

# DRBC



## *Annual Report*

DELAWARE RIVER BASIN COMMISSION

*Contents*

Introduction .....	1
The Commission .....	2
The Staff .....	3
The Commission's Year .....	4
The Planning Programs: 1964 Progress .....	6
The Comprehensive Plan: A Progress Report .....	12
Other Resource Progress .....	14
Water Quality: A Special Report .....	16
River Conditions .....	19
The Organization .....	21
Auditor's Report .....	22
The Budget Outline .....	23





## Introduction

This is the second Annual Report of the Delaware River Basin Commission, the agency established under the interstate-federal Delaware River Basin Compact of 1961 to plan and guide the comprehensive development of the water resources of the four-state river system.

Covering the fiscal year from July 1, 1963 through June 30, 1964, this report is presented respectfully to the 6½ million citizens of the valley and to the legislative branches of the five signatory parties — the Government of the United States, the Commonwealth of Pennsylvania and the States of New Jersey, New York and Delaware.

As the report year opened, the staff still was orienting itself to an atmosphere of a new agency and, to many, a new river basin. Blueprinting of the organization and programs to be undertaken, data collection, and establishment of relations with public agencies and private groups concerned with Delaware water matters continued into the 1963-64 year.

This report spans a period in which rapid progress was made on the development of fundamental policies that will shape the Commission's activities for years to come. Earlier outlines of the Commission's nine planning programs began taking shape. Action was taken on many features of the Comprehensive Plan that the Commission had adopted in 1962. The Compact underwent interpretation on a variety of occasions in response to new situations. Effective cooperation was established by Commission people in the five signatory capital cities and with their representatives in the field. Commission procedures were adapted to a broad range of legislative, administrative and fiscal practices of the five parent governments. Several important water control projects under way by signatory agencies with which the Commission is closely allied moved a year nearer to completion, and the celebrated Tocks Island Reservoir finally went into design.

The Commission believes that events of the past year show it was a fruitful period for the water interests of the people of the Basin that points to a productive 1964-65.



Governor Carvel, Governor Hughes, Secretary Udall, Governor Rockefeller and Governor Scranton.

## The Commission-1964

*Chairman* Nelson A. Rockefeller † *Governor of New York*  
*Vice Chairman* Richard J. Hughes † *Governor of New Jersey*  
 Elbert N. Carvel † *Governor of Delaware*  
 William W. Scranton † *Governor of Pennsylvania*  
 Stewart L. Udall \* *U.S. Secretary of Interior*

† Ex officio  
 \* By appointment of The President

### Alternate Commissioners



Norman M. Lack  
*Delaware*



H. Mat Adams  
*New Jersey*



Harold G. Wilm  
*New York*



Maurice K. Goddard  
*Pennsylvania*



Vernon D. Northrop  
*United States*

### Advisors to Commissioners



Arthur C. Ford



Samuel S. Baxter



Col. Elmer P. Yates





James F. Wright  
*Executive Director*



William Miller  
*General Counsel*



Mr. Briganti, Mr. Buckingham, Dr. Hull, Mr. Thursby and Mr. Howlett.



W. Brinton Whitall  
*Secretary*



Arthur E. Peeck  
*Chief  
Administrative Officer*

*Planning  
Division*

- Herbert A. Howlett  
*Chief of Planning*
- C. H. J. Hull *Head,*  
*Program Planning Branch*
- Theodore Briganti *Head,*  
*Project Review Branch*
- Robert Buckingham *Head,*  
*Water Quality Branch*
- J. W. Thursby  
*Staff Economist*



## The Commission's Year

The 1963-64 year was one in which the Delaware River Basin Commission made what it believes to be significant advances in exercising its leadership position in the valley's resource affairs, both in terms of fostering a vitally needed regional outlook to the Basin's conservation matters and in the development of its program activities. Yet it was a year that must be regarded as part of the agency's formative period.

For the first time, all nine planning programs of the Commission were manned by staff members. (The following section, reviewing the progress of the nine planning programs, also describes the Commission's planning activities referred to elsewhere in this report.) Four employees were added during the year, raising to 39 persons the size of the staff that had numbered only five a year earlier on July 1, 1962.

It was the first year in which there was no change in the membership of the five-seat Commission. And the original alternate commissioner from each signatory government continued to carry on in that capacity through 1963-64.

On January 2, 1964, William L. Rafsky, former Development Coordinator for the City of Philadelphia, resigned as Advisor to the Pennsylvania Commissioner and was succeeded by Philadelphia Water Commissioner Samuel S. Baxter, by appointment of Governor Scranton.

The annual reorganization meeting of the Commission, held February 27, 1964 in New York City, marked the second exchange of the gavel. The chairmanship passed to Governor Nelson A. Rockefeller of New York from U. S. Interior Secretary Stewart L. Udall, and Governor Richard J. Hughes of New Jersey succeeded Governor Rockefeller as Vice Chairman. Former Governor David L. Lawrence of Pennsylvania had been the first and only other chairman.

Governor Rockefeller, speaking as the new Chairman, labeled the Compact "a broad and pioneering experiment in effective federalism" and said it "offers a model for regional planning and development." He said "the problems of today provide dramatic challenge to the federal system," and added, "the Delaware River Basin Compact is an exciting response to that challenge, recognizing shared sovereignty and accepting shared responsibility." The Governor declared that "the degree to which the Commission effectively responds to the challenges ahead will have significant impact not only on the orderly development of the Delaware River Basin and the Northeast, but upon the American federal system."

Governor Rockefeller referred indirectly to three unusual features of the Commission. First, it is the nation's only water resources agency in which the Federal Government has joined a group of states as an operating partner in tackling a regional problem. Secondly, in no other river basin does a single agency have such a broad range of responsibility and power for dealing with all phases of water resources. Finally, the membership of the Commission's governing body is unique in that it is constituted by the Governors of the four states and a representative of the President of the United States.

The 1964 annual meeting also represented the culmination of a major effort of the staff which started early in 1963. The Commission adopted its first Water Resources Program, a six-year action timetable based on the long-range content of the Comprehensive Plan that had been adopted two years earlier. The document presented a compendium of facts on supply





and demand for water in the Basin and, in addition, contained a series of recommendations regarded as vital to the valley's development:

*The Water Resources Program urged intensified study of the existing interstate water pollution control standards for the Delaware River. Plans for implementing this recommendation were taking form as the report year closed. (The description of the water quality program and progress and a special report on water quality, both appearing elsewhere in this report, discuss this subject in more detail.)*

*Recommended in the Program also was early acquisition of desirable reservoir sites that could otherwise permanently lose their natural resource value through incompatible development. A specific recommendation for action by New Jersey, under its Green Acres land acquisition program, to protect the important Hackettstown Reservoir site on the Musconetcong River appeared to be enjoying tangible response as the report year drew to a close.*

*The Water Resources Program called for immediate construction of five multi-purpose reservoirs, all part of the Commission's Comprehensive Plan, and in each case progress can be reported. (See section on Comprehensive Plan.)*

Another important action was taken by the Commission at its annual meeting with the adoption of Rules of Practice and Procedure. This document laid down the ground rules under which new projects and policies are to be included in the Comprehensive Plan and in the Water Resources Program. In addition, it outlines the steps for screening water-related public and private projects to assure their compatibility with and protect the integrity of the Comprehensive Plan.

The broad significance of the Rules adopted at the annual meeting is that they carry out in specifics the harmonious relations between the Commission and the signatory government agencies as called for by the Intergovernmental Relations Article of the Compact. This article requires in strong terms that all water resources projects be the result of cooperative planning between the Commission and the signatory parties and it sets down a number of ground rules designed to avoid conflict of jurisdiction and to give full effect to the Commission as a regional agency of the signatory parties that joined in creating it. The Rules generally signify a meeting of minds on the part of the Commission staff and officials of dozens of agencies of the four signatory states and the Federal Government, as well as with business leaders and other private groups with an interest in the Commission and in the valley's resources.

The Commission's Rules also present its first attempt to give a quantitative definition of projects with a "substantial effect" on the Basin's water resources. These include such diverse effects as impoundments of more than 100 million gallons, ground or surface water withdrawals of more than 100,000 gallons daily, changes in land cover on major

ground water infiltration regions, bridges and highways crossing reservoir or recreation sites in the Comprehensive Plan, and high pressure liquid petroleum pipelines at strategic stream crossings.

Thirty-nine times during 1963-64 the Commission exercised its important Project Review function by screening and approving plans for public and private projects such as water supply installations, waste treatment operations, small watershed developments and even two multi-million dollar transportation projects — a bridge and a ferry that will provide important new links between New Jersey and Delaware, both partners in the Delaware Basin Compact. In each instance, several with conditions imposed, the Commission ruled there would be no conflict with the Comprehensive Plan. In the year's most notable Project Review case, the Commission imposed a series of conditions on the stream crossing construction of a major transcontinental liquid petroleum pipeline to safeguard against possible contamination of the Wilmington area's water supply source.

As the year closed, the Commission was embarking on important negotiations with the Basin states on the issue of meeting the cost of non-federal features in reservoirs scheduled for construction by the Corps of Engineers. These negotiations were undertaken following notification by the Corps that before it could proceed with final design work on one major reservoir — Beltzville in the Lehigh Valley — it must receive assurances that the Federal Government will be reimbursed the cost of the water supply portion of the project. The use of the Commission as leader and negotiator in cost sharing arrangements was a major purpose of its creation.

### *In the Congress*

It was an important year for the vital Tocks Island dam and reservoir project on the main stem of the Delaware just north of the Water Gap. A \$250,000 appropriation for first-year design funds was approved by the Congress, which also allotted \$240,000 for second-year design work on the Beltzville Reservoir. In his 1965 budget message, President Johnson requested an additional \$450,000 for Tocks Island and \$276,000 for Beltzville and \$100,000 in initial funds to launch the important Blue Marsh project on the Schuylkill headwaters.

On June 8 and 9, three weeks before the close of the report year, the National Parks Subcommittee of the U. S. House Committee on Interior and Insular Affairs conducted hearings on proposed legislation to establish the Tocks Island National Recreation Area. In addition to overwhelming support by the witnesses, the Chairmen of both the Subcommittee and parent Committee expressed approval of the plan. However, the Subcommittee requested more up-to-date land acquisition cost estimates and more precise delineation of the park boundaries. The February 1, 1965 deadline set by the Subcommittee for receipt of this information was seen as an indication that the House of Representatives probably would not act on TINRA during the calendar 1964 session.



# The Planning Programs

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## 1

### Continuing Inventory of Water Supply

- *The Problem*

A continually up-to-date Comprehensive Plan is reliant upon the collection, compilation, evaluation and periodic publication of reliable water crop data. While federal, state and other governmental and private sources collect much Basin information, it is not continually compiled in form suitable to permit analyses upon which Commission decisions must depend. Each day, week and year present new combinations of climatologic and hydrologic phenomena to be evaluated.

- *Progress - 1963-64*

Compilation of basic data on precipitation, surface runoff, and ground water conditions continued. Compilation and dissemination of monthly reports on current and recent hydrologic conditions in the Basin were undertaken. Studies of natural runoff were completed for the Commission by the U. S. Geological Survey. To facilitate pinpointing of locations, alternative stream mileage systems were studied for application to the Delaware. An inventory of data on surface water withdrawals compiled by others was initiated.

The general locations of major ground water pools were determined and studies of their hydrologic characteristics were undertaken. Studies were started to determine the extent of salt water intrusion into major coastal plain aquifers. Major withdrawals from Basin aquifers for municipal water supplies were located and tabulated. Compilation of data on major industrial ground water withdrawals was begun.

## 2

### Population Analysis and Demands for Land and Water

- *The Problem*

Population concentrations, types of land use and water prices all influence water demands. Information on these factors is being collected by government at all levels and from private sources, which also are forecasting population shifts and planning land use accordingly. Only the Delaware Basin Commission is empowered to plan for unified basin development with a view toward compatible and efficient land and water uses.

- *Progress - 1964*

Records of population in all political sub-divisions in the Basin were compiled by drainage areas. Population estimates for 75 per cent of the sub-basins for 10-year intervals from 1970-2010 were completed. Studies of present and future land uses were started. New data on unit water use in the Lehigh River sub-basin, the Musconetcong sub-basin, and the Trenton-Philadelphia area were gathered, and earlier estimates of water use were revised. Information on municipal and industrial water use and reuse estimates and waste discharge projections was developed for use in preparing water supply policies.



# 3

## Analysis of Recreation, Fish and Wildlife Demands

### • *The Problem*

The natural gravitation of people to streams, lakes and reservoirs mandates that the program for development of the Delaware Basin's resources accommodate water-based recreation seekers. In addition to recreational water use, the protection and enhancement of sport and commercial fisheries are among the considerations in the establishment of water quality and streamflow objectives.

### • *Progress - 1964*

Collection of data on public and private recreational facilities and resources continued. A Fisheries and Wildlife Technical Assistance Committee to the Commission was established. A study of water temperatures in the upper reaches of the Delaware River was initiated. Research was undertaken on the effects of pollution upon the movement, species composition, distribution, and relative abundance of resident and transient fish populations in the estuary. Steps were taken to initiate a Basinwide fish kill reporting program. Coordination of a variety of recreation, fishery and wildlife programs was instituted. Work began to evaluate and classify the recreational, fish and wildlife resources of the Basin. The effects of various proposed projects and programs were reviewed in relation to fish, wildlife and recreation. Data on shad fishery resources and industry in the Basin were developed. Recreational plans for several reservoirs were reviewed. Origins of anticipated visits to the proposed Tocks Island National Recreation Area were analyzed.

# 4

## Analysis of Power Potentials and Demands

### • *The Problem*

The Basin's water resources have a determinable potential for generating electric power. A balance must be found between this potential and demands for it, since marketing factors are essential to decisions on timing and compatibility of alternative proposals to establish power installations, private or public. Changing technology will also bear on these decisions.

### • *Progress - 1964*

Records of the activities of the principal electric utility systems in the Delaware River service area were reviewed and applied to the estimates of the water demands for the generation of electricity in the Basin in order to include the effect of currently scheduled or proposed additions or retirements of generating equipment. Studies of the activities of the electric industry with regard to generation, transmission, distribution, sales, finance, regulation, research and development, power pooling, load forecasting, load dispatching, automation, rate scheduling, and related subjects were continued. New developments in the economics and technology of electric power and the trends in the electric industry were reviewed. Studies of the Tocks Island project and other projects involving potential hydroelectric power progressed. Current information on construction, financing, and operation of electric power facilities and the distribution and marketing of electric power was reviewed. Study was made of hydro-power design and operation criteria. The Beltzville site was studied with regard to pumped storage facilities. Liaison with outside interests was extended. Various meetings were held with power company representatives and with federal, state, and local officials, and others interested in electric power in the Basin.



# Programs...

## 5

### Investigation of Projects Proposed by Others

- *The Problem*

There is a constant flow of plans by public agencies and private sources to undertake projects that could alter the natural flow of water, its quality and even the cost of water downstream. Some installations simply delay runoff through temporary use of water, while others may export water from the Basin. Examples of projects affecting the river are dams, waste disposal installations, water supply systems and water using industries. Section 3.8 of the Compact requires the Commission to screen such projects for compatibility with the Comprehensive Plan.

- *Progress - 1964*

Liaison was continued with state and federal agencies to maintain familiarity with their activities in the Basin and to keep abreast of projects requiring Commission action under Sections 3.8, 11.1 and 11.2 of the Compact. Part II of the Administrative Manual, entitled "Rules of Practice and Procedure," was developed and approved by the Commission to cover the processes whereby the Commission will include projects in its Comprehensive Plan and extend them into the annual Water Resources Program. Also set forth in the Rules were procedures and definitions that the Commission will use in screening projects proposed by others to insure their compatibility with the Comprehensive Plan. Initial steps were taken for the development of administrative agreements with government agencies as provided by the Rules.

Investigated and approved by the Commission during 1963-64 were 39 projects by municipalities and other public bodies and by business concerns requiring clearance before work could progress. They were four surface and four ground water supplies, 14 sewerage and sewage treatment facilities, two industrial waste treatment operations, six petroleum pipeline installations, five docks and wharfs, a bridge and a ferry boat operation and two stream encroachments.



# 6

## Water Quality

- *The Problem*

Water of the Delaware River system is presently used and reused for navigation, irrigation, generation of electric energy, domestic and industrial supply, propagation of fish, shellfish and aquatic life, recreation (including swimming and water skiing) and assimilation of sewage, natural and industrial wastes. The effects of these multiple uses must be monitored, analyzed and governed so that optimum benefits from the waters of the Basin can be attained.

- *Progress—1964—Data and Stream Analysis*

Current data of Basin surface water quality were collected. Characteristics of waste return flows and basic data of possible pollution sources were analyzed. Efficiency of present sampling programs was evaluated. A cooperative investigation was made of the effect upon the aquatic environment of a pesticide being used in the U.S. Department of Agriculture's gypsy moth control program in New Jersey. The effects of proposed impoundments on downstream water quality were studied, with emphasis on the proposed Beltzville and Marsh Creek projects. Basin waste treatment facilities were investigated for efficiency.

- *Progress—1964—Control and Investigation of Pollution*

In accordance with a recommendation in the first Water Resources Program, a Basinwide ad hoc committee was established to develop a uniform legal and administrative interpretation of the quarter-century old Incodel zone pollution standards. A preliminary feasibility study on installing oxidation lagoons for further treatment of sewage effluent was completed. Investigations of the effects of petroleum wastes and oil spills on waterfowl and fish were initiated. A listing was made of all industries fronting on and adjacent to the Delaware River — from Trenton to Salem, N. J., on the east bank and from New Castle, Del., to Morrisville, Pa., on the west. In addition, both sides of the Schuylkill River in Philadelphia, from Fairmount Dam to the Delaware River, were surveyed. Cooperative investigations were made with the New Jersey Health Department of the waste discharges of three industrial concerns. A study was completed of effluents from specific industries at the request of the U. S. House Subcommittee on Natural Resources and Power to determine their compliance with the Incodel standards. The initial stages of an impaired water quality warning system were developed.

- *Progress—1964—Research and Development*

Rutgers University was awarded a \$20,000 research contract to determine relationships, in dollar terms, between water quality and benefits for given uses. The first phase of this project will assess methods proposed, or currently in use, for evaluating benefits associated with various uses of water. The second phase will develop the best techniques for measuring the monetary value of various levels of water quality. Commission staff established cooperative relations with the Public Health Service's Delaware Estuary Study group, and served on the Technical and Policy Advisory Committees to the PHS unit.



## 7

### Comprehensive Plan and Water Resources Program

- *The Problem*

In recognition of the interrelation of interests and needs throughout the four Basin states, the Compact requires the Commission to maintain a Comprehensive Plan for the valley's development on a continually updated basis. In addition, it calls for annual adoption of a Water Resources Program, based on the Plan, presenting the Basin's needs and the projects required to meet them.

- *Progress - 1964*

Administrative direction was provided to all planning and review activities. The first annual Water Resources Program was completed and, in February 1964, adopted by the Commission. Work continued on an expanded outline for a revised Comprehensive Plan. Rules of Practice and Procedure were prepared and adopted by the Commission to govern the process of adding projects to the Comprehensive Plan and extending them into the Water Resources Program. Studies of alternative means of financing construction of projects, or separable features thereof, and of alternative methods of recovering reimbursable costs were initiated. Procedures were recommended for determining benefits, allocation of costs, and priorities among alternative Basin projects.

## 8

### Flood Loss Reduction

- *The Problem*

Homes, businesses and industries continue to crop up on land that is vulnerable to occasional yet severe floods. There is a lack of awareness of the hazards, and construction of even modest flood control measures tends to instill a false sense of security among flood plain dwellers. In addition, it is often economically infeasible to build expensive facilities to protect even a highly developed area from floods that are extreme but infrequent. The Commission must exercise leadership in alerting the public to the hazards, in providing information on flood locations, frequency, duration and inundation and in establishing programs to reduce loss of life and property damage.

- *Progress - 1964*

High water mark records for the August 1955 flood were compiled by sub-basins and located on topographic maps. After discussions with county and municipal officials, the Commission contracted with the U. S. Geological Survey for preparation of flood plain maps and supporting data for a 25-mile reach of the Delaware River and an eight-mile section of the Schuylkill River, both high damage stretches. Existing flood forecasting and warning plans for the Basin were reviewed with representatives of the U. S. Weather Bureau. A review of existing programs in the Basin for flood loss reduction was completed and study of similar programs and related programs affecting flood plain development in other basins was continued.



# 9

## Basin Operations

- *The Problem*

A river system such as the Delaware offers innumerable possible operating combinations. For example, adjustments can be made to intercept flood waters for use as water supply and flow augmentation later in the year. Also, excess flows can be pumped to off-stream reservoirs during off-peak electrical demand periods and released again to produce hydro-electric power during peak demand periods. Through the use of computers, it is now possible to develop an efficient, integrated plan for operating all projects in a river system. Since such a plan should be prepared early in a basin's development, the young Delaware Basin Commission is in a good position to profit from this new approach.

- *Progress - 1964*

This program proceeded at a reduced rate in order to expedite the water demand program. However, assistance was provided to staff members in storing, retrieving and using data through the use of machine techniques. Mass storage of basic data on waste treatment inventory and streamflow volume was initiated. Techniques of basin operation being tested at the Harvard Graduate School of Public Administration were investigated.





# The Comprehensive Plan

The Commission's Comprehensive Plan, which was adopted during the first year of the agency's existence, was neither enlarged nor changed in 1963-64.

However, it was a period that produced marked progress on a great number of the physical features of the Plan, which is the Commission's long-range blueprint for insuring orderly development of the water resources throughout the 12,750-square-mile Basin.

**These are the component features of the Commission's Comprehensive Plan:**

- Six multi-purpose reservoir projects with federal aid flood control features, all authorized by Congress in 1962 for probable construction by the Corps of Engineers — Beltzville, Blue Marsh, Trexler, Tocks Island, Aquashicola and Maiden Creek.
- Two existing flood control dams built by the Corps to be enlarged for water supply and recreation, also authorized by Congress—Prompton and Francis E. Walter (formerly Bear Creek).
- A New York City water supply reservoir under construction — Cannonsville, in the northernmost reaches of the Basin.
- Eight local watershed programs consisting of systems of dams and reservoirs and land treatment measures — Little Schuylkill, Brodhead Creek, Greene-Dreher watershed and Lackawaxen tributaries in Pennsylvania; Silver Lake, Paulins Kill and Maurice Cove in New Jersey; Brandywine Creek in Pennsylvania and Delaware.
- Four non-federal major reservoir installations for water supply and recreation — Hackettstown in New Jersey, Tohickon and Evansburg in Pennsylvania, and White Clay Creek near Newark, Del.
- Water quality standards for the Delaware River, and many existing water supply and waste disposal installations, recreation areas and river stage and stream gauging stations.

In adopting its first Water Resources Program at the 1964 annual meeting, the Commission urged immediate action on five important projects in the Comprehensive Plan. They are Beltzville, Blue Marsh, Tocks Island, Tohickon and Marsh Creek, a feature of the Brandywine Creek watershed program. Important advances were made during the year on each of these vital projects.

The second of three years of design work by the Corps of Engineers on Beltzville Reservoir on Pohopoco Creek, a tributary of the Lehigh River, was concluded. The final dam site was selected and preliminary real estate taking lines were established. The first construction contract is expected to be awarded in the spring of 1966.

The long-anticipated Tocks Island Dam, which will back up a 37-mile long reservoir on the main stem of the Delaware above the Water Gap, went into its first year of preconstruction design. As 1963-64 came to an end, the first phase of sub-surface explorations and borings was in progress, as was a topographical survey of the area. The Corps of Engineers looks toward a 1967-68 construction start.

President Johnson requested \$100,000 for preconstruction design work by the Corps of Engineers on the Blue Marsh project during fiscal 1965. The anticipated approval of this request will mean that for the third consecutive year Congress has moved to start a new Delaware Basin project with a federal appropriation.







The Commonwealth of Pennsylvania neared the completion of land acquisition for Tohickon Reservoir near Newtown and at year's end was working on recreation facilities at the Francis E. Walter Reservoir in the Lehigh headwaters. Progress was reported on two projects in which Pennsylvania and the U. S. Soil Conservation Service are in partnership. They are the Marsh Creek Reservoir, part of the Brandywine Valley watershed program, on which design work continued, and the Locust Creek Dam project, a feature of the Little Schuylkill watershed development, on which construction neared completion.

Including the Brandywine and the Little Schuylkill, five local watershed programs of the Conservation Service in the State of Pennsylvania are also components of the Commission's Comprehensive Plan. The Conservation Service projects in Pennsylvania are primarily for flood protection.

Of 10 structures planned in the Brandywine program, one is in design. In the Little Schuylkill plan, two of four are completed and a third is under construction, while channel improvement work remains to be done. In the Lackawaxen development, five of seven dams have been completed, and in Greene-Dreher five of 16 are finished. The next step in the Brodhead Creek development, where the State of Pennsylvania has completed flood protection work in East Stroudsburg, is acquisition of land rights for four additional sites.

The Soil Conservation Service's Silver Lake-Locust Island project in South Jersey was completed in 1962. Miles of dike with tidegates now protect the area from tidal flooding and provide good drainage on both agricultural and wildlife land.

In the Paulins Kill watershed project in Northwestern New Jersey, three floodwater retarding structures were completed and two miles of channel improvement work in the Blairstown area progressed.

On the Maurice River, a 6900-acre Conservation Service project in South Jersey, two miles of dikes and other water control structures were completed. Channel improvement work was also under way in this program to cut flooding and help drainage on agricultural land and to improve the marshland wildlife habitat.

Construction of Cannonsville Reservoir, one of the principal components in New York City's water system, neared completion as the year ended, and the State of Delaware moved to facilitate creation of an agency empowered to build the Newark Reservoir on White Clay Creek.





## Other Resource Progress

A wide range of diverse resource-related activities not specifically reflected in the Commission's Comprehensive Plan progressed in the Basin during 1963-64.

Some involved actual physical works that contribute to the development of the valley. Some were geared toward promoting a better understanding of water resource problems by local officials and citizens. Still others were aimed at alerting the three-state Tocks Island Reservoir area to the changes in store.

The Delaware Basin Commission participated directly in much of this work as part of its function as an action agency. That being carried out by other government units and private groups also was watched over closely by the Commission under its responsibility for insuring the harmonious resource development of the Basin.

### *Flood Information Program*

The existing and proposed big dams in the Commission's Comprehensive Plan offer no solution to about 65 percent of the \$9½ million in potential annual flood damages in the Basin. Among other reasons, this is due to the economic impracticability of building dams or levees that would cost more than the value of the property to be protected and to flooding occurring in areas upstream from major reservoirs. One of the Commission's main concerns, therefore, is reduction by other means of flood losses.

In 1963-64 the Commission contracted with the U. S. Geological Survey for the preparation of flood atlases for each of two high-damage stretches—the Schuylkill River near Philadelphia and the Delaware main stem from Easton-Phillipsburg to Belvidere, N. J. It is hoped that this flood information work, which the Commission and the Geological Survey are financing jointly, will encourage enlightened action on the part of local officials in promoting compatible flood plain uses. The Commission-Geological Survey work is part of 70 miles of flood mapping in progress in the Basin. Nearly 70 or more miles of similar work has already been completed and another 300 miles of mapping is scheduled, principally by the Corps of Engineers.

### *About Tocks Island*

Much of the Commission's effort in promoting the Tocks Island Reservoir and National Recreation Area, as well as the understanding of them, has been and will continue to be in cooperation with other agencies and groups supporting that dramatic multi-purpose undertaking.

For example, effect on fishery resources is one of the factors being considered by the Commission in weighing the proposal by a group of New Jersey electric utility companies to link a pumped storage hydroelectric operation to the Tocks Island dam. A Fish and Wildlife Technical Assistance Committee representing various interests in the Basin was established under the Commission's leadership to help in this phase of its review of the application.

Talks between the Commission and the non-governmental Water Resources Association of the Delaware River Basin resulted in creation of the Tocks Island Interagency Committee. Consisting of representatives of state, interstate and federal agencies whose operations may in some way touch the Tocks Island project, the committee's purposes are to anticipate planning and development problems presented by the project and to help coordinate activities to meet them. The committee also is closely identified with an economic impact study in progress to gauge the changes in store for the five-county, three-state Tocks Island area.



At a public meeting held under the interagency committee's auspices on April 16, 1964, a group of officials met with the citizens of the small village of Bushkill, Pa., which will be inundated by the Tocks Island Reservoir, to discuss relocation of the community. A packed firehouse crowd listened intently to the prospective scheduling of the project and to suggestions on how the relocation might be approached and achieved.

The National Park Service, which first proposed the Tocks Island National Recreation Area, produced a natural history survey of the reservoir area and has initiated historical and archaeological investigations of the region.

The Water Resources Association continued to press for creation of a regional council representing counties and municipalities that would be affected by the National Recreation Area.

### *Project 70 - - Green Acres - - Now or Never*

In an important advance in the cause of conservation, the voters of Pennsylvania approved in November 1963 the Project 70 land acquisition program for preservation of open space, which the Commonwealth's Alternate Delaware Basin Commissioner, Maurice K. Goddard, has said could figure significantly in development of Delaware Basin programs.

New Jersey had approved its counterpart Green Acres program two years earlier, and as 1963-64 closed there was some prospect that it might be used to help preserve the Hackettstown Reservoir site on the Musconetcong River. In another matter involving the Hackettstown facility, the Commission exercised leadership in promoting compatible planning for both the reservoir and a superhighway through the area.

Within three years after its initiation, New York State's \$100 million "Now or Never" program of recreation and conservation land purchases in and out of the Delaware River Basin has been essentially completed.

### *Watershed Development*

Aside from the eight small watershed programs of the Soil Conservation Service that are part of the Commission's Comprehensive Plan, there was extensive activity throughout the Basin on similar developments that have not yet become part of the Plan. These projects involve flood protection, channel improvements, drainage and other land treatment measures.

One such program, the Pine Mount-Mill Creek project in New Jersey's Cumberland County, was completed in May 1964. Progress continued on three others — on Kaercher Creek in Pennsylvania and on Repaupo Creek and Middleneck Creek, both New Jersey. Advanced planning neared completion on five local watershed projects — on the Wissahickon and Mauch Chunk Creeks in Pennsylvania and on Assunpink and Parkers Creeks in New Jersey. The Conservation Service was processing applications for work on nine other watersheds — Upper Monacacy, Pocono and Lower Brodhead Creeks in Pennsylvania, and on Salem River, Riggins Ditch, Furnace Brook, and Oldmans, Maple and Dennis Creeks in New Jersey.

### *Flood Protection Work*

In addition to its building and planning efforts on big reservoirs, the Corps of Engineers was involved in many local flood protection projects throughout the Basin. One, on Little Mill Creek in the State of Delaware, was in the preconstruction stage, and four were undergoing authorization studies. They are a group of streams in Camden County and the North Branch of Newton Creek in New Jersey, the East Branch of the Delaware River in New York State, and Darby and Cobbs Creeks in Pennsylvania.



# Water Quality Activities

The extent of the water quality problem in the Delaware Basin and the work lying ahead in establishing effective policies and programs to alleviate it present to the Commission one of its great challenges. The magnitude of the pollution problem was reflected during the past year in the attention focused on it — at and away from the Commission's headquarters, including a Congressional inquiry.

## *Congressional Inquiry*

The year spanned by this report was only a few weeks old when the U. S. House Subcommittee on Natural Resources and Power cast its spotlight on the Delaware's water pollution troubles and whether the Commission, the Basin states and the polluters are equipped to cope with them.

The Congressional panel, a unit of the House Government Operations Committee, selected the Delaware for the first of its series of nationwide on-site inspections and hearings into water pollution matters in a two-day visit to the Basin in August 1963.

Although the Subcommittee had not yet issued its findings on its nationwide pollution inquiry by the time of publication of this report, the Chairman, Rep. Robert E. Jones of Alabama, recorded his favorable views in a letter to the Executive Director that is reproduced on the following page.



The Commission did not wait for outside interest to be demonstrated in its pollution abatement jurisdiction before itself giving recognition to the weight of the problem.

In the Spring of 1963 it engaged a panel of three distinguished water quality management authorities to analyze conditions in the heavily industrialized and urbanized Basin and to help stimulate development of a program by the Commission's water quality staff, the largest the agency has assigned to a single water resource specialty.

In its report, made in July 1963, the panel outlined its concept of water quality management under the Delaware Basin Compact and identified areas of study and action to implement the concept, labeling the job of the Commission both "broad and urgent." (The 62-page Consultants Report for Development of a Water Quality Management Program is available from the Commission for 50 cents a copy.)

Among the consultants' specific recommendations was that the Commission "move without delay to actively participate" in the comprehensive water quality study of the Delaware River estuary that had been launched by the U. S. Public Health Service in April 1962.

## *IncodeI Standards*

The Commission absorbed the Interstate Commission on the Delaware (IncodeI) in January 1963. Several months earlier, the new agency had incorporated in its Comprehensive Plan the zone pollution control standards originated by IncodeI.

As an initial step toward improving the effectiveness of these standards, the Commission's first Water Resources Program, adopted in February 1964, urged that the Compact's signatory parties join without delay in seeking a uniform Basinwide interpretation of both the legal and administrative aspects of the IncodeI standards.

Under Commission auspices, a special committee representing all the signatory parties was formed toward the end of the report year to carry out this assignment.

*(Continued on Page 18)*



ROBERT E. JONES, ALA., CHAIRMAN  
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CAPITOL 2-3121  
EXTENSION 5417

EIGHTY-EIGHTH CONGRESS

## Congress of the United States

### House of Representatives

NATURAL RESOURCES AND POWER SUBCOMMITTEE

OF THE

COMMITTEE ON GOVERNMENT OPERATIONS

ROOM 8349 B RAYBURN OFFICE BUILDING  
WASHINGTON, D.C. 20515

Mr. James F. Wright  
Executive Director  
Delaware River Basin Commission  
Trenton, New Jersey

September 10, 1963

Dear Mr. Wright:


I want to thank you for your assistance to the Subcommittee on Natural Resources and Power of the Committee on Government Operations, U. S. House of Representatives, at our hearing in Trenton, New Jersey on August 9, and during our inspection tour the following day along several of the principal streams and bodies of water, when we examined into the status and problems of water pollution control and abatement in the Delaware River Basin. This hearing and inspection, the first in a series of regional hearings by our Subcommittee in various parts of the nation, was both informative and interesting. It was a productive experience that will substantially aid the Subcommittee in preparing recommendations on the problems of water pollution control and abatement.

We think it is very important that the Delaware River Basin Commission has been established as a government agency in the four-state basin area with large power to set water quality standards and to enforce them on a basin-wide rather than on a geographically fragmented basis. We were particularly interested in your Commission's structure because it reflects a Federal-interstate-state operating partnership which, we understand, is unique in the nation.

The Federal Government is sharing the responsibility and expenses of your Commission's operation. In addition, Federal agencies are providing substantial aid to attain the objective of pollution control management in the Basin; for example the work being performed by the Public Health Service on the Delaware Estuary study. This study, which was requested by and is receiving cooperation from the affected states, evidences good Federal-local cooperation. We feel sure that the Federal Government will seek implementation by local authorities, including your Commission and the four States, for any program ultimately recommended as a result of the Delaware Estuary study.

Our Subcommittee was impressed by the favorable outlook for the development of a sound program for water quality management in the Delaware River Basin. The Subcommittee desires to encourage maximum effort by the state and local governments, your Commission, business and civic organizations, and citizens of the region to solve the water pollution problems of the area. The Federal Government will certainly cooperate and assist in helping to meet those problems. I am sure there will be continued surveillance of the water quality situation in the Basin by both the executive and legislative branches of Government to assure further progress and to reassess, from time to time, how effectively the program of water pollution control and abatement is being carried out.

Sincerely,



ROBERT E. JONES  
Chairman  
Natural Resources and Power Subcommittee



### *Estuary Study*

The Public Health Service study of the water quality problems of the Delaware estuary was among the first to be set up under the Federal Pollution Control Act. It is estimated that the undertaking will cost well over a million dollars before it is completed, probably in 1967.

Through the use of mathematical models that simulate conditions in the Basin through the use of computers, the estuary study staff is working at its headquarters in Philadelphia to produce a comprehensive program for reducing the pollution of the Delaware estuary waters. The estuary extends as far north as Trenton, but intense pollution problems occur mainly below North Philadelphia.

By feeding statistics on projected pollution loads into the computers, the PHS hopes to forecast future conditions in the Basin, and to determine the costs required to obtain various levels of water quality. Due to brisk waste treatment activity in recent years, the estuary's pollution load has remained about the same as it was in 1958 despite sharp industrial and population growth since then. But unless far-reaching programs are put into effect, it is foreseen that the estuary's pollution rate by the dawn of the 21st century will be so intense as to limit further population and industrial expansion.

As urged by the consultants, the Commission's water quality personnel has worked closely with the PHS estuary study staff and serves on two of its important advisory committees — on policy and technical matters.

### *Public Health Service Grant*

Besides conducting its own extensive estuary study, the Public Health Service also provided a \$45,448 grant to the Commission in fiscal 1964 toward its water quality program. In giving its required approval to the Commission's work outline, the PHS declared, "your agency will be developing and maintaining a water pollution control program that should contribute materially toward an improvement of the conditions of the area in which your agency has jurisdiction."

While suggesting that "additional emphasis" be placed on the Commission's stream monitoring activities north of Trenton, the PHS listed these nine "strong points" in the agency's program plan:

The Commission's close cooperation with agencies at other levels of government, its stream sampling and analysis work, its inventory of waste discharges, the Rutgers University research contract, the move toward Basinwide uniformity regarding the Incodel standards, an investigation into automatic stream monitoring equipment, the plan to keep pollution control costs down through "optimum management," the intent to determine the extent of municipal and industrial compliance with existing pollution standards, and the plan to measure waste loads from industrial groups in relation to existing regulations.

### *Rutgers Research Project*

An important water quality research effort was initiated by the Commission during the year. Under the terms of a \$20,000 contract, Rutgers University agreed to determine for the Commission the actual monetary relationship between water quality and resulting benefits for specific uses. The Commission has decided it must be prepared, as it gets involved in the development of multi-purpose water control projects, to place a dollar value on pollution abatement achievements just as it will have to do for other benefits such as flood control, water supply and recreation.



## River Conditions

Delaware Basin hydrologic conditions in 1963-64 repeated the story that had prevailed in the Basin since August 1961 — continued sustained drought. Slight upturns were reported during the winter and early spring months, but both periods of temporary relief were soon wiped out by the dominant dry spells.

Total precipitation for the 12-month period was less than the 1931-60 norm throughout the Basin, and records lows were recorded for several months at several check points. October 1963 produced the lowest precipitation for that month on record at both Trenton (.05 inches) and Philadelphia (.49 inches), and the second lowest at Allentown (.15 inches), Reading (.17 inches) and Wilmington (.21 inches). It was the driest May ever at four major cities, at Allentown (.09 inches), Trenton (.25 inches), Philadelphia (.47 inches), and Wilmington (.22 inches). The May-June combined rainfall hit a record low at Philadelphia (.68 inches) and Wilmington (1.24 inches). With the exception of January and March 1964, below-average flows of the Delaware River were tabulated at Montague, N. J. and Trenton for each month of 1963-64. On October 31, 1963, the discharge of the Delaware River at Trenton dropped to 1170 cubic feet a second, the lowest ever recorded at that point.

Storage at New York City's Pepacton and Neversink Reservoirs in the Catskill Mountains of New York State dipped to 7.7 billion gallons and 22 million gallons, respectively, on November 6, 1963. This represented the lowest combined total storage, as well as the lowest level at Pepacton, from the time these reservoirs were first filled.

The severity and the length of the salt water intrusion into the Delaware estuary in the summer and fall of 1963 were the worst since 1957. On July 1, 1963, the salt front had advanced beyond Chester. By late August it had reached Pier 11 in Philadelphia before penetrating as far upstream as the Tacony-Palmyra Bridge in November.

The picture was dark also for the Basin's ground water resources, although most well levels were higher as 1963-64 ended than they had been a year earlier.

During the summer of 1963, ground water levels in many observation wells declined sharply and continued to drop into early November, producing record lows. Many small communities dependent on ground water were forced to resort to emergency supplies during the prolonged drought.

The usual October recovery did not occur until mid-November. Toward the end of 1963 and in early 1964, well levels continued to rise, with many still below average. The April leveling off period was followed, as normal, by declines, but they were more rapid than usual in June due to lack of precipitation and increased water consumption.

Despite the sustained drought, there was no recurrence of the previous year's large number of serious fish kills.

The publication of a monthly summary of the Basin's water conditions, compiled with the assistance of several other agencies, was well received.



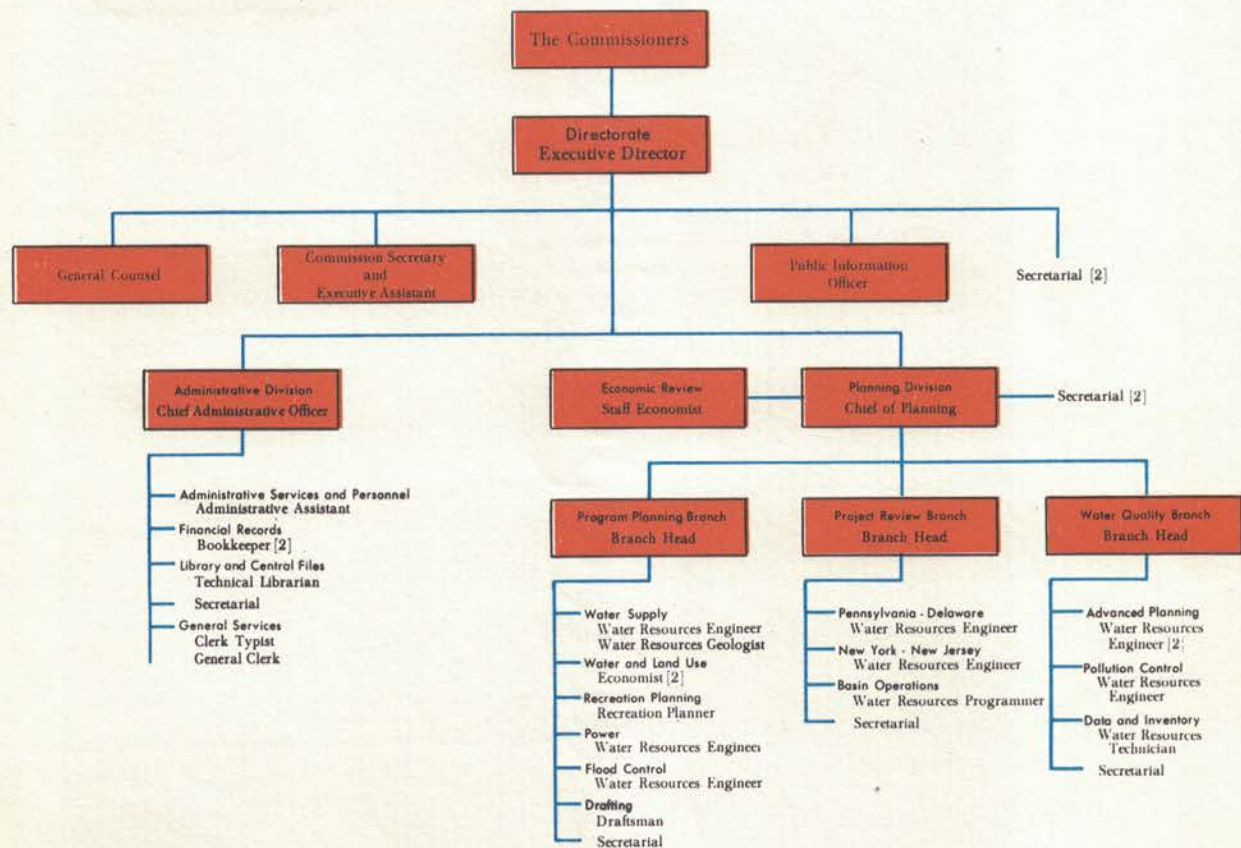
October 1963 brought the lowest flow of the Delaware ever recorded at Trenton. This is how the river appeared from the Morrisville bank. The domed building on the far left is New Jersey's State Capitol.







# The Organization





# Auditor's Report

## ERNST & ERNST

FIDELITY PHILADELPHIA TRUST BLDG

PHILADELPHIA, PA. 19109

Delaware River Basin Commission,  
Trenton, N. J.

We have examined the balance sheet of the Delaware River Basin Commission as of June 30, 1964, and the related statements of revenues and expenditures and unencumbered appropriations for the fiscal year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances, and nothing came to our attention to indicate that moneys received by the Commission have been expended other than in accordance with the provisions of the Delaware River Basin compact.

Office furniture and other equipment budgeted and acquired during the year have been treated as current expenses and are not included in the balance sheet.

In our opinion, the accompanying balance sheet and statements of revenues and expenditures and unencumbered appropriations present fairly the financial position of the Delaware River Basin Commission at June 30, 1964, and the results of its operations for the fiscal year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

*Ernst & Ernst*

Philadelphia, Pa.  
July 21, 1964





REVENUES

1964 (Actual)	1965 (Anticipated)
Delaware 16,000	16,000
New Jersey 117,000	117,000
New York 117,000	117,000
Pennsylvania 117,000	117,000
U.S. 117,000	92,000
Public Health Service Grant 45,448	40,000
Miscellaneous 377	121
INCODEL Balance 0	13,379
Working Reserve 0	34,500
<b>TOTAL</b> 529,825	<b>547,000</b>

# Budget Distribution

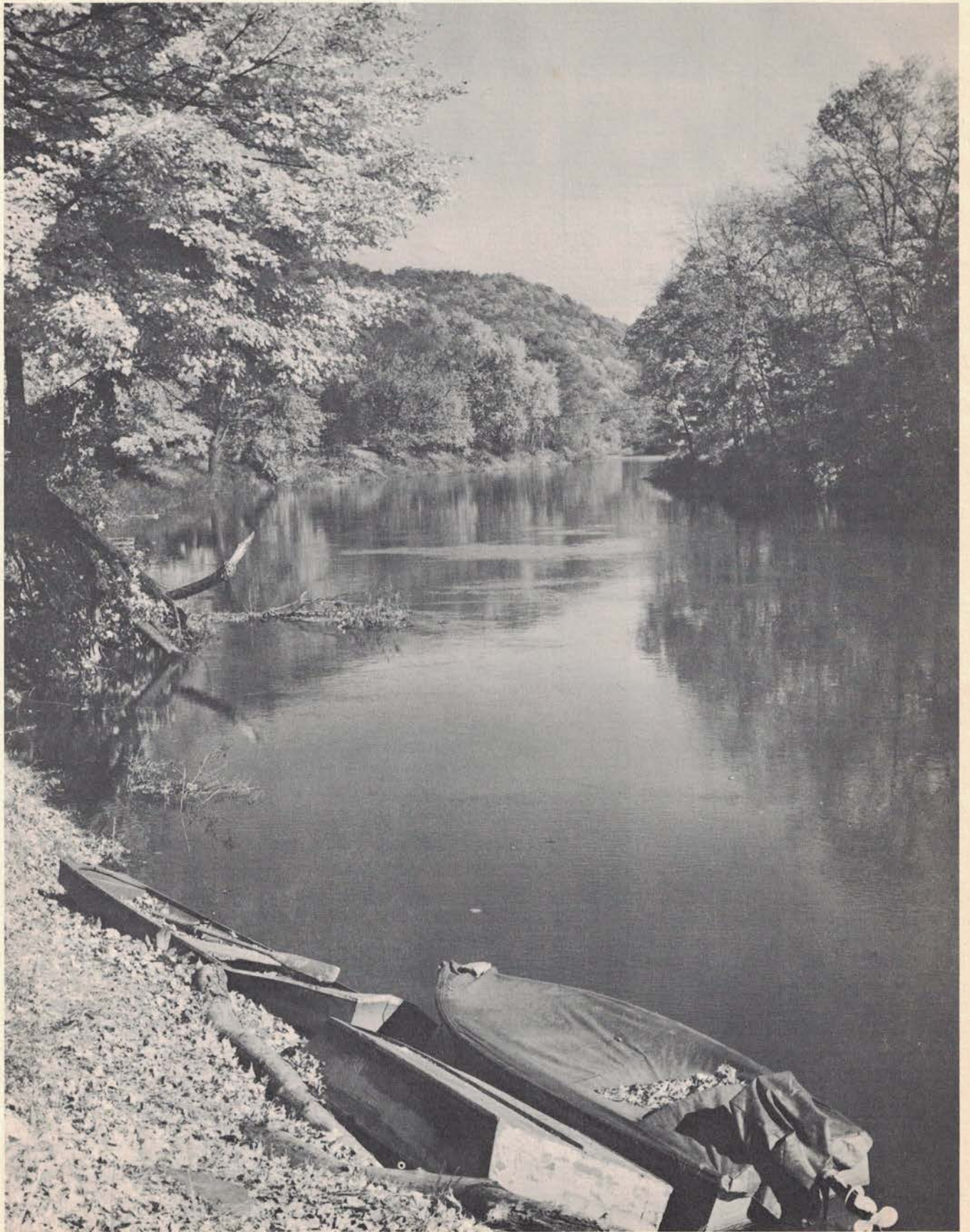
## Fiscal Years 1964 and 1965

EXPENDITURES

	1964 (Actual)	1965 (Anticipated)
<b>By Organization</b>		
Directorate	98,407	97,630
Administrative Division	63,383	64,525
Planning Division	347,683	384,845
<b>TOTAL</b>	<b>509,473</b>	<b>547,000</b>
<b>By Program</b>		
WATER SUPPLY	46,873	42,000
WATER DEMAND	37,657	55,400
RECREATION	31,298	31,200
POWER	38,537	33,000
PROJECT REVIEW	75,469	87,100
WATER QUALITY	125,754	121,800
COMPREHENSIVE PLAN	118,025	130,200
FLOOD LOSS	18,459	39,800
BASIN OPERATION	17,401	6,500
<b>TOTAL</b>	<b>509,473</b>	<b>547,000</b>
Unexpended Balance	20,352	0
<b>GRAND TOTAL</b>	<b>529,825</b>	<b>547,000</b>







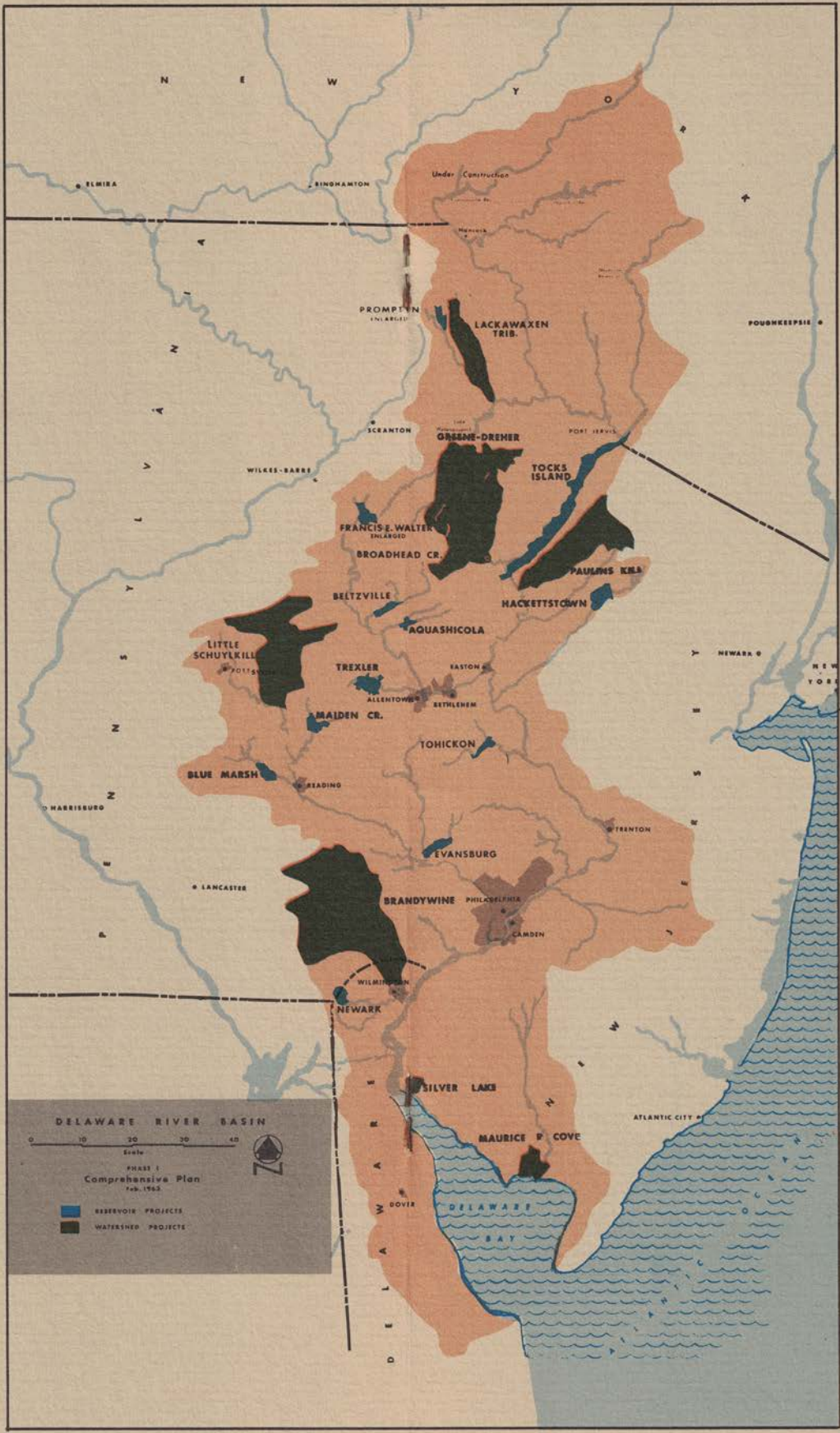




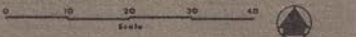








**DELAWARE RIVER BASIN**



PHASE I  
Comprehensive Plan  
Feb. 1963

- RESERVOIR PROJECTS
- WATERSHED PROJECTS



Under Construction

PROMPTON  
ENLARGED

LACKAWAXEN TRIB.

SCRANTON

OSAGE-DREHER

PORT JERVIS

WILKES-BARRE

FRANCIS E. WALTER  
ENLARGED

BROADHEAD CR.

TOCKS ISLAND

PAUMPS KMA

BELTZVILLE

HACKETTSTOWN

AQUASHICOLA

LITTLE SCHUYLKILL

TREXLER

EASTON

MAIDEN CR.

ALLENTOWN

ESTLENEM

TOHICKON

BLUE MARSH

READING

TRENTON

EVANSBURG

LANCASTER

BRANDYWINE

PHILADELPHIA

CAMDEN

NEWARK

SILVER LAKE

MAURICE P COVE

ATLANTIC CITY

DOVER

DELAWARE BAY

N E W Y O R K

P A N N A

S C R I P S

Y L Y

Y L Y

S C R I P S

N E W

Y L Y

P A N N A

S C R I P S

Y L Y

N E W

Y L Y

FOURKEEPSIS

NEWARK

NEW YORK

D E L A W A R E