

DELAWARE RIVER BASIN,

TOCKS ISLAND LAKE,

PENNSYLVANIA, NEW JERSEY  
AND NEW YORK;

**ENVIRONMENTAL  
IMPACT  
STATEMENT**

PROPERTY OF  
NEW JERSEY STATE LIBRARY

JUL 5 1972

185 W. State Street  
Trenton, N. J.

J719.32  
U5.4 7/2

J719.32  
U5.4



U.S.

DEPARTMENT OF THE ARMY

PHILADELPHIA DISTRICT, CORPS OF ENGINEERS

CUSTOM HOUSE - 2D & CHESTNUT STREETS

PHILADELPHIA, PENNSYLVANIA 19106

New Jersey State Library

J719.32

Copy 2.

U5.4

U.S. Dept. of the Army.  
Corps of Engineers.  
Philadelphia District.

Delaware River Basin, Tocks  
Island Lake, Pennsylvania, New Jersey  
and New York: Environmental Impact  
Statement.

te I

New Jersey State Library  
Department of Education  
Trenton, New Jersey 08625

( ) DRAFT ( X ) FINAL ENVIRONMENTAL STATEMENT

TOCKS ISLAND LAKE PROJECT

DELAWARE RIVER

NEW JERSEY, NEW YORK, PENNSYLVANIA

SUMMARY

RESPONSIBLE OFFICE: U.S.ARMY ENGINEER DISTRICT, PHILADELPHIA, PENNSYLVANIA

1. Name of Action: ( X ) Administrative ( ) Legislative

2. Project Description. 1/ The proposed project provides for the construction of a dam on the Delaware River roughly five miles above the Delaware Water Gap and seven miles northeast of Stroudsburg, Pennsylvania. Normally, stream flows to be impounded by the dam will form a 12,425 acre reservoir which will extend 37-miles upstream to the confluence of the Delaware and Neversink Rivers at Port Jervis, New York. This project will serve the purposes of flood control, water supply, hydroelectric power and recreation, inclusive of fish and wildlife. The 12,425 acre reservoir will also serve as a focal point for the surrounding 47,000 acre Delaware Water Gap National Recreation Area which is being developed by the National Park Service. In the State of New York the following counties are affected by the project: Orange, Sullivan. In the Commonwealth of Pennsylvania the following counties are affected by the project: Pike, Monroe, North Hampton. The following New Jersey counties are affected by the project: Warren, Sussex.

3A. Environmental Impacts. This project will provide water supply, flood control, conventional hydroelectric power and recreation by means of an earth and rock-fill embankment, a two unit powerhouse with a rated capacity of 70,000 KW and initial development of four recreation areas. Approximately 25,200 acres of land will be acquired. Relocations will include approximately 24 miles of U. S. Route 209, 5,000 graves, 30 miles of power lines, 40 miles of telephone lines, two elementary schools and minor modifications to two gas pipelines. Also, roughly 10 miles of flood protective works will be constructed in the vicinity of Port Jervis, New York, and Matamoras, Pennsylvania.

1/ Environmental impact statements are in preparation for the Delaware Water Gap National Recreation Area (DWGNRA) and the Kittatinny pumped storage project.



Impoundment will cause replacement of a gently flowing stream with a 37-mile long lake and inundate an additional 10,000 acres of land over the 2,425 acres now covered by the existing stream. Commitments to water supply, recreation, fish and wildlife and power generation will be met by the lake operational program. Lowering of the lake level will expose mostly shoreline which is steep-sloped with soils that are generally free draining. However, some areas will require drainage to prevent secondary ponding to eliminate breeding grounds of mosquitoes and other nuisance vectors. The outlet works will be gated for selective withdrawal to control releases from the lake to meet downstream release schedules of controlled quality of water. The effect of this selective withdrawal on nutrients passing downstream has not been determined. Recently, the DRBC and USGS established a program to establish present nutrient concentrations within the upper Delaware.

Following a 6- to 10-year period of expanding game fishery, the fishery will change from outstanding to good. The resident sport fishery above the lake will not be affected. Release of all lake inflows during April, May and June will be made to provide protection from the oyster drill for the Delaware Bay oyster resources. A fishway will be provided; however, use of the river by shad sport fishermen above the lake will be reduced by 50 percent. Loss of some shad habitat will occur within the lake and downstream commercial harvest for shad in the lower river and bay will also be reduced by about two-thirds. This assessment is based primarily on the physical difficulty of passing shad at the site. On-going experience at Columbia River dams contradicts this project, as 80 to 90 percent of upstream migrants are being successfully passed.

Inundation of the valley will not appreciably affect the economic geology of the area. River bottom plant communities within the lake and part of the coniferous species in inundated portions of the gorges will be eliminated. As time passes the river bottom plant community will be re-established on lands ecologically suited to sustain characteristic species. The open field flat land will be lost except in small scattered areas above elevation 410. The permanent 12,425 acre lake will eliminate 10,000 acres of potentially available wildlife habitat and effect an estimated annual loss of 1,950 hunter days. Wildlife management and public hunting areas will be developed in cooperation with State agencies. There will be 880 acres of mitigation land provided. Areas of historical, ecological and archaeological interest will be preserved in their natural setting above the normal pool elevation.

Bridges, large culverts and other crossings in connection with relocation of U. S. 209 will be designed to afford the best possible stream conditions and to preserve the existing environment as nearly as possible. During construction, the contractors will be required to avoid contamination of the streams and prevent erosion. Landscaping will be provided to blend new construction into the surrounding landscape.



The combined reservoir and national recreation area projects would create an interrelated economic and environmental impact on the seven counties bordering the project areas. There will be temporary inconveniences created by disruption of traditional social, economic and cultural pursuits by indigenous residents. Pre-project commercial tax revenue will eventually double and employment opportunities increase. Through flood control 4,000 acres of land previously undeveloped or providing low economic return would be made available for economic development or for improved land uses.

The impact of 10.5 million visitors annually on sewage and solid waste disposal systems will be mitigated by ties into the regional plan of DRBC or development of treatment systems to serve the Tocks Island and DWGNRA projects. The adverse aesthetic effect caused by the dam, appurtenant structures, grading, borrow areas and excavation will be minimized by architectural treatment of the structures and an appropriate landscape architectural plan for restoring construction scars.

3B. Adverse Environmental Effects Which Cannot be Avoided. Development of the project will result in the loss of 37 miles of free-flowing streams and 10,000 acres of land which include primary bottom land and upland habitat for wildlife. Some losses in commercial and sport shad fishery will occur even with provision of fish passage facilities. Variable hydropower water releases associated with conventional power are expected to cause a reduction in fisherman usage of resident sport fishery below the dam. Much of the spawning habitat for shad both within the lake and downstream of the dam will be lost. This lost habitat plus the necessity of passing through the fishway on upstream journey and through power facilities on downstream journey preclude the possibility that the shad potential of the unobstructed river can be realized.

Road and power line relocation will destroy the natural vegetation and scarify the earth along the path of construction. Some drainage runoff patterns will also be affected. Part of Old Mine Road will be inundated. About 2,600 basin residents will be required to relocate and construction of protective works in the vicinity of Port Jervis, N. Y., and Matamoras, Pa., will impair the view of the river in scattered locations. To date residents have been resituated. The recently enacted Relocations Act, Public Law 91-646 Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, will significantly assist those people affected by relocation.

4. Alternatives. Three classes of alternatives were considered:
- a. Alternate multi-purpose project.
  - b. No action.
  - c. Alternates which avoid one or more adverse environmental effects.



5. All sources of written comments received.

Bureau of Outdoor Recreation	Delaware Valley Conservation Association
Bureau of Sport Fisheries	Lenni Lenape League
Department of Health, Education & Welfare	Save New Jersey's Natural Environment
Federal Power Commission	Sandyston Township Association, Inc.
Federal Water Quality Administration	Sierra Club, Atlantic Chapter,
National Park Service	Eastern Pennsylvania Group
Delaware River Basin Commission	Tocks Island Citizens Association
Commonwealth of Pennsylvania	Tocks Island Regional Advisory Council
State of Delaware	Trout Unlimited, New Jersey Chapter
State of New Jersey	Water Resources Association of
State of New York	Delaware River Basin

6. Draft Statement to CEQ 3 Feb 1971.

Final Statement to CEQ 1 Oct 1971.



# TOCKS ISLAND LAKE

## ENVIRONMENTAL IMPACT STATEMENT

### SYNOPSIS

The purposes and scope of the development discussed in this evaluation necessitate a lengthy Environmental Impact Statement. To aid in appreciation of the underlying basic theme of this statement the general outline is discussed first. There are seven principal parts (refer to the Index) which can be inter-related. The logical sequence used can be depicted using the sketch below.

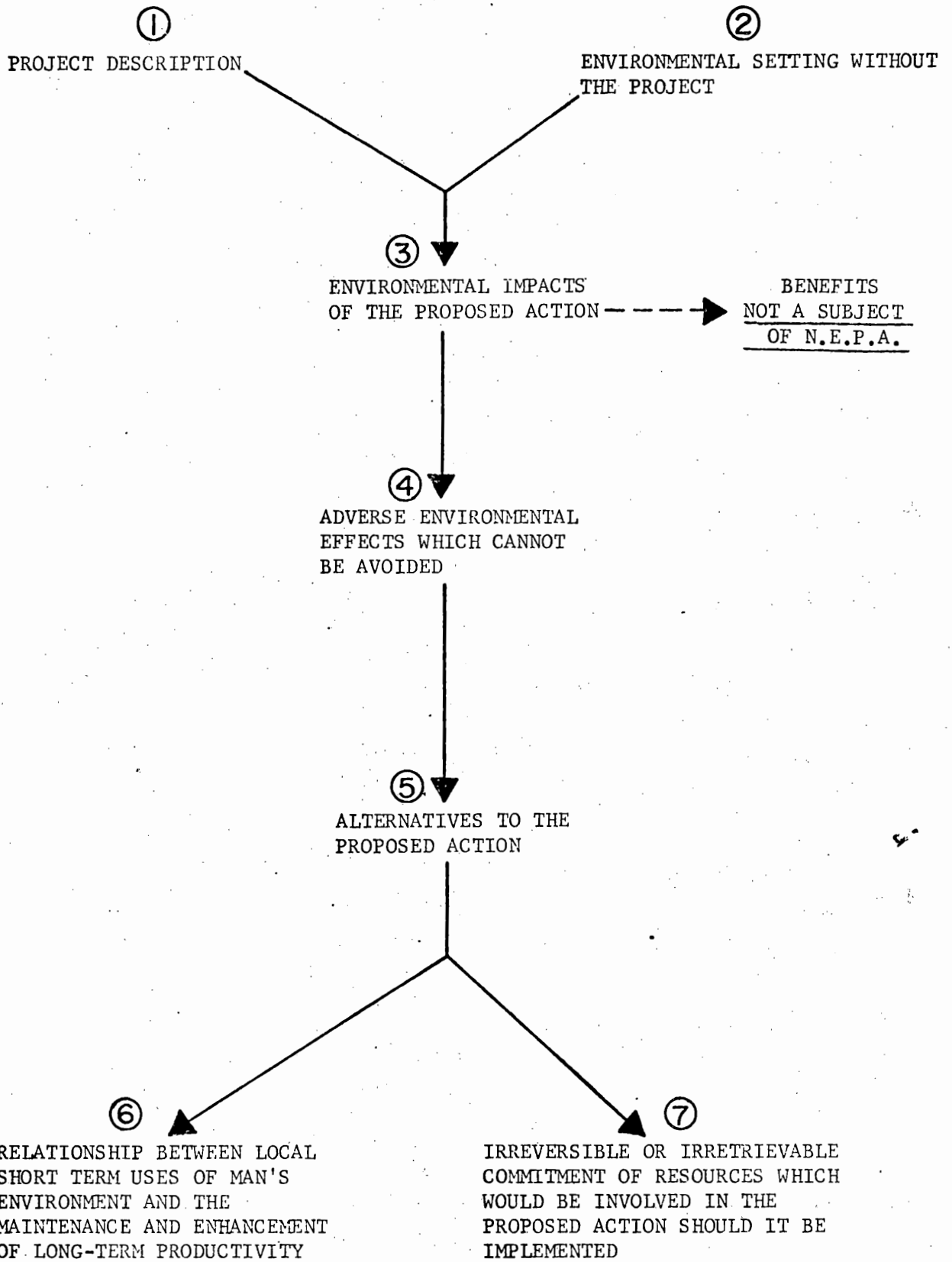
Within Section 1 a word description of the project is synthesized from the various drawings, charts, reports and models. Section 2 presents the diverse aspects of the environmental setting in the absence of the projects. Section 3 represents the result of inserting the project of Section 1 into the particular environmental setting of Section 2. Conceptually both benefits as well as environmental impacts arise at this point. It is noted, however, that project-produced benefits are not a subject of the Environmental Impact Statement.

Of the environmental impacts resulting from the action of developing the project, some are beneficial or neutral but others may be adverse in character. Within Section 3, an analysis is made to categorize the impacts while assessing whether the adverse impacts can be effectively mitigated. In cases amenable to mitigation the measures to be employed as part of the project are identified and discussed. In the balance of situations involving adverse impacts, analysis delineates the problem. Such adverse environmental effects which cannot be avoided are the subject of Section 4. In this section the extent, nature and implication of these effects are discussed. Various alternative actions that might avoid some or all of the adverse effects of Section 4 are explored in Section 5. A conspectus for this section lays out the considerations involved in comparing alternatives.

The remaining parts of the Environmental Impact Statement, Sections 6 and 7, complete the main text of the statement. Section 6 supplements the discussion of the Sections 1 - 5 by presenting the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity. Lastly the irreversible or irretrievable commitment of resources which would be involved in the proposed action should it be implemented are given in Section 7.

The balance of this report in accord with the outline herein advanced builds into the Federal decision making process an appropriate and careful consideration of the environmental aspects of the proposed actions. The statement has used a systematic, interdisciplinary approach employing the natural and social sciences along with the environmental design arts, in stating the overall impact of the subject project.





**TOCKS ISLAND ENVIRONMENTAL IMPACT STATEMENT**



## FOREWARD

During the early 1950's, the Corps of Engineers was restudying a previous comprehensive report on the Delaware River Basin; and the Governors of the four-state basin area were studying formation of an interstate commission to undertake a joint survey of water resources problems in the basin. While these efforts were in progress, two disastrous hurricanes struck the basin in a period of less than one week during August 1955. The basin-wide floods which resulted from these storms caused loss of life, and extensive property and related damages. After reviewing the damaged areas within the basin, the President declared the basin a major disaster area.

In addition to participating in the restoration of this major disaster area, the Corps immediately began a Congressionally directed four-year study of water resources and water needs of the Delaware River Basin. Views and desires of as many basin interests as possible were incorporated into this study through public hearings and through formation of the Delaware River Basin Survey Coordinating Committee, comprised of representatives from Federal, State, and local agencies concerned with the use of basin resources. After reviewing all expressed views and desires, the Corps of Engineers coordinated the efforts of all agencies in a survey of water resources and in the development of a comprehensive plan for the most efficient and effective use of basin water resources to meet projected water and water-related needs. Population and demand projections made as a part of this survey revealed that the population of the basin would probably double by the year 2010 and that estimated gross water demands would increase more than fourfold. State park type recreation needs and electric power requirements were expected to increase almost seven and ten times, respectively, over those existing in 1955. In addition to these demands, annual flood damages in the basin were expected to increase an estimated 138 percent. The comprehensive plan formulated to meet these needs, the Delaware River Basin Plan, envisioned development of 19 major and 39 small control projects with a supplemental program for land management. The Congress reviewed the plan and passed the Flood Control Act of 1962 which authorized Federal construction of eight of the major control projects. The Tocks Island Lake project is the largest of the authorized projects and is the only project located on the main stem of the Delaware River.

The Tocks Island Lake project was formulated to provide for meeting 40 percent, 35 percent, 40 percent and 75 percent, respectively, of the total basin needs to be met by the Basin Plan for flood control, water supply storage, recreation value and conventional hydroelectric power.

1

1942

1942

Tocks Island Lake, due to its purposes and location, bears a relationship to two other major projects in this area: The Kittatinny Mountain (pumped storage) power development proposed by certain utilities and the Delaware Water Gap National Recreation Area (DWGNRA), a project of the National Park Service.<sup>1/</sup> The Kittatinny Mountain project would utilize the reservoir head and water for pumped storage power generation while the lands of the National Recreation Area are contiguous to the Tocks Island Lake project. Under the authorizing statute and the legislative history, the National Recreation Area cannot proceed without the Tocks Island multi-purpose project.

The Delaware River Basin Commission was created in 1961 upon enactment of concurrent legislation by the Congress of the United States and the respective basin States legislatures. Under authority of the Delaware River Basin Compact, the Commission was established as the governmental mechanism responsible for developing, managing, planning and protecting the water resources of the 13,000 square mile Delaware River Basin. In 1962, the Basin Commission approved the Tocks Island Lake project for incorporation into the Comprehensive Plan for the Delaware River Basin.

<sup>1/</sup> The authorizing statute is PL 89-158.



TOCKS ISLAND LAKE  
DELAWARE RIVER, PENNSYLVANIA, NEW JERSEY, AND NEW YORK  
ENVIRONMENTAL IMPACT STATEMENT

INDEX

	<u>Page</u>
<b>1. <u>Project Description</u></b>	
a. Authority and Location	1-1
b. Project Function, Boundary and Relationships to Other Developments in the Region	1-1
c. Major Project Features	1-2
d. Storage Pools and Proposed Lake Operating Program	1-3
e. Drawdown	1-4
f. Fishery Program	1-4
g. Archaeological and Historical Survey Programs	1-5
h. Clearing Operations	1-6
i. Current Project Status and Benefit-Cost Ratio	1-6
<b>2. <u>Environmental Setting Without the Project</u></b>	
<b>2.1 <u>DELAWARE RIVER BASIN</u></b>	
a. The Delaware River	2-1
b. General Terrain Features	2-1
c. Land Use	2-2
d. Population Growth and Demands for Water	2-2
e. Water Quality	2-2
f. Floods and Droughts	2-3
g. Other Reservoirs in the Delaware River Basin	2-3
h. Legally Established Flow Requirements	2-4
<b>2.2 <u>PROJECT AREA</u></b>	
a. General Description of Project Area	2-4
b. Hydrology	2-4
c. Aquatic Vegetation and Animals	2-5
d. Fishery	2-5
d1. Marine Fishes	2-7
d2. Anadromous and Catadromous Fishes	2-8
e. Geology and Soils	2-9
f. Vegetative Cover	2-9
g. Wildlife	2-10
h. Land Use	2-10
i. Archaeological and Historical	2-11



TOCKS ISLAND LAKE

INDEX (Cont'd)

	<u>Page</u>
<b>3. <u>Environmental Impacts of the Proposed Action</u></b>	
a. Physical Changes Caused by the Project	3-1
(1) Temporary Changes	3-1
(2) Permanent Changes	3-1
b. Effects of These Physical Changes	3-2
(1) Construction	3-2
(2) Project Facilities	3-2
(3) Project Operation Effects	3-5
c. Analysis of the Environmental Impacts Stemming from Physical Changes Caused by the Project	3-7
(1) Construction Activities	3-8
(2) Dam Embankment	3-8
(a) Earthquake Considerations	3-8
(b) Fishery for Migratory Species	3-9
d. Creation of a Lake	3-10
(1) Eutrophication	3-10
(2) Wildlife with the Project	3-11
(3) Vegetative Cover	3-13
(4) Delaware Fishery	3-13
(5) Lake Fishery	3-14
(6) Fishery for Riverine Resident Species	3-15
(7) Geology and Soils	3-15
(8) Archaeologic and Historic Features	3-16
(9) Lake Water Level Fluctuations	3-16
(a) Long-term water level fluctuations	3-16
(b) Short-term water level fluctuations	3-16
e. Establishment of Recreational Areas	3-18
f. Permanent Supporting Facilities	3-19
<b>4. <u>Adverse Environmental Effects Which Cannot Be Avoided</u></b>	
a. General	4-1
(1) During Construction	4-1
(2) Post-Construction	4-1
(3) Mitigation Design	4-2
b. Land Acquisition and Relocation	4-2
c. Impoundment	4-2
d. Recreation Facilities	4-4
e. Operation of the Lake	4-6



TOCKS ISLAND LAKE

INDEX (Cont'd)

	<u>Page</u>
5. <u>Alternatives to the Proposed Action</u>	
a. Background	5-1
A. Adverse Characteristics Brought on by Creation of Lake	5-1
B. Adverse Characteristics Arising from Lake Operations	5-2
C. Recreation - Related Adverse Effects	5-2
b. An Alternate Multi-Purpose Project	5-2
c. The No-Action Alternative	5-2
d. Alternate Actions Which Avoid One or More Adverse Environmental Impacts	5-4
Constant Level Reservoir on the Delaware River	5-4
Reservoir Development on Tributary Streams	5-4
Elimination of Recreation as a Project Purpose	5-5
Non-impounding Structural Alternative	5-5
Non-Structural Alternative	5-5
Dry Reservoirs	5-6
Alternate Sources for Water Supply	5-6
Deletion of Power Generation as a Project Purpose	5-7
6. <u>Relationship Between Local Short-Term Uses of Man's Environment and the Maintenance and Enhancement of Long-Term Productivity</u>	
a. Local Short-Term	6-1
b. Long-Term Productivity	6-1
7. <u>Irreversible or Irretrievable Commitment of Resources Which Would be Involved in the Proposed Action Should it be Implemented.</u>	7-1
8. <u>Coordination with Other Agencies.</u>	8-1
Agencies Contacted for Draft Statement Review	8-2



TOCKS ISLAND LAKE PROJECT

COMMENTS RECEIVED FROM FEDERAL, STATE  
AND LOCAL AGENCIES AND ORGANIZED  
CITIZENS GROUPS

INDEX

<u>Organization</u>	<u>Page</u>
<u>Federal</u>	
Bureau of Outdoor Recreation	A-1
Bureau of Sport Fisheries and Wildlife	
Preliminary	B-1
Final	B-2
Department of Health, Education and Welfare	C-1
Federal Power Commission	D-1
Federal Water Quality Administration	E-1
Environmental Protection Agency	
Northeast Region	F-1
Region III	F-2
Washington, D. C.	F-4
National Park Service	G-1
<u>Quasi-Federal</u>	
Delaware River Basin Commission	H-1
<u>State</u>	
Pennsylvania	I-1
Delaware	J-1
New Jersey	K-1
New York	
Preliminary	L-1
Final	L-4
<u>Local Agencies and Organized Citizens Groups</u>	
The Delaware Valley Conservation Association	M-1
Lenni Lenape League	N-1
Save New Jersey's Natural Environment	
Basic	O-1
Sandyston Township, Layton, N.J. (supplementary)	O-26
Walpack Township, Sussex County, N.J. (supplementary)	O-28
Sandyston Township Association, Inc., Layton, N. J.	P-1
Sierra Club, Atlantic Chapter, Eastern Pennsylvania Group	
Basic	Q-1
Dr. E. E. MacNamara, Milford, N. J. (supplementary)	Q-4
Tocks Island Citizens Association, Bushkill, Pa.	R-1
Tocks Island Regional Advisory Council, Stroudsburg, Pa.	S-1
Trout Unlimited, East and North Jersey Chapters	T-1
Water Resources Association of the Delaware River Basin	U-1



LIST OF TABLES

<u>Table No.</u>	<u>Title</u>	<u>Page</u>
1-1	Drawdown Figures for Various U. S. Reservoirs	9-0
1-2	Preliminary Flow Data: Daily Gage Height (feet) and Discharge (CFS)	9-0-a
2-1	Water Quality Data for the Delaware River	9-1
2-2	Estimated Average Flows at Tocks Island Damsite	9-2
2-3	Low Flow Recurrence Interval	9-3
2-4	Summary of Environmental Impact on Fishery	9-4
2-5	Average Annual Hunting Use of Lands	9-5



LIST OF FIGURES

<u>Figure No.</u>	<u>Title</u>	<u>Page</u>
1	Tocks Island Reservoir	10-1
2	Pool Elevation Occurrence	10-2



## TOCKS ISLAND LAKE

DELAWARE RIVER, PENNSYLVANIA, NEW JERSEY, AND NEW YORK

### ENVIRONMENTAL IMPACT STATEMENT

#### 1. Project Description.

a. Authority and Location. Tocks Island Lake was authorized by PL 87-874, Section 203 (Flood Control Act of 1962) to be constructed substantially in accordance with the recommendations of the Chief of Engineers contained in House Document No. 522, 87th Congress, 2d Session. The damsite for the project is located on the Delaware River roughly five miles above the Delaware Water Gap and seven miles northeast of Stroudsburg, Pennsylvania. The project's boundary includes portions of Monroe and Pike Counties in Pennsylvania; Warren and Sussex Counties in New Jersey; and Orange County in New York.

b. Project Function, Boundary and Relationships to Other Developments in the Region. This multi-purpose project is the major element of the Comprehensive Plan 1/ for the Delaware River Basin, prepared by the Corps of Engineers with the assistance of other Federal and State agencies, approved by Congress and adopted by the Delaware River Basin Commission. It will meet a significant part of the basin's needs for flood control, water supply, conventional hydropower and recreation, inclusive of fish and wildlife, projected to the year 2010. About 1/3 of the Delaware River Basin drainage area lies above the damsite.

The lake it forms will be regulated to ensure that downstream releases are adequate to sustain environmental quality. Stream inflows in excess of these releases will be impounded by the dam to sustain a 12,425 acre lake at elevation 410, the top of the conservation pool, or released at a safe rate. At this elevation, the lake will extend 37 miles upstream to the confluence of the Delaware and Neversink Rivers at Port Jervis, New York, 9.5 miles up the Flat Brook, 4.0 miles up the Bushkill, and 2.5 miles up the Neversink arms of the lake. (See map at figure 10-1.) Initial filling of the lake to elevation 410 can be completed during the spring runoff period of a single normal water year without reducing downstream flows below acceptable levels. In accordance with usual procedure, however, filling will take place during the construction period following closure.

While functionally and economically capable of standing alone, Tocks Island Lake is closely related to two other authorized projects in its immediate proximity: The Delaware Water Gap National Recreation Area (DGNRA), a project of the National Park Service, Department of the Interior; and the Kittatinny Mountain power development proposed by a combine of private utilities (New Jersey Power and Light, Jersey Central Power and Light, and Public Service Electric and Gas Companies). PL 89-158 established the DWGNRA as a part of the Tocks Island Lake project.

1/ There are two plans in effect: (a) the Delaware River Basin Plan - Federal-state, (b) Comprehensive Plan for the Delaware River Basin - DRBC.



The lands to be acquired for DWGNRA and Tocks Island Lake are for the most part contiguous and they constitute a single recreational facility. About 4 miles of the lake upstream from Milford lies outside the DWGNRA. Wildlife management requirements apply to both projects; pollution control measures will serve both projects' needs in concert; and the relocation of U. S. Highway 209 will support both projects, generally bounding the DWGNRA on the west.

Section 5 of PL 91-282 modified the Tocks Island Lake project authorization to permit the lake project conventional power purpose to be developed by the specified private utilities as an incident to their proposed pumped storage development at Tocks Island and adjacent Kittatinny Mountain, subject to environmental and other requirements of PL 91-282, and to the approval of the Delaware River Basin Commission and the Federal Power Commission. The Secretary of the Interior has found the utilities' general engineering plans for this comprehensive power development to be in accordance with the environmental safeguards imposed by PL 91-282 for the preservation of Sunfish Pond and the protection of Kittatinny Mountain, and the utilities' application now is being processed before the Delaware River Basin Commission. Until approved by that Commission, and the Federal Power Commission, in accordance with PL 91-282 the planning for Tocks Island Lake project will continue on a basis which will permit its conventional power potential to be developed either by the originally authorized separate conventional power plant, or by the utilities as part of their proposed pumped storage development. Draft environmental statements will be prepared by the agencies (DRBC, FPC, Interior) concerned with these other projects. In addition, an overview statement is being prepared under Corps of Engineers auspices showing the interrelationship of the three major projects in the vicinity of Tocks Island. Consequently, this statement relates exclusively to the Tocks Island Lake project. The other projects will be discussed only as they directly affect or are directly affected by the Tocks Island Lake project.

c. Major Project Features. The Tocks Island Lake will contain about 11 million cubic yards of earth and rock fill with a central impervious core. Its top elevation will be 160 feet higher than the existing stream bed. The dam will be about 3,000 feet long, consisting of three principal features:

- (1) An embankment section;
- (2) A concrete spillway equipped with operating gates; and
- (3) An outlet works section including an intake tower, with multi-level inlets, stilling basin and tunnels located in rock along the New Jersey abutment.

Fish passage facilities will be provided.

A two-unit powerhouse, having a rated capacity of 70,000 KW, is planned for the downstream terminus of the outlet works tunnel system to convert the energy of the downstream releases from the lake into conventional hydroelectric power.



Four areas along the lake shoreline will be developed initially to provide water-related recreational opportunities for the visiting public. Other lands will be set aside for subsequent development of six additional recreation areas.

Near the upstream limit of the project, approximately 10 miles of flood protection works are planned along the shores of the Delaware and Neversink Rivers at Port Jervis, New York, and Matamoras, Pennsylvania.

Development of the Tocks Island Lake project will necessitate acquisition of about 25,200 acres of land, including 9,500 acres for recreation, 880 acres for wildlife mitigation, and 700 acres for relocation of U. S. Route 209 in Pennsylvania. Relocations required include 24 miles of U. S. Route 209, 10 miles of New Jersey secondary highway, the U. S. Route 6 bridge crossing the Neversink River in New York, an estimated 5,000 graves, 30 miles of power lines, 40 miles of telephone lines and two elementary schools, as well as minor modifications to two gas pipelines in Pennsylvania. The private toll bridge now crossing the Delaware at Dingmans Ferry, Pennsylvania, will be acquired and removed without replacement.

d. Storage Pools and Proposed Lake Operating Program. Characteristics of some lake levels are summarized below:

STORAGE POOLS

	<u>Elevation Feet above m.s.l.</u>	<u>Surface Area Acres</u>	<u>Storage Between Pools Acre Feet</u>	<u>Cumulative Storage Acre-Feet</u>
Top of flood control pool <u>a/</u>	432	17,230	323,500	845,400
Top of conservation pool <u>b/</u>	410	12,425	425,600	521,900
Bottom of conserva- tion pool <u>c/</u>	356	4,170	96,300	96,300
River bed <u>d/</u>	295			

a/ Top of spillway gates.

b/ The conservation pool provides for recreation, water supply, hydropower and flood control. As we do not design benefits for water quality we cannot claim storage for such purpose.

c/ Except during periods of severe drought this is the lowest level to which the lake will be drawn for any purpose, including power generation.

d/ 19,000 acre-feet of storage has been reserved for sediment accumulations anticipated over the 100-year physical life of the project.



The lake operating program serves all project purposes through regulation of the conservation and flood control pool. At the start of the summer recreation season, the regulation program goal is to maintain the lake at elevation 413. Project operating plans provide for the lake to be drawn down slowly to elevation 407 by mid-August, to provide maximum recreational opportunities during the recreation season while also meeting the need to provide maximum flood control storage during the primary hurricane season. An average minimum daily release of 2,784 cfs will be maintained for the purpose of low-flow augmentation, even though, in unseasonably dry periods, lake levels may fall below those most desirable for recreational purposes. It is estimated that low-flow augmentation releases will be required approximately 50 percent of the time. During the months of April, May and June all lake inflows, within the limits of safe downstream channel capacity, will be released to maintain natural stream flows over the Delaware Bay oyster beds.

In the event of flooding as severe as that caused by the August 1955 flood (the flood of record), the operating program will permit full control of flood runoff and will reduce downstream flood damages which would have occurred without the dam to negligible amounts. For floods of less magnitude than the flood of record, releases from the lake will be kept below 70,000 cfs, the zero flood damage downstream channel capacity. Conventional project power operations result in lake releases which could fluctuate within a maximum range of 1,300 to 10,500 cfs, depending upon the actual daily pool elevation. Use of the maximum release range will be necessary at a frequency of once in 100 years when the pool is drawn down to elevation 356.

e. Drawdown. In the course of an average year's operating cycle, drawdown of the lake would total 18 feet, although it could be as little as 2 feet or as much as 57 feet. 1/ This latter event has a one percent chance of occurrence. (See figure 2 - pool elevation occurrence.) During the 14 weeks of the prime summer recreation season, the operating program for the lake would result in an average drawdown of only 7 feet, or less than one inch per day. 2/

During severe drought periods the stored capacity below the conservation pool will be available for those uses which would be most beneficial for the basin.

f. Fishery Program. The U.S. Fish and Wildlife Service in its report on the project's effect on fisheries, prepared in cooperation with the state fish agencies involved, 3/ recommended that certain

1/ Comparative drawdown figures for reservoirs nationwide are given in Table 1-1.

2/ Representative fluctuations in current Delaware River flows are presented in Table 1-2.

3/ N. J., Pa., N. Y. and Del.



features and capabilities be incorporated into the project for mitigation of damages to, and for enhancement of, the fishery. These features include fish passage facilities, fishing piers, fish concentration structures, seining areas and zoning of the lake; capabilities planned for the project include the maintenance of downstream releases within 8° F. of lake inflow temperatures, 1/ at a dissolved oxygen concentration of not less than 5 mg/l 2/ and the release of all flows other than flood flows between April 1 and June 30 to inhibit oyster drill activity at the Delaware Bay oyster beds. Provisions for passage of anadromous and catadromous species to their historic spawning and nursery areas will be maintained during and after construction. Construction contracts will contain provisions to limit stream sediment loads and turbidity caused by construction activities. A multi-level intake structure will be installed to permit lake releases from several levels, or combinations thereof, to make maximum use of the water quality zones that will form in the lake.

The location and extent of all planned features for the fishery will be coordinated with state and Federal agencies during the design phases of the project. The overall recreational zoning plan for the lake, which will include zoning for its fishery, will provide for minimal disturbance to the aquatic ecosystem that will develop within the lake.

g. Archaeological and Historical Survey Programs. In furtherance of his responsibility to develop the DWGNRA, the Secretary of the Interior, acting through the National Park Service, has undertaken extensive archaeological and historical survey programs within the project areas.

The archaeological program has been underway since 1960. To date, site inventory and testing have been completed, salvage has been completed in more than 55 of the 65 recognized archaeological sites within the area to be inundated. Selective testing is continuing, and necessary reports prepared, under contracts with local universities and museums. The Historic American Building Survey Program which involves photography, measurement and architectural documentation of certain historical buildings and structures within the lake project area is expected to be completed this year. Those archaeological artifacts and historic buildings deemed as significant will either be protected or moved to permanent display areas beyond the effects of the lake. 3/

1/ The 8° F. temperature range presently contemplated would not permit the establishment and maintenance of a trout fishery under consideration for a reach extending 10 miles downstream of the damsite. If it is decided to establish this fishery, the selective withdrawal facilities of the dam will be capable of regulating outflows at the desired temperature range.

2/ Milligrams per liter.

3/ No properties on the National Register of Historic Places are located within the Tocks Island Lake project boundary.



h. Clearing Operations. Clearing operations, as presently planned, will extend downward from elevation 413 to the river bed along the entire lake shoreline. This will permit generally obstruction-free recreation use of the lake, maintain lake water quality, and minimize maintenance of the lake. To avoid wasting the project's useable timber resources, large diameter trees will be offered for sale. Then all growth will be cut to a maximum height of six inches above ground. Accumulated material (e.g., brush from clearing operations) will be disposed of in the most economical manner consistent with applicable laws. During clearing operations, objectionable features such as cesspools, land fill sites and swamps, will be treated in accordance with applicable Federal and/or State Public Health Service standards to prevent deterioration of lake water quality and to avoid creation of breeding areas for disease and nuisance vectors.

i. Current Project Status and Benefit-Cost Ratio. The total costs of the project are estimated to be \$259 million at July 1970 price levels. Of this amount, \$158 million are Federal and \$101 million non-Federal. <sup>1/</sup> The project was first funded for advance engineering and design in FY 1964 and for land acquisition in FY 1968. Physical construction is scheduled to begin in FY 1972. This first increment of construction involves preparation of the dam's foundation, relocation of a small power line crossing the river at the damsite and installation of a construction bridge. Filling of the lake is expected to commence in FY 1977 and the project is scheduled for completion in FY 1979.

As of 30 June 1971, 5,895 acres of the 25,200 acres required for the project have been acquired and \$24.60 million have been appropriated for preconstruction planning, engineering and design, land acquisition and construction. The Appropriations Bill for 1972 provides an additional \$8.55 million for the continuation of construction and land acquisition. The current benefit-cost ratio for the project is 1.9 to 1, based on a discount rate of 3-1/8 percent, which is consistent with accepted practice and Water Resources Council policy. If the project were discounted at the 5-3/8 percent rate applicable to projects currently being justified, the benefit-cost ratio would be approximately 1.3. Recreation benefits used in computing the above benefit-cost ratios have been limited to those accruing from the direct use of Tocks Island Lake project lands and waters only.

<sup>1/</sup> The non-Federal costs include reimbursable costs for water supply of \$66.1 million and for power of \$34.9 million.



## 2. Environmental Setting Without the Project.

### 2.1 DELAWARE RIVER BASIN.

a. The Delaware River. The East and West Branches of the Delaware River both rise on the western slopes of the Catskill Mountains in lower New York, uniting just below Hancock, N. Y. Below their confluence, the main stem flows through a narrow, heavily forested, highly scenic valley to Port Jervis, New York. Within this reach, the river is comparatively swift consisting of riffles and long pools which draw white water canoeing enthusiasts. In the vicinity of Matamoras and Port Jervis, the upstream limit of the Tocks Island Lake project, the Delaware is joined by the Neversink River. At that point, it turns abruptly to the southwest and descends through a broad U-shaped valley, numerous tributaries notably the Bushkill and Flat Brook joining it during its course. Near the damsite there is presently in operation the Yards Creek pumped storage development. This power development, located on the southerly side of Kittatinny Mountain, was completed and in operation since 1965. Two pools are associated with this project. The Yards Creek Upper Reservoir constructed atop Kittatinny Mountain and Yards Creek Lower Reservoir situated below it on Yards Creek. At Stroudsburg, Pa., the river turns sharply to the southeast and pierces the Kittatinny-Blue Mountain ridge to form the Delaware Water Gap, a major scenic and geologic attraction. From there the Delaware continues on a generally meandering course to the sea, passing the highly industrialized centers of Easton, Pa., Trenton, N. J., Philadelphia and Chester, Pa., and Wilmington, Delaware.

The drainage area of the Delaware contains approximately 12,800 square miles of land in Pennsylvania, New Jersey, New York, Delaware and Maryland. Its dimensions are approximately 235 by 55 miles.

The uppermost reach of the main stem of the Delaware - the 76 miles between Hancock, New York, and the vicinity of Matamoras, Pennsylvania and Port Jervis, New York, is well known for canoeing and fishing and is presently under consideration by a Federal-interstate task force as an addition to the National Wild and Scenic Rivers System established by PL 90-542. If recommended and approved for designation as a wild river, this reach will be kept largely in its natural state and would complement the Tocks Island Lake project and the DWGNRA.

b. General Terrain Features. The upper region of the basin and the northeastern part of its central region have been glaciated, and narrow valleys and several scenic gorges are filled with deep deposits of glacial debris which contain the most productive although intermittent, groundwater wells in that area. The basin's lower region contains the best source of groundwater. The entire basin lies in the vegetation zone designated Eastern Woodlands. About one-half of its area is forested, the upper region being heavily covered.



The basin contains more than 500 lakes, ponds and reservoirs, of which only 20 percent are of 100 acres or larger in size.

c. Land Use. Almost 50 percent of the basin's 8 million acres of land is suitable for cultivation; however, only 3 percent is suitable for cultivation without special conservation measures. About 40 percent of its land is suitable wildlife habitat. Because of the urban sprawl associated with the basin's growing population, in the year 2010 an estimated 27 percent of the basin lands will be applied to urban uses. By the same time, an additional 12 percent will be required for recreational use.

d. Population Growth and Demands for Water. The population of the area affected by the project is expected to reach 30 million by 1980 and 52 million in 2010. By the year 2010, water-dependent industries are expected to employ 30 percent of the manufacturing labor force of the basin. This constitutes an increase of 10 percent over 1955.

Demands for water supply are expected to grow at an even faster rate than for water-related industry. By the year 2010, the need for municipal and industrial water supplies in the areas served by the project is expected to increase by 100 percent over present levels. 1/

e. Water Quality. The quality of the waters in the reach above the damsite is generally good. 2/ The water is saturated with dissolved oxygen, ranging from 8 to 10 mg/l during the summer, and is low in hardness and turbidity; hardness averages 22 mg/l and dissolved solids 27 mg/l. For almost 95 percent of the time during the 1968 water year, suspended sediment loads were less than 5,000 tons/day and averaged under 200 tons/day. The Delaware River from Port Jervis to Trenton, New Jersey, is generally of high quality. In times of normal flow, it is saturated with dissolved oxygen. Lower levels of dissolved oxygen are found below the confluence of the Lehigh and Delaware Rivers, resulting from waste loads and partially treated industrial effluents. At Trenton the Delaware passes over a series of rock ledges known as Trenton Falls, where it is aerated and from which it enters the estuary saturated with dissolved oxygen. The water in the Delaware estuary between Trenton and Philadelphia is of marginal quality. Chlorides are generally below 30 mg/l. Dissolved oxygen is usually above 4 mg/l and turbidity averages 30 units. Below Philadelphia, the water is of poor quality, especially during summer when water temperatures are high and flows are low. Water quality information for three stations is presented in table 2-1.

1/ Annual Water Resources Report, 1970, DRBC.

2/ The 1966 report prepared for the Corps by the Federal Water Quality Administration states that "generally the waters of the river and its tributaries for this section are of excellent quality." (Water Quality Study, Tocks Island Reservoir, Delaware River Basin).



f. Floods and Droughts. During the last 130 years of record for the Delaware River Basin, 12 significant floods have occurred. The most severe of the floods on the mainstem and their discharges are summarized below:

<u>Flood</u>	<u>Discharge</u>
Aug 1955	329,000 cfs
Jan 1841	256,000 cfs
Mar 1936	227,800 cfs
Oct 1903	205,000 cfs
May 1942	157,400 cfs
Dec 1952	138,500 cfs

Both the August 1955 and October 1903 floods were the result of hurricanes; the August 1955 flood resulted from two hurricanes occurring less than a week apart. The August 1955 flood of record along the lower Delaware River is estimated to have a recurrence frequency of about once in 90 years. This flood is not recognized as a "freak" event in the basin, as the May 1942 flood was slightly more severe in the Lehigh River sub-basin. The October 1903 flood on the mainstem was almost as severe, producing a peak flow of 205,000 cfs at Port Jervis, New York. Below the Tocks Island dam site, damages occur with discharges in excess of 70,000 cfs. Ice jams are almost an annual event within the 40 mile river stretch from the Gap to Port Jervis. Although actual damage is small, potential for major floods at local damage centers is severe. Ice jams at Port Jervis in 1903 produced a river stage higher than that of the 1955 flood at that town. Several periods of protracted low flows have occurred in the basin. From 1922 to the present, ten significant drought periods were experienced, ranging from 83 days in 1939 to 5-1/2 years between 1962 and 1967, the basin's most severe drought of record. During the recent drought, the 250 parts per million isochlor concentration (the maximum desirable for potable water) threatened the Philadelphia water supply intakes at Torresdale. In normal years the isochlor is found in the vicinity of Chester, Pennsylvania.

g. Other Reservoirs in the Delaware River Basin. There are 11 reservoirs on streams tributary to the Delaware River which regulate a drainage area equivalent in size to only 50 percent of that to be controlled by the Tocks Island Lake project, the largest of these being the Cannonsville and Pepacton Reservoirs on the West Branch and East Branch, respectively. Of the entire Comprehensive Plan, only one of the eight major Federal control projects, Beltzville Lake on Pohopoco Creek, a tributary to the Lehigh River, has been completed to date. Two major control projects previously constructed require only modifications. Of the 39 recommended small control projects, two are under construction in the Brodhead Creek subbasin.



h. Legally Established Flow Requirements. A U. S. Supreme Court decree of 7 June 1954 1/:

(1) Permits the City of New York to divert 800 MGD (1250 cfs) of Delaware River flows into the New York Board of Water Supply System from the upper basin reservoir system, comprised of the Cannonsville, Pepacton and Neversink Reservoirs.

(2) Requires the City of New York to make releases from its reservoirs in sufficient amounts to maintain an average daily minimum flow of 1750 cfs at the Montague, New Jersey, stream gaging station 24 miles upstream of the Tocks Island damsite as well as additional releases which are required under further conditions of the decree.

(3) Permits the State of New Jersey to divert up to a maximum of 100 MGD (155 cfs) from the Delaware River without the need for compensating flows.

2.2 PROJECT AREA.

a. General Description of Project Area. The reach of the river directly affected by the project's development passes through a generally narrow valley floor which gradually expands to form a broader flood plain with an average width of 1,800 feet at Wallpack Bend. Downstream of the Bend, the flood plain expands abruptly before narrowing to 2,500 feet at the damsite. The terrain along the Pennsylvania shore rises steeply from the broad river terraces to form a rolling plateau with an average elevation 900 feet above the valley floor. Numerous tributary streams along this shore have eroded deep gorges and formed picturesque waterfalls which descend from the plateau to the river. The accumulations of recent stream deposits and previous glacial deposits have created a broad terrace area adjacent to the river with soils of sufficient fertility to support an existing modest farming effort. The Pennsylvania shore is sparsely settled with communities at Bushkill, Dingmans Ferry, Milford and Matamoras. The New Jersey shore is rugged and forested, forming the western slopes of the Kittatinny Mountains which rise to an average elevation 1,200 feet above the valley floor. The northern portion of this terrain is intersected by stream valleys, notably Flat Brook, and provides some agricultural land. Numerous glacial lakes are found near the mountain crest which support localized recreation activities. Major communities along this shore are located at Flatbrookville and Millbrook in New Jersey and at Port Jervis, New York.

b. Hydrology. The mean annual flow of the Delaware River at the damsite is approximately 6,735 cubic feet per second. Maximum and minimum daily stream flows at the damsite are estimated to have been 230,000 and 513 cubic feet per second, respectively. Mean monthly estimated discharges at the damsite, based on 40 years of historical stream flow records are given in table 2-2.

1/ Rendered in the case of New Jersey vs. New York, Pennsylvania Intervenor, 283 US 336, 805 (1931).



The frequency of occurrence of 7- and 30-day low flows at Riegelsville, New Jersey, located 68 miles below the damsite are presented in table 2-3. Existing daily fluctuations of the river reach within the Tocks Island Lake project boundary average 0.5 to 1.0 foot. A 1.0 foot drawdown in this area would expose approximately 30 acres of the river area. However, wide daily fluctuations during periods of high runoff and recessions in times of decreased summer flows cause as much as six vertical feet of saturated stream bank to be exposed.

Records of the Port Jervis, New York, gaging station reveal a range of turbidity from 300 parts per million during spring runoff to two parts per million during winter and summer months. Recorded maximum and minimum daily sediment loads of the river as measured at the same station were 69,500 tons and 0.8 tons, respectively. The total sediment load carried by the river is estimated to be 340,000 tons annually.

c. Aquatic Vegetation and Animals. During previous tri-state fishery studies within the affected reach of the river, larval stages of several insect families were collected. Three sampling stations were located in this river reach and samples obtained indicated a common to an abundant population of mayflies, two-winged flies, caddisflies and other fish food. Round worms were collected at one sampling station but were not detected at other stations. The study revealed a common occurrence of such aquatic vegetation as Cladophora and a less frequent occurrence of Oedogonium between Matamoras and Bushkill, Pennsylvania. Hydrodictyon and Spirogyra were encountered in small quantities. Vascular plants collected during the study included small amounts of eelgrass and water star-grass in shallow water areas. Six species of aquatic plants were found: (1) Elodea (waterweed or ditchmoss), (2) Pontederia (pickereelweed), (3) Vallisneria (eelgrass or wild celery), (4) Ranunculus (crowfoot), (5) Lemna (duckweed), (6) Sagittaria (arrowweed). Ditchmoss was found in abundance.

d. Fishery. The Delaware River and Bay support a commercial and sport fishery. The less desirable catfish are also present. A sport fishery for shad and for resident fish, such as smallmouth bass, walleye, sunfish and trout, exists in the Delaware and tributary streams within the project boundary, principally in the Bushkill in Pennsylvania, Flat Brook in New Jersey, and Neversink River in New York. The sport fishery also extends a considerable distance upstream of Port Jervis, New York, and 70 miles downstream of the damsite. Anadromous and catadromous fishery resources would improve without the project as a result of expected pollution abatement programs in the upper estuary of the Delaware River. Stream fish production would increase without the project from increasing nutrient input to the river and possibly from correction of undesirable fluctuations in streamflow and temperature now imposed by existing upstream reservoir operations. Sport fishery use of resident fish of the affected sections of the Delaware is forecast at 290,000 man-days annually under without-project conditions. This use is about equally divided between the more than 100 miles above the damsite and the 70 miles from Tocks Island downstream to Trenton.



A minor sport as well as a commercial fishery for the catadromous American eel also exists in New York.

Estimated sport fishery usage (fisherman days) as determined by the U. S. Fish and Wildlife Service and the basin's State fish agencies is given in table 2-4.

Delaware River and Bay also support a commercial fishery, in order of declining value, for oysters, shad and eel. The oyster industry is primarily dependent upon oyster planting grounds situated in the Maurice River cove area of the bay and oyster seed beds located just upstream of the planting grounds along the New Jersey shore. The oyster industry of Delaware Bay which has been diminished by developments on Delaware River would support a potential annual harvest estimated at 1.5 million bushels without the project. In 1968, only about 2,500 acres of seed beds were productive. Oysters live, grow and propagate within a salinity range of 5 to 32 parts per thousand. Oyster beds are also adversely affected by fluctuation in salinity of a 15 parts/1000 increase or by an 8 part/1000 decrease from the norm. Oyster production in recent years has been drastically curtailed by invasion of the oyster drill, a predaceous snail, and outbreaks of a parasitic oyster disease (MSX) within the seed beds. The oyster drill and MSX protozoa can exist only in salinity ranges which exceed 15 parts per thousand. Reduced fresh water inflows to the bay during low flow or drought conditions cause the drill line to move upstream from its normal location at Ship John Light and invade the remaining oyster seed beds. Oyster production in New Jersey has ranged from a high of 2.5 million bushels in 1929 to a low, partially attributable to basin drought conditions, of about 95,000 bushels in 1966. Presently studies are being carried forth at Federal, State and local levels to assist the oyster industry to develop a strain of "super" oysters, which would resist primary predators, through expansion and improvement of existing seed beds and improved management methods.

Historically, the American shad is reported to have mainly spawned in the river reaches between the damsite and Trenton. In recent years the pollution block below Trenton appears to have caused selection for the shad races that spawn in the East Branch and other waters upstream from Tocks Island. This is because the young of these races migrate past the polluted area after the oxygen depletion is abated in the fall while the young downstream races, migrating earlier, were killed by the oxygen block. Stream temperature and dissolved oxygen content of the river play an important role in shad migrations. Shad do not normally begin upstream migrations until water temperatures reach 42° F around March or April in Delaware Bay. Adult shad spawn during late May or early June in swift shallow waters above the Delaware Water Gap and return to the ocean. Young shad live in the upper nursery areas of the river during the summer and begin a downstream migration to the sea in early fall, generally when water temperatures dip below 50° F. At maturity, female and male shad return to the river of their birth to spawn.



Unlike other shad, the Delaware shad survive the rigors of spawning. Studies indicate adult shad and young shad require dissolved oxygen concentrations of at least 2 mg/l and 3 to 3.5 mg/l, respectively. Due to the pollution block (described in Section 2-1-e) containing low dissolved oxygen concentrations in the upper estuary during mid-summer, the adult shad returning to the sea in July normally cannot survive. 1/ Continuation of the shad fishery is generally dependent on the successful downstream migrations of young shad in early fall when water quality conditions are somewhat improved. It is believed that the summer pollution block existing in the estuary has effected the present decline of the shad fishery.

Commercial production levels of the shad fishery have declined from a high of 19 million pounds in 1896 to a low of 76,000 pounds in 1954. Since 1920 the commercial harvest of shad in Delaware River and Bay has averaged 255,000 pounds. Adoption and enforcement of water quality standards by the Delaware River Basin Commission and by the basin States are expected to improve stream conditions and thus revive the shad fishery. The U. S. Fish and Wildlife Service is undertaking a comprehensive study in cooperation with the basin States to determine means of preserving and enhancing the Delaware River shad fishery. The magnitudes of the shad and eel runs are not documented by actual counts or even by population estimates based on tagging. However, the evidence from historical commercial landings, fishermen creel censuses, and other observations of fish, fishing use, and habitat conditions indicate that the runs are substantial and have high potential for increase in numbers. The estimated average annual runs of American shad at Tocks Island without the project are forecast at 500,000. Sport fishing for shad is estimated at 125,000 days per year and the commercial catch at 275,000 pounds per year. Estimated average annual run of American eel is 10,000. Harvest of eels is unknown but is not considered significant.

The estimated annual potential commercial usage of the Delaware fishery within the influence zone of the project as determined by the U. S. Fish and Wildlife Service and the basin's State fish agencies is summarized in table 2-4.

dl. Marine Fishes. The portion of the Delaware River Basin in which marine finfish and shellfish are found, at least during part of their life cycles, include the river, some of its tributaries, and the estuary. That part of the estuary - diluted sea water - within the ocean consists of a 2,000 to 3,000 square mile coastal area outside and mostly south of the entrance to Delaware Bay, roughly, to the 100-fathom contour and Chincoteague Inlet, Virginia.

In the intertidal zone of the beaches all along the bay-shore, are more rich areas that are productive of baitfish such as anchovy and fillifish. Abundant here, too, are the young of valuable species that find food and refuge here during the first

---

1/ A pollution abatement program, which will alleviate this block, is underway.



critical year of life - such as young bluefish, striped bass, weakfish, flounder, croaker, menhaden, mullet, silver perch, kingfish, black drum and spot.

This geographical area, constituting the Delaware Bay Subbasin, supports coastal fisheries which are among the most productive in North America and, perhaps, in the world. It is the geographical center of distribution of migratory fish stocks ranging between Cape Cod and Cape Hatteras, and it is considered the southern range limit of northern marine species and the northern limits of southern species inhabiting the eastern coastal waters of the United States. More than 200 finfish species alone are known to inhabit the subbasin.

The marine finfish and shellfish of the area have high commercial value. During a recent 6-year period 1951-56, the general trends in total tonnage of fish landed in New Jersey and Delaware has risen from approximately 412 million pounds in 1951 to 890 million pounds in 1956, although the annual rate of increase has not been constant. In 1955, fifty species of finfish and twelve species of shellfish were included in the total commercial catch. These included the following 6 species of finfish and 6 of shellfish, listed in descending order by size of catch: menhaden, porgy, fluke, sea trout, sea bass, and croaker; eastern oyster, surf clam, blue crab, hard clam, sea scallops, and lobsters.

The high regard for the recreational value of the marine fisheries of the area is supported by the approximately 130,000 salt water sport fishermen who devote some 900,000 man-days to fishing within the Delaware Bay Subbasin each year. These persons are mostly fin fishermen but large, though uncounted, numbers of individuals also engage in non-commercial clamming and crabbing. The 6 finfish species which account for the largest annual harvests by sport fishermen are (in descending order): bluefish, porgy, weakfish, fluke, sea bass and croaker.

d2. Anadromous and Catadromous Fishes. Certain of the fish species often treated for convenience as fresh, warm-water and/or marine fishes, are more properly designated from a physiological and ecological standpoint as anadromous or catadromous.

The anadromous fishes, whose most common representative species in the Delaware River Basin are shad, herring (alewife), striped bass, and white perch, live much of their life cycles in salt water and ascend fresh-water streams to spawn. The abundance of these fishes, including the principal species which is shad, has declined drastically in the fresh-water streams of the basin over a period of several decades to the present, insignificant, low level. These fresh-water streams include the Delaware River and its tributaries primarily, together with streams emptying directly into Delaware Bay.



Catadromous fishes live much of their life cycles in fresh-water and descend to the ocean to spawn. The eel is the only species in this category within the basin. Its numbers, in the same fresh-water streams of the basin once harboring an abundance of anadromous fishes, have also declined drastically within recent decades.

Although the eel is still of commercial value in the basin, largely in the upland region, the size of the catch is only a fraction of what it was formerly.

e. Geology and Soils. The project area is characterized by glacial drift and stream alluvium which covers much of the exposed bedrock. The bedrock structure has influenced the human occupancy and economy of the region through the occurrence of such mineral resources as copper, limestone, flint or chert, and flagstone; however, it has been the soil overburden materials which have contributed significantly to the area's growth and development. Abundant quantities of sand and gravel exist in the glacial debris, but they have never been commercially exploited because of lack of profitable local markets. The flood plain and alluvial soils occurring along the banks of the river are young and fertile and have long been utilized for agricultural purposes. In the uplands, soils are thin and rocky, making farming difficult, however, they lend to forest growth. The glacial cover is a major source of groundwater and supplies good quality water to a large number of wells throughout the valley. Springs along the flank of the valley are a local source of potable water. With the exception of a few unusual cases these springs diminish or disappear during drought periods.

f. Vegetative Cover. The project area is characterized by three primary ranked bands of plant species which generally parallel the river and are dictated by elevation changes and soil conditions. These are river bottom, open-field flatland and steep sloped mountains. There are numerous blendings and extended transitions between plant communities resulting from occasional sedimentary flatland pockets and deep cut gorges. The river bottom species generally consist of birch, sycamore, silver maple and American elm. The higher flatland above this zone is generally devoid of trees. Forestation surrounding working farmland is a transitional blending of high level river bottom species such as aspen, birch, maple, sycamore and elm, coupled with intrusions of species from the steep-sloped mountain community including oak, maple, ash, linden and poplar. Where the flatlands have been withdrawn from farming, natural reforestation of easily self-propagating species has occurred. That community is represented by species consisting generally of the red cedar, aspen, birch, ash and poplar. The steep-slope mountain species consist generally of mixed hardwood and coniferous species such as white, red and chestnut oak, hickory, red maple, linden, ash, sycamore, white pine and hemlock. The river bottom community extends nearly unbroken on both banks of the project reach and on the islands in



the river. The open field flatland plant community encompasses about 40 percent of the land bordering the river. The steep-sloped mountain plant community covers about 85 percent of the uplands and mountain sides.

g. Wildlife. The State of New Jersey has three principal holdings in or near the lake project. Worthington State Forest, near the damsite, contains 6,200 acres of land. Stokes State Forest and High Point State Park occupy the eastern slope of Kitatinny Mountain near the northern limit of the project area. Lands of the latter two holdings are open to public hunting. Three tracts of State game management lands totaling 2,623 acres are located along the Flat Brook arm of the Delaware. These tracts are the Haney's Mill, Flat Brook and Ro Public Shooting Grounds, portions of which lie within the project area. In Pennsylvania, the Childs State Park in Dingmans Gorge lies just beyond the project boundary. The area contains game indigenous to northern Pennsylvania and New Jersey; the habitat is best suited to forest game species. Important feeding areas for deer are the cultivated and fallow agricultural lands and other river bottom habitat. Deer population densities are high and an overbrowsing problem exists within the area. They are intensively hunted. Ruffed grouse and woodcock are common within the area and are the next most hunted species after deer. Natural reproduction of pheasant is low in the area, however, and hunting opportunities are provided on State game land through a stocking program. Wild turkeys and black bear are infrequently encountered on wooded slopes in Pennsylvania. The river and tributaries provide nesting habitat for mallard, black duck, wood duck and merganser. Waterfowl use of the river has declined in recent years; however, waterfowl hunting activity is comparable to that sustained for ruffed grouse and woodcock. Fur animals abound in the area and include muskrat, mink, skunk, raccoon, and red and gray foxes. Foxes, raccoon, squirrel, and opossum are also hunted. Posting against hunter trespass is prevalent in the area and is expected to increase in the future. Large tracts of land are under lease to sportsmen's clubs and other groups. Wildlife habitat within the project area also supports wildlife which inhabits the surrounding Delaware Water Gap National Recreation Area lands and vice versa. The estimated average annual use (hunter-days) of the combined project lands over the project life is indicated in table 2-5.

h. Land Use. The project area contains an average of only one major improvement for every 15 acres. By far the major portion of its land is in an unimproved state, much of it abandoned farmland. The majority of the cleared land has been left uncultivated. Year-round residences are about equal in number to summer-only residences. The present use of the project lands can be considered as interim, since the area is gradually being converted from farming to summer and permanent residential use.



At present, their highest and best uses would be classed as recreational, residential, commercial and farmland. Less than five percent of the river shoreline in this reach is open to public access. A significant land speculation activity has been underway ever since the project was authorized. Near the damsite there is presently in operation the Yards Creek pumped storage development. This power development, located on the southerly side of Kittatinny Mountain, was completed and in operation since 1965. Two pools are associated with this project. The Yards Creek Upper Reservoir constructed atop Kittatinny Mountain and Yards Creek Lower Reservoir situated below it on Yards Creek.

i. Archaeological and Historical. A total of 67 buildings within the project area have been determined to have significant regional historic value. 1/ Old Mine Road, considered to be the oldest road of substantial length in the United States, runs north and south along the New Jersey side of the river. It was built in the 1950's by Dutch settlers to transfer copper ore from the mines in Pahaquarry Mountains to Esopus, New York. The present highway is hard-surfaced and generally follows the route of the original road.

Field surveys and archaeological excavations have indicated that most major cultural epochs are present in the project area. Evidence of man ranging from Paleo-Indian times to the historic period has been observed. Most fields yield some traces of Indian occupation. Many sites have been destroyed by natural forces of erosion and flooding, as well as building, farming and soil removal operations. Ceramic, bone, metal and chipped stone artifacts have been collected.

---

1/ Refer to the Environmental Impact Statement for the DWGNRA prepared by the National Park Service for a more extensive discussion of this topic.



### 3. Environmental Impacts of the Proposed Action.

a. Physical Changes Caused by the Project. Development of the Tocks Island Project will produce substantive changes in the existing physical conditions at and around the project site. Certain changes will be associated with construction activities and thus temporary, while others are associated with the facilities constructed and/or their operation and consequently are permanent. The physical changes are identified in this section and/or their effects and significance discussed in the following paragraphs.

(1) Temporary Changes. The temporary changes associated with construction will be localized to the actual areas of construction and, in those areas, change the setting from one of rural tranquility to one of relatively heavy activity. Such changes include the increased noise levels produced by construction operations, dust generated by construction activities, and hydrocarbon emissions from construction equipment. Mud and silt materials will be generated in large areas to be stripped of vegetative covers for open borrow pits. Local water table levels will be changed temporarily due to construction activity. Social factors include the increase in population from introduction of transient work force. Other changes include local and state police activity - surveillance, protection, and investigation due to increased population. Fire protection will also be required. There will be changes in traffic patterns due to closure and detours, and increased demands on utility systems - telephone, electrical, gas, water and sewerage. Lastly, the course of the river will be altered with some wildlife displaced.

(2) Permanent Changes. The permanent changes created by the construction are in two classes. The first category includes those changes arising from the facilities proper, and the second category considers the changes caused by facility operations. The changes caused by construction of the facilities themselves in the project area involve introduction of a dam, outlet works, spillway, powerhouse, switchyard, fish passage facility and operational structures. In addition to recreation facilities in other areas, flood protection barriers and pumping stations in the Port Jervis, New York - Matamoras, Pa. area will be introduced. Other developments involve relocation of roads, utilities, cemeteries and structures, bank stabilization measures, and the inundation of some areas of historical or archaeological interest. The changes caused by the operation of the facilities constructed in the project area are attributable to the creation of a 37 mile long lake and its operation for the purposes of producing water supply, flood control, power and recreation benefits. These changes pertain to the river environment upstream of the lake, to the lake area proper, or to the river downstream of the lake. Occurring upstream of the lake are changes in available shad spawning grounds and resident fish habitat; the alteration of the water table in the Port Jervis, N.Y. -



Matamoras, Pa. area, and operation of pumping facilities behind the levees. Changes in the lake area proper are the transformation of a free-flowing river environment to that of a lake environment with a fluctuating pool level, with increases in shore line length and water area, and alterations in water table elevations in the project area. A change in land utilization from primarily private agricultural, resident and recreation purposes to public use for recreation, water supply, power generation and flood control will also occur. Introduction of a large transient population into the area for recreation purposes implies solid and liquid waste disposal requirements, and hydrocarbon emissions from vehicles. Also, there will be changes in policing requirements, local road and utility use, accompanied by increases in economic activity, and demand of local flood outlets, and housing accommodations. In time, introduction of a permanent work force to maintain and operate the facilities constructed will give rise to similar demands.

Physical changes in the river downstream of the lake include more uniform flow pattern, and alteration of water quality, as well as marine life regimen. The downstream flood hazard will be reduced and recreational boating opportunities enhanced.

b. Effects of These Physical Changes. The changes outlined in the preceding paragraph will have effects of varying significance as discussed in the sequel.

(1) Construction. Initial environmental impacts arise from construction operations. Increased noise levels attendant to construction operations will not affect many persons other than the men actually engaged in construction owing to the remoteness of most of the construction sites.<sup>1/</sup> The work force will vary, peaking at a population of about 1,000 persons. The resident population, within 25 miles of the construction sites, is about 825,000 persons. The percentage increase in population by introduction of work force entirely from outside a 25 mile distance from the construction would not add significantly to the population within travelling distance of the construction. However, it is very unlikely that all of the work force will be non-local.

The solid and liquid wastes generated by the work force will be treated and disposed of in consonance with applicable sanitary standards and hence will have no environmental impact. The obligation to perform that disposal will be a contractual requirement. In view of the insignificant increase in population brought about by the work force, the impact on the transportation system during construction in the area will also be insignificant. The increased utilization of housing and catering facilities will lead to greater economic activity in the area. The impact on the economic environment will be beneficial.

<sup>1/</sup> Currently, the Congress is considering legislation which would limit the noise limits of construction equipment, any such limits set by law will apply to the Tocks Island construction.



Dust is usually generated by construction activities; the amount of dust generated is governed by the dust control techniques employed. Dust control measures will be a contractual obligation of the construction contractor. What dust is generated by the contractor will not have a significant environment impact.

Hydrocarbon emissions 1/ generated by construction equipment will have a somewhat adverse localized effect on the environment.

All construction work involving earthwork generates mud and silt materials. Such materials achieve environmental significance when introduced into a water course in quantities greater than that water course can assimilate without unacceptable increases in turbidity. The largest potential mud and silt generating operation is dredging for the placement of the dam foundation. In order to overcome this problem, dredged materials and the water associated with them will be placed in a confined settling basin of a size which would permit a settling period of sufficient duration to produce an effluent of low enough mud and silt material content to be environmentally acceptable. The foregoing dredging procedure will be a construction contract obligation. In addition, the construction contractor will be obligated to conduct all of his operations in such a manner that no discharge into any waterway will contain mud and silt in quantities to be significantly detrimental.

Almost all construction projects produce natural materials which must be wasted. The wasted materials are native to the region and will have no long-term toxic effect on the environment. During construction clearing operations, materials will be temporarily located and placed about with very little net or permanent effect on the aesthetic environment.

Construction operations will require that some local roads be closed. Real estate acquisition and relocation of many residents will occur prior to the initiation of any construction so that the impact on the local transportation system will be negligible. Increases in the utility load (telephone, electric, gas, etc.) by the work force will be negligible as these people will represent such a small percentage of the population in a 25 mile radius area. Increases in local and state police and fire protection activities to serve the work population will be required. Since the local resident population will have been relocated prior to start of construction, the local police and fire service will not have to be increased above the current levels.

---

1/ The number of pieces of construction equipment required and the remoteness of the construction sites from manufacturing plants and heavy traffic indicate that the environmental impact of emissions will be minimal. Most of the construction will take place after emission control standards legislated by the Congress are effective, and after that time legal hydrocarbon emissions will have no environmental significance.



Currently stretches of Delaware River and its banks are used for public and private recreation purposes. Some of those areas will be removed from recreation usage to permit construction. There are considerable numbers of persons who consider viewing construction activities as recreation. "Overlooks" to view construction will be provided for the public. The net result on the recreation environment will be a change in the type recreation available in the areas of construction. During construction, the course of the river will be changed and the river finally closed. River water will be delivered downstream through a diversion tunnel. There will be occasional ponding at the upstream end of the tunnel as the flow finally becomes less than the flow of the river at higher stages. The construction of the earthwork of the dam will cause a constriction of the river channel and consequent higher flow velocities.\* Those higher velocities could be a possible impediment to passage of migratory fish and migrations of resident fish. In order to obviate that possibility a series of "resting pools" will be created in the constricted channel.

After diversion of the river, unimpeded fish passage will be possible. Temporary measures will be utilized to provide fish passage, until permanent fish passage facilities are completed. In the event that the temporary measures fail to maintain adequate fish populations, fish management techniques such as stocking and creation of new hatchery areas will be employed. The creation of the temporary pond will not cause any significant environmental impact although some of the areas which will be used for construction are currently utilized for wildlife habitat. In order to avoid this loss, wildlife mitigation lands will be purchased and put into service prior to initiation of construction. Construction will require that large areas of ground be stripped of vegetative cover. The areas so stripped will, in the case where they are not inundated as permanent lake area, be landscaped and vegetative cover re-established. Construction of the dam will require use of large borrow pits. Many of those pits will be inundated by the permanent lake. In the cases where they are not inundated, the ground will be restored. In contrast to this, the left abutment of the dam (on New Jersey side) will require excavation to a considerable depth. The seepage of ground water through that excavation will lower the ground water table in this immediate area. The lowering will be temporary, and the ground water table will return to pre-project elevation when the construction is completed. The lowering of the ground water table will not create an adverse environmental impact.

(2) Project Facilities. Emplacement of the facilities changes the land utilization in the areas occupied. The facilities do not occupy a significant percentage of the total project lands and hence their impact from a land utilization viewpoint is negligible. Following is a discussion of other effects on the constructed facilities.

---

\*This work will be coordinated with the Fish and Wildlife Service.



The dam, outlet works, spillway, powerhouse, switchyard, fish passage facilities and operational structures will change the aesthetic environment of the existing valley in the area. This change will be considered offensive by some persons but attractive by others. As at other similar installations, an overlook will be provided at this site to allow one to view the constructed works.

The attractiveness of the facilities and adjoining area will be enhanced by applying a unified architectural theme to all structures and performing extensive landscaping. The excavation of the left abutment for the dam will expose a long uninterrupted rock face, which will detract from the otherwise attractive setting. Suitable landscape treatment for that rock face is being studied for incorporation into the construction.

Construction of the recreation facilities will be in consonance with an attractive architectural theme for these facilities in attractively landscaped areas. The resultant change in land use is thus minor.

Flood protection barriers and pumping stations will be installed in the Port Jervis, N.Y. - Matamoras, Pa., area to obviate the effects of backwater from reservoir operation. These barriers will partially block the view of the river now available to some adjacent residents in both Port Jervis and Matamoras. Although the walls streamline the appearance of the waterfront in both towns, there results a net adverse impact on the aesthetic environment. Pumping stations will be inside the floodwalls. The structures will receive architectural treatment and the areas around them will be landscaped. Relocated roads, utilities, cemeteries and structures will not increase the quantities of those items in the area but only alter their location. The relocated items will not cause any environmental impact over that now existing, except for the acquisition of additional land for these purposes. During the course of construction some sites of limited archeological significance will be destroyed. Artifacts and other items of interest will be removed from those sites and put on annotated display in public recreation areas. The impact of the archaeological environment will not be significant. In the area of Milford, Pa., there are structures located atop a high, steep bluff. Reservoir wave action could cause the base of that bluff to erode. The base of the bluff will be protected with stone for scour protection. There will be no significant environmental impacts arising from provision of that protection.

(3) Project Operation Effects. Realization of project purposes as made possible by creation and operation of a lake involves changing the project area from a river type to a lake type environment. Comparison of the quality of the environment of the Delaware River with Tocks Island Lake to the quality of the river without the lake represents the environmental impact of the project. The effects of lake creation include environmental changes upstream of the lake, a small but significant



fishery improvement in resident fish, along with some decrease in shad fishery and spawning activities. Ground water elevations will be altered in scattered locations in the Port Jervis, N.Y. - Matamoras, Pa. area and the fluctuating lake pool level produces alternate exposure and submergence of lands in some areas.

Introduction of a large recreation population and operating forces will have a pronounced effect on the area with respect to: the liquid and solid wastes generated by those persons, required roads and utilities. The density of land utilization for recreation will increase. Regional aesthetics are compromised inasmuch as what was a relatively isolated recreation area will become more intensely used. The fishery in the lake will be improved over existing conditions; and there will be no net quantitative change and the wildlife in the area will be enhanced. Present agriculture and housing will be deleted from land utilization. However, the current trend without the project has been to convert the land use to recreation. This has been accomplished by commercial developers with, in many cases, scant regard for environmental degradation. The planned recreation of the project is compatible with the environment. The elevation of the water table in the vicinity of the project will be raised; generally this is a favorable effect.

Other indirect effects can be attributed to project operations. Generally project purposes of flood control, water supply, hydropower and recreation will be served. Development of the Delaware Water Gap National Recreation Area (DWGNRA) and the proposed additional pumped storage power facilities at this site are enhanced by the lake development. Savings will accrue to users of conventional hydropower produced at the project. Project development and visitation will accelerate economic, social and political changes in adjacent communities while the river's flood plain as protected by the project will undergo change in land use. Accelerated population growth in surrounding communities, will create a need for more public services (highways, schools, hospitals, utilities, etc.). Tocks Island Lake and attendant recreational facility development will attract intensive visitation from surrounding urban and suburban areas while partially satisfying open space needs of the adjacent three State area. Present overuse of recreational facilities at area State parks will also be decreased. Scenic, historic, scientific and cultural artifacts extant in areas which would otherwise have been lost to private development or enjoyed only for a few private interests, will be preserved and made available to the public. Thirty-seven miles of existing river, the majority of which previously was available only for private use, also will be available to the public for recreational activity. Extensive visitation attracted to the project area and adjacent communities will increase solid and liquid waste loads existing in the area. Minor increases in noise and air pollution will also result from project development.



Creation of lake and development of recreation areas will affect wildlife environment and create a need for acquisition of supplemental wildlife lands. In this way wildlife habitat within the project area which would otherwise have been lost to encroaching private development will be preserved. In addition the lake and fluctuating lake levels will affect standing fish crop, fish spawning grounds, environment (plant growth, the food chain) for resident and migratory fish. Change in stream regimen due to project development will retard upstream intrusion of the 250 ppm isochlor during drought periods thus protecting affected river reaches as a source of potable water supply. The nutrient concentration profile within river reaches affected by project development will be altered. This affects present and future Delaware Bay oyster industry. Maintenance of high minimum river flows will mitigate adverse water quality conditions in downstream reaches, previously experienced during periods of drought. The lake and altered stream regimen will affect vegetative cover adjacent to the new lake shoreline. Plant growth may be enhanced within the reservoir area and retarded downstream due to change in river flow nutrient concentrations. The lake surface will offer resting areas to migratory birds on the North American (or Pan Am) Flyway.

c. Analysis of the Environmental Impacts Stemming from Physical Changes Caused by the Project.

The preceding paragraphs of this section have identified the physical changes and associated effects occasioned by the project which have significant impact upon the environment. As these impacts can best be analyzed in terms of their direct and indirect effects, they are treated below on that basis.

(1) Construction Activities. Construction operations attendant to the project will disrupt the landscape, necessitate clearing of some forested areas and produce intermittent muddy haul roads and stream turbidity. These effects are of short-term character lasting less than a decade. With the exception of the major relocation of U. S. 209 highway, the principal effects will be confined to the immediate area near the damsite and the Port Jervis and Matamoras areas. An overriding consideration is that actual building operations and procedures are within the scope of the construction contract specifications and thus subject to close control by the developing agency. Tocks Island project planning has anticipated the diverse potential sources of environmental degradation and applicable contractual specifications will be enforced to control pollution to the maximum extent practicable. Contractor performance will involve full compliance with detailed environmental protection specifications. In particular, prior to commencement of the work, the contractor will submit in writing for approval his detailed proposals for implementing environmental pollution control.



The relocated U. S. Route 209 highway will include four bridges over Bushkill, Little Bushkill, Dingmans Creek and Adams Creek varying in height from 100 to 250 feet above stream beds. Large culverts and other crossings over minor streams will be provided in order to afford the best possible stream conditions and to preserve the existing environment in its present state as nearly as possible. During construction, the contractors will be required to avoid contamination of the streams traversed and to prevent erosion. Borrow material for construction at the dam-site will be taken from lands within the area of lake inundation. Restorative landscaping will be provided to blend new construction into the surrounding landscape. The adverse aesthetic effect caused by the dam, appurtenant structures, and excavation will be minimized by architectural treatment of exposed structural features and implementation of an appropriate landscape architectural plan for treatment of construction scars.

(2) Dam Embankment. The presence of the dam embankment will alter the loading on the underlying soils. This artificial land form represents a small superimposed load safely accommodated by the design location of the dam axis. Specific geological considerations arose from the dam proper.

(a) Earthquake Considerations. The damsite centerline is 100 feet downstream of the lower end of Tocks Island. Refer to figure 1. Investigations made in selecting this site necessitated field reconnaissance and topographic study, geophysical surveys, extensive borings and laboratory tests of soil samples. Extensive drilling and testing was concentrated in a 3000-foot reach between Tocks Island and Labar Island to determine the precise location where foundation conditions were best. At the selected location, the silt and clay portion of the foundation is more favorably situated than at any other location within the reach. On this basis, the site was selected as most favorable for the dam.

The location of Tocks Island Dam is in Seismic Damage Zone 1, as shown on the seismic risk map recently developed by Environmental Science Service Administration and Coast and Geodetic Survey.<sup>1/</sup> The assignment of Zone 1 to the Tocks Island area is based on records of comparatively recent earthquake shocks occurring throughout North America.

---

<sup>1/</sup> This map is used as a guide for the determination of earthquake loading in the structural design of hydraulic structures. The scale goes from Zone 0 (no damage) to Zone 3 (major damage). The map is a revised edition of an earlier one, which was included in the Uniform Building Code, International Conference of Building Officials, 1961, Zone 1 is described as "minor damage such that a distant earthquake may cause damage to structures with fundamental periods greater than 1.0 seconds." This corresponds to intensities V and VI of the Modified Mercalli intensity scale of 1931.



The incidence of earthquake generated hazards, such as embankment damage, subsidence, landslides in the structural and reservoir areas (with possible generation of destructive waves in the lake), and loss of reservoir water into subterranean fissures is adjudged to be minimal based on past history of areal seismic activity and probability of occurrence during the life of the project. However, the design of the dam is based on much more severe earthquake effects that would normally be used for a structure in Zone 1. Since the behavior of the silt and clay foundation to earthquake loadings could not be determined with complete assurance, severe conservative assumptions were made regarding the soil behavior and the dam designed to provide safety for these conditions.

At the New Jersey or left abutment of the dam an extensive rock cut is necessitated to establish proper foundation conditions for both the dam and spillway. This exposed rock en masse constitute a decided visual impact to the observer and for this reason is discussed more fully in Section 4.

Viewed as an obstruction the dam will interrupt the free migration of anadromous and catadromous fish. The fish life will be profoundly affected. Species which require migration upstream in their life cycle, finding their path blocked by dams may have their spawning and migration interrupted. Provision of a phased fish passage facilities program, including a fishway, will circumvent this deleterious effect.

(b) Fishery for Migratory Species. The project will have an effect on the American shad, American eel and other fish which migrate past the dam site to spawn or grow up in upstream waters. The potential of the Delaware River for shad production can be largely realized under project conditions with abatement of pollution in the 40 or 50 miles of river that; under present conditions, is seasonally devoid of oxygen around Philadelphia.

Blockage of migratory fish by the dam can be mitigated by proper installation and operation of fish facilities, although reduction in fish numbers and related values cannot be entirely avoided. Fish passage will be required both during and subsequent to construction if losses to the dependent fisheries are to be acceptably mitigated. Hatchery propagation of the shad is possible but it would not provide an upstream sport fishery if it were used as an alternative to a fishway and downstream migrant facilities at the dam.

A fishway will help to assure preservation of the gene pool of the upstream races against future habitat losses downstream.



A complication to shad production concerns the ability and inclination of the migrant fish, both adults and young, to transit the stilled waters of the reservoir and reach their necessary destinations upstream and downstream. Evidence of several comparable situations indicates they will, but it is not fully conclusive.

The Fish and Wildlife Service estimates the sport fish harvest at 125,000 man-days without the project, which the commercial catch projected at only 275,000 pounds annually. The Service also estimates that there will be a loss of 11,000 of the 35,000 man-days of shad sport fishing estimated to occur in the reservoir site without the project. The remaining 25,000 man-days of shad fishing at the site is expected to be transferred to the river probably above the reservoir but possibly below the dam. The loss to the commercial shad fishery dependent on the spawning area occupied by the site is estimated at 25,000 pounds annually.

Overall, the impact of the project complex on migratory fish resources, assuming all necessary fish facilities are installed and operated effectively, is forecast to somewhat reduce the shad harvest, particularly the sport fishing in the reservoir site and the commercial harvest, but the eel resource is expected to be maintained at without-project levels.

Land use downstream of the dam will intensify due to greater assurance of flood protection and controlled river flows.

d. Creation of a Lake. Impoundment of waters behind the Tocks Island Dam will cause the replacement of a gently flowing stream of average 10 foot depth and 500 foot width with a 37 mile long lake of average 1/2 mile width and a depth which varies from 110 feet at the dam to 10 feet at the upstream limit of the lake. The lake waters will permanently inundate 10,000 acres of land in addition to the 2,525 acres now covered by the existing stream and, infrequently, would affect an additional 6,000 acres of land during temporary storage of flood waters.

(1) Eutrophication. One of the paramount environmental problems associated with the newly created impoundment will be control of eutrophication. In its natural state the Delaware is an enriched cool and reasonably well shaded flowing river. When the flow is obstructed by the dam at time of closure the entire ecosystem will be disrupted. After the initial traumatic change on the system, a modified ecosystem will develop. The new system within the lake will be characterized by warmer water, reduced flow velocities, and additional shallow water along the lake periphery. In the new lake there will be a tendency for the soluble nutrients to be utilized by higher aquatic plants or by algae. These in turn may die, sink to the bottom and contribute to the organic build-up and consequent BOD.



The nutrient utilization can follow two paths. Some of the nutrient will stimulate both floating plants and submerged plants. Alternatively the nutrients may be used in the production of algae. Rapid growth of algae produces an algae bloom characteristic of eutrophication conditions and appears on the water surface. Dead and dying algae blooms can be extremely odoriferous, and after sinking to the bottom, deplete the dissolved oxygen in the lake waters.

Both plants and algae may occur simultaneously in different reaches of the lake. The lowered oxygen content associated with high organic matter under such conditions further defines the environmental conditions for fish and for water based recreation purposes. The operation and maintenance features of the water management programs for the lake will consider this natural phenomenon. In particular regulation of detention time will greatly reduce the reaction time in which the nutrients can express themselves in the form of eutrophication. One possible maintenance program will involve both chemical and mechanical elimination of water plants. It is recognized also that careful control of outfalls in tributary waters can effectively inhibit eutrophication.

The effect that the impoundment will have on nutrients passing downstream is not fully understood. Currently the Delaware River Basin Commission, working with the U. S. Geological Survey, is collecting data on existing nutrients in the upper Delaware to assess extant eutrophication activity in the stream. Moreover, the nutrient content of water passing downstream at a given time can be influenced by selecting discharges from that level of the lake with the most appropriate nutrient content.

As discussed above, eutrophication merely means plant growth, and plant growth in the lake will not render the water unfit for water supply. Modern water filtration works easily remove the microscopic plants -- algae -- that grow in all surface water bodies. Many -- probably most -- water works using surface water take their raw water from sources more eutrophic than Tocks Island Lake will be. The residual adverse effects of eutrophication are addressed in Section 4.

(2) Wildlife with the Project. Clearly the wildlife habitat and non-mobile wildlife of the lake pool areas will be eliminated; however, trends of land use now underway indicate that much of these losses would occur without the project not only in the main lake area but additionally in the National Recreation Area. At the Bureau of Fish & Wildlife recommendation, the Corps of Engineers has agreed that 880 acres of land will be acquired to mitigate losses of terrestrial wildlife and related public uses which would otherwise total 2,700 man-days of hunting and 1,650 man-days of other uses. It is expected that about 450 acres of these lands will be in Pennsylvania and 430 acres in New Jersey. If feasible, the lands selected will be located adjoining nearby State wildlife



management areas. In addition, preservation and conservation of the natural environment on the 41,000 acres planned for little or minimum development is expected to largely compensate for the wildlife losses on other lands to be intensively developed and the pool areas which total about 20,000 acres.

Some farm game habitat, particularly for doves and pheasants and much of the marsh and river edge wetland habitat will be lost within the lake area. However, comparable but smaller habitat losses would also occur without the project as a result of different but similarly degrading changes in land use.

Forest game habitat will permanently increase over time on the natural areas of the national recreation area and thus offset losses in the remaining areas of the complex (intensive use areas).

Waterfowl are expected to use the lake pool at least as intensively as they now use the river surface. Although river edge habitat will be lost as noted above, waterfowl nesting on lakes, ponds, and marshes of tributary streams included in the National recreation area will probably increase and be more successful as a result of more conservation-oriented management, less poaching and other human disturbances, and elimination of grazing and other interfering uses. Fur animals also will increase around the lakes, ponds, and marshes of the recreation area for the same reasons. In addition some of the ponds and lake will be managed to improve fishing opportunities.

No rare or endangered species will be threatened by project development, and goals of the National recreation area plan favor such species. Completion of the National recreation area plans are expected to restore and improve wildlife habitat conditions so that some species previously displaced or endangered may return through migration or introduction.

At elevation 410 the permanent 12,525 acre lake will inundate approximately 10,000 acres of land, portions of which contain primary terrestrial wildlife habitat. Portions of 6,000 acres of land adjoining the lake would be periodically inundated during flood control operations and would adversely affect wildlife habitat. The carrying capacity on ranges adjacent to the lake would also be reduced, since wildlife habitat within the project area also supports wildlife which inhabits the surrounding Delaware Water Gap National Recreation Area and vice versa. The lake would effect an additional estimated annual loss of 660 hunter-days of deer hunting and a minor loss of small game hunting. Increased development and population which would occur in the area even without project development would eliminate an estimated one-third of the area wildlife habitat. The new effect of the lake project on the wildlife of the combined project areas is displayed in table 2-5. However, the lake project in combination with the DWGNRA results in no significant net gain or loss of wildlife resources.



1

4

2

(3) Vegetative Cover. When the water is impounded, the lake shoreline will be near the dividing line between the steep-sloped mountain plant communities of plant species described previously and the open field, flatland community. The impoundment will eliminate river bottom plant communities within the lake area and part of the coniferous species in the inundated portions of gorges. The lake will generally be bordered by the steep-sloped mountain species. As time passes, the river bottom plant community will be re-established on lands ecologically suited to sustain characteristic species. The open field flatland community will be lost except in small scattered stands above elevation 410. The dense continuous forest bordering the lake will be aesthetically pleasing and will extend beyond the project boundary into the adjacent National Recreation Area. However, the transitional gradations between the lower level plant communities and the separate ecosystems they support cannot be significantly re-established after the lake is formed. Inundation of the forested area above the permanent pool, for short infrequent periods is not expected to be significantly detrimental.

(4) Delaware Fishery. Because of the lake and dam the resident game fishery will expand rapidly within the lake and would produce excellent fishing for a period of 6 to 10 years following impoundment. Following this period the fishery will change from an outstanding fishery, with the major part of the catch being game fish, to a good fishery with game, pan and rough fish all represented in the catch. Seining areas established along the lake shoreline and a lake drawdown program during rough fish spawning periods should effectively control rough fish populations, which would otherwise overpopulate the lake. Provision of boat ramps and parking facilities, fishing piers and fish concentration structures in the lake will increase fisherman use of the resident sport fishery. The resident sport fishery above the lake will not be affected by project development. Provision of an intake structure with multiple level intake ports will mitigate the detrimental effects on the fishery which would occur from fluctuating conventional hydro-power releases without such a facility. Parking facilities downstream of the dam will encourage fisherman usage of this area. This is also a mitigation measure.

Until new strains of oysters are produced, future success of the oyster industry will be dependent upon maintenance of proper temperatures and control of fresh water flows over the oyster seed beds such that salinity levels would not exceed 15 parts per thousand during the critical drill activity period. The Bureau of Sport Fisheries and Wildlife and Bureau of Commercial Fisheries have stated that with the lake operated during each April, May and June to provide for downstream release of all lake inflows, except for flood flows, project development and operation would cause no damage to the Delaware Bay oyster resources. Such operation provides for maintenance of natural



stream flows over the oyster beds during the principal activity period of the oyster drill. Downstream releases of the project are being analyzed further to determine whether sufficient capability exists to enhance flow conditions over the seed beds. More uniform stream flow conditions would result from the project and would reduce the intrusion of the drill line into upper portions of the bay containing the valuable oyster seed beds, which would otherwise have occurred without the Tocks Island project. Operating experience will determine the extent to which this reduction enhances the oyster production.

(5) Lake Fishery. The river fishery of the lake site will be supplanted, of course, by a lake-type fishery which will support 384,000 man-days of fishing annually. The warm surface of the lake will support a fair to good fishery for black bass, crappies, other sunfish, walleye, and catfish. It is likely that habitat suitable for trout will occur in the lake, resulting in a two-story fishery, provided lake releases are properly managed to conserve the cold bottom waters by means of the planned multiple-level outlets. The Flat Brook arm and possibly the Bushkill arm of the lake, which now support trout fisheries, will probably become more productive of trout fisheries, due to the refuge provided for large trout by the lake. Similarly trout production which is now marginal in the main stem in the lake site may be improved by proper lake management. In addition, consideration will be given during post-project studies to introduction of northern pike, striped bass, coho salmon or other predatory species to provide additional sport fishing and to control utilization of alewife, carp, and other forage fishes which are likely to become abundant.

The spawning of most desirable fish species is not expected to be interrupted by drawdown or power fluctuations. With some species, carp and sunfish, the drawdowns can be used to benefit the fishery by destroying unwanted spawn. However, the changes in water level will interfere with pike and pickerel spawning through elimination of aquatic plants necessary to their reproduction. They also will strand and kill some young fish that frequent the shallows. Mitigative measures can be taken if these effects are found to be significant.

The impacts of drawdowns as well as of daily fluctuations on fish and wildlife uses will, of course, be greatest in late summer and fall. The rate of fishing as well as hunting use probably will be reduced somewhat more in late summer and fall during years of moderate to extreme drawdown than in normal years, but fishing success probably will be greater. The reduced rate of use is expected as a result of lessened attractiveness and length of the shoreline, lessened utility of access facilities, smaller surface area, and greater competition among users. Similar effects on recreational users other than fishermen and hunters seem probable, and scenic values during the fall season will undoubtedly be greater during years when the lake is full.



To assure full fishing use of the lake, special fishermen access facilities and lake area zoning against conflicting boat uses have been recommended and are included in current plans. In addition, fishery management studies should be conducted during the early years of lake operation to guide proper management by the States in cooperation with the National Park Service and Corps of Engineers.

(6) Fishery for Riverine Resident Species. Project regulation of the river will improve conditions for smallmouth bass and walleye in the warmer river reaches downstream for the dam. Some increase in fishing use devoted to resident species upstream from the lake also is expected due to migrations of larger fish in and out of the lake. With the project the stream fishing use is estimated at 150,000 man-days in the river downstream from the lake and 100,000 man-days above the lake. The 70,000 man-days of stream fishing in the lake site for resident fish will, of course, be lost, so that a net loss of 40,000 man-days of stream fishing for resident species is projected with the project.

The commercial harvest of eels in New York will be affected to an insignificant extent. A summary of the impact on the Delaware River and Bay sport and commercial fishery is presented in table 2-4. 1/

Concern has been expressed over possible harmful effects on the resident fishery in the Tocks Island Lake from water level fluctuation arising from pumped-storage. A research report has been completed entitled "Limnological Effects of Simulated Pumped-Storage Operation at Yards Creek," 2/ which analyzed the adaptability of certain species of fish to daily fluctuations within a series of testing ponds at Yards Creek. The fluctuations represented a simulation of prospective variations in the lake from pumped-storage operations. This study concluded that: (1) Fish did adapt to daily regulated fluctuations and succeeded in spawning and hatching eggs. No unusual problems were encountered in early fish development and growth. (2) No marked effect on fish population resulted from measurable effects observed in plankton and micro-invertebrate productivity, plant colonization, relative length-to-weight factor, or physical and chemical properties of the test ponds.

(7) Geology and Soils. The inundation of the valley will not appreciably affect the economic geology of the area. Sand and gravel resources will be reduced only slightly since exploitable deposits exist in contiguous areas. Aquifers in the surrounding valley areas will be enhanced by the lake level and will provide easier access to plentiful water supplies by the drilling of wells in the glacial materials. The elevation of the ground water table in the Matamoras, Pa. area will also be altered. Historically

---

1/ See appendix J: Fish and Wildlife Resources, to the Comprehensive Report on the Development of the Water Resources of the Delaware River Basin.

2/ Baren, Carl F., Kausch, Robert C., et al, Delaware River Basin Commission, March 1971.



mining of copper along Kittatinny Mountain has never been a profitable venture because of the low grade of the carbonate ore. Therefore, except for historical value as presented in Section 2, loss of this mineral source will be of minor consequence. Other minerals exist in very minor quantities and have little or no commercial value. There is no evidence that fossil fuels exist in the rocks beneath the lake area.

(8) Archaeologic and Historic Features. Unique features such as areas of historical, archaeological and ecological interest above the normal pool elevation will be preserved in their natural setting. In the area to be inundated, survey programs have indicated significant items of interest which justify relocation beyond the effects of the lake.

(9) Lake Water Level Fluctuations.

(a) Long term water level fluctuations. The interaction of natural lake inflows and the lake management program will produce both long-term and short-term water level fluctuations. Analysis of these long-term variations considers scattered mud banks and flats with attendant plant rooting problems, impeded access to lake waters, and design constraints on water related recreational facilities. The impact of these features are direct and moderate. Bank and flat areas to be intermittently exposed have been identified for sanding to promote rapid draining of in situ soils. This proven design measure has merited acceptance at other recreational lakes. It should be emphasized that drawdowns at other heavily visited reservoirs (refer to table 1-1) far exceed the fluctuation to be found within Tocks Island Lake. Experience also vindicates the judgment that fluctuating waters will not materially impede access to the lake or detract from water-based recreation. Supporting facilities in the land/water zone include design provisions (size, layout and adaptability) to accommodate water level fluctuations.

(b) Short-term water level fluctuations. A separable source of water level variation is power generation at the project. Such fluctuations are characterized as short-term<sup>1/</sup> in distinction to the long-term annual tendencies analyzed above. Brief changes in water level will affect fish spawning and nesting, aquatic plant rooting capability, mosquito habitat and to a limited extent local aesthetics. Extensive limnological studies<sup>2/</sup> completed to date indicate that the short-term water level fluctuation are generally (dependent upon species) neutral or in fact slightly beneficial insofar as fish spawning and nesting are concerned. Plant rooting capability in the intermittent wet zone of the lake has not been conclusively established. However, relevant experience provides a favorable prognosis. Significantly, this feature is amenable to experimentation and phased solution as the lake becomes operational. A positive

---

<sup>1/</sup> This applies whether conventional hydropower, simple pumped storage or comprehensive power is incorporated into the project.

<sup>2/</sup> Baren, Carl F., Kausch, Robert C., et al Delaware River Basin Commission, March 1971.



program for mosquito control is anticipated employing U.S. Public Health Service criteria. Typically, small rivulets can be incorporated into the bank area as required to preclude ponding in such locations.

Aesthetics incidental to changes in water level, that is damp ground as opposed to dry land, are of small consequence. In particular, the operational experience in this area gained at diverse locations demonstrate public acceptance of the intermittently wetted areas to the same general extent that periodically inundated ocean beaches continue to experience heavy usage.

Important indirect considerations stemming from introduction of the lake include destruction of established communities, the removal of land from agricultural productions and the encouragement of tourist developments. About 2600 basin residents will be required to relocate. Recently established legislation 1/ will significantly assist people affected by relocations. Indirect social changes also include requirements for police and fire protection in newly emergent communities, proper planning and management for rapid and significant regional economic growth and appropriate revisions to the tax structure throughout the region. These considerations are addressed more fully in Section 4 of the Environmental Statement.

A continually updated lake operational program will coordinate the demands on the lake during the life of the project so that commitments to water supply, recreation, fish and wildlife, and power generation can be met. Controlled changes in lake water level can effectively control some environmental problems. However, the ultimate effect on certain elements of the environment, such as the ability of specific aquatic plants to root, cannot be fully understood until some operational experience with the lake has been obtained. Since there are a variety of soil conditions and ground slopes involved and many aquatic plants available, no single solution to the control of aquatic plants is expected to be effective. The lake level will remain essentially constant through April, May and June, the critical period for fish life within the lake, as all inflow, except for flood flow skimming, will be released directly downstream. Drawdown during the recreation season will be minimal with the greatest reduction in lake level not occurring until after Labor Day. Land exposed as a result of lowering of the lake level will be largely steep-sloped so that drainage will not be a serious problem. Also, most soils encountered in these areas are free-draining. Some areas, however, will require drainage to prevent secondary ponding which could become breeding places for mosquitos and other nuisance vectors.

The outlet works will be gated in such a way that releases from the lake can be made from several levels or combinations thereof so maximum use can be made of the water quality zone that will form in the lake. The ultimate quality of the impounded

---

1/ P.L. 91-646 Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970.



waters, however, will be unavoidably affected by contaminants entering from upstream. Recently established Delaware River Basin Commission water quality standards, when fully in effect, should provide adequate protection for the lake. New York State water quality regulations will also ameliorate present stream nutrient charges. Changes in downstream flows as a result of the lake will alter the location (but not necessarily the magnitude) of the dissolved oxygen sag which presently occurs in the Philadelphia area. Under present river conditions there is less than a half-mile variation in the location of this sag. The significance of this effect is dependent upon the timing of upgraded waste treatment facilities in the Philadelphia/Camden area of the river. Through implementation of the basin pollution abatement program to be completed by 1977, the minimum DO content of the Delaware will be raised to about 3 parts per million.

e. Establishment of Recreational Areas. A significant waste control management program is necessitated to accommodate intensive recreational usage anticipated at key locations throughout the project. In addition anticipated rapid development in the area surrounding the reservoir and park will create problem related to water supply and waste disposal, piecemeal solutions which may be detrimental to environmental quality.

The summer conservation pool will offer a 100 mile shoreline and will be supplemented by an extensive plan of water-related recreation development which will support an estimated 4.2 million annual recreation days in the initial stage and 9.6 million ultimately. Except at the dam, public access will be permitted along the entire shoreline.

Only a small portion, approximately 13%, of the increased water, sewage and solid waste disposal demands is developed in the recreation and visitor areas. These project features will generate primarily day as opposed to overnight, water and waste disposal demands. The impoundment of the water in the lake will assist in maintaining the water table in the surrounding area and provide the necessary water supply through wells. A sewage collection system has been provided in the development of the Corps of Engineers recreation development plan. The Delaware River Basin Commission (DRBC) coordinated the Tocks Island Regional Environmental Study 1/ to develop a regional sewage treatment plan which would provide for handling the wastes from communities in watersheds tributary to the lake, as well as large areas draining into the Delaware River below the dam. The DRBC through the individual States would be responsible for enforcing existing water quality standards to control upstream effluent discharge. The baseline study provides for future expansion of the regional system. If possible, the sewage collection system for the Tocks Island project and the DWGNRA will be tied into the regional system. If this

1/ Tocks Island Region Environmental Study (TIRES), Roy F. Weston, Inc., West Chester, Pa. 1970.



regional plan does not materialize a treatment system to serve the Tocks Island project and the DWGNRA will be developed. This alternative system would necessarily be designed in consonance with the recreational and water supply aspects of the lake. The present phasing of the Tocks Island project will allow full exploitation of the results of active Corps and Environmental Protection Agency pilot programs in waste water management. From these ongoing studies 1/ a range of alternative regional waste water management system applicable to Tocks Island will be evolved. A product of the pilot studies will be a complete analysis of the economic, environmental and social effects of various waste water management programs. It is anticipated that innovative systems such as land disposal using lagoon-like treatment cells and spray irrigation technology may be effectively employed. Such systems use the soil aerobic zone as a living filter to achieve a high level of final treatment while returning the waste water to the basin as a resource. Solid waste disposal requirements generated by the project will be coordinated with the regional waste disposal developments to be implemented as part of the Tocks Island Regional Interstate Solid Waste Management Study. 2/

f. Permanent Supporting Facilities. Supporting facilities occasioned by the project include small buildings, roads, bridges and culverts in various locations. An analysis of facility-induced change leads to the following considerations. In some cases extant natural scenic views and vistas will be supplanted with man-made landforms. This is most pertinent to the re-routed U.S. 209 roadway. Balanced against a loss of near-wilderness qualities is the increased recreation benefits obtained through safer, quicker visit-or access to these lands. In lieu of natural informal touring of the region, a more structured, planned and formalized approach to visitation will be introduced. In areas destined to receive a pump-ing station or operator residence, landscape and architectural de-sign will be required to lessen the feeling of decreased open space. Restorative landscaping is a central element in all road relocations to blend the roadway to the surrounding terrain. For the major re-location project planning and design has provided for aesthetic treat-ment to standards more stringent than local or state Government prac-tice. It was necessary to adapt the bridges and culverts for the relocated roadway to the present ecosystems of the region. Culvert sizes and their orientation as well as bridge footings must be de-signed to avoid stream interference and to pass local wildlife. Visible bridge externals require specific fascia treatment to develop an acceptable visual impact. Terrain conditions at the uppermost reaches of the lake will necessitate flood protective works at Port Jervis and Matamoras. These facilities include floodwalls and levees and pumphouse buildings. Analysis of the adverse effects of the local protection works is presented in Section 4.

1/ In Chicago, Cleveland, Detroit, San Francisco, Boston's Merrimack River, Muskegon County (Mich.), Codoras Creek, Pa.

2/ The study was directed by the Tocks Island Regional Advisory Council, August 1969.



#### 4. Adverse Environmental Effects Which Cannot Be Avoided.

a. General. The existing ecosystem is a natural mountain slope forest community dominated by continuously dense stands of deciduous and coniferous trees and shrubs. Mixed hardwoods comprise the predominate species. Significant stands of hemlock and oak are to be found in concentrated areas. The area forests can generally be described as second growth mixed hardwoods. Present land use on the area consists of about 78% forest, 15% agriculture, and 7% developed. These uses, however, can be considered as interim since the trend in the area is toward uncontrolled development of summer homes, resorts and service establishments. Such unmanaged developments are considered deleterious to the existing wildlife and fishery in the project area. This trend toward environmental degradation will be reversed with development of the project due to provisions for fishing, hunting, and general recreation, and attendant orderly development of the surrounding lands. Development of the project, however, will result in other environmental impacts which may not be beneficial. Of the various environmental impacts discussed in Section 3, only the following involve adverse effects which cannot be completely mitigated or avoided with the project as now formulated.

(1) During construction. Construction operations will necessitate extensive removal of surface and rock material along the riverward ridge of Kittatinny Mountain, thus exposing a large rock outcrop. The area to be exposed will measure approximately 2,000 feet long, 750 feet wide and will extend in elevation to a maximum of 300 feet higher than the dam. About 35 acres of rock will ultimately be exposed. Construction contracts will incorporate rigid controls on the construction methods in order to minimize and confine the destruction of existing vegetation, unnecessary grading of the landscape and temporary silt load pollution of streams. Corps of Engineers provisions for environmental protection 1/ will be applied by the contractor as monitored by the Resident Engineer.

(2) Post-Construction. Excavation for the recommended location of the spillway, outlet works and power facilities will expose the base rock of the region. This new ground feature, which contrasts with the surrounding forest, can be expected to remain essentially unaltered in the future. The exposed rock bedding plane has a natural slope of 1 on 2 or flatter above the top of the dam and forms a continuous strata of impervious brownish-red sandstone. The sandstone contains random color variation introduced by seams of quartz, calcite, and gray limestone. The face of the rock may be expected to be marked by narrow dessication cracks which appear darker in color than the basic material. The greater portion of the exposed planes would occur between elevations 450 and 750. Steeper cut slopes will occur at lower elevations adjacent to the spillway and outlet works structures. These slopes, however, would be distinguished by profiled rock strata, each differing both in color and texture. Although the rock is not unique in a geological sense, the areas exposed will effect a decided visual impact because of size, color, and contrast to the forest surroundings. These areas

1/ USA Corps Regulation EC 1110-2-109.



will be observable from a proposed visitor outlook on the opposite shore of the lake. The inherent attraction of the rock arising from its color and veination may be diminished somewhat because of its extent and in some locations abrupt transition with the surroundings.

(3) Mitigation Design. Several earthwork design aspects have been advanced to improve the treatment of the rock outcrop area. Briefly, these ideas include: direct soil application, development of surface vegetation, and architectural sculpturing of the rock. An environmental engineering consulting firm has been engaged to augment the Corps effort in preparation of the detailed final design. The consulting firm retained will study the total project environment in the vicinity of the dam and not confine itself to the excavated area at the left abutment. Such studies will identify treatments or techniques, presently in the development stages, which can be successfully employed to aesthetically enhance the present design.

b. Land Acquisition and Relocation. Construction of the project will require acquisition of 25,200 acres of lands for development and subsequent operation and maintenance. However, not all of these lands will be altered from their present use. Development of the project will also require displacement of about 2,600 permanent residents and an undetermined number of seasonal residents from the project area. Additionally, acquisition will disrupt several long-established communities. U.S. Route 209 will be relocated to the west boundary of the DWGNRA and will be constructed to high landscape design standards so as to minimize any adverse effect on the scenic quality of the previously undisturbed land use patterns along the relocation route. Local government bodies, however, must exercise zoning controls to prevent the addition of billboards and tourist service facilities which would have an undesirable effect on the scenic vistas along the route.

c. Impoundment. The major adverse effect of Tocks Island Lake will be the permanent loss of a 37 miles stretch of the free-flowing Delaware River, 4 miles of the Neversink River, and 8 miles of Flat Brook and inundation of 10,000 acres of adjacent lands, in addition to the 2,400 acres now covered by existing streams. These streams have largely retained a natural appearance and scenic charm and at present, receive relatively limited use because public access is restricted to about 5% of the shoreline. Creation of Tocks Island Lake, while providing greater public access, would preclude preservation of the Delaware River and Flat Brook in their present state and efforts to increase public use in semi-natural conditions through appropriate acquisition of streamside lands.

Portions of the extensive historic Pahaquarry Cooper Mine workings and the location of the Old Mine Road will be inundated by the Lake. The outcrop of Chalcocite ore was first worked by the Dutch as early as 1644, which possibly makes it the oldest cooper mine in the United States. The mine has not been an operating mine for some



time and relatively recent efforts to develop economic operations have proved fruitless. The workings are not now easily accessible to the public. The 100-mile Old Mine Road was built about 1650 from the mine to Esopus (now Kingston, N.Y.) and was used to haul copper ore. It was the longest stretch of good road in colonial times, played a major role in the settlement of Northern New Jersey, and was well travelled as late as 1800. In December 1776, General Gates moved seven regiments of troops down this road to reinforce Washington's army just before the famous crossing of the Delaware. Today there is a two-lane paved secondary road which generally follows the location of Old Mine Road.

While portions of these historic features will be lost, a six-mile stretch of Old Mine Road and much of the Pahaquarry workings, which extend up the Kittatinny mountainside, will be preserved, made accessible to the public, and their historic significance interpreted for the visitors.

Impoundment of the river to form a lake will accelerate natural eutrophication of the stored waters to an extent which is not now fully known. While the total dissolved solids content of the Delaware River is low compared to water stored in most large impoundments, significant quantities of phosphates and nitrates exist because of agricultural runoff and treated sewage effluents upstream of the lake.

There is, at present, only meager basic understanding of eutrophication and interrelated limnological processes in lakes, and predictions are somewhat uncertain. Future growth in upstream population and heavy visitation to the proposed recreation developments along the lake and to the DWGNRA would, of course, increase the rate of eutrophication unless corrective actions are undertaken.

One possible adverse effect of eutrophication, should it occur to a significant extent, is development of excessive blooms of algae in Tocks Island Lake. These blooms could impair the attractiveness of recreational use of the lake and the lakeside developments and diminish the value of stored waters for municipal and industrial uses. Another possible adverse effect is development of a low dissolved oxygen content, during the summer, in the bottom layer of the lake. This reduction of dissolved oxygen would be caused by decay of algae and other detritus that sink to the bottom.

A low oxygen layer would have adverse effects on desirable fish species such as chain pickerel, walleye, pike, and trout (if introduced in the lake) that seek cool water layers in the summer. The layer could also impair the quality of downstream water releases to the extent that it is not counteracted by use of selective outlet works.



Working experience with other reservoirs suggests that, even where impoundment conditions appear to be highly favorable for utilization of nutrients such as calcium, potassium, nitrogen and phosphorus by algae, with consequent blooms, the reservoirs do not act as a nutrient trap. This indicates that there is no rapid accumulation in the reservoir system of inflowing nutrients. Instead, a large proportion of the nutrients are passed through the reservoir without being incorporated into the biomass of the reservoir. Much of the phosphorus, on the other hand, does appear to be precipitated and buried in the bottom muds, but in an insoluble form.

On the basis of experience with a large number of impoundments, the Bureau of Sport Fisheries and Wildlife, in its most recent evaluation of Tocks Island Lake, suggests that the fishery would be improved by a moderate increase in the available nutrients over existing levels. Algae growth, if not excessive, is necessary for a productive, balanced fishery that contributed to satisfactory angler success and does not detract significantly from water uses.

A study which utilizes existing data and projects expected nutrient loads on Tocks Island Lake under various assumptions was conducted for the Corps of Engineers by an interdisciplinary group of consultants. The principal findings of this study <sup>1/</sup> may be generally summarized as follows. During the five-year construction period preceding stream closure, it will be possible to obtain an improved, more extensive understanding of existing water quality in the Upper Delaware River Basin. Thus, sufficient time is available to provide for establishment of a water quality monitoring network to provide baseline data. This is essential to a sound water resource management program for the project. To this end the installation and maintenance of at least three continuous-monitoring electronic probe stations at appropriate sites including an autoanalyzer and weather monitoring station to be installed at Port Jervis, New York were recommended. The operation of these stations in conjunction with grab sampling of selected biological and chemical parameters should provide adequate baseline data on which to base operations and management decisions. After the reservoir becomes operational, additional autoanalyzer instrumentation should be incorporated into the dam to monitor outflow characteristics.

Existing mathematical models can be modified to describe temperature distribution in the reservoir but no single model is available to reliably predict variations in other parameters for such a large reservoir. The formulation of a comprehensive water quality model

---

1/ An Appraisal of the Potential for Cultural Eutrophication of Tocks Island Lake, Jack McCormick and Associates, Devon, Pa., Sept. 1971.



that integrates physical, chemical, and biological parameters of the Tocks Island Lake should be initiated and probably could be developed before the reservoir becomes operational.

The projected rapid rate of development within the Tocks Island geographic region will necessarily affect water quality; the nature and rate of change is difficult to predict with high precision. The consultants recommended initiation of a comprehensive study to collect information of potential sources of nutrient enrichment and pollution of the watercourses in the Upper Delaware River Basin so that appropriate steps may be begun to maintain or improve the quality of the influent water flow to Tocks Island Lake. This inventory program can be undertaken in consort with the construction program.

If large waste water treatment facilities to satisfy regional demands are constructed downstream of the dam on the Delaware River, special management and advanced planning will be required to accommodate the effects of mixing water from the reservoir as well as the effluent from these plants. Therefore, the development of special models to indicate preferred methods for multiple releases of water from the impoundment concomitant with the projected release of effluent from the treatment facilities was recommended. Such models must consider water quality data of treatment plant effluents and all stratification layers of the lake, while regulating mixing according to the requirements of the existing downstream biological community. The evaluation of the condition of downstream aquatic communities should emphasize both quantitative and qualitative information. An ancillary recommendation is that the project-related treatment facilities provide tertiary treatment with at least 98% phosphorus removal. The levels of biologically important parameters in treatment plant effluents ideally would be comparable to levels in the inflow to the reservoir.

Management of the multi-level discharge system of the proposed reservoir should attempt to maximize voiding of nutrients from the hypolimnion during the summer stratification period, yet maintaining acceptable downstream water quality. Hypolimnetic waters during stratification typically are low in dissolved oxygen and the discharge should contain sufficient well-oxygenated epilimnetic water to maintain adequate oxygen levels. As an alternate, existing technology includes techniques which could be used to oxygenate the hypolimnetic discharge. Temperature should be maintained near that of downstream waters. Insofar as possible, outflow water quality should be equal to or better than influent water quality with respect to all biologically important parameters.

Elaboration of existing documentation of extant fish species in the Tocks Island area should encompass their water quality requirements. Such study should include known water quality requirements for eggs, juveniles, and adults, with particular emphasis on the requirements for spawning. This data



should be collected both prior to construction of the closure portion of the dam and continue through the first five years of operations.

Solid organic wastes should be removed from the area of inundation before and during construction of the dam. The potential nutrient input from this material is great and its removal will reduce the severity of eutrophic conditions that often occur immediately after an impoundment is created.

In view of the lack of knowledge of the effects of destratification on eutrophication in large impoundments, artificial destratification of the Tocks Island Lake during the summer is not recommended as a management tool. Voiding of nutrients through selective discharge and reduction of nutrients from basic cultural sources should be the principal methods of minimizing the potential of accelerated eutrophication.

Heavy reliance on use of copper sulfate and other algicides to control algal blooms should be discouraged in view of possible deleterious ecological effects. Such measures if employed should only supplement and not substitute for sound preventive management.

The investigation concluded that the potential for cultural eutrophication of the proposed impoundment is subject to control. The controls recommended by the study as well as the stream water quality improvement program can be implemented during the construction program and in advance of stream closure. In this way, the lake would not become a severe environmental or aesthetic problem.

The Tocks Island Lake project will improve stream conditions in the lower river for the shad fishery by materially reducing the intensity of the pollution block that inhibits upstream and downstream migration. However, creation of the impoundment will cause an unavoidable loss of some spawning habitat for the growing shad fishery in the 37-mile reach of the Delaware. An additional short stretch upstream will be lost to production because shad eggs are slightly heavier than water and roll with the current along the bottom. Those that are deposited in the lake probably will not survive.

d. Recreation facilities. Installation of four lakeshore recreation facilities with design peak capacity of 48,000 will be installed concurrently with project construction. Ultimate peak visit or design load for water-related facilities is estimated to be 112,000.



Preproject conditions are discussed in some detail in the 1966 Nathan Report 1/. Available 1970 census data indicate continuation of the population trends foreseen in that report. The population of each of the five counties adjacent to the project area has increased significantly over the past two decades.

The eastern parts of Sussex and Warren Counties are today experiencing suburban pressure from the New York Metropolitan region, while on both margins of the immediate project area (Monroe and Pike Counties, Pa., and the western portions of Sussex, Warren, and Orange Counties), resort, vacation-home and related developments are the principal sources of population growth.

These growth trends have been encouraged by improved access to the adjacent Pocono and northern New Jersey areas and by an increase in the number of families seeking natural outdoor recreation opportunities. The anticipated general impact of the Corps recreation developments on the surrounding area would be an acceleration and intensification of these trends. The most likely result appears to be a mixture of adverse and favorable environmental and socio-economic effects.

The lakeside recreation facilities, in their pleasant scenic setting, are expected to be the major source of visitor attraction to the reservoir. Despite the best efforts to spread visitor pressure effectively among the facility areas and to minimize visitor impact on the area, there will be unavoidable occasions during which traffic congestion and visitor overuse will occur with resultant adverse effects of short-term damage to the surroundings. Unsightly accumulations of trash and litter are nearly inevitable under such circumstances, and will mar the visitor experience somewhat for short periods of time. During summer weekends and holidays, in particular, traffic congestion induced by the presence of the recreation facilities will adversely affect, to some degree, adjacent highways and communities.

Many of the region's residents, particularly those in the low-income areas on the Pennsylvania fringe, will welcome better socio-economic conditions as an improvement. The provision of short-term services for visitors, such as daily and weekly sleeping accommodations and eating establishments, will stimulate the local economy and create jobs for many residents.

Many permanent and seasonal residents will be distressed over the loss of the existing predominantly rural and scattered commercial development pattern. Careful zoning controls and other local regulatory measures will be needed to prevent future commercial development serving the visiting public from occurring in areas outside the DWGNRA and the lake project, in a way that conflicts with sound regional land use plans.

---

1/ "Potential Impact of the Delaware Water Gap National Recreation Area on the Surrounding Communities", Robert R. Nathan Associates, Inc., Washington, D.C., 1966.



e. Operation of the Lake. As discussed in Section 2 of this statement, Tocks Island Lake will be operated to pass all inflows of less than flood volume during the period April through June. The operational program also provides for a minimum daily average flow of 2784 cfs throughout the year. The average yearly drawdown will be 18 feet, although drawdown during the 14 week prime recreation season will average 7 feet. Larger drawdowns will, of course, occur in drought years. In addition, there will be daily fluctuations averaging about 0.6 feet from releases due to operation of the hydropower plant that will be included in the project. If the Kittatinny pumped storage project is licensed and installed this fluctuation will be slightly greater.

The adverse effects of drawdown and fluctuation are primarily aesthetic. The Bureau of Sport Fisheries and Wildlife, in its appraisal of the Tocks Island Lake Project, concludes that adverse effects on fisheries will be minimal, and even possibly helpful, in its disruption of spawning of less desirable rough fish.

The aesthetic effect is not likely to be substantial, since 80% of the shoreline is steep-sloped with most of the soils along the rest of the lakeshore free-draining. Therefore, the exposure of these lands is not expected to produce any substantial area of saturated soils (mudflats). Minor drainage or other measures will be undertaken to minimize mudflat problems where they may exist. Adverse effects on recreational use are not expected since beach areas and supporting facilities will be designed to accommodate the drawdowns on all but the most extreme drought years.

Variable outflows from the lake will cause an undetermined, but probably small, amount of bank sloughing for a short stretch of river below the project. Interference with, and some danger to, boaters will also occur in the vicinity of the tail-race when discharges through the turbines for power operations occur. Experience at other hydroelectric projects indicates that this danger can be minimized by signs and other warning devices.



5. Alternatives to the Proposed Action. Presented below are various alternative actions that might avoid some or all of the adverse environmental effects. These alternatives were explored in the course of development of the Tocks Island project. Evolution of the project as well as its formulation within the framework of the Delaware River Basin Plan is discussed in detail within the report on the Comprehensive Survey of the Water Resources of the Delaware River Basin. 1/

a. Background. The inventory of potential major reservoirs included sites advanced in thirty-five prior reports covering water resource development in the basin or identified in additional studies made in connection with the Basin Plan. A total of 193 major dam and reservoir sites were compiled. Of necessity the subsequent selection process was extensive due to the permutations and combinations implicit in the number of sites proposed. A further complication was the interdependency of the basin physical characteristics. That is, the introduction of a project on a single tributary of the region will generally affect to some extent the regional water resource characteristics. The evaluation method used in the survey for deriving the composition of the recommended Basin Plan involved a set of successive discrete screenings of proposed projects followed by detailed appraisals of the resulting preferred plans. In this manner the present plan 2/ of which Tocks Island is the major feature was defined.

In examining the alternatives to the proposed action it is helpful to frame the discussion in terms of the adverse effects of the Tocks Island multi-purpose project as identified in Section 4 of this statement. See also the conspectus for this section. These characteristics may themselves be placed in three physically motivated classes as follows:

A. Adverse Characteristics Brought on by Creation of Lake.

1. loss of free-flowing stream qualities
2. reduction in agricultural production
3. reduction in spawning grounds in tributaries
4. exposure of extensive rock cut at the damsite
5. partial inundation of copper mine at Pahaquarry

1/ December 1960 (revised May 1961) in eleven volumes. Printed and distributed by the U.S. Government Printing Office, 1962 as H.D. No. 522. See especially Appendix Q: Formation of the Plan of Development.

2/ The Delaware River Basin Plan also presented the comprehensive power development at Tocks Island, outlined in the New Jersey companies' Kittatinny Mountain Project application pending pursuant to P.L. 91-282, as well as the National Recreation Area.



6. partial inundation of Old Mine Road with attendant historical and archaeological features
  7. flood protection works
  8. accelerate natural eutrophication
  9. hardship related to relocation and acquisition.
- B. Adverse Characteristics Arising from Lake Operations.
1. drawdown, plant rooting and fish spawning problems
  2. relocation of poor quality water zone downstream
  3. resident fishery changes.
- C. Recreation - Related Adverse Effects.
1. traffic jams
  2. solid waste
  3. liquid waste.

In evaluating the various alternatives to the Tocks Island project certain of these adverse characteristics could be altogether avoided or experienced to a greatly diminished extent. The balance of this section presents alternatives to the proposed action beginning with the no-action concept and concluding with alternative actions which avoid one or more adverse environmental impacts. It should be noted at the outset that alternate multi-purpose projects providing the equivalent services were investigated in the comprehensive plan for the Delaware River Basin.

b. An Alternate Multi-Purpose Project.

Another possible course of action would be an alternate multi-purpose project, located elsewhere on the mainstream of the Delaware, of sufficient size to serve the same functions as the adopted Tocks Island project. Major alternatives to this project included developments at Knight's Eddy, Barber Kill, or Wallpack Bend. Within the constraints of the Plan, these projects are themselves mutually exclusive with a similar environmental impact albeit upon different sections of the river and environs. No particular environmental advantage could therefore be anticipated.

c. The No-Action Alternative.

One alternative to the proposed action would be to recommend no water resource development. The major effect of this course of action would be to essentially preclude all of the adverse effects attributed to



the project. It must be noted however, that without the project experienced regional growth patterns would produce traffic jams and solid/liquid waste disposal problems. The demonstrated project benefits of flood control, water supply, recreation and hydropower would be foregone. Tocks Island represents 50 percent, 35 percent, 40 percent and 75 percent, respectively, of the basin needs to be met by the Delaware River Basin Plan for flood control, water supply, recreation and hydropower. Elimination of such a large portion of the Basin Plan would require a complete re-evaluation of the plan to determine whether development of the remainder with or without augmentation would be meaningful in view of the extent of the basin's needs. 1/

In view of these factors, the no-action alternative would make it impractical for future water resources development in this region. Without the project the lands and properties downstream would still be subject to flood damage. Owing to the high degree of regional development and multitude of political subdivisions, introduction of effective flood plain zoning restriction is not realistic. In the absence of the project, the existing and future needs for water supply and power would have to be met by other alternatives while the need for recreation facilities would be largely unsatisfied because of lack of adequate public access to the river waters. Furthermore, without the project, existing recreation facilities would be further overtaxed and abused.

The alternative of developing the Delaware Water Gap National Recreation Area (DWGNRA) without the Tocks Island project was also explored. 2/ That is, development of the area could be accomplished by extension of the DWGNRA to include the river area. 3/ Environmental advantages would accrue by avoiding some of the eutrophication and inundation-related effects. Patently the benefits of flood control, power, and water supply would be foregone. Less obvious, however, is the lack of satisfaction of the recreation objective which would result from this approach. While there is natural beauty inherent in a wild, free-flowing river, this development would nonetheless provide recreation opportunity for only a limited number of

1/ The development of the Tocks Island project has also been incorporated into water resource planning for Northern New Jersey, New York City and the Western Connecticut metropolitan areas. The project also is a central element in the Commonwealth of Pennsylvania Project 70 recreational program and the counterpart Green Acres program of the State of New Jersey.

2/ "A Natural System Plan for the Delaware Water Gap National Recreation Area", National Park Service, Washington, D.C., 21 Sep 71.

3/ Additional legislation would be needed to permit adoption of a DWGNRA alternative without Tocks Island Lake. In the words of the reference in footnote 2/ above: "The Delaware Water Gap National Recreation Area, authorized by Congress in 1965, presumed a large reservoir previously authorized for the Delaware River."



people. Recreational needs of the basin which would have been met by the combined Tocks Island Lake and National Recreation Area projects would only be partially met through recreational development of both the National Recreation lands and lands within the boundary of the proposed lake project. The paramount reason for this is that a large body of water such as Tocks Island Lake is a proven attraction in a recreational project of this type. Visitor affinity for water recreation generally runs two to one over land activities. The National Park Service and the Bureau of Recreation (Department of Interior) concur in the Corps estimate that of the visitation to the combined lake and DWGNRA, 9.6 million people would be seeking and require water



related recreation. However, a significant decrease in water-related recreational capacity would accompany this alternative through loss of 10,000 acres of surface water and miles of shoreline available with the lake and through the restricted availability of open river recreation as compared to lake recreation.

d. Alternate Actions Which Avoid One or More Adverse Environmental Impacts.

Constant Level Reservoir on the Delaware River. An alternative action employing a reduced size, constant level reservoir was explored. This alternative would avoid large drawdowns, reduce the extent of relocations, and avoid the flood protective works required at Port Jervis and Matamoras. No flood control benefits would accrue from this type of development. Power generation capacity would also be appreciably reduced and water supply benefits would necessarily be compromised.

Reservoir Development on Tributary Streams. Another alternative envisages a system of small reservoirs located on tributary streams. This alternative would avoid the extensive rock cut at the Tocks Island damsite, the flood protective works at Port Jervis/Matamoras, the partial inundation of the Pahaquarry mine and other historical/archeological features. For example, except for their aggregate local effects, the Equinunk, Callicoon, Milanville, Masthope, Lackawaxen, Shohola Falls, Bridgeville, Girard and Flat Brook projects are, collectively, an alternative for the Tocks Island project. This would eliminate the direct environmental impact on the Delaware River, including that on the river fishery and the wildlife habitat of adjacent lands. In turn, the aggregate environmental impact of the system of small reservoirs would be greater than that of the proposed project and would be spread throughout the tributaries rather than concentrated at one impoundment. Such a system would be more detrimental to tributary stream fishery than the existing project. The single impoundment is more efficient and fully serves all project purposes with less detrimental effect on the regional environment.

Construction of the required number of smaller projects along with access roads and the related facilities would extend detrimental effects over a wider area and would involve ecosystems of many tributary streams. This widespread disturbance could be expected to have some effect even on the main stem of the Delaware. The coordinated operation of such a large number of projects for water supply, flood control and recreation would itself be an extremely complex task. Liquid wastes generated at this number of remote locations would constitute an additional and dispersed environmental hazard. Drawdown to serve supplies of water and flood control purposes would limit the effectiveness of these reservoirs for optimum recreational use as well as fishery development. Hydropower benefits of the proposed project would be lost due to inadequate head and lower flows of necessarily smaller developments.



In brief, a system consisting only of small reservoirs on tributary streams would have a far greater impact on the region's environment while poorly serving some of the water resource needs and failing completely to serve others. For example, the potential adverse effect on fish and wildlife precluded major control projects on the Beaverkill Basin.

Elimination of Recreation as a Project Purpose. Elimination of the recreational aspects of the Tocks Island project would be accompanied by dropping people pollution effects--intermittent traffic jams and solid/liquid waste demands. This observation may be qualified with the continuing growth of regional visitation and associated traffic and solid/liquid waste problems. Recall also that the project-introduced waste load is only a small portion of the regional waste control requirements.

Unmanaged development of summer homes, permanent residences and recreation-oriented businesses in the project area is continuing at an increasing rate with resultant change in present land use. Undetermined effects on the existing environment will accompany such changes, the magnitude of which will depend on the effectiveness of fragmented local controls enacted to protect the environment.

Non-impounding Structural Alternative. Loss of river basin lands by inundation and/or flood pool effects could be circumvented by a system of levees and flood walls. Pre-project free-flowing stream conditions would also be maintained at the sacrifice of water supply, recreation and power project purposes. Flood protection, however, could be accomplished by an extensive system of levees and flood walls. Used in lieu of the project's flood storage capacity, this alternative provides partial protection from floods. This type of structural technique when used as a general protective measure would have an adverse effect on the environment in the area of construction. Fauna would be denied free access to the river waters; aesthetics would be impaired by creating a canal type visual appearance; traditional human access to the stream waters could be impeded and the view of the river would be impaired for extended reaches.

Non-Structural Alternative. The need to avoid adverse environmental impacts led to the consideration of positive non-structural measures. The regulation of flood plain usage supplemented with a subsidized system of regional flood insurance would in effect redistribute but not diminish the economic losses of flooding. Such an approach, if adopted, would not address the loss of life implicit in flooding and would preclude higher-valued uses of the flood plain lands such as residential, agricultural or industrial development. The project benefits of water supply, recreation and power would not evolve from this alternative. The necessary zoning ordinances to accomplish this would be difficult to implement on a basin-wide concept. This arises because of the many local governing bodies involved in zoning. A more severe problem is extant land improvements in the industrialized portion of the Delaware River which could not be readily relocated.



Dry Reservoirs. A series of dry reservoirs each smaller than Tocks Island is also an alternative for flood control. In particular, this alternative avoids most inundation effects, avoids the need for levees, reduces relocation requirements, avoids congestion, avoids eutrophication potential, and avoids drawdown. To implement this alternative appears desirable, as it is a passive system; but it would nonetheless entail environmental impact. The pool capacity required for adequate protection would lead to excessive scattered land requirements in necessarily undeveloped areas. Given such land acquisition, flora and fauna would be adversely affected by periodic inundations, by drought, and discontinuous flows. Debris carried along with flood waters in floating periods would be deposited in such reservoirs leading to waste control problems. The reservoirs would also be subject to vector inhabitation. Some remaining adverse effects of this alternative would be the necessity of constructing access routes and the seasonal flooding of river lands. In addition, this alternative would entail seasonal flooding of river and streamside land and create an esthetically unpleasing area near the damsite filled with silt and debris. It would also forego power, water supply and mass recreation benefits or require satisfaction elsewhere as discussed above. The consequence of foregoing a reservoir-based water supply could be alleviated by drawing upon other sources.

Alternate Sources for Water Supply. Surface water in the quantities required to meet projected demands is simply not available from other watersheds; the water supply problem is regional. Water supply needs could be partially met by ground water supplies but would be subject to low yield during drought conditions. Ultimately, by the year 2000 it could be expected that all sources of economically retrievable ground water supplies would be exhausted, requiring development of surface water sources of supply. The environmental impact resulting from overuse of ground water in the area is uncertain; however, in some regions serious consequences have resulted, such as ground surface subsidence in California and Mexico City, and salt water intrusion in many coastal areas.

Desalinization is a potential source of unlimited water supply. However, under present non-nuclear technology the power required to extract the water would place a burden on diminishing supplies of fossil fuel. A single desalinization plant, based on maximum daily plant outputs and related costs expected within the near future, would not approach the daily water supply output and related costs of the Tocks Island Lake project. The by-products from generating the required energy for desalinization would produce an additional (both thermal and air) pollution load on the environment, the precise extent of which would be undetermined prior to selecting a specific location and type of facility.



Deletion of Power Generation as a Project Purpose. Adverse characteristics arising in part from hydropower generation include drawdown and a change in downstream regimes. To reduce these impacts, the power generation could be deleted in favor of producing equal capacity at another location via various schemes. It was recognized that power can be feasibly produced by several common methods to meet the demand to be satisfied by development of the conventional power potential of Tocks Island. Each of these methods has environmental impact, the extent of which is unique to a specific location and type of facility. Fossil fueled plants lead to air and thermal pollution, waste ash generation and requisite transportation access routes. Nuclear plants produce a high demand on cooling waters along with thermal elevations of contiguous bodies of water.

Hydropower generation at the project, given the existence of a reservoir, does not deplete natural resources; the associated impact on the environment is minimal as no air or thermal pollution is produced. An additional advantage is that possible oil spillage accidents are essentially foreclosed by employing hydro-powered generation. The conventional power potential of Tocks Island could support a plant factor of about 20%. This precluded the use of gas turbine generators or jet engines as economically feasible power peaking alternatives.



CONSPECTUS

EXPLORATION & EVALUATION OF ALTERNATE ACTIONS THAT  
MIGHT AVOID SOME OR ALL ADVERSE ENVIRONMENTAL EFFECTS

	1. Alternate Multi-Purpose Project	2. No Action	3. Constant Level Reservoir	4. Development on Tributaries	5. Eliminate Recreation	6. Non-impounding Structure	7. Non-Structural	8. Dry Reservoir	9. Alternate Water Supply	10. Deletion of Power						
<b>ADVERSE ENVIRONMENTAL IMPACTS</b>																
<u>Lake Creation</u>																
Lose Free-Flowing Stream	X		X		X					X						
Lose Some Lands	X		X	X	X	X	X	X	X	X						
Lose Some Spawning Grounds in Tributaries	X		X	X	X					X						
Extensive Rock Cut Visual Affront	X		X		X				X	X						
Inundation of Pahaquarry Mine	X		X		X				X	X						
Inundation of Sections of Old Mine Road, Historical and Archaeological Features	X		X		X				X	X						
Flood Protection Works	X		X	X	X				X	X						
Accelerate Natural Eutrophication	X		X	X	X				X	X						
Relocation & Acquisition Hardships	X		X	X	X			X	X	X						
<u>Lake Operation</u>																
Drawdown, Plant Rooting & Fish Spawning Problems	X			X	X				X	X						
Relocation of Poor Quality Water Zone Downstream	X				X				X	X						
Changes in Resident Fishery	X			X	X				X	X						
<u>Recreation Related</u>																
Traffic Jams	X			X					X	X						
Solid Waste	X	X		X				X	X	X						
Liquid Waste	X	X		X				X	X	X						
<b>Unsatisfied Needs</b>																
• Flood Control		✓	✓	*		*	*		✓	✓						
• Water Supply		✓	*	*		✓	✓	✓	✓	✓						
• Recreation		✓	✓	*	✓	✓	✓	✓	✓	✓						
• Power		✓	*	*	✓	✓	✓	✓	✓	✓						
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th align="center" colspan="2">LEGEND</th> </tr> <tr> <td align="center">✓</td> <td>Unsatisfied</td> </tr> <tr> <td align="center">*</td> <td>Partially Satisfied</td> </tr> </table>											LEGEND		✓	Unsatisfied	*	Partially Satisfied
LEGEND																
✓	Unsatisfied															
*	Partially Satisfied															
<b>Other Factors</b>																
		Mutually Exclusive	Overtax Existing Facilities			Impede Stream Access Poor View			Disperse Environ. Impact							



6. Relationship Between Local Short Term Uses of Man's Environment and the Maintenance and Enhancement of Long-Term Productivity.

a. Local Short Term. Presently, the 37-mile long section of the Delaware Valley which would be utilized for project development is extensively occupied by year-round, seasonal, and farm dwellings and also contains a few resort and camp developments. Generally, the area is experiencing a changing economy with land use expected to change from farming to permanent and seasonal residential. Several extensive land tracts have been developed for recreational or seasonal use within counties bordering the project area. It is recognized that even without the project, future developments within the project boundary would eventually eliminate a large portion of the present wildlife habitat and impair the natural character of the region. Presently there are no uniform standards effectively governing regional development.

Roughly five percent of the shoreline along this stream reach is available for public use; water-related recreational use is estimated at less than 200,000 annual recreation days. The principal tributaries and main stem support an existing walleye, bass, trout and shad sport fishery which annually supports 415,000 sport fisherman days. Less desirable fish such as catfish are now present in the stream. The river also supports a commercial fishery for shad, oysters, and eels whose estimated potential is 1,500,000 pounds, 1,500,000 bushels and 10,000 pounds, respectively. Area wildlife supplies are projected to provide an estimated 35,000 hunter days of annual recreation use over the life of the project. This arises from increases in regional population and public access to areas which are not fully harvested. Uncontrolled development over the life of the project within the project area would eliminate a large portion of existing wildlife habitat. Uncontrolled flooding in the downstream reaches below the proposed dam produces an estimated annual flood damage of \$2.7 million (July 1970 Price Levels). Further, in its present uncontrolled flow through this valley reach, the river cannot adequately support either the present or the projected gross water and water-related needs of the basin.

b. Long-Term Productivity. The proposed project with a designed life of one century would provide full public access for recreational opportunities along a 100-mile shoreline and would ultimately provide an estimated annual 10.5 million recreation days of use in combination with the Delaware Water Gap National Recreation Area. With inclusion of the various features recommended by the U. S. Fish and Wildlife Service, the project would produce a net overall beneficial effect on the Delaware fishery. Although the existing sport and commercial shad fishery will be adversely affected and the commercial eel industry in New York would be reduced to minor proportions, releases from the lake are expected to establish a 10-mile long cold water trout fishery



below the dam. The project would cause an estimated loss of 65,000 sport fisherman days for shad and 1,000,000 pounds in the commercial shad fishery. 1/ The Delaware Bay oyster industry would not be affected by the project. The project would produce an estimated increased use of 364,000 sport fisherman days for sport fishery. Provision of 880 acres of wildlife lands has been recommended by U. S. Fish & Wildlife Service to mitigate project-induced damage to wildlife habitat. This acreage is augmented by downstream lands now protected from flooding by the dam.

Flood control storage would reduce flood damages on the main stem alone below the dam by an estimated \$2.7 million per year (July 1970 price levels). Flood protection afforded by the project will produce a feeling of security in the downstream populace. Also, about 4,000 acres of land previously undeveloped or providing a low economic return due to intermittent flooding would be made available for economic development or for improved land uses. Damage centers experiencing relief resulting from the project include Easton, Riegelsville, New Hope and Yardley in Pennsylvania. Their counterparts on the New Jersey side are Belvidere, Phillipsburg, Trenton and Burlington. Associated with reduction of frequent flooding in the various river reaches, land development and land values of 4,000 acres of land would be enhanced. Water supply storage would utilize excess river flows, which presently are discharged to the sea, to assist in meeting the gross water needs of the Trenton, North Jersey, and Philadelphia area to the year 2000. The project will significantly eliminate previously experienced low flow conditions through maintenance of a minimum daily release of 2,780 cfs and in conjunction with other basin projects will function to meet the impending water supply needs. Low flow augmentation would reduce and stabilize upstream invasion of the 250 parts per million isochlor concentration within the lower estuary. This is the recognized maximum for potable water. Refer to section 2 above. Electric power which would be developed would assist in meeting the overall demand existing within the service area of the Pennsylvania-New Jersey-Maryland Interconnection.

Aside from providing an acknowledged significant contribution to regional power, an essential to sustained long term productivity, the project-associated power development will also provide financial reimbursement to the Federal Government on a continuing basis.

---

1/ This figure represents the future shad run as augmented by planned Delaware estuary improvement. Historically, the shad run commercial harvest averages 245,000 pounds (section 2).



7. Irreversible or Irretrievable Commitment of Resources Which Would be Involved in the Proposed Action Should it be Implemented.

Development of the Tocks Island project would cause the loss of the intrinsic value of free-flowing 37 miles of the Delaware and 8 miles of Flatbrook, a tributary stream in New Jersey. The project will temporarily disrupt the river ecology. In addition 10,000 acres of land would be permanently inundated, portions of which are either primary bottomland or upland habitat for wildlife. Some wildlife will be lost from filling of the lake. Historical features and archaeological artifacts which are not removed or relocated, prior to inundation will also be lost. The portion of the valley within the immediate impact zone of the project would also experience accelerated development requiring a vast commitment of economic resources. Assuredly changed land use will accompany this development. However, with implementation of the prepared Sketch Plan for the area, it is believed that a controlled, calculated commitment of these resources would prevail. 1/

With the exception of a large permanent rock face at the left abutment, occupation of the area by the project facilities does not in general constitute an irreversible or irretrievable commitment of resources.

The major resource commitments are less enduring and of restorable character. In areas of local protection works the natural stream banks will be lost and replaced with flood walls and levees. The corridor of relocated U. S. 209 due to grade adjustments requiring cut and fill represents an artificial land modification. These features could be removed and the area completely restored to its pre-project uses, should future generations find that such removal and restoration could serve some greater public economic or social good. The construction of the basic dam embankment although very massive does not preclude its alteration or removal. While truly a major undertaking, this change could be made for a compelling (and as yet unknown) future need.

1/ Preface to Planning: A Sketch Plan for the Tocks Island Region prepared by Raymond and May Associates for Pennsylvania State Planning Board and the New Jersey Department of Conservation and Economic Development, 1 Nov 1966.



8. Coordination with Other Agencies. During the advance engineering and design phase, coordination was maintained with various Federal and non-Federal agencies. In addition, comments were invited from these agencies as well as local interests on the Preliminary Draft Statement. The principal subjects of comments of these agencies and local interests on various aspects of the project or draft of the environment statement are as follows:

Bureau of Outdoor Recreation	Operation and drawdown
Bureau of Sport Fisheries and Wildlife	No comment
Department of Health, Education and Welfare	Sewage disposal, vector control and air pollution
Federal Power Commission	No comment
Federal Water Quality Administration	Liquid waste disposal
Delaware River Basin Commission	Full support of the project
Commonwealth of Pennsylvania	Waste disposal, drawdown, fish resources and mitigation lands
State of Delaware	Altered downstream flows
State of New Jersey	Requests further data
State of New York, Department of Environmental Conservation	Loss of resources, additional studies, and fish and wildlife resources
Delaware Valley Conservation Association	Nuclear power and hydrologic processes
Lenni Lenape League	Drawdown, power, stream and air pollution and fishery resources
Save New Jersey's Natural Environment	Drawdown, land loss and benefit to cost ratio
Sandyston Township Association, Inc.	Loss of tax ratables
Sierra Club, Atlantic Chapter, Eastern Pennsylvania Group	Ecology studies, land usage, fish and wildlife resources
Tocks Island Citizens Association	Drought control
Tocks Island Regional Advisory Council	Road relocation, water quality, natural resources and in-progress review
New Jersey Chapter Trout Unlimited	Benefit to cost ratio, power, flood control and fishery resources.
Environmental Protection Agency	Environmental considerations.

Many of the comments received were editorial in nature and where applicable have been incorporated into the statement. Also, the statement has been substantially revised to incorporate many of the environmentally related comments. The more significant comments are summarized below. Comments of a non-environmental nature are not considered appropriate for response in this environmental statement.



AGENCIES CONTACTED FOR DRAFT STATEMENT REVIEW

TOCKS ISLAND LAKE PROJECT

U. S. Department of the Interior  
Bureau of Outdoor Recreation  
Federal Building  
1421 Cherry Street  
Philadelphia, Pennsylvania 19102

U. S. Department of the Interior  
Fish and Wildlife Service  
Bureau of Sport Fisheries and Wildlife  
U. S. Post Office and Courthouse  
Boston, Massachusetts 02109

Department of Health, Education and Welfare  
Office of the Secretary  
Washington, D. C. 20201

Federal Power Commission  
Regional Office  
26 Federal Plaza  
New York, New York 10007

U. S. Environmental Protection Agency  
Federal Water Quality Administration  
Northeast Region  
John F. Kennedy Federal Building  
Boston, Massachusetts 02203

Delaware River Basin Commission  
25 State Police Drive  
P. O. Box 360  
Trenton, New Jersey 08603

Mr. Maurice K. Goddard, Secretary  
Department of Forests and Waters  
Commonwealth of Pennsylvania  
P. O. Box 1467  
Harrisburg, Pennsylvania 19120

Mr. Austin N. Heller, Secretary  
Department of Natural Resources and  
Environmental Control  
Natural Resources Building  
Dover, Delaware 19901

Mr. Richard Sullivan, Commissioner  
New Jersey Department of Environmental Protection  
P. O. Box 1390  
Trenton, New Jersey 08625



AGENCIES CONTACTED FOR DRAFT STATEMENT REVIEW

TOCKS ISLAND LAKE PROJECT (Cont'd)

Mr. Ronald W. Pedersen  
Department of Environmental Conservation  
State of New York  
Albany, New York 12201

Mrs. Joan Matheson  
Delaware Valley Conservation Association, Inc.  
Box 264, R. D. 1  
East Stroudsburg, Pennsylvania 18301

Mr. Henry W. Smith  
Lenni Lenape League  
Box 214, R. D. 1  
Washington, New Jersey 07882

Miss Ann Turner  
Executive Committee  
Save New Jersey's Natural Environment  
Price Street  
Branchville, New Jersey 07826

Mr. Harold Bailey, President  
Sandyston Township Association, Inc.  
R. D. 2, Box 222  
Branchville, N. J. 07826

Mr. Harold A. Lockwood, Jr.  
Sierra Club, Atlantic Chapter  
Eastern Pennsylvania Group  
2015 Land Title Building  
Broad & Chestnut streets  
Philadelphia, Pennsylvania 19110

Mr. J. K. Britton  
Tocks Island Citizens Association  
Box 204, R. D. 1  
Bushkill, Pennsylvania 18324

Mr. Thomas E. Klock, Director-Secretary  
Tocks Island Regional Advisory Council  
621 Monroe Street  
Stroudsburg, Pennsylvania 18360

Trout Unlimited, North and East Jersey Chapters  
c/o Mr. D. Ecker  
2200 North Central Road, Apt. 56  
Fort Lee, New Jersey 07024

Mr. Paul M. Felton, Executive Director  
Water Resources Association of the  
Delaware River Basin  
21 South Twelfth Street  
Philadelphia, Pennsylvania 19107



BUREAU OF OUTDOOR RECREATION

Comment:

1. Suggest existing unique features such as areas of historical, archeological and ecological interest should be included.
2. Expand discussion of operational features such as drawdown, which may cause environmental change or interfere with recreational uses. Indicate unique areas to be inundated.
3. Summarize seasonal operation of filling the reservoir and subsequent water discharge.

Response:

This has been included in the statement. Refer to Sections 7-1, 4, 3h in particular.

This has been included in the statement in Section 1-e. It is considered that to meet water supply needs during infrequently occurring prolonged droughts, the lake would be drawdown and previously submerged bank areas would be exposed along the shoreline. Depending on the severity of the drought, the estimated rate of drawdown would vary from a maximum of four inches per day with an overall average rate of drawdown of one inch per day over the recreation season. Over 80 percent of the lake's shoreline is steep-sloped and not subject to retention of waters. Although the remaining shoreline is flat-sloped, the soils within this region are free draining. Beaches and boat beaching areas proposed for recreational developments along the shoreline are planned to be constructed with sand-covered slopes within the recreational season drawdown zone. Boat launching ramps located within the same drawdown zone are planned to be constructed of concrete. The combination of the uniform rate of drawdown, free-draining soils and the proposed method of constructing recreational facilities within the drawdown zone is not expected to produce extensive adverse soil conditions during the recreation season. Objectionable soil conditions may occur at sporadic locations along the shoreline outside planned recreational areas, however, their extent can be controlled through landscape sculpturing. Complete elimination of adverse soil conditions is not possible nor would it be desirable for the overall ecology of the lake.

This has been included in the statement as section 1-d.



BUREAU OF OUTDOOR RECREATION (Cont'd)

4. Discuss effects of project development other than of the dam and reservoir, such as road relocation, which may adversely effect natural resource values in the project area.

This has been included in the statement. See section 2-2-j, 3i, 7-1.

5. Statement that excess river flows are wasted should be restructured or supported.

Statement has been restructured.



BUREAU OF SPORT FISHERIES AND WILDLIFE

Comment - Letter of 24 June 1971

Response

1. Indicates a need for control of sediment loads and pollution resulting from the construction activities.
2. Asks for assurance of effective passage of migratory fishes (mainly American shad) past the area during construction.
3. Will cooperate in producing proper design of permanent fish facilities in relation to the dam and pumped-storage features.
4. The Bureau does not expect fish and wildlife related uses of the reservoir and recreation area to loom large in terms of recreational use.
5. The Bureau expects resident fish values to increase substantially from the addition of the reservoir fishery. It is also expected that small but significant improvements of the fisheries for resident fishes in the river both below and above the dam.
6. Even with proper fish facilities, we expect small losses will occur in the number of American shad as a result of elimination of spawning area in the reservoir site and losses associated with fish passage. The consensus judgment, however, is that they would dwindle to a fraction of the without-project potential.

Existing Corps requirements will be followed by contractors during construction so as to reduce increased turbidity, air pollution, water pollution, land despoilment, noise pollution, sediment control, etc.

A fishway will be provided during construction that will be adequate for fish passage prior to completion of the project.

A permanent fish facility will be included. It will consist of a fish ladder or other facility which would be coordinated with the Fish & Wildlife Service.

No reply required.

The Corps concurs.

The Corps concurs.



BUREAU OF SPORT FISHERIES AND WILDLIFE (Cont'd)

Comment

Response

7. Oyster and other estuarine fishery values will be maintained or possibly increased.

The Corps concurs.

8. Wildlife values of the reservoir site lands will be eliminated but improved management of the reservoir shorelands, the national recreation area, and mitigation lands is expected to reduce losses to a minimum as contrasted to the case without project development.

No reply required.

9. Concludes that no fish and wildlife related basis is apparent that justifies objecting to construction of either the Tocks Island Dam and Reservoir or the Kittatinny Mountain project.

No reply required.



DEPARTMENT OF HEALTH, EDUCATION AND WELFARE

Comment:

Consist primarily of an assessment of the project in terms of their interest and are generally favorable. They have outlined the following areas for consideration in the statement.

1. vector control
2. Disposal of cleared material, brush, etc., during construction.
3. Treatment of land disposal sites.
4. Air pollution, particularly from burning of cleared material which is prohibited under New Jersey law.

Response:

This has been added to the statement.

This has been added to the statement.

This has been added to the statement.

The statement regarding prohibition of burning under New Jersey law is incorrect; this restriction is contained in a proposed law. Should pertinent laws change, the disposal plans would be altered to fully conform to such updated provisions.



FEDERAL POWER COMMISSION

Comment:

No statement to make at this time with respect to the environmental impact of the conventional or pumped storage installation at the project.

Response:

Conventional power only is authorized for Federal development. The environmental impact of combined conventional-pumped storage development will come under review when the Kittatinny Mountain Project is processed by DRBC and FPC.



FEDERAL WATER QUALITY ADMINISTRATION  
(Now Water Quality Office, Environmental Protection Agency)

Letter of 22 October 1970.

Comment:

Findings and conclusions furnished in their report, "Water Quality Control study - Tocks Island Reservoir, Delaware River Basin", 1966, are still essentially applicable. Also commented on the study of liquid waste disposal in the Tocks Island Basin Commission.

Letter of 4 January 1971.

Comment:

Draft statement furnished does not provide sufficient information to make the review required by the National Environmental Policy Act. Request design memo, etc.

Response:

The approach to be used by the Corps of Engineers in coordinating with the Water Quality Office and the DRBC is now outlined in section 3j.

The Water Quality Office has in the past (as FWQA) provided water quality reports on this and other similar projects without the design memo level of information. Additional coverage of water quality related material is furnished throughout the text in this revised Environmental Statement. Specific references include section 2-1-d and Table 2-1. A courtesy copy of the revised and expanded statement has been circulated to the EPA.



DELAWARE RIVER BASIN COMMISSION

Comment:

Tocks Island Lake, the National Recreation Area, and pumped storage as a project purpose all are components of the Comprehensive Plan of DRBC. The jurisdiction and work of DRBC directly and indirectly involve the multi-purpose project—ranging from determination of the needs of the project benefits to administering and sale of water supply.

No comment required.

The project has been planned since its authorization in consultation with DRBC in accordance with the legal requirements of Article 11 of the Delaware River Basin Compact. Further, under the requirements of the Project Review provisions in Section 3.8 of the Compact, the engineering details of the project will be subject to approval by the Commission prior to construction.

DRBC staff has consulted on a continuing basis with the Corps with regard to its extensive comments on the working drafts of the environmental statement on the Tocks Island Lake subsequent to the original brief preliminary version.



COMMONWEALTH OF PENNSYLVANIA

Comment:

Request coverage of:

1. Breakdown of mitigation land between states.
2. Disposal of wastes as result of increased population.
3. Pumped storage and its implications.
4. Effect of drawdown.
5. Omitted fish species.
6. Trout fishing below dam and effect of cold water release for trout on shad fishery.

Response:

This has been added to the statement in summary section 2.

This is a regional problem more pertinent to the area outside the project and is now under study by the Delaware River Basin Commission and the Tocks Island Regional Advisory Council. See also section 3j.

A separate environmental statement for the pumped storage project has been submitted to the Delaware River Basin Commission by the sponsors of that project.

This has been added to the statement; see section 1e.

This has been added to the statement; section 2-2-d and 3-d.

This matter will be coordinated through the U. S. Fish and Wildlife Service, the state fish agencies, and the Corps of Engineers.



STATE OF DELAWARE

Comment:

1. Restates the State position concerning flow releases ("would not exceed 3000 cfs"... "should not fall below 3000") from Tocks Island as measured at Trenton.
2. Expresses concern over the transfer of the dissolved oxygen sag now occurring in the Philadelphia area into Delaware waters.
3. States that oyster beds can be adversely affected by fluctuation in salinity above or below the norm.
4. Expresses concern that effective fish passage around the dam can be provided for shad and other anadromous fish.
5. Emphasizes the interrelationship of improved water quality standards in the Philadelphia - Camden area to Tocks Island flow releases.

Response:

Established flow requirements and their origin and justification are discussed in section 1-a and 2-1-g.

This phenomenon is presented in section 3-b of the statement.

This data has been incorporated in the statement in section 2-2-b.

A fish passage facility with a capacity of 500,000 fish is planned for the dam.

This interrelationship is recognized in the statement.



STATE OF NEW JERSEY

Comment:

Before furnishing substantive comments the State requests any available updated information.

Response:

The features within the expanded Draft Statement will be discussed with New Jersey.



STATE OF NEW YORK - DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Letter of 25 November 1970.

Comment:

1. The current status and benefit-cost ratio of the project should be incorporated into the statement.
2. Statement should include some discussion of inter-relationships between Tocks Island and other Federal, State and local agency projects in operation or under consideration.
3. Adverse environmental effects, such as effect of the lake on nutrient needs of downstream aquatic vegetative and animal life and on area ground water levels, should be provided in the statement.
4. Further information on effect of alternative to project development of "no action" should be included in statement.
5. Discuss possibility of re-establishing existing environment within the project area if significant environmental effects result from project development.

Letter of 6 January 1971.

Comment:

1. Recommend further study of possible effect on natural and scenic resources resulting from loss of 37 miles of free flowing river and 10,000 acres of bottom-land versus flood control and hydroelectric power benefits.

Response:

Information has been provided.

This information is now provided on various new sections. Refer to index.

Information on these subjects provided in Section 3 above.

Further description of this alternative provided in Section 5 above.

Discussion presented in Section 7 above.

Response:

Previous studies and planning documents, especially Comprehensive Study of the Water Resources of the Delaware River Basin (refer to Section 5 of the Environmental Statement) adequately cover the trade-offs in resource allocation made in formulating the regional plan.



STATE OF NEW YORK - DEPARTMENT OF ENVIRONMENTAL CONSERVATION (Cont'd)

Comment:

2. States that 100-mile radius used to analyze recreational potential and effectiveness of site is misleading.

3. Suggest that possible adverse environmental impact and effects may require further study before project implementation.

4. Question whether reservoir drawdown can effectively control species of rough fish as recommended in U.S. Fish & Wildlife Service report.

5. Cover loss to New York State's natural resources, i.e., shad sport fishery and include potential damage to fishery resource if Fish and Wildlife Service recommendations are not followed.

6. Add detail to discussion of environmental impact alternatives, such as cost.

7. Cover developmental impact around Port Jervis in more detail.

Response:

The 100-mile radius referred to was arrived at through a series of meetings with the National Park Service, the Bureau of Outdoor Recreation and the Corps of Engineers. Cognizance was taken of the demand for recreational facilities in the area and success in meeting this demand through existing and projected facilities. It is considered that they are not meeting the present demand.

In cases where recognized deficiency in data or knowledge exists additional studies are underway or planned. As an example the effect of impounded water on the ground water table in the Matamoras area is under study

Recommendation of this technique is based on study of project by U.S. Fish and Wildlife Service, which has experience in the field.

The environmental impact on Basin fishery is covered throughout the Environmental Statement. Refer to Sections 1-f, 2-d, 3-d, and 4-d in particular.

The section on alternatives has been expanded and includes greater coverage on economics.

This is now treated in the statement. See section 7, 4a, summary section 3.



DELAWARE VALLEY CONSERVATION ASSOCIATION

Comment:

1. The statement fails to place this particular 40-mile stretch of the Delaware River in its overall context in the total Delaware River system and therefore the major systematic impact of the project goes without any indication whatsoever.

2. The statement fails to relate the 25,000 acre area of the project to the 1,200 square mile Minisink aquifer and watershed, which will be radically debased by the concomitant exploitation of the Tocks Island Regional Development Plan.

3. The statement does not mention the planned nuclear power plants, both downstream and upstream of the lake, which constitute the real backbone of the comprehensive plan for the Delaware River Basin.

Response:

Additional descriptive information provided in section entitled "Environmental Setting Without the Project."

Ground water tables in the Delaware Valley Area surrounding the project will be enhanced by the impoundment. Water supply for small communities will be more plentiful and can be easily obtained from wells drilled through the glacial overburden. Questions on the effect of the Tocks Island Regional Development Plan on the watershed and aquifer should be more properly directed to the Tocks Island Regional Advisory Council, the agency coordinating the planning for the area surrounding the project.

No nuclear power plants are proposed for development by the Federal Government within the Basin. Particular plans of private interests for future development of such plants within the Basin must be submitted to The Delaware River Basin Commission and Federal Power Commission for approval. In addition, nuclear power plants are not the backbone of the Comprehensive Plan.



LENNI LENAPE LEAGUE

Comment:

1. Environmental statement is shallow; does not cover the questions brought forward by conservation groups.
2. Most important disadvantage to the Delaware River Valley as result of constructing dam is annual drawdown which will range from 18 to 56 feet per year and the ecological effects thereof.
3. Daily drawdown created by proposed pumped storage power system will have detrimental effects on the ecology of the area.
4. Thermal effect of Portland Electric Generating Station on cold water releases for trout.
5. Ecological effect caused by visitation of 10.5 million people per year.

Response:

Statement has been expanded.

The statement has been expanded to cover drawdown data and proposed operation. The 56-foot drawdown is over a full water year and would only occur one year out of a hundred and most likely during the early winter. The normal drawdown during the recreation season is seven feet. Plant and animal life along the shoreline will be affected, the results of which cannot be predicted. Sediment deposition, and confined flats of mud are not expected as 80% of the shore line is steep sloped and the soil is free draining. The area will be reviewed and drainage developed for those areas where stagnation would be a problem.

Proposed pumped storage developments and their inter-relationship to the Tocks Island project are now discussed in the statement. Specific environmental issues will be addressed by the Federal Power Commission during their review for approval.

The heat effect of non-nuclear power plants of this type is minimal except for the immediate area of the effluent.

Under controlled conditions visitation should not prove excessive. A number of Corps of Engineers reservoirs approach 10 million visitors annually without adverse impact. Estimated ultimate peak day visitation at Tocks Island is 142,000.



LENNI LENAPE LEAGUE (Cont'd)

6. How will the sewage from the visitation in the initial stages of the project be handled?

Required sewage treatment facilities will be provided either as independent facilities or as part of the Delaware River Basin Commission plan.

7. What effect will regional sewage treatment plan being investigated by the Delaware River Basin Commission have on the lake and the lower Delaware River?

This topic is now addressed in section 3.j of the revised statement.

8. Plan does not provide protection for pollution entering the lake from the upper reaches of the Delaware River.

This is considered a problem to be resolved between the Delaware River Basin and the bordering states.

9. Has the sewage element been considered in the cost of Tocks water quoted by the District Engineer?

The cost as quoted by the District Engineer was addressed to water supply storage costs only.

10. The denuding of 16,000 acres of forested land will reduce the oxygen production for east coast regions.

Recent reports (Vol. 21, No. 4, p. 163) in Bioscience tend to allay this fear.

11. How many smaller dams in the tributaries would be required as an alternative measure?

Three-hundred sixty-eight sites were studied; to implement this type of alternative plan would require construction at more than 100 of the 368 sites studied.

12. Why was pumped storage still an alternative for conventional hydroelectric power?

Pumped storage is not an alternative to conventional power. Pursuant to PL 91-282, the conventional power potential may be developed by the New Jersey companies or incident to their development of the pumped storage power.

13. Refers to construction of jet engine driven power producing plant in Florida that does not necessitate use of water and suggests that this option should be considered.

The load factor to be accommodated with the Tocks Island power installation is about 20% - too high for economical use of the jet engine option. The water being used (run-of-the-river releases) is that which has to be released for downstream use.

14. Refers to compressed air, pumped storage, gas-powered turbines and cycling boilers for power and states that a power plant should not be located within a National recreation area.

These plants produce more detrimental environmental problems than hydropower which is a clean form of power.



LENNI LENAPE LEAGUE (Cont'd)

15. Effects on wild animal life from visitation of 10 million people per year.

Sufficient areas are planned for mitigation of lost wildlife habitat. There will, however, be detrimental effects on wildlife from human visitation to the entire region. Visitors to the project will be largely concentrated in specific areas aggregating only a small part of the total area, leaving a major part of the area for use by wildlife.

16. What adverse effect will project have on shad as regards successful use of fish ladder, progress upriver after they get over the dam and return to sea after hatching?

Effect is being determined through coordination with U. S. Fish and Wildlife Service. They believe a fish ladder, allowing fish to traverse the lake and return to the sea, can be successful. Study on this item is continuing.



NATIONAL PARK SERVICE

Comment:

1. Suggests added emphasis on the comprehensive studies of the 1950's.
2. Points out that meeting the needs for water supply, flood control and recreation have positive environmental impacts.
3. The statement should contain confirmation from the Pennsylvania and New Jersey State Liaison Officers for Historic Preservation that the project does not adversely affect any listings in their respective State Register of Historic Places. It should also contain a notice that no properties on the National Register of Historic Places are endangered.
4. NPS is not sure whether or not the DWGNRA could legally proceed without the Tocks Island project; mentions that a legal opinion would be needed to clarify this.
5. With regard to item 7 on Page 8-25, we agree that area to be included in the combined Tocks Island Project and Delaware Water Gap National Recreation Area does not meet Wilderness Act criteria for designation as Wilderness. It should be noted that the National Park Service has classified 24.9% of the total area as either primitive or outstanding natural areas, and an additional 47% has been classified as Natural Environment. Thus, nearly half of the total land and water surface will be managed for extensive rather than intensive recreation, and over one fourth will be managed as primitive area, very similar to a designated wilderness area.

Response:

Adequate historical coverage is now provided in the statement introduction.

This point is implicit throughout the entire text of the Environmental Impact Statement.

A statement to the effect that no properties on the National Register of Historic Places are endangered is now included in section 1-g.

Resolution of this technicality remains chiefly academic as present Federal policy environs full development of both projects.

This has been included in this response.



NATIONAL PARK SERVICE (Cont'd)

Comment:

6. Asks that the figures in Table 2-5 be reviewed in light of the NPS Master Plan. Questions whether hunting use of lands within the exterior boundaries of the DWGNRA would decline to the extent shown.

Response:

Table 2-5 draws largely upon U. S. Fish and Wildlife service data; the data included will be reviewed in subsequent inter agency coordination meetings.



SAVE NEW JERSEY'S NATURAL ENVIRONMENT

Comment:

1. Drawdown of the lake during drought periods to meet water supply demands would expose soil banks and reduce recreational use of the lake.
2. Highway congestion would result from development of the project and would not permit recreational use of the lake.
3. Project lands and resources could not support the expected influx of visitors to the project.
4. Old Mine Road is a country lane along the northern Delaware border which has retained its wilderness quality and historic authenticity and should be preserved in its entirety.

Response:

See "Response" (2) under Bureau of Outdoor Recreation.

Adjoining states are preparing regional transportation plans which would provide for maintaining free flow of traffic into and around the project. Highway capacity at times will be exceeded; however, with freedom of access to the lake's shoreline and a highway management program, such occurrences should be minimal.

A comprehensive land and water resources master plan will be developed which would describe and locate the regions of flora, fauna, land, water and cultural resources. The plan would present programs for preserving these features and would serve as a long-range guide for development of individual area plans. The initial plan of recreational development at the project is of limited scope, representing but a portion of the resource potential. From experience gained from initial attendance, proper control of the effect on the project's resources can be carried forth in development of the projects ultimate carrying capacity.

Old Mine Road is not considered to be a country lane but a secondary road by reason of the type of construction and the volume of traffic. Further description of the historical value of this route has been provided in Section 2. Due to the average elevation of the existing road, the estimated cost to preserve the entire portion lying within the project boundary is prohibitive. Levee systems which would have to be constructed to protect the road from normal storage would significantly reduce the wilderness character of the route. Preservation of a selected portion of the route in its natural setting in a traffic free condition is considered a reasonable alternative.



SAVE NEW JERSEY'S NATURAL ENVIRONMENT (Cont'd)

5. Present Federal land acquisition practices are inappropriate and taxpayers who will remain within Warren and Sussex Counties in New Jersey will be forced to pay a higher than normal tax burden as a result of acquiring county properties for project development.

Experience with projects of comparable character indicate that the tax base will actually increase over the long run.

6. The capability of Tocks Island Lake would be diminished by the Corps of Engineers dam proposed to be developed upstream at Knights Eddy, New York.

The Corps of Engineers has no proposal for a dam at Knights Eddy, New York.

7. Recreational losses such as second homes and camp facilities acquired for the project, Old mine Road and lands and businesses acquired for construction of new highways are not included in the project overall benefit cost ratio.

These losses are now recognized within the statement in several sections.

8. The oyster industry in Delaware Bay will cease to function if the project is developed.

The proposed method of operating the lake during the period from 1 April to 30 June when the oyster resources are most dependent on river flows has been the subject of intensive coordinated study by the U.S. Fish and Wildlife Service and the Corps of Engineers. The Corps of Engineers has modified the lake operation program as a result of this study and the Bureau of Sport Fisheries and Wildlife and the Bureau of Commercial Fisheries of the U.S. Fish and Wildlife Service have concluded that the operation program will not damage the oyster resources.

9. The proposed method for operating the lake during the spring will not permit refilling of the lake to meet summer water supply needs.

As the lake operation program during this period provides for downstream release of all inflows to the lake (except for flood inflows greater than downstream channel capacity), lake inflow would equal lake outflow. Except for surface evaporation, which itself will be partially offset by eliminating transpiration from 10,000 acres of inundated vegetative lands, operating the lake to provide for oyster resource needs during this period will not cause a drawdown of the lake. Water supply needs could still be met. However, as the lake will remain at the same elevation throughout the three-month period as that encountered on 1 April of each water year,



prolonged droughts over the winter months may cause the pool to be drawn down below the top of the water supply pool on that date. Although such a condition would occur on an infrequent basis, the project's total water supply capability would be reduced slightly. Further study is in progress to determine means of maintaining full lake capacity for water supply needs under this condition.

10. Preservation is not a genuine motive of the project as scenic, scientific and historic features will be destroyed for development.

In accordance with the Master Plan for the project, scenic and scientific features located above the normal pool elevation will be preserved in their natural setting. Historic and archaeological survey programs within the project area have determined the location of significant features, artifacts representative of various cultural periods have been selected for location beyond the effects of the lake for full enjoyment of the visitor. Representative flora are also proposed for removal from within the pool area and would be relocated within recreation areas to enhance interpretive values. The remaining scenic scientific and historic features located in the area below the normal pool level not selected for preservation will be irretrievable once the pool is filled.

11. Lands (880 acres), in addition to those acquired for project development, are planned to be acquired within Sussex County for wildlife mitigation lands, thus placing a further tax burden upon remaining residents.

The specific location of lands to be acquired for wildlife mitigation purposes has not been determined and is a subject of further study between the U.S. Fish and Wildlife Service and the affected state fish and game agencies.

12. The Delaware River, in its present condition, can better serve the projected water related needs of the basin. The lands acquired for the project to date can be used to establish a National Recreation Area.

In its present state, the Delaware River could not meet the region's future gross water demands, particularly during summer low flow periods. Developing this resource for recreational needs only would be a wasteful and inefficient use of the resource and would not provide the same capacity for recreation as would be achieved through development of the Tocks Island and Delaware Water Gap National Recreation Area projects. In addition, such a proposal ignores the required needs for water supply, flood control and hydroelectric power. These needs would therefore have to be met through development of additional land and water resources.



SANDYSTON TOWNSHIP ASSOCIATION, INC.

Comment:

The Association backs the conservation and municipal groups in their opposition to the project and their requests for project deauthorization. They suggest an investigation in the use of all natural resources, question the legality of the Delaware River Basin Commission and refer to the Delaware River Basin Compact which they state contains provisions for reimbursement to localities for loss of ratables for which they claim reimbursement has not been received.

Response:

Comments are not related to environmental impact.



SIERRA CLUB, ATLANTIC CHAPTER, EASTERN PENNSYLVANIA GROUP

Comment:

1. Questions the validity of the statement because it is not based on current ecological statements.

Response:

Study and coordination with the Fish and Wildlife Service and other cognizant environmental agencies are continuing for the purpose of evaluating the impact. The U. S. Fish and Wildlife Service prepared reports (circa 1970) in coordination with the basin states' fish and game agencies, on the fishery and wildlife affected by project development. The Federal Water Quality Administration (now part of the Environmental Protection Agency) prepared a report on water quality for the project in 1966; reviewed the report in November 1970 and found the conclusions drawn from their initial study remain without need for change.

2. Project is not being incorporated into a comprehensive plan of water resources development.

The Tocks Island Lake is the largest of the 19 major projects recommended in the Comprehensive Basin Plan as a result of the comprehensive study of the entire Delaware River Basin as documented in House Document No. 522, 87th Congress, 2d Session. This study was reported in 1962. The DRBC has incorporated the project in the Comprehensive plan for water resource development of the Delaware River Basin.

3. Reduced downstream flows resulting from operation of the project will cause adverse effects on ecosystems downstream of the project.

The aggregate of flows in the river downstream of the dam will not be reduced by operation of the project. The project will reduce the maximum flow of the river and store the water for more critical. Conversely, during very low flow periods the natural stream will be supplemented by water from the reservoir in order to prevent more serious pollution and salt water intrusion problems downstream.



SIERRA CLUB, ATLANTIC CHAPTER, EASTERN PENNSYLVANIA GROUP (Cont'd)

Comment:

4. Requests assurance that the river upstream of the dam will be maintained as a free-flowing stream including preservation of the surrounding wilderness values.
5. Request assurance that pool fluctuations due to the operation of the project will not cause undesirable shoreline soil conditions that would negate the contemplated recreational benefits.
6. Requests assurance that a natural aquatic ecosystem be permitted to develop the reservoir, including the maintenance of water quality and the regulation of activities on the reservoir, compatible with the development of a natural ecosystem.
7. Set aside a wilderness area equivalent in size and quality to that used for the dam, reservoir, recreation and roadways.

Response:

The Corps of Engineers does not have jurisdiction over the use of the river upstream of the project. The Corps recognizes that preservation of the upstream reaches of the river as a free flowing stream will enhance the Tocks Island project.

See Response (2) to Bureau of Outdoor Recreation above.

An aquatic ecosystem natural to the lake will develop in time. Maintenance of water quality is a goal prescribed by the Federal Water Pollution Control Act Amendments of 1961. Recreation activities on the lake will be zoned so as not to upset the nearby developed ecosystem.

Area being taken for use cannot be classified as a wilderness area and with time would certainly be developed in a more haphazard fashion than now contemplated. The National Park Service has provided the following assessment. "...we agree that area to be included in the combined Tocks Island project and Delaware Water Gap National Recreation Area does not meet Wilderness Act criteria for designation as Wilderness. It should be noted that the National Park Service has classified 24.9% of the total area as either primitive or outstanding natural areas, and an additional 47% has been classified as Natural Environment. Thus, nearly half of the total land and water surface will be managed for extensive rather than intensive recreation, and over one fourth will be managed as primitive area, very similar to a designed wilderness area."



SIERRA CLUB, ATLANTIC CHAPTER, EASTERN PENNSYLVANIA GROUP (Cont'd)

Comment:

8. Add water use balance sheet to the statement to demonstrate that all purposes can be served.
9. Proposed dam will require the construction of additional dams, power generating facilities or other projects which would impair the environmental values of the area.

Response:

Not considered an environmental element.

Refer to the introduction section.  
The project is the largest of eight Federal control projects authorized for construction by the Flood Control Act of 1962. The several projects together constitute the development of the resource as explained in response (2). Tocks Island Dam will not, by virtue of its existence, require that other dams or generating facilities be constructed.



SIERRA CLUB, ATLANTIC CHAPTER, EASTERN PENNSYLVANIA GROUP (Cont'd)

Comment:

10. Assurance that existing historic and archaeological sites be inventoried, interpreted, managed and preserved.
11. No need to impound normal stream flow, which is minimal in the summer as it is, and requests that the anticipated filling time be included in the statement.
12. The statement that the project will serve the purpose of flood control inclusive of fish and wildlife, is felt to be misleading or in error in that the composition of the fishery at the section of the river to be inundated will be changed, probably to one characterized by the common sucker.
13. Addition of a breakdown of the affected lands based on soils units and soil capabilities which should include agricultural lands to be affected and their percentage of the total agricultural lands of each township and county.
14. Present information on use and harvest of the Delaware fisheries in order to demonstrate the tremendous recreation industry presently supported by the river.
15. Description of the main game animals of the area should be expanded to include the squirrel and opossum. A list of all the fauna of the region should also be included.
16. Data on stability of the pool level should be included to correct the impression that a stable 12,425-acre impoundment will exist at all times. Further, the term "normal summer reservoir pool" is misleading because of extreme pool fluctuations.

Response:

Statement expanded to more clearly describe the extent of the work.

Comment results from a misinterpretation of the project description. Estimated filling time has been included in the statement.

The views are counter to those of the Fish and Wildlife Service which is responsible for evaluation of the effects of projects on the associated fisheries. The Service's view is included in the statement.

More detailed information about the area soils and the agricultural lands affected by the project has been included in the statement; however, ecology is not affected by political boundaries.

Available data on recreational fishing of the river has been included in the statement. Such use is severely limited at the present time. The public has direct access to only about 5% of the river shoreline because of private ownership of adjacent lands.

The statement has been so modified.

The statement indicates land use and not pool level stability. Information on pool stability has been included in the statement.



SIERRA CLUB, ATLANTIC CHAPTER, EASTERN PENNSYLVANIA GROUP (Cont'd)

Comment:

17. There seems to be no reason to mention the Delaware Water Gap National Recreation Area in the statement except to obscure adverse environmental impacts.

18. If the reservoir drawdown practices are employed for the removal of trash fish, the reservoir pool will not be functional for other project purposes. Such drawdown will cause water quality and sedimentation problems downstream.

19. During the critical months for fisheries reproduction, April and May, the reservoir will fluctuate an amount between 3 and 12 feet, as a conservative estimate.

Response:

The Delaware Water Gap National Recreation area is described in conjunction with the reservoir project to provide an understanding of the aggregate attractions that will draw an estimated 10 million people annually. No known adverse environmental effects are obscured by this description.

Drawdown will be controlled so as to be consistent with other project purposes. The actual drawdown program for control of rough fish populations within the lake will be established in coordination with cooperating state fish and game agencies. The reservoir outlet works will be equipped with discharge gates located such that water can be released from the level of the reservoir that contains water of the most desirable quality. No appreciable amount of silt will be released with these discharges except during periods when inflows cause the reservoir in general to be turbid. In this event considerably less silt will be released than is contained in the normal river flows. See Response to Bureau of Recreation above for further discussion of drawdown.

During the months April, May, and June the reservoir will be operated such that outflows are equal to inflows except in the case of very high river flows in which case flood water skimming will be performed to prevent flood damage downstream.



SIERRA CLUB, ATLANTIC CHAPTER, EASTERN PENNSYLVANIA GROUP (Cont'd)

Comment:

20. The fluctuating nature of the reservoir may eliminate successful spawning of northern pike, chain pickerel, muskellunge and walleyes.

21. It is very doubtful that the fluctuating reservoir level will permit the establishment of rooted aquatic vegetation, thus, the problem of shoal area turbidity and siltation will be real rather than just possible.

22. Because of the undesirable spawning conditions, it is questionable whether the most important predatory sport fishes of the region, the escocidae, will be able to establish and maintain themselves in the reservoir. Lack of these predators will permit the suckers to develop unchecked as they grow too large before entering the reservoir for other than the escocidae to ingest them.

Response:

As noted in response to the previous comment, the lake level is expected to be quite stable during the critical spawning months. A special team of fish biologists completed a three-year study on the effect of pool fluctuations on the spawning habits of several species of nest building and non-nesting fish. The results of this controlled experiment indicated that most fish adapt very well to the unstable surface conditions and spawn successfully. On the other hand, no factual disclosures have been made to the contrary.

This is a valid comment in that it also expresses uncertainty as to whether rooted aquatic vegetation will develop. There is no known way to establish this with certainty until the reservoir has been in operation. Some varieties of aquatic plants may be successful while others fail.

Actual pool level fluctuations during the critical spring months will be only a fractional part of that upon which the prediction of failure of the Escocidae was based. For want of factual data on precisely what conditions are required for their survival and in view of the fact that they do inhabit man-made multipurpose reservoirs, it is presumed that there is an excellent chance that they will survive in this reservoir. The report prepared by the U. S. Fish and Wildlife Service regarding the fishery of the project did not cite this as a major problem.



SIERRA CLUB, ATLANTIC CHAPTER, EASTERN PENNSYLVANIA GROUP (Cont'd)

Comment:

23. Issue is taken with the use of the positive verb "will" in the statement: "Incorporation of the Fish and Wildlife recommendations will significantly increase the resident sport fishery - - -." The Sierra Club feels that available data and hypothesis indicate a probable decline and eventual extinction of the sport fisheries.

24. The 880 acres of wildlife mitigation lands is not adequate to offset the loss of habitat destroyed by the project.

25. Flooding is intermittent, not constant. There is no evidence of any "inherent fear" of flooding.

26. The economic development of some 4,000 acres of presently undeveloped land is a negative environmental benefit.

27. Add a listing of the botanical stations to the statement.

28. Natural resources such as peat bogs, gravel pits, to be inundated are not mentioned.

Response:

Further information on the view of the Fish and Wildlife Service and the cooperating state fish and game agencies on project effects has been incorporated in the statement. The U. S. Fish and Wildlife Service is responsible for evaluating the fisheries resources at Federal water resource projects. There seems to be inadequate justification for questioning its judgment in this instance.

Land being inundated is not largely unused wilderness area available for wildlife habitat. Information concerning present land use is included in the statement. The acreage of required mitigation lands was the recommended consensus of the Fish and Wildlife Service who coordinated evaluation of the project's effects on fish and wildlife resources with the basin's fish and game agencies.

"Constant" has been changed to "frequent".

Comment is in part correct. Loss of wildlife due to intermittent and rapid flooding limits its present value as habitat.

Information now included in paragraph 3.

Information now included in paragraph 3.



SIERRA CLUB, ATLANTIC CHAPTER, EASTERN PENNSYLVANIA GROUP (Cont'd)

Comment:

29. Add information on sites of archaeological interest.
30. Add information on summer homes, motels, campgrounds, and hunting and fishing clubs to be displaced.
31. The environmental impact of the relocation of Route 209 has not been presented.
32. During the first 5 to 6 years of construction, no shad will be allowed to pass the site.
33. The downstream migration of shad fingerlings through the relatively still water of the reservoir past the turbines and into the river downstream of the dam is questionable.
34. Downstream siltation during construction would seem to be a problem.
35. Ultimate eutrophication of the impounded waters is a possibility.

Response:

- Information now included in paragraph 3.
- Information now included in paragraph 3.
- Information now included in paragraph 3.

Provisions for passing shad during construction are included in project planning.

Admittedly, there is little proven information concerning precisely what conditions will prevent downstream migration of fry or the upstream migration of the adult shad. However, this project appears to offer no more obstruction to migration in either direction than does the Holyoke Water Power Company's reservoir on the Connecticut River or the several Corps' reservoirs on the Columbia River. In these instances shad are moved upstream by elevator and fish ladder, respectively, and are given no assist downstream. As the shad runs are on the increase, it is presumed that the projects have little adverse effect.

Special measures will be taken to minimize turbidity of the river during construction. Plans for this work are being coordinated with the appropriate Federal and State agencies.

Enforcement of the water quality standards that have been set by the Delaware River Basin Commission and the appropriate state agencies should minimize the possibility of serious eutrophication. In the event that the serious eutrophication does occur the contaminated water can be released from the reservoir so that dilution with fresh water will sufficiently reduce the concentration of the contaminant so as to control the adverse effects.



TOCKS ISLAND CITIZENS ASSOCIATION

Comment:

Statement should include further information on the drought control capability of the project.

Response:

Desired information has been incorporated into the statement.



TOCKS ISLAND REGIONAL ADVISORY COUNCIL

Comment:

Supports the project, however, has statements of a general nature, such as:

1. Suggestion for in-progress review.

2. Water in reservoir should be maintained at maximum quality level.

3. Insufficient consideration shown in U. S. Route 209 relocation for environmental impact of stream crossings and performance standards during construction.

4. Lake must be maintained for game and anadromous fish through construction of a fish ladder, design of the penstock openings and grading of banks to discourage propagation of trash fish.

Response:

The Corps under its established environmental guidelines for the Civil Works Program requires that, during the planning, design, construction and operation phase, a continuing in-progress review be maintained to assure that environmental aspects are enhanced, protected, preserved or restored at every stage of development and utilization.

The DRBC and State regulatory agencies have responsibility for surveillance and criteria of water quality in the basin which would affect inflow to reservoir and its consequent water quality. The Corps would coordinate with DRBC to assure maximum water quality level in the reservoir.

This will be resolved in the design stage, however, the environmental statement includes supplemental information on the relocation of U. S. Route 209.

The project has always contemplated incorporation of the features recommended by the Council.



TROUT UNLIMITED, EAST AND NORTH JERSEY CHAPTERS

Comment:

1. Damages resulting from this development are likely to be of substantial, irreversible and permanent consequence.

2. Necessity for creation of project is not proven.

3. Justifying the project with a benefit-cost ratio analysis does not take all pertinent factors into consideration.

Response:

The U.S. Fish and Wildlife Service, through its Bureaus of Sport Fisheries and Commercial Fisheries, coordinated efforts of the basin state's fish agencies in studying and evaluating the effects of project development on the fishery resources of the basin. The Service also coordinated efforts of these agencies in studying and evaluating project effects on the basin's wildlife resources. In addition to these efforts, the Federal Water Quality Administration (now part of the Environmental Protection Agency) studied and evaluated the effect of project development on water quality of the Delaware River. The results of these studies are summarized in paragraphs 2 and 3 and evaluated in paragraph 4. Known irretrievable or irreversible commitments of resources are described in paragraph 7.

House Document No. 522, 87th Congress, 2d Session, describes in minute detail the reasoning which led to formulation of the overall Delaware River Basin Plan of which this project is a major element.

The benefit-cost ratio for the project is used to establish the relationship existing between tangible benefits and costs associated with project development. To pass judgment on any proposal, one must also analyze the intangible benefits and costs attributed to that proposal. Although these intangible factors cannot be quantified, they were analyzed sufficiently to permit Congress to make a judgement decision of the projects overall effects and merits.



TROUT UNLIMITED, EAST AND NORTH JERSEY CHAPTERS (Cont'd)

4. Private development of a fossil-fuel steam electric plant on the New Jersey coast would serve the same load requirements as the conventional power plant to be installed at the project and would eliminate one of the primary purposes of the project.

5. Since the disastrous flood of 1955, numerous flood control structures have been constructed on the Upper Delaware River and metropolitan water supply demands have reduced the flowage volume of the river, thus negating the need for the flood control purpose of the project.

6. Future out of basin water supply demands could more rightfully be met by rehabilitation of the Hudson and Passaic Rivers.

7. The proposal to provide 880 acres of wildlife mitigation lands as an offset to loss of wildlife habitat within 16,000 acres of lands to be either permanently or temporarily flooded by the project is an exhibition of the Corps of Engineers total disregard for environmental consequences.

A fossil-fueled steam plant would not serve the same load requirements as a project conventional hydroelectric power plant. The fossil-fuel steam plant alternative proposed serves continuous or "baseload" power requirements. The conventional hydroelectric plant authorized would serve as a "peaking" plant, i.e., one needed to supply additional power required during hours of peaked demand only. While the project's portion of the basin's power needs would be required to serve the remaining project purposes of flood control, water supply and recreation. Further, the power plant uses run-of-the-river releases only (average daily flows will serve other purposes and will not be modified to satisfy any power needs) and in non-polluting.

In addition to the flood control storage capacity of the project, a coordinated operational program for all existing and proposed reservoir projects in the Comprehensive Plan for the basin would be required to adequately control the flood volume associated with a recurrence of the 1955 flood.

The water supply capability of the project was formulated to assist in meeting the project water supply needs of the Trenton-Philadelphia area to the year 2000. Diversion of Delaware River waters to New York City and New Jersey was established by the Supreme Court Decree of 7 June 1954. The responsibility for any further future diversions lies with the Delaware River Basin Commission.

In accordance with the Fish and Wildlife Coordination Act, the U. S. Fish and Wildlife Service completed a detailed study in coordination with the basin state's game agencies on the effect of project development on existing wildlife resources. The results of this study were presented in a Wildlife Resources report on the project and the above acreage for mitigation purposes was recommended therein.



TROUT UNLIMITED, EAST AND NORTH JERSEY CHAPTERS (Cont'd)

8. The estimated 6,000 acres of land contained within the projects flood control storage zone will be "mudflats."

9. If the lands adjacent to the river within the project area were acquired in public ownership, there would be no need to construct an impoundment for the same purpose.

10. No fish ladder has been designed, nor is money guaranteed for the building of such a ladder.

11. If a fish ladder were built at the project, the problems attendant to attaining proper migration of anadromous and catadromous species between the estuary and the headwaters of the lake, make it inevitable that loss of these species would be the foreseeable consequence of the project.

Infrequent storage of flood waters within this storage zone coupled with a steep-sloped shoreline would not produce extensive objectionable soil bank conditions. Isolated conditions may occur around the lake but the extremely temporary storage of flood waters within this zone would not cause such conditions to exist on a permanent basis.

Although this is a realistic alternative to providing public access, it would not permit the same degree of water-related recreational use as would be provided through impoundment of a lake, nor would the other project purposes be served.

To date, three fish passage design concepts have been completed. The total project cost estimate contains an item for installing fish passage facilities. The estimated cost of these facilities at July 1970 price level is \$4.8 million.

The many problems associated with successful passage of these migratory species are well recognized. However, these problems are being reviewed with the Delaware River Basin Commission's Fish and Wildlife Technical Assistance Committee comprised of representatives of the basin state's fish and game agencies and the U.S. Fish and Wildlife Service. Notable success with passage of shad has been attained on the Cape Fear River in North Carolina, at Holyoke Dam on the Connecticut River and on the Columbia River in Washington and Oregon where upwards of 500,000 shad migrate successfully from the Pacific Ocean to the headwaters of the Columbia and Snake Rivers, passing a series of dams along their 400-mile journey.



TROUT UNLIMITED, EAST AND NORTH JERSEY CHAPTERS (Cont'd)

12. No biological or research studies are being made to disprove the expectation that anadromous and catadromous species would be lost if the project were developed.

Under Public Law 89-304, the U.S. Fish and Wildlife Service, in cooperation with the basin states, is undertaking an extensive study of means of conserving and enhancing the anadromous fishery of the Delaware River. This research program has been underway since 1968.

13. Emphatically do not accept promise of lake functioning for initial ten years as an excellent game fishing or that beyond this period it would develop into a good game fishery.

The views on the lake fishery expressed in the statement represent the combined views of the U.S. Fish and Wildlife Service and the basin states fish and game agencies. These agencies are responsible for protection of the basin's fishery resources and as such offer expert opinion on the subject.



WATER RESOURCES ASSOCIATION OF THE DELAWARE RIVER BASIN

Comment

Consider the statement to be a frank appraisal of the advantages and disadvantages of the project.

Response

No response required.



ENVIRONMENTAL PROTECTION AGENCY

Comments

EPA Northwest Regional Office requested additional information in January to review water quality and other features. Information not provided by Corps.

8-38  
Considers water quality, particularly possibility of rapid eutrophication a significant unresolved issue. If subsequent area development is not accompanied by well designed liquid and solid waste disposal plants, water quality will be degraded and suitability for recreation and fishing will be substantially reduced.

Expresses view that, though regional waste management is not a Corps responsibility, adequate waste management is necessary to protect Federal investment. Impact statement should indicate correct status of planning to deal with these purposes and time table for implementation of waste management plans.

Acknowledges divided in-house opinion on whether result of eutrophication is controllable by reservoir management. Requests opportunity to review ongoing study of assessment of eutrophication risk.

States opinion that construction should not proceed until the issue of eutrophication is resolved.

Response

By letter of 25 March 1971, EPA was invited to Philadelphia District office to review extensive available data for determination of what material was required for their review. No response received. Corps representatives at Washington furnished all available back-up data informally to EPA Washington representatives during May, June, July and August of 1971.

Potentially damaging affects of eutrophication are considered to be manageable. Standards for discharges into the lake from outside the project area have been set by DRBC, EPA, and the Corps of Engineers under Section 13 of the Refuse Act of 1899. States are developing more rigid standards.

Statement does reflect the current plans for waste disposal for the Corps project, see paragraph 3e. Time table has not been established. This is under control of DRBC.

Eutrophication study has been prepared for the Corps of Engineers by knowledgeable consultants. A copy will be furnished to EPA.

Present state of the art is not refined to finite predictions of eutrophication. Present indications are that eutrophication can be controlled by careful monitoring and management. This control can be formulated concurrent with construction.



TABLE 1-1

DRAWDOWN FIGURES FOR VARIOUS U. S. RESERVOIRS 1/

	Surface Area (Acres)	Depth (Feet)		Pool Fluctuation (Feet)	Fish Standing Crop lb/acre	Age (Years) At time of SC (est.)	
		Mean	Maximum				
Tennessee River	Kentucky	158,300	17	60	5	389	14
	Pickwick	42,700	22	74	6	359	25
	Wilson	15,930	37	108	3	303	34
	Wheeler	67,100	17	58	6	365	16
	Guntersville	69,100	14	54	2	277	19
	Hales Bar	6,420	21	64	2	322	20
	Chickamauga	34,500	17	55	6	160	20
	Watts Bar	38,600	25	70	6	146	18
	Fort Landown	14,560	25	117	6	225	18
Hiwassee R.	Ocoee's No. 1	1,760	47	120	15	34	49
	Apalachia	1,120	52	130	15	77	16
	Hiwassee	4,680	66	251	100	19	18
Clinch R.	Melton Hill	5,720	21	70	10	98	1
	Norris	34,200	60	200	60	124	22
Holston R.	Cherokee	19,100	41	123	60	211	17
	Fort Patrick Henry	890	30	97	5	311	7
	Boone	4,880	44	125	3	324	10
	So. Holston	7,580	84	257	80	225	9
	Watauga	6,430	89	259	100	115	10
French Broad R.	Douglass	19,700	36	100	30	125	18
Little Tenn. R.	Santeetlah	2,860	55	180	45	53	31
	Fontaria	8,680	128	440	130	52	17
	Nantahala	1,380	80	230	55	30	17

1/ Source: DRBC 6/28/71



PRELIMINARY FLOW DATA: DAILY GAGE HEIGHT FEET AND DISCHARGE  
 CUBIC FEET PER SECOND 1/  
 DELAWARE RIVER BELOW TOCKS ISLAND DAMSITE NEAR DELAWARE WATER GAP

Water year Oct. 1969 to Sept. 1970

DATE	MEAN GAGE HEIGHT	DISCHARGE
8-05	5.19	1960
8-06	5.52	2760
8-07	5.70	3250
8-08	5.84	3620
8-09	5.65	3080
8-10	5.64	3060
8-11	5.74	3330
8-12	5.63	3040
8-13	5.66	3130
8-14	5.70	3250
8-15	5.68	3190
8-16	5.60	2960
8-17	5.56	2840
8-18	5.73	3310
8-19	5.57	2870
8-20	5.51	2730
8-21	5.71	3280
8-22	5.63	3030
8-23	5.60	2960
8-24	5.88	3750
8-25	5.74	3360
8-26	5.32	2250
8-27	5.38	2400
PERIOD		
Missing record 1/09 to 1/29		
1-29	6.89	6840
1-30	6.89	6840
1-31	8.94	7050
2-01	7.06	7470
2-02	7.08	7500
2-03	8.02	11300
R 2-04	13.66	
R 2-05	17.93	
R 2-06	17.39	
R 2-07	16.38	



TABLE 1-2

PRELIMINARY FLOW DATA: OF DAILY GAGE HEIGHT FEET AND DISCHARGE  
 CUBIC FEET PER SECOND <sup>1/</sup>  
 DELAWARE RIVER BELOW TOCKS ISLAND DAMSITE NEAR DELAWARE WATER GAP  
 (Cont'd)

Water year Oct. 1969 to Sept. 1970

DATE	MEAN GAGE HEIGHT	DISCHARGE
2-08	15.29	49400
2-09	14.72	46600
2-10	14.78	46900
R 2-11	16.48	
R 2-12	17.77	
R 2-13	16.67	
2-14	15.33	49700
2-15	14.40	45000
2-16	13.82	42100
2-17	14.12	43600
2-18	14.20	44000

PERIOD

1/ Source: U. S. Geological Survey  
 Water Resources Division  
 Trenton, New Jersey



TABLE 2-1

WATER QUALITY DATA FOR DELAWARE RIVER

Water Years 1957-1969 incl.

Parameter	Montague, N.J.				Trenton, N.J. (1)				Ben Franklin Br. (2)			
	Summer(3)		Winter(3)		Summer(3)		Winter(3)		Summer(3)		Winter(3)	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Dissolved Oxygen (mg/L)	15.6(4)	6.0(4)	17.4(4)	7.6(4)	15.2	4.6	16.5	6.5	11.0	0.0	14.1	0.0
Temperature(°F)	81	35	69	32	93	36	83	32	87	45	75	32
Ph	7.4	6.0	7.3	4.6	8.0	6.2	7.9	6.4	7.7	5.9	7.3	5.0
Nitrates mg/L	2.2	0.0	4.8	0.1	9.8	0.4	9.1	1.7	17.0	2.0	18.0	2.0
Phosphates mg/L(5)	0.08	0.0	0.31	0.0	0.59	0.07	0.18	0.07	0.63	0.0	0.02	0.0
Iron mg/L	0.29	0.0	0.91	0.0	0.82	0.0	0.81	0.0	0.20	0.0	0.23	0.0
Manganese mg/L(5)	0.08	0.0	0.03	0.0	0.14	0.0	0.05	0.0	0.27	0.0	0.03	0.0

(1) Water quality recorder upstream of Trenton falls

(2) Philadelphia, Penna.

(3) Summer 1 Jun - 30 Nov; winter 1 Dec - 31 May

(4) Records from Dunnfield, N.J. and E. Stroudsburg, Pa. used

(5) Partial Record



TABLE 2-2

ESTIMATED AVERAGE FLOWS AT TOCKS ISLAND DAMSITE  
(Cubic Feet Per Second)

January	6,970	July	3,750
February	6,900	August	3,270
March	12,560	September	3,320
April	14,220	October	3,900
May	8,320	November	6,520
June	4,720	December	7,070



TABLE 2-3

LOW FLOW RECURRENCE INTERVAL (YEARS)  
Minimum average Flow (cfs)

<u>Consecutive Period (Days)</u>	<u>50</u>	<u>25</u>	<u>20</u>	<u>10</u>	<u>5</u>
7	1020	1180	1210	1350	1510
30	1190	1350	1400	1550	1780



TABLE 2-4

SUMMARY OF ENVIRONMENTAL IMPACT ON FISHERY  
(Annual Basis)

Delaware River and Bay

SPORT FISHERY (FISHERMAN DAYS)

Area	<u>w/o project</u>		<u>w/project</u>		<u>NET BENEFIT</u>	
	<u>RESIDENT</u>	<u>SHAD</u>	<u>RESIDENT</u>	<u>SHAD</u>	<u>RESIDENT</u>	<u>SHAD</u>
Upstream	90,000	40,000	100,000	20,000	10,000	-20,000
Lake	70,000	35,000	434,000	24,000	364,000	-11,000
Downstream	130,000	50,000	150,000	40,000	20,000	-10,000
Total	290,000	125,000	684,000	84,000	394,000	-41,000

Delaware River and Bay

COMMERCIAL FISHERY

<u>w/o project</u>			<u>w/project</u>			<u>NET BENEFIT</u>		
<u>SHAD*</u>	<u>EELS*</u>	<u>OYSTERS**</u>	<u>SHAD*</u>	<u>EELS*</u>	<u>OYSTERS**</u>	<u>SHAD*</u>	<u>EELS*</u>	<u>OYSTERS**</u>
275	10		250	10		-25	0	

\* Thousands of pounds

\*\* Thousands of bushels



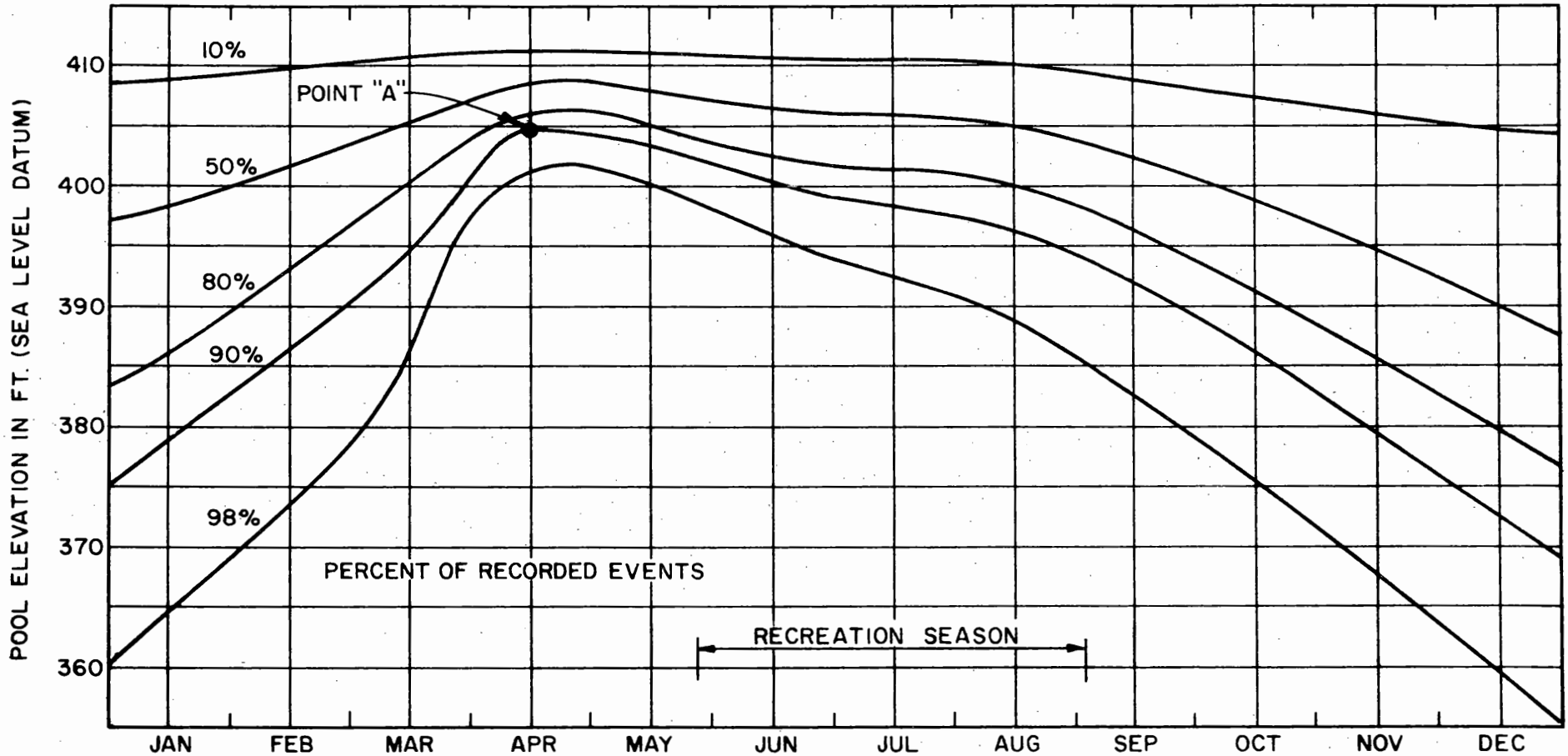
TABLE 2-5

Average Annual Hunting Use of Lands (Man Days of Hunting)

	<u>Without the Project</u>		<u>With the Project</u>		<u>Net Effect</u>	
	<u>Pa.</u>	<u>N.J.</u>	<u>Pa.</u>	<u>N.J.</u>	<u>Pa.</u>	<u>N.J.</u>
Deer	4,000	5,600	3,200	4,540	-800	-1,060
Small Game	2,100	22,800	1,780	22,370	-320	- 430
	6,100	28,400	4,980	26,910	-1,120	-1,490



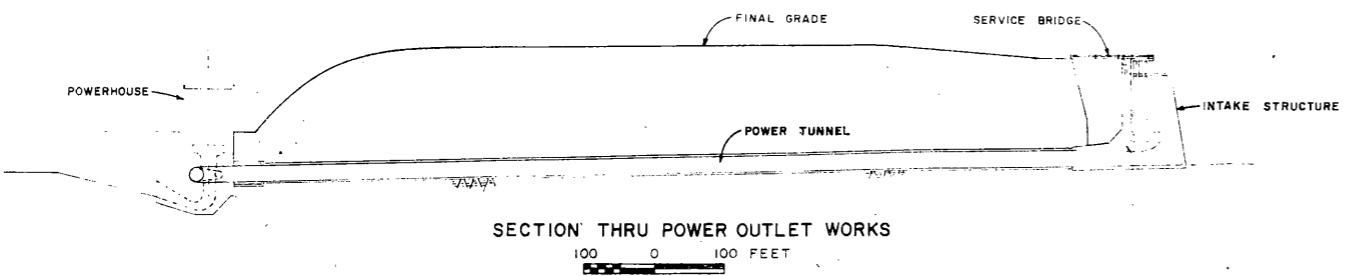
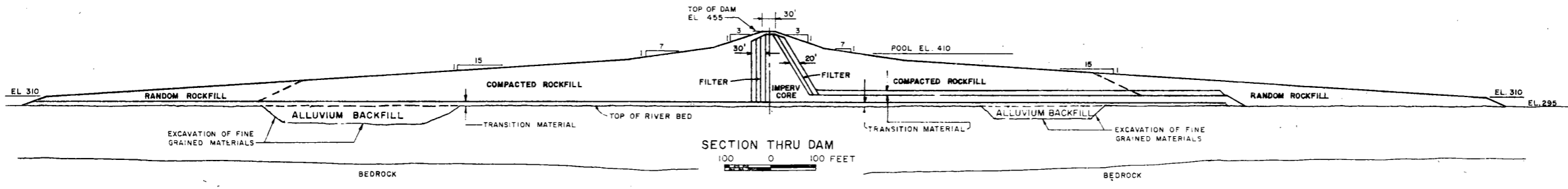
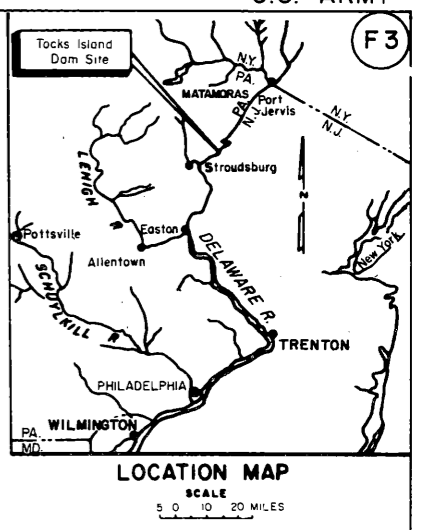
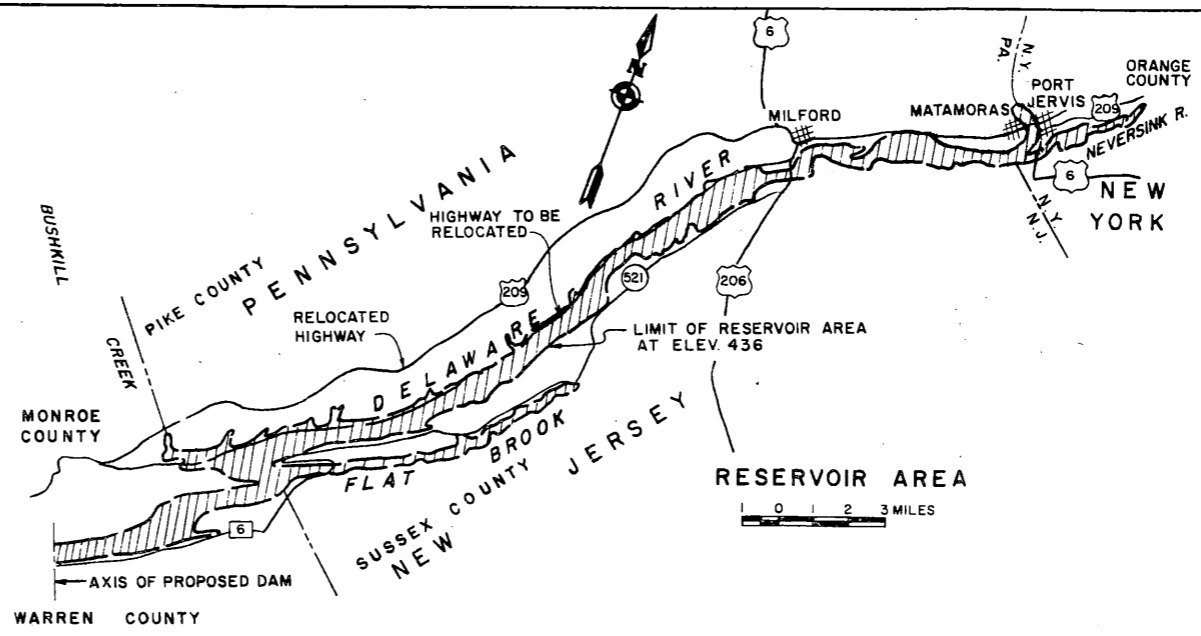
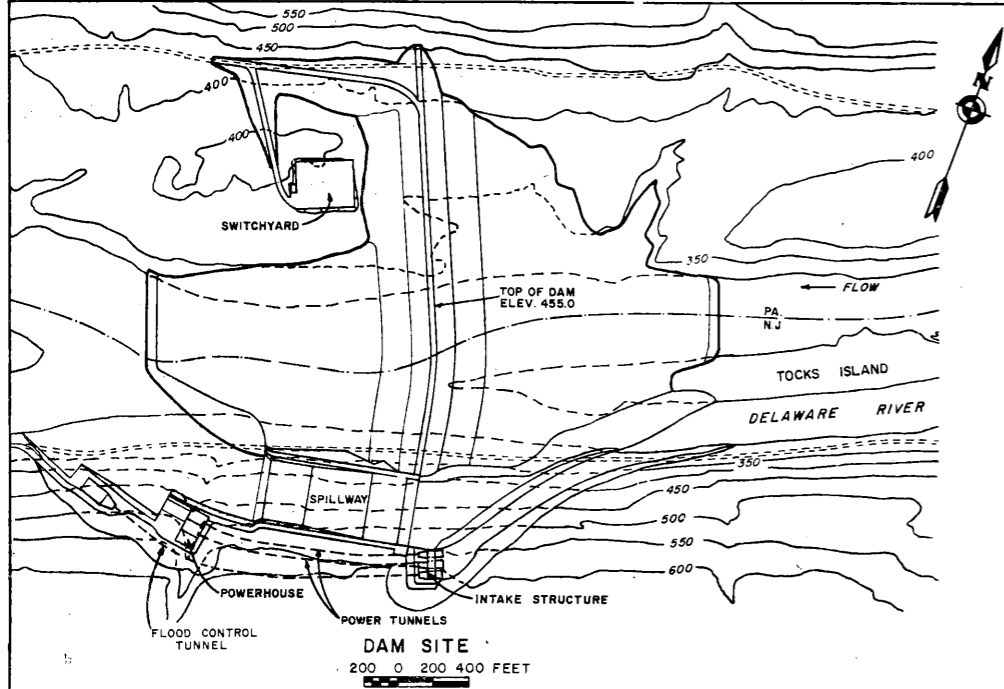
## POOL ELEVATION OCCURRENCE



NOTE: CURVES REPRESENT HISTORICAL FREQUENCY THAT MINIMUM AVERAGE DAILY POOL ELEVATION FOR THE MONTH WILL BE GREATER THAN OR EQUAL TO THE ELEVATION SHOWN.

EXAMPLE:  
 POINT "A" INDICATES A 90% HISTORICAL FREQUENCY THAT THE MINIMUM AVERAGE DAILY POOL ELEVATION DURING APRIL WILL BE GREATER THAN OR EQUAL TO EL. 405





**DELAWARE RIVER, PA.**  
 FLOOD CONTROL PROJECT  
**TOCKS ISLAND RESERVOIR**  
 RESERVOIR AREA  
 PLAN AND SECTION  
 REVISED 30 JUNE 1969  
 SCALE AS SHOWN  
 U.S. ARMY ENGINEER DISTRICT, PHILA.

SECRET

**FEDERAL AGENCY COMMENTS**





UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF OUTDOOR RECREATION  
FEDERAL BUILDING  
1421 CHERRY STREET  
PHILADELPHIA, PENNSYLVANIA 19102

IN REPLY REFER TO:

November 27, 1970

Colonel James Johnson  
District Engineer  
Philadelphia District  
Corps of Engineers  
U. S. Custom House  
2nd and Chestnut Streets  
Philadelphia, Pa. 19106

Dear Colonel Johnson:

We have reviewed the draft environmental statement for the Tocks Island Reservoir project which accompanied your letter dated October 20, 1970. Our comments have been keyed to section numbers used in the draft of the environmental statement.

Section 2. The statement should specifically discuss existing unique features of the proposed project area. Included in this category are areas of historical, archeological and ecological interest. If no unique areas will be affected, it should be so stated.

Section 3a. The discussion of the reservoir should be expanded to explain operational features such as drawdown which may cause environmental changes or interfere with recreational uses of the area.

If unique areas in the proposed site will be inundated, these should be mentioned in this section of the environmental statement.

The references to water storage and discharge are confusing in the context of the environmental statement. We suggest that a brief summary of the seasonal operation of filling the reservoir and subsequent water discharges should be included in Section 3a of the statement.

This section of the statement should also be expanded to include a discussion of the effects of project developments other than of the dam and reservoir. For example, proposed road relocations may adversely affect natural resource values in the project area.



Section 3b. The extent of loss of unique features due to inundation or other project developments should be assessed in this section of the environmental statement.

Section 3d(2). The final sentence should be restructured or information should be supplied to substantiate the allegation that "excess river flows" are wasted. There is no information in the statement as drafted which provides the definition to the environmental regimen of the Delaware Basin which would be necessary to quantify the flow required to support existing recreational activities.

Thank you for the opportunity to review the draft statement. Our comments have been provided for purposes of technical assistance and we hope you find them useful as you further develop your statement.

Sincerely yours,

Rolland B. Handley  
Regional Director

By:

  
Earl C. Nichols





UNITED STATES  
DEPARTMENT OF THE INTERIOR  
FISH AND WILDLIFE SERVICE  
BUREAU OF SPORT FISHERIES AND WILDLIFE  
U. S. POST OFFICE AND COURTHOUSE  
BOSTON, MASSACHUSETTS 02109

NOV 17 1970

District Engineer  
Philadelphia District  
U. S. Army Corps of Engineers  
Custom House, 2nd & Chestnut Street  
Philadelphia, Penna. 19106

Dear Sir:

It would be appreciated if you would send our Upper Darby, Pa. area office a copy of all of your future requests to this office for comments on your environmental statements such as you do when requesting that we provide you with a fish and wildlife report on your plans for project construction, maintenance, etc. This practice will reduce the time required for that office to receive the request and thereby contribute toward an earlier response from this office.

Thank you for your continuing cooperation.

Sincerely yours,

  
ACING Regional Director

NOV 18 1970





UNITED STATES  
DEPARTMENT OF THE INTERIOR  
FISH AND WILDLIFE SERVICE  
BUREAU OF SPORT FISHERIES AND WILDLIFE  
U. S. POST OFFICE AND COURTHOUSE  
BOSTON, MASSACHUSETTS 02109

JUN 16 1971

District Engineer  
U. S. Army Engineer District, Philadelphia  
Corps of Engineers  
Custom House, 2nd and Chestnut Streets  
Philadelphia, Pennsylvania 19106

Dear Sir:

We have reviewed the draft of an environmental statement on Tocks Island Lake project, Delaware River, which we received from your office May 19 (missing tables received May 26).

We are pleased to note that the statement reflects past concerns and recommendations of the Fish and Wildlife Service. As you know, there was a conference of various agencies with the Council on Environmental Quality recently for the purpose of reviewing your environmental statement. Subsequently, a special task force, as we understand it, is to prepare an Interior Department analysis of the environmental impact of this project.

We appreciate the opportunity to review your statement.

Sincerely yours,

*Richard E. Griffith*

Regional Director







DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

OFFICE OF THE SECRETARY

WASHINGTON, D.C. 20201

JAN 6 1971

Colonel James A. Johnson  
District Engineer  
U.S. Corps of Engineers  
Department of the Army  
Philadelphia, Pennsylvania 19106

Dear Colonel Johnson:

As requested in your respective letters of September 25 and October 19, 1970, to our New York and Philadelphia regional offices, the environmental statement for the proposed Tocks Island Reservoir Project, Pennsylvania, New Jersey and New York, has been reviewed by agencies of the Department that have an environmental interest.

The enclosed report considers environmental health features of the proposal that fall within the responsibility and concern of the Department.

We recommend that the environmental health problems discussed in the report be included in the environmental statement. It is suggested that the enclosed report also be used as a guide in all future planning for the Tocks Island Reservoir Project.

Sincerely yours,

Roger O. Egeberg, M.D.  
Assistant Secretary  
for Health and Scientific Affairs

Enclosure



REVIEW  
OF  
TOCKS ISLAND PROJECT  
AND  
ATTENDANT ENVIRONMENTAL IMPACT STATEMENT

I. Water Supply

A. Tocks Island Reservoir Project

The construction of the Tocks Island dam will create an impounding reservoir that will enhance man's environmental health relative to water supplies in both New Jersey and Pennsylvania. It appears that in addition to the 100 mgd, New Jersey is permitted to divert from the Delaware River through the Delaware and Raritan Channel, an additional diversion of 300 mgd will initially be permitted from Tocks Island. Engineering estimates indicate that New Jersey will be one of the first States not to have potential water resources within its boundaries for future population and growth. The Tocks Island Reservoir water is of equal or better quality than most of the major sources within the northeastern area of New Jersey.

The Tocks Island Reservoir will also provide low flow water augmentation for quality control in the upper Delaware estuary. Numerous water supplies, including the City of Philadelphia, presently use estuary water as their major potable water source. Probably the major parameter to be controlled relative to water flow from the new reservoir will act as a salt water barrier that is expected to permit the use of the Delaware estuary water by the City of Chester, Pennsylvania, for a municipal supply.

Plans also are included for holding a chloride content of 15,000 ppm over the oyster beds (spats) to prevent infestation by oyster drills.

II. Recreational Sanitation

The Tocks Island Park and Recreational Area will provide the first large scale national facility accessible on a daily basis to the New York-Philadelphia metropolitan area.



It should provide an excellent recreation area away from the cities and an environment that is needed for man's health. In no other area on this scale will the recreational waters be under such strict control. The Delaware River Basin Commission maintains the highest degree of surveillance over the water quality in the basin. This responsibility is derived from the Commission's compact.

The Bureau of Community Environmental Management, through a long-standing agreement with the National Park Service to provide sanitary engineering consultation for all National Park Service facilities, will cover environmental health matters within the limits of the Delaware Water Gap National Recreation Area. Sanitary Engineering consultation will be provided on such matters as water supply, liquid and solid waste disposal, and food service. State and local health departments are responsible for recreational areas in the Tocks Island region outside National Park Service areas.

Since swimming and other water contact activities will be primary features of the recreational developments, a concentrated effort should be made to provide reservoir water of the best bacteriological, chemical, and physical quality possible. The quantity and quality of waste discharges to the reservoir will be difficult to predict and the assimilative capacity of the proposed impoundment is unknown. However, it is important to select a method of waste-water collection, treatment and disposal, that will protect the healthful and beneficial uses (municipal water supply and recreation) of the Tocks Island Reservoir. From our point of view, a central system discharging treated effluent at a point below the proposed dam would be the most desirable method.

### III. Vector Control

In 1967, the Tocks Island Regional Advisory Council (TIRAC) created a Vector Control Advisory Group made up of officials from Federal and State agencies concerned with vector control in the States of Pennsylvania, New Jersey, and New York. The Advisory Group assisted TIRAC in the development of an application for a Public Health Service 314(e) demonstration grant for a coordinated vector control plan and program in the entire Tocks Island region. This program would have been implemented if the dam construction and other developments in the Tocks Island region had come about. It was recognized that a regional vector control program was needed to protect the area against certain



disease and nuisance vectors -- mosquitoes, ticks, rats, deer flies, wasps, black flies, etc. In 1968, for example, New Jersey suffered an outbreak of eastern encephalitis involving twelve human cases and claiming six lives, as well as more than 100 fatal horse cases. This mosquito-borne disease deserves particular attention. The grant application requested a total of \$435,755 over a five-year period for coordination of the vector control program and conduct of limited surveillance activities just prior to and during the construction phase of the project. Most of the actual operations would be carried out by the various State or local vector control programs using other funds. The application was approved, but unfunded, because of the delay in appropriating money for the development of the dam and other associated projects such as the Delaware Water Gap National Recreation Area by the National Park Service.

A coordinated vector control program for the Tocks Island Region remains an important integral part of a comprehensive regional environmental protection system. With the dam development and the associated major ecological changes, coupled with a fluctuating water level in the reservoir, vector control considerations deserve continuous coordinated attention. Due to a change in emphasis concerning Public Health Service grant funds, it is now recommended that the Corps of Engineers support an updated regional vector control program along with the dam and reservoir plan.

It is also important that the reservoir and recreational areas be constructed in a manner that will avoid creation of breeding areas for disease and nuisance vectors. Appropriate vector control guidelines recommended for use during the planning, design, construction and operation, and maintenance of the Project, are outlined in the Public Health Service Publication, "Prevention and Control of Vector Problems Associated With Water Resources," January 1965.

#### IV. Solid Waste Management

There are two phases to this project, the construction of the Tocks Island Dam by the Corps of Engineers, and the development of the shore of the pool and surrounding areas into a national recreation area by the National Parks Service. This review treats these phases separately.

##### A. The Tocks Island Reservoir Project, Corps of Engineers

1. The construction of the dam and the preparation of the reservoir will generate a large amount of solid waste. There will be a large amount of brush.



The general design memorandum does not state how this brush is to be disposed of. It is understood that the intention is to burn it. Open burning is prohibited by State law. Uncut and not reduced in volume, it would overload present municipal disposal sites. If cut up and chipped on site, the brush may be more easily disposed of or possibly sold.

2. The flooded area may affect some present solid waste disposal sites. One, an incinerator at Port Jervis, will be given protection from the design backwater flooding.

B. Delaware Water Gap National Recreation Area

1. The master plan for this development mentions that solid wastes will be generated by campers, picnickers, boaters, trailer camps, and concessions. The plan does not state how these wastes will be disposed of.
2. The recreation area is expected to have an impact of some magnitude on the areas outside the park, but adjacent to it. Seven counties, three in Pennsylvania, two in New Jersey, and two in New York, will be affected by the influx of tourists and are expected to experience gains in population and the development of housing and business. There will be a definite impact due to increased solid waste generation.
3. Fortunately, the long-range solid waste management for these seven counties is being comprehensively planned for by the Tocks Island Regional Advisory Council. Membership in the solid waste management program of the Council includes the Public Health Service, the Corps of Engineers, the National Park Service, and the representatives of the States and counties. This activity is being funded in part by the Public Health Service. The management program will cover the park area, wastes from which will be disposed of outside the park in municipal or county facilities. Landfill sites are now being selected, but the plan allows for new techniques to be employed in the coming years.



4. There are five land disposal sites with the "take" area. These are:
  - a. A site in Walpack Township, New Jersey, about one mile northeast of the community of Flatbrookville. The exact location is unknown, but the site may be inundated.
  - b. A site in Warren Township, New Jersey, near Pohaquarry, about three miles northeast of the Delaware Gap and two miles west of the community of Mount Vernon. The exact location is not known, but it may be inundated. It may not be in use at present.
  - c. A site in Delaware Township, Pennsylvania, about a mile north of Dingman's Ferry. It is probably not in use, but is in the flood plain.
  - d. A site in Dingman Township, Pennsylvania, about a half-mile downstream of the U.S. Highway 206 bridge between Milford, Pennsylvania, and Montague, New Jersey. This site is believed to be on the edge of the pool. It is not well compacted and is in a situation where it may be easily eroded. There may be some material floated or carried away by the current when the water rises. This site is now in use.
  - e. A site in West Fall Township about a mile south of the Interstate Highway 84 bridge site. It is not in use, but is in the flood plain.
5. Area plans for solid waste management will take care of the loss of these disposal sites in the future. Thought should be immediately given, however, to plans for closing those which are in use and protecting the sites from erosion before the pool is flooded. If materials of a water polluting nature which have not degraded sufficiently, or are nondegradable, have been deposited on or in these sites, some special correction may be required. This could be excavation and removal. Much depends on the kind of cover and its depth if these were covered sites.



With the exception of the disposal of construction debris and brush during the construction stage, and the proper handling of the disposal sites which may be flooded, it is felt that the solid waste aspect of the environmental health impact of this project has had and will have appropriate attention by the States and counties involved.

V. Air Pollution

Consideration of air quality management is omitted in the master plan, an oversight that should be remedied in future projects. It is inferred that open burning of brush and other material from land clearing operations will be practiced during the construction period. This is prohibited under New Jersey law. Additional coverage of alternatives is covered above under solid waste management. Dust problems may also arise from land clearing operations requiring wetting to reduce dust concentrations. With a predicted 10 million vacationers a year, peaking during the summer months, efficient roadway entrances, exits, and parking facilities should be planned to reduce traffic jams and, therefore, minimize pollution from automobile exhausts. The master plan indicates a combination of sanitary land-fill and municipal incinerators may be used for refuse disposal, Municipal incinerators must be of the type which will pass New Jersey's air pollution code and requirements for permit issuance.

Air pollution potential should be considered also in the application of pesticides for vector control, particularly if aerial spraying is utilized.



FEDERAL POWER COMMISSION  
REGIONAL OFFICE

26 Federal Plaza  
New York, New York 10007


November 4, 1970

James A. Johnson  
Colonel, Corps of Engineers  
District Engineer  
Philadelphia District, Corps of Engineers  
Custom House - 2d and Chestnut Streets  
Philadelphia, Pa. 19106

Dear Colonel Johnson:

In reply to your letter of October 28, 1970, this is to advise you that we have no further comments to make at this time with respect to the environmental impact of the conventional or pumped storage installations at the Tocks Island Reservoir Project.

Sincerely,

  
John H. Spellman  
Acting Regional Engineer

D-1

1920 "Meeting Today's Challenges



Providing for Tomorrow's Goals" 1970

50th ANNIVERSARY





UNITED STATES  
DEPARTMENT OF THE INTERIOR  
FEDERAL WATER POLLUTION CONTROL ADMINISTRATION  
Northeast Region  
John F. Kennedy Federal Bldg.  
Boston, MA 02203

October 22, 1970

Colonel James A. Johnson  
District Engineer  
U. S. Army Corps of Engineers  
U. S. Custom House  
2nd & Chestnut Streets  
Philadelphia, PA 19106

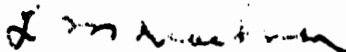
Dear Colonel Johnson:

Reference is made to your letter requesting our comments on the environmental impact of the Tocks Island Reservoir Project. The findings and conclusions presented in our report, "Water Quality Control Study - Tocks Island Reservoir, Delaware River Basin", 1966 are still essentially applicable.

Recently we reviewed a preliminary chapter on Liquid Waste Disposal in the Tocks Island Regional Environmental Study report. At this time we would like to present our general comments relative to the consultant's recommendation on this subject. The chapter suggests several waste collection and treatment alternatives to serve the TIRES area. The consultant's (Roy F. Weston) recommendation, to date, is a waste treatment plan which designates six sub-regional liquid waste collection and treatment systems located upstream from the reservoir. Our opinion favors another alternate plan which calls for the collection of all liquid wastes throughout the study area to a central treatment facility located downstream from Tocks Island Dam. We believe this plan offers maximum protection of the water quality in the proposed reservoir and in general would afford greatest protection and enhancement to the total environment both upstream and downstream of Tocks Island Dam. Dr. Fritz Bartsch, a FWQA consultant in reservoir water quality, also supports the plan to divert liquid waste discharges downstream of the dam.

Aside from the above comments relative to only future water quality, we feel the Tocks Island Reservoir project will prove beneficial to the entire Delaware River Basin.

Sincerely yours,

  
Lester M. Klashman  
Regional Director



UNITED STATES  
ENVIRONMENTAL PROTECTION AGENCY  
FEDERAL WATER QUALITY ADMINISTRATION  
Northeast Region  
John F. Kennedy Federal Bldg.  
Boston, MA 02203

January 4, 1971

Colonel James A. Johnson  
District Engineer  
~~U. S. Department of the Army~~  
Corps of Engineers  
Custom House  
Second & Chestnut Streets  
Philadelphia, PA 19016

Re: Tocks Island Lake Project letter dated 20 October 1970

Dear Colonel Johnson:

We have reviewed the subject environmental statement and find that it does not provide sufficient information for us to make the detailed review required of us by the National Environmental Policy Act. We request more information and data which will enable us to make the required evaluation of the impact of the project on the environment. The material provided should include information as to the technical, aesthetic, economic, environmental, and other considerations utilized in siting, designing, and determining uses and methods of operating the dam, reservoir and associated project facilities. This material should include, but not be limited to, the following:

1. The comprehensive land and water use Master plan for the reservoir and national recreation area prepared by the National Park Service, and mentioned in the Environmental Impact Statement.
2. The design memorandums, study reports, other comprehensive reports, studies, and evaluations that have been developed in connection with the project, with particular emphasis on those items which will affect water quality.

Taking into consideration the magnitude of this project, its potential impact on the environment, and the complex and interrelated nature of its proposed uses, we expect that preparation of a thorough evaluation will require at least 90 days following the receipt of the information noted above.

Sincerely yours,

  
Edward J. Conley  
Federal Activities Coordinator



ENVIRONMENTAL PROTECTION AGENCY  
Office of Water Programs  
Region III  
918 Emmet Street  
Charlottesville, Virginia 22901

June 8, 1971

Colonel Carroll D. Strider  
Department of the Army  
Philadelphia District  
Corps of Engineers  
Custom House  
2nd and Chestnut Streets  
Philadelphia, Pennsylvania 19106

Dear Colonel Strider:

This acknowledges receipt of Environmental Impact Statements recently submitted to several program offices of the Environmental Protection Agency.

As you know, several Federal environmental programs were consolidated under the Environmental Protection Agency on December 2, 1970. Programs involved in this transfer of functions included the former Federal Water Quality Administration-U. S. Dept. of the Interior; the National Air Pollution Control Administration-Dept. of Health, Education and Welfare; the Bureaus of Solid Waste Management, Water Hygiene, and Radiological Health-Dept. of Health, Education, and Welfare; and various Federal pesticide programs.

We are now attempting to deal directly with projects affecting the environment through a comprehensive EPA "overview" rather than through individual and specific agency interest. In compliance with EPA interim procedures, our comments will be forwarded to Headquarters for their consideration in making a direct response to your office.



An extension of the review period is requested for statements thus far received so that we may provide a comprehensive and meaningful response regarding the projects' environmental impacts.

Sincerely yours,



for John W. Baumeister  
Regional EIS Coordinator

cc: L. W. Gebhard, IRC  
Region III Programs (EPA)



C O P Y

ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D. C. 20460

September 10, 1971      Office of the  
Administrator

Brigadier General Kenneth B. Cooper  
Deputy Director of Civil Works  
Office of the Chief of Engineers  
Department of the Army  
Washington, D. C. 20314

Dear General Cooper:

The Environmental Protection Agency has reviewed the draft environmental impact statement on the Tocks Island Reservoir. The revised draft statement was provided at a meeting at the Council on Environmental Quality on August 6.

This is the third draft statement submitted for the Tocks Island Project. The Department of Health, Education, and Welfare commented on several of the issues now within EPA's jurisdiction in January of this year. These comments cover the questions of water supply, recreational sanitation, solid waste management, vector control, and air pollution.

The Northeast Regional Office of EPA requested additional information in January in order to review the water quality and other features of the project. The information requested included land and water use plans, design studies, and other studies and reports with emphasis on water quality. This information was never provided by the Corps. This review is therefore based primarily on the information provided in the August 6 draft statement, which was prepared by the Corps in response to an April request from the Council on Environmental Quality.

Our principal concern is the still unresolved issue of water quality in the reservoir, particularly the risk of rapid eutrophication. The draft statement recognizes that excessive growths of algae and other plant life would impair the recreational value of the lake. The rate of eutrophication of Tocks Island Lake will be largely determined by existing nutrient concentrations in the upper Delaware River and by the sanitary waste loads generated by development in the watershed of the reservoir. Substantial new loads of pollutants will be forthcoming in the watershed area near the lake as a result of new residential and recreational developments. These developments are now proceeding rapidly and can be expected to lower the present high quality of

F-4

C O P Y



C O P Y

- 2 -

the Delaware River water if adequate treatment is not provided. Development will be accelerated as a result of the Tocks Island reservoir and the Delaware Water Gap National Recreation Area. If land-use controls, together with well designed liquid and solid waste disposal plans are not provided the water quality of the reservoir will be degraded and its suitability for recreation and fishing substantially reduced.

We recognize that development of local or regional waste management plans is not the responsibility of the Corps. Nevertheless, it is our opinion that adequate waste management systems will be necessary to protect the Federal investment in the reservoir. The impact statement should indicate the current status of planning to deal with these problems and the extent to which the timetable for implementation of waste management plans will coincide with the schedule for completion of the reservoir.

There is a division of opinion among EPA offices which have reviewed the statement as to whether the risk of eutrophication is controllable by careful reservoir management plans or whether probable wasteloads will be too great to permit maintenance of high water quality in the reservoir by water management at the site. We do not have enough information to resolve this question at the present time.

According to the impact statement, the Delaware River Basin Commission, with the U.S. Geological Survey, is collecting data on existing nutrient levels in the Upper Delaware River. The Corps has undertaken a study to project nutrient loads for an assessment of eutrophication risk. The Environmental Protection Agency would welcome the opportunity to review that study as soon as it becomes available. We understand the study is to be completed soon.

The possibility of substantial eutrophication of Tocks Island Lake cannot be ruled out without additional data and analysis. We do not believe that construction of the project should proceed until this question has been settled. The Environmental Protection Agency will provide a prompt review of the eutrophication study underway as soon as it is completed. We hope that this can afford a basis for the long-standing controversy over the environmental impact of the Tocks Island Project.

Sincerely,

/s/ George Marienthal  
George Marienthal  
Acting Director  
Office of Federal Activities

C O P Y





# United States Department of the Interior

NATIONAL PARK SERVICE

NORTHEAST REGION

143 SOUTH THIRD STREET

PHILADELPHIA, PA. 19106

IN REPLY REFER TO:

A98  
NER (CP)

Colonel Carrol Strider  
Division Engineer  
Philadelphia District  
Corps of Engineers  
Custom House  
2nd & Chestnut St.  
Philadelphia, Pa. 19106

JUN 14 1978

Re: Tocks Island Impact Statement

Dear Sir:

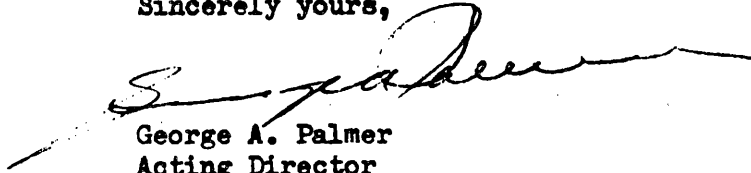
The subject environmental statement seems to us to be an honest, forthright document. Our comments are relatively minor, and are as follows:

1. We would suggest a paragraph or two under Project Description summarizing the comprehensive study of the 1950's, of which the project is an outgrowth. We, at first, read over the coverage of this in the introduction.
2. The Tocks Island Project is not a spontaneous concept, but the culmination of nearly 50 years of study, survey, and planning. It is designed to meet certain well-established needs. Meeting such needs as those for water supply, flood control and recreation has positive environmental impacts which might well be discussed.
3. The statement should contain confirmation from the Pennsylvania and New Jersey State Liaison Officers for Historic Preservation that the project does not adversely affect any listings in their respective State Register of Historic Places. It should also contain a notice that no properties on the National Register of Historic Places are endangered.
4. We are not sure whether or not the Delaware Water Gap National Recreation Area could legally proceed without the Tocks Island project. A legal opinion would be required on this.



5. With regard to item 7 on page 8-25, we agree that area to be included in the combined Tocks Island Project and Delaware Water Gap National Recreation Area does not meet Wilderness Act criteria for designation as Wilderness. It should be noted that the National Park Service has classified 24.9% of the total area as either primitive or outstanding natural areas, and an additional 47% has been classified as Natural Environment. Thus, nearly half of the total land and water surface will be managed for extensive rather than intensive recreation, and over one fourth will be managed as primitive area, very similar to a designated wilderness area.
6. Table 2-5, page 9-5. These figures should be reviewed in the light of the National Park Service Master Plan. While we are not experts in this field, we question whether hunting use of lands within the exterior boundaries of the National Recreation Area would decline to the extent shown.

Sincerely yours,



George A. Palmer  
Acting Director  
Northeast Region



**QUASI-FEDERAL AGENCY COMMENTS**





**JAMES F. WRIGHT**  
EXECUTIVE DIRECTOR

**DELAWARE RIVER BASIN COMMISSION**  
25 SCOTCH ROAD  
P. O. BOX 360  
TRENTON, NEW JERSEY 08603  
(609) 883-9500

October 6, 1970

Colonel James A. Johnson  
District Engineer  
U. S. Corps of Engineers  
Philadelphia District  
Custom House  
2d and Chestnut Streets  
Philadelphia, Pennsylvania 19106

Dear Colonel Johnson:

Reference is made to your letter of August 31, 1970, requesting comments with respect to the environmental impact of the Tocks Island Reservoir project.

The following comments are presented below largely as the result of experience gained in participating in the planning of the project. In this connection there has been close cooperation between the various agencies, including the Commission, charged with the responsibilities of protecting the public interest.

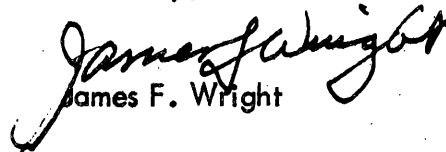
- (a) Project formulation and facility planning have been careful and thorough. As a result, the project will make the best use of available resources in meeting the multi-purpose requirements for which it is intended, with a minimum adverse effect on the environment.
- (b) Any adverse environmental effects which cannot be completely avoided can be controlled to the extent of being made tolerable.
- (c) There is no economically feasible alternative known to the Commission which can so well meet the requirements with lesser harm to the environment.
- (d) The beneficial effects of the project can be expected to last many years and to be enjoyed by millions of people including future generations. In emergencies, such as those that may occur in the form of droughts, floods, or power shortages, the project will be operated to provide all possible assistance to stricken areas.



The pressing need, particularly in the Delaware River Basin and Service Area, for more water and power for water supply, water quality control, and electricity, will be significantly alleviated once the project becomes operational.

(e) Commitments involved in the use of the project will be made consistent with the needs of a large segment of the Nation's population. Resources under commitment will be predominantly retrievable and can be made available for uses other than those under present intention should the need become sufficiently important in the interest of the public.

Sincerely,

  
James F. Wright



**STATE AGENCY COMMENTS**



1





COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF FORESTS AND WATERS  
HARRISBURG  
17120

In reply refer to  
WCE  
F 90:1

P. O. Box 1467

December 2, 1970

Col. James A. Johnson  
District Engineer  
U. S. Army Engineer District, Philadelphia  
Corps of Engineers  
Custom House - Second and Chestnut Streets  
Philadelphia, Pennsylvania 19106

Dear Colonel Johnson:

Reference is made to your letter of October 28, 1970, requesting the Commonwealth of Pennsylvania's views and comments on the draft copy of the environmental statement prepared by your office on the Tocks Island Reservoir Project.

As the coordinator for Federal water resources projects in Pennsylvania, I have contacted those State agencies most interested in the environmental impact of this project, requesting their comments. This letter represents the consolidated views of the Pennsylvania Fish Commission, Game Commission, Department of Health and the Department of Forests and Waters.

We note that in Section 3, Impact Statement, the report mentions the acquisition of approximately 880 acres of mitigation land located in New Jersey and Pennsylvania. Perhaps the report should list the actual acreage to be acquired in each State for this purpose.

Although the impact statement indicated that certain studies are being made for a regional environmental protection system, the project will have the significant environmental effect of bringing a very large number of people into an area that was not very heavily populated. The population increase will result



in some environmental deterioration but attempts are being made to minimize this deterioration. The project, to date, does not include satisfactory provisions to handle the wastes that will be generated by the increase population of the area. We feel that the environmental statement does not adequately cover this aspect of the effect of the project.

Considering the size and potential impact of this project, the statement appears to be rather brief and tends to gloss over some of the very important ecological effects the Tocks Island project may have throughout the river system and estuary. Another shortcoming of the statement is the omission of any reference to pumped storage and its implications.

We note that the general theme of this statement tends to downgrade the present recreational value of the Delaware River to be inundated by the project. The scenic environment as well as water-related recreational activities exist to a high degree at the present time and could actually deteriorate as a result of the Tocks Island Reservoir. However, benefits to be derived from the project will far outweigh the losses to the recreational aspects of the existing river.

We note that in Section 3 b, Adverse Environmental Effects, no mention is made of periodic drawdowns which will expose many acres of unsightly shoreline. It is suggested that these effects be included in the final report.

On pages 2 and 7, reference is made to a sport fishery for walleyes, bass, trout and shad in the main stem and the principal tributaries. No mention is made, however, of the sport fishery for some other important species such as eels, chain pickerel, muskellunge and panfish.

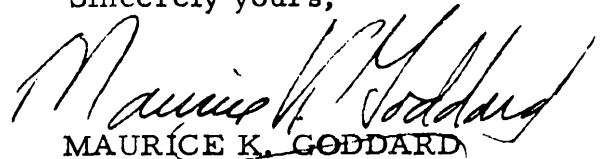
There are comments on page 3 on the possible trout fishery below the dam as well as the possibility of controlling rough fish through a drawdown program. The Pennsylvania Fish Commission has not been in favor of a trout fishery below the dam and views with great concern what effect cold water releases would have on the upstream shad migration. There is also doubt that rough fish can be controlled throughout drawdown as stated. The very large size of the reservoir would not likely permit the rapid lowering necessary to strand rough fish eggs and fry.



December 2, 1970

Thank you for giving the Commonwealth of Pennsylvania the opportunity to comment on this matter. In view of the short period of time allowed for review, and since we must coordinate the review with other State agencies, it would expedite matters considerably if on all future requests for comments that you send at least six (6) copies of the material to be reviewed.

Sincerely yours,



MAURICE K. GODDARD





STATE OF DELAWARE  
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL  
Dover, Delaware 19901

June 4, 1971

Austin N. Heller,  
*Secretary*

Colonel Carroll D. Strider  
Corps of Engineers  
Custom House  
2nd and Chestnut Streets  
Philadelphia, Pennsylvania 19106

RE: Tocks Island Lake Project  
Environmental Impact Statement

Dear Colonel Strider:

May I offer our apologies for not having answered your request of October 28, 1970 until this late date. I was under the impression an answer had been forwarded to you.

Delaware's position remains essentially as that given during the hearings and at the Delaware River Basin Commission meetings. We had expressed certain reservations and requested assurance of other items prior to our acceptance of the plan.

The assurance given to Delaware was that the flow in the Delaware River at Trenton due to release from Tocks Island would not exceed 3,000 cfs. It is necessary that this value be agreed upon to prevent degradation of Delaware waters. An increased flow would result in a transfer of the dissolved oxygen sag now occurring in the Philadelphia area into Delaware waters. Before such increases could be made, it would be necessary to upgrade markedly waste treatment facilities in the Philadelphia-Camden area.

The flow at Trenton should not be allowed to fall below 3,000 cfs due to storage since the Delaware River Basin Commission waste treatment criteria and load allocations are also based on this value.

Another ill effect of high flows would be an increase in bacterial and industrial waste load to the upstream (Woodland Beach) oyster beds. The oyster beds are also adversely affected by fluctuation in salinity of a 15 parts/1,000 increase or by a 8 part/1,000 decrease from the norm.



Colonel Carroll D. Strider

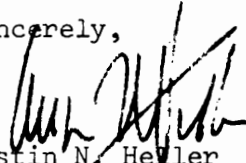
Page 2

June 4, 1971

We expressed concern and our reservations that an effective fish passage around the Dam could be provided for shad and other anadromous fish.

While we do not desire to protest the construction of Tocks Island Reservoir, we must respectfully insist that Delaware's request for managed flow at Trenton be adhered to, and that every effort be made to assure successful fish passage.

Sincerely,



Austin N. Heller  
Secretary

ANA:my





## State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION

TRENTON 08625

OFFICE OF THE COMMISSIONER

Post Office Box 1390

Colonel Carroll D. Strider  
District Engineer  
Philadelphia District Corps of Engineers  
Customs House  
Second and Chestnut Streets  
Philadelphia, Pennsylvania 19106

Re: NAPEN-P  
Environmental Policy Statement on Tocks Island Lake

Dear Colonel Strider:

We have completed a review of the Corps' draft copy of the environmental statement for the Tocks Island Lake Project forwarded under the cover letter dated 28 October 1970.

The various divisions of the Department have reviewed the draft statement. At this point, substantive comments cannot be made regarding the proposals in the draft statement in relation to the various programs of the New Jersey Department of Environmental Protection.

It is our understanding that your office has prepared an expanded statement as to the environmental impact of the Tocks Island Lake Project and we would appreciate the opportunity to review the additional material before any final comment is made by this Department.

I assure you of my desire to be of service.

Sincerely yours,

A handwritten signature in cursive script, reading "Richard J. Sullivan".

Richard J. Sullivan  
Commissioner





RONALD W. PEDERSEN  
FIRST DEPUTY COMMISSIONER

STATE OF NEW YORK  
DEPARTMENT OF  
ENVIRONMENTAL CONSERVATION  
ALBANY

November 25, 1970

Dear Colonel Johnson:

This is to acknowledge receipt of the environmental statement for the Tocks Island Lake Project sent to Commissioner Diamond on October 28, 1970.

After a preliminary examination of the statement, and the project, we have found it necessary to delay our final State reply until the views of all concerned agencies have been received.

Listed below are our preliminary comments on the statement. We have distributed it to other appropriate agencies and will forward further comments in the near future.

1. Project Description. Included in this section should be the current status of the project as well as the current benefit-cost ratio.
2. Environmental Setting Without the Project. This section should also include some discussion of the interrelations and environmental implications of this project and other projects or alternatives under construction or in operation by other State, Federal or local agencies.
3. Impact Statement
  - a. Identify "the environmental impacts of the proposed action." It is quite important here to make a careful distinction, whereby the impacts are discussed without making a judgement as to the relative worth or value that are subsequently made when detailing effects in the next section. Discussing the satisfaction of a current or projected recreation demand or flood protection, is not identifying the environmental impact of the project.

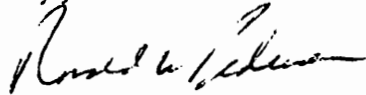


- b. Identify "any adverse environmental effects which cannot be avoided should the proposal be implemented." Secondary and indirect effects should also be discussed here. For instance, will the entrapment of sediment in the reservoir result in a loss of nutrients in the river reaches below the dams and have an effect on aquatic vegetative and animal life? Will the reservoir cause an increase in groundwater levels to the extent that property damage will occur? Are the geologic conditions in the impoundment area of sufficient character and strength to support the weight of the water without faulting or fracturing occurring.
- c. Identify "alternatives to the proposed action." A more detailed discussion should be presented on the alternative of no action. This would require a projection of the future environmental setting if the project is not accomplished. A discussion should also be presented of the alternative(s), if any, investigated with environmental objectives as the sole purpose.
- d. Discuss "the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity." It is important to recognize that there may be long-term unidentifiable adverse environmental effects resulting from the apparent short-term uses. It should be noted that each generation is a trustee of the environment for succeeding generations and any proposal which would narrow the range of choices of future decision-makers should be avoided.
- e. Identify "any irreversible or irretrievable commitment of resources which would be involved in the proposed action should it be implemented." This section should discuss irretrievable, irrevocable, and irreversible actions and effects of the project on the environment, both as it exists now and as it may be after project construction. For example, will it ever be possible to return the environment to its present state if cumulative environmental effects are identified after project construction?



Again, since we expect more specific comments from other State agencies, including the new Office of Parks and Recreation, please excuse the delay in our final State reply.

Sincerely,



Colonel James A. Johnson  
District Engineer  
Department of the Army  
Philadelphia District, Corps of Engineers  
Custom House - 2D & Chestnut Streets  
Philadelphia, Pennsylvania 19106





RONALD W. PEDERSEN  
FIRST DEPUTY COMMISSIONER

STATE OF NEW YORK  
DEPARTMENT OF  
ENVIRONMENTAL CONSERVATION  
ALBANY

January 6, 1971

Dear Colonel Johnson:

Attached are the final comments of New York State in regard to the environmental impacts of the Tocks Island Lake Project and the environmental statement.

We feel, generally, that while the project could have recreation benefits, the possible adverse effects on natural and scenic resources warrants a great deal of further study and investigation. The permanent loss of 37 miles of the free flowing Delaware River and 10,000 acres of primary bottomland and upland wildlife habitat may offset any flood control or hydroelectric power benefits. Furthermore, impairment of 37 miles of free flowing Delaware River is really only a partial description of loss. The Delaware River is the last remaining unimpounded major stream on the East Coast. There are more than 300 miles of unimpeded naturally flowing waters. This river in its current unimpaired state is definitely an amenity of great value.

In addition, the 100 mile radius used to analyze the recreation potential and effectiveness of this site is somewhat misleading. Other National Park Service proposals, such as Gateway and Fire Island National Seashore, may more effectively serve the high demand areas of New York than the Tocks Island project.

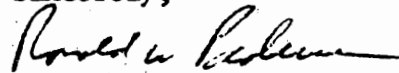
We therefore feel that because of the extent and magnitude of the project, the possibility of adverse environmental impacts and effects is great enough to necessitate



further studies before project implementation. We request that such studies be made in order to comprehensively assess any and all possible adverse environmental impacts.

Thank you for giving us the opportunity to review and comment upon this proposal.

Sincerely,



Colonel James A. Johnson  
District Engineer  
Department of the Army  
Philadelphia District, Corps of Engineers  
Custom House - 2D & Chestnut Streets  
Philadelphia, Pennsylvania 19106

Attachment



Comments on the Tocks Island Reservoir Project,  
Pa., N.J., and N.Y. and Environmental Statement

1. Identify the "environmental impacts of the proposed project."

Features recommended by the Fish and Wildlife Service to mitigate fisheries losses should be considered preliminary as based on the project as presented at the time the recommendations were made. These recommendations are subject to review and modification as project design is modified and as new information becomes available from the fisheries studies now underway. There is serious question as to whether a reservoir drawdown program can effectively control the species of rough fish likely to dominate the reservoir as stated in this item.

2. Any adverse environmental effects which cannot be avoided should the proposal be implemented.

The report recognizes that the project will have a detrimental effect on the shad sport fishery. Since no fishery benefits will accrue to New York through the construction of the Project, it follows that the project will cause a net loss to New York State's natural resources. (The shad sport fishery in New York, without the Tocks Island Project, has a potential for far greater development than that which exists today.)

The report states that a U.S. Fish and Wildlife Service fishery report "concluded that provided certain features or functional capabilities are included in the project, the overall project effect would be beneficial". No effort is made in the report to discuss potential damages to the fishery resource, if Fish and Wildlife Service recommendations are not met.

The loss of free flowing stream listed as an adverse effect should be given much more weight. The real significance of this loss is the fact that this is the last major unimpounded stream in the East.

3. Alternatives to the proposed action.

The environmental impact of alternatives to the Tocks Island Project are not discussed in nearly enough detail. The report suggests that the various alternatives would have less environmental impact than the Tocks Island Project, but no attempt was made to compare the differential nature of this impact. Costs of the alternatives are mentioned, but costs of the Tocks Island Project are not mentioned anywhere in the statement.



4. Identify "any irreversible or irretrievable commitment of resources which would be involved in the proposed action should it be implemented".

The area of developmental impact around Port Jervis also deserves more attention than is indicated in this report. The statement indicating that implementation of a sketch plan for the area is believed to be a firm basis for establishing control of development is probably incorrect. New York State and local agencies can, however, resolve this problem as well as other problems related to coordinating this development with plans for the Upper Delaware region.

5. Coordination with other agencies.

List all government and private entities with whom coordination has been accomplished, as well as a discussion of public participation efforts and specific coordination measures with environmental interests. All views expressed, both pro and con, concerning the environmental effects of the proposal should be summarized, identified, and included. When formal coordination measures have been accomplished, a copy of all comments received concerning the proposal will be attached to the statement. If formal comments are not included, state what coordination measures have been taken and the resultant comments.



**LOCAL AGENCY COMMENTS**



THE DELAWARE VALLEY CONSERVATION ASSOCIATION  
Dingman's Ferry, Pennsylvania 18328

December 15, 1970

Colonel James A Johnson, CE  
Philadelphia District

Dear Colonel Johnson,

Thank you for sending me a copy of your Environmental Statement on the Tocks Island projects. Enclosed, you will find my commentary on it. I'm sure you will not be surprised to find it is severe, just as we will not be surprised if none of this accomplishes much. Everything seems caught in the glue, today. The battle is no longer for men's minds but for their influence, prestige and a kind of paralysis vaguely called "power".

Just between you and me, I want you to understand that neither I nor the Minisink Bull have joined in the fashionable attack on the Corps, which has become so handy a shield for a whole host of political hacks, industrial "conservationists" and other androgynes. As an old Engineer wife, I know that the Corps, even in its present state as part of the national debasement, is better than another federal agency created to take its place. If I dream, it is of a Corps that fires its public relations men and returns to hard facts and hard figures, ruat caelum.


I remember when the Corps mapped Southeast Asia behind the back of the government and I know the men who did it. I hope to god the Corps has the same initiative today, and that it has already obtained copies of the plans of all the reactors, topo maps and wind-drift maps of their surroundings, and has some plan in mind for coping with a major accident at whatever site it occurs. Somehow, one feels certain, when it happens, it will be the Corps' baby.

You have a rotten job, Colonel, and I feel for you, particularly as I saw my husband go through that kind of wringer on three different occasions. The last, time, in Paris, he decided to fight it all the way. He finally got the aid of General Baker. Today, however, that particular stable is heaped higher than ever, Baker is dead and Dave had the honor of retiring as a Lt Col. One wonders just how many more such battles this country can afford to lose.

It may jolly well be that the AEC racket will be the last.

I begin to believe that the tumultuous youth has put its finger on the problem even though they have no solutions. We organize to solve our problems and wind up captives of our organizations, and all problems are thenceforth insoluble. Did you ever think that Christ was condemned by religion, abandoned by government and crucified by the military? That's organization for you.

Sincerely,

  
Joan Matheson



THE TOCKS ISLAND DAM AND THE DELAWARE WATER GAP NATIONAL RECREATION AREA.

A COMMENTARY ON THE ENVIRONMENTAL STATEMENT PREPARED BY THE CORPS OF ENGINEERS, CONCERNING THE ENVIRONMENTAL IMPACT OF THE ABOVE PROJECTS.

PREPARED BY JOAN MATHESON, VICE PRESIDENT, THE DELAWARE VALLEY CONSERVATION ASSOCIATION, R.D. 1, EAST STROUDSBURG, PENNSYLVANIA

---

The Environmental Statement of the Corps of Engineers, concerning the impact on the environment of the Tocks Island Dam and the DWGNRA reiterates the public myth that masks a fluvicide.

1. The Statement fails to place this particular 40-mile stretch of the Delaware in its overall context in the total Delaware River system, and therefore the major systemic impact of the projects goes without any indication whatsoever.
2. The statement fails to relate the 72,000 acre area of the projects to the 1200 square mile Minisink aquifer and watershed, which will be radically debased by the concomitant exploitation of the Tocks Island Regional Development Plan.
3. The Statement nowhere even mentions the planned nuclear power plants which constitute the real backbone of the Comprehensive Plan for the Delaware River Basin. The one (or more) above the reservoir will impregnate the silt beds with nuclides, pollute the waters of the reservoir, contaminate the area of the park. Those below the reservoir will consume the lion's share of the waters, necessitating drawdowns of an extent so far unavowed.

Should these projects, and the Comprehensive Plan of which they form a key part, be pursued, we can foresee nothing but an ecological disaster of a magnitude never before experienced in the history of mankind. Without going into the manifold ramifications of that disaster, let us merely elaborate somewhat on the three points above.

1. The Delaware is a small river. It has been described as more of a "big creek" than a river. Yet this small watercourse supports, relatively, the most intensive industrial development in the continent of North America.

The area of the projected Tocks Island reservoir, from Port Jervis, New York on the north to Delaware Water Gap on the south, represents the last living tissue of the river. This forty-mile reach is the last part of the river in which normal hydrologic processes still take place. If the river is deprived of this stretch, then it will be devoid of any remaining means of regeneration.

North of Port Jervis, the river is under presently pejorative demand. The East and West Branches each have very large impoundments from which water is exported out of the basin to New York City. In the past, the city has been permitted to take 450 mgd. The newest allocation made by the Supreme Court will permit the City to take 800 mgd.

The Mongaup has four hydroelectric plants on four dams.



The Lackawaen impounds a very large recreation lake behind another hydroelectric dam.

The Nevasink's headwaters are impounded exported to the City.

To this massive consumption and fatiguing of the headwaters must be added the poor water quality controls of New York State, which permit communities of the upper reaches to run their effluents almost unimpeded into the stream. The river receives New York State's last gifts at Fort Jervis.

Below Port Jervis, however, the river enters the Minisink, the "kidney" of the Delaware River. For forty miles, a long series of shallow gravel riffles cleanses and aerates the waters and mixes them with the pure streams flowing richly from the giant Minisink aquifer of the Pocono Mountains and the Jersey foothills.

This is the precise organ of the river which the Tocks Island reservoir would obliterate, covering the gravel with sludge and drowning the riffles under a 37-mile pool.

Immediately south of Delaware Water Gap, serious thermal pollution begins with the first power plants. Industrial pollution is added at Easton, urban pollution is added at Trenton, harbor pollution at Philadelphia, while the bay will face a future "enriched" by the 200 plus isotopes that will inevitably be emitted by the Salem County nuclear reactor just approved by the Delaware River Basin Commission.

2. The Delaware Water Gap National Recreation Area proposes to "save" 72,000 acres of the Minisink. That is about 10% of the watershed. The other 90% of this forested aquifer will be subjected to the "economic development" of the Tocks Island Regional Plan.

To illustrate the irrationality of this plan, one may give the statistics of Pike County, in Pennsylvania.

Pike County had a stabilized population of 7000 in 1955. 42% of the county belongs to the state in the form of forest reserves, state parks, gamelands etc. The local economy was based on agriculture on the prime bottomlands, where the deposits of Tioga and Chenango soils range from six to ten feet deep, and on privately owned and operated recreational facilities. These ranged from public beaches and riding stables to small resorts, camps and cabin colonies, rustic in mode, and with generally large tracts of land surrounding small developments. It was an optimal arrangement, permitting the area to be self-supporting without degrading the water resources by overdevelopment and overuse.

Today, vast tracts of the forest are being subdivided into "second-home" subdivisions, situated on undevelopable uplands with unstable water tables. Swamps are drained, filled or made into lakes, streams are dammed or routed through conduits, sewerage systems will have to be introduced in water-bearing rock strata, highways are being run through the area contrary to policies set by Gifford Pinchot for the protection of this major water resource. A population of 75,000 is anticipated.

As these Pocono highlands are the area where floods occur, and not the river, the burgeoning subdivisions face acute flood-threats both during summer storms and winter melts. The result has been a demand for drainage systems. In short, the Regional Development plan is dedicated to the extensive reduction of the forest, the resectioning of the water courses, and the draining of the aquifer!



It should further be noted that as the water table is frequently on top of the ground, surface and sewerage effluents will pollute the table, and that pollution, due to lack of soils, can go nowhere but into the reservoir.

The problem of 10,000,000 visitors per year, in an area in which the native population has had to control numerous forest fires even under the optimal conditions of the past, does not greatly concern me, since I am confident that drawdown will discourage visitation, and that increasing drought will have the park closed a good part of every year.

3. In view of the present fundamental importance of this area to the well-being of the entire Delaware Basin, the Pocks Island projects and the Regional Development Plan would appear to be strokes of evil genius, dedicated to the debilitation of one of America's most important industrial basins. But when one adds to these errors the introduction of nuclear fission plants in the basin, one begins to feel that those industrialists have decided to make a Carthage of their assets, without the assistance of an enemy.

It is incredible that any sane government would continue to fund, or even permit, a nuclear fission program, in the face of the facts presented by a growing list of America's finest biophysicists; facts which show that, however small the increments, the radioactive pollutants emitted by such plants constitute permanent, and therefore accreting poisons that are lethal and eventually final.

On the purely economic level, it is incredible that any sane government would support nuclear fission reactors which are enormously costly to build and maintain, and punitively unreliable in performance.

It is incredible that power companies continue to intoxicate themselves with visions of quadrupling our present power output, when every watt that goes down the wires leaves from two to eight watts worth of energy polluting the environment. There is a limit to power production. That limit is the point at which the environment can no longer absorb waste energy and simultaneously support its biological populations. We have already passed that point. From now on, every step of "progress" (conventionally defined in terms of 19th century expansionism) will cost us biological capital we cannot regain.

Those who offer their technologies as adequate prosthetics for the natural systems of the planet are guilty of a cardinal scientific sin: they have forgotten the order of magnitudes. Though mischievous application of modern technology are capable of causing great destruction, due to the "chain reaction" along the food chains of interwoven orders and species, they are ridiculously puny in the face of time and the elemental cycles of the planet. When the food, air and water resources are bullied too far, the technologies which have fattened on these riches will vanish like mist.



It has been denied by all that there will be atomic reactors in the Tocks Island Area. We never said there would be. We do say that the water of the reservoir will be largely consumed by the reactors downstream, and the Tocks Island area largely polluted by the reactors upstream and upwind. We do say that the Atomic Energy program is the only logical reason for these projects, which in every other instance are counterproductive to their "justifications". We do say that the Atomic Energy program now being propagandized in every high school and fraternity lodge in the area would not be supported by Metropolitan Edison for reasons of philanthropy. We do say that the Tocks Island projects, the development of the Tocks Island Area, and the planned atomic reactors will mean the end of the Delaware River and all that it presently sustains.

The continued cries for Progress, pressing furiously in the wrong direction, with the wrong criteria, for the wrong reasons, toward the wrong goals, remind one only of Parkinson's Law of the Administrative Block: "The planned layout of perfection is achieved only by institutions on the point of collapse. The perfection of planning is a symptom of decay; perfection is finality, and finality is death."



REC'D 12-

Henry W. Smith  
Box 214 R. D. 1  
Washington, N. J. 07882

December 14, 1970

Mr. Russell Train  
Chairman, Council on Environmental Quality  
722 Jackson Place N. W.  
Washington, D. C. 20006

Dear Mr. Train:

As Regional Director of the Lenni Lenape League, a conservation group, I would like to comment on the environmental statement as prepared for the Tocks Island Project by Col. James A. Johnson, District Engineer.

Basically, we feel the statement is extremely shallow in that it does not cover, to any degree, the questions which have been brought forward by the many conservation groups interested in this project.

Col. Johnson in identifying the environmental impacts of the proposed action, covers only the very elementary aspects, but in no manner whatever, provides any serious comments.

We are also concerned because Col. Johnson's statement was not submitted to our organization, although we have been concerning ourselves with some aspects of this project for many years. We have submitted testimony before the Senate and House Sub Committees on Appropriations and we are under the impression that the law requires the Army Corps of Engineers to apprise all conservation and interested groups with their findings.

We believe one of the most important disadvantages to the Delaware River Valley as a result of constructing the dam is the annual drawdown which will range from 18 to 56 feet per year. The Army's statement does not even mention this fact and more important it does not discuss the ecological effects which will result.

According to figures provided by the Delaware River Basin Commission, the drawdown in a normal year will be 18 feet and will diminish the size of the lake by almost one quarter. During a year of extreme drought, the drawdown will be 56 feet and will shrink the lake by more than two-thirds its normal size.

The 18 foot drawdown will uncover 3,253 acres of shoreline while the 56 foot drawdown will expose 12,500 acres. This will have very serious effects on the ecology of the valley, yet it was not mentioned in the Army's report.



According to the information we have gathered, the drawdowns will create mudflats; have a detrimental effect on plant and animal life along the shoreline and will be a factor in affecting the food chain for fish and migratory birds. A very extensive report on this question has been prepared and is available from Dr. Edlen MacNamara of Lehigh University in Bethlehem, Pennsylvania.

In addition to the annual drawdown there will be a daily drawdown in the reservoir which will be created by the operation of the proposed pumped storage power system on the Kittatinny Mountain.

According to power company officials this drawdown will range from nine inches to three feet per day and will also have detrimental effects on the ecology of the area.

We believe the public should know exactly how these variations in the water level will effect the valley. The idea of pumped power within the project area, using five billion gallons of water per day, is also not mentioned in the Army's statement.

Questions which need answering along these lines include: Will the project create turbidity in the water and if so, what effect will it have on animal and fish life as well as on the recreational aspects of the project?

What will happen to fish as a result of the power plant sucking some 120,000 gallons of water per second?

How will the pumped storage system effect the temperature of the lake?

Will the river water, pumped to the top of the mountain, pollute the headwaters of the many small spring-like streams and Sunfish Pond?

Col. Johnson reports that there will be cold water releases from the bottom of the dam to provide a cold water trout fishing area some ten miles long.

What affect will the pumped storage have on this concept?

Will the release of cold water from the lake adversely affect the temperature of the water remaining in the lake?

What thermal effect will the Portland Electric Generating Station, less than 10 miles downstream of the dam, have on the cold water releases for trout?



The army statement reports the visitation of some 10.5 million people per year, but does not consider what ecological affect might result. We have information as to what is happening to our great national parks in the west as a result of intense visitation and believe the Army should provide some answers in this direction. In those areas, the visitation did not exceed four or five million, but the results were chaotic. How can the Army Corps of Engineers justify, ecologically speaking, more than 10 million visitors to an area much smaller than our western parks?

For example, what plans are being made to handle the sewage from the visitors who will come here in the initial stages of the project's development? We are aware that the Delaware River Basin Commission has recently made public a 50 year plan to construct a sewage system in the Tocks region, but in the meantime how will this be handled?

The plan, as unveiled by the commission, includes five alternatives ranging from the construction of 116 individual sewer plants, to one huge plant to be located below the dam at Columbia in Warren County. The latter alternative would dump 5 00 million gallons of effluent into the river each day.

However, the plan which has been recommended to the basin commission by its consulting engineers, involves the construction of six large treatment plants. Three of these projects would be located above the dam and would empty their effluent into the lake. The three remaining systems would be located below the dam and dump their effluent into the river.

This plan raises many questions, none of which were entertained in the Army's statement.

We believe the public should know what effect these plants will have on the lake and the lower Delaware River.

Furthermore the plan only covers the Tocks area and does not provide any protection of pollution entering the lake from the upper reaches of the Delaware. Without such protection there is a real danger that improperly treated domestic and industrial wastes will empty into the Tocks Lake.

What effect will the sewers have on the water quality in the lake and below the dam? What is the result of treating wastes from 10 million people at 95 per cent efficiency? What effect will the proposed sewer system have on the proposed cold water trout fishing stretch?

How can we justify building a dam for water supply and at the same time dumping effluent from sewage treatment plants into it? Can this water be used for drinking purposes? If so, how much will it cost to purify it and should not these costs be added, or made known to the public?



Col. Johnson said the cost of Tocks water is one cent per each 1,000 gallons. Has the sewage element been considered in his figures?

In reviewing the ecological effects of the project, we feel the Corps should have submitted an estimate of the oxygen producing qualities of the valley. The de-nuding of 16,000 acres of forested land will reduce the oxygen production for east coast regions.

Col. Johnson said the construction of dams in the tributaries of the river to provide water and flood control would be an "unrealistic number." How many is unrealistic?

In describing the effects of the power plans for the Tocks area, the corps offered only one alternative for conventional hydro electric power. In the first place, he does not mention pumped storage, which has already been approved by congress and only awaits approval by the Federal Power Commission. There is no doubt this system will be included in the proposal and it should, therefore, be a consideration.

It appears to us that Col. Johnson is side-stepping the effects of the pumped storage system and furthermore has not researched the idea of presenting alternate plans for power.

For example, power officials in Miami, Florida have recently completed the construction of a jet engine power producing plant. This plant took one year to construct and produces full power in three minutes at the push of a button. This does not necessitate the use of water and should very well be a consideration in this instance.

There is also compressed air pumped storage, gas powered turbines and cycling boilers. There is also the consideration that perhaps a power plant should not be located within a national recreation area.

We believe the corps should have considered the effects to wild animal life, faced with the visitation of more than 10 million people a year.

He mentions that the project will have an adverse effect on shad. What effect and how much? Will there be a fish ladder which shad can use successfully? Can shad find their way up the river if they can get over the dam? Can they find their way back to sea after they are hatched?



As you know, there is a hue and cry in the United States today to control our ecology before it destroys the human race. The U. S. Army Corps of Engineers has been singled out, time and time again, in newspapers, magazines and books as a destroyer of our rivers.

We see Col. Johnson's statement as indicative of the Engineer's long time lack of concern for conservation values, which has brought this nation to its knees and aroused a great concern among the general public.


We feel this communication has provided enough information and questions to permit your office to seek and demand a more thorough inquiry into the ecological impact of the Tocks projects.

If we can assist further, either through conferences or by providing more detailed information, please feel free to ask.

cc: Col. James A. Johnson  
Corps of Engineers  
2nd and Chestnut Sts.  
Phila. Penna. 19106

Sincerely,

News Media  
U. S. Senator Clifford P. Case  
U. S. Senator Harrison Williams  
U. S. Senator Allen Ellender  
U. S. Senator John Sherman Cooper  
Gov. William Cahill  
Gov. Nelson Rockefeller  
Gov. Milton Shapp  
Gov. Russell W. Peterson  
State Senator Wayne Dumont  
Assemblyman Robert Littel  
Assemblyman Thomas Kean  
Congressman Frank Thompson  
County Governing Boards  
County Planning Boards  
Paul N. Van Wegen, DRBC  
Delaware River Basin Commission  
State & National Conservation Groups  
Tocks Island Regional Advisory Council  
N. J. Dept. Environmental Protection

---

Henry W. Smith



SAVE NEW JERSEY'S NATURAL ENVIRONMENT

Emily Cardineau  
Virginia Fuller  
Esther Gallup

Edith Hull  
Ann Turner  
Isabelle Van Atta

Claire Weiler

Executive Committee

Price Street  
Branchville  
New Jersey, 07826

December 15, 1970

Colonel James A. Johnson, District Engineer  
Department of the Army  
Custom House  
2nd and Chestnut Streets  
Philadelphia, Pa., 19106

Dear Sir:

As regards your letter dated November 19, 1970 and received November 21, 1970, requesting that SAVE NEW JERSEY'S NATURAL ENVIRONMENT state its views concerning the Tocks Island projects as an organized citizen group concerned with environmental protection; these views to be incorporated into the final environmental statement on the Tocks Island projects to the Council on Environmental Quality in accordance with the Environmental Policy Act of 1969 as required by Section 102 (2) (c)----

SAVE NEW JERSEY'S NATURAL ENVIRONMENT submits, as per your request, here enclosed, its comments concerning your preliminary draft environmental statements.

We thank you for this opportunity to reaffirm our position concerning the projects at Tocks Island.

Sincerely yours,

Executive Committee

SAVE NEW JERSEY'S NATURAL ENVIRONMENT

ACT:cpw  
Encl.

cc: Governor William T. Cahill  
Senator Clifford P. Case  
Senator Harrison Williams  
Representative Frank Thompson, Jr.  
Sussex County Board of Chosen Freeholders  
Warren County Board of Chosen Freeholders  
Chairman Russell Train, Environmental Quality Council  
Senator Allen Ellender  
Newark News  
New Jersey Herald  
Michael Frome, Conservation Editor, Field & Stream  
Richard Madden, New York Times



STATEMENTS OF

SAVE NEW JERSEY'S NATURAL ENVIRONMENT

RE: TOCKS ISLAND RESERVOIR PROJECT--PENNSYLVANIA, NEW JERSEY AND NEW YORK  
AND ENVIRONMENTAL PRELIMINARY DRAFT STATEMENTS OF THE  
UNITED STATES ARMY CORPS OF ENGINEERS

#1. Project Description:

1/Corps Statement--"Normally, stream flows to be impounded by the dam will form a 12,400 acre reservoir...."

1/S.N.J.N.E. Statement--"Normal" conditions, we must assume, are accepted in this case to mean the conditions of the river impoundment and its flow under adequate and evenly distributed rainfall conditions.

The Delaware River is, according to official description, "one of the smallest river basins in the United States." The sources of this immature waterway are only a small lake in Schoharie County in New York State and small feeder streams in the Catskills. Drought conditions prevail in the Appalachian region--usually in the summer months. After construction of a dam at Tocks Island the need for "low flow augmentation" in the lower river reaches at this seasonal period will leave the proposed reservoir in an extensively mud-flatted condition. (Witness, for example, Youghiogheny Reservoir in southwestern Pennsylvania and Crabtree Creek, a tributary of the Savage River in the Potomac waterway system.) This deep seasonal drawdown could not mean a water-filled reservoir of 12,400 acres during either the summer or autumn seasons as a result.

The term "normal" then can only refer to a post-rain period or spring thaw on the Delaware River.

2/Corps Statement--"This project will serve the purposes of flood control, water supply, hydro electric power and recreation, inclusive of fish and wildlife."

2/S.N.J.N.E. Statement--The above statement should read: "It is desired that this project will serve etc." Seasonal drawdown alone negates the possibility of the multi-purposes actually being served.

Potable water supply service during drought season drawdown will, with greatly lowered water reserve, be gravely diminished. For the same reason, pumped storage use of the northern Delaware River will be diminished since its daily fluctuating withdrawal of the Delaware River water to support peak hour electrical supply need will, indeed, be subjected to the seasonal drawdown lower water levels. Again, the recreational use of the Tocks Island Reservoir area and the DWGNRA will be greatly diminished because of the same seasonal drawdown. The mud-flatted conditions will prove repugnant to visitors; swimming, boating and fishing will be beyond capability in what, at seasonal drawdown, will be a stagnant sump instead of the proposed 12,400 acre water impoundment.

3/Corps Statement--"The 12,400 acre reservoir will also serve as a focal point for the surrounding 47,000 acre Delaware Water Gap National Recreation Area...."

3/S.N.J.N.E.--TIRAC (Tocks Island Regional Advisory Council) brochures state that the proposed Tocks Island Dam and The Delaware Water Gap are the two main features of the projects. They detail, however, that because HIGHWAY CONGESTION will be so problematical...the visitor will be allowed only a fleeting glimpse of the Gap and will not be able to leave his auto-



mobile to view this NATURAL spectacle (as he is presently able to do). The reservoir, under such circumstances, would then become such a "focal point." However, during the largest visitor seasons (summer and fall) the aforementioned seasonal drawdown would negate the reservoir's recreational use capacity.

#2. Environmental Setting Without The Project:

1/Corps Statement--(Referring to northern Delaware shore) "Numerous glacial lakes are found near the mountain crest..."

1/S.N.J.N.E. Statement--This statement refers to New Jersey's glacial aspects, describing the intrinsic value in this northwestern mountain area--the glacial lakes, waters and soils that were created from the Last Ice Age. (That evolution places this New Jersey section on the OLDEST LAND ON THE NORTH AMERICAN CONTINENT.) The land's glacial quality finds it with primitive and ancient vegetation (ferns especially on the Old Mine Road) on the river border, along with prehistoric bones and other archaeological finds that have already proven of significant value and of rare nature. Proposed inundation intensifies in its tragic aspects when New Jersey's northwestern glacial quality is recognized.

2/Corps Statement--"...glacial lakes...support localized recreation activities."

2/S.N.J.N.E.--This is understood to mean that local areas of northwestern New Jersey presently serve recreational interest by using their natural environment. This section of New Jersey (Sussex County, for example) serves more than 100,000 "outside" visitors annually, according to official estimates. Currently, however, property losses, as a result of Tocks Island projects, amount to more than \$14,000,000 in Sussex County alone --when much of this land had been owned by "second home" vacationers. This severe recreational loss had NOT been put into the Corps benefit-cost ratio as it and every other local recreational loss should be concerning these projects. (Losses of camp facilities, Sunfish Pond recreational atmosphere, the obliteration of the Appalachian Trail under the pumped storage proposal and the inundation of the largest part of New Jersey's Old Mine Road, of course, and the vast quantities of land, homes, businesses and regional recreational atmosphere due to the proposed massive highway systems that must serve the estimated 10.5 million visitor onslaught...were NOT submitted in the Corps benefit-cost ratio.)

3/Corps Statement--(Referring to forested areas)"...and youthful growth overrunning the abandoned agricultural fields scattered throughout the river terraces."

3/S.N.J.N.E. Statement--We question the use of the word "abandoned" when referring to agricultural fields, since this word lends to belief that the local citizen has somehow allowed them to fall to disuse and abuse. This certainly is not so in most cases. Generally, the small farm is dying in northwestern New Jersey due to large farming, at almost "industrial" levels in other areas. Property tax is this area's local and state service lifeline and it precludes the small farmer's maintenance of vast acreage. Therefore, the "small" farmer in northwestern New Jersey today has either turned to other work or is selling his land to the "gentleman farmer" as a second home country estate. The word "abandoned", indeed, should be put instead upon the federally acquired lands and buildings under Tocks projects. (The



dwellings "boarded up" neglected quality in Pahaquarry and Walpack Townships, for example, are genuinely "abandoned"--their septic tanks and wells left untended and uncared for, to leak or to contaminate after Corps acquisition.)

4/Corps Statement--"These characteristics (referring to generally fertile soils on the river border and abundant ground water supplies) have supported active agricultural farming areas which have been cultivated since early colonial times."

4/S.N.J.N.E. Statement--This Corps statement emphasizes the colonial heritage of this region and the time-honored farmer who utilized this beautiful and natural environment, yet, at the same time, preserved it.

5/Corps Statement--"The present use of the project lands can be considered as an interim use since the area is gradually being converted from farming to recreational and seasonal residential use due to increases in land values caused by a regional emphasis on a recreational economy."

5/S.N.J.N.E. Statement--RECREATION is being served in northwestern New Jersey. Today, for example, in Sussex County, "private enterprise" recreational economy is well organized and desirous of maintaining the natural environment while serving its monetary benefits. (Mr. Donald Hehn has organized the Kittatinny Recreation Association, now reaching into Warren County as well as Sussex.)

6/Corps Statement--"Throughout its course, the Delaware River supports a varied fishery from the shad and oyster commercial fishery in lower Delaware Bay--to the extensive sport fishery for bass, walleye, shad and trout found between Trenton and the headwaters."

6/S.N.J.N.E. Statement--The Delaware River does presently serve varied and abundant fishery.

However, daily massive "fluctuation" of the water resources due to the Tocks Island projects will deny the present massive quantities of varied forms of fish life; this as a result of pumped storage drawdown of the proposed impoundment.

The OYSTER INDUSTRY will, indeed, cease to function in the Delaware Bay should the dam at Tocks Island be constructed and if the warning pleas of this vital commercial endeavor are ignored.

The oyster fishermen have warned that should this dam remain closed during the spring thaw "run-off" (for building the water bank reserve) the resulting saline content of the lower Delaware (due to oceanic backwash) would be disastrous to the oyster industry. Promises have been made to this important industry that the dam would be open to allow "inflow waters" to be released for three months--this period during the overflow season following winter (when the river swells)--when the melted snows would otherwise have filled the reservoir or, at least, prepared it for "seasonal drawdown."

It must be remembered that season drawdown will follow this three month inflow waters FREEFLOW period of spring thaw. REFILLING the reservoir after this freeflow would, under Delaware River normal conditions, require a long period of time. Refilling the reservoir water reserves would be impossible during the summer and autumn severe drought months on the northern Delaware River. Summer and autumn reserve water supply then (having lost spring thaw inflow waters because of three month freeflow) would be further diminished; the already disastrous seasonal drawdown taking its toll on the impoundment--then, having no spring season reserve for even a minimal amount of inflow waters supply--the northern Delaware will become a dead



stagnant muddy sump, unable to augment low flow conditions below the dam and leaving that section impaired; all of this until the snows come again to the Appalachian region or one of its sporadic rain periods occurs.

Mr. Gary Marshall, graduate student under Dr. Trembley, noted fish ecologist, has warned that the drawdowns on the northern Delaware River-- due to seasonal drought conditions and electrical pumped storage daily withdrawal proposals--will negate any possibility of VARIED fishery in the Delaware River. The intensive daily fluctuation results due to pumped storage could take as much as 16% of the reservoir-lake; causing an "imbalance" of fish life, leaving suckers in the largest volume. The walleyed pike, for example, and all other fish that spawn at the reservoir edge will diminish due to the fact that strong sunlight will kill the fish eggs as a result of the shallow mud-flatted conditions. Pumped storage drawdown, coupled with seasonal drawdown and inflow water release in the spring months will leave any varied amounts of fish life not possible in the proposed impoundment. And, of course, existing fish life (those that do not spawn at the reservoir border) will diminish as the aforementioned drawdowns leave the reservoir a mud-flatted stagnant bowl.

#3. Impact Statement: (in response to Section 102 (2) (c) of the National Environmental Policy Act of 1969.)

a. Identify "the environmental impacts of the proposed action."

1/Corps Statement--"The reservoir waters will permanently inundate 10,000 acres of land in addition to the 2,400 acres now covered by the existing stream, and, infrequently, would affect an additional 6,000 acres of land during temporary storage of flood waters."

1/S.N.J.N.E. Statement--The term "flood waters," we must assume, refers to the spring thaw season when the melted snows cause the Delaware River to "swell". "Flood" denotes disastrous overflow conditions. This is NOT so on the northern Delaware River. "Swelling" of the Delaware River is the best description during spring thaw. It must be recalled that after dam construction the river will be in inflow waters freeflow in order to save the oyster industry; this during the Corps referred to "temporary storage" period (spring thaw). Therefore, inundation of the referred to "additional 6,000 acres of land" will NOT take place during the spring thaw.

However, during heavy rainfalls (that are sporadic and unpredictable at other times of the year), such as those of mid-November 1970 (after a very dry summer and early fall), this additional acreage will be inundated....so compounding the tragic loss of border land to our State of New Jersey. This "flooding", as a result of the Tocks Island Dam, will destroy Flatbrookville in Walpack Township--so inundating Sussex County's most beautiful and historic section of land--also destroying the Old Mine Road, the oldest road of its kind in the nation.

Our State of New Jersey can ill afford land losses for any reason, since it is the fourth smallest, most densely populated and most urbanized state in the nation. Our borders are already heavily eroded on all coasts and "man-made" land loss, such as in this case, is a monumental tragedy.

Sussex County, New Jersey is our state's "last rural frontier" and land inundation on this naturally beautiful river border is again a monstrous disaster.

2/Corps Statement--"The normal summer reservoir pool will offer a 100-mile shoreline and will be supplemented by an extensive plan of in-



itial water-related recreation development which will support an estimated 4.2 million recreation days."

2/S.N.J.N.E. Statement--The term "normal" should, by necessity, be changed to "desired" since seasonal and pumped storage drawdowns alone will mean that the average reservoir shoreline will be EXTENSIVE mud flats.

"Water-related recreation development" means, of course, spring, summer and autumn recreational use, largely. We remind that spring will mean inflow waters freeflow--summer and autumn will mean extreme drawdown with low water supply. Recreational development that is water-related will be impossible in those seasons. Therefore, "4.2 million estimated recreation days" cannot be factually based.

3/Corps Statement--"...15% of the population of the United States resides within 100 miles of the project site. Due to the unsatisfied demand of this great northeastern megalopolis for outdoor recreational opportunities...it was proposed...that land adjacent to the reservoir project be established as the Delaware Water Gap National Recreation Area."

3/S.N.J.N.E. Statement--15% of the United States' population is a MAMMOTH amount of persons to serve recreationally on the proposed site--48,000 acres. This organization does NOT support the concept that this amount of acreage could bear such a vast visitor onslaught. Traffic congestion in northern New Jersey, for example, is already extreme and New Jersey's land is presently seriously ravaged by highway systems. Open lands in our state are few and growing more scarce. We denounce the federally desired MAMMOTH visitor quality of this recreational project--the DWGNRA.

We also point out that the Department of the Interior has proposed the GATEWAY NATIONAL RECREATION AREA for the New York Bay region (including Sandy Hook) that will be created largely on government owned lands. This proposal, which would encompass many presently polluted and ravaged water areas and grounds, would UPGRADE their quality and make USEABLE an environment that today serves little or no purpose. The "Gateway Recreation Area" proposal will serve an estimated 52,000,000 visitors annually and will be in the "backyard" of the people needing it the most. We denounce the use by an estimated 10.5 million visitors a year that will cause extremes in highway ravage and which is too small in area to possibly support such a visitor onslaught. We remind that New Jersey has a present population of 7½ million.

Of course, spring, summer and fall recreational use of the DWGNRA will be small because of the drawdown extremes. Recreational use will largely be winter sport activity.

We also remind that, according to the New York Daily News, Bergen County in New Jersey is to have a dam and recreation area on the Hackensack River--proposed to serve that heavily populated area. We comment here that the Hackensack River will require serious DEpollution efforts first.

4/Corps Statement--"The Recreation Area project (DWGNRA) was developed for...preservation of the scenic, scientific and historic features of the area."

4/S.N.J.N.E. Statement--We remind that, by the Corps' own statement, 10,000 acres of land will be permanently inundated and an additional 6,000 acres will be temporarily inundated in temporary storage periods. (We remind--WHAT WILL THE 6,000 ACRES LOOK LIKE AFTER INUNDATION--WHEN THE WATERS RECEDE?)

Preservation CANNOT be a genuine motive of these projects, since vast



amounts of scenic (Flatbrookville in Walpack, N. J.), scientific (archaeological digging grounds) and historic (Old Mine Road and ancient buildings) features will be destroyed because of them.

5/Corps Statement--"The recreational opportunities to be offered within both project areas, combined with the highly scenic value of the Delaware Water Gap, are anticipated to be capable of attracting an estimated 10.5 million recreational visitors per year."

5/S.N.J.N.E. Statement--The combined acreage of both projects--that of the reservoir and that of the recreation area--will altogether comprise only 72,000 acres. It must be noted here that National Park areas MUCH LARGER have been found INCAPABLE of meeting FAR SMALLER visitor populations; this chaotic situation having already been felt in the western United States where "open lands" are more prevalent and where year-round populations are smaller and considerably less dense than is the situation in New Jersey. Yet, these western parks suffer from what officials are calling "people pollution." This organization desires to know what people pollution effects have been researched under the Tocks Island projects and IN WHAT MANNER WILL THIS ENVIRONMENTAL PROBLEM BE AVOIDED? Refer to S.N.J.N.E. Statements--(#1--3) (#2--6) (#3a--3) (#3a--4)

6/Corps Statement--"The National Park Service has prepared a comprehensive land and water use Master Plan for both the reservoir and national recreation area projects. This plan envisions heavy recreational use without significant impairment to the area's natural resources."

6/S.N.J.N.E. Statement--Refer to S.N.J.N.E. Statements--(#1--3) (#2--6) (#3a--2) (#3a--4) (#3a--5)

We note here that, for example, the proposed "Foothills Freeway" (to serve the 10.5 million visitor onslaught) will tear through Sussex County's Bear Swamp--this area's natural water table; re-emphasizing the fact that massive impairment to the area's natural resources is evident under Tocks Island projects proposals.

According to Dr. Edlen E. MacNamara, head of the Center in Marine and Environmental Studies at Lehigh University in Pennsylvania--in his report made to the National Park Service, upon its request, concerning Sunfish Pond and the pumped storage proposal--NO ENVIRONMENTAL ASPECTS HAD BEEN CONSIDERED in the original planning. S.N.J.N.E., therefore, submits here that--this having been true of the pumped storage proposal--the SAME is true of other Tocks Island proposals and their planning.

7/Corps Statement--"In addition to recreational use, the (National Park Service) plan provides for preservation of the scenic, scientific and historic features of the area."

7/S.N.J.N.E. Statement--Refer to S.N.J.N.E. Statements (#3a--4) (#3a--6)

8/Corps Statement--"An extensive historic building survey and archaeological survey within both project (reservoir and DWGNRA) areas is underway. Buildings ultimately recommended for preservation will be protected or relocated to an area beyond the effects of reservoir operation."

8/S.N.J.N.E. Statement--The historic building survey, according to TIRAC brochures, will mean preservation of structures with a NATIONAL INTEREST only. This is peculiar polarization of what is historically significant in this latter 20th Century. In other words, according to official brochures, local and state historical values hold NO interests worthy of



preservation.

Relocation measures are deeply abhorrent to New Jerseyans who are fully cognizant of the reasons WHY ancient buildings exist WHERE they do. (For example, the Van Campen Inn PRESENTLY exists on the OLD MINE ROAD since it was originally constructed to serve the weary "traveller" in colonial times. RELOCATION is planned for this historic building because inundation as a result of the Tocks Island Dam ~~that~~ would, otherwise, destroy it. Relocation of this old inn and like structures is NOT educationally honest and presents these structures in a false light.)

Underground passageways exist with some of the structures. These, of course, CANNOT BE RELOCATED and will be destroyed by the "flooding" due to Tocks Island Dam construction.

NO archaeological survey can preserve the extensive archaeological digging grounds that pervade the inundation area on New Jersey's northern Delaware River shoreline. As a result of the extensive nature of these diggings, their intrinsic value yet remains untapped. Now, with the proposed inundation by dam construction, they will succumb to the "flood" waters and will be lost to mankind forever.

It must be noted here that, according to C. Weslager, a State of Delaware archaeological historian, paleographs were found on boulders (before unseen) deep in the Walpack Township, New Jersey river bed section; this happening during serious drought conditions during a summer of the latter 1960's. These paleographs were untranslatable; bringing attention to the fact that there were Indians of an age hitherto UNKNOWN in this section. This archaeological "find", it is believed, is a link to Indian evolution on the North American Continent. Such "finds" will be lost to man should the Tocks Island Dam reach fruition and this archaeologically precious area become inundated.

9/Corps Statement--"Selective archaeological artifacts will be exhibited at various locations within both project areas."

9/S.N.J.N.E. Statement--Refer to S.N.J.N.E. Statements--(#3a--4)  
(3a--8)

"Selective" samplings, as proposed, according to the Corps statement, is a tragic end to what is NOW an "archaeologically rich" stretch of land on the northern Delaware River border. This organization strongly denounces such a substitute proposal as "selective archaeological exhibitions."

10/Corps Statement--"The U. S. Fish and Wildlife Service prepared extensive reports on the effects of the reservoir project on the Delaware (River) fishery and wildlife resources...; functional capacities...required for releasing waters from various levels within the reservoir to sustain the downstream fishery and for releasing all reservoir inflows during April, May and June to avoid damage to the Delaware Bay oyster industry."

10/S.N.J.N.E. Statement--Refer to S.N.J.N.E. Statements--(#2--6)  
(#3a--1) (3a--2) (3a--3) (#3a--4) (#3a--6)

Extensive conflict is obvious under the Tocks Island proposals--as witness Corps Statement (#3a--10)

11/Corps Statement--"Incorporation of the F&WS recommendations will...mitigate a portion of the detrimental effects of the reservoir on the sport and commercial shad fishery."

11/S.N.J.N.E. Statement--"The term PORTION here emphasizes the fact of detrimental effects of dam construction on the Delaware River that will wound the presently abundant shad fishery, as well as, the current sport fishing recreational use of the river.



12/Corps Statement--"A reservoir drawdown program can be used to effectively control rough fish which would otherwise overpopulate the reservoir after the initial ten-year primary harvest period for game fish."

12/S.N.J.N.E. Statement--Refer to S.N.J.N.E. Statement--(#2--6)-- paragraph #2.

The reservoir drawdown program CANNOT be used effectively to control rough fish overpopulation because of--Refer to S.N.J.N.E. Statements--(#1--1) (#1--2) (#1--3) (#2--6) (#3a--1) (#3a--2) (#3a--3) (#3a--4) (#3a--6).

13/Corps Statement--"The wildlife report concluded that primary bottomlands and upland wildlife habitat...would be lost or significantly impaired by the project...would require the acquisition of approximately 880 acres of land for replacement. These lands are tentatively located beyond the project boundary in New Jersey and Pennsylvania."

13/S.N.J.N.E. Statement--This illustrates well the poor planning of the Tocks Island projects. In addition to the current land acquisition program that has caused more than a \$14,000,000 property loss in Sussex County alone, 880 additional UNPLANNED acres must be acquired to promote wildlife preservation. (This situation does, indeed, put Sandyston Township, for example, into a peculiarly anxious position, since federal intentions, as previously stated, maintained that the projects would consist entirely of 72,000 acres, leaving this lovely rural township with only 9000 remaining acres after acquisition.)

This obvious error in planning also emphasizes our statement that THE ENVIRONMENT WAS DISREGARDED WHERE TOCKS ISLAND PLANNING WAS CONCERNED.

We add here S.N.J.N.E. seriously doubts that attempts to preserve wildlife habitat will succeed after the first year of 10.5 million visitor onslaught. We do, however, know that wildlife balance is in upheaval for more than thirty years after construction of dams and that, indeed, the F&WS quite properly desires to maintain whatever it can of it in the Tocks Island projects areas; recognizing, we assume, that New Jersey's wildlife has largely succumbed to overpopulation, urbanization and industrialization, and that this northwestern area's wildlife must be protected.

14/Corps Statement--"...the combined reservoir and national recreation area projects would create an interrelated economic and environmental impact on the seven counties bordering the project areas."

14/S.N.J.N.E. Statement--There are extensive ratable losses (more than \$14,000,000 in Sussex County property acquisition) thus far. These tax revenue losses are so powerful as to demand revaluation to "pay the way" since in New Jersey economy exists on the property tax "lifeline" at local, county and state levels. (We refer to TOCKS ISLAND RECREATION AREA HEARINGS --March 1, 1965--testimony of the late freeholder, Mr. Denton Quick of Sussex County, New Jersey). Revaluation demands precede natural revaluation need and are necessary so that the remainder of the county might pay for existing services (WITHOUT yet providing facilities that will be required under the Tocks Island projects.) Refer to S.N.J.N.E. Statements (#2--2) (#2--3) (#2--5). Of course, as facilities that must be provided and that are begun, taxation problems will far outsize any revaluation attempts to provide much needed revenue. This CHAOTIC situation (particularly in Sussex County, N. J.--since this area will, by federal detail, be the victim of the largest visitor onslaught--60% of the 10.5 million--and is suffering the largest land loss) will, as a result, bring "blight and havoc" to the area, both environmentally and economically as tax demands rise beyond the ability to pay.



We make note here that already "opportunism" in northwestern New Jersey has raised its head with, for example, an attempt to build a "factory slab city" on Sussex County's water table--the Bear Swamp-- and such speculators who have applied for "commercial" airport construction overlooking quiet rural villages. These types of "opportunism" are only beginning, but, as tax losses mount, the speculators chances of gaining a foothold rise with them until, since anything will be allowed as the taxpayer "gives in", this will help to pay the bills.

Therefore, S.N.J.N.E. does concur with the Corps statement that the Tocks Island projects would create an interrelated economic and environmental impact on the counties involved under them, for, indeed, they have already.

15/Corps Statement--"...consultants were utilized...to...serve to guide orderly growth and change of the population and economy such that the unique quality of the area can be retained..."

15/S.N.J.N.E. Statement--Refer to S.N.J.N.E. Statement (#3--14). The "unique quality" of the Tocks Island area, of course, cannot be retained because of the SIZE of the proposed projects. 10.5 million visitor estimates leave local areas with construction of enlarged hospital facilities, enlarged police protection, enlarged rescue squads and construction of access roads because of planned vast expressways--to name just a few of the HUGE local taxpayer expenses involved under these projects.

16/Corps Statement--"...studies are in progress to determine the required additions to existing area highway systems."

16/S.N.J.N.E. Statement--From "Highway Facts--N. J. Dept. of Transportation"--(proposals)

Interstate Rte. 80--Sussex & Warren Cties.

Route 15 Freeway--Sussex Cty.

" 24-46 Freeway--Warren Cty.

" 23 Freeway--Sussex Cty.

" 31 Freeway--Warren Cty.

Intra-state Freeway 206--Sussex Cty.

Foothills Freeway--Sussex & Warren Counties (This to tear through Sussex County's water table, the Bear Swamp; so also bringing opportunist desirous of building a "factory slab city" on the water table.) Refer to S.N.J.N.E. Statements (#3a--3) (#3a--15).

These massive highways to support an estimated 142,000 visitors daily in 80,000 automobiles daily is so monumentally ravaging in its environmental aspects that this organization feels that no further comments are necessary. What has been referred to by the Corps as a presently unique quality in the Tocks Island areas will be a disaster after this vast highway ravage of New Jersey's lovely and natural environment.

17/Corps Statement--"...a Tocks Island Regional Advisory Council (TIRAC), comprised of the seven affected bordering counties, has been working continually on four main elements of a regional environmental protection system: (1) water supply and sewage systems (2) solid waste programs (3) vector control systems (4) electrical utility systems."

17/S.N.J.N.E. Statement--We might say here that the taxpayer-voter does NOT adhere to the concept of an organization like TIRAC. Represented as an organization to AID the seven counties' residents, it is heavily federally funded, putting its members into a federally representational category. Its membership includes county government officials (in



New Jersey--Freeholders) who are elected by N. J. county voters to represent them in all areas that apply. Allowing that TIRAC IS NOT PERMITTED TO MAKE LEGISLATION it has, however, imposed programs that deeply involve the TIRAC member in interstate activity--so taking the county freeholder out of his county-elected category and limitation. The seven counties involved in TIRAC pay in excess of \$5,000 a year for membership--so draining further the fast-dwindling tax revenues at county level (Sussex County, for example, expects a county tax hike of \$1,000,000 for this new fiscal year) to serve what actually amounts to the federally initiated projects at Tocks Island.

Today "hardship cases", as a result of the land acquisition program under the Tocks Island projects, are rapidly mounting; yet TIRAC members are UNHEARD in this difficult and chaotic period since they are involved in studies and programs to further the creation of the projects. (These same programs that will cause MORE county taxpayer expense since he cannot tax the federal government for maintenance of the huge facilities that will be necessary. And NO commitments have been made as to WHO WILL PAY FOR THE MAINTENANCE OF THE FEDERAL ASPECTS OF THE PROGRAMS.)

TIRAC, according to Corps Statement (3a--17) "has been working continually" on four main elements of a regional environmental protection program.

(1) Water supply and sewage systems--We note that, according to Delaware River Basin Commission (DRBC) spokesmen, water supply for the areas surrounding Tocks projects (DWGNRA) will be largely derived from ground waters since these are abundant in these areas (Warren and Sussex Counties) so eliminating (for, at least, 50 years) any regional demands for Tocks Island Reservoir potable water supply use. This meaningful factor points up the fact that New Jersey's complete surface and ground water supply resources SHOULD fall under careful scrutiny before any further plans are made to supply potable water need anywhere in the state from the proposed Tocks Island Reservoir.

Sewage waste - titled "liquid waste" by consultants for the DRBC is to be under a regionalized system that will include the DWGNRA. (In addition to the surrounding local areas) Tertiary systems would be necessary since it is planned under the consultant-recommended scheme to discharge effluent from, at least, three of the proposed sub-regionalized sewage facilities (Matamoras, Milford and Flatbrook) INTO THE PROPOSED RESERVOIR.

This organization reminds that SERIOUS LOW-FLOW conditions already prevail in the small Delaware River basin and that after dam construction massive drawdowns will exist, leaving the river at extremely low flow seasonally and at daily pumped storage fluctuating periods. Sewage waste discharge "run-off" planning in this immature water basin should be carefully analyzed before such a plan is consummated.

(Also, DWGNRA will be replete, according to TIRAC and DRBC spokesmen, with SEPTIC TANKS to serve a portion of the 10.5 million visitor onslaught.) This factor leaves this organization wondering at such federally poor planning, as well as, the poor planning of TIRAC and the DRBC. Environmental aspects in this planning could not have been soundly derived, since, even at 95% sewage treatment, the impoundment could not withstand and dilute the wastes at times of drawdown. Indeed, HOW POTABLE WILL THE RESERVOIR BE?

We add that "people pollution" is so bad in western nationally owned areas that some may have to be closed.

(2) Solid Waste programs--have been largely designed by TIRAC'S Solid Waste Steering Committee. This proposed plan is to supply garbage disposal need with use of the "sanitary landfill." As many as five of these will, for example, be placed in Sussex County alone. Environmental education tells this organization that "landfills," unless compactly "changed"



into "brick-like" packages before disposal, leaves the ground SOFT and UN-USABLE where future construction is concerned. We remind that GARBAGE INCINERATION (NON-pollutive method) can supply much needed electrical power. We wonder at the "environmental awareness" of the Tocks Island planners who see "landfills" that will take as much as 11 square miles within fifty years of rare and precious land.

(3) Vector Control systems--Sanitary conditioning under these projects should be extremely well planned because the DWGNRA alone brings such a huge concentrated population to this area. (The Tocks Island region being small in size--note tiny New Jersey and 60% of 10.5 million in little Sussex County.)

We note here that the "scouring effect" of the Russian-built Aswan Dam on the Nile River is causing wide-spread medical concern about the growth of bacteria in the lower reaches--this since there is no sedimentation to carry it away as a result of the dam. "Plague" warnings have been made concerning this growing problem.

S.N.J.N.E. asks--What results the industrial and sewage wastes will have when discharged into the Delaware River and "sedimentation flow" is eliminated due to the dam barrier?

(4) Electrical Utility systems--See "alternatives" under #3--S.N.J.N.E. Statements.

In summation of these TIRAC programs, this organization finds NO answers forthcoming as to WHO will pay for the federal participation. Cost to the local taxpayer under these programs could be prohibitive should federal aid not be forthcoming ~~and~~ <sup>not</sup> federally paid maintenance of federally owned properties ~~be~~ initiated.

We conclude that these programs bring more questions in the public mind than they do answers--both economically and environmentally.

18/Corps Statement--"Flood protection afforded by the project will replace the inherent fear of constant flooding."

18/S.N.J.N.E. Statement--There is no inherent fear of flooding on the northern Delaware River. We note here that the DRBC 1970 Report shows a flood plain map that appears to designate the entire river as a flood area. This is erroneous. Flood control was considered after the disastrous DOUBLE HURRICANE WEATHER FREAK that dumped torrential rains over the northern Delaware in the summer of 1955. "Loss of life" was on the tributaries of the northern Delaware, NOT on the main body. The northern Delaware River does NOT do more than "swell" during spring thaw. "Double hurricanes" had NEVER been witnessed before 1955 and have NOT been witnessed since. (The statistics concerning this should be derived from the U. S. Weather Bureau.)

This organization desires to know how flood storage for LOWER Delaware River flood control can take place when the dam will release ALL inflow waters during April, May and June?

We submit that flooding in the lower Delaware is tributary. Why no dredging, flood walls or tributary damming if control is required?

19/Corps Statement--"...about 4,000 acres of land previously undeveloped...due to constant flooding would be made available..." (with the Tocks Island Dam)

19/S.N.J.N.E. Statement--"Constant flooding" terms in this Corps statement and that of Corps Statement (#3a-18) denotes that the river is eternally in overflow conditions which simply is not so.

20/Corps Statement--"The project will significantly eliminate previously experienced low flow conditions through maintenance of a constant minimum daily release of 2,780 cfs and in conjunction with other basin



projects will function to meet the impending water supply need."

20/S.N.J.N.E. Statement--This admission of "experienced low flow" conditions on the Delaware River is quite properly named. Yet--Corps statements (#3a-18) and "#3--19) declare CONSTANT FLOODING.

This organization desires to know why such conflicting testimony exists here. We also note that the DRBC 1970 Report establishes average rainfall on the Delaware River in 1969 as considerable when, in actuality, this average was gained because of UNUSUAL RAINS in the month of July 1969. There were other drought seasons that year but "averages" gained because of this rare July '69 condition. We note this to illustrate that planning of these projects was made on just such averages and unusual conditions. We suggest that the subject of "rainfall" under projects like those of Tocks Island should deeply involve statistics and testimony of the U. S. Weather Bureau so that TRUE AVERAGES MAY BE DERIVED USING HISTORICAL AND FUTURE PREDICTION DATA, thereby allowing the environmental aspects fuller measure of regard with deeper and more efforted thinking.

A "constant" minimum daily water release is not possible. Refer to S.N.J.N.E. Statements (#1--1) (#1--2) (#2--6) (#3a--1) (#3a--2) (#3a--4) (#3a--18) (#3a--19)

Water supply needs cannot be met under Tocks Island projects. Refer to S.N.J.N.E. Statement (#1--2)

21/Corps Statement--"Hydroelectric power...would assist in meeting the overall demand..."

21/S.N.J.N.E. Statement--The massive drawdowns existing under these projects' proposals, along with the natural conditions of the river, puts serious doubt concerning fulfillment of the tremendous water need that is required for pumped storage "peak hour" electrical supply. This type of facility (like a tremendous vacuum cleaner) would draw vast water amounts from the Delaware River (at high and medium water levels on the river) and would seriously undermine the recreational and potable water supply use of the proposed reservoir-lake. In extreme LOW LEVEL drawdown (summer and autumn) water-related recreational use, potable water supply need and peak hour electrical supply need could NOT ALTOGETHER be supplied under Tocks Island projects proposals. Refer to S.N.J.N.E. Statements (#1--1) (#1--2) (#2--6) (#3a--1) (#3a--2) (#3a--6) (#3a--10) (#3a--11) (#3a--12) (#3a--18) (#3a--19).

This organization strongly denounces any proposals of electrical pumped storage use of the Sunfish Pond area that will so ravage that glaciated site, along with an obliteration of the Appalachian Trail. (Pumped storage there will mean that the historically important trail will NO LONGER cross the Kittatiny Ridge.)

b. Identify "any adverse environmental effects which cannot be avoided should the proposal be implemented."

1/Corps Statement--PARAGRAPH #1 (see Corps Preliminary Draft Statement--#3b.)

1/S.N.J.N.E. Statement--Refer to S.N.J.N.E. Statements (#1--1) (#1--2) (#2--6) (#3a--1) (#3a--2) (#3a--4) (#3a--6) (#3a--10) (#3a--11) (#3a--12) (#3a--13) (#3a--20) (#3a--21)

2/Corps Statement--"Major segments of historic Old Mine Road will be permanently inundated. The original 100-mile dirt route is now a two-laned paved highway which traverses the New Jersey shore of the Delaware from the dam to upstate New York. It is proposed to retain a segment of the route in a traffic free condition within the National Recreation Area as a



major historic feature."

2/S.N.J.N.E. Statement--Refer to S.N.J.N.E. Statements--(#1--3)  
(#2--1) (#2--3) (#3a--1) (#3a--2) (#3a--4) (#3a--6) (#3a--8) (#3a--9) (#3a--15).

This organization notes here that the Old Mine Road, oldest of its kind in the United States, remains today--regardless of its aging asphalt paving--largely as it was originally established; its wilderness quality UNtouched and its historic authenticity mainly UNravaged.

If, as this Corps statement reads, a segment will be saved as a MAJOR HISTORIC FEATURE, then its NATIONAL HISTORICAL SIGNIFICANCE is recognized--but it is to be largely inundated--leaving again only a "sample" of New Jersey's rich and vital heritage for an unwary public.

Also, the Corps statement "two-laned paved highway" offers the impression that this N. J. roadway carries some main artery traffic when this is not so. The Old Mine Road is yet a COUNTRY LANE, asphalt paved, that outlines the northern Delaware River border, unencumbered by the "urbanized" conditions that exist in northern New Jersey's eastern areas.

3/Corps Statement--"...about 2,600 permanent residents within the reservoir area will be required to relocate..."

3/S.N.J.N.E. Statement--Refer to S.N.J.N.E. Statements--(#2--2)  
(#2--3) (#2--6) (#3a--1) (#3a--13) (#3a--14) (#3a--17)

It must be noted here that, according to property owners in the N. J. areas involved, these residents are, many of them, being paid only two-thirds of the property's value; yet prices for land carrying "billboard" advertising, for example, are being acquired at exorbitant prices. NO payment is made, of course, for business loss on the acquired lands. This organization recommends that "investigation" of land acquisition practices is in order and that "new" federal rulings be made as a result concerning "Eminent Domain" programs.

4/Corps Statement--"...construction of upstream protective works ....will affect the...populace's unobstructed view of the river."

4/S.N.J.N.E. Statement--This organization feels that this adverse effect is NOT worth noting...due to the fact that so many other factors are detrimental in the EXTREME.

c. Identify "alternatives to the proposed action."

1/Corps Statement--"Responding to...Congressional resolutions, several...from the floods of August 1955... the Corps...completed a four year study of basin water resources and projected water needs."

1/S.N.J.N.E. Statement--Refer to--SN.J.N.E. Statements--(#1--1)  
(#1--2) (#1--3) (#2--1) (#2--2) (#2--3) (#2--4) (#2--5) (#2--6) (#3a--1)  
(#3a--2) (#3a--3) (#3--4) (#3--5) (#3a--6) (#3a--7) (#3a--8) (#3a--9)  
(#3--10) (#3a--11) (#3a--12) (#3a--13) (#3a--14) (#3a--15) (#3a--16) (#3a--17)  
(#3a--18) (#3a--19) (#3a--20) (#3a--21) (#3b--1) (#3b--2) (#3b--3) (#3b--4).

S. N. J. N. E. concludes at this point that IN-DEPTH ENVIRONMENTAL RESEARCH AND PLANNING WERE NOT A PART OF THE CORPS "4-YEAR STUDY" as they should have been; thus...this multipurpose group of projects is at odds with itself.

2/Corps Statement--"The Tocks Island project was formulated to serve a major portion of the basin plan. As the goods and services to be provided by the project are presently needed to partially satisfy the present and projected water resource needs within the basin, to forego development to meet these needs cannot be considered as a realistic alternative."



2/S.N.J.N.E. Statement--Refer to S.N.J.N.E. Statement (#3c--1)

Because of the COMPLEX nature of the demands to be placed upon the Delaware River, their MASSIVE quality and their disastrously CONFLICTING aspects under the Tocks Island projects' proposals, S.N.J.N.E. asks that NO DAM BE CONSTRUCTED ON THE MAIN BODY OF THE DELAWARE RIVER. We ask that the Tocks Island Dam be DEAUTHORIZED. This organization feels that this is the ONLY REALISTIC ALTERNATIVE as regards the PRESENTLY FREE-FLOWING DELAWARE RIVER; at the same time we note that we feel that this present condition of the Delaware is man's BEST resource with the MOST VALUE in its service to him as regards his present and future needs.

We add that we agree also with Mr. George Laycock's contention in "The Diligent Destroyers" that "expiration dates" should be stated as regards any federal project. Those of Tocks Island will soon be entering their ninth year. Upon "expiration" projects like Tocks Island should be "automatically" deauthorized. Nine years is, indeed, too long a period of time for projects like these to paralyze local and county planning.

3/Corps Statement--"...feasible economical alternatives to each project purpose...would provide the same amount of goods and services..."

3/S.N.J.N.E. Statement--This organization submits that ALTERNATIVES to serve man's need MUST be sought since the Tocks Island Dam proposal means the impending DEATH OF THE DELAWARE RIVER: this will leave him WITHOUT this precious resource if the Tocks Island proposals reach fruition.

We note here that with environmental problems to be incurred by dam construction being of such magnitude, MORE goods and services will be derived using "alternatives" with which to serve man's need. Refer to S.N.J. N.E. Statement (#3c--1)

ALTERNATIVES

FLOOD CONTROL

Alternative #1

Corps Statement--"...flood control dam at Walpack Bend..."

S.N.J.N.E. Statement--S.N.J.N.E. denies this as a sound alternative. We agree with the Corps that the "environmental impact" (though less) would be "similar to" the "environmental impact" caused by the present Tocks Island Dam proposal. We are pleased that the Corps recognizes the environmentally disastrous impact of the current Tocks Island proposals--at least in some of their aspects. Refer to S.N.J.N.E. Statement (#3c--1)--paragraph #2.

Alternative #2

Corps Statement--"The second least costly alternative would... combine flowage easements, removal of occupancy within the flood plain and construction of protective works at major downstream damage centers."

S.N.J.N.E. Statement--This organization supports ALTERNATIVE #2 as the best alternative to any other flood control method on the Delaware River; these "flowage easements" being dredging, flood walls, small tributary dams, for example. These measures, of course, would be taken in the LOWER REACHES OF THE DELAWARE RIVER to which Corps statements concerning "flooding" refer.

Corps Statement (Adverse effects)--"Flowage easements would affect the economy of the region..."

S.N.J.N.E. Statement (Adverse effects)--Because "flooding" aspects under Tocks Island proposals refers to alleged LOWER Delaware River hazards--if such conditions exist--the adverse ECONOMIC effects of such flooding are ALREADY taking their toll. Thus, flowage easements could



NOT impose adverse economic effects and conditions.

Corps Statement (Adverse effects)--"...removal and relocation of flood plain occupants would increase operating costs for remaining water users..."

S.N.J.N.E. Statement (Adverse effects)--Again, this adverse effect refers to LOWER Delaware River property owners. S.N.J.N.E. must note here that the federal land acquisitions, as a result of the Tocks Island proposals, will leave vast numbers of Sussex and Warren County taxpayers with all operating costs, as well as construction, to provide facilities that must support the projects plus the fact that they are being left to pay the property tax deficit that is resulting because of the enormous ratable losses along the northern Delaware River. These property tax problems and land acquisitions FAR SURPASS the relocation problems and the water-user operating costs that would be involved with Corps Alternative #2.

We also add that Sandyston Township, Sussex County, N. J. will be left with only 900<sup>0</sup> acres after land acquisition completion. WHO WILL PAY THEIR WAY in ALL service lifeline areas?

Corps Statement (Adverse effects)--"...protective measures would produce localized environmental problems."

S.N.J.N.E. Statement (Adverse effects)--This organization repeats --the death of the Delaware River, as well as that of New Jersey's "last rural frontier" (Sussex County), as a result of the multipurpose Tocks Island proposals, are so monumental in their true aspects as to make Corps referral to "localized environmental problems" on the LOWER Delaware River due to Alternative #2--flowing easements--not worthy of mention. We do, indeed, wonder at the environmental concern in the lower river reaches' tributary areas when there is little concern for the environment of the MAIN BODY of the Delaware River.

Corps Statement (Adverse effects)--"...studies of tributary streams (flood control reservoirs) revealed that...an unrealistic number of reservoirs would be required, each producing its own environmental changes."

S.N.J.N.E. Statement (Adverse effects)--This organization has not seen or researched these studies that concern "tributary damming" to provide LOWER Delaware River flood control before making a statement concerning this Corps-stated "adverse effect."

We do note here, however, that a Corps proposal to construct a dam at Knight's Eddy, New York, because of well-known low-flow conditions on New Jersey's section of the Delaware River in its northern reaches--which would diminish the useability of the proposed Tocks Island Reservoir--along with further Corps proposals for other numerous upstream dams (about which the Atlantic Chapter of the Sierra Club has made mention)--makes Corps statements about adverse effects referring to "unrealistic number of reservoirs--each producing its own environmental changes" where tributary damming is concerned (on the LOWER Delaware River) as an alternative measure, a statement of little value when detailing constructive alternatives to Tocks Island "flood control" proposals.

S.N.J.N.E. does support, however, the Corps statement that dams DO cause "environmental changes". We desire to know why tributary dam environmental changes are Corps-interpreted as so adverse in effect, yet the Corps does NOT regard the MUCH LARGER EFFECTS that will MORE ADVERSELY "CHANGE" THE ENVIRONMENT after Tocks Island Dam construction as MORE VITAL AN ISSUE?

#### WATER SUPPLY

##### Alternative #1

Corps Statement--"The least costly alternative for providing the same water supply (as Tocks Island proposals) at an estimated cost of \$136 million...with dams at Walpack Bend and Flatbrook."



S.N.J.N.E. Statement--Refer to S.N.J.N.E. Statement (#3a--1)-- paragraph #2.

This organization does NOT support Corps Alternative #1 as a sound method of serving water supply need.

Corps Statement (Adverse effects)--"...such a development would produce environmental effects similar to but not as extensive as the multi-purpose project." (the Tocks Island Dam projects)

S.N.J.N.E. Statement (Adverse effects)--This organization supports this Corps statement, especially as the statement notes the EXTENSIVE ENVIRONMENTAL EFFECTS of the current Tocks Island Dam proposal.

Alternative #2

Corps Statement--"The next least costly alternative would involve construction of a desalinization plant along the New Jersey coast."

S.N.J.N.E. Statement--We support Corps Alternative #2 as one of the best methods of supplying much of the potable water need.

Corps Statement (Adverse effects)-- "...desalinization plant costs...for the same estimated daily reservoir yield (as Tocks Island proposals) would range between \$0.20 and \$0.30 per 1,000 gallons. In comparison, the Tocks Island Reservoir would provide water supply at a cost of approximately \$0.01 per 1,000 gallons."

S.N.J.N.E. Statement (Adverse effects)--While costs are Corps stated as much higher per 1,000 gallons daily for desalinization, COST under the Tocks Island proposals must, because this is a MULTIPURPOSE project, accept ALL COSTS of the projects when considering potable water supply service. Separation of water supply cost from the other proposal costs offers a distorted picture of REALISTIC water supply daily cost under the Tocks Island proposals. (It must be recalled that POOR PLANNING MIS-PLACED the proposed Tocks Island Dam site at a cost of \$14,000,000. Such an error should be added into the potable water supply cost when detailing price per 1,000 gallons under current Tocks Island Dam proposals.)

Also, the monumental COST, the impending death of the Delaware River, in order to supply a desired need by placement of the dam at Tocks Island negates all debate concerning dollars and cents value of one alternative over another.

We make note here that N. J., in addition to its natural "peninsula" value to support DESALINIZATION of its border waters in order to supply potable water need, also has MORE than 710 square miles of NATURAL INLAND WATER RESOURCE. (Much of it is POLLUTED today and DEpollution efforts MUST be made to provide MUCH NEEDED potable water supply.)

In addition, pipeline cost to carry Tocks Island Reservoir water to New York City, for example, would be much more than a DESALINIZATION piping system in New York Bay or the Hudson River.

This organization also points out that New Jersey's PINE BARRENS have very recently been discovered to hold ABUNDANT WATER SUPPLY--yet the Pine Barrens were to have been ravaged by a jetport--so qualifying this organization's contention that NO GENUINE EFFORT has been made ANYWHERE to survey New Jersey's REAL natural water supply resources. Nor does ANY AGENCY appear to be fully cognizant of HOW POTABLE WATER SUPPLY NEED IN THIS STATE MAY BEST BE SERVED.

Corps Statement (Adverse effects)--"...studies by...U. S. Geological Survey revealed that existing economical ground water resources of the basin are inadequate to meet the estimated total gross water needs of the basin at year 2010. Only 11% of gross water demands of the basin at year 2010 can be satisfied by ground water resources, involving use of virtually the entire resource."

S.N.J.N.E. Statement (Adverse effects)--This organization notes



here that the Delaware River Basin is not only proposed to be used by north-eastern New Jersey (N. J. has asked the DRBC for 300 mgd), but by New York City as well. (New York has asked for 800 mgd)

This organization reminds that, for example, the Hackensack River has an abundant water supply, but is limited because of extreme pollution and the "Gateway National Recreation Area" proposal in New York Bay carries with it "clean-up" intentions. DEPOLLUTION then will serve to brighten the picture of potable water supply in the metropolitan areas. In addition, depollution in the bay areas will open these waters to desalinization.

The Hudson River is virtually UNTAPPED as an abundant potable water resource for the New York-New Jersey metropolitan area. Although the Hudson River carries with it considerable saline content, "desalinization" efforts for its use as a potable water supply source would be far less expensive than "desalinization" of oceanic waters in those urban areas--all of this after depollution.

We also note here that "nickel-lined" tanks now provide economical and durable storage of desalinized water supply; so solving that problem.

It should be added that New York City, now demanding 800 mgd from the proposed Tocks Island Reservoir, is NOT WATER-METERED except for 28% in its newer buildings. Water waste in SUB-STANDARD HOUSING is monumental, due to leaking toilet facilities, leaking sink faucets in baths and kitchens, and, of course, in the piping of the buildings themselves. A COMPLETE and IN-DEPTH STUDY of these conditions should be REQUIRED of any area that intends to put demand for water supply like 800 mgd on the Delaware River Basin. If, we feel, this should require proper legislative action, then we do, indeed, support such a move.

We must conclude at this point that the DELAWARE RIVER BASIN and its capabilities appear to be LAST in any studies or research that involved Tocks Island proposals planning. "PEOPLE DEMANDS" are obviously regarded as "top priority." It appears to this organization that an irresponsible public that has put "demands" for potable water supply upon the Delaware River does so with little or no regard for the life of that waterway. It is also obvious that NO attempts are made with any of these sizeable demands to search for "water waste" in these areas. (Consider, for example, the LOWER DELAWARE RIVER that has been allowed, as a result of irresponsibility and public apathy, to have become the nation's most festering sump. Yet, at the same time, DEMANDS are put upon this river and the small life that remains here in her northern regions waters, where it is UNPOLLUTED, to satisfy "needs", many of which would NOT exist were it not for irresponsibility and apathy.) S.N.J.N.E. must state here that a SYSTEM OF PRIORITIES MUST BE ESTABLISHED if our environment is to survive. In other words, THE LIFE OF THE DELAWARE RIVER MUST COME FIRST WHERE ANY PLANNING TO USE HER AS A RESOURCE IS CONCERNED. We add, the Tocks Island projects proposals appear to this organization to have put the river's life into last category, if at all.

S.N.J.N.E. supports "ZONING OF THE NORTHERN DELAWARE RIVER WATERSHED."

## RECREATION

### Alternative #1

Corps Statement--"The most economical alternative is a recreation reservoir project with a dam located at Tocks Island."

S.N.J.N.E. Statement--Refer to S.N.J.N.E. Statement--(#3a--1); so denying Corps Alternative #1 as a supportable recreational alternative.

### Alternative #2

Corps Statement--"The second least costly alternative would require the expansion of existing lands and facilities at State Parks..."



S.N.J.N.E. Statement--We do NOT support Corps Statement under Alternative #2 as a means of providing recreation. This organization does NOT regard "turning over federally-acquired lands" to state maintenance as sound policy; this because present taxpayer COSTS at local and county levels in New Jersey are already extreme for existing services. Under the Tocks Island proposals, state cost to the taxpayer would be prohibitive.

We note here that the Corps statement under Alternative #2 is made as though NO LANDS had already been acquired. Indeed, more than \$14,000,000 worth of property has been federally acquired as of October 1, 1970 in Sussex County, N. J. alone. Pahaquarry in Warren County had approximately twelve homeowners remaining as of the same date as a result of the federal land acquisitions under the Tocks Island projects.

S.N.J.N.E. believes that the BEST ALTERNATIVE to the current DWGNRA proposal is a NATURAL RECREATION AREA--so preserving forever the "unique quality" of the northern Delaware River New Jersey lands and offering Sussex County, N. J. (the last rural outpost in this state) the opportunity to PRESERVE the major portion of this environmental condition.

### CONVENTIONAL HYDROELECTRIC POWER

#### Alternative #1

Corps Statement--"The least costly alternative for generation of peakload power would be a fossil fuel system plant located on the coast of New Jersey...".

S.N.J.N.E. Statement--It must first be noted that "pumped storage" electrical generation for peak hour need is expensive and is also extremely "new" as such electrical facilities are concerned. This current proposal under Tocks Island projects is, at the same time, NOT a "conventional" source of power supply.

However--S.N.J.N.E. does NOT support Corps Alternative #1. (We note that the term "conventional" actually is not meaningful when exposing how best to serve man's electrical power needs. Whether the method of supply is "new" or "old" makes no difference. This organization wonders then WHY the "pumped storage" proposal was authorized and is NOT CONVENTIONAL, yet Corps alternatives as listed are titled "CONVENTIONAL". Why, we must ask, are all of the Corps-chosen alternatives channeled into the "conventional" category; leaving no place for "new" methods as alternatives?

S.N.J.N.E. does NOT support Corps Alternative #1 unless a NON-POLLUTIVE METHOD is created. The pollutive aspects of "fossil fuel steam" generation are already well-known.

#### Alternative #2

Corps Statement--"Power generation at the alternative site would produce a minimal effect on the coastal environment and would eliminate the minimal environmental impact of the proposed power project on the Delaware."

S.N.J.N.E. Statement--An alternate site has been chosen for pumped storage on a river in Pennsylvania. This organization CAN NEITHER SUPPORT NOR DENOUNCE THIS ALTERNATIVE (#2). It would be impossible for this organization to commit itself on this matter of an "alternate site" for the pumped storage facilities since we DO NOT KNOW WHERE THE SITE IS; thereby leaving us unknowledgeable concerning the "environmental" impacts of such an alternate proposal. (The size of the river--its environmental condition--its surrounding intrinsic value, etc., would, by necessity, have to be researched and studied before proper committment could possibly be made.)

We add here that PUMPED STORAGE FACILITIES AT SUNFISH POND will have EXTREME ENVIRONMENTAL IMPACT on this historically important section. This



glacial area with an UNUSUAL glaciated lake, as well as coexisting with the NATIONALLY KNOWN and RECOGNIZED APPALACHIAN TRAIL. The environmental RAVAGE TO SUNFISH POND AND THE APPALACHIAN TRAIL are well-known to be in the EXTREME as regards this area and the impact it will suffer under Tocks Island pumped storage proposals. This organization must deny the Corps statement that "minimal environmental impact" would result with pumped storage facilities at Sunfish Pond.

It should be added, however, that IF PUMPED STORAGE AT THE CHOSEN SITE ALTERNATIVE IS TO BE USING DELAWARE RIVER BASIN WATERS, then, of course, we, by all means denounce such a proposal. (Refer to S.N.J.N.E. Statement (#3c--1)).

This organization supports the NON-pollutive method of GARBAGE INCINERATION that, if used in the United States, could support as much as 10% of the nation's electrical power need. Also, this method's use of burnable garbage could cure one of the greatest of New Jersey's and the nation's ills-- what to do with solid waste. (We make note here that Paris, France supplies all of its steam heating with this method of garbage incineration.)

Other alternatives, such as the use of shipping as electrical generators are also possible. (Moving vessels that would supply power generation also would have the advantage of going where peak hour supply was most needed.)

Further, S.N.J.N.E. reminds that Congress, through proper legislation, could make it possible for the Federal Power Commission to oversee all "taxpayer-built" electrical power projects so that GENUINE NEED is supplied to those areas demanding it. For example, the TVA project COULD have helped to "turn on the lights" during the "Great Power Blackout" in the northeast just five years ago, but did not since TVA cannot be forced to supply such power, even though TVA was constructed with U. S. TAXPAYER MONIES.

We add that we regret that the Corps did not investigate other alternatives where electrical power supply is concerned, be they costly or not so costly, since ALTERNATIVES ARE MANY WHERE ELECTRICAL POWER SUPPLY need is researched and studied.

d. Discuss "the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity."

(1) Local Short Term

1. S.N.J.N.E. Statement--We support the first paragraph of this section until the following Corps Statement: "...future development within the project boundary would eventually eliminate 1/3 of the existing wildlife."

We remind that the F&WS has stated that with the construction of the dam at Tocks Island 880 ADDITIONAL ACRES must be acquired as a wildlife refuge. We again wonder how much wildlife will be able to survive the 10.5 million visitor onslaught.

Obviously, the Corps feels that local "development" of what will be, after acquisition, "the project area" would eventually eliminate wildlife. Our own "urbanized" history of New Jersey tells us that this is true. HOWEVER this organization does NOT see the current Tocks Island proposals to serve 15% of the United State's current population recreationally on this tiny rural countryside as a method of "wildlife preservation." It does see "urbanization" of this same rural countryside as a result of the Tocks Island projects; at the same time it sees the inevitable LOSS OF ALL of the current wildlife that inhabits the area with, perhaps, the exception of the more hardy squirrels, robins and other common and more tame varieties. Of course pollutive hazards may eliminate even the more hardy



species. (Auto, noise, sewage, litter, and all other "people pollution" hazards.)

2. Corps Statement--"...5% of the shoreline along this stream reach is available for public use."

2. S.N.J.N.E. Statement--Our NATURAL RECREATION AREA "alternate" plan would change the conditions of the Corps statement.

3. Corps Statement--"...water-related recreational use is estimated at less than 200,000 recreation days."

3. S.N.J.N.E. Statement--Refer to S.N.J.N.E. Statement (#3d--1) (para. 1)

4. Corps Statement--"(The presently "natural" Delaware River). . .support (s) an existing walleye, bass and shad fishery which annually provides 415,000 sport fisherman days. Deer, ruffed grouse, pheasant, cottontails, turkey and black bear are to be found within the area..."

4. S.N.J.N.E. Statement--We support Corps Statement #4.

5. Corps Statement--"(The area referred to in Corps Statement #3)...would provide annually an estimated 55,000 hunter-days of recreation over the life of the project."

5. S.N.J.N.E. Statement--We again refer to S.N.J.N.E. Statement (#3d--1).

We note here that, as regards this Corps Statement (#3d--5), the Tocks Island projects' life will reach termination. (The life span of the earthen dam being 100 years in approximation.)

We point out, however, that the S.N.J.N.E. proposal <sup>that</sup> NO DAM be placed on the Delaware River will mean that the S.N.J.N.E. proposed NATURAL RECREATION AREA will have an UNLIMITED life span, so making it of "eternal quality" and in continual usefulness, increasing in value with the passing of time.

6. Corps Statement--"Uncontrolled flooding in the downstream reaches below the dam produces an estimated annual flood damage of \$3.12 million."

6. S.N.J.N.E. Statement--Refer to S.N.J.N.E. Statement (#3c--Alternatives--Flood Control--Alternative #2) Also S.N.J.N.E. Statement (#3c--Alternatives--Flood Control--Alternative #2--Adverse effects.)

The "economic adverse effects" due to "flooding" in the LOWER Delaware River are established at damage costs of \$3.12 million yearly, so negating any economic effects that "flowage easements" would have on the LOWER Delaware River property owners. Even with the flood insurance plan as detailed by the DRBC, such insurance is good only once; making "flooding economic losses" to these property owners very costly year after year, as so-related by the Corps. Flowage easements then would INCREASE property values and DECREASE losses.

\$3,12 million worth of yearly LOWER Delaware flood damage is NOT a justifiable reason to place a MASSIVE dam on the NORTHERN DELAWARE RIVER or, indeed, ANYWHERE on the main body of the river. The damages that will be incurred with the stoppage of the NATURAL flow of the main river body will PROVE FAR MORE COSTLY THAN ANY FLOOD DAMAGES THAT MAY BE OCCURRING in the LOWER river reaches--that is, seasonal drawdown alone will leave impoundments behind the dam in ugly mud flats bringing to a tragic end the life of the entire Delaware River basin until sporadic rains or melted snows refill it. But then, because of the peril to the oyster industry, any storage of these waters will not be had during April, May and June and the river bed will again be bared to the summer and autumn sun. Meanwhile, with the release of ALL inflow waters in the spring thaw season, when the reservoir would otherwise be at the highest level, in-



tended storage would be put into freeflow and again this organization asks what flood control will take place when these inflows are released? If the inflow waters are extreme in volume, for example, what would prevent them from causing the same damages in the LOWER reaches of the Delaware River? It appears to us that during a severe rainfall spring period (during free-flow of inflow waters) "tributary damming", dredging, flood walls, etc., would, by necessity, be required for flood control in that lower river area.

We conclude here that again the CONFLICTS and the DISCORDANT effects of the Tocks Island projects proposals appear; leaving the small Delaware River able to serve little of man's need. ALTERNATIVES are numerous.

7. Corps Statement--"...in its present uncontrolled flow through this valley reach, the river cannot adequately support either the present or the projected gross water needs of the basin."

7. S.N.J.N.E. Statement--Refer to S.N.J.N.E. Statement (#3c--1) This Corps Statement re-emphasizes the fact that this is a SMALL river basin and that it could not possibly meet the demands that are to be placed on it under the Tocks Island proposals.

## (2) Long-Term Productivity

1. Corps Statement--"The proposed Tocks Island Project would provide full public access for recreational opportunities along the 100-mile shoreline and would ultimately attract an estimated 10.5 million annual visitors in combination with the National Recreation Area."

1. S.N.J.N.E. Statement--Refer to S.N.J.N.E. Statements (#1--2) (#1--3) (#2--2) (#2--5) (#3a--2) (#3a--3) (#3a--4) (#3a--6) (#3a--8) (#3a--9) (#3b--2) (#3c--Alternatives--Recreation #1 and #2)

2. Corps Statement--"With inclusion of...features recommended by U. S. F.& W.S., the project would produce an overall beneficial effect on the Delaware fishery...existing shad fishery may be adversely affected, releases from the reservoir are expected to establish a 10-mile long cold water trout fishery below the dam."

2. S.N.J.N.E. Statement--Refer to S.N.J.N.E. Statements (#1--2) (#2--6) (#3a--2) (#3a--6) (#3a--10) (#3a--12) (#3d--4)

3. Corps Statement--"Provision of 880 acres of wildlife lands would mitigate project induced damage to wildlife habitat."

3. S.N.J.N.E. Statement--Refer to S.N.J.N.E. Statement (#3a--13).

4. Corps Statement--Paragraph #2 under Long-term Productivity.

4. S.N.J.N.E. Statement--We find this statement NONSUPPORTABLE in ALL aspects; Tocks Island water storage proposals are NOT possible. Refer to S.N.J.N.E. Statements (#1--1) (#1--2) (#2--6) (#3a--1) (#3a--2) (#3a--3) (#3a--4) (#3a--6) (#3a--18) (#3a--19) (#3a--20) (#3a--21) (#3c--Flood Control--Alternative #2) (#3c--Water Supply)

e. Identify "any irreversible commitment of resources which would be involved in the proposed action should it be implemented."

### Corps Statement:

1. Loss of 37 miles of "free-flow" on the Delaware River.
2. Loss of 8 miles of the Flatbrook in New Jersey.
3. Inundation of 10,000 acres of land (partially primary bottomland and upland wildlife habitat.)
4. A portion of valley in immediate impact zone would experience accelerated development. (requiring vast com-



commitment of resources.)

- (a) The Corps notes that it believes that with its use of its sketch plan for the area-controlled calculated commitment of resources would prevail.

S.N.J.N.E. Statement:

As regards 1. through 4., only a FEW of the irretrievable losses are mentioned. However, this organization enters this complete group of statements titled

"Statements of Save New Jersey's Natural Environment

Re: Tocks Island Reservoir Project, Penna., New Jersey & New York, Environmental Statements of the U. S. Army Corps of Engineers."

We add here that we do not support part (a) of 4. We add that we enter this report as evidence that control of any part of this multipurpose group of projects and its impact will be difficult, if not impossible.

S.N.J.N.E. Conclusions

This organization finds the Tocks Island projects proposals of monumentally disastrous environmental and economic effects. The multipurpose aspects of these projects conflict and oppose each other, as well as the fact that each purpose overtaxes the abilities of the Delaware River to supply it.

It is evident that the Tocks Island proposals have been poorly researched, poorly planned, and poorly justified. The subject of man and his need and how best to supply it is NOT answered with the Tocks Island projects proposals.

Also, it is the hope of this organization that continued Congressional appropriations to the Tocks Island projects NOT be justified by the assertion that "because of past monies already spent" the projects, as proposed, must reach fruition. S.N.J.N.E. CANNOT support such Congressional justification as "throwing good money after bad." Congress must realize that the Tocks Island projects are "old" methods of supplying immediate need and are not commensurate with a rapidly moving modern pace. Because man's environment is quickly being absorbed into his immediate need, man will, indeed, be unable to survive if IN-DEPTH REAPPRAISALS are not made of all projects like those of Tocks Island.

What, therefore, we believed was possible and correct more than eight years ago--when the Tocks Island proposals were initiated--man knows today is NOT possible if he is to survive into future generations.

We ask for DEAUTHORIZATION of the Tocks Island projects--NO DAM ON THE MAIN BODY OF THE DELAWARE RIVER--and for a NATURAL RECREATION AREA for the acquired lands.

S.N.J.N.E. Additional Statements

1. Noted geophysicist Gordon MacDonald has stated that "earthen dams" cause earthquakes and earth shudderings. Lake Hopatcong in northwestern N. J. has had, in the past year, a series of earthquakes and has been found to have a fault running its full length. What would an earthen dam at Tocks Island do to northwestern N. J. in that regard, if anything?
2. A report by Federal Auditor, Elmer Staats, was released to the Hocoho Record last spring stating that the Corps had acquired the "wrong lands" economically and that it should have bought in less densely populated areas that were less costly. We remind that this must be considered poor planning on the part of the Corps.
3. Nuclear power proposals that will use the Delaware River Basin waters



in vast amount will also further compound the serious drawdown problems that will be incurred by the Tocks Island Dam.

According to the DRBC 1970 Report, a twin-reactor nuclear plant is proposed for the Schuylkill River near Pottstown, Pennsylvania. Storage of Delaware River cool water will be required as the Schuylkill is inadequate due to the fact that such storage takes 40 million gallons daily of water supply; this <sup>and an</sup> additional 50 million gallons daily drawdown (doubling by 1990) for the Neshaminy Creek Watershed in Pennsylvania. The DRBC Report notes that "water for cooling the power plant, most of which would be evaporated, would come from storage in upper Delaware Basin reservoirs ..." (as well as those for the Neshaminy supplies.)

Two more nuclear power plants are proposed for Salem County and Bordentown in N. J. Because the DRBC acknowledges that the Delaware River is "smaller" at Bordentown than in Salem County, "cooling" towers for Delaware River storage supplies will be necessary there as well.

This organization notes here that such proposals bring with them perilous drawdown possibilities (80 mgd for Schuylkill and Bordentown plants, for example.) Of course, the EXTREMES in water loss due to EVAPORATION go without further comment. What hope has the Delaware River?

4. The Corps' continual use of the term "Tocks Island Project", instead of PROJECTS, calls attention to the fact that Tocks Island proposals' planning was over-simplified; it appears to this organization that singularization of these multipurpose projects, even in written referrals, lends belief that they are easily constructed and carried out and will incur little or no adverse effects.

Therefore, we must state here that these are the Tocks Island Projects and that their huge and multipurpose nature has, indeed, made them vastly conflicting and highly complex.

5. We are told by "land acquisition residents" that the "split tract" factor involved with their properties (land owned in both the reservoir and the recreation area) is not as serious a problem to them as other problems--so stated in the S.N.J.N.E. Statements.

Residents of Walpack Township have been victimized since land acquisitions began, with "squatters" on the federally-owned lands, (this also being the case in Pahaquarry in Warren County, N. J.) escaped convicts hiding in the Kittatinny Mountain ranges because they realized that Pahaquarry and Walpack contained many abandoned houses, and a "pop-festival" that has cost Walpack Township \$15,000.00 to fight in court--these "environmentally concerned" local governing officials fearing the ravage of their ancient and precious river border lands, (The Walpack Township Committee has recently asked county officials for financial aid with which to pay this legal fee since land acquisitions have severely altered their revenues.) The "festival", of course, would have overpowered the county (Sussex) as well as lovely Walpack Township, environmentally and economically wounding the areas in extreme amounts. Indeed, the entire county thanks Walpack for ~~its~~ successful efforts that eliminated the festival from this rural area. Now it is the hope of this organization that Walpack Township will receive financial remuneration for ~~its~~ genuine concern and good efforts.



## S.N.J.N.E. Conclusions

This organization finds the Tocks Island Projects proposals of monumentally disastrous environmental and economic effects. The multipurpose aspects of these projects conflict and oppose each other, as well as the fact that each purpose overtaxes the abilities of the Delaware River to supply it.

It is evident that the Tocks Island proposals have been poorly researched, poorly planned and poorly justified. The subject of man and his need and how best to supply it is not answered with the Tocks Island projects proposals.

Also- it is the hope of this organization that continued Congressional appropriations to the Tocks Island projects NOT be justified by the assertion that "because of past monies already spent", the projects, as proposed, must reach fruition. S.N.J.N.E. CANNOT support such Congressional justification as "throwing good money after bad." Congress must realize that the Tocks Island projects are "old methods of supplying immediate need and are not commensurate with a rapidly moving modern pace. Because man's environment is quickly being absorbed into his immediate need... man will, indeed, be unable to survive if IN-DEPTH REAPPRAISALS are not made of all projects like those of Tocks Island.

What, therefore, we believed was possible and correct more than 8 years ago--when the Tocks Island proposals were initiated man knows today is Not possible if he is to survive into future generations.

We ask for DEAUTHORIZATION of the Tocks Island project- NO DAM ON THE MAIN BODY OF THE DELAWARE RIVER and for a NATURAL RECREATION AREA for the acquired lands.



Price Street  
Branchville, New Jersey 07826  
December 16, 1970

Colonel James A. Johnson  
Department of the Army  
Custom House-2nd & Chestnut Streets  
Philadelphia, Pa. 19106

Dear Sir:

Enclosed please find brief statements from the Sandyston and Walpack Township-Sussex County, New Jersey governing bodies.

Since these committies were not invited to review the Corps Preliminary Draft Environmental Statement concerning the Tocks Island projects, S.N.J.N.E. has invited them to submit remarks along with our own. Having been given only one month in which to make our report-we were unable to contact Montague and Pahaquarry Townships.

This organization believes that the Environmental Policy Act of 1969 guarantees the aforementioned governing bodies the privilege of such review because these local agencies are responsible for environmental ordinances and their enforcement.

It is our hope that a future invitation will be made to these local agencies; thus enabling them to appraise the Corps Statement in full.

Sincerely,  
Executive Committee-  
Save New Jersey's Natural Environment

a.c.t.



TOWNSHIP OF SANDYSTON  
HIXON SPANGENBERG, CLERK  
LAYTON, N. J.

December 16, 1970

Colonel James A. Johnson, District Engineer  
Department of the Army  
Custom House - 2nd & Chestnut Streets  
Philadelphia, Penna. 19106

Dear Colonel Johnson:

In accordance with the provisions of Public Law 91-190, we understand that we have the privilege of submitting statements and comments regarding the Tocks Island project.

We are concerned about the proposed acquisition of an additional 880 acres of land (to replace bottom lands and upland wildlife habitat) if any part of this acreage is to be taken from Sandyston Township since we can ill afford to have any more land withdrawn from our tax rolls.

We approve of preserving the area in its natural state, i.e., without the dam, but we wonder if the ecology can be preserved with an anticipated annual influx of 10.5 million people.

The release of all inflow during the months of April, May and June raises a question as to what effect this will have on the level of the reservoir during peak recreation months in the summer. Fluctuations of 18 feet in seasonal draw downs with the resulting exposure of 3, 253 acres of mud flats (or, roughly, 25% of the 12,400 acre reservoir) can be expected and, according to your statistics, in a year of extreme drought, draw downs could reach as much as 56 feet, thereby reducing the water surface by two-thirds and creating 8,845 acres of mud flat shoreline.

The latter fact alone, in our opinion, calls for a new and complete evaluation of this multi-purpose project.

Very truly yours,



Harold I. Haskins, Chairman  
Sandyston Township Committee



TOWNSHIP OF WALPACK

SUSSEX COUNTY

NEW JERSEY

WAYNE B. TREIBLE, CLERK  
WALPACK CENTER,  
NEW JERSEY 07881

RESOLUTION

A special meeting of the Township Committee of The Township of Walpack was held December 15, 1970, 8P.M. at the Town Hall. The following resolution was unanimously adopted.

Be it resolved by the Township of Walpack that the Conclusions\* of the Save New Jersey's Natural Environmental environmental report on the Tocks Island Project be adopted as read.

\*Copy attached

*Wayne B. Treible Clerk*



**SANDYSTON TOWNSHIP ASSOCIATION, INC.**

(TAXPAYERS - 101 MEMBERS TO DATE)

~~XXXXXX~~

LAYTON, NEW JERSEY

Reply to: R. D. 2, Box 222  
Branchville, N. J. 07826  
December 16, 1970

Col. James A. Johnson  
U. S. Corps of Engineers  
2nd & Chestnut Sts.  
Philadelphia, Pa. 19106

Re: For inclusion with your report to the Presidents Council  
on the Environment.  
PL-87-874(76 Stat.1173) Flood Control Act of 1962-Tocks Island Dam  
PL-89-158(79 Stat. 612) - Sept. 1, 1965 - D. W. G. N. R. A.

Dear Sir:

We back the many conservation and municipal groups in their opposition to these projects and to their requests for these projects deauthorization.

We agree with J. Frederick Weinhold, in his talk before the DRBC, that the efficiency with which electricity is consumed in the U. S. needs investigation. An investigation should be extended to the use of all natural resources, for it is obvious that power structures continue to propangandize to create the need and then proceed to demand the resources to fill the need, regardless of what will be left for future generations.

We question the legality of the D.R.B.C. Senator Wayne Dumont at his meeting with us in April 1970, stated that New Jersey's approval of these projects was contained in the D. R. B. C. Compact of 1961. This compact was signed by the then Governors Meyner of N. J., Carvel of Delaware, Lawrence of Pa., Rockefeller of N. Y., and Stewart L. Udall, Secretary of the Interior, and was never on a referendum. That Compact contained provisions for reimbursement to localities for loss of ratables, but no reimbursement has been forthcoming, though the power of eminent domain is used in acquisition of land for these projects, many times leaving the property owners worse off than they were. Remaining taxpayers are bearing the burden for the ratables lost and are expected to provide the facilities projected as needed for the future, all by the blank check authority of the D. R. B. C.



**SANDYSTON TOWNSHIP ASSOCIATION, INC.**

**XXXXXX**

**LAYTON, NEW JERSEY**

The D. R. B. C. in its approval for the construction of a nuclear generating station in Salem County, N. J. has sanctioned "ultimate pollution" as contended by Sen. Michael Gravel, D., Alaska in his earth day speech, a copy of which is attached.

WE APPEAL TO ALL IN AUTHORITY TO ACT TO REVERSE THE PRESENT HARDSHIPS AND INEQUITIES AND POTENTIAL DAMAGE THAT HAS BEEN WROUGHT.

Very truly yours,



Harold Bailey  
President

CC: Mr. Russell Train, President's Council on Environment  
Governor Cahill, N. J.  
Governor Elect Milton Shapp, Pa.  
Governor Rockefeller, N.Y.  
Governor Peterson, Dela.  
Secy of Interior, Rogers Morton  
Sen. Clifford Case  
Sen. Harrison Williams  
Rep. Frank Thompson, Jr.  
Sussex Co. Freeholders  
N. J. Photo News  
Newark News  
N. J. Herald  
Senator Wayne Dumont





# Congressional Record

PROCEEDINGS AND DEBATES OF THE 91<sup>st</sup> CONGRESS, SECOND SESSION

Vol. 116

WASHINGTON, THURSDAY, APRIL 30, 1970

No. 68

## Senate

### ADDRESS BY SENATOR GRAVEL AT UNIVERSITY OF WISCONSIN ENTITLED "RADIATION: THE ULTIMATE POLLUTION"

Mr. NELSON. Mr. President, during the recent nationwide Earth Day observance the distinguished Senator from Alaska (Mr. GRAVEL) spoke before a student teach-in gathering at the University of Wisconsin in Madison.

The topic of Senator GRAVEL's remarks was: "Radiation: The Ultimate Pollution."

Senator GRAVEL's message raises some penetrating questions regarding the dangers of nuclear radiation and presents a strong case for the need to provide greater supervision and control for protecting the ecology from this threat.

Describing the radiation hazard as "Public Enemy No. 1" Senator GRAVEL said guidelines for polluting the environment should be set at zero and indicated he will propose legislation to develop a new concept for protecting man and his environment against the dangers of pollution.

Quoting from his text, he said: "We must revalue our culture as well as economic priorities. Anyone proposing an activity which would pollute or damage the environment should be required to present his case before the government and negotiate for the right to pollute."

Senator GRAVEL's remarks are a valuable contribution to an issue of great concern to all Americans. I ask unanimous consent that his speech be printed in the Record.

There being no objection, the speech was ordered to be printed in the Record, as follows:

#### RADIATION: THE ULTIMATE POLLUTION

##### I. A DECISION NOW FOR ALL TIME

I am honored to join you on the eve of Earth Day, because I believe deeply that this is an area in which we all must be involved.

The struggle against pollution demands a commitment from each of us—not just from students and scientists, but from legislators and other leaders in every field.

My special interest in the field of ecology, which this week is so very much in the forefront of our national attention, is the ugly problem of atomic radiation. I am deeply conscious of the fact that along with Nevada, only Alaska has been the site of a test explosion of nuclear weapons. And the possible long term effects of these explosions are awesome—nuclear radiation has indeed become "the ultimate pollution."

The economist John Maynard Keynes once said very aptly that in the long run we all are dead. That is my thesis today in simplest terms: If we overlook the worst environmental threat of all, nuclear radiation, in the long run it means quite literally that we are all dead.

If we contaminate this earth radioactively, no amount of money and goodwill can clean it up later. This invisible new contamination is already under way, and it's not "just another pollution problem," any more than terminal cancer is "just another health problem."

Once for ounces, and gram for gram, radioactive substances are a million to a billion times more harmful to life than non-radioactive pollutants.

Furthermore, radioactive contaminants are indestructible, once we turn radioactivity on, we can not turn it off. Radioactivity decays at its own immutable rate. No campaigns or protests or laws can change it.

In other words, we're stuck with radiation forever, since several of the common radioactive wastes take hundred and even thousands of years to decay completely.

Plutonium—that radioactive element which has been leaking from a nuclear bomb-trigger factory outside Denver—lasts many times longer than its half-life, and its half-life varies up to 24,000 years.

Plutonium is also one of the radioactive substances which will be produced in enormous quantities by the much-promoted "breeder" reactors which are meant to solve our electrical power problems in the next decade.

As you know, the atomic energy commission is dedicated to the promotion of nuclear energy. That is its charter under law. But it frightens me that the AEC is also both judge and jury of radiation hazards.

In reality, no one is in charge of preventing the radioactive contamination of our planet. In other words, the stage is presently set to assure the cumulative contamination of the globe.

We don't even know to what extent we have already done it. There is enough that each of us carries a burden of man-made radioactivity in his body, and every baby is born with it. Every cubic meter of our air, every gallon of our river water, every meal which we eat contains it.

Although people can tell you how much soot and sulphur we toss into the air every year, no one is even estimating how much radioactivity we release.

This absence of information makes disagreement inevitable about the urgency of the threat.

The ultimate complacency was expressed on January 14th, 1970 by AEC Commissioner Thompson:

"In the name of protecting the environment, many are suggesting that even minimal amounts of radioactivity . . . should not be even temporarily introduced into the environment. . . . It is as though we decided not to get out of bed anymore because we might slip on the way to the bathroom."

Commissioner Thompson is a nuclear physicist with a mission; he has devoted most of his life to the development of nuclear reactors.

I am not a scientist and not a great authority on reactors. I can ask more questions than I can answer. But I do understand that we and our government have permitted all kinds of chemical pollutants to get out of control, and that if we take the same wait-and-see attitude toward the burgeoning nuclear industry, no remedy will be possible.

That's the frightening thing about nuclear radiation.

##### II. PLAYING WITH THE NATURE OF THINGS

Last Fall, I sent out a questionnaire asking scientists: who is working on the problem of turning radioactivity off? No one. All physicists agree there is no way for man to turn a radioactive atom into a stable atom.

Actually, radioactivity itself is a major mystery. About 75 years ago, Madame Curie and some others made the astonishing proposition that there was an element which could generate its own light. By cooking and stirring tons of pitchblende ore, that stubborn woman personally refined the first decigramme of radium, and it did glow for her in the dark. Radium was a radioactive sensation, and it still is.

There are a few other naturally radioactive elements, but not many. No one understands yet why they should be radioactive in the first place. But when an atom is radioactive, it is suffering from some malaise of the nucleus which makes it spit out particles and energy. It's changing into a different element. It's literally suffering from an identity crisis!

Fortunately, a balance of forces exists which makes most atoms stable. But man has begun fiddling with stable atoms. He splits them. He deliberately adds and subtracts particles from their centers, to upset their natural balance.

He has operated so diligently that he has created at least one unstable radioactive twin for every natural, stable element. And once he has upset those atoms, they start disintegrating in radioactive ways which are supremely harmful to living targets.

So far, this experimentation has brought us both the nuclear bomb and the nuclear reactor. They are not so different. After a year or two of operation, a good-sized reactor has produced as much radioactivity as the explosion of a fair-sized nuclear bomb.

Some reactors today are permitted to release large quantities of their radioactive gases up the stack. Less than a dozen power-

generating reactors are operating now. But eighty mammoth models are under construction or planned. In thirty years, we may have hundreds in this country alone. And the numbers will multiply around the world.

The AEC believes that it will be able to transport and contain most of the radioactive poison from its reactors year after year.

Already we are stuck with some 80 million gallons of seething radioactive waste in tank farms. A single gallon is enough to poison the water supply of a city. These tanks will have to be guarded for 600 to 1000 years.

The trouble is, radioactivity seeps away just about every container that man has been able to devise. Several storage tanks have leaked thousands of gallons into the soil already.

And this corrosion problem is also one of the trickiest problems inside reactors themselves. Metal disintegrates and disappears under intense radioactive bombardment. Then the radioactive fission products begin leaking, up the stack and into the cooling water.

It is interesting to note that private insurance companies will not cover reactors for more than one per cent of the maximum credible accident, and therefore apparent that utilities would not be building any reactors if it were not for an amendment to the Atomic Energy Act which puts almost all the liability on the public.

It is scarcely reassuring that the former head of American Electric Power said recently, "We're going to have some accidents with atomic plants. We don't want to have any. But we're going to."

His apprehensions were echoed just last year by David Lilienthal, the first head of the AEC, who said, "once a bright hope shared by all mankind, including myself, the rash proliferation of atomic power plants has become one of the ugliest clouds hanging over America."

Measuring with the atom is one of the most serious activities ever undertaken by man. It is not an exaggeration to say that nuclear fission can bring our planet to an end with a bang, or more slowly, with an agonizing radioactive whimper.

I wonder whether it is just an uncanny coincidence that three apparently unrelated phenomena are happening together in history:

Man makes nuclear bombs and nuclear reactors, and begins creating a radioactive legacy for all time.

Man goes to the moon and becomes aware that all of us are "riders on the earth together, brothers on that bright loveliness in the eternal cold." (Archibald MacLeish).

And, practically overnight, students and others recognize that man is committing a suicidal assault on the planet's fragile web of life.

There is no doubt that the impetus for saving this planet is coming from students, and that the country's leaders are following you.

The more I look into the subject of radiation and its politics, the more I feel like someone in an unreal world. There is time to give you only two examples from many.

##### III. MAN'S THREATS TO LIFE

Four years ago, a book called "The Radiology of Aquatic Organisms" was published by the highly respected scientist, G. O. Polynearp. It contained several warnings: The maximum permissible concentration of radioactive strontium had already been reached in the Pacific Ocean and in the Irish Sea.

Second, Fish eggs are by far the most sensitive form of marine life to radiation damage.

Third, Damage to fish embryos at very low concentrations of radioactivity is visible.

Fourth, The reduction of the fish population would mean the proliferation of bacteria and radio-resistant invertebrates.

Fifth, and I quote, "We are already in the position to draw the important conclusion that further radioactive contamination of sea-water is inadmissible."

Now, only a fraction of the fallout from atmospheric bomb tests is down so far. There is a lot more to come. And only a fraction of what fell on land has been washed into the



Yet here we are, dumping more and more low-level radioactive waste, from more and more reactors, into more and more rivers—which carry it off to the ultimate sink.

Yet here we are, dumping more and more higher-level radioactivity into the soil, where it has been known to creep into the water.

And here we are, creating an indescribable legacy of contaminated underground water with the bomb-tests in Nevada and my own State of Alaska.

So perhaps you can share my shock to read the warning that even the ocean has had all it can stand.

It is strange that the Atomic Energy Commission does not even intend to make an effort to investigate the possibility that radioactive fallout from the Pacific bomb tests may be causing the current starfish plague in the Pacific Ocean.

Starfish—which incidentally are among the marine invertebrates to which Polykarpov was referring—are eating up coral reefs from the eastern Pacific clear across to the Indian Ocean and the Red Sea. At the rate the starfish are consuming coral, in five years they can wipe out medium-sized atolls which took thousands of years to form.

Among the regions most threatened are the Hawaiian Islands, the coast of Guam, and Australia's great barrier reef.

In response to my inquiry, the Atomic Energy Commission chose to explain the phenomenon by saying that blasting and dredging have upset the local ecology. Keep in mind that the starfish plague is attacking coral from the Eastern Pacific to the Red Sea. The unusual wave of blasting and dredging in that area has somehow escaped my attention.

The other area of incredibility I want to mention concerns the so-called permissible levels of radiation under which the AEC is promoting its nuclear technology.

Last November, two leading scientists inside the AEC's own biomedical research program—did some calculations which alarmed them—their calculations concerned the increase of cancers in humans who, for one reason or another, had been exposed to radiation.

No matter how they considered the data, they came to the conclusion that the AEC's plans to promote nuclear energy would reverse every single advance made in public health during the last generation.

In other words, they calculated that, if we go on contaminating the environment until we each receive the legally permissible dose of radiation, cancer would increase by 10%. That means an additional 32,000 cases in the United States every year. Plus miscarriages, stillbirths, deformities, mental retardation, and other tragic effects of radiation. Just suppose these two men are right?

They presented their testimony in November before the Senate Subcommittee on Public Works, which is considering my bill to create an independent commission to investigate certain AEC activities.

How have their ideas been received?

The head of the National Council on Radiation Protection at first dismissed their thesis by claiming that he did not have time to comment. Subsequently, the full board of the Council asserted that the Gofman-Tampin material "has presented no new data, new ideas, or new information."

The possibility of a ten per cent increase in the incidence of cancer surely seems to me something new and worth discussing.

Immediately following the Gofman-Tampin testimony, the Atomic Energy Commission announced that the two men were wrong.

Gofman and Tampin promptly challenged both the AEC and the Council on Radiation Protection to an open debate before scientific peers on the accuracy of their figures. There have been no takers so far. The AEC has not even made public its own set of figures on the extra incidence of cancer to be expected from the permissible radiation dose.

According to the magazine *Nucleonics Week*, the five AEC Commissioners recently met to discuss lowering the permissible levels of reactor pollution. Two of them favored stiffer over-all radiation standards, but the other three prevailed.

The AEC has sunk billions of tax dollars into the nuclear reactor program. The electric power industry and the banks have been persuaded to invest additional billions. Suddenly, this challenge to radiation standards seriously threatens the future of this technology, and has touched off a monumental power struggle.

The struggle rages in the White House, the Office of Science and Technology, the Environmental Quality Council, the National Academy of Sciences, the Atomic Energy Commission, the FEW, the Congress, the power industry, the bomb industry, the labor unions whose workers receive occupational exposures, the ecologists, the fifty sovereign States, and not least of all, you and me.

More than a dozen States have joined the State of Minnesota in a court battle for the right to set stricter contamination standards for reactors than the AEC has set.

Hardly a day goes by now without a new move in this intricate drama. The stakes are very high, and I am convinced that if the full story is ever unraveled, it will make the Dreyfus case look like small-town gossip.

The odds, of course, are still stacked against those who question the wisdom of plunging ahead into nuclear technology. The odds have always been stacked against the opponents of any new technology. We use it for the same reason we climb Mount Everest, "because it is there."

There always have been plenty of dollars and scientists devoted to discovering the benefits of nuclear technology. It is a multi-billion-dollar juggernaut.

But where do we employ scientists whose mission is to investigate and warn us about the disadvantages of nuclear technology?

I am not necessarily an enemy of nuclear energy—indeed, I recognize its possible benefits—but I am against the hasty or undemocratic imposition of any new technology which represents a potential menace to all forms of life.

As we face the prospect of using nuclear reactors to meet our power demands, there is another set of figures we must consider—namely, the numbers presented on January 26th, 1970 to the Joint Committee on Atomic Energy by Dr. Karl Z. Morgan, from the AEC's Oak Ridge lab.

Dr. Morgan calculates that, if all Americans were to receive the legally permissible dose of nuclear radiation, there would be from 18,000 to 21,000 extra deaths per year from genetic disorders, and another 17,000 people per year whose lives would be shortened by 10%. These casualties far exceed the annual American death toll in the Vietnam war.

Extra cancer deaths plus extra genetic deaths . . . clearly, the presently permissible dose of radiation is a license to kill. To kill massively.

There is no time to describe how the presently permissible dose was set. Suffice it to say that the public has been given no idea what level of risk it represents. There has never been, not even yet, an open calculation of the risks and the benefits from either nuclear reactors or from the AEC's plowshare program—which involves the use of nuclear bombs for peaceful purposes.

The AEC simply cannot be allowed to serve as its own control.

When something goes wrong and contamination escapes, the AEC has been known to deny it. Time after time, private citizens have had to prove safety violations and hazards before the AEC would admit them.

Now, largely due to the new cancer calculations which the AEC has tried to disregard, the Federal Radiation Council has been ordered by its chairman to review itself, its assignment is to say whether or not there is anything wrong with the permissible dose which it set ten years ago.

Presumably, at some unspecified time, the council will either set a new permissible dose or agree to keep the old one. What concerns me is that there apparently is no room in this process for public opinion to assert itself. Somehow there must be an expression of public judgment in this vital decision, and some form of cost/benefit analysis by an independent source.

For half a century, the Food and Drug Administration has accepted the principle, at least, that food additives must be proven safe before they are permitted. But this principle has not yet been applied to pesticides, chemical pollutants, or nuclear radiation. I believe it is time to put the principle into practice.

It is grossly unfair to make the public defend its health and its environment endlessly against every new assault. The burden of proof belongs elsewhere. Let those who propose to contaminate or injure the environment justify their activities, by stating clearly for us what benefits they are offering us, and at what price.

IV. A PROPOSAL

Radiation is not the only lethal pollutant. But it is virtually a permanent one, and by far the strongest. As I have said, I consider it the ultimate pollution.

So, starting with radioactive pollution, and extending the principle to all other fields, I am going to propose this idea in the form of legislation to the United States Senate:

Guidelines for polluting the environment should be set at zero.

Pollution can be a killer. Therefore, let no levels of pollution be automatically permissible.

Let anyone proposing a significant activity, which would pollute or damage the environment come before the government and negotiate for the right to pollute.

Let the polluter specify:

One. The necessary level of his proposed pollution.

Two. The benefits of his proposed activity for people in general.

And three. The ecological consequences and human cost of his proposed activity, and remedial means to restore the ecologic balance.

Let us also hear the independent voice of scientists assigned to study the disadvantages.

Let all hear. Let decisions which affect the very existence of so many people be made openly and democratically.

We would then finally be on the road of common sense and justice. The fundamental question we face is the creation of a whole new set of values within our economic and cultural environment. It is not sufficient to talk of haphazardly truncating energy supplies in the interests of protecting our ecology, when we have not yet begun to define our national priorities in this field.

I agree wholeheartedly with Denis Hayes, the national coordinator on Earth Day, who said, "most of the politicians and businessmen who are jumping on the environmental bandwagon don't have the slightest idea of what they are getting into. I don't think they realize that we are going to need fundamental changes in the values of this country."

Government must take a new look at society and the needs of man, and establish a policy that permits man to have his cake and eat it too.

calculations





# SIERRA CLUB

215 LO 3-4613

## *Atlantic Chapter*

**EASTERN PENNSYLVANIA GROUP**

**REPLY TO: Philadelphia address**

2015 Land Title Building  
Broad & Chestnut Streets  
Philadelphia, Pa. 19110

December 18, 1970

James A. Johnson  
Colonel, Corps of Engineers  
District Engineer  
Custom House - 2nd & Chestnut Streets  
Philadelphia, Pa. 19106

**RE: Tocks Island Reservoir Project**

Dear Colonel Johnson:

We appreciate the opportunity to comment on the preliminary draft environmental statement respecting this project, prepared by the Corps of Engineers.

Accordingly, we submit the attached comments which express the Sierra Club's concerns.

We request that the Project be re-evaluated in the light of these concerns and the extent to which these concerns can be met, should be set forth in the final environmental statement.

We are aware of some criticisms of the engineering aspects of the Project on which however, we reserve judgment, these matters being well within the historic competence of the Corps.

Finally, we request the opportunity to comment upon the final environmental statement to be submitted.

Sincerely yours,

HAROLD A. LOCKWOOD, JR.  
Chairman, Sierra Club  
Eastern Pennsylvania Group

HAL/cs  
Encl.



TOCKS ISLAND RESERVOIR PROJECT, PA., N.J. & N.Y.

SIERRA CLUB COMMENTS RESPECTING CORPS OF ENGINEERS PRE-LIMINARY ENVIRONMENTAL STATEMENT.

1. The statement fails to demonstrate a clear understanding of the ecological impact of the proposed project on the ecosystem of the area.
2. The statement fails to provide sufficient identification, data or analyses upon which to base an intelligent conclusion respecting the feasibility of the project.
3. Because the conclusions of the statement are not based on current ecological studies, the basic validity of the entire statement must be questioned.
4. The statement fails to provide assurance that the following objectives will be achieved or how they will be achieved.

a) That the project is coordinated with and based upon a comprehensive plan rather than piecemeal manipulation of the water resources of the Delaware River basin.

b) That reduced stream flow will not have an adverse effect on the ecosystem of the Delaware River south of the dam site.

c) That upstream and north of the dam site, the river will be maintained as a free flowing stream including preservation of the surrounding wilderness values.

d) That the fluctuating levels of the reservoir and resulting mud flats will not impair the remaining environmental values or vitiate the recreational values of the shoreland margins.

e) That a desirable natural aquatic ecosystem be allowed to develop north of the dam site in the reservoir area including the maintenance of water quality and activities on the reservoir, compatible with the development of a natural ecosystem.

f) That wilderness areas, equivalent in size and quality be set aside and maintained as wilderness areas to replace the natural areas being taken for recreational, dam site, reservoir, parking, highway and other uses in connection with the proposed projects.

g) That the various uses, purposes, demands and requirements related to stream flow can and will be fulfilled as demonstrated by actual tables showing all water inputs and outputs.



h) That the proposed dam will not result in or require the construction of additional dams, power generating facilities or any other projects which would tend to interfere with or impair the environmental values of the area.

i) That existing historic and archeological sites be completely inventoried, interpreted, managed and preserved.

5. The statement is otherwise deficient for the reasons more fully set forth in the comments of Dr. E. E. MacNamara attached hereto and made part hereof.

18

Box 61 R.D. #1  
Milford, New Jersey 08848  
December 1, 1970

Harold A. Lockwood, Jr.  
Chairman, Sierra Club  
Eastern Pennsylvania Group  
2015 Land Title Building  
Broad & Chestnut Streets  
Philadelphia, Pennsylvania 19110

Dear Mr. Lockwood:

I have reviewed with great interest the brief description on the environmental impacts of the Tocks Island project prepared by the staff of Colonel Johnson, District Engineer. I find the statement to contain terminology and phraseology that glosses over, or actually omits, some of the potential, probable, or actual adverse environmental impacts that are associated with the project. I also feel that the statement omits many of the problems, environmental, associated with reservoir operations as I believe they are to be. The draft of the statement is well written, and probably represents the Corps of Engineers viewpoints of environmental impact. I welcome your request to comment upon the statement. You may forward, if you wish, my remarks to the Corps. I would appreciate it very much that they either be forwarded in toto, rather than abstracted or summarized or incorporated in a statement without direct authorship noted. My comments are presented under the headings used in the Corps draft, while some of the more notable omissions are discussed at the end.

COMMENTS:

1 - Project Description. The statement refers to impoundment of normal stream flow to create a 12,400 acre reservoir. There is no need to impound normal stream flow, which is minimal in the summer anyhow. Other correspondence I have reviewed, emanating from the same offices as this draft statement of environmental impact, indicated that the normal, as well as the historical, flows of the spring period, would be maintained in order to partially alleviate the infestations of oyster drills into the Delaware Bay. A certain flow is guaranteed by the Supreme Court decision, leaving the flows to be impounded to be only the flood or high runoff flows, not the normal flows. The phraseology employed gives the impression that filling of the reservoir to the



12,400 capacity would be rapidly accomplished, which if normal, and to be beneficial summer flow augmentation, flows are maintained, will not be the case. The calculated length of time to fill should be included.

That the project will serve the "purposes of flood control, ....., inclusive of fish and wildlife.", is misleading, if not erroneous. The composition of the fishery of the affected section of the river will be drastically changed, probably to one characterized by the common sucker. To maintain a game-sport fishery within the impoundment will require massive efforts and, based on literature review, be of only very limited success. (I can develop this point to some length if it is desired. Others, including my colleague, F.J. Trembley, have already done this, although little attention has been paid to their warnings.)

The values to the indigenous wildlife, the deer, rabbit, squirrel, and other terrestrial forms, will certainly be negative. The forms of wildlife associated with aquatic systems, including the muskrat, mink, and possibly the otter, may benefit from the proposed reservoir, although the severe fluctuations in water levels from the mode of reservoir operation will have a limiting effect on their population levels.

It is admitted readily that some benefits will accrue to the shorebirds and migratory waterfowl; especially as resting-feeding grounds to the latter during the migratory period. Reproduction of waterfowl within the project boundaries will not be greatly enhanced because of the water level fluctuations inherent to the operation of the installation creating vulnerability to predation and nest destruction.

2 - Environmental Setting without the Project. I find myself in general agreement with the first two paragraphs of this section. As a third, additional and supplemental paragraph, I would like to see a breakdown of the affected lands based on soil units and soil capabilities, exclusive of flood hazard. Further compilation should include the percentage of agricultural lands to be affected, and their percentage of the total agricultural lands of each governmental unit (Township, County, etc.).

The present third paragraph is insufficient to describe the fisheries of the Delaware, their recreational and economic uses and potential. I believe surveys of use and harvest have been made. These data are necessary if the project reviewers, sited in some area other than the Delaware Valley, are to understand the tremendous recreation industry presently supported by the river. The potential growth of this industry, without the reservoir project, but including the separate Delaware Water Gap National Recreation Area, probably is greater in economic value than the reservoir project benefits, if calculated over the expected life of the reservoir and including the costs of maintaining recreation uses, including fishing, in the reservoir.

The very brief paragraph describing the main game animals of the area should be expanded to include at least the squirrel and opossum. If a listing of the game animals is to be a part of the



environmental statement, I think that a listing of all the fauna of the region, data that are readily available, should be included. With very few exceptions, all of these creatures will be eliminated within the project bounds. I would be glad to furnish a more complete list to the Corps, if they request it.

3 - Impact Statement. I find the discussion under "Identify ....." to be entirely misleading. Specifically, the impression is given, as I am certain the intent was to be, that the 12,400 acre impoundment will exist at all times. My acquaintance with the readily available project literature strongly suggests that this will not be the case. Waterlevel manipulations for potable water supply, low flow augmentation, flood control storage, et cetera, preclude the existence of any single pool level, hence any fixed acreage, for any appreciable length of time. The data, which I am certain are available in reduced form, on the probabilities of waterlevel maintenance at any given stage of pool should be included in the description. Figures given in the press, the origin of which is in doubt but probably has its roots in the offices of the Corps, indicate that as much as 4000 acres of the reservoir pool will be barren of water during parts of the year, especially the biologically important parts of the year. As the summer period will be one of low flow augmentation, the use of the term "normal summer reservoir pool" is entirely misleading. The level will be fluctuating, thus the 100 miles of shoreline may be, in fact, 100 miles of barren mudflats, rocky slopes, and silty shores, all lacking vegetation and being aesthetically unpleasant.

The second paragraph of this section, relating to the interactions between the Delaware Water Gap National Recreation Area and the Reservoir Project is somewhat misleading. The Recreation Area does not need the Reservoir for its justification, nor did it utilize the Reservoir in its authorization. Within the section discussing environmental impacts, I find no need for these statements, except to obscure adverse environmental impacts.

Unfortunately I have not been furnished a copy of the "extensive reports" prepared by the Fish and Wildlife Service, however I have spoken to some of the cooperators whose inputs were considered by FWS. I have severe reservations to the degree that the overall project would be beneficial if certain features and functional capabilities are included within the project. As the critical problem in fisheries management is the elimination of the rough fish, mainly sucker, populations on a periodic basis, and the means suggested is a drawdown, physical removal, I envision great and unresolvable conflicts in reservoir management. If drawdown practices are employed for the removal of the trash fish, the reservoir pool will not be functional for its other uses, low flow augmentation, potable water supply, water-based recreation, et cetera, through a certain percentage of its existence. Drawdown implementation will cause downstream problems in water quality and siltation.

Digressing from discussion of the Corps' statements, I would like to present some of the rationale upon which I base my pessimistic outlook upon the potential of the Tocks Island Reservoir as a recreational fishery.



There are only limited data available on the dynamics of fishes within inland bodies of water that undergo daily, weekly, and other periodic and non-periodic fluctuations in water levels. Critical to the analysis of the potential Tocks Island situation is the knowledge of predator-prey relationships and the natural histories of the fishes concerned. What follows is a synopsis of personal knowledge, discussions with fisheries biologists, and scanning of the literature, especially that concerning the 1956-62 FWS study of Lewis and Clark Lake in the Missouri system.

If we concern ourselves first with the critical months for fisheries reproduction, April and May, we find that the proposed maximum, within the month, fluctuation of water level is some eighteen feet. I do not know what the average, weekly, daily, or monthly fluctuations will be, but assume that the figure is somewhat more than three feet, and somewhat less than twelve feet. These fluctuations are related to the purposes of flood control, freshwater releases through the period to assist in the oyster culture problems, and potable water supply withdrawals. Superimposed on the unknown fluctuations, there is a predicted daily fluctuation of one foot related to pumped storage hydro-electric power generation.

The important predatory fishes in Tocks Island Reservoir should be the members of the Escocidae, the pike-perches. The individual fishes of both predatory and sport fishing interest should be the walleye, northern pike, chain pickerel, and muskellunge. All of these fishes prefer clean, clear water as adults, but critically need clean, clear, and relatively shallow waters for spawning. These fishes all deposit their eggs on the bottoms adjacent to the shores in lake situations. The northern pike, chain pickerel, and muskellunge prefer, as spawning areas, those areas covered with aquatic vegetation. Walleyes require rocky or gravelly bottoms for successful spawning.

The fluctuating nature of the proposed reservoir may eliminate successful spawning. There are a number of possible effects that may accrue from the daily, weekly, and monthly waterlevel fluctuations. The eggs may become completely exposed, suffocating and dessicating the embryos. Total exposure may not be necessary to cause failure of embryo maturation. If waterlevel fluctuations lead to only shallow coverage of the eggs, sudden temperature increases and/or variations in dissolved oxygen content may be lethal. Eggs of the Escocidae are especially vulnerable to death due to temperature fluctuation. Fluctuations in water levels will result in stirring up on bared areas, possibly causing siltation problems. It is very doubtful that the daily, weekly, monthly, and seasonal waterlevel fluctuations will allow the establishment of rooted aquatic vegetation, thus the problems of shoal area turbidity and siltation will be real, rather than just possible.

For each of the previously stated reasons, including their interactions, I feel that the most important predatory-sport fishes of the region, the Escocidae, will not be able to establish and maintain themselves in the reservoir. Lack of these predators has very serious implications to the maintenance of the other



sport-game fisheries of the lake.

The reasoning is based on the natural history of the locally important trash fish, the common sucker. Sucker spawning will not be adversely affected by the fluctuations in the lake pool because the suckers migrate upstream into feeder streams and tributaries of the river to spawn. Most of the spawned out adults will return to the lake, but the newly hatched sucker fry will remain and mature for two to three years in the streams prior to migration to the lake. Thus when they enter the lake they will be of rather large size. The only major predators, within the Delaware River, that are able to ingest, in appreciable quantities, 2-3 year old suckers are the members of the Escocidae, which by the nature of the reservoirs multiple purpose operation, will not be present in great numbers.

It is interesting to note that the common sucker is one of the most tolerant of fishes relative to turbidity, organic enrichment, siltation, and other forms of water quality degradation. The most probable predominating fishery in the reservoir will be the common sucker.

While the effects of fluctuating water levels on individual fishes, and on the diverse interactions of fish communities, are imperfectly known, the data from the previously mentioned Lewis and Clark studies do offer some basis for further comment.

Lewis and Clark Lake is a self regulating reservoir subject to maximum fluctuations of only 6 inches daily and 1 to 2 feet weekly under normal operating conditions. The seasonal fluctuations are only four feet. It has been reported that the shore spawning fishes, the northern pike and largemouth bass in this case, experienced difficulty in reproduction. In most cases, they produced no or very restricted amounts of fry. The lack of successful reproduction was attributed to interactions in fluctuations in waterlevels, scarcity of foods for early life stages, and turbidity. In addition, during the study period the diversity of fish species in the lake declined, as did growth rates.

In an attempt to artificially stimulate the establishment of a predatory fish population in the lake, over 1.75 million northern pike and walleye fingerlings and fry were stocked in the lake in 1958. By 1962 there was no evidence of survival of these fishes in the lake. The data from this series of studies does not portend establishment of a desirable fishery in the Tocks Island Reservoir.

Returning to the Corps' statement, I take issue with the use of the positive verb, will, in the statement, "Incorporation of the F&WS recommendations will significantly increase the resident sport fishery,....". The sport fishery is not over harvested to date, and additionally there is no guarantee that any increase in the sport fishery will develop. To the exact converse, available data and hypotheses indicate a probable decline and eventual extinction of the sport fisheries.



The paragraph concerning itself with the replacement of land for lost wildlife resources is incorrect. I am certain that it must be a typographical error, for I cannot see how all the wildlife habitat, including upland bird habitat, songbird habitat, small mammal habitat, and the numerous occupants of the diverse ecological niches of floodplains, rocky gorges, and swampy thickets can be physically arranged in 880 acres of replacement land. The competition for territory would be tremendous. I suspect the figure was meant to be 8800 acres. The acquisition costs for this acreage, especially in New Jersey, far exceed the acquisition costs for the lands to be actually occupied by the reservoir project. The 880 acre is repeated in a later section, however I prefer to feel that the original typographical error was repeated.

Progressing on to page four of the Corps' statement, I find terminology that is inaccurate, specifically the repeated references to constant flooding. Flooding in the Delaware Valley is intermittent, not constant. I do not know of any "inherent fear" of flooding existing. I have spoken with a number of insurance agents concerning flooding fears. They do not seem to feel the fears of flooding are such that excessive fees for insurance are necessary, and I accept this as indicative of a lack of basis for fear.

The aspect of economic development of some 4000 acres of presently undeveloped lands is a negative environmental benefit. Faced with the open space needs of the northeast, the need for recreational space previously mentioned within the Corps' statements concerning the Recreation area, I suggest that development of present open space not be fostered.

Section b. "Identify 'any adverse.....'"

There are a number of additions to this section that should be pointed out, ecological, historical, and economical.

Some unique botanical stations will be inundated. I do not have a listing of these available, nor do I believe a catalog of the sites has been completed. It should be.

No mention of the natural resources, peat bogs, gravel pits, and forestry products, to be destroyed is made. The potential value of these resources, when combined with the maintenance of open space that is associated with their exploitation, is worthy of some brief mention.

While some mention is made of the inundation of the Old Mine Road, I note that no mention is made of the loss of the sites of archaeological interest, including the Minisink Indian villages, camps, and other middens. Additionally, the sites of Transue's Ferry, Shoemaker's Ferry, Decker's Ferry, Rosenkranz's Ferry, Dingman's Ferry, and Well's Ferry, all points of historical interest, will be permanently destroyed.

The mention of relocation of 2600 permanent residents is well and good. Unfortunately, no mention is made of the number



of summer or seasonal residences and residents displaced, the number of motel, hotel, hostel, and camp ground units to be destroyed, or the number of properties of outdoor recreation enthusiasts, including hunting and fishing clubs with leased or owned grounds, that will be inundated. Additionally I find no mention of, the number of seasonal workers displaced, the number of actual and potential jobs permanently destroyed, nor of the potential economic gains shortcircuited by the taking of the land from private enterprise. The vegetable growing industry, on the floodplain soils, had, prior to the initiation of the reservoir project, tremendous potential, both in desirable land use and in economic return. The influx of people into the area, with the present vacationland boom in the Poconos, would absorb much of the potential production. If the Recreation Area visitors, numbering in the millions were considered, without the reservoir project, the market potential is great.

c.. "Identify 'alternatives...."

I have great difficulties in understanding much of this section. Not being an economist, I fail to understand how removal and relocation of floodplain occupants under the alternative of flowage easements and the Wallpack Bend dam would cost more than the relocation and removal of these same residents under the existing plan. Knowing that much of the flood damages associated with the August 1955 flood occurred on the tributaries, I fail to understand how a mainstem flood control reservoir will preclude repetition under similar meteorological conditions.

Moving to specifics, the subsection 3 that concerns recreation is based on production of identical recreational features as will exist if the project is initiated. I find this an unrealistic form of analysis. Firstly, the recreation potential of the reservoir, especially as it is dependent upon water related recreation including fishing, swimming, boating, et cetera, is not nearly as great, in reality, as has been indicated. The recreation potential of the 37 mile long stretch of the river to be destroyed has never been fully exploited. Some forms of specific recreation, for example white-water or flowing water canoe trips, walleyed pike fishing, eel fishing, smallmouth bass fishing, and river bank camping, will not be replaced by a reservoir. The net recreation potential should be stated in simple terms, both in visitor days and visitor dollars. The economics of the visitor makeup, or mix, may indicate a negative dollar benefit with increased visitor use. In this analysis, the existence of the National Recreation Area as a recreation outlet remains constant, for its visitor use is not predicated on the reservoir as much as it is based on being accessible and desirable open space. I personally feel that the recreation values, net to society, of the reservoir have been greatly overstated.

Although I do not claim to be an economist, I find some problems in interpretation of the remainder of the report from the standpoint of economics. If the project life is 100 years, project costs have risen to nearly 300 million at the present, and the expected flood control benefits are only 2.4 million per



year, the deficiency of some 60 million, exclusive of operating costs, maintenance, and future inflation prior to implementation, strongly suggests that the unfavorable decisions given to some of the alternatives in 1960, because of some few millions of cost differential, should be reconsidered. If recreation potential is the major benefit, I feel it is overstated.

Turning to some of the gross omissions of the report, the largest of which is the relocation of Route 209 for some 20-30 miles, I have some specific questions to be asked, concerning economics and environmental impact.

The press has recently carried the statements of the Corps on the relocation and creation of a new Route 209. It will be a 4 lane highspeed transportation route, located some distance westerly of the reservoir project and with limited access. The relocation is necessitated because of the inundation of the existing route. Many acres of forested areas will be taken from public and private ownership in the right of way. Additional acres of valuable wildlife habitat will be disrupted by temporary takings for channelization of streams, construction activities, and construction accesses. No mention of either the environmental impacts or the increased costs to the reservoir project is made in the Corps' statement on environmental impact. This omission is of major importance, for the unique ecosystems to be disturbed and destroyed have values that certainly cannot be replaced by the 880 acre purchase for wildlife. I do not know of the number of residents to be displaced, jobs to be destroyed, or streams to be permanently degraded by discharge of highway runoff waters in the new route, but I believe immediate research into this facet of the reservoir project is warranted.

A second major, in my opinion, omission in the Corps' statement on environmental impact is the probability of total, and final, elimination of the shad fishery of the Delaware. The major part of the shad reproduction within the Delaware Basin takes place upstream from the proposed damsite. Construction of the dam and associated facilities has been conservatively estimated at 5 or 6 years. During this period, no shad would be allowed to pass the site, for, as I understand, no provisions for passage during this interim period have been made. The lack of recruitment would eliminate the shad fishery. Re-establishment efforts, questionable ventures at best, would also encounter great problems.

The problems of passage of shad upstream during the spawning run are not insurmountable. I understand that the fish passage facilities to be employed are of the elevator type, and hence, I do not envision problems in excess of cost of maintenance and operation. However, the downstream migration of shad fingerlings through the reservoir, and past the intakes for hydroelectric generation, into the lower mainstem of the Delaware is questionable. I have learned that young shad swim weakly, with their heads upstream, while being carried downstream by the currents. There is a great deal of conjecture involved in the assumption that young shad will be able to negotiate the relatively still waters of the reservoir. Stocked fingerlings, lacking the vitality and

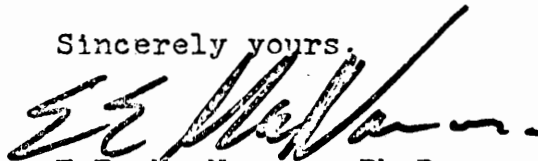


vigor of the native stocks that have successfully transgressed the low water quality zone of the lower Delaware for so many years, might not be able to re-establish the shad fishery.

There are a number of other omissions of environmental impact, including downstream siltation during construction, destruction of the existing eel migration and fisheries, the ultimate eutrophication of the impounded waters, and understatement of the hunter-days to be destroyed by the coverage of 10,000 acres of habitat. The figure given is 35,000 hunter-days over the period of life of the reservoir. If we assume the life of the reservoir to be 100 years, although the original design was a 50 year life, this figure is 350 hunter-days per year. Records of the Coventry Hunt Club, leasee of a small acreage on the New Jersey side, shows in excess of this annual average. I estimate the Corps' figure to be off by at least one order of magnitude, and possibly two orders. The estimate of error is based only on the increase of hunting pressure on the vanishing open space of New Jersey and the eastern section of Pennsylvania, not on increases in human population.

Finding that this review of the Corps' statement has grown to some length, I shall cease to comment at this point. I hope my efforts at pointing out some of the inadequacies, errors, and omissions is of some assistance to you.

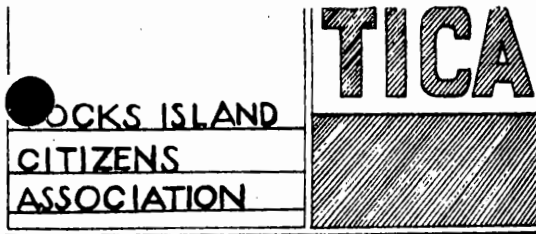
Sincerely yours,



E.E. MacNamara, Ph.D.

FEM/sem





Box 204, Bushkill, Pa. 18324

December 20, 1970

Colonel James A. Johnson  
Corps of Engineers, District Engineer  
Department of the Army  
Custom House, 2nd & Chestnut Streets  
Philadelphia, Pa. 19106

Dear Colonel Johnson:

A copy of the preliminary draft of the environmental statement of the Tocks Island project which you sent to me was mailed to each of our Board members for their consideration. Due to ice storms, our Board meeting (originally scheduled for early this month) has had to be twice postponed, and it was only on Saturday, December 19th, that we were finally able to meet and discuss this statement.

It was the feeling of the Board that the statement was very good indeed, and they gave it their full endorsement. The only addition that might be in order would be some emphasis on drought control, which is certainly inherent in the project. (Apropos the five consecutive years of severe drought in the early '60's, the effects of which would definitely have been eased had the Dam been in use at that time.)

With best wishes, I am

Sincerely yours,

*Vance P. Britton*

Mrs. J. K. Britton, President  
Tocks Island Citizens Association



1951

1952

1953

1954

1955

1956

1957

1958

1959

1960

1961

1962

1963

1964

1965

1966

1967

1968

1969

1970

# TOCKS ISLAND REGIONAL ADVISORY COUNCIL

December 23, 1970

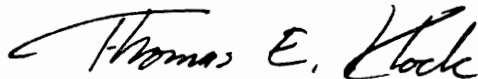
Colonel James A. Johnson  
Corps of Engineers, Phila. District  
Custom House  
2nd and Chestnut Streets  
Philadelphia, Pennsylvania 19106

Dear Colonel Johnson:

The Tocks Island Regional Advisory Council has reviewed the draft copy, dated November 19, 1970, of the environmental statement which you prepared for the Tocks Island Lake project. At the December 19th meeting of the TIRAC Executive Committee, action was taken by the members present to formally adopt the enclosed comments as expressing the views of the Council on the project.

On behalf of the Council members, I express their appreciation for providing the Council with the opportunity to review your statement draft. I trust that the comments will be considered in their intent - that of being constructive.

Sincerely yours,



Thomas E. Klock  
Director-Secretary

TEK:il

Enc.



## TOCKS ISLAND LAKE PROJECT

### ENVIRONMENTAL REVIEW AND COMMENT - Environmental Policy Act of 1969, Section 102 (2) (c).

In accordance with the request by the U. S. Army Corps of Engineers, Philadelphia District, for comments by TIRAC on behalf of the region affected by the project, the following is presented as representative of the concensus of the Council.

We, the members of the Tocks Island Regional Advisory Council, are members of local governments who have combined their efforts to work towards solution of the many problems which construction and operation of the Tocks Island Dam will bring to its neighbors. The Council was conceived as a cooperative body, with staff employed to do planning studies and recommend courses of action which would promote the well-being of our citizenry. Although we recognized from the outset that the location of these projects would change the natural setting and accelerate growth, we recognized also the legitimate purposes for which these projects were planned: that is, flood control, water supply, recreation and power.

Neither the Council nor its staff are environmental experts. We have listened carefully to the claims of the conservationists and of the Corps of Engineers and the National Park Service, and we have attempted to discern the path of objectivity and truth. As is so often the case, the truth does not lie clearly with one side or the other, and the problem is one of reconciling conflicting expert views and weighing consequences which are not clearly known.

For these reasons, the Council feels that it should accept the plan for the development of the Delaware River Basin as prepared and adopted by the Delaware River Basin Commission. The Commission's responsibility was to study the water and related resources of the entire drainage area of the Delaware River, and to prepare a plan which would best utilize and conserve these resources for the use of all of the people of the basin. Their plan was accepted by the four states and the federal government as being in the best public interest. To date, we have not seen evidence to the contrary.

Although we feel that the environmental statement prepared by the Corps is essentially correct, it is given in broad terms and does not deal with some issues considered of importance to us and to professional conservation personnel. As first priority we would suggest that a formalized method be established to assure continuous, in-progress review of all planning being undertaken for the projects. The purpose of the review would be to provide the Corps with information on the potential environmental damage which their activities will produce, and also to arrive at methods to minimize such damage. In many cases this may mean the re-planning of construction procedures or facilities. The Corps should be empowered and directed to expend funds for both the requisite professional advice and the adoption of resulting recommendations. Only through a close liason among all parties concerned will the projects reflect the rising environmental concerns now facing us.



There are several specific issues with which the Council has been concerned for several years. One is the problem of maintaining high standards of health protection. We feel it is essential that the water quality of the reservoir be maintained at a maximum level. We are now reviewing the Tocks Island Region Environmental Study which outlines five alternatives for regional sewer systems. If some form of regionalization is recommended, we feel that the federal agencies must demonstrate their commitment to maximum water quality.

Another major issue is the highway network needed to service visitors to the dam and park. To serve as a model review, TIRAC convened a group of environmental specialists to quickly assess some key areas of the proposed U.S. 209 relocation. The group felt that there had been insufficient concern shown for some of the stream crossings, which are the most fragile types of areas. They also pointed out the need for written performance standards and continual inspection of the construction process itself, as this is often when extensive damage is done. These findings have been brought to the Corps' attention, and are now being resolved.

Although the Corps has had a study done of the fish and wildlife, there has as yet been no statement as to acceptance of the recommendations made by the Fish and Wildlife Service. It is claimed that, if properly managed, the lake can be maintained for game and anadromous fish through the construction of a fish ladder, design of the penstock openings, and by sculpting the banks of the reservoir to discourage propagation of trash fish. The C.E.'s report also recommended replacement of flooded wildlife habitats through purchase of additional acreage.

From the Forest Service comes word that a unique stand of Norway Spruce, in the Worthington tract of New Jersey, is being threatened by dam site construction, because that area has been designated as a borrow area. Although these trees were artificially planted, they are of an age and size which give them special significance in the northeastern region.

Other environmental concerns will become apparent as detailed plans become finalized. We do not feel that the type of review requested here should be the only method of evaluating the impact of the Tocks Island projects. After the initial assessment is made of the project as a whole, there should be detailed review as the project progresses. We suggest that the vast investment by the federal government in these two endeavors should be protected by assigning a small but specific portion of the total costs to assuring that all possible environmental ramifications have been studied. This should be done by professionals on a professional basis, with an agreed upon feedback method, so that recommendations can be implemented.

The local governments of the seven counties of TIRAC are doing their utmost to protect the natural resources of the areas adjacent



to the park. We feel that it is necessary to increase the level of cooperation between federal and local agencies, on a continuing basis, so that we and our citizens can be assured of reciprocal efforts during the planning, construction and operation phases of the projects about to be introduced into our region.

Adopted December 19, 1970 by the TIRAC Executive Committee as a Council policy position.



December 18, 1970

Colonel James A. Johnson  
Corps of Engineers  
Department of the Army  
Philadelphia District  
Custom House - 2D & Chestnut Streets  
Philadelphia, Penna. 19106

Ref: NAPEN-D

Dear Colonel Johnson:

Thank you for providing, in preliminary draft, an environmental statement for the Tocks Island Project which you state will be submitted, in finalized form, to the Council on Environmental Quality.

On behalf of the North Jersey Chapter and the East Jersey Chapter of Trout Unlimited, the following statement represents, in brief, some of the reasons why our combined membership stands unalterably opposed to construction of the Tocks Island Reservoir.

Although professed in the early portion of the Corps of Engineers' Environmental Statement ("1. Project Description:) that "this project will serve the purposes of flood control, water supply, hydroelectric power and recreation, inclusive of fish and wildlife" we respectfully submit that not only is proof lacking that such benefits may, indeed, be expected, but that in many aspects the reverse may be anticipated, i.e., that damages resultant from this impoundment are likely to be of substantial consequence, irreversible and permanent. Further, we allege that the necessity for creation of this reservoir is not proven. We believe that the cost-accounting processes employed by the Corps in attempts to justify this project on a benefit-cost ratio are not only highly suspect but in many respects seemingly willfully distorted and do not take into consideration all pertinent factors.

With reference to the benefit-cost ratio, it is imperative to point out that your statement itself cites, as an alternative for generation of peak load power, a fossil fuel steam plant which could eliminate the (admitted) "minimal" environmental impact of the proposed power project on the Delaware. Such an alternative, financed by private industry (who are in any event the major beneficiaries of this project) will provide the desired generating capability without drain of tax dollars and with no major environmental impact. This alternative obviously eliminates one of your major reasons for the entire project. Not only is this the least costly to the tax-payers but it is in fact, of no cost at all. Moreover, we are in agreement with Senator Ellender, who has seriously questioned whether the private utilities, as beneficiaries of this federal installation, are coming even close to reimbursing the federal government and the tax-paying public for the investment costs of this facility. Can this be serving the best interests of the tax-paying public as a whole?



As for flood control, you refer to an historic event or flooding occurring in 1955 as a prime justification for this reservoir. Since then, on the upper Delaware, the Pepacton, Cannonsville and other important flow-controlling impoundments have been installed. Metropolitan potable water demands, in addition, have since materially reduced the flowage-volumes of this river.

As for water supply, the tragic fact is that because of the gross mismanagement of other resources, the consequent encroachment of demands for potable water upon the Delaware watershed by metropolitan areas results in undue strains upon these limited resources.

As to your predictions of future water supply demands, they should rightfully be met by rehabilitation of the Hudson River, Passaic River and others, now so polluted as to be presently unfit for use. Such rehabilitation would relieve the pressure on the Delaware River Basin. This monumental rehabilitation project is one far more worthy of the undeniable engineering genius of the Army Corps than the plundering of this last remaining free-flowing river. To further aggravate the problem, the proposed Tocks plan would result in the bringing of 10 1/2 million people annually to its waters, while at the same time piping these waters away to other peoples.

We believe your "Impact Statement" cited (3a and 3b) represents, typically, the total disregard for environmental consequences exhibited by the Army Corps in numerous other of its projects, both completed and in plan. The Indiana Dunes, the Cross-Florida Barge Canal, Devil's Jump, The Ramparts Dam projects are best examples. In the case of the Tocks Island Project "permanent" loss of 10,000 acres of land is admitted. Another 6,000 acres, you state, would be "affected" (inundated) by temporary storage of flood waters. What are these 6,000 acres (if not, indeed, more accurately, nearly 9,000 acres) of "temporarily inundated" lands to be but mud-flats? And as offset against this total of thousands of acres of wildlife habitat erased, you propose to provide 880 acres of other lands to "mitigate project induced damage to wildlife habitat".

You state that "roughly 5% of the shoreline along this stream reach is presently available for public use". Yet no construction of an impoundment is required to open this stream reach to public access, if the surrounding lands are acquired in public ownership.

It is, however, with your allegation and reputedly, that of the U.S. Fish & Wildlife Service that the proposed impoundment will have a "beneficial effect" on fishery resources, that we take most violent issue. In spite of talk of fish ladders and other vague assurances, we believe it correct to state that no fish ladder has been designed and no money guaranteed for the building of such a ladder. Even if built, there is considerable question concerning efficiency of operation in getting the fish successfully up and down in their migrations. Because of inevitable ecological changes above the Tocks Island Basin, owing to the dam and its operation (to say nothing of those changes from the impoundment downstream to the estuary of the Delaware) loss of anadromous and catadromous fishes must be the foreseeable consequence, upstream all the way to the headwaters. We are aware of no research or biological studies to disprove this expectation. Our organizations emphatically do not accept your promise of "10 years" functioning as an "excellent game fishery" (which claim we doubt, from the testimony of such reputable biologists as Drs. MacNamara and Trembley, of Lehigh University) coupled with your weak assumption



that the reservoir may develop into a "good game fishery" (game, rough and pan species) as a basis for commitment of these waters to at least 100 years as a reservoir. We are convinced, as for example, in Hungry Horse Dam in Montana, that this promise of the Army Corps for "beneficial" effects on the fishery will be discovered to be just as empty.

We deplore the fact that the Army Corps, despite its abundant assurances of benefits, is being increasingly proved wrong and culpable in its advance minimizations of ecological damages. We protest the fact that those of the Corps who are now advocating these catastrophic environmental changes do so with complete impunity and practical immunity, knowing full well that they can never personally be held accountable since the major impact will only be fully experienced by future generations.

In the words of Dr. Gifford B. Pinchot, "the purpose of the Corps is to perpetuate itself, and their statements about the benefits that are to be derived from this dam are merely window-dressing to justify their depredations on the environment. Their past track record suggest that these statements are meaningless---since (they) are just unsupported generalizations and no facts are brought forward".

We, the undersigned Chapters of Trout Unlimited, hereby submit, for the record, the above statement in opposition to the proposed construction of the Tocks Island Dam and we respectfully request that these views be included with any statement submitted by the Army Corps of Engineers to the Council on Environmental Quality.

Very truly yours,

North Jersey Chapter, Trout Unlimited

East Jersey Chapter, Trout Unlimited

By Fred S. Burroughs  
Fred S. Burroughs, President

By Donald A. Ecker  
Donald A. Ecker, President

East Jersey Chapter, Trout Unlimited - North Jersey Chapter, Trout Unlimited  
c/o D. Ecker  
2200 N. Central Rd. - Apt. 5L  
Fort Lee, New Jersey 07024  
Sparta, New Jersey



