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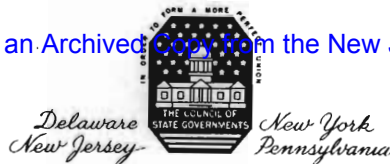
PRELIMINARY STUDY

relative to

Advisability of Future Construction of an Integrated Water Development Project, consisting of a series of Dams and Reservoirs on the Main Channel of the Delaware River and its Tributaries

December 31, 1948

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INTERSTATE COMMISSION on the Delaware River Basin

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DIRECTOR, STATE PLANNING BOARD
HON. CHARLES C. SMITH
MEMBER OF HOUSE OF REPRESENTATIVES

Gentlemen:

Your Technical Subcommittee is pleased to submit to you, the members of Incodel's Regional Water Supply Committee, the accompanying report covering a preliminary study relative to the advisability of the future construction of an integrated water development project, consisting of a series of dams and reservoirs on the main channel of the Delaware and on its tributaries, in the upper Delaware River Basin above Trenton, New Jersey - Morrisville, Pennsylvania.

Your subcommittee is composed of the chief engineers of the water control and development agency of each of the States, of the largest metropolitan area of each State, and of Incodel. Its membership is as follows:

- James H. Allen - Chairman
Incodel
- John C. Thompson
New York State Department of Conservation
- H. T. Critchlow
New Jersey Water Supply Council
- R. J. Gillis
Pennsylvania Water and Power Resources Board
- Roger W. Armstrong
New York City Board of Water Supply
- Charles H. Capen
North Jersey District Water Supply Commission
- Elbert J. Taylor
Philadelphia Bureau of Water

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The primary purpose of the proposed project will be to meet the prospective water supply requirements of metropolitan areas, within or without the Basin, in the States of New Jersey, New York and Pennsylvania. Incidental uses and benefits probably would include flood control, recreation, salinity control,

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stream flow regulation and hydroelectric power.

Although the project, if found to be advisable, would be for the general benefit of the entire Basin and its surroundings, the areas most directly concerned are New York City and the lower portions of New York State that might be served by the development, North Jersey metropolitan area, the City of Philadelphia, and the Philadelphia-South Jersey metropolitan area.

These metropolitan areas contain almost one-tenth of the entire population of the United States, are fast growing and constitute the industrial and commercial backbone of the nation. For more than a quarter of a century, they have been constantly confronted with the difficult problem of providing their people with a sufficient supply of suitable water for both domestic and industrial purposes. Each has determined that the Upper Delaware Basin is a logical and attractive source of future water supply. Each has advanced proposals for that purpose.

But, in every instance, each agency, in attempting to formulate a future water supply program, has acted entirely independent of the other two, and only in the case of New York City has a water supply project involving the waters of the Delaware Basin been undertaken. Moreover, until Incodel was created, and except under its auspices, all efforts on the part of the States to negotiate cooperative agreements respecting the development of the water resources of the region have failed.

It is estimated that the three metropolitan areas, together with the States of which they are political entities, have spent in the aggregate well over \$2,000,000 for consulting services covering investigations relative to their individual water supply problems and their individual rights in the matter of meeting them. Never has there been an effort to coordinate and integrate the activities of the interested jurisdictions in their search for new sources of water supply despite the several strong indications that have cropped up over the years that the problem could best, if not only, be solved through such action. No appropriation has been made available for the purpose of considering the problem on a unified basis.

The time has now come when that step should be taken. Cooperatively, the States should make a sincere attempt to develop a program that will best meet the future water supply requirements of their major political subdivisions and, at the same time, incorporate those principles respecting the utilization of the interstate waters of the Delaware Basin that will inure to the mutual benefit of all interests. By so doing, the States will provide a direct service of outstanding significance. Also, they will be fully prepared to cope with jeopardizing

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propositions that may be advanced by the federal government or by private agencies, such as those proposed within recent years for the construction by the federal government of a ship canal across the State of New Jersey connecting the Delaware River with Raritan Bay, or the scheme of the so-called, privately controlled non-operating Electric Power Company of New Jersey Inc. to build a series of dams on the Delaware River for the production of hydroelectric power.

Appended hereto is a draft of the subject matter which is recommended by your Committee for inclusion in a bill designed to be reciprocally enacted by New York, New Jersey and Pennsylvania for the authorization of a joint investigation, through Incodel, of the merits of an integrated water project in the Upper Delaware Basin. Although each affected agency is in possession of a vast wealth of data and information that will constitute the bulwark of the study and be made available for that purpose, the investigation is too big and complex to be carried out by those agencies, with their available personnel and facilities. It will require the services of one or more firms of consulting engineers.

It is estimated that the investigation will require almost two years to complete and will cost about \$200,000. Distributed among the three states over a two-year period, this will be equivalent to less than \$35,000 per year each. Considering that at least ten times the amount involved has been spent for the inconclusive and uncoordinated surveys of the past, and taking into account the benefits to be derived, the proposal obviously constitutes a sound investment.

Attached to the proposed material for a reciprocal bill is a draft of a statement, for each State, explaining its purposes and objectives.

Data supporting the above conclusions and recommendations are contained in the accompanying report.

Respectfully submitted,

JAMES H. ALLEN, Chairman

H. T. Critchlow

Roger W. Armstrong

R. J. Gillis

Charles H. Capen

John C. Thompson

Elbert J. Taylor

THE INTERSTATE COMMISSION ON THE DELAWARE RIVER BASIN

December 30, 1948

Preliminary Draft of Subject Matter Recommended For Inclusion
in a Proposed Act Authorizing an Investigation to Determine
the Advisability of a Tri-State Water Supply Project in the
Delaware River Basin.

AN ACT

To promote interstate cooperation for the conservation and protection of the water resources of the Upper Delaware River Basin for an integrated project designed, among other incidental purposes, to meet prospective municipal water supply requirements of municipal subdivisions and metropolitan areas within the State of New Jersey, both within and outside of the Delaware Basin; authorizing The Interstate Commission on the Delaware River Basin to be responsible for the conduct of investigations necessary to determine the advisability of such a project, and making an appropriation therefor

Be it enacted by the Senate and General Assembly of
the State of New Jersey:

PREAMBLE

WHEREAS, municipal subdivisions and metropolitan areas in the State of New Jersey, in common with similar units in the Commonwealth of Pennsylvania and the State of New York, are constantly confronted with the problem of providing an adequate and satisfactory supply of municipal water, both for domestic and industrial purposes, to meet existing and prospective requirements of the people which

they serve; and

WHEREAS, the waters of the Delaware River Basin are the property of the people of the State of New Jersey and the Commonwealth of Pennsylvania and the State of New York, and a logical and attractive future source of municipal water for certain municipal subdivisions and metropolitan areas in each of such States; and

WHEREAS, the United States Supreme Court in its decree in the Delaware River Case (U. S. 283 U. S. 336) confirmed the principle enunciated by the Master that the use of the waters of the Upper Delaware River Basin for municipal water supply has precedence over all other purposes; and

WHEREAS, agencies other than the said States and their political subdivisions have recently advanced, or sought to secure approval of, projects involving the construction of dams and reservoirs for the development of the waters of the Upper Delaware River Basin for purposes other than municipal water supply which, if effectuated, might interfere with and probably seriously jeopardize the rights and interests of the States and their municipal subdivisions and metropolitan areas in the matter of providing adequate and suitable sources of municipal water supply; and

WHEREAS, the State of New Jersey and the Commonwealth of Pennsylvania and the State of New York have each created and now maintain a Commission (or Committee) on Interstate Cooperation for the purpose of promoting cooperation among said States, respectively, and among other States of the Union, in various fields of governmental operations, including the utilization, control and conservation of the water resources of interstate river systems; and

WHEREAS, said Commissions (or Committees) on Interstate Cooperation of the State of New Jersey and the Commonwealth of Pennsylvania and the State of New York --and also Delaware --have organized and established and are now maintaining as an instrument of governmental machinery a joint advisory board known as "The Interstate Commission on the Delaware River Basin" for the purpose, among other things, of formulating integrated policies and programs for the mutual and beneficial protection of the water resources of the Delaware River Basin for municipal water supply and other incidental purposes.

Section 1 - SCOPE OF ACT - It is hereby declared to be the intent and purpose of this Act to authorize and direct The Interstate Commission on the Delaware River Basin to be responsible for the conduct of investigations necessary to determine the advisability of the future construction of an integrated water project within the Delaware River Basin above Trenton, New Jersey-Morrisville, Pennsylvania, comprised of a series of dams and reservoirs on both the tributaries and the main channel of the Delaware River, to meet the combined prospective water supply requirements of municipal subdivisions and metropolitan areas in the State of New Jersey and the Commonwealth of Pennsylvania and the State of New York, both within and outside of the said Basin; and to authorize and direct said Commission to submit a report to the Governors and Legislatures of each of said States prior to January 1, 1951, setting forth its findings, conclusions and recommendations concerning said investigation.

Section 2 - PROTECTION OF STATE'S INTERESTS

Section 3 - RIGHT OF ENTRY

Section 4 - APPROPRIATION - For the purpose of carrying out the investigation provided for in this Act, a sum of thirty-five thousand dollars per year for two years is hereby appropriated for the use of The Interstate Commission on the Delaware River Basin.

Section 5 - EFFECTIVE DATE - The provisions of this Act shall become effective and the appropriation made thereunder shall become available only in the case that the Commonwealth of Pennsylvania and the State of New York both have provided for an appropriation of the same amount to the said Commission for the same purpose.

Section 6 - DEFINITIONS

EXPLANATORY STATEMENT

Proposed Act Authorizing An Investigation To Determine
The Advisability Of A Jointly Controlled and Operated
Tri-State Water Development Project In The Delaware
River Basin.

The purpose of this Bill, as stated in the Title, is to permit the State of New Jersey, in cooperation with the States of New York and Pennsylvania, through the medium of the Interstate Commission on the Delaware River Basin (Incodel), to determine whether an integrated water project in the Delaware River Basin, will provide, in conjunction with other incidental benefits, a satisfactory and economical source of additional water supply to meet the future requirements of municipal subdivisions and metropolitan areas within the State.

The water problem in New Jersey, particularly in the North Jersey metropolitan area, is acute. Present sources there are being drawn upon to their full capacity. In fact, serious water shortages would have occurred in recent years, had there been less than average rainfall. For various reasons, efforts during the past quarter of a century to adopt a program for additional and reserve supplies to meet this situation have failed. It appears that many of the objections raised to proposals advanced for this purpose would be eliminated if a water development project in the upper reaches of the Delaware River Basin were determined to be advantageous and were adopted.

A water supply situation comparable to New Jersey's also exists in both New York and Pennsylvania. The most affected jurisdictions in these States, New York City and Philadelphia, also look favorably upon the Delaware River system for additional or new sources of water supply.

Because of the joint interest, and because the Delaware River is an interstate stream, the only way that the States can determine whether an integrated water project would be mutually advantageous and, if so, how it could be carried out, is through a joint investigation such as is provided for in this Bill.

The Interstate Commission on the Delaware River Basin was created by the interested States, and the State of Delaware, for just such a purpose. New Jersey, together with New York and Pennsylvania, should take advantage of the unusual opportunity to resolve water supply questions of long standing through this governmental agency which jointly serves the three States.

Each of the States is requested to share the total cost of the necessary survey on an equal basis by appropriating \$35,000 per year for two successive years, it being estimated that it will take about eighteen months to complete the investigation and that it will cost \$200,000.

The Bill calls for the submission of a final report covering the results of the survey to the Governor and the Legislature prior to January 1, 1951. It is urgent that the survey be promptly authorized, not only in order to meet this schedule, but, more important, to permit the States to undertake such projects as are found to be advisable in consequence of the survey as promptly as possible. Past experience has shown that many years elapse between the time that a water project is started and its final completion. The water problem is too urgent to delay too long.

* * *

Note: A comparable statement covering this subject has been prepared for New York and Pennsylvania.

I.

THE WATER SUPPLY PROBLEM IN THE 1920's

The water supply problem in Philadelphia, New York and North Jersey first began to become acute in the early 1920's. At that time each of the three jurisdictions, almost simultaneously but entirely independently, authorized surveys of its future requirements and engaged outstanding engineering talent to handle the assignments.

Philadelphia

Philadelphia created its so-called 1920 Mayor's Water Commission. The City then, as indeed it still is, was taking its raw water, before treatment, from intakes in the grossly polluted Delaware and Schuylkill Rivers within its municipal confines. It was then processing, on the average, approximately 300 million gallons per day.

A Board of Consulting Engineers serving the Mayor's Commission recommended:

- (1) Extensive improvements in the distribution and treatment facilities of the existing water works system.
- (2) Abandonment of the Schuylkill River intake and its replacement by a development on Perkiomen Creek, a nearby tributary.

- (3) Construction of storage reservoirs on Meshaminy Creek, a tributary of the Delaware below Trenton, to impound natural flows, augmented when necessary by water pumped from the Delaware River above Trenton.

Attention also was given to the advisability of securing the City's water supply from mountain sources comprised of tributaries of the Upper Lehigh and Upper Delaware Rivers. It was recommended that this alternative be deferred, because of relative costs, until the suitable nearby sources were fully developed.

Controversy arose over the findings and conclusions of the 1920 Commission and, as a result, another commission was appointed in 1924. This Commission, like its predecessor, was serviced by a group of eminent consulting engineers. Substantially, it confirmed the recommendation of the 1920 Commission. It, however, discussed five other projects in considerable detail. The fifth of these concerned the development of a new gravity supply from tributaries of the upper Delaware and Lehigh Rivers. In comparing relative advantages and disadvantages of the six proposals, the report of the engineers stated:

"This (the upland) project is unquestionably the best of all which have been considered for the City of Philadelphia, if we leave out the question of cost

"This project is scarcely feasible at present on grounds of cost

"Nevertheless, we believe the day will come when

Philadelphia will desire its major water supply from
the Blue Mountains."

North Jersey Water Supply District

The North Jersey Water Supply District was created by an Act of the New Jersey Legislature, Chapters 70 and 71, P. L. 1916. The legislation divided the state into two districts, North and South, and provided that joint projects in either region were to be financed by participating municipalities. South Jersey has never utilized this statute. North Jersey, on the other hand, established a District Water Supply Commission and, under the terms of the law, commenced construction of its Wanaque project in 1920. This project, completed in 1930, coupled with other developed sources, now supplies the water supply needs, in whole or part, of Newark, Paterson, Passaic, Clifton, Montclair, Glen Ridge, Kearney, Bayonne, Elizabeth, Cedar Grove, West Paterson, Totawa, Little Falls, Harrison, East Newark, and several other municipalities.

Approximately two and one-half million persons were served in the middle 1920's and the demand then averaged about 260 million gallons per day.

The Commission has no power to initiate new projects and cannot finance its activities except as agent of the municipalities it represents or may represent through contract agreements.

The New Jersey Water Policy and Supply Council (formerly the Water Policy Commission) must approve sources of supply which are developed by the Commission.

In 1922, a report covering a state-wide survey of the water

problem was submitted to the New Jersey Department of Conservation and Development by the firm of Hazen, Whipple and Fuller, consulting engineers. It reported that there was potential catchment area of 1718 square miles within the State, well suited for development to meet the future needs in Northeastern New Jersey, and capable of yielding 1550 million gallons of water daily.

Two projects were suggested that involved Delaware River Basin waters. One, designated Long Hill, proposed a huge reservoir on the upper Passaic River, a stream outside of the Delaware watershed, with tunnels tapping Flat Brook, Paulins Kill, Beaver Brook, Pequest, Pohatcong and Musconetcong Rivers, all tributaries of the Delaware, and the Raritan River, an intra-state stream. The estimated yield from these sources was 619 million gallons per day, of which 451 would be contributed by Delaware tributaries. It was pointed out that the tunnels could be extended to tap the Delaware itself.

The other New Jersey project, apparently less favored, was called the Raritan supply. It called for the impounding of the waters of the North and South branches of the Raritan River, to produce a supply of 429 million gallons daily. It was suggested that an almost indefinite increase in the capacity of the Raritan project could be secured by tapping the Delaware River a short distance above Belvidere, New Jersey.

Neither of these projects has been adopted as North Jersey's future program.

In 1924 the North Jersey District Water Supply Commission, recognizing the potency of protests to use of the land at the Long Hill site, proposed use of the Chimney Rock site near Round Brook, with water to be derived first from tributaries of the Raritan River and later from

tributaries of the Delaware River. The first stage of this plan, with diversions wholly from intra-state streams, was estimated to yield 150 million gallons per day and later, with Delaware tributaries, to be capable of delivering 750 million gallons per day.

In 1929 the State Water Policy Commission recommended a diversion from largely the same area but with a reservoir at Bunnvale on the South Branch of the Raritan River. The following year the District Commission compared Chimney Rock and Bunnvale projects and again reported in favor of the former.

New York City Board of Water Supply

The New York City Board of Water Supply was created by an Act of the New York State Legislature in 1905. Its principal function was to formulate and execute projects to meet the water supply requirement of greater New York. Under its jurisdiction the Esopus project of the Catskill system was completed in 1917 and, in the early 1920's, it was in the midst of the construction of the Schoharie supply. Both of these developments are in the upper region of the Hudson River Watershed. These two sources are estimated to have a dependable yield of 525 million gallons of water daily. Supplemented by other sources constructed before the turn of the century, the total available yield of the New York City system in 1925 (and at present) is approximately one billion gallons per day.

The 1925 population served was about 6,400,000 persons, and the average daily demand for water approximately 840 million gallons daily.

Under authority of a resolution of the Board of Estimate and Apportionment, adopted June 17, 1921, the Board of Water Supply was directed to investigate sources of additional supply. This investigation was very

thorough. It included consideration of every source within the State within a reasonable distance of New York City. The Board concluded that the next major additional supply should come from the Delaware Basin and submitted a plan to procure a supply equivalent to 600 million gallons daily from the New York State section of the region.

Summary

From the foregoing it will be noted that during the first half of the decade between 1920 and 1930, all three of the metropolitan regions in New York, New Jersey and Pennsylvania were looking upon the Delaware watershed as their source of additional, or new, water supplies.

But, the Delaware River was an interstate stream and there was a serious question at that time, in view of the prevailing application of the common law rule of riparian rights, whether any of the states, or their political subdivisions, could build a water supply project involving a diversion of the natural run-off of the streams without the consent of the other states. Consequently, and because of the obvious joint interest of the three sovereignties, Commissioners were appointed in 1923 to negotiate a compact for a division of the waters of the Delaware Basin.

Tri-State Compact Commissions

In 1925, the Commissioners arrived at an agreement and submitted recommendations to the Legislatures calling for the allocation of all of the waters of the Delaware Basin, over and above certain stipulated minimum flows, to the three States. New York immediately ratified the compact.* The New Jersey and Pennsylvania Legislatures did not adopt the agreement. However, they authorized the continuance of negotiations through a new set of

*New York Laws, 1925, Chapter 177.

commissioners.

During the deliberations of the second compact commissioners, the water supply situation in New York became very pressing and in October, 1926, the Board of Water Supply recommended securing additional water from Dutchess, Columbia and Rensselaer Counties in the Hudson Basin. This plan was submitted as the best of available sources not involving Delaware Basin waters.

Shortly after, however, the treaty commissioners completed their labors and adopted a compact to which its members unanimously subscribed. This agreement did not attempt to allocate all of the available water resources, but provided for an apportionment of 600 million gallons daily to each of the States of New Jersey and New York, and 900 million gallons to Pennsylvania.

During the 1927 Legislative session, New York ratified the second proposed compact**, but once more the agreement failed to be adopted in New Jersey and Pennsylvania.

Unwilling to risk the danger of further delay, New York City decided, in 1929, to proceed immediately with its plans to develop a new source of water supply from tributaries of the Delaware River in New York State. It proposed to develop and divert 600 million gallons of water daily from five tributary streams and to operate the project in accordance with rules of release for compensation water as set forth in the proposed 1927 compact.

Delaware Diversion Case

New Jersey objected and brought legal action to enjoin the State

**New York Laws, 1927, Chapter 682.

and City of New York from making this development. The famed Delaware Diversion Case resulted. New Jersey contended, among other things, that the diversion would cause substantial damage to navigation, water power, sanitary condition of the river, industrial use, oyster industry, shad fisheries, municipal water supplies, agricultural lands and recreation.

Pennsylvania did not take sides in the issue, but became a party to the controversy as intervenor, solely to protect its own rights and in no wise aligned with either of the litigants. It did, however, in presenting its interest, contend that Philadelphia and other Pennsylvania municipalities, would necessarily depend upon the upper Delaware River and its tributaries as a source of future water supply and introduced proof to show that Philadelphia and Eastern Pennsylvania would have need of 750 million gallons of water a day by 1980.

After two years of controversy during which the engineering heads of the water resources agencies of the three states flanked by an impressive array of outstanding engineers, had submitted a mass of technical information relating to the problem involved, the Supreme Court, May 4, 1931, rendered its decision. It permitted a New York diversion, to the extent of 440 million gallons per day (instead of the 600 million gallons originally planned), stipulated that New York must release a limited quantity of compensating water during periods when the flow at port Jervis, New York, or Trenton, New Jersey, or both points, was less than 0.50 cubic feet per second per square mile, and required that sewage from the City of Port Jervis should be adequately treated before any diversion could take place.

In the decree validating New York's rights to divert a limited quantity of water from the upper Delaware Basin under conditions designed to prevent damages to lower riparian owners, the Court informed the litigants that the Delaware River "is more than an amenity. It is a treasure. It offers a necessity of life which must be rationed among those who have power over it."

A master appointed by the Court to hear the case recommended, and the Court approved, the following guiding principles:

1. That the highest use of the waters of the Delaware River Basin is for municipal water supply;
2. That the doctrine of equitable apportionment controls the division and use of interstate waters;
3. That priority of apportionment creates no superiority of right in interstate waters.

The Court also retained jurisdiction in the Delaware Diversion Case "for the purpose of any order or direction or modification or any supplemental decree".

Discussions Regarding Delaware Diversion Case

The decree of the Supreme Court was made in May, 1931. In September of the same year, the New England Water Works Association reported the discussions of the case by many of the participants, including Mr. H.T. Critchlow, one of the members of Incodel's technical subcommittee responsible for this report, and Mr. Charles E. Ryder, recently retired chief engineer of the Pennsylvania Water and Power Resources Board and a former member of Incodel's advisory committee on water supply problems.

Mr. Critchlow stated in part:

"Decisions of the Supreme Court are fundamental rather than specific. Therefore, the interesting thing now is to speculate how the decision will control and affect the other states when they come to divert and use their share of the Delaware River, for obviously they have a share and undoubtedly in the future will need to utilize it.

"The writer believes the logical outcome will be, or at least should be, the adoption of interstate compacts which will enable interstate streams to be used as public necessity demands and thus forestall litigation and delay. In that way, the engineers and the public officials, whose duty it is to supply water, can plan comprehensively and prudently to meet future needs for a vital necessity in the progress of mankind."

Mr. Ryder's contribution to the discussion was as follows:

"The recent decision of the Supreme Court has settled certain very important principles relative to the use and allocation of interstate waters, but it did not include other matters, of importance to the three states....

"Prior to the first compact negotiations in 1923, a study was made in the writer's office of the possibility of developing the main Delaware River as a source of future gravity water supply for the City of Philadelphia and for the area in eastern Pennsylvania between the Lehigh River and the City of Chester, by the construction of a dam across the river, at or near Wallpack Bend, which would form a reservoir about 24 miles long extending to a point just below Port Jervis. Without going into further details, it need only be said that the investigation seemed to show that the scheme had considerable merit and was superior in many respects to previous plans for developing tributaries of the upper Delaware and Lehigh Rivers. Due possibly to the prohibition against dams across the Delaware River by the Pennsylvania-New Jersey treaty of 1783, and the interstate nature of such development, this scheme to the writer's knowledge had not been suggested previously. The compacts of 1924 and 1927 would have made possible such development

"Such development is not possible under the recent Supreme Court decision and the writer believes could only be accomplished through compact between New Jersey and Pennsylvania, possibly with the purpose of joint development with additional storage provided on tributary streams. The studies already made seem to indicate that the main Delaware River itself must be considered as

a possible source of future domestic water supply
for the City of Philadelphia. . . ."

Thus, passed the eleven years since 1920, when the three metropolitan areas began their intensive search for future water supply sources. Four of these were consumed in an unsuccessful effort to adopt a mutually satisfactory compact. Failing these negotiations, the urgency of the New York situation made it imperative that action should be taken in that state and New York City's decision to go ahead with the Delaware development brought on the Supreme Court's Delaware Diversion Case. Two years and approximately a million dollars were spent on this legal battle. And what was the result? The chief engineers of both the New Jersey and Pennsylvania water resources agencies expressed the opinion that the logical outcome - the future settlement of the problem - should be based upon the results of interstate action and negotiation, not interstate litigation.

* * *

II.

EVENTS OF THE 1930's

To all practical intents, the decade of the 1930's was a repetition of the independent, competitive and indecisive actions of the 1920's. It was during this period, however, that Federal actions entered the picture in an active way for the first time.

U. S. Army Engineers "308" Report

In March, 1932, the office of the United States Engineers, under authority of the so-called "308" Acts of the 1927 Session of Congress, filed its report concerning the development of the water resources of the Delaware River. A similar report on the Lehigh River had been submitted in September, 1931.

While the scope of both studies, by law, was intended to be limited to federal functions, such as navigation, hydroelectric power, flood control and irrigation, the investigations were hardly under way before the Engineers rightly concluded that no survey of these streams could be complete or conclusive without consideration of water supply.

The future needs of the three metropolitan areas by 1980 for water from the Delaware River Basin were estimated in the Engineers "308" report to be as follows:

New York City	1240 million gallons daily
Northeastern New Jersey	400 million gallons daily
Philadelphia District	640 million gallons daily

The Engineers suggested the development of a chain of twenty-four reservoirs on the Delaware River and its tributaries in order to meet these

needs, produce a substantial quantity of hydroelectric power and afford incidental benefits for other uses. The project would be featured by a huge reservoir on the Delaware extending from Tocks Island to Port Jarvis, a distance of 33 miles, from which would be drawn the proposed water supplies to Philadelphia and New Jersey. The New York supply would be taken from reservoirs at Downsville, Claryville, Godeffroy and Barryville.

The report concluded that the development of the Delaware River should be placed under the jurisdiction of an interstate agency representing the joint interests of the four states in the Delaware River Basin.

Similarly, the report on the Lehigh River suggested the development of a project, consisting of one large and three small reservoirs, for the dual and primary purpose of water supply and water power. It was estimated that the project would yield 236 million gallons of water daily and be suitable as a source of gravity supply for the City of Philadelphia.

Objections were offered to both the Delaware and Lehigh River proposals, based principally upon the inclusion of water power development as a primary use. It was contended that, while a limited amount of water power might be produced on an incidental basis in conjunction with a water supply project, the requirements underlying the two uses were basically in contradiction.

Tennessee Valley Authority

The fact that the Tennessee Valley Authority was created by the Congress in 1933 raised a new question in the minds of representatives of the state and local governments most concerned with problems respecting

the future development of the Delaware Basin. They asked: "Was this the first step in a greater plan by the federal government to blanket the United States into a small group of federally controlled river basin authorities?" Later events proved that these fears were not unfounded. Witness the frequent efforts, including those currently being pressed, to have the Congress create more "TVA's" in other river watersheds of the nation.

Incodel Created

Concern over the threat of federal intervention and knowledge of the past failure of the states to view problems relating to the utilization, control and development of water resources of the Delaware River Basin on a cooperative basis were the principal motives for the creation, in 1936, of the Interstate Commission on the Delaware River Basin (Incodel). During the remaining four years of the 1930 decade, most of its attention was directed to its successful effort to secure the adoption of a unified program to meet its number one problem, the abatement of stream pollution.

National Resources Committee

In 1936, the former National Resources Committee issued a report entitled Drainage Basin Problems and Programs.

In a section devoted to the Delaware, it reported that the top ranking water use problem of the Delaware Basin "was the provision of additional water supplies for New York City, Philadelphia and other communities."

"The public interest," the report concluded, "requires that the future development of these (water) resources be effectively coordinated under the guidance of an interstate agency clothed with appropriate authority. An important initial step in this direction has been taken through the organization of the Interstate Commission on the Delaware River."

North Jersey Water District

Meanwhile, in 1931, the New Jersey State Water Policy Commission again proposed that the Bunnvale project should be adopted in lieu of the Long Hill and Chimney Rock proposals recommended in the 1920's.

This plan contemplated the development of a high level water supply of 165 million gallons daily from reservoirs on Raritan River tributaries and on the Musconetcong River, a branch of the Delaware in New Jersey. As usual, there was controversy over this project, which, like other proposals, contemplated a diversion of the waters of the Delaware Basin.

Later, in 1939, in a special message to the Legislature, Governor A. Harry Moore advanced a proposal calling for the development and utilization of the Delaware and Raritan Canal and its feeder as a right-of-way for an aqueduct to convey 150 million gallons of water daily from the main channel of the Delaware River at Bull's Island (about 20 miles above Trenton) to the northern New Jersey metropolitan area, and possibly 50 million additional gallons to Trenton and cities to the south in the Delaware Basin.

Philadelphia

During the decade, the Philadelphia water problem was a subject of almost continuous discussion, and in 1937, Mayor S. Davis Wilson appointed another study commission. This group considered seven different proposals which had been advanced from time to time in the past. It reported that it was unable, with the limited time, resources and data at its disposal, to establish definitely any plan as being the best for the City and recommended that a comprehensive engineering survey should be authorized to accomplish that purpose.

This recommendation was shelved.

New York City

In the spring of 1931, when the decision of the United States Supreme Court removed the last obstacle to the development of tributaries to the Delaware River in New York State for a domestic water supply for New York City, the country was in the throes of a business depression and the condition of the City's finances did not permit an immediate start on the construction of the project. It was not until the Spring of 1937 that the first contract for the construction of the Delaware Water Supply System was awarded, but from that time on the work was prosecuted vigorously. Toward the end of the decade, however, the demand for materials and equipment for war purposes became so great that work on the water supply project was materially slowed down and early in the 1940's ceased altogether.

Summary

Despite the numerous recommendations advanced in the 1930's to solve the water problems in the metropolitan areas of New York, New Jersey, and Pennsylvania, controversy, as usual, arose in respect to practically every suggestion and no official future plan was adopted.

* * *

III

EVENTS OF THE 1940's

As far as settling the problem of future water supply for the tri-state metropolitan regions is concerned, the picture in the 1940's is quite similar to the two preceding decades.

The period was marked by World War II. This had the effect of diverting the attention of the States and their political subdivisions to the more important task of helping to provide materials and manpower necessary for the winning of the conflict.

It was during the period of hostilities, however, that the States enacted the reciprocal legislation developed by the Interstate Commission on the Delaware River Basin, incorporating conditions under which each sovereignty has agreed to operate any individual water supply diversion project in the Delaware River Basin which may be constructed within its confines in the future.

New Jersey Ship Canal

It was largely because of the war that a bill was introduced during the 1942 sessions of the Congress, seeking authorization for the federal construction of a ship canal across the State of New Jersey connecting the Delaware River near Trenton to the Raritan River near New Brunswick. The project was originally supported by the Army Engineers as an national defense measure. Later this emphasis was modified to include a further

justification as a post-war unemployment public works project.

As first advanced the scheme called for the filling of the canal - a lock level structure - with waters secured largely from rivers and streams entirely within the State of New Jersey, including a limited quantity to be pumped from the Delaware River from a point near Trenton. Later, because of strong objections raised by the State of New Jersey, the Engineers were prepared to suggest that the major portion of the water for the canal should be obtained from the upper reaches of the Delaware River Basin by the construction of a reservoir on the West Branch of the Delaware River in New York State at Camonsville. In behalf of its supporting State Governments, the Interstate Commission on the Delaware River Basin consistently maintained that such waters must be preserved for their ultimate superior use as sources of municipal water supply.

The ship canal project now appears to be "resting in mothballs". The atomic bomb apparently obliterated its supporters' visions of the canal constituting a vital item in the future defense system of the country. At the moment chances of the proposal being resurrected seem remote. However, a new emergency, real or fancied, might conceivably bring it into the light again.

The Electric Power Company of New Jersey

Another scheme that would have seriously jeopardized the interests of the States in the development of the waters of the Delaware Basin was brought forth by a privately controlled non-operating agency having the impressive name of Electric Power Company of New Jersey, Inc. The Company sought for years to secure a license from the Federal Power Commission for the construction

of a series of dams on the Delaware River between Easton and Port Jervis for the production of hydro-electric power. The application was finally denied December, 1948. It was strenuously opposed by all three of the Basin States and by The Interstate Commission on the Delaware River Basin. Had the permit been granted, the program of these agencies for the development of the resources of the watershed would have been seriously affected. It is probable that this project will be advanced again some time in the future.

Philadelphia

In March, 1940, the City of Philadelphia engaged the services of a firm of consulting engineers to formulate an action program for the improvement of the existing waterworks system, which had sunken to a terrible state of disrepair. A program of rehabilitation was begun shortly after and is still in process.

Despite the forwarding of this water works rehabilitation program, Mayor Samuel, in 1945, appointed another commission for the purpose, in the Mayor's words, "of settling once and for all time" the question of the City's future water program. The commission engaged a board of five eminently qualified consulting engineers, as well as the services of a special counsel. Approximately \$200,000 was spent on the survey.

The board of consulting engineers recommended that the City should secure its future source of water supply from a reservoir on the main channel of the Delaware River at Wallpack Bend. The commission served by the board, however, advised the City to proceed with an expanded program to modernize its existing water works system

and to defer further consideration regarding the development of a new source from the upland section of the Basin. However, it did advise the City to file a request with the Pennsylvania Water and Power Board for the establishment of priority for the development of a future supply at Wallpack Bend.

New Jersey

In New Jersey, only a few rather superficial studies were made in regard to the potable water problem in the 1940's. It was during this period that suggestions were offered for the construction of the so-called Dock Watch Hollow Reservoir as a part of various schemes for a new supply. The Round Valley development, originally proposed in 1919, also was revived; and the North Jersey District Commission sought approval of a plan for diverting the excess flows of the Ramapo River for use of its present participants.

None of these proposals have been adopted.

The Delaware and Raritan Canal project, referred to in the preceding section, however, was adopted in modified form by the New Jersey Legislature for recreational use and a source of industrial water supply. This project is now nearing completion as a source of industrial water supply.

New York City

The rate of consumption of water in New York City, which remained practically stationary for 12 years, in 1943 began a phenomenal rise, showing an average annual increase of from 50 to 60 million gallons a day. Consumption soon exceeded the dependable safe yield of all sources and it became evident that if the rate of increase continued,

even with some abatement, the demand would continue to exceed the dependable yield up to the time of the completion of the Delaware system. It is estimated, however, that even the additional water from the Delaware would maintain an excess of dependable yield over demand for two or three years only and steps would have to be taken immediately to increase the City's supply. Because of these circumstances the Board of Estimate in December 1947 directed the Board of Water Supply not only to recommend a temporary supply to meet any possible emergency prior to the completion of the Delaware system, but also to investigate and recommend new sources of supply to take care of the future needs of the City. An engineering division was immediately organized to handle these matters and is now at work. It is evident from available studies that the best practicable sources in New York State, outside of the Delaware River Basin, have already been developed for the City's use and it is inevitable that the City must look to the Delaware River as a source of its future water supply.

Flood Control

On May 23, 1942, a torrential rainfall over most of the upper Delaware Basin caused floods in the Lehigh and Lackawaxen Rivers and other streams resulting in loss of 32 lives and property damages in excess of \$10,000,000.

As a consequence of this catastrophe a flood control reservoir project has since been authorized by the Congress on Bear Creek, a tributary of the Lehigh, and on the Lackawaxen River and Dyberry Creek, tributaries of the Delaware.

The latter two reservoirs are a part of a single project,

authorized during the second session of the 80th Congress (1948).

No appropriation has been made for its construction.

It may be feasible and advisable to design and construct the Lackawaxen and Dyberry Reservoirs for the combined purpose of flood control and water supply. This potential use should be given immediate attention, otherwise the project will continue to be considered, as it now is, for the sole purpose of flood control.

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IV.

THE PRESENT STATUS

From the foregoing it will be observed that for three decades--thirty long years--the States of New York, New Jersey, Pennsylvania and their principal metropolitan areas, New York City, North Jersey metropolitan area and Philadelphia, have been continuously considering their respective water supply problems, but have largely failed to adopt programs to meet them.

It is conservatively estimated that at least two million dollars were spent during this period for litigation and uncoordinated investigations. Never in the entire period was an effort made to make the search for new sources of water supply on an integrated basis. No monies were ever made available to handle the problem from a regional point of view.

Since 1930, the capacity of developed water supplies for New York City and Northern New Jersey remained at a standstill. But the demands on the system have increased tremendously, particularly since the end of the war. At the present time the safe yield of both of these sources (1,000 million gallons daily in New York; 350 million gallons daily in New Jersey) is no greater than the demand. Only good fortune in more than average rainfall has made it possible to avoid serious water shortages.

Philadelphia has continually used the grossly polluted Delaware and Schuylkill Rivers as its source of municipal water supply. Admittedly, these streams provide an adequate quantity of water; but the quality of the raw water is decidedly substandard, although the water can be processed to make it useable and safe for human consumption, but possibly not dependably palatable.

While satisfactory progress is being made in abating unwarranted pollution in both of these streams, the City should be planning for the day when it may relieve its citizens of the necessity of being supplied with water for domestic purposes secured from a section of two great rivers more logically and ideally adaptable for the concentration of highly commercial and industrial activities. The use of these waters for the discharge of sewage and industrial wastes, after appropriate treatment, is reasonable. Their service as the source of a municipal water supply has been outmoded.

Cognizant of this situation and of the past inability to find answers to these problems, Honorable Orus J. Matthews, Secretary of the Pennsylvania Department of Commerce, at the 1948 annual meeting of the Interstate Commission on the Delaware River Basin, suggested that States should give consideration to joining forces in coping with the problem of the development of the water resources of the Delaware Basin. Your Committee and your Technical Sub-Committee were created in consequence of this recommendation.

* * *

V.

RESULTS OF TECHNICAL COMMITTEE PRELIMINARY STUDY

The foregoing reports cover most of the major findings resulting from your technical subcommittee's preliminary study of the advisability of the future construction of an integrated water development project in the Delaware River Basin. They show that the metropolitan areas centering upon New York City, Philadelphia and Northeastern New Jersey have reached the point where it seems imperative that the States in which they are located should join in a cooperative and intensive investigation in order more definitely to establish future water supply and other water use programs involving the development of the interstate Delaware River and its tributaries.

For almost thirty years, each of these jurisdictions have looked upon this problem from their individual points of view. In each case, each metropolitan area has found that the Delaware River Basin offers an attractive answer to its water supply problem. But, also in each case, each jurisdiction has learned that, because of interstate complications, many obstacles would have to be overcome before a project could be undertaken.

At the present time, the existing supplies of New York City and the North Jersey Water District are being drawn upon to their full capacity. The source of Philadelphia water, while adequate in quantity, is of an extremely inferior quality.

Your committee has concluded, and it strongly recommends, that the States of New York, New Jersey and Pennsylvania, through the

Interstate Commission on the Delaware River Basin, should initiate at the earliest practicable opportunity a comprehensive investigation for the purpose of evaluating the relative merits of a single integrated water project, to be jointly controlled and operated, to meet the combined additional water supply needs of their respective metropolitan areas and to provide such other incidental benefits as may be consistent with this primary purpose. These results would be further appraised in the light of comparable information which obtain in connection with the uncoordinated developments, to be individually controlled, that have been advanced by or for all three jurisdictions from time to time in the past for the same purpose.

Your technical committee has considered the possibility of a joint project consisting of a series of dams and reservoirs on both the main stem of the Delaware River and on its tributaries in the section of the Basin above Trenton, New Jersey. It is of the opinion that such a development probably will be found to be feasible, economical and mutually advantageous. But, obviously, it is utterly impossible to arrive at a positive and definite conclusion in this matter until the problem has been subjected to an exhaustive investigation. Among other things, such comprehensive investigation must give careful consideration of the future growth of the areas to be served and the necessary requirements to meet reasonably foreseeable conditions. Topographical surveys and underground explorations must be made. The advantages of operating the project in such a manner as to affect a reduction of flood flows and an increase of run-off during periods of drought, and of coordinating power development and recreational uses as a part of the water project, must be thoroughly appraised.

This is an immense task, too big and complicated to be

undertaken without the assistance of consulting services. Your committee believes that it will require about two years to make the necessary survey and will cost approximately \$200,000. It is firmly convinced that the work should be undertaken and will prove an excellent investment by providing clear-cut answers to the problems which have been plaguing the States and their principal metropolitan municipalities for many years.

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