ILLINOIS

INDIANA

KENTUCKY

NEW YORK

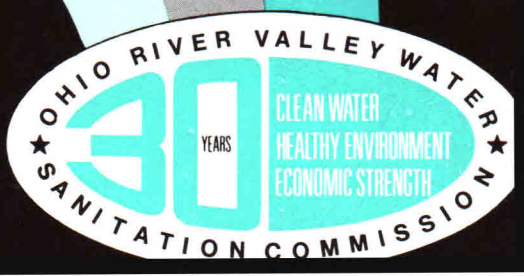
OHIO

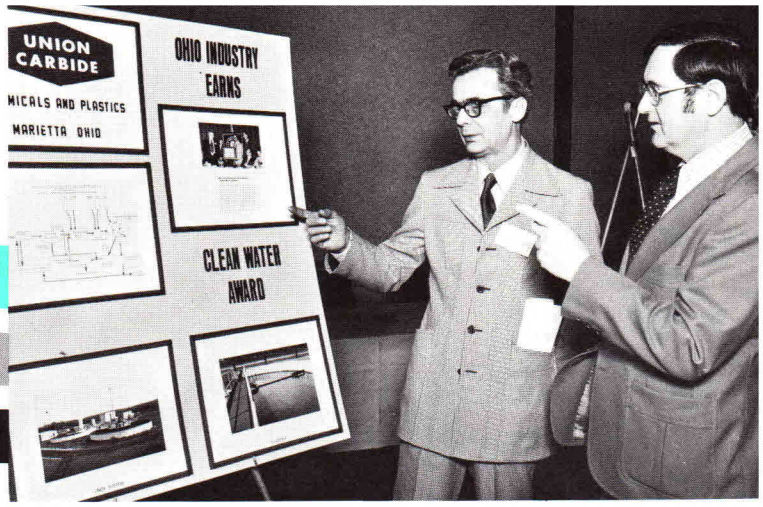
PENNSYLVANIA

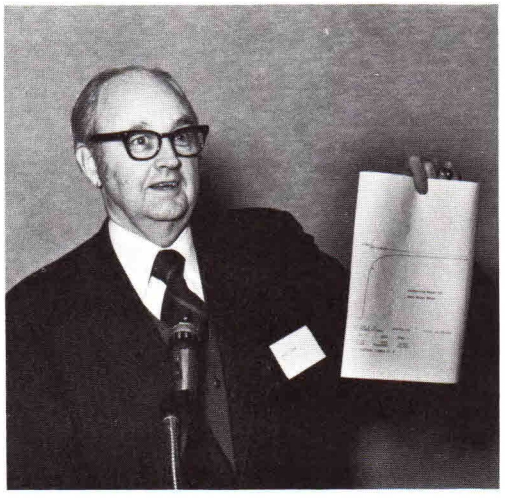
VIRGINIA

WEST VIRGINIA

ORSANCO

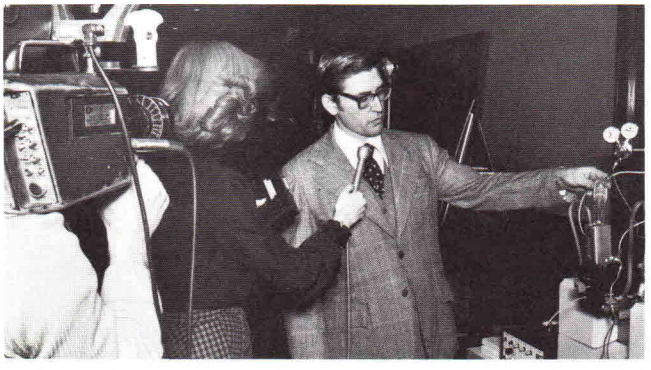






In January, ORSANCO celebrated its 30th year with an anniversary luncheon honoring the eight states of the Commission. A collection of displays dramatized progress made in improving Ohio River quality during the past 30 years. The luncheon's highlight was the first transmission of data from the Early Warning – Organics Detection System.

OHIO RIVER VALLEY WATER SANITATION COMMISSION
30 YEARS
CLEAN WATER
HEALTHY ENVIRONMENT
ECONOMIC STRENGTH



TO:

The Honorable James R. Thompson
Governor of Illinois

The Honorable Otis R. Bowen, M.D.
Governor of Indiana

The Honorable Julian Carroll
Governor of Kentucky

The Honorable Hugh L. Carey
Governor of New York

The Honorable James A. Rhodes
Governor of Ohio

The Honorable Richard L. Thornburgh
Governor of Pennsylvania

The Honorable John Dalton
Governor of Virginia

The Honorable John D. Rockefeller, IV
Governor of West Virginia

The Commissioners of the Ohio River Valley Water Sanitation Commission — an interstate compact agency created jointly in 1948 by

the State of Illinois,
the State of Indiana,
the Commonwealth of Kentucky,
the State of New York,
the State of Ohio,
the Commonwealth of Pennsylvania,
the Commonwealth of Virginia, and
the State of West Virginia

with the approval of the Congress of the United States — respectfully submit a review of the Commission's activities in 1978.

1978

MEMBERS OF THE COMMISSION*

ILLINOIS
R. S. Engelbrecht, Ph.D., Professor of Environmental Engineering, University of Illinois
Daniel Malkovich, Editor and Publisher, *Outdoor Illinois*
Michael P. Mauzy, Acting Director, Illinois Environmental Protection Agency

INDIANA
Robert A. Holt, Chairman, Stream Pollution Control Board
William T. Paynter, M.D., State Health Commissioner
Ralph C. Pickard, Assistant Commissioner for Environmental Health, Indiana State Board of Health

KENTUCKY
Frank C. Campbell, Vice President and Chief Engineer, Louisville Water Company
Eugene F. Mooney, Secretary, Department for Natural Resources and Environmental Protection
Frank L. Stanonis, Ph.D., Professor, Geology and Geography, Indiana State University

NEW YORK
Robert L. Barber, Assistant Professor of Government and Economics, Jamestown Community College
Peter A. A. Berle, Commissioner, New York State Department of Environmental Conservation
(Vacancy)

OHIO
Christine M. Carlson, League of Women Voters
Lloyd N. Clausing, Director, Portsmouth Water Department
Ned E. Williams, Director, Ohio Environmental Protection Agency

PENNSYLVANIA
Wesley E. Gilbertson, Special Assistant for Planning, Department of Environmental Resources
Maurice K. Goddard, Ph.D., Secretary, Department of Environmental Resources
Gail Rockwood, Vice Chairperson, Citizens Advisory Council to the Pennsylvania Department of Environmental Resources

VIRGINIA
Warren L. Braun, State Water Control Board
Millard B. Rice, State Water Control Board
Kenneth B. Rollins, State Water Control Board

WEST VIRGINIA
Edgar N. Henry, Director, West Virginia Water Development Authority
George E. Pickett, M.D., M.P.H., State Director of Health
(Vacancy)

UNITED STATES GOVERNMENT
Richard C. Armstrong, Chief, Engineering Division, U. S. Army Engineer Division, Ohio River
Norman H. Beamer, District Chief, U. S. Geological Survey
John C. White, Regional Administrator, Region IV, U. S. Environmental Protection Agency

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Warren L. Braun, Chairman
Ned E. Williams, Vice Chairman
R. S. Engelbrecht, Ph.D., Secretary
Albert J. Brooks, Treasurer
Leo Weaver, Executive Director and Chief Engineer

Edward J. Cleary, Executive Director and Chief Engineer Emeritus

LEGAL COUNSEL
Leonard A. Weakley, Taft, Stettinius & Hollister

*As of December, 1978

FROM THE CHAIRMAN . . .

On this, the thirtieth birthday of the Commission, we pause in our endeavors to survey what has been accomplished in the Ohio River Valley. The road we have traveled is marked by many milestones which have resulted in substantial stream pollution abatement, measured by such criteria as may be easily perceived — by the tripling of the Ohio River fish population over the last two decades, by the dramatic increase in recreation on the river, and by the virtual disappearance of oil slicks and manmade debris.

Great strides have been made in the past year with the inauguration of the Commission's Early Warning — Organics Detection System. Lest we become complacent, however, we must remember that much remains to be done. A number of quality problems still plague the Ohio. The challenge posed by hazardous trace substances has yet to be met.

Through its history ORSANCO has served as a conduit for interstate and interagency cooperation of a rare stamp. United, we will confront the challenges of the future with the Commission's goals firmly in mind: clean water, a healthy environment, and economic strength. The path to attaining those goals is fraught with obstacles, but the direction is certain.

Warren L. Braun

Warren L. Braun, Chairman

MILEPOSTS IN WATER QUALITY

Since 1952, when the Water Users Network was initiated, the Commission has coordinated regular monitoring of Ohio River water quality. Many surveillance activities have been added since then, and the data which is gathered today provides a composite picture of the quality of the Ohio River and the lower reaches of the major tributaries. A monthly bulletin, the *Quality Monitor*, reports the Commission's water quality data to agencies and individuals concerned with water pollution control. When conditions warrant, a "Quality Update" is issued, giving more immediate notification of a specific water quality condition. If a particularly serious water quality problem arises, the Commission provides state and federal agencies and water utilities with special weekly reports on water quality in the affected area. Recurring problems call for more investigation, and this past year the Commission has coordinated interstate consultations on river quality problems involving pH, cyanide, phenols, mercury, and bacteria.

A Look Back

Water quality data collected over the course of the Commission's 30 years indicate significant improvement in several areas. The period of record is different for each parameter, because monitoring has changed as water quality problems on the river have shifted. Some records go back as far as 1908; but the Commission's two major analytical efforts, the electronic monitor network and the manual sampling program, did not begin until 1961 and 1975, respectively.

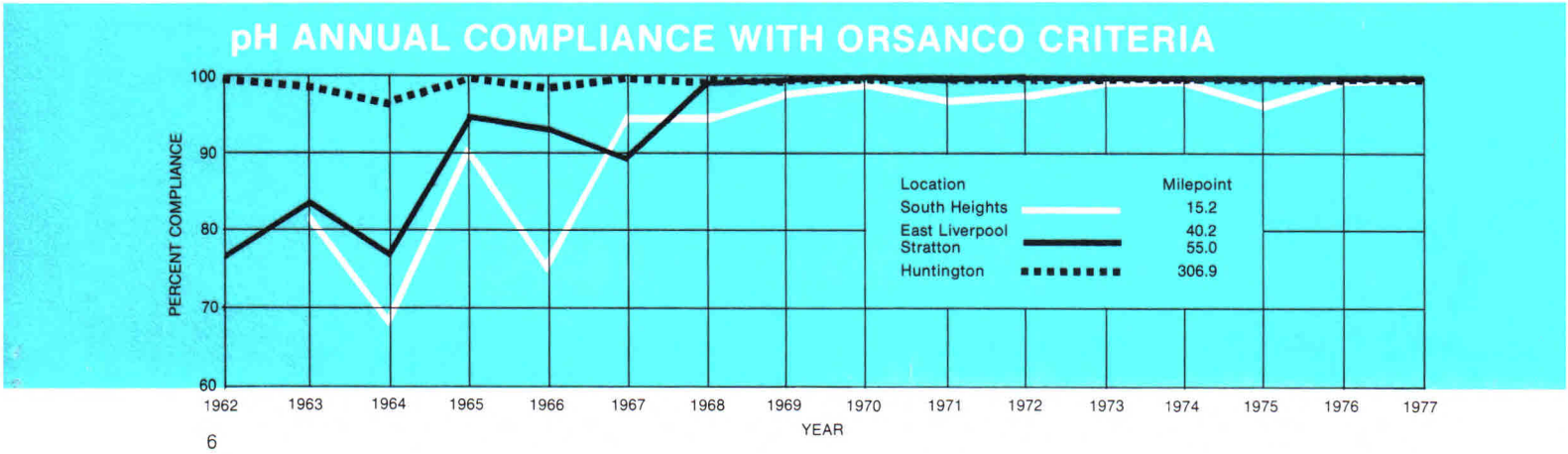
A decrease in *turbidity* is clear from data gathered at certain Water User locations back to 1948. Data from Steubenville are typical, where annual averages in 1948 and 1949 exceeded 100 units and in recent years have dropped to 15 or less. Some of the improvement in turbidity is attributable to the completion of Pike Island Dam; turbidity averaged over 30 units before completion and under 20 afterwards. Increased treatment of wastes discharged to the river apparently accounts for the additional improvement.

Sulfate levels show a decrease since 1952, when extensive measurements began. In the 1950's, monthly average values were often greater than 250 mg/l, the maximum singular value allowed by ORSANCO criteria. Since 1973, no reported monthly average has been that high; fewer than ten individual values above 250 mg/l have been found at all stations in the last three years. A major factor in the decrease has been the control of waste discharges from steel mills and mining operations.

In the past, acid mine drainage has been a major cause of low *pH* values on the upper river and tributaries. Minimum values of 5.0 or less were common at South Heights, Stratton, and Huntington when the electronic monitor system began operation. Since 1975, however, the recommended minimum of 6.0 has been met at all times at all Ohio River electronic monitors.

In 1962, *chloride* was a problem in parts of the basin, particularly on the Muskingum River, where brine wastes were discharged; and the electronic monitors were equipped to measure chloride concentration. By 1975, elimination of major chloride discharges resulted in substantial decreases in chloride levels, and continuous measurement was terminated.

While still a problem in places, *dissolved oxygen* levels have improved markedly since continuous measurement by the electronic monitors began. At most of the electronic monitor locations, DO levels were below the minimum allowable daily average (5 mg/l) for weeks at a time during the summer months in the early 60's. In recent years, violations have been much less frequent. The



most dramatic improvement has been on the Kanawha River at Winfield, where DO was zero for entire months in 1962 and 1963. Criteria violations still occur on the Kanawha, but monthly values have generally been 5.0 mg/l or better in recent summers. Frequent violations still occur in the portions of the Ohio River affected by discharges from the Cincinnati and Louisville areas. Treatment improvements under way in these areas should result in essentially complete compliance with DO standards in the river.

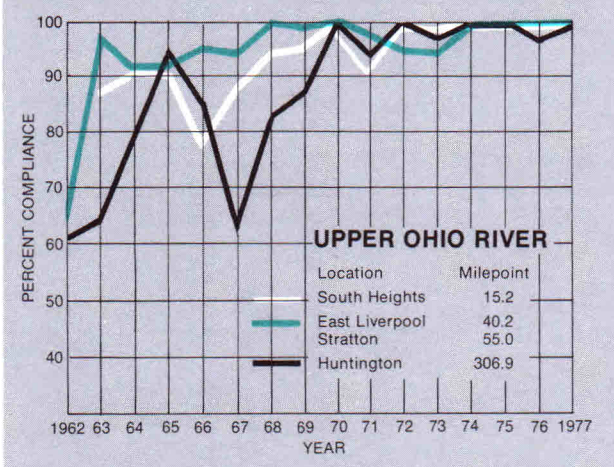
Phenol was noted as a major problem in the Commission's early annual reports, and it still is a problem. Data from the Wheeling Water Works, where phenol has been measured daily since 1952, indicate that the present criterion (10 ug/l) was exceeded essentially all of the time in the early 1950's, when monthly average values of over 100 ug/l were common. Since 1972, the maximum monthly average has been 26 ug/l, and violations are now the exception rather than the norm.

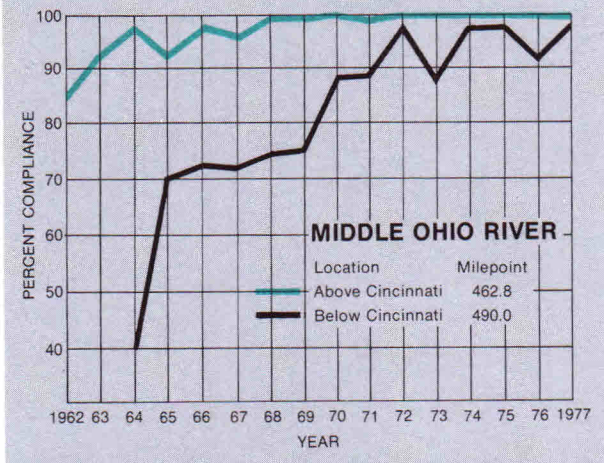
Coliform bacteria were also mentioned as a major problem in early annual reports and continue to be a problem today. While improvement can be seen at several locations, recreational criteria are still exceeded on most of the river. The problem is partially attributable to nonpoint sources, particularly overflows from combined and storm sewers. A recent survey of disinfection practices, however, indicated that many treatment facilities are not consistently meeting effluent requirements for coliform bacteria.

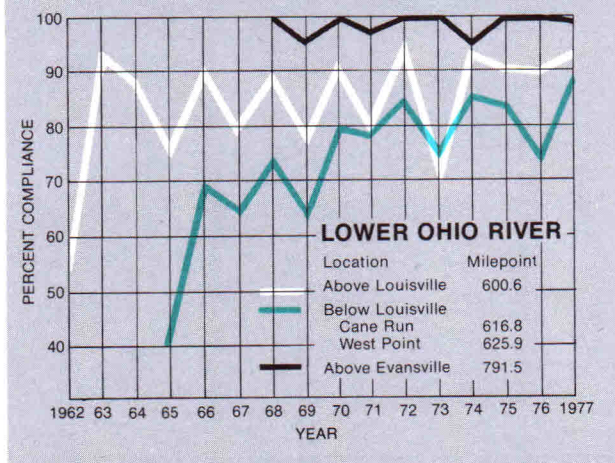
For several trace metals and chemicals, lower reporting levels and stream criteria have been adopted in recent years, resulting in increased violations. *Cyanide* is an example. In the 1966 annual report it was noted that cyanide was not a problem, since levels were well below the criterion of 0.2 mg/l adopted for public water supply protection. Since that time, a criterion of .025 mg/l has been recommended for protection of aquatic life. Monitoring for cyanide was discontinued in the 1950's, because values were never greater than .06 mg/l. While these values were well below the criterion used then, they are well above the present criterion. Similar levels have been detected since monitoring for cyanide was resumed in 1975.

While trace organic constituents have been viewed as a potential problem for several years, extensive monitoring data have been available only recently. Data collected in the past two years will serve to quantify background levels. Criteria for individual organic compounds, other than cyanide and phenolic materials, have not been established.

DISSOLVED OXYGEN ANNUAL COMPLIANCE WITH ORSANCO CRITERIA







1977-1978

From July, 1977, through June, 1978, Ohio River water quality was generally suitable for use as public water supply after appropriate treatment. For the most part, conditions were suitable for the protection and propagation of fish and other aquatic life. Criteria for water contact recreation, however, were not met at many locations. Of the 21 constituents for which numerical criteria have been established, 12 were within the criteria in all samples collected from the Ohio River and its tributaries. These constituents were specific conductance (dissolved solids), unionized ammonia, arsenic, barium, chloride, hexavalent chromium, fluoride, nitrite and nitrate nitrogen, selenium, silver, and sulfate. Criteria for cadmium and dissolved lead were each exceeded in two of the 432 samples collected. Maximum temperature criteria were exceeded a few days in July, 1977, and June, 1978, at three of the 22 Ohio River monitoring locations. On the mainstem, pH criteria were met at all times. Among the tributaries, the maximum allowable pH was exceeded on the Kanawha River during a July low flow period; and in July and August, the minimum allowable was not met during and after a flood on the Allegheny River.

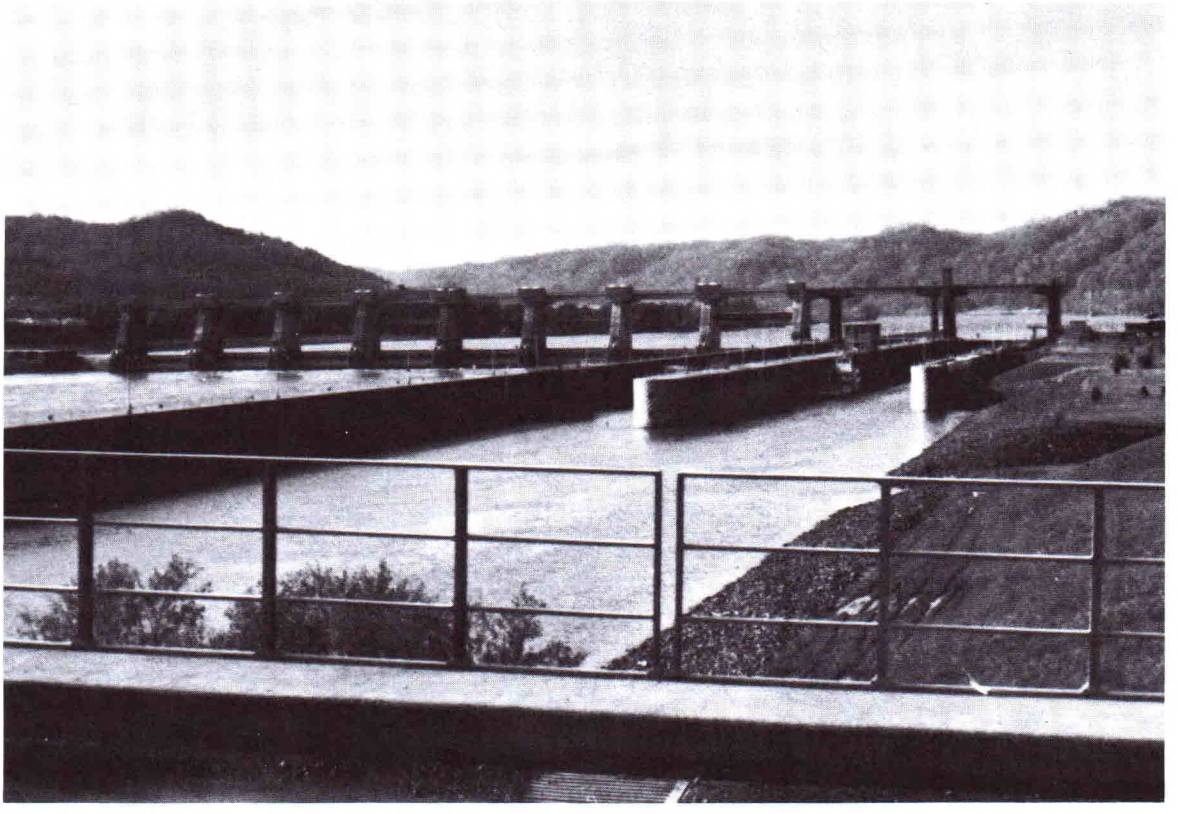
Criteria for dissolved oxygen, fecal coliform bacteria, mercury, cyanide, and phenol were exceeded most frequently. All except mercury had been exceeded in previous years with similar frequency. The number of violations of the *mercury* criterion increased in 1978 because the reporting limit of one of the laboratories was lowered and more violations could be noted. The reporting limit had previously been higher than the criterion (0.2 ug/l). Levels were generally below 0.5 ug/l, the former reporting limit, in the upper river. In April, however, extremely high mercury values were detected in the Green River and in the Ohio River below its confluence with the Green. Levels decreased in May and June, but still exceeded the criterion. An investigation by the Kentucky Department for Natural Resources and Environmental Protection did not identify a source for the mercury.

Dissolved oxygen levels followed a familiar seasonal pattern, with minimum values occurring in the low flow, warm weather months. On the upper river, criteria were not met about ten percent of the time each at Shadyside in July and at Huntington in September. Violations occurred with similar frequency on the lower river at Evansville in August and at Joppa in September. The most frequent violations were observed on the portion of the river from Markland (below Cincinnati) to Cannelton (below Louisville). Criteria were not met at the four electronic monitor locations in this area for periods ranging from 10 to 40 percent of the time in July, August, and September, indicating the impact of waste discharges from the Cincinnati and Louisville metropolitan areas.

A seasonal pattern was also evident in *cyanide* levels, with highest values occurring in the coldest months. Cyanide was first detected at upstream locations in September; in the following months, it appeared at successive downstream sites until January, when all samples from Pittsburgh to Louisville showed cyanide. The trend then reversed in February, as cyanide detections ceased in downstream locations. In June, cyanide was detected at only the two most upstream monitoring sites. The stream criterion (10 ug/l) was exceeded at Ohio River locations from Pittsburgh to Belleville (MP 203.9) in January, February, and March.

Phenol levels followed a similar, though less pronounced, pattern. The ORSANCO criterion was exceeded most frequently in December and February, and least frequently in May. In-stream processes by which phenol and cyanide decompose are inhibited at low temperatures, thereby creating the seasonal pattern. Because of unusually cold weather, levels of both constituents have been higher the past two years than in preceding years. While this accounts for cyanide values to a great extent, it does not fully explain the pattern of phenol levels, as numerous violations of the phenol criterion were observed in August. The random nature of the violations indicates that nonpoint or intermittent sources may be a partial cause of the problem.

Fecal coliform bacteria criteria for public water supply were generally met during the year. At five of the seven Ohio River locations where water users test for fecal coliform at least five times per month, as required by the criteria, water supply criteria were met at all times. At the other two locations, which are both on the upper river, water supply criteria were not met for four months at the first (MP 62.2) and eight months at the second (MP 86.8). The more stringent criteria for water contact recreation, which are generally in effect from May through October, were not met at any of the three upstream locations. Recreational criteria were met most frequently at sampling sites above Cincinnati and above Evansville — five of the six months. At the other two locations, Portsmouth and Louisville, the recreational criteria were met two months. Fecal coliform levels were highest during December at six of the seven locations.



Hannibal Lock and Dam, on the Ohio River

1978 Commission Publications

Guidelines for Prevention, Control, and Reporting of Chemical Spills at an Industrial Facility. April, 1978. An outline of the essential components of an effective in-plant spill control program prepared by the Commission's Chemical Industry Advisory Committee as an aid to management in evaluating, improving, or developing such a program.

Model State Program for Control and Prevention of Water Pollution from Surface Mines. December, 1978. A model state administrative/regulatory program to control and prevent water pollution from surface mines, including preplanning of the mine operation, control of active mines, and post-mining reclamation and maintenance.

Model State Program for Control and Prevention of Water Pollution from Underground Mines. April, 1978. A model state administrative/regulatory program to control and prevent water pollution from underground mines, including preplanning of the mine operation, control of active mines, and post-mining reclamation and maintenance.

Ohio River Main Stem: Assessment of 1977 and Future Water Quality Conditions. March, 1978. A detailed examination of 1977 water quality on the Ohio River mainstem, prepared for Illinois, Indiana, Kentucky, Ohio, Pennsylvania, and West Virginia, in partial fulfillment of the provisions of Section 305(b) of Public Law 92-500.

Report and Notification of Spills and Accidental Discharges, Parts One and Two. Revised June, 1978. Part One: A compilation of procedures for notifying appropriate agencies in the event of a spill or accidental discharge and for minimizing a spill's effects upon users of waters within the jurisdiction of the compact. Part Two: Graphs for predicting Ohio River time-of-travel and instructions for their use.

WASTEWATER TREATMENT:
A SIGN OF PROGRESS

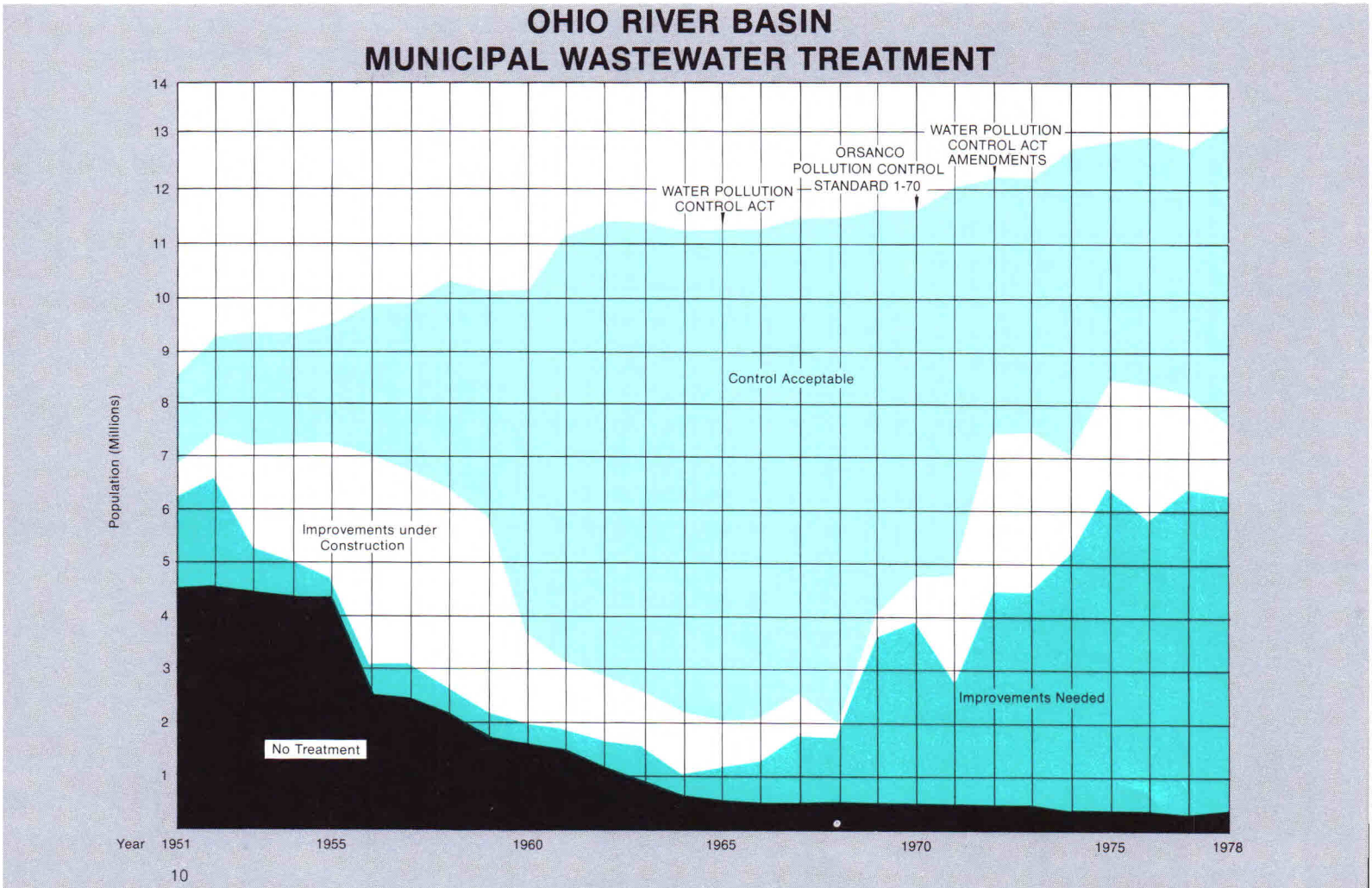
The extent to which sewage treatment is provided by the cities and towns of the Ohio River Basin is a dramatic measure of progress toward attaining the goal expressed in Article I of the ORSANCO Compact — control of future pollution and abatement of existing pollution in the rivers and streams of the basin.

Municipalities

In 1951, community treatment facilities served only 39 percent of the sewered population in the Ohio River Basin, as compared to 97 percent in 1978. During the same period, the number of people not served by any treatment facility has been reduced from five million to only 340,000 — a reduction which is even more impressive in view of an increase of almost five million in the basin's sewered population. On the Ohio River alone, less than 0.5 percent of the 3.7 million sewered population has yet to be provided with sewage treatment facilities. In the early years of the Commission, sewage from more than 99 percent of the mainstem population entered the river untreated.

The past year has brought progress in levels of treatment provided residents of the Ohio River Basin. New treatment facilities or improvements in existing ones were completed by 125 cities and towns, 26 of which are located along the mainstem. Improvements are under construction at another 128 municipalities in the basin, 63 along the Ohio River.

Though these figures represent a survey of facilities alone and do not reflect the operational



STATUS OF MUNICIPAL AND INSTITUTIONAL WASTEWATER CONTROL FACILITIES — JULY, 1978

Number of communities (top) and population (bottom)

STATUS	ILL.	IND.	KY.	N.Y.	OHIO	PA.	VA.	W. VA.	TOTAL	% OF TOTAL
Control currently acceptable	86 389,200	205 814,000	135 574,812	1 85,000	69 1,017,800	281 2,134,700	109 120,100	89 351,400	970 5,410,512	46.9 41.0
Treatment provided, improvements needed	1 2,600	91 740,400	58 719,988	11 77,000	291 2,963,300	157 1,034,300	36 43,600	55 402,700	700 5,983,888	33.9 45.4
Treatment provided, improvements under construction	4 7,500	7 751,900	36 162,900	5 18,500	44 275,900	23 149,900	7 45,900	2 23,000	128 1,435,000	6.2 10.9
New treatment works under construction	1 800	2 1,400		1 100	1 1,700		3 300	2 5,100	10 9,400	0.5 0.1
No treatment, construction not started		85 57,600	1 1,400		15 12,400	73 139,300	22 24,300	62 106,700	258 341,700	12.5 2.6
TOTAL	92 400,100	390 2,364,800	230 1,459,100	18 104,100	420 4,271,100	534 3,458,200	177 234,200	205 888,900	2,066 13,180,500	— —
New treatment works or improvements completed	1 25,900	10 11,600	24 361,000	1 8,500	18 57,100	47 50,600	22 20,900	1 500	125 536,100	

STATUS OF INDUSTRIAL WASTE CONTROL FACILITIES — JULY, 1978

STATUS	ILL.	IND.	KY.	N.Y.	OHIO	PA.	VA.	W. VA.	TOTAL	% OF TOTAL
Control currently acceptable	27	472	128	19	172	278	220	306	1,622	77.1
Control facilities inadequate, improvements needed	1	7	4	12	101	102	69	79	375	17.8
Control facilities under construction	4	18	13		37	9	6	20	107	5.1
Number of industries	32	497	145	31	310	389	295	405	2,104	
Control facilities, improvements completed	4	275	1	4	28	19	4	21	353	

status of any individual facility, they clearly indicate the dramatic improvement in sewage treatment capacity in the Ohio River Basin. It is important to note, however, that more stringent treatment requirements enacted in recent years have rendered a number of facilities inadequate, and many of them will require upgrading in the future.

Industries

The progress in industrial waste treatment is just as dramatic, in view of increasingly stringent requirements. The number of basin industries providing acceptable treatment facilities has almost doubled since 1953 and represents 77 percent of all industrial discharges in the basin. On July 1, 1978, 1,622 of the 2,104 industries discharging into the basin waters provided control facilities which complied with state and federal requirements.

The 1978 tally indicates that 353 industries in the basin have improved their treatment apparatus during the year; facilities are under construction at over 100 more. Still, 375 industrial dischargers require modifications to meet current regulations.

MILEST

1948 Compact signed in Cincinnati

1949 First sewage treatment standard adopted for the Cincinnati Pool
Dischargers notified of compact and compliance requirements

1950 First comprehensive Commission sampling program of the Ohio River
Annual status report on municipal and industrial sewage treatment in the Ohio River district inaugurated
Industry Action Committees formed

1951 State obligation to the compact reinforced by U.S. Supreme Court decision
Bacterial quality objectives for the Ohio River established
Study initiated to assess potential health hazard of trace constituents in industrial and other wastes
Extensive public information program launched

1952 Water Users Committee organized and Water Users Monitoring Network formed

1954 Municipal sewage treatment requirements completed for the Ohio River

1955 Basic industrial waste requirements adopted

1957 First application of enforcement powers: resolution requesting compliance schedule from the City of Gallipolis
First Commission-sponsored inventory of aquatic life resources in the Ohio River

1959 Resolution adopted placing upon industries the responsibility for reporting spills and accidental discharges to state agencies

1960 Adoption of mine-drainage control measure
First robot monitor units placed in operation

1963 Eight compact states awarded the Outstanding Civil Engineering Achievement Award of 1963 for "the most effective large-scale water pollution abatement program ever undertaken in the Western Hemisphere"

1948

OHIO RIVER VALLEY WATER SANITATION COMMISSION
30 YEARS
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TONES:

1966 Stream quality criteria adopted by the Commission

1967 Investigation initiated into deep well waste disposal in the Ohio Valley
Development begun of mathematical model for the Ohio River

1968 Publication of monthly *Quality Monitor* inaugurated
Commission awarded The Wildlife Society's Group Achievement Award "for leadership in a cooperative approach to pollution-abatement programs by municipalities, industry, state and federal governments"

1970 Adoption of Pollution Control Standards 1-70 and 2-70
Registry of underground wastewater disposal wells established

1973 Study initiated to assess organic materials in the Ohio River
Creation of Public Interest Advisory Committee

1974 Monitoring strategy reassessed and manual sampling program expanded to meet state and federal needs
Power generating facilities on the Ohio River inventoried and thermal effects studied

1976 Stream quality criteria revised and impetus for basinwide criteria strengthened
Special project organized to study specified organic materials in raw and treated water, along with removal effectiveness of specific treatment processes
Nonpoint sources of pollution investigated

1977 Organics monitoring program expanded
Electronic monitoring program independently evaluated and streamlined
First in a series of public forums on organic substances held in Cincinnati

1978 Early Warning — Organics Detection System inaugurated
Time-of-travel charts developed to aid in estimation of in-stream spill movement

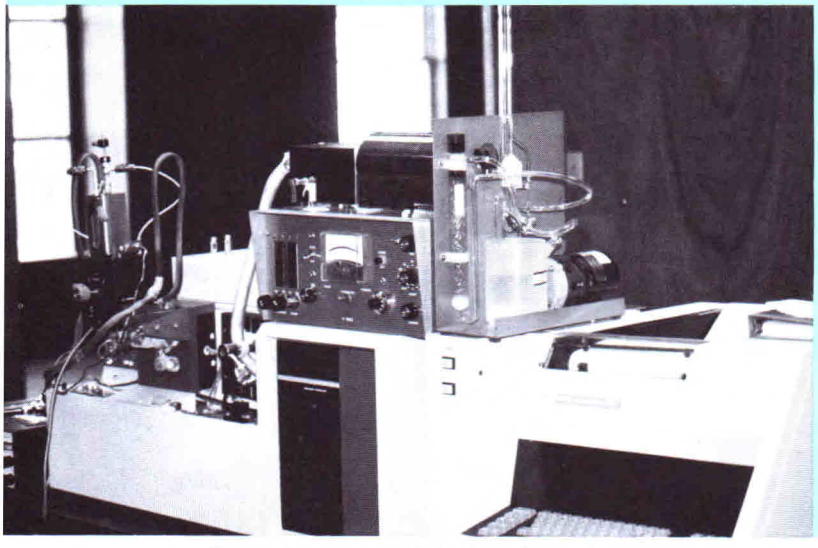
1978

OHIO RIVER VALLEY WATER SANITATION COMMISSION
30 YEARS
CLEAN WATER
HEALTHY ENVIRONMENT
ECONOMIC STRENGTH

ORGANIC SUBSTANCES:

THE NEXT MILE

Special training sessions were held for operators from the early warning sites.



A gas chromatograph is the primary instrument used in the Early Warning – Organics Detection System.

The instrument provides scans depicting levels of some organic materials in river water.

Early Warning — Organics Detection System

In 1977, when a carbon tetrachloride spill passed through Ohio River water supplies undetected, a crisis in public confidence occurred. The incident demonstrated to the public the ineffectiveness of operative monitoring systems in detecting such a spill and dramatized the need for further safeguards on the river. To meet that need, the Commission proposed an innovative monitoring network which would alert water utilities along the Ohio when unusual levels of certain organic substances were detected. Such a network would help pinpoint sources of those substances and, as a consequence, improve the effectiveness of state and federal discharge permit systems. Assistance in financing was sought from U. S. EPA for the network, which would provide daily monitoring at 11 stations. Christened the Early Warning — Organics Detection System, the network became operational in its first phase during the spring of 1978, and since then it has garnered a number of successes which have assured it a place in the public regard.

At seven sites on the mainstem and major tributaries, samples are taken every weekday and analyzed for unusual levels of selected organic materials. During its first few months the system detected two significant spills and helped to track another. In each case federal and state agencies were notified, along with downstream water utilities, and the source of the spill

was traced.

The key to the system's success is the support of the seven utilities which serve as testing sites, donating personnel and time to the project, and the expert guidance and participation of the Commission's Water Users Committee, to which many of the utilities belong. A $100,000 grant was received from the U. S. Environmental Protection Agency for purchase of equipment for the network's first phase.

The system's first year has not been without stumbling blocks. At some sites technical problems have rendered the equipment inoperable for periods of time, and costs for operating the network have continued to increase during the year. The system is deemed so vital that in June the Commission realigned funds to keep the network running through 1978, despite the necessity of curtailing other important programs.

From the inception of the system, the Commission has been committed to a goal of sampling every day at a minimum of 11 sites. In September a Congressional mandate provided $275,000 for the coming year to expand and operate the system. Once that grant is received, the Commission will be able to realize a goal born out of the trials of 1977, and the 11-site Early Warning — Organics Detection System will become a reality in 1979.

Additional Organics Monitoring

The completion of the Commission's special project, "Organic Substances in the Ohio River and Associated Water Supplies," is scheduled for early 1979. The study, which was funded by the 11 participating water utilities and U. S. EPA, has provided a store of information about selected organic materials in raw and untreated water, as well as data regarding the effectiveness of various treatment processes in removing certain organics from drinking water. In conjunction with the project, the Commission conducted a sampling program of raw water from a number of additional sites on the Ohio and the major tributaries. Preliminary results from a total of 27 locations indicated that some of the organic materials were present in the raw waters at levels typically at or below one part per billion. Chloroform was the chemical detected most frequently in the raw waters, at a maximum concentration of 3.4 parts per billion. For treated drinking water, U. S. EPA has proposed a regulation limiting the total amount of trihalomethanes, a class which includes chloroform, to 100 parts per billion. Other organic materials detected in trace amounts included carbon tetrachloride, bromodichloromethane, and dichlorobenzene. A final report from the special project is expected in 1979.

Spill Response

As early as 1959, the Commission recognized the hazard created by spills and accidental discharges of toxic chemicals and potentially dangerous organic materials; and in that year, the Commission instituted a policy placing upon industries the responsibility for reporting such spills to state and federal water pollution control agencies. Because of the interjurisdictional nature of the Ohio River, the Commission has since served in a vital coordinating role, aiding communications among state and federal agencies alike. Once again this past year the Commission published and distributed a manual providing information on how to report spills and to whom, along with telephone numbers and emergency response procedures of the states, as well as U. S. EPA and the U. S. Corps of Engineers. When a spill occurs, the Commission acts as a vehicle to facilitate communications among these agencies; however, reporting a spill to the Commission does not relieve any city or corporation from the responsibility of complying with local, state, or federal regulations which may be applicable. An addition to the spills manual this year was a series of time-of-travel graphs to aid in the prediction of a spill's movement downstream.

A further effort in spill response has been the development, in consultation with state and federal agencies, of a basinwide spill contingency plan, "Ohio River Interstate Spills Notification Plan." The document is another step toward maximum coordination among the agencies involved in any Ohio River spill situation. The Commission is also exploring additional areas for ORSANCO assistance in control and reporting of transportation-related spills.

To aid in stemming the spill at its source, the Chemical Industry Committee, which provides expert advice to the Commission on behalf of the industry, formulated a manual outlining an effective in-plant spill control program for all types of industrial operations. The manual was published by the Commission and distributed to more than 2000 industries in the Ohio River Basin. Many additional copies of this helpful tool were requested by companies wishing to streamline their spill control programs.

WATERMARKS: SURVEILLANCE

Monitoring Strategy

During 1978, the Commission's monitoring strategy has been reevaluated and its manual sampling program streamlined to meet state needs more efficiently and to fulfill U. S. EPA requirements for a basic water quality monitoring program. Samples will still be taken at 36 stations in the Ohio River system, but frequency of analysis for most parameters except cyanide and phenols has been reduced from three times to once per month. Certain metals which have remained well within applicable standards will be monitored on a quarterly basis. Quality control procedures to assure the reliability of sampling and laboratory results will remain in effect.

Automatic Monitors

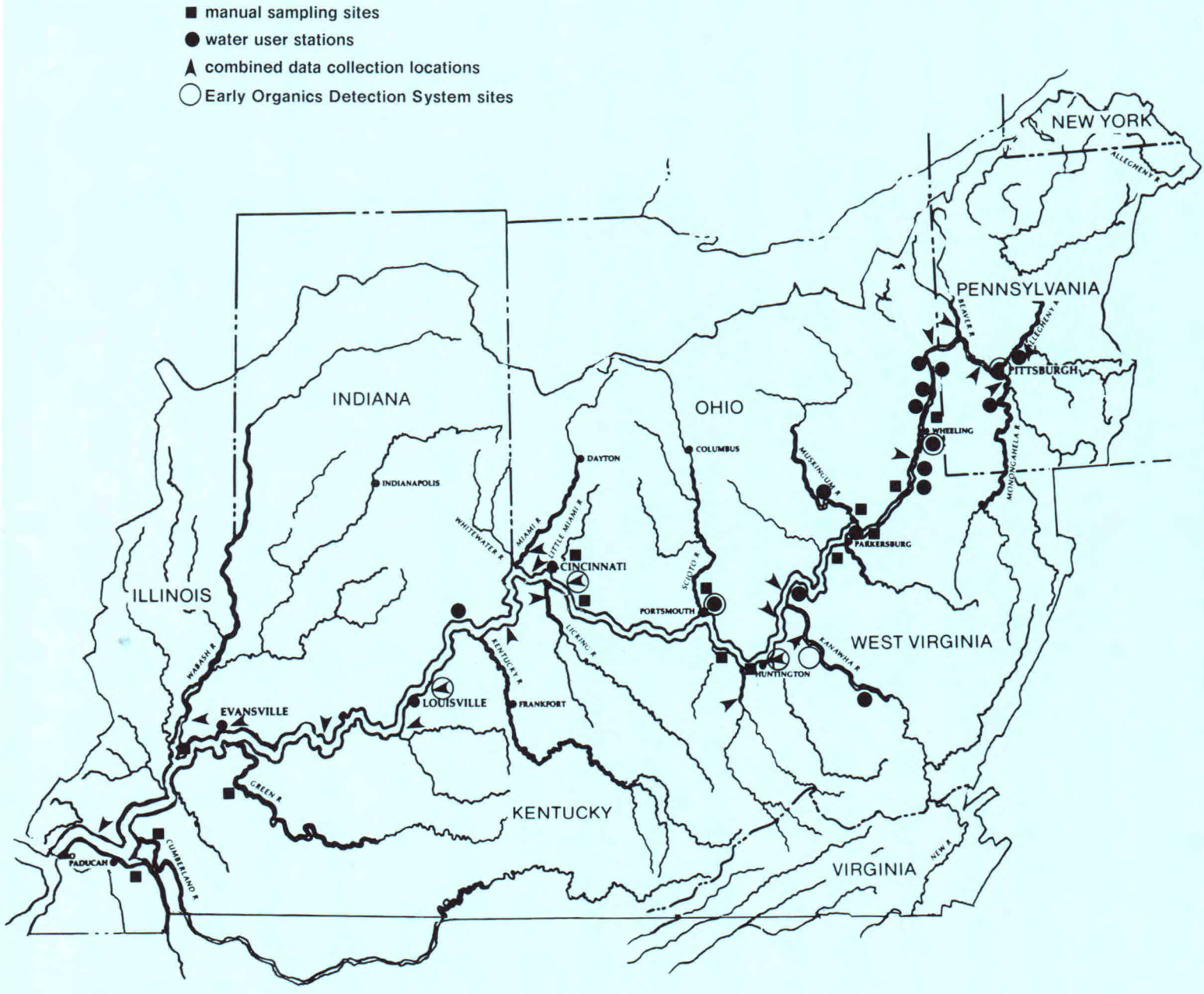
The present surveliance network includes 22 monitors which automatically measure dissolved oxygen, temperature, pH, and conductivity on an hourly basis. During the past year a modification has been completed in the system which transmits the automatic monitor data to the Commission's data processing center, thereby reducing substantially the ultimate cost for operating the monitors. In addition, gauges to measure river level are being installed at selected automatic stations to aid the U. S. Corps of Engineers in its monitoring of Ohio River stage.

The map and table indicate location of current mainstem and tributary surveillance sites — manual sampling sites, water user sites, locations combining electronic and manual sampling, and Early Organics Detection System sites.

- ■ manual sampling sites
- ● water user stations
- ▲ combined data collection locations
- ◯ Early Organics Detection System sites

OHIO RIVER STATIONS	MILE POINT
South Heights, Pa.	15.2
East Liverpool, Oh.	40.2
Toronto, Oh.	59.1
Weirton, W. Va.	62.2
Steubenville, Oh.	65.3
Yorkville, Oh.	83.6
Pike Island Dam	84.2
Wheeling, W. Va.	86.7
Shadyside, Oh.	102.4
Moundsville, W. Va.	111.0
Natrium, W. Va.	119.4
Hannibal Dam	126.4
Willow Island Dam	161.8
Parkersburg, W. Va.	183.7
Belleville Dam	203.9
New Haven, W. Va.	241.6
Addison, Oh.	260.0
Gallipolis Dam	279.2
Huntington, W. Va.	306.9
Kenova, W. Va.	315.8
Greenup Dam	341.0
Portsmouth, Oh.	350.0
Meldahl Dam	436.2
Cincinnati, Oh.	462.8
North Bend (Miami Fort), Oh.	490.0
Markland Dam	531.5
Madison (Clifty Creek), Ind.	559.5
Louisville, Ky.	600.6
West Point, Ky.	625.9
Cannelton Dam	720.7
Evansville, Ind.	791.5
Uniontown Dam	846.0
Joppa, Ill.	952.3

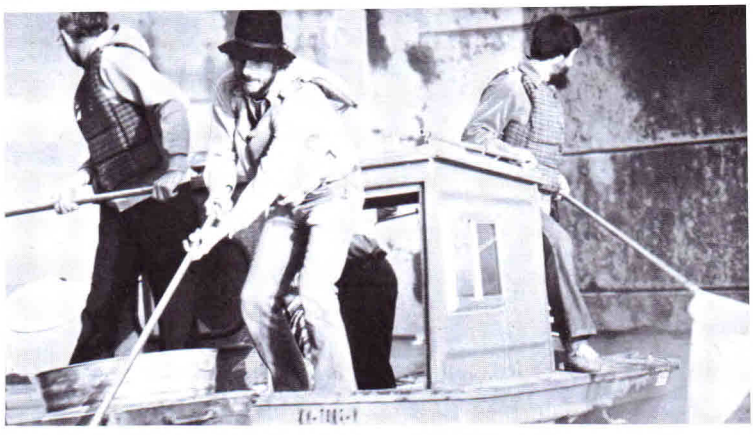
OHIO RIVER TRIBUTARY STATIONS	Miles from sampling station to confluence of tributary with Ohio River	Mile at which tributary enters Ohio River
Allegheny River at Oakmont, Pa.	13.3	0.0
Allegheny River at Pittsburgh, Pa.	8.9	0.0
Allegheny River at Wilkinsburg, Pa.	8.8	0.0
Monongahela River at Charleroi, Pa.	42.6	0.0
Monongahela River at South Pittsburgh, Pa.	4.5	0.0
Beaver River at Beaver Falls, Pa.	5.3	25.4
Muskingum River at Beverly, Oh.	28.0	172.2
Muskingum River near Marietta, Oh.	5.8	172.1
Kanawha River at Cabin Creek, W. Va.	74.3	265.7
Kanawha River near St. Albans, W.Va.	39.0	265.7
Kanawha River at Winfield Dam	31.1	265.7
Big Sandy River near Louisa, Ky.	20.3	317.1
Scioto River near Lucasville, Oh.	15.0	356.3
Little Miami River at Newtown, Oh.	3.4	463.4
Licking River at Covington, Ky.	4.5	470.3
Great Miami River at Elizabethtown, Oh.	5.5	491.1
Green River near Sebree, Ky.	41.3	784.5
Wabash River at New Harmony, Ind.	51.5	848.0
Cumberland River at Barkley Dam	30.6	922.6
Tennessee River at Highway 60 near Paducah, Ky.	6.0	935.0



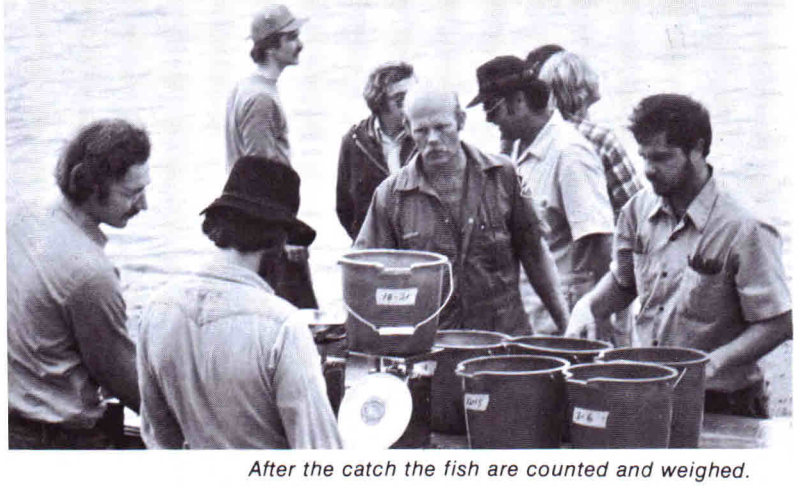
THE OHIO RIVER VALLEY COMPACT DISTRICT ON-STREAM INFORMATION NETWORK

Biological Surveillance

Since 1975, the Commission has coordinated yearly fish studies, including assessment of fish populations and analysis of fish tissues for selected trace materials. The 1978 sampling effort was conducted at 15 Ohio River and tributary sites. Cooperating in the study were representatives of the wildlife and water quality agencies from the mainstem states and the federal government. The U. S. Food and Drug Administration is analyzing fish fillets collected in the study for trace organics and selected metals. The U. S. Fish and Wildlife Service will be performing analyses of whole fish for similar materials. Samples of macroinvertebrates, small animals which serve as a basic link in the aquatic food chain, were collected on the mainstem in conjunction with the fish study. Results from all of these analyses are expected in early 1979.



State and federal workers net fish in Meldahl Lock.



After the catch the fish are counted and weighed.

An initial assessment of the populations retrieved in the fish study indicates that the total biomass of fish in the mainstem has not changed substantially since 1976. However, more than half of the stations sampled showed an increase in commercially valuable fishes; and the downstream stations boasted an excellent take of sport fishes, with large increases in bass and sunfish noted at Smithland (MP 918.5).

ORSANCO MONITORING PROGRAM

MONITORING ELEMENT	*COOPERATING AGENCY*	*PARAMETER*	*NUMBER OF ACTIVE STATIONS*	*FREQUENCY OF SAMPLING*
Electronic Monitor	U.S. Corps of Engineers	Temperature, Conductivity, pH, and DO	14 Ohio River 8 Tributary 3 Corps of Eng.	Hourly
River Stage	U.S. Corps of Engineers	River Stage	6 Ohio River	Hourly
Routine Site Sampling	PA Laboratory OH Laboratory	Physical, Mineral, Nutrients, Trace Metals, Bacterial	22 Ohio River 14 Tributary	Chemical, Metals Monthly
Water Users	Water Utilities	Physical, Mineral, Chemical, Bacterial	19 Ohio River 10 Tributary	Weekly to Daily
ORGANICS *1. Water*	Ohio EPA	PCB's, Pesticides, Trace Metals	11 Ohio River 4 Tributary	As Scheduled
2. Sediment	U.S. Geological Survey	PCB's, Pesticides, Trace Metals	As Prescribed	As Scheduled
3. Fish	State and Federal Agencies	PCB's, Pesticides, Trace Metals	As Prescribed	As Scheduled
Early Warning – Organics Detection System	Water and Power Utilities	Purgeable Organics	5 Ohio River 2 Tributary	Five Days a Week
Radionuclides	OH Laboratory	Gross α and β Radium 226, Tritium, Strontium 90	6 Ohio River	Quarterly
Biologicals	State and Federal Agencies	Species, Quantities, Distribution, Size, Anomalies	As Prescribed	As Scheduled
ADDITIONAL DATA *River Flow, Velocity, and Stage*	NOAA Flow Forecast Center	River Flows and Velocity	22 Ohio River 15 Tributary	Daily

A LOOK TO THE FUTURE

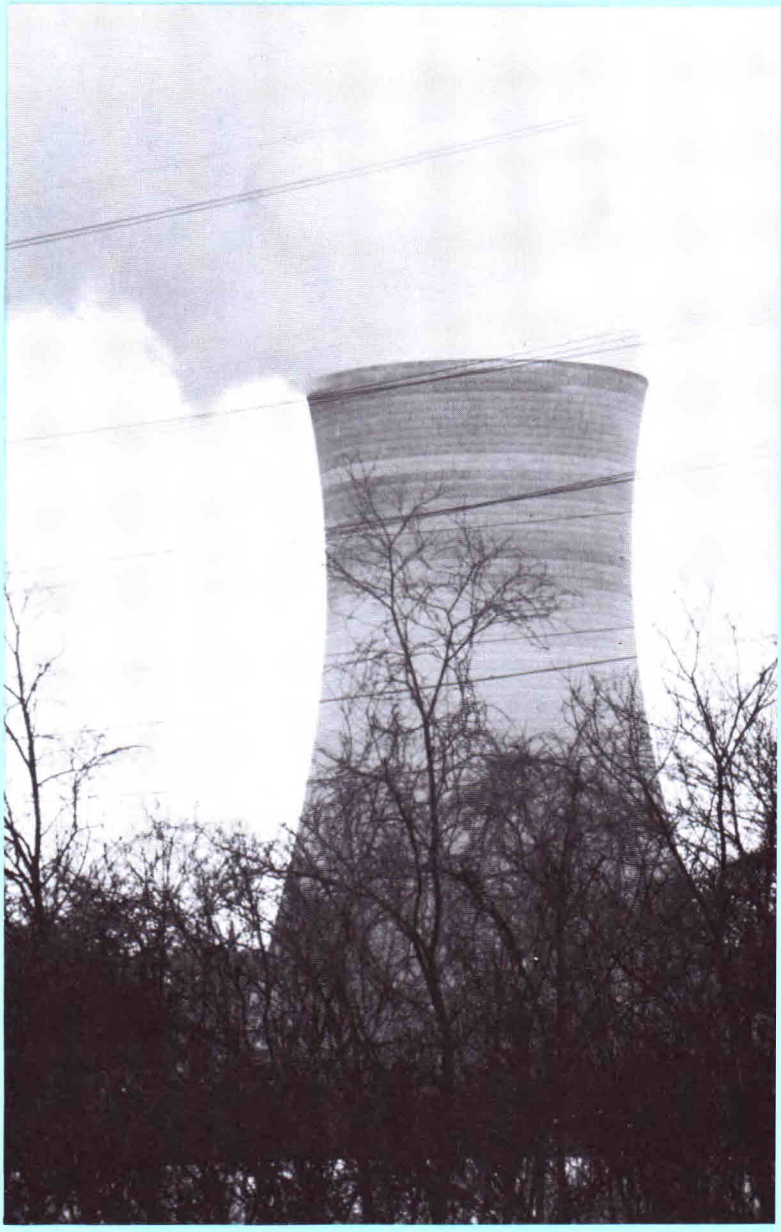
A long look back through the past 30 years brings a feeling of satisfaction for goals realized, but with it comes a recognition of challenges still to be met. The future holds many vital water quality questions which must be approached with renewed enthusiasm. In the years to come, the Commission will be probing new areas of concern and attacking problems which remain unsolved.

Mine Drainage

Historically, acid mine drainage has been a problem in the valley; and though acid conditions in the major streams have improved dramatically, work remains to be done. In 1978, the Commission published two documents outlining model state programs for preventing and controlling water pollution from surface and underground mines. Early next year another manual will be forthcoming which addresses procedures for regulating mine preparation and disposal areas. These three manuals will aid the states in streamlining their programs and applying federal regulations which control mining activities.

Stream Quality Criteria

Federal law has required each state to formulate and update regularly quality criteria for the public waters it administers. The Commission has recommended stream criteria for the Ohio River, and in 1978 a great deal of effort was devoted to participating in state deliberations regarding criteria adoption. The Commission has urged greater cooperation among all states and regional branches of federal agencies involved with water quality control in the Ohio River Basin. In this regard, ORSANCO has worked closely with U. S. EPA. The state and federal members of the Commission's Stream Quality Criteria Conflicts Committee have labored untiringly toward the goal of consistent criteria for the Ohio River. In general, the states have responded by adopting criteria compatible with the Commission's recommendations, but criteria conflicts remain to be resolved.



Siting of major facilities along the Ohio River has become a recent topic of study by the Commission.

Siting of Major Facilities

Recently the proliferation of major facilities along the Ohio River has caused valley-wide concern. At the request of the Commonwealth of Kentucky, a task force has been formed to investigate utilization of the powers given the Commission by the ORSANCO Compact to help facilitate interstate cooperation in the siting of major facilities within the Ohio River Basin. In the coming year, the feasibility of such a use of the Commission's resources will be further evaluated.

WATER POLLUTION CONTROL:

A PUBLIC PATH

Commission Chairman Warren L. Braun presided at one session of the Pittsburgh symposium.

Citizens from a wide range of backgrounds attended the symposium.

Executive Director Leo Weaver answers a press query.

It was in response to public concern about the decaying Ohio River that the Commission was formed in 1948. In the mid-30's, civic groups, industrialists, business leaders, and conservationists had decided it was time to do something; and an interstate approach to water pollution control seemed the appropriate answer. In the past three decades, as changing water quality challenges have been tackled and met, the Commission has continued to recognize its public base of support and its obligation to serve the people of the valley.

Symposium

In November, the Commission sponsored a public symposium in Pittsburgh, in conjunction with the states of Ohio, Pennsylvania, and West Virginia. Almost 200 people were on hand to hear experts from around the nation discussing the significance and impact of organic substances on water supplies. Students, industrialists, environmentalists, and professionals in the field of water pollution control attended the meeting, which was hosted by the Pennsylvania Department of Environmental Resources. The symposium followed a similar meeting held last year in Cincinnati.

Release of Data

ORSANCO has always maintained the importance of making all pertinent water quality data available to the public as promptly and effectively as possible. During 1978, the Commission reevaluated its procedures for releasing information to the news media, in order to make them more efficient and responsive to state and federal needs. Aiding in the assessment of news release policy was the Public Interest Advisory Committee, which advises the Commission regarding its responsiveness to the public interest.

ADMINISTRATIVE HIGHLIGHTS

Commission

Three representatives from each of the eight member states and three representatives from the United States government comprise the Commission. Appointed by the chief executives of the states and of the nation, these members serve at no recompense from the Commission, though their expenses in performing Commission-related duties are reimbursed.

> Dr. Marion K. McKay, Commissioner from the Commonwealth of Pennsylvania since 1956, passed away June 11, 1978. Dr. McKay served as Chairman of the Commission in 1968-1969.

Warren L. Braun was elected Chairman of the Commission, succeeding Ralph C. Pickard. Re-elected as Vice Chairman, Secretary, and Treasurer respectively were Ned E. Williams, Dr. Richard S. Engelbrecht, and Albert J. Brooks.

Eugene F. Mooney succeeded Robert D. Bell as ex officio Commissioner from the Commonwealth of Kentucky. Frank C. Campbell was appointed by Governor Julian Carroll to replace Arnold L. Mitchell, who resigned his Kentucky Commission seat at retirement. Commissioner Mitchell served the Commission for six years and was Vice Chairman from 1975 to 1977.

Robert L. Barber was appointed by Governor Hugh L. Carey as Commissioner representing the State of New York.

Gail Rockwood was appointed by Governor Milton J. Shapp as Commissioner representing the Commonwealth of Pennsylvania, filling the seat vacated by the death of Dr. McKay.

Luther N. Dickinson resigned as Commissioner from the State of West Virginia.

John C. White, U.S. Environmental Protection Agency Region IV Administrator, received Presidential appointment as a federal representative to the Commission.

Staff

Surveillance: Glenn E. Moore joined ORSANCO as Manager of Surveillance. Jan R. Taylor and Robert D. Timmerman, Jr. replaced Bruce E. Hurst and Thomas S. Lux as Surveillance Specialists. Neeta Jauhar was assigned the position of Laboratory Technician at Pittsburgh, filling a vacancy from 1977. John P. Donnelly resigned as Head, Data Acquisition Engineering, to accept other employment.

Administration: Karyn L. Colyer, Secretary, left the Commission to accept other employment.

Data Processing: Jeffrey L. Medaugh left his position as Programmer/Analyst.

Special Projects: Sarah B. Dirr joined the project, "Organic Substances in the Ohio River and Associated Water Supplies," as Secretary.

David M. Sunshein became Chemist with the Early Warning — Organics Detection System, replacing Claude F. Wilson, Jr., who came to the Commission in early 1978 and left later in the year to accept another position.

FINANCIAL REPORT

The following information relative to revenues, expenses, and statement of resources was extracted from the Annual Auditors Report of Wm. H. Mers & Co., Certified Public Accountants, for the year ended June 30, 1978.

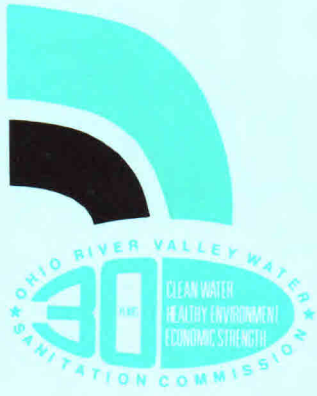
OHIO RIVER VALLEY WATER SANITATION COMMISSION

STATEMENT OF REVENUES AND EXPENSES FOR YEAR ENDED JUNE 30, 1978

Revenues:		
From signatory states:		
State of Illinois	$ 18,900.00	
State of Indiana	69,788.00	
Commonwealth of Kentucky	78,000.00	
State of New York	3,975.00	
State of Ohio	96,112.00	
Commonwealth of Pennsylvania	54,825.00	
Commonwealth of Virginia	12,825.00	
State of West Virginia	40,575.00	
Total from signatory states		$ 375,000.00
From U. S. Environmental Protection Agency:		
Water Pollution Control Act Grant	$ 403,917.00	
Safe Drinking Water Act		
Early Warning — Organics Detection System Grant	100,000.00	
Organic Substances in the Ohio River Research Grant	148,371.00	
Total from U. S. Environmental Protection Agency		652,288.00
From U. S. Corps of Engineers:		
Electronic Monitoring Support	$ 55,999.94	
Allegheny and Pittsburgh District Support	48,950.00	
Total from U. S. Corps of Engineers		104,949.94
From Water Utilities		90,350.00
Other revenues		11,424.04
Total revenues		1,234,011.98
Expenses:		
Basic Program	$1,003,651.58	
Organic Substances Project	239,916.05	
Ohio Main Stem Study	4,688.00	
Total expenses		1,248,255.63
Excess of expenses over revenue		$ 14,243.65

STATEMENT OF RESOURCES AT JUNE 30, 1978

Cash		$ 118,299.29
Deposits		1,748.18
Accounts Receivable:		
U. S. Environmental Protection Agency	$ 117,741.00	
Water Utilities	24,924.50	
Employee advances	1,321.17	
		143,986.67
Total		264,034.14
Less:		
Accounts payable	$ 64,433.17	
Accrued expenses	81,245.19	
U. S. Geological Survey Grants	7,263.07	
		152,941.43
Available resources June 30, 1978		$ 111,092.71
Available resources at beginning of year	$ 125,336.36	
Excess of expenses over revenues	14,243.65	
Available resources at end of year		$ 111,092.71



ORSANCO STAFF*

Administration

Leo Weaver — Executive Director and Chief Engineer
William L. Klein — Assistant Executive Director
Albert J. Brooks — Manager, Finance
Nancy Harmon-Stewart — Accounting Assistant
Deborah S. Decker — Information Specialist
Janet S. Fischesser, Janice Squires — Secretaries

Surveillance

Glenn E. Moore — Manager
John L. Keyes — Senior Surveillance Specialist
Jan R. Taylor — Surveillance Specialist
Robert D. Timmerman, Jr. — Surveillance Specialist
Glenn E. White — Surveillance Specialist
Neeta Jauhar — Laboratory Technician
Ruth A. Lustman — Laboratory Technician
Lillian G. Revenco — Secretary

Technical Services

Robert J. Boes — Manager, Assistant Chief Engineer
A. Majid Chaudhry — Environmental Engineer
Peter A. Tennant — Water Resources Engineer
Jane W. Renaldo — Secretary

Data Processing

Leonard McDonough — Manager
Timothy J. Van Epps — Senior Analyst
Donna M. Carroll — Computer Operator

Project: Organic Constituents in the Ohio River and Associated Water Supplies

Robert J. Boes — Project Director
Richard J. Miltner — Principal Investigator
Bonnie Barger Cummins — Project Scientist
Sarah B. Dirr — Secretary

Project: Early Warning — Organics Detection System

Glenn E. Moore — Project Director
Bill G. Razor — Senior Chemist
David M. Sunshein — Chemist

Photography – Adrian Alfano, Glenn E. White, Deborah S. Decker

Art – Ray Loos

*As of December 1, 1978

REGULATORY AGENCIES OF THE SIGNATORY STATES

ILLINOIS

Division of Water Pollution Control
Environmental Protection Agency
2200 Churchill Road
Springfield, Illinois 62706
(217) 782-2829

INDIANA

Stream Pollution Control Board
State Board of Health
1330 West Michigan Street
Indianapolis, Indiana 46206
(317) 633-0166

KENTUCKY

Department for Natural Resources
and Environmental Protection
Division of Water Quality
U.S. 127 South, Century Plaza
Frankfort, Kentucky 40601
(502) 564-3410

NEW YORK

Division of Pure Waters
Department of Environmental Conservation
50 Wolf Road
Albany, New York 12201
(518) 457-6804

OHIO

Environmental Protection Agency
P. O. Box 1049, 361 East Broad Street
Columbus, Ohio 43216
(614) 466-2390

PENNSYLVANIA

Bureau of Water Quality Management
Department of Environmental Resources
P. O. Box 2063
Harrisburg, Pennsylvania 17120
(717) 787-2666

VIRGINIA

State Water Control Board
P. O. Box 11143
Richmond, Virginia 23230
(804) 257-0056

WEST VIRGINIA

Department of Natural Resources
Division of Water Resources
1201 Greenbrier Street
Charleston, West Virginia 25311
(304) 348-2107

ORSANCO

414 Walnut Street
Cincinnati, Ohio 45202
(513) 421-1151