Wisconsin Department of Natural Resources determined that even with secondary waste water treatment and "best practicable treatment" for industries, that it would not be possible to achieve the desired minimum DO standards on the river. In 1975 the Fox Valley Water Quality Planning Agency, one of the original 208 Agencies was asked to model the river and provide a wasteload allocation that would meet the Clean Water Act requirements.

24 - Major
Dis-
charger
Fox Riv

<u>Slide</u>	<u>Description</u>
24	There are 14 major dischargers (12 industrial and 2 municipal) in Clusters I and II of the Lower Fox River from Neenah/Menasha to Kaukauna. The yellowed portions of the river are those areas identified by the QUAL III water quality model as dissolved oxygen sags. The first and

last of those areas were the most severe and resulted in the identification of the clusters of discharges principally responsible for that dissolved oxygen deficit. There are five industrial (Pulp and Paper mills) and two municipal discharges in each cluster.

The Wisconsin Code called for recreational use and fish and aquatic life in the Fox River. This meant a minimum DO standard of 5 mg/l would have to be met. At first it was uncertain if the 5 mg/l DO standard could be met without causing economic and social hardship. With the modeling both an economic and social impact study were conducted and resulted in a wasteload allocation based on a minimum 5 mg/l D.O. that would not pose severe social or economic impacts. By 1977, the majority of industrial dischargers in Wisconsin had met the BPT deadline. As of 1979 all but one of the pulp and paper mills in Wisconsin had installed BPT. This level of treatment has resulted in a 75% reduction in BOD and SS loadings during the past 7 years. These reductions have occurred despite continued increases in production during the same time period. During the past 2 years, the Fox River, except that portion north of Lake Winnebago, has been generally able to maintain a water quality standard of 5 mg/l D.O., which was previously not possible. This change has been brought about primarily by improved treatment of point source pollution.

25 - Fox
River
D.O.

Further improvement in water quality flowing into Green Bay occurred when the Scott Paper Mill closed. Before its pulp mill was closed at Oconto, Scott Paper was discharging an average of 40,000 lbs. of BOD per day. In comparison, all 16 paper mills on the Fox River discharge a total of 48,000 lbs. of BOD per day, but produce 20 times the pulp and 40 times the paper the Scott plant produces. In terms of water quality, the most significant aspect of this controversial closure is the dramatic improvement of the Oconto River. This has occurred during the relatively short period of time following the pulp mill closure. Since this time, DO levels have risen to water quality standards (5.0 ppm). In-stream concentration of ammonia nitrogen and BOD have been reduced to near background levels. Aquatic life is improving. However, it should be noted that while significant water quality improvements have been made, problems still exist. The segment below Oconto Falls still suffers major impacts from the pulp and paper mill.

26 - Small
boat
(fisherman)

The implications of the toxics monitoring completed to date are, perhaps, best viewed from the perspective of the priority pollutant program. In addition to inorganic data presented, this program also, includes organic data. This program was established to assess the water, fish and sediment quality for 129 parameters.

Region V became involved in the Priority Pollution Program as required by Headquarters through a Consent Decree that was brought against EPA by the National Resources Defense Council. Since that time, thirty (30) fate, exposure/risk, and dilution studies have been conducted from various locations throughout the Region (slide showing map of study locations).

27 - Map

With the exception of isolated areas such as the Grand Calumet River in Indiana, the overall results of the priority pollutant studies have shown less severe toxicity problems than had been expected. This was particularly true for organics, where at most sampling locations only a small number of the 55 organic priority pollution parameters were detectable in the water column. The sediment samples yielded a greater number of pollutants, but not in high enough concentrations to pose a serious problem.

Somewhat similar findings throughout the Country has caused Headquarters to reevaluate its position. It has now been determined that it is not necessary for the Regions to analyze for all 129 priority pollutants at each sampling site, but rather that each Region should use its own environmental risk assessment for the local area. However, at a minimum, Headquarters requires that 12 priority pollutants or categories of pollutants be looked at for additional controls on a nationwide basis, since they are projected to be present even after Best Available Technology (BAT).

28 - Pollu-
tants
which
may
require
analysis

I have mentioned treatment plants having been candidates for or having received O&M awards in these success stories. I'd like to take a little time here to discuss the performance of POTW's for the 1975-1980 period and tell you a little about the awards program.

For many years the performance of POTW's has been actively monitored by EPA and the States. The graph shows the national trend of POTW's from 1975 to 1980 in meeting or exceeding secondary standards.

29 - % meeti
seconda
standar

One significant action that Region V has taken to contribute to the national trend is the development of the O&M awards program. This slide shows the location and category of plants that have received awards. (1981). This program has received a favorable response in the Region.

30 - O&M
Awards

AIR QUALITY STATUS PRESENTATION

Region V Total Suspended Particulate (TSP) Status

While particulate emissions have decreased from 1970 to the present due mostly to the control of traditional industrial stack emissions and fuel switching, national summaries have suggested that ambient levels have not decreased as much in recent years because low level fugitive emissions from industry and windblown dust have not decreased. As of 1979, all or portions of 61 counties in Region V were designated primary nonattainment for TSP. Although not everyone in these counties is exposed to primary standard violations everyday, the population of these 61 counties represents 55% of the Region's total. A comparison of the attainment status based on 1980 data to that experienced during 1975-77 follows.

In 1975, 24% (225/947) of the TSP sites exceeded the annual standard while 7% (63/947) sites exceeded the 24-hour primary standard.

By 1980, 20% (197/971) (Change: -4%) sites exceeded the annual standard while 4% (39/971) (Change: -3%) exceeded the 24-hour primary and 28% (274/971) (Change: -10%) exceeded secondary standards.

31 - TSP,
1980

Thus, we note reductions of 4% primary and a surprising 10% reduction in secondary nonattaining monitoring sites. Progress is being made in TSP monitored areas!

As compared to 1975-1977, we note 52 counties showing improvement while only 7 showing a worsening condition.

Monitored Population Exposure

In a rough sense we can estimate the number of persons exposed to TSP concentrations at the primary, secondary, and attainment levels. We utilize the good assumption that monitors are now concentrated in the high population urban areas, thus the number of monitors is proportional to the population exposed. The Regional population exposed to TSP concentrations has decreased from 1975 to 1980 by 3-1/2%, with the monitored population exposed to primary standard violations decreasing to just under 17%.

This decrease in primary standard exposure is excellent considering:

- (1) Many urban areas already had the most significant decreases in TSP levels between 1970 and 1975.
- (2) Improvement in monitoring network after 1978, relocation of sites to peak concentration areas or "hot spot" special purpose monitoring and reduction of the number of TSP sites significantly under the primary standards (year after year).

Trends toward improved air quality with respect to TSP were noted in Detroit, Chicago, Indianapolis, Dayton, Akron, Youngstown and Madison. Although, as in the Regional trend analysis, almost half of the attainment sites remain statistically no change.

Highlighted Areas

Let's take a closer look at some of these areas and our successes in reducing TSP. With only a few exceptions, the Greater Detroit area in 1980 displayed improvement in TSP when compared with data for previous years. Wayne County displayed greater regional improvement as a result of a reduction in emissions.

On the first Detroit slide we see isopleths of the 1972 annual TSP geometric mean. The outer blue ring represents secondary level (60 ug/m^3), next is green (75 ug/m^3), yellow (100), pink (125), and (150) at the innermost ring. The second slide represents the isopleths for 1980. Changes are evident with shrinking areas of non-attainment to be confined to the inner area where the heavy industrial base is located. However, concentrations are even down in this area; the River Rouge site, for instance, improved 26% in 1980 over the previous year and the site at the northern edge of Zug Island reduced by 22%, to the lowest on record. The nonattainment sites are in close proximity to steel mills (Great Lake Steel - Zug Island and the Ford Steel Division Plant) which have been shown to be major contributors. Further improvements are expected through particulate reductions resulting from Michigan iron and steel regulations, industrial fugitive regulations, and nontraditional fugitive source strategies.

32 - Detroit
1972

33 - Detroit
1980

Another area, Middletown, Ohio, has made significant progress. I'm talking, of course, about the ARMC0 bubble. Having the knowledge that I would be giving the ARMC0 Steel bubble as a success story, I was shocked when I read the newspaper article that the ARMC0 Plant was to shut down -- only to read the fine print and realize that it was not the main facility in Middletown but the new coking plant in Miami! Actually, there is success in that employees in Miami will be working at the Middletown plant. But returning to TSP, ARMC0 Steel has employed an alternative emission control plan to reduce open dust emissions called a "bubble". This is a pie chart of ARMC0 TSP emissions to air. ARMC0 produces about 3 million tons of steel per year and is the major industrial source in this primarily commercial and residential area. The company submitted a bubble proposal consisting of extensive open dust fugitive control programs as a substitute for installing secondary control systems which would control process fugitives emitted from roof monitors on their blast furnace cast house, basic oxygen shop, and open hearth shop. From the slide, one can see there are alternatives to get to the same goal - TSP emission reductions - by cutting any of the pie in a cost effective manner.

34 - ARMC0
pie

ARCO reduced open dust emissions by reducing plant traffic, paved parking lots and 7 miles of roadway, comprehensive paved road cleaning program, dust suppressants, and storage pile spraying. TSP values obtained at a site near the plant every year from 1975-79 showed one of the highest annual averages in the Region (193 to 133 ug/m³ compared to 75 ug/m³ standard). A major monitoring effort since 1979 has shown post-control annual means measuring 75 ug/m³ representing a reduction of 54% from 1978 control level. In addition, no exceedances of the 24-hour primary standard were observed during all of 1980. These results demonstrate that an innovative fugitive dust control program can achieve significant air quality improvement and at the same time yield substantial cost savings to industry.

A third TSP nonattainment area is Steubenville, Ohio which at the beginning of this decade was one of the nationally renowned dirty areas! Indeed, this area of the Ohio River Valley has recorded some of the highest annual and short-term TSP concentrations ever recorded in this Region and air stagnation conditions were almost a weekly occurrence in this valley - much like a bowl with a lid trapping the contents! Within the last five years, there has been remarkable improvement in TSP air quality. The next slide shows the past 11 years of TSP air quality data at four monitors located in the vicinity of Steubenville and Mingo Junction. Concentrations recorded at these locations were over three times the primary annual standard. The Mingo Junction site has fallen steadily from 147 to 123 from 1975 1980, a significant downward trend. Likewise, three nonattaining sites in Steubenville have dropped from 135 to 91 with steady significant downward trend.

35 - Steubenville trends

Reduction in stationary source TSP emissions in Jefferson County 116,000 in 1977 to 48,000 in 1980 (a remarkable 58% reduction) reflect improvement in pollution control efforts here.

Region V Sulfur Dioxide Status

Regionally, most of the urban area wide reduction in SO₂ occurred prior to 1975 due to fuel switching, both home and industrial (coal to gas, oil, low sulfur coal). Only three sites in three counties exceeded the primary 24-hour standard for SO₂ in 1980 and only one site exceeded the secondary 3-hour standard, of the 347 monitors reporting. No site in the Region exceeded the primary annual standard in 1980. The counties with primary standard exceedances were Lake County, Indiana (Hammond - refinery malfunction), Dakota County, Minnesota (Pine Bend - refinery area), Marathon County, Wisconsin (Brokaw - paper pulping). The secondary violation occurred in St. Clair County (East St. Louis, chemical - oil refineries). By contrast, in 1975 there were 27 of 595 monitoring sites exceeding the primary annual standard and 27 exceeding the primary 24-hour standard. Remarkably, Ohio in 1975 had 21 of the 27 violating sites and in 1980 had none!

36 - SO₂, 1980

Thus, in reviewing the Region V SO₂ status in 1975-77 to 1980, we note that 11 counties improved and no county worsened.

Region V SO₂ Population Exposure

The Regional population exposed to primary SO₂ violations has been reduced from 2% in 1975 to a mere .3% in 1980.

Region V Nitrogen Dioxide (NO₂) Status

From 1975 to 1977 only 4-5 sites/year were not attaining the primary annual standard; however, in 1978 and 1979 eleven (11) and eighteen (18) sites (10 and 17 in Cook County, Illinois) exceeded the standards respectively. Although other cities showed increasing trend during this time, the standard was not exceeded. In 1980 only three sites, all in Cook County, exceeded the standard.

37 - NO₂,
1980

The phenomenon of an increasing trend for NO₂ is not limited to Chicago but to the Region as a whole (including Cleveland, Akron, Canton, and Indianapolis). In fact, nationally many major areas have shown this trend.

The Report to the Administrator for 1980 summarized that "nationally, ambient NO₂ levels increased 15% between 1975 and 1979 at 180 sites. Additionally, total NO_x emissions have increased 12% between 1975 and 1979 due to increase in the fuel consumed by power plants during this time period. Growth in vehicle miles travelled (35% increase) offset the NO_x emissions reduction per vehicle. While this increasing trend is cause for concern, it is important to realize that only 3% of NO₂ measurements at 933 sites with acceptable data exceeded the health-related standard."

Region V NO₂ Population Exposure

In 1978 only Cook County was listed as primary nonattainment with 12.8% of the Region V population. All other counties were designated attainment. The slide displays continued compliance in the Region with the exception of Cook County.

Region V Carbon Monoxide Status

In 1975 30% (22 of 73) sites exceeded the primary 8-hour health standard regionwide. By 1980 this was cut almost in half to 17% (11 of 64) of the CO sites exceeding the standard. Twenty-eight counties were designated nonattainment primary (47% of the Region's population). Mobile source CO emissions have been significantly reduced through the Federal Motor Vehicle Control Program (FMVCP) and transition from larger to smaller cars. Under FMVCP cleaner, more fuel efficient vehicles are introduced by requiring car manufacturers to make vehicles

38 - CO,
1980

able to meet increasingly more stringent tailpipe emission standards. Carbon monoxide, hydrocarbons, and oxides of nitrogen are the three principal auto pollutants requiring these more stringent standards.

Local air quality plans have been able to show a marked decrease in the amount of pollution credited toward mobile sources. For instance, in Milwaukee's seven county area, the base planning year of 1977 had 519,788 tons of CO emitted from mobile sources. By 1982, Milwaukee will have a reduction of 32% from the 1977 year to 354,964 tons.

Region V CO Population Exposure

Population exposed to primary CO violations has decreased from 1975 by 11%, down to just under 8% of the population exposed in 1980. Urban areas showing sites with decreasing trends are Chicago (3), Peoria (1), Saginaw (1), Detroit (3), Toledo (1), Dayton (1), Cleveland (1), Akron (1).

Region V Ozone Status

155 of 533 Region V counties were designated primary nonattainment in 1978. Strategies to reduce ozone concentrations in these areas impact over 75% of the Region's population. By 1980, of the 84 counties still monitored, 33 contained at least one site over the primary standard.

39 - O₃
1980

Regionally, by 1980 almost 11% fewer people than in 1975 reside in areas violating primary standards, down to just over 21% of the population residing in primary nonattainment areas.

Region V Ozone Trends can be Summarized by:

# Sites with increasing concentration	6 (5.9%)
# Sites with decreasing concentration	39 (38.6%)
# Sites with no change	56 (55.5%)

This summary dramatically illustrates a short-term decrease between 1978 and 1980, which appears to be due to a combination of factors: more conducive meteorological condition for ozone formation, calibration changes and changes in quality assurance procedures and reduction in emissions. Chicago, Detroit, Cincinnati, Cleveland, Milwaukee, St. Louis, and Louisville have all shown significant downward ozone trends, especially based on the 1979-81 data.

WASTE

Beginning in June of 1980, the Region became extremely active in using specific Federal authorities at uncontrolled hazardous waste sites. Although Superfund legislation was imminent, its pending status required all actions for cleanup to be taken under the authority of Section 311 of the Clean Water Act. During a six month period from June, 1980, the Region's activities associated with 311 increased approximately 1000 percent. The best example of these activities is described by our work at the Seymour Recycling Center, Seymour, Indiana. Our actions at this site, which is one of the largest in the country, significantly reduced the threat to both human health and the environment. Our specific efforts addressed collection and treatment of runoff from the site, determination of relative groundwater contamination and direction of flow, and removal of approximately 1/2 million gallons of hazardous substances. Although considerable work remains at this site, our activities under 311 have set the standard for fast track management approaches and administrative cost control mechanisms necessary at virtually all of the uncontrolled sites we must deal with.

40 - Seymour

41 - Seymour
drums

When the Superfund legislation was signed into law in December, 1980, Region V was well prepared to begin implementation. The Region is actively participating in the national remedial action site ranking process (national slide). Thirteen sites from Region V appear on the interim priority site list of 115 published last fall.

42 - CERCLA
Sites

In addition, we have underway seven Superfund removal actions. Of these, our action in Isanti County, Minnesota, provides a good example of environmental cleanup and State/EPA cooperation. Our specific actions here were phased to involve 1) removal of drums that had been abandoned at 4 different sites in the county, and, 2) excavation of buried drums at one of the sites. What we have done thus far displays the kind of public health protection and environmental cleanup that is readily achievable under the Superfund Law.

We recently completed removal of approximately 300 drums from the surface and, in a program first, we are about to conclude a contract with the State to undertake and direct the operations necessary for drum excavation, removal and disposal. At the conclusion of this latter effort, the groundwater contamination problem in Isanti County will, in large part, be resolved.

At the Rasem Tannery site in Ashtabula, Ohio we recently completed clean-up of approximately 80 drums of highly flammable waste solvents and a 5,000 gallon mixture of Toluene and water located in the basement of one of the buildings at the site. The site had posed a significant public health threat because of its close proximity to three neighborhood schools with a total enrollment of nearly 1,500 children, who would pass the site daily on their way to and from school.

Our removal actions under the authority of Superfund have addressed the following sites:

43 - Reg. V
Worst
Sites

Detroit Drums Detroit, Michigan	removal and disposal of randomly dumped drums	completed
Laskin's Waste Oil Jefferson, Ohio	remove contaminated waste oil and soil	completed
Ohio Drum Cleveland, Ohio	diversion of runoff around contaminated area	completed
Old Mill Rock Creek, Ohio	remove and dispose of waste solvents	completed
Rasem Tannery Ashtabula, Ohio	remove and dispose of waste solvents	completed
MIDCO I Gary, Indiana	remove and dispose of surface contaminants	in progress
Isanti Solvents Isanti County, Minnesota	removal of surface drums and buried materials	in progress
Berlin and Farro Swartz Creek, Michigan	stabilize runoff by deepen- ing sediment traps	in progress
Chemical and Minerals Cleveland, Ohio	removal and disposal of drums and contaminated soil	in progress
Greiner's Lagoon Fremont, Ohio	removal and disposal of contaminated waste oil and soil capping	in progress

PCB Disposal Site Approval Process

The PCB disposal site approval program has had an indirect, positive effect on the environment of Region V. The program approves equipment of facilities capable of destroying or removing PCBs from the general or industrial environment.

Industry is responding to the massive problem created by PCBs contamination by developing several types of full-scale equipment and facilities. Incineration, chemical detoxification, and disposal are the primary types. These may be stationary or portable.

Incineration is environmentally advantageous for two reasons: (1) It destroys PCBs, and (2) It saves energy by using the PCBs-contaminated liquid as equivalent replacement fuels.

Chemical detoxification provides three notable environmental benefits: (1) It destroys PCBs, (2) It allows recycling of purified dielectric oils, and (3) The equipment being developed is portable, thus eliminating the necessity to transport the PCBs-contaminated material. Stationary facilities have included:

- High efficiency boilers
- Incinerators
- Landfills

Portable facilities have included chemical detoxification.

(Show the "PCBs Disposal Site Approval Process Summary" Slide)
As of this date, USEPA Region V has approved or authorized 12 PCB disposal applications. These 12 authorized facilities have a combined disposal capacity of approximately 200,000 gallons/year of liquid PCBs and about 100,000 cubic yards/year of non-liquid PCBs. Eight (8) other applications are currently under review which, when approved will add a minimum 4.4 million gallons/year of liquid PCBs to the disposal capacity in Region V.

44 - PCB
Approval
Disapproval

Region V has been the leader in the country in developing analysis methodologies and permitting techniques for the program. Our approaches are being adopted by the other Regions.

The permitting of PCB disposal facilities and methods has an obvious positive impact on the PCB program. As facilities that have been holding PCB contaminated oils and other materials in storage begin to dispose of or reclaim the contaminated oils we will have fewer and fewer locations where environmental problems can occur.

45 - Chemical
landfill

School Asbestos Program

The Region has also been very successful in implementing EPA's Voluntary Asbestos Control Program for public and private schools in the Region, 17,621 (or 75 percent) have been inspected. Of those 2,035 (12 percent) required corrective action and 672 (33 percent) schools have taken steps to eliminate or control exposure to asbestos. It is estimated that 287,000 children are no longer being exposed to this source of asbestos.

Crete Metals Investigation

The success of a coordinated effort on a Federal, State and local level is evidenced by the outcome of the Crete Metals Investigation. The Region along with the Illinois EPA, a physician-toxicologist from Cook County Hospital and a vet from the U of I joined forces to identify the cause of health problems in humans and animals residing near this wire reclamation incinerator.

The human health complaints included several cases of respiratory and eye irritation, some skin disorders and a neurological disorder in one person. Several horses at a nearby stable had died shortly before the investigation commenced. In the spring, prior to their deaths, those horses and others were left overnight in a pasture where the maximum ground level concentration of pollutants from the incinerator was calculated to occur. All the horses exhibited fluctuations and difficulty in maintaining weight, and also had skin disorders. One mare gave birth to a blind foal this same spring. Several weeks later during the investigation, this mare died; she was examined for symptoms of exposure to toxic substances.

The acute human health problems were linked to air pollution from the operation of the wire reclamation incinerator, which frequently operated without pollution controls. Tetrachlorinated dibenzo-p-dioxin and tetrachlorinated dibenzofurans were found in ashes scraped from the inside of an incinerator and stack, in soil collected on site, and in a fat sample from the deceased mare. Soil from the pasture did not contain detectable levels of either substance.

The results of this investigation led to the shut down and removal of the incinerator and an improvement in the health problems.

PESTICIDES SECTION

2,4,5-T/Silvex Suspension

On February 9, 1979, the Administrator suspended the registrations of all pesticide products containing 2,4,5-T or Silvex. Certain uses of these chemicals were suspected of being carcinogens and of causing spontaneous abortion in pregnant women. All producers, distributors and known user groups were notified to remove the products from sale or use until certain label changes were made. Certain of the product labels could not be amended and registrations were finally cancelled.

It became known in early 1981 that the Minnesota Department of Transportation (DOT) and county maintenance offices had not been notified of the suspension order and, in fact, were still using the products for highway and rights-of-way brush control thus exposing applicator personnel and other citizens to an unacceptable risk. Region V in March of 1981, wrote all county engineers informing them of the suspension order and offering assistance in the proper disposal of any stocks on hand. Response was immediate and was directly responsible for the removal, from Minnesota, of 1600 gallons of 2,4,5-T Silvex. The Region directed the consolidation of stocks and the subsequent shipment to acceptable warehousing or disposal sites.

This action has effectively precluded the possibility of any further citizen exposure to the suspect chemicals and stopped rights-of-way spraying and the associated deposition of 2,4,5-T residues along Minnesota rights-of-way throughout the State.

As a result of this incident the Minnesota Department of Agriculture has set up a retraining program for Minnesota DOT applicator personnel.

Hazardous Waste Management Program

Implementation of the RCRA program is relatively new. Consequently, a positive environmental impact associated with the granting of RCRA permits cannot be clearly seen as yet. On the other hand, an indirect positive effect on the environment of Region V is apparent from our follow-up of compliance activities associated with inspection of facilities that generate, transport, treat, store, or dispose of hazardous waste.

Out of a nationwide total of approximately 66,000 generators, transporters, and TSD facilities which have notified USEPA of hazardous waste activities, almost one-quarter are in Region V.

46 - Where
are
Wastes

Since November 1980, over 1800 compliance inspections have been performed in Region V by EPA and State inspectors. These inspections have resulted in an overall positive environmental impact in Region V. In addition to the actions the States have taken in instances of non-compliance, Region V has taken more than 200 enforcement actions. Of these greater than 80 percent have been resolved by the facility coming into compliance.

CHICAGO

That concludes the media specific presentations, and brings us to that toddling town, Chicago. Along with the Regional Office, the Metropolitan Sanitary District and the City of Chicago have an abiding interest in the quality of the lake water--the primary source of drinking water for most of the population in the area.

47 - Chicago
Lake
Front

When you talk about the Chicago Metro area, you are talking about large numbers. We have here the greatest concentration of just about everything in the Region, from POTWs to steel plants, with the associated waste discharges and emissions. There are 529 counties in the Region populated by 44 million people. Of that number, Cook County alone contains 12.8 percent of the total population in the Region, or 5.6 million people. Of course, with this large number and concentration of people, environmental problems emerge.

Phosphorus has long been recognized as a significant problem for the near shore. Current evidence is accumulating from shoreline studies that detergent phosphate bans have resulted in significant improvements in near shore water quality. A linear regression analysis shows that the Indiana detergent phosphate bans have reduced nearshore concentrations, while extensive studies have been published that linked 50 percent reductions in the nearshore abundances of phytoplankton along Chicago's shoreline with the implementation of the City's detergent phosphate ban and reduction in discharges from storm runoff.

48 - P Trend

49 - Phyto-
plankto
reduc-
tion

There are 66 major municipal and 23 major industrial dischargers in the Chicago SMSA. At the present time, the waste treatment plants have an overall compliance rate of 66 percent. Due to the major emphasis on water quality in the Regional Office, at IEPA and MSD construction grants have been available to achieve secondary treatment of all municipal dischargers. This is particularly noteworthy in that this is the first major metropolitan area in the nation to reach such an achievement. However, urban runoff and combined sewer overflows have masked the impact of the secondary treatment on stream quality. (At this point, I'm going to be conspicuously silent and not mention TARP). In one sense though, water quality improvement can be measured by noting that there has not been any further degradation of the surface waters in the area, even though new dischargers are coming on line continuously.

In spite of the relatively high compliance rate for the STPs, lapses do occur as witnessed by the significant number of beach closings which occurred during 1980 (36 in all). You may remember that extensive investigative work was completed by the Region along with personnel from the MSD. The sampling enabled us to positively relate water and source samples and led to the identification of a Hammond

50 - No
Swimmin

Sanitary District pumping station as the source of the pollution. These problems have since been corrected following a concerted water program, enforcement and surveillance effort which fast tracked grant, litigation and construction of an additional sewer line from court order in November 1980 to the pipe on line in May 1981.

We were able to trace all of the beach closings to a source except one that appeared to be associated with pollution from Navy Pier. Chicagofest, 1980 was going on at that time. However, our previous Regional Administrator had recently absolved Chicagofest of any problems at a press conference and the connection to Chicagofest was not pursued. The MSD though, was alerted to the possibility. You may recall what happened the next year at the 1981 Chicagofest; leaking sewage lines were discovered which allowed raw sewage to discharge directly into the lake. That problem has also been corrected.

Chicago Priority Pollution Program

We are all well aware of other serious water quality problems in the NW Indiana area as well. We, therefore, conducted an extensive dilution study on the Grand Calumet River, Lake George Canal and the Indiana Harbor Canal. The study area is located entirely in Lake County in Northwest Indiana, an area of intense industrial activity, with a population in excess of 500,000. The environmental condition of the study area is considered to be severely degraded. Electro-shocking for fish was conducted in the Indiana Harbor Canal. Only one carp was collected and no other fish were observed. A comparison of the chemistry data with Indiana water quality standards shows exceedances for a number of parameters. These include:

51 - Indiana
Harbor
Canal

Ammonia-Nitrogen	Chloride
Cyanide	Fluoride
Phenol	Mercury
Total Phosphorus	Oil and Grease

Sediment data showed high concentrations in nearly all samples. Aluminum, iron, cadmium and barium were the most abundant. In addition, eighteen different organic compounds were detected at varying concentrations in the sediment samples. Although efforts are being made to improve the water quality in this part of Lake County, in fact, even this degraded condition is an improvement over the past years -- much remains to be done.

Well, how good is the air quality here? During the past ten years of air monitoring ambient standards for total suspended particulates (TSP), sulfur dioxide (SO₂), nitrogen dioxide (NO₂), carbon monoxide (CO), and ozone (O₃) have not been attained in all areas of the Chicago urban area. However, by 1980 with 232 actual air monitors in the Chicago area, only 30 sites (12.9 percent) were in excess of primary health standards for the criteria pollutants.

TSP

The greatest number of TSP air pollution sources in the Chicago urban area are found in Cook County and Lake County, Indiana where we have a high concentration of steel mills grain elevators, chemical plants and, refineries. However, some notable improvements have been made through the elimination of outdated, inefficient open hearths; the rebuilding of leaking coke batteries and the installation of new, cleaner steel making furnaces and particulate control devices. Since this equipment can be expensive and the problem so immense, the retrofitting has taken more years than planned. State implementation plans to address excessive TSP emissions in southeastern Cook County and Lake County Indiana include completion of TSP related technical studies and implementation of new source review. As a result of these efforts, a 50 percent reduction in steel mill process and 50 percent reduction of fugitive dust emissions has occurred.

52 - TSP
Sources
SE
Chicago

Carbon Monoxide

In Chicago, CO concentrations and frequency of exceedance of the standard are generally decreasing with time. This is particularly true for the downtown monitoring sites. The most likely cause of these downward trends is a downward trend in mobile source CO emissions. Mobile sources are the predominate source of CO in the Chicago area. Mobile source CO emissions have been significantly reduced through the Federal Motor Vehicle Control Program (FMVCP) and through the public's transition from larger to smaller cars.

53 - Loop
Traffic

Ozone

As is the case of CO, ozone concentrations in Chicago have decreased significantly from the pre-1978 levels. This observed downward trend can probably be attributed to reduction in emissions of volatile organic compounds (VOC) as well as an improvement (less conducive to ozone formation) in meteorology. A number of VOC emission control programs have been implemented in the Chicago area. These include controls on evaporative emissions, combustion emissions, and mobile source emissions. Strategies for reducing hydrocarbons and thus the ozone problem have included again the Federal Motor Vehicle Control Program (FMVCP) and volatile organic vapor lablace control. The FMVCP should reduce hydrocarbons by 56 percent - from 248,613 tons in 1977 to 109,666 tons in 1987. (Slide on VOC Emission Reduction in Chicago) The employment of reasonably available control technology (RACT) for major sources of volatile organic compounds (VOC) - i.e., "gasoline marketing operations," includes gasoline storage, gasoline loading of tank trucks at terminals, and bulk plants, and gasoline delivery by tank trucks to bulk plants and gasoline service stations.

54 - VOC
Emission

Gasoline Loading Racks

Enforcement actions taken against 112 gasoline loading terminals owned by 31 major oil companies in Illinois, Indiana and Ohio reduced annual hydrocarbon emissions by more than 16,000 tons.

55 - Stage 1
Recovery

This decrease in hydrocarbon pollution is especially significant since it has an energy-saving benefit in recovering gasoline as well as an environmental benefit in reducing the formation of ozone. Reducing hydrocarbon emissions by 16,000 tons means a potential annual saving of more than 6.5 million gallons of gasoline.

Nitrogen Dioxide

Unlike CO and ozone, no significant downward trend can be seen in the Chicago NO₂ data. The lack of such a downward trend appears to be typical of Region V as a whole. At this time, it is unclear why a downward trend does not exist. Mobile source NO_x emissions, through the FMVCP, were expected to decrease significantly after 1977. Stationary source emissions of NO_x were expected to remain relatively constant. Both the USEPA and the Illinois Environmental Protection Agency are rethinking our strategy for reduction of NO₂.

Hazardous Waste Sites Sweeps

Chicago has been positively impacted by EPA regardless of the media or program. We have inspected many facilities in the Chicago/NW Indiana area for PCB Storage and disposal compliance, pesticide registration, use and removal when appropriate (such as the suspension of Silvex and 2,4,5-T) and we've also made sure that our children's exposure to asbestos particles has been minimized. In addition we've taken either 311 or Superfund actions at such sites as Outboard Marine in Waukegan, and MIDCO I, Gary, Indiana but probably the most unforgettable, and highly publicized impact that the Region has made in this metropolitan area in recent times began in July, 1980 when the first of four major metropolitan "sweeps" to identify hazardous waste sites commenced in Southeast Chicago following a weekend discovery of silos of caustic wastes by the Chicago MSD at U.S. Scrap. Here we see two slides of the "before" and one of "after" at that location. This was a total effort by all Regional personnel even remotely involved in the hazardous waste program at the time. In the span of less than three work weeks, approximately 100 locations were inspected to determine if hazardous wastes existed on site and, if so, were the wastes being properly managed. Besides filing two cases with the U.S. Attorney (Acme Refining and the Cisar Property) several other immediate cleanups were effected. Two more besides U.S. Scrap are shown in the following before and after slides:

56 - U.S. Scrap
Before
57 - U.S. Scrap
Before
58 - U.S. Scrap
After

1. Shamrock Environmental Services
Bolingbrook
2. A & B Containers, Chicago

- 59 - Shamrock
Before
- 60 - Shamrock
After
- 61 - A & B
Before
- 62 - A & B
After
- 63 - Barker
Before
- 64 - Barker
After

In addition to the immediate actions the sweep also identified facilities to be targeted for RCRA Interim Status Standards Inspections when the regulations became effective on November 19, 1980.

The Barker Chemical Company (before and after slides), mentioned earlier in the general waste discussion, was one of those sites and resulted in our first RCRA compliance order.

In Northwest Indiana, we repeated our sweep effort the following month (August 1980). There we inspected 135 sites, again filed two actions with the U.S. Attorney and targeted more facilities for RCRA ISS Inspections. I'll stop here by noting a lesson reinforced by the sweep activities for the waste program that had been one of the keys to success in all media programs -- and that is the fantastic cooperation that was established between USEPA, the State Agencies, the 208 planning agencies, the State Police and County Sheriff's Departments and several other agencies at all levels. The most effective way to handle all of our environmental problems is as a joint effort.

That concludes the presentation. I hope I have been successful in giving you a good feel for the overall quality of the environment in Region V, and in highlighting some of our successes.