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NEW JERSEY WATER RESOURCES DEVELOPMENT

A Preliminary Report to the Legislature

by the

Legislative Commission on Water Supply

pursuant to A.J.R. 4 (1955)

August 1, 1955

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STATE OF NEW JERSEY
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Findings and Recommendations

- 1) There is a need for present action to expand the water supply for the Northeastern Metropolitan Region, the only region whose needs are critical at this time.
- 2) This expansion should be done in two stages. In the first stage, three additional supplies with a total yield of 77 million gallons daily should be constructed at three major existing public systems at a cost of \$22,140,000. In the second stage, to provide for needs to the year 1975, the construction of a major supply development at Chimney Rock is recommended, after stated reservations are resolved, at a cost of the first, or 70 million gallon plan of \$53,910,000.
- 3) A referendum bill, providing for a bond issue in the total amount of \$76,050,000 is recommended. It is proposed that the State shall pledge receipts from water sales, the proceeds of a special tax to be apportioned among the benefited areas, and the real estate tax, as credit for the proposed bond issue.
- 4) It is recommended that a five man Water Supply Board be established in the Division of Water Policy and Supply in the Department of Conservation and Economic Development. The Board, whose members should be appointed by the Governor with the consent of the Senate, would be empowered to execute water developmental programs as provided by law.
- 5) It is recommended that the powers of the Water Policy and Supply Council be strengthened in various respects.

Background

The Legislative Commission on Water Supply was created pursuant to Assembly Joint Resolution 4 (1955) for the purpose of studying the water resources of the State, and recommending to the Legislature by August 1, 1955 what step or steps should be taken to ensure an adequate water supply for the immediate and more distant future. The Commission was empowered by the Joint Resolution to retain the services of a competent engineering firm to make a comprehensive survey of New Jersey's water resources and needs, which would provide the basis of the Commission's report to the Legislature.

At the outset it became obvious to the Commission that a detailed engineering report of the kind sought could not be produced within the time limit set by the Joint Resolution but that a preliminary report could be obtained by July 15, 1955, and a final report by December 15, 1955. Invitations to offer services were then submitted through trade papers and individual letters to a large number of well known engineering firms with experience in making water surveys. Thirty-five firms, acting singly or jointly, subsequently offered their services. From the large number of applicants, the firm of Tippetts-Abbett-McCarthy-Stratton of New York City was finally selected to make the water resources survey under a contract ceiling price of \$165,000. Two factors explaining the selection of the firm should be emphasized. This firm has had extensive experience in various foreign countries, as well as in the United States, in planning large-scale water projects. In spite of its extensive experience with water problems, Tippetts-Abbett-McCarthy-Stratton, who shall hereafter

be referred to as the Engineers, had not been identified with previous surveys or projects within, or affecting, New Jersey, and hence, could approach the State's water problems without preconceived ideas. In accordance with the terms of the contract, a report of a Preliminary Survey of New Jersey Water Resources Development was made to the Commission by the Engineers on July 15, 1955. This report, which will hereafter be referred to as PER (Preliminary Engineering Report), is the basis of the recommendations made by the Commission in the present report and will be referred to in support of this Commission's findings.

The State-Wide Water Problem

It is encouraging to note that "the total water resources of the State are adequate to meet the total future needs of the State for an indefinite period" (PER I-4). As the Engineers indicate, however, there are concentrations of population and industry which make it impossible for local sources to supply local needs, so that as population and water use increase, it becomes necessary for certain areas to be supplied from ever-more remote sources. The basic problem, then, in a state with no foreseeable over-all shortage, is one of proper storage and distribution of an adequate natural supply of water.

Throughout a large part of the State there are isolated instances where whole towns or individual water users are without an adequate supply of water, usually in the Summer months. In some cases, this condition re-

results from inadequate utilization of existing sources of water because of the failure of local water companies to provide additional storage capacity or to improve distribution facilities. However, it is the conclusion of this Commission that the supplying of water in adequate amounts to all citizens within this state is of such obvious importance that if local companies fail to perform their duties in this respect, it will be necessary to compel a higher standard of performance. For this reason the Commission concurs in the recommendation of the Engineers that the Water Policy and Supply Council within the Department of Conservation and Economic Development be empowered to enforce scrupulous observance of the terms of water company franchises, with suitable penalties for violations, even to the extent of revocation of franchise for repeated and prolonged violations (PER V-11, V-12). It should be emphasized, however, that we recognize that much of the blame for failure to develop adequately sufficient water sources rests with the State government and we are not trying to shift responsibility. It is not intended by this proposed substantial increase in regulatory powers to harass those companies which have, and are, providing adequate service. In addition the

Water Policy and Supply Council should have power to protect ground water sources against pollution, or excessive depletion and should have the power to protect lower riparian owners by establishing legislative formulae for controlling stream flow (PER V-11, V-12). A bill providing for strengthening the powers of the Water Policy and Supply Council in these respects is being drafted and will be introduced for the consideration of the Legislature in the near future.

In addition to these increased supervisory powers over water company franchises, stream flow and ground water sources, there is another problem of state-wide significance that the Commission believes requires state action. This has arisen from the separate growth of independent public and private water companies, which are not interconnected in many instances and frequently find it uneconomical to interconnect. In other cases, interchange of water is hampered by cost differentials. Similarly, some water systems lack an adequate supply to meet peak demands, but find it uneconomical to make substantial investments to meet only occasional needs.

To encourage the development of interconnections and encourage the exchange of water between separate systems, the Commission proposes that the Legislature empower a newly created state agency to be known as the Water Supply Board in the Division of Water Policy and Supply, to integrate the available various water supplies by the construction and operation of interconnections, where private companies fail to do so, and to provide for the exchange of water between existing systems on a fair and rational basis (PER V-4, V-5). A bill to provide these powers is being drafted and will be intro-

duced for the consideration of the Legislature when prepared. The purpose and, it is hoped, the effect of these powers, and those in the bill previously mentioned, will be to maximize the use of water supplies already in existence, but imperfectly utilized at present.

Regional Problems

For the purposes of this study, the Engineers divided the State into four regions, each of which is relatively homogeneous, with one or more distinguishing characteristics. Each region was studied with respect to its population, present and projected, and its water supply, current and projected, in order to determine whether or not a present or imminent water shortage existed (PER I-11 to I-20). The situation in each region was found to be as follows.

Southwestern Metropolitan Region

This area, which includes Burlington, Camden, Gloucester, Mercer and Salem Counties, consumes 15% of the state total and uses wells for the most part. While no shortages exist at the present time, there is the problem of salt water intrusion. The Commission feels that this region will benefit from a comprehensive ground water study of the kind proposed by the Engineers (PER II-2, IV-2 to IV-6). The final report of the Engineers to be rendered December 15, 1955 will treat this subject in some detail.

The Coastal Region

This region which includes Atlantic, Cape May, Cumberland, Monmouth and Ocean Counties, uses 8% of the total state consumption. Saline contamination from

overpumping of some well systems presents a problem, but the vast potential ground water supply makes a future shortage unlikely. The subject of ground water resources in the vast Pine Barrens area will be treated in the final Engineers' report (See IV-2 to IV-6).

Northwestern Region

This region which includes Hunterdon, Morris, Somerset, Sussex and Warren Counties, consumes 6% of the state total, and has no foreseeable shortage. Existing surface supplies, supplemented by ground water use, should be sufficient.

Northeastern Metropolitan Region

Because of the heavy concentration of population and industry in the Northeastern Metropolitan Region of the State (Bergen, Hudson, Essex, Middlesex, Passaic and Union Counties) the demand for water in large portions of this region approaches closely the present dependable yield of developed supplies (PER I-17). This region, which uses 71% of the State's total consumption, is, according to the Engineers' findings, the only critical region at the present time (PER Ch. I, III-2). The specific proposals to meet the problems of the Northeastern Metropolitan Region will be considered more fully in the next section of this report.

The Northeastern Metropolitan Region

This region, which is defined to include Bergen, Hudson, Essex, Middlesex, Passaic and Union Counties, contains, as of 1950, 3,092,000 of the State's total population of 4,835,000 (PER I-8). By the year 2000

the region's projected population will be 4,704,000. It is also the most intensely industrialized area, whose water needs are substantial. An analysis of the available and developed water supplies for the entire State reveals that for the present, at least, only this region "faces a critical situation with consumption rapidly approaching the dependable yield of existing supply systems" (PER II-2).

It is the conclusion of the Engineers upon completion of population and water consumption studies (PER Ch. I) that for this region "the available dependable supplies may equal demand before a major new system can be completed by 1960 or 1961 and that even with the completion of a new 200 mgd (million gallons daily) supply the demand may again approach dependable yields less reasonable reserve by 1975" (PER III-2).

The Engineers propose a three stage development, with which the Commission concurs. In the first stage, the supply for the region will be expanded by short-range projects, financed by the State, to provide for needs to 1960. In a second state, a major supply must be developed to provide for needs to the year 1975. A third stage envisages the development of a major supply to the year 2000 (PER III-2). In the Preliminary Report recommendations have been made concerning the first two stages only. Plans for dealing with the third stage will be covered in the Engineers Final Report to be submitted by December 15, 1955.

First Stage Development

Officials responsible for operation of the existing water supply systems in the Northeastern Metropolitan Region recognize that additional supplies are needed,

However, while numerous projects have been proposed by companies within this region, it is important to note that to date none has been executed or started except for preliminary work on the DeForest Lake reservoir on the Hackensack. Upon completion this project, which is located within New York State, will furnish an additional 20 mgd for the Hackensack Water Company and its New Jersey customers only until such time as the demand of the company's New York State users is sufficient to utilize all of this increased supply.

What must be understood by citizens living within this Northeastern Metropolitan Region as well as those living elsewhere in the State is the simple economic fact that as communities and regions require ever-greater quantities of water, it becomes necessary to go ever-farther to develop additional sources, which inevitably is translated into higher unit costs for the additional water obtained. It must be apparent also, that while any substantial developmental program undertaken by an existing water system is designed to meet present and foreseeable future demands, it will not, in most cases, be a profitable investment at the outset, since only a portion of the increased supply will be purchased immediately. Moreover, where one system by expansion obtains water in excess of its own needs, it may find it difficult to obtain long term contracts even from systems in need of water because of the higher unit cost of this water. Although the time may arrive when the need for water is so great that higher unit costs will become a negligible factor to prospective purchasers, that time has not yet been reached. Hence, many existing systems, although recognizing the need

for substantial additions of supply within the next two decades are reluctant to undertake costly programs that will be unprofitable for at least a substantial period of time. In any event, it is apparent that no concrete plans are underway to produce the increases in supply needed by 1960 and the period following up to 1975.

The Engineers propose as a first stage the development of increased supplies through new construction at three locations within existing water systems: Newark-Pequannock, Jersey City-Rockaway, and Passaic Valley, yielding 77 mgd at a total cost of \$22,140,000 (PER III-3 to III-7, IV-1 to IV-2). In order that this valuable and relatively inexpensive augmentation of supply proceed without delay it is proposed that the State, acting through a Water Supply Board to be created within the Department of Conservation and Economic Development will undertake the development of these new water supplies. It is recommended that the State shall make this water available at wholesale rates to distributing agencies served by these systems on an equitable basis. While it would be more desirable to have each of these projects executed by the system involved, it seems clear that if the water supply is to be increased to meet immediately foreseeable needs, action must be taken now.

The Commission recommends the adoption of legislation providing for a referendum under which the amount necessary (\$22,140,000) will be made available through a newly created State Water Supply Board which will undertake the construction of these valuable and relatively inexpensive additions to present supply.

Intermediate Stage

The 3,350,000 persons served by the Northern New Jersey Systems used 420 mgd in 1953. The dependable yield at that time was 456 mgd (PER II-2). With the proposed addition of 77 mgd a future supply of 533 mgd is thus assured. The estimated minimum average requirement of the Northeastern Metropolitan Region will be 471 mgd in 1960 and will rise to 526 mgd in 1970 and to 583 mgd in 1980. Because of the necessity of maintaining an adequate margin between average need and dependable supply, it becomes apparent that well before 1970 a critical point will be reached even with the addition of 77 mgd, and consumption will equal or outrun supply.

To meet this second stage requirement, and because of the long period necessary to plan and construct a major supply development, the Engineers have recommended the acquisition of a reservoir site, the construction of a dam, pumping stations and mains, and transmission lines to serve this region in which need is critical. The Commission concurs with this recommendation. It is evident that piecemeal, local efforts to meet what is essentially a vast regional problem will inevitably fail. Even if the State undertakes the three specific construction measures recommended above, only a temporary solution has been provided. What is needed is planning to meet water needs to the year 1975 long before the critical stage is reached.

It should be pointed out that the need for the creation of a new major supply for this region has been recognized for a considerable period of time. A water commission, a State agency, and the authors of several bills introduced in this and recent sessions of the Legislature have proposed the creation of a major supply at Round Valley in

Hunterdon County. At the beginning of the investigation the Engineers were instructed by the Commission to study the advisability of developing a supply at Round Valley, from Wallpack Bend or some alternative plan on the Delaware River, on the Raritan, or any combination of these and other possible sources. No possible choice was foreclosed by any directives of this Commission. After their independent study of all feasible major sources (PER Ch. III), the Engineers narrowed their choice to two sites which had the potentiality of becoming major water supply sources for the intermediate stage. One of these—Round Valley (in Hunterdon County)—has been mentioned prominently in recent years as a possible reservoir site for an expanded supply for the Northeastern Metropolitan Region. The other—Chimney Rock (in Somerset County)—had not been examined seriously as a possible site in recent years, primarily because of the large number of families living there, as compared with those living at Round Valley. As the investigation of the Engineers' progressed, it became apparent to them that a Chimney Rock development, somewhat different from those previously recommended, would be considerably less costly. Specifically, Chimney Rock would cost \$8 million less at the first (70 mgd) stage of development (\$53,910,000 compared with \$59,940,000 for Round Valley) and, even more striking, at the ultimate stage of development (200 mgd), would cost \$40 million less (\$102,650,000 compared with \$143,630,000) (PER III-7 to III-11). It should be noted that the cost of Round Valley as estimated by the Commission's Engineers is considerably higher for the 200 mgd stage than are estimates published elsewhere. First,

however, it should also be noted that the data furnished by the Commission's Engineers is current (April- July, 1955). The cost estimates of our Engineers and those published elsewhere are comparable for the 70 mgd stage, (\$59,940,000 including \$3,900,000 for interest during construction by our Engineers compared with \$54,345,165 exclusive of interest during construction published elsewhere). But when the ultimate 200 mgd stage is reached there is a sharp discrepancy between the estimates of our Engineers and those published elsewhere. The chief explanation for the lower figure given by its proponents for the ultimate stage of Round Valley is their assumption that the center of future need and the consequent center of transmission termination in the future will be in the area of Bound Brook. If this assumption is adopted for Chimney Rock as well, its saving of the latter over Round Valley will remain comparably large (\$62,550,000 for Chimney Rock compared with \$102,030,000 for Round Valley). In fact, no detailed cost estimates for the final stage of development of Round Valley have been published, previous to this report by the Commission's Engineers. Moreover, as the Engineers' report emphasizes, the development of Chimney Rock has the great advantage of permitting the utilization now of water wholly within the control of this State. Undoubtedly, there will be substantial development of the Delaware in the future. The Supreme Court decree of 1954 left the door open for New Jersey to return and secure the Court's consent to increased diversion. Reservoir sites will be needed and it is clear that the initiative in developing Wallpack Bend on the Delaware rests by law with the

Commonwealth of Pennsylvania. Thus, even with the choice of Chimney Rock as the site for future major development of the resources of the Raritan Basin, the Commission recommends to the Legislature the passage of a bill providing for the acquisition of the last remaining major reservoir site, Round Valley (presently Assembly Bill #36). The relatively low cost of this step (approx. \$3 million) suggests its wisdom as an insurance measure. While the Engineers who will not complete their study of possible projects for long range water development (to the year 2000 and after) until December 15, 1955, have not recommended this action, the Commission feels that action to acquire the site should be taken in the near future before increasing settlement of the area makes the cost of acquisition much higher. Existing properties could be leased to the present owners on favorable terms pending final decisions on eventual reservoir construction.★

There are sound grounds, conclude the Engineers, for the selection of the Chimney Rock site for the development of a major water supply over that of Round Valley. We are able to say that in a physical and engineering sense, we concur with the findings of the Engineers that Chimney Rock appears to be a feasible site. There are still reservations to be answered regarding dislocation of people, the effects upon industry, the extent of acquisition of real estate, causeways and sanitation steps, the need for low flow augmentation downstream, and continued quarry operations. Such factors

★ Senator Dumont wishes to reserve decision on this proposal until and if, such time as the Engineers recommend as wise and feasible the development of a supply at Round Valley.

must be weighed against a possible needless expenditure of \$40 million, and the advantage of full state control of a Raritan development.

But acting under the mandate of the Legislature to report by August 1, 1955, this Commission did not have ample time to test with finality all of the Engineers' assumptions, or to resolve all doubts by asking for further engineering data and by holding public hearings.

Therefore, we recommend to the Legislature that the resolutions to these reservations be obtained through public hearings of the appropriate legislative committees. There should be ample time for such hearings prior to the deadline for the submission of referendum legislation. We believe that if our reservations regarding Chimney Rock are resolved under public scrutiny, then the Chimney Rock development will best create an additional major water supply for the Northeastern Metropolitan Region within the next five to ten years.

Legislative Action Required

State Water Supply Board

It has been recommended that the powers of the Water

Policy and Supply Council be strengthened in various respects (p. 3, this report). In addition it will be necessary, in the judgment of the Commission to create a Water Supply Board within the Division of Water Policy and Supply in the Department of Conservation and Economic Development, authorized to acquire sites, construct dams, pumping stations and transmission lines as provided by legislation in order to make substantial amounts of water available on an equitable basis at wholesale rates to existing water systems. It is not recommended that the State engage in the retail distribution of water. It would seem feasible to establish this Board, preferably consisting of five members, appointed by the Governor, with the consent of the Senate, within an augmented Division of Water Policy and Supply, thereby gaining the assistance of state personnel experienced in water problems, without sacrificing the initiative and enthusiasm to be gained by a new agency.

Some of the powers requisite to the efficient function of this Board are set forth in Per V-3 to V-5. The Commission will in the near future recommend to the Legislature a bill setting forth the powers of the Board in detail. It is the recommendation of the Commission that when large scale additions to the water needs of a large area or region are required, it should be the responsibility of the Legislature after careful study in each instance, to propose the development of new water supplies, and to provide financial support by pledging through law the credit of the state and state taxing power. In this present instance the resources of the state are brought to the

aid of the vast Northeastern Metropolitan Region. But in the decades to come, it is to be anticipated that similar measures will be undertaken in support of the fast-growing Southwestern Metropolitan Region. Nor is it likely that other areas in the other regions of the state to remain long without serious problems. At some points in the Coastal Region salt water intrusion threatens wells which provide the chief water supply for important localities. In the central part of the state some communities find their well systems inadequate for their rapidly growing populations. In the final report of the Engineers the results of a more detailed study of the ground water resources of New Jersey will be reported. From evidence already before this Commission, it is probable that the inception of a long range study, including test borings, of the Pine Barrens and other ground water areas, will be recommended to the Legislature by this Commission, if we are to meet and solve new water problems before they become acute.

Financing Water Resources Development

It is recommended that the cost of substantial developments, such as the three smaller supply additions recommended (p. 8, this report), and that of Chimney Rock (p. 10, this report), be financed in such a way that those immediately in need of water will not be required to pay a disproportionately high rate, but rather, in such a way that those living in the region receiving substantial benefit will help defray capital costs and carrying charges,

as well as any short-run operating deficits, through a special tax. The basic plan is this. A State Water Supply Board will compute and allocate on the basis of a formula to be set forth by law, the respective shares of the total development and operating cost to a water district or districts, as will be defined by law. Water district boards, consisting of representatives appointed by the boards of Chosen Freeholders of the counties within the district, will then receive certified bills, which they in turn will apportion among the municipalities and governmental units within their district. A referendum bill providing for a bond issue in the amount of \$76,050,000, to be financed in the method outlined, as well as by charges to users of the new water supply, will be introduced in the Legislature in the very near future. It is proposed that this referendum bill be presented to the people of New Jersey at the forthcoming general election (1955). In this bill the receipts from water sales, the proceeds of the special tax on benefited districts, as well as the general real estate taxing power of the state will be pledged in support of the recommended bond issue. Admittedly, this is a heavy financial undertaking at least for the immediate future. But there can be no great improvements in the social and economic life of our State without some financial sacrifice. Failure to plan for the future means that industry will go elsewhere, where a suitable supply of water is made available. Needless to say, the maintenance of our high standard of living requires continued availability of an adequate supply of water for industrial and domestic use. The referendum bill provides

a method of taking action in the immediate future, so that an increase in supply will be available within three years, and a major addition will become productive by 1960-61. This step, coupled with the creation of an energetic State Water Supply Board in the Department of Conservation and Economic Development through a bill to be submitted later to the Legislature, and the strengthening, by a bill to be introduced shortly, of the existing powers of the Water Policy and Supply Council, will mark the substantial beginnings of a comprehensive program of water development. In December, 1955, after receiving the final report of our Engineers¹, this Commission will submit recommendations for a development program to provide major increases in water supply for the years 1975-2000 and beyond. The alternative to the adoption of a new and comprehensive long-range program to increase the State's water supply will be a series of water crises, which, it may be prophesied, will be met by hastily improvised short-run measures. We respectfully urge the Honorable members of the Legislature, and the citizens of New Jersey, to take action now, while time remains.

Respectfully submitted,

Senator Mark Anton

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