

C O M M I T T E E M E E T I N G

of

ASSEMBLY CONSERVATION

AND NATURAL RESOURCES COMMITTEE

"To receive testimony from the United States Army Corps of  
Engineers on the Pompton-Passaic Rivers Dual Inlet  
Flood Control Tunnel Diversion Plan."

May 14, 1990  
Room 403  
State House Annex  
Trenton, New Jersey

MEMBERS OF COMMITTEE PRESENT:

Assemblyman Thomas J. Duch, Chairman  
Assemblyman Daniel P. Jacobson, Vice Chairman  
Assemblywoman Maureen Ogden  
Assemblyman John E. Rooney  
Assemblyman Anthony J. "Skip" Cimino

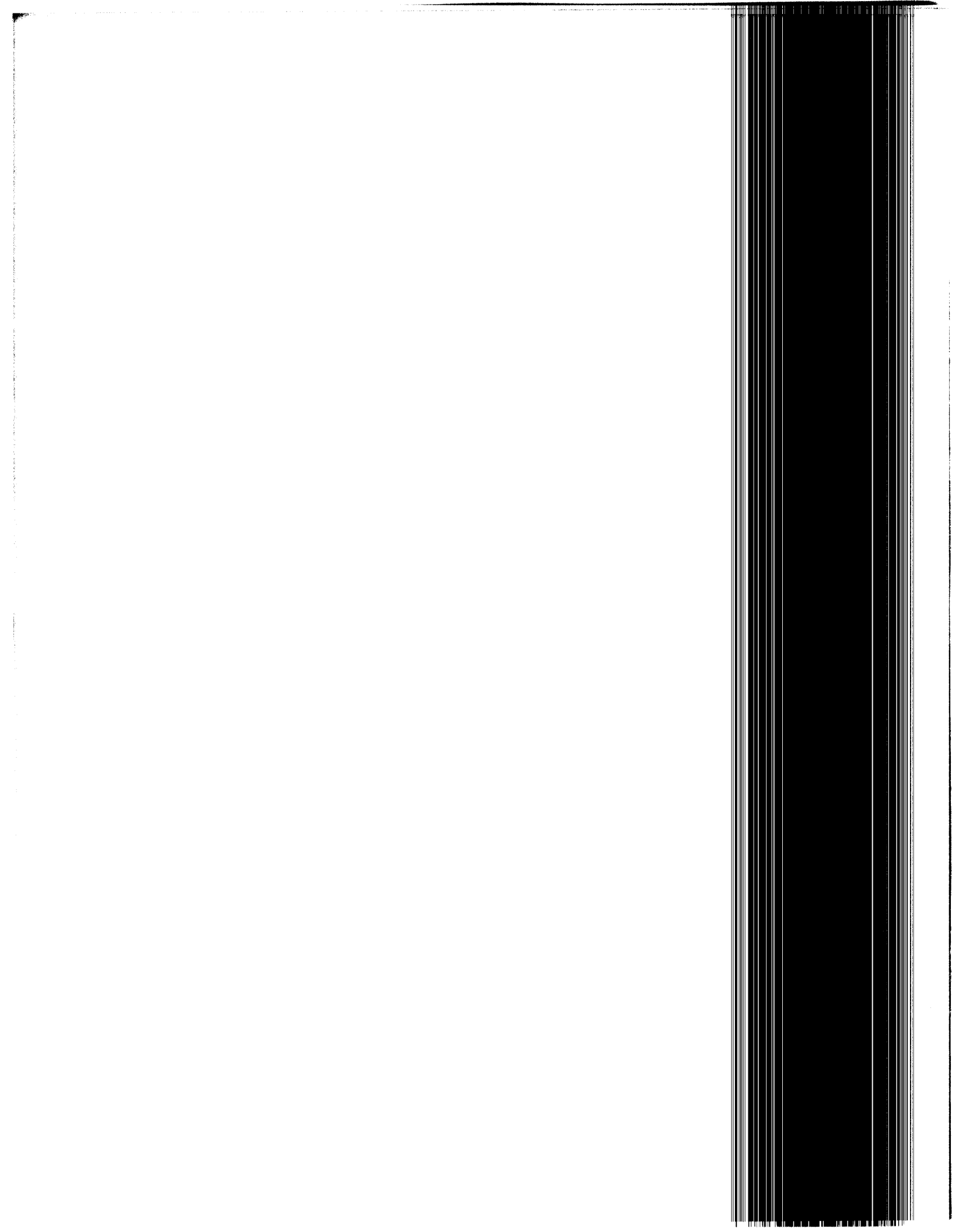
ALSO PRESENT:

Jeffrey T. Climpson  
Office of Legislative Services  
Aide, Assembly Conservation and  
Natural Resources Committee

New Jersey State Library

\* \* \* \* \*

Meeting Recorded and Transcribed by  
Office of Legislative Services  
Public Information Office  
Hearing Unit  
State House Annex  
CN 068  
Trenton, New Jersey 08625





THOMAS J. DUCH  
CHAIRMAN  
DANIEL P. JACOBSON  
VICE-CHAIRMAN  
JOSEPH A. MECCA  
MAUREEN OGDEN  
JOHN E. ROONEY

**New Jersey State Legislature**  
**ASSEMBLY CONSERVATION**  
**AND NATURAL RESOURCES COMMITTEE**  
STATE HOUSE ANNEX, CN-068  
TRENTON, NEW JERSEY 08625-0068  
(609) 292-7676

**COMMITTEE NOTICE**

TO: MEMBERS OF THE ASSEMBLY CONSERVATION AND  
NATURAL RESOURCES COMMITTEE

FROM: ASSEMBLYMAN THOMAS J. DUCH, CHAIRMAN

SUBJECT: COMMITTEE MEETING - MAY 14, 1990

*The public may address comments and questions to Jeffrey T. Climpson, Committee Aide, or make scheduling inquiries to Deborah Del Vecchio, secretary, at (609) 292-7676.*

---

The Assembly Conservation and Natural Resources Committee will meet on Monday, May 14, 1990 at 9:30 A.M. in Room 403, State House Annex, Trenton, New Jersey, to receive testimony from the United States Army Corps of Engineers on the **POMPTON-PASSAIC RIVERS DUAL INLET FLOOD CONTROL TUNNEL DIVERSION PLAN.**

Issued 5/9/90



**ASSEMBLYMAN THOMAS J. DUCH (Chairman):** The meeting will come to order. This is a meeting of the Assembly Conservation and Natural Resources Committee. The Committee is meeting today to receive testimony from the United States Army Corps of Engineers on the Pompton-Passaic Rivers Dual Inlet Flood Control Tunnel Diversion Plan.

We will hear first of all from the United States Army Corps of Engineers. At the conclusion of their presentation, members of the Committee will be recognized with any questions that they may have and members of the Legislature may be recognized at that time, as well.

Joining us today at this hearing, I would like to welcome Assemblyman Skip Cimino, who is standing in for Assemblyman Joseph Mecca. We also have Assemblyman Daniel Jacobson, who is Vice Chairman of the Committee. Assemblyman Rooney and Assemblywoman Ogden, their arrival is imminent. However we are going to begin at this time.

If you would introduce yourselves and handle the presentation as you see fit.

**C O L O N E L R A L P H M. D A N I E L S O N:** Good morning, Mr. Chairman. I am Colonel Ralph M. Danielson, Commander and District Engineer of the New York District of the U.S. Army Corps of Engineers.

I'm accompanied this morning by Mr. Bob Pietrowsky on my immediate left who is Chief of the Passaic River Division of our District and is the Program Manager for the Passaic River Flood Protection Project. Also accompanying us, on my extreme left is Mr. Ray Boc, the Deputy Chief of the Division, and on my right Ms. Phyllis Kronick, who is with the Passaic River Division.

I'd like to thank you, Mr. Chairman, and the members of the Conservation and Natural Resources Committee for this opportunity to tell you this morning about the Passaic River Project.

As I'm sure you well know, the people of northern New Jersey have long suffered from the chronic and severe flooding of the Passaic River. To alleviate this flooding, the Corps of Engineers has developed the Passaic River Flood Protection Project in partnership with the State of New Jersey and its Department of Environmental Protection. In fact, the plan we will be describing for you here this morning was selected and has been strongly supported by the State.

The Corps of Engineers' report and the environmental impact statement which subsequently recommended this plan, have been thoroughly reviewed and accepted by the New Jersey Department of Environmental Protection, the U.S. Environmental Protection Agency, and the U.S. Fish and Wildlife Service, and all other Federal agencies with a scientific, environmental, or policy jurisdiction. Earlier this year, the Bush administration gave this plan its blessing. Congress is now considering a Water Resources Bill that would authorize construction of the project.

The principal feature of the project is a flood diversion tunnel from the Pompton River in Wayne to the Passaic River in the Clifton/Nutley region. We are, of course, aware of the strong interest on the part of the New Jersey Congressional delegation to authorize the project with an extension of the tunnel to Newark Bay.

Senators Bradley and Lautenberg introduced on the 26th of February of this year, Amendment No. 1265 to the proposed Water Resources Development Act, which would authorize the extension. The House is considering taking similar action.

If approved, this alternative would change the outfall of the tunnel from the Clifton/Nutley area directly into Newark Bay. This would increase the tunnel length by approximately seven miles, and would eliminate the need for nine levee systems between Wallington and North Arlington, and between Nutley and Belleville.

I might point out that the Newark Bay alignment was one of the alternatives studied by the Corps of Engineers, but it was not recommended because the Clifton/Nutley alignment provided the same protection at a lesser cost.

The difference between the two is roughly estimated to be about \$300 million, at October 1989 price levels. I should point out though that while it is more costly, the Newark Bay alignment does have a positive benefit to cost ratio.

At this point, I'd like to ask Bob Pietrowsky to give you a more detailed presentation using the slides that we have set up here to discuss some of the principal aspects and principal features of this large and very complex project. Upon completion of his presentation, we'll be most happy to address any questions that the Committee may have.

ASSEMBLYMAN DUCH: Thank you, Colonel.

COLONEL DANIELSON: So, Bob?

R O B E R T P I E T R O W S K Y: Thank you, and good morning. I'm happy to be with you today for this presentation of the Passaic River Flood Protection Project. This project will fulfill a major need in northern New Jersey by bringing flood damage relief to the people living and working in the highly developed and chronically flooded Passaic River Basin.

Passaic River flooding is recognized as the most serious unresolved flood problem on the east coast. The potential for the loss of life, human suffering, environmental damage, and property destruction, is unparalleled in the nation.

The following slides are scenes from the April 1984 flood. This is the largest flood in the region since 1945. This is a particular shot of the City of Paterson during that flood event. (a slide presentation follows)

The Passaic River Basin includes portions of the most densely developed metropolitan area in the country. Again, this is the City of Paterson, the downtown area, capital seat of Passaic County.

The Basin contains more than 2 million people, and the floodplain includes over 30,000 homes and places of business. These are a series of garden apartments in the Borough of Lincoln Park. It is a major center of economic activity in New Jersey with over 10,000 commercial properties affected by flooding.

The Basin has been subjected to serious flooding 15 times over the last 20 years, with seven of these floods resulting in Federal disaster declarations for all parts of the Basin. Since 1903 there have been more than 30 major Passaic River floods, with 26 people killed and property damage in excess of \$3.2 billion in damage as documented losses in the Passaic River Basin. The April 1984 flood alone caused an estimated \$390 million at October 1989 price levels.

In the period between December 1983 and May 1984, there have been three flood events in which five people were killed alone in that period. Three people were killed in the 1984 flood event.

Expected annual damages throughout the Passaic Basin are more than \$100 million per year. And if a flood of the magnitude of the 1903 flood, the flood of record, were to occur today in today's conditions, it is estimated that over \$1.9 billion in damages would result. Such a flood would result in more than 10,000 people being evacuated with hundreds of homes destroyed. Home heating oil, raw sewage, and hazardous materials would spill into the water due to flooding, with overbank flood depths of up to 20 feet in depth. Transportation routes such as Routes 46, 23 and 80 would be closed, and secondary business and retail losses would total in the hundreds of millions of dollars.

Due to the regional nature of the flood problem, the Corps of Engineers was requested by the Congress and the State of New Jersey to develop flood damage reduction alternatives.

Over the last 12 years, over 150 alternatives were evaluated, including a full range of nonstructural plans such as buy-out alternatives.

Through the DEP, the State has been actively involved in the development of the flood protection plan. The first interim portion of the project that was implemented was in cooperation between the Corps and the State of New Jersey through the NJDEP, and that was the Passaic River Flood Warning Project. This project has already been implemented and has recently won the prestigious Smithsonian Award for innovative computer application in the natural resources and environmental category.

Before I get into a description of the project, just a little orientation on the basin: The Passaic River Basin is a 935 square mile drainage area, of which 84% lies in New Jersey and 16% in New York State. It's drained by the main stem Passaic River, which originates in the southwestern portion of the basin, and its seven major tributaries. The main stem Passaic River flows generally north and east to the City of Paterson, and then south, down to Newark Bay.

The bulk of the flood flows come from the northern tributaries, the Ramapo, Wanaque, and Pequannock Rivers, and down the Pompton River, where it joins the Passaic River at an area known as Two Bridges. About two-thirds of the flood flows come down the Pompton Valley. The lower Passaic River from Newark up to Dundee Dam in the Garfield area, is also under tidal influence, and is threatened by the potential of hurricane events.

The basin includes portions of ten counties, eight in New Jersey and two in New York, and politically, over 130 municipalities lie in the basin. The New Jersey portion of the basin includes all or parts of 117 municipalities.

The recommended plan treats the entire main stem Passaic River flood problem, and would provide protection

against rainstorms and hurricanes. The plan combines large underground diversion tunnels with channel modifications, levees and flood walls, and the acquisition and preservation of open space. It will provide protection ranging from the 100- to the 500-year flood event.

Again, for your orientation, the Passaic River in this slide starts in the lower left-hand corner, flows up to join the Pompton River, then east to the Paterson area, and then south to Newark Bay. The major elements of the plan are the two tunnels shown in yellow. The main tunnel has an inlet on the upper Pompton River, downstream of where the three Pompton tributaries join.

The main tunnel is 39 feet in diameter, 13-and-a-half miles long, and as currently proposed, would have its outlet on the main stem Passaic River in the vicinity of the confluence with the Third River, a tributary that is the border between Nutley and Clifton, in the lower Passaic River.

In addition to the main tunnel, there is a spur tunnel which has its inlet on the Passaic River, just downstream from the Passaic River, Pompton River confluence. That tunnel is 1.2 miles long, 22 feet in diameter, and gives the capability to the project to capture flood waters from not only the Pompton River which generates most of the flood flows, but also from the Passaic River. The spur tunnel from the Passaic River joins with the main tunnel at an underground connection.

The key to the plan is the tunnel system, because the tunnels will divert most flood flows. No surface flood control measures will be required along seven miles of the Pompton River, or along 15 miles of the lower Passaic River down to the Garfield area. These areas get full flood protection without surface works. The project minimizes the surface works needed because its major features, the large diversion tunnels, will be constructed hundreds of feet underground. The tunnel would

not be constructed from the surface. It would be constructed underground. At its deepest point under the Watchung Mountains, the main tunnel would be some 450 feet underground.

The two tunnels will use specialized construction methods including tunnel boring machines. Machines such as this one were used to complete 31 miles of tunnels in Chicago's Tunnel and Reservoir Project. Phase III of that project is ongoing right now. This particular machine was used in phases I and II in the Chicago Project, which was completed ahead of schedule and within 1% of the projected cost.

The tunnels would be constructed deep underground at depths where competent solid rock would allow the use of tunnel boring machines. The tunnels are not going through the unconsolidated layers that provide sole source water supply sources. It will not affect groundwater used for water supply.

This is a picture of a bore tunnel up in Milwaukee, a 30-foot tunnel, and this is prior to the adding of a concrete lining to the tunnel. The tunnels in the Passaic Project would be lined with concrete and, again, would not affect groundwater, and would not leak, just as the Holland and Lincoln Tunnels do not leak and drain the Hudson River.

Because of the depth of the tunnel, construction activity will only be evident at four construction shafts and the inlet and outlet shafts, where the material removed from the tunnel would be stockpiled and then transported away. A significant part of the tunneling process involves the removal of rock from the tunnel face to disposal areas. Therefore, the tunnel route alignments and the location of the work shafts considered the availability of disposal areas to satisfy project needs.

There are several large quarries located along the tunnel route of the recommended plan and are readily available to stockpile the material excavated from the tunnel. This is one of the large quarries up at Garret Mountain, and there are

**New Jersey State Library**

several others up in that area. Actually the quarries in that area are actually playing out, and are in need of good clean material and the material that will be excavated from the tunnel is pristine rock, which crushes easily and is highly marketable as a concrete aggregate.

In addition to the tunnels, the plan includes 5.9 miles of channel modifications shown in white. These are designed to direct the flood flows into the inlets. These channel modifications extend up to Pequannock, Wanaque, and Ramapo Rivers, the Pompton tributaries, and also above the Passaic and Pompton River inlet at Two Bridges area. Note that with the use of the underground tunnels, that of the 60 miles of the Passaic River protected, six miles of the channel would be altered as part of the plan, 5.9 miles would be altered.

These 5.9 miles of channel modifications will, however, have an adverse effect on the aquatic environment for those rivers. This is an adverse impact of the project that is documented in the environmental impact statement. The Corps would be working with the U.S. Fish and Wildlife Service, and the U.S. EPA, on the mitigation of such aquatic losses, and we plan to use innovative environmental design measures to ensure that the fisheries in the area will be restored as much as possible after construction. This is the commitment of the environmental impact statement.

Tunnel operating rules have also been carefully developed in coordination with the Environmental Protection Agency, U.S. Fish and Wildlife, and N.J. DEP, to minimize environmental impacts during operation of the project. For nonflood conditions -- and this is all of the time up till the river flow that starts to flood developed areas, so that's based on historical U.S. Geological Survey records, that's about 355 to 360 days a year-- Under nonflood conditions, there's no change in the river flow. No flows would be diverted. There would be no change in the natural flows of the

river, no impacts to wetlands, no impacts to groundwater, and no impacts to surface water supplies. Again, that's about 355 to 360 days a year, on the average, there would be no change.

The project would only operate under flood conditions. Based on historical stream gauge records, that's about five to ten days a year. And when the project operates, it will only divert flows above the channel bankfull capacities. So, it will keep floods out of residential and commercial areas, but will keep the wetlands wet. It will ensure adequate flows for water supply and will have no impact on groundwater supplies. In fact, the project has provisions for ponding water upstream of the inlets during drought periods, and can be used to increase groundwater recharge, if desired.

This slide shows the New Jersey Department of Environmental Protection model of the tunnel inlet on the Pompton River. Let me just orient that slide for you. The Ramapo River is coming from the right hand side of the River, and that existing structure on the Ramapo is the Pompton feeder dam, which is an existing structure now. The Ramapo River joins the Pequannock River and then flows south as the Pompton River down to Jackson Avenue. That's the Jackson Avenue Bridge there, in Wayne.

Under nonflood conditions there would be no change. There are gates in the flow restrictor shown in the slides, and those gates would be open, so under normal conditions flow would be just as it is today, the river is not dried up. When flooding that would be exceeding the bank full capacity would get into developed areas would occur, the gates in the flow restrictor would be closed allowing a base flow to remain downstream, a base flow of 500 cubic feet per second approximates the daily average flow in the River, and that would continue even during flood events. Water would then

pond; the excess water would then pond behind the flow restrictor, would then flow through gates in the spillway, into a concrete basin which is about 70 feet in diameter, eight feet deep, and would fill up the basin and the water would then flow into a morning glory inlet, which is sort of like the shape of the bell of a trumpet. It would flow into the inlet and would drop down 125 feet into the tunnel which is deep underground.

After the flood peak is passed, the flow restrictor gates are opened and flows equivalent to the one-year flood event, which is approximately the largest nondamaging flow that can pass downstream without causing significant problems to developed areas, would be allowed to pass downstream for further nourishment of wetlands and to facilitate the natural flushing of sediments.

So, even during a flood event, there would always be water flowing downstream equivalent to the average daily flow, and at the end of the flood when the flood peak is passed, a simulation of the annual flood event would occur to nourish wetlands and to facilitate sedimentation.

Again, these rules have been worked out with the involved natural resource agencies and are designed to achieve a balance between the flood reduction and the environmental objectives of the project.

Now, as mentioned before, the plan also includes levee floodwall systems. They were shown in red on the slide. They total about 37 miles in length. We're going to go through these individually. The one shown on this slide are the five levee systems that provide hurricane and storm surge protection to the urban areas of Newark and Kearny. These systems are independent from the other elements of the project, and they are not related to the tunnel element. They are for hurricane protection, tidal storms that emanate from the ocean, in Newark Bay.

There are also ten levee systems lying in the Morris/West Essex County area, providing flood protection in addition to the tunnel, in order to achieve consistent level of protection in the western portion of the basin. These again, are supplemental, incremental to the tunnel element of the project.

Finally, there are nine levee systems in the lower valley that provide both flood protection from rainfall and hurricane events and would also safely contain the flows exiting from the tunnel outlet. These systems are required elements of the plan, due to their role in containing the flood flows exiting from the tunnel.

These nine levee systems, which total about 13.5 miles in length, are required because of the location of the tunnel outlet on the Passaic River. I'll be getting back to discuss these in more detail in a few minutes.

This particular slide shows the outlet location that is proposed in the recommended plan. The outlet would be located on the Passaic River west bank above its confluence with the Third River in Clifton. Again, this is the N.J. DEP model of the proposed outlet. The floodwaters would exit through an up shaft to the surface and greatly reduce the velocity through a dissipating structure there -- you can see in the river east of the McCarter Highway -- and the waters would then flow out into the Passaic River out to Newark Bay.

This particular slide is a picture of an outlet structure the Corps of Engineers constructed for a very similar project, for the Park River Tunnel in Hartford, Connecticut. It's a slightly smaller tunnel, 24 feet in diameter, but it's the same concept. It's a flood diversion from the Park River to the Connecticut River. And that is the outlet structure. In fact, in the foreground is a levee structure on the Connecticut River, part of the levee system the Corps has constructed for the State of Connecticut on the Connecticut River.

When the tunnel operates for very large flows, the flows exiting from the tunnel will have the effect of increasing river stages over and above what they would have been without the project in the lower valley area. For the 100-year design event, this increase would average about one-and-a-half feet over a six-and-a-half mile reach of the lower Passaic River in South Bergen and East Essex Counties. That's from the area in Bergen County from North Arlington, upstream through Wallington; on the west bank the communities of Belleville, Nutley, Clifton, and the lower end of the City of Passaic.

The greatest impact is at the tunnel outlet itself, where the increase for the 100-year design flood is almost four feet. This is a negative impact of the project, and this is why the dikes and levees along this area are required elements of this recommended plan. These structures will ensure that increases in river stages would not result in flood damages in this area. I must emphasize that no one in this area would suffer additional flood damages due to the project.

Because of the interest in the outlet location and the controversy surrounding the nine levee systems in the South Bergen, East Essex area, there has been much congressional interest in extending the tunnel and moving the outlet to Newark Bay to resolve this issue. This particular slide highlights the difference between the Newark Bay alternative that's been suggested in the Lautenberg/Bradley Amendment in the Senate, and the recommended plan, and the State selected plan that's in the Corps report sitting in Washington.

With the tunnel outlet relocated to Newark Bay, the flows exiting from the tunnel would discharge into a significantly larger body of water and would do so without increasing water surface elevations at the outlet, or upstream on the Passaic River. Therefore, the Newark Bay outlet would

not impact on lower valley communities in Hudson, Essex, and Bergen Counties, nor on any other location such as a Newark Airport.

With the Newark Bay outlet plan, the nine levee systems in the Bergen/Essex area would not be required to safely contain the flows exiting from the tunnel and would no longer be necessary for the plan to function.

This is a slide showing what the plan would look like with the Newark Bay alternative. For this alternative, the main tunnel would be about 20 miles long, versus the 13-and-a-half miles long for the recommended plan, or about six-and-a-half miles longer. This additional extension of the tunnel, however, would add an additional \$300 million to the project cost, and I believe the content of the Lautenberg/Bradley Amendment calls for the cost sharing of that \$300 million in the same proportion of the project on a 75% to 25% basis.

This plan, therefore, the lower 25 miles of the Passaic River, including the 16 communities in Passaic, Bergen, and Essex County, would receive flood protection without any surface works along the river. Now, again, this is not the plan that is included in the Corps report in Washington. This is the plan, however, that is supported by the congressional interests and would impact on what plan is authorized for construction, and ultimately what plan would be designed and implemented by the Corps.

I have a few slides, just to show you what levees and floodwalls look like and how recreation is built into them. Measures would be taken with all levees and floodwalls to minimize the impacts on the surrounding area. Parklands would normally retain their recreational uses. These series of slides are projects from the Corps of Engineers around the country, levee projects. Ray, if you could just point out the levee -- it's tough to see here -- but a levee is a structure

with a flat top, about eight to ten feet on top, usually with a macadam paving used for maintenance, but also used for recreational uses such as jogging, hiking and biking. A levee has earthen side slopes; one on two-and-a-half, one on three side slopes with grass plantings. Again, you can see the macadam halfway here, with the side slopes. Usually the top of the levee has other amenities such as park benches, lights, water fountains, and things of that nature.

On the protected side of the levee, usually recreational -- passive recreational -- features are integrated into the plan and these features are in the cost of the project at this time, in terms of picnicking and other recreational features.

Access to the river would be provided. It would be different. Instead of standing in the park and looking directly at the tree line and the river, you would see the earthen berm, the hill, and staircases or openings in the levees would be necessary to either gain access to the top of the levee to view the river, or openings would be provided and are planned for emergency boat access or for recreational boating access.

Again, this is a levee system in one of our projects in Iowa showing the recreational aspects of the levees. Normally the levee design is tailored to the type of area involved. This would be more typical in an urban area where floodwalls are used and the parks are a little more urban in nature. Again, overlooks and viewing points can be incorporated also, into the project features.

I would like to just move on to the last project feature -- it's a key one -- and in that regard, discuss the impact of the project on wetlands. The impact of the project on wetlands are twofold.

First, the construction of the structural elements of the plan will destroy approximately 785 acres of existing

wetlands. These wetlands will be fully mitigated for by the creation, enhancement, and management of wetlands on project lands. Again, this is a commitment of the environmental impact statement, and it is the basis for an agreement with the U.S. EPA and our work that is ongoing with the U.S. Fish and Wildlife Service regarding the development of a comprehensive wetlands management plan for the Passaic River.

We are also committed to establish an Environmental Advisory Board consisting of not only the Federal agencies, but of nationwide experts and university interests that will make decisions on how to best mitigate for these losses.

In addition to this mitigation, the plan also includes the acquisition and preservation of 5350 acres of natural storage areas including 5200 acres of wetlands. These are the areas shown in light green on this slide. They're in eight major wetland areas in the Morris County, Essex County area.

The preservation of these wetlands would work in conjunction with the wetland areas that are already protected under other government programs, including the agreement by the State of New Jersey to maintain existing floodway delineations in the central Passaic Basin resulting in the protection in total of over about 21,000 acres of wetlands.

This is natural flood detention -- a nonstructural flood control measure that will help keep the flood problem from worsening in the future, thus maintaining the project's design level over its life.

I'd like to close the slide presentation just highlighting current cost of the project, \$913 million at October, 1989 prices; the Federal share, \$674 million, the nonfederal share estimated at \$239 million. Again the State of New Jersey is the nonfederal sponsor of the project.

Tying it to the Newark Bay option, the Newark Bay option would be about \$300 million greater in cost than this plan, totaling about \$1.2 billion with the Lautenberg/Bradley

Amendment cost sharing increasing the nonfederal share, the share of the State of New Jersey, to about \$300 million.

One of the questions we get is the future cost of the project, and recently we've been providing through the President's Office of Management and Budget, the cost of the project with future inflation built in using the OMB approved inflation rates. The current cost of the project with inflation through the construction period is \$1.2 billion. That's the recommended plan.

As Colonel Danielson stated, the Corps is in a very unique position at this time in that the plan selected by the project sponsor, the State of New Jersey, and recommended in our report which is down in Washington, is a different plan than the one supported by the New Jersey congressional delegation. The transition to a new State administration is also a key factor to this uncertainty.

In the interim, we stand ready to design and implement whatever plan is desired, and we're committed to serving the people of New Jersey and reducing flood damages in the Passaic Basin.

I thank you for the time for the presentation. That closes the slide show, and we can open it up to any questions you may have.

ASSEMBLYMAN DUCH: Thank you, Colonel Danielson, and thank you Mr. Pietrowsky. I would like to acknowledge that during the presentation rather than interrupt you, we were joined by two other Assemblypersons, and I would like to introduce them at this time.

We were joined by Assemblyman John Rooney, and we were also joined by Assemblywoman Marion Ogden. I'm sorry, Maureen Ogden. I'm sorry about that, Maureen.

Anyway, okay. I will acknowledge Senator Bubba in just a couple of minutes, but I would like to just ask this. You spoke about the extension of the tunnel to Newark Bay. Is the Corps in agreement with that extension proposal?

COLONEL DANIELSON: I guess I'm not sure what you mean by agreement. It is an alternative that was studied by the Corps. It was not recommended by the Corps because of the cost differential. Other than that, it meets all environmental tests. It has a positive benefit to cost ratio, but it is a more expensive alternative.

ASSEMBLYMAN DUCH: Okay. But your first choice is the plan with the Clifton/Nutley outfall?

COLONEL DANIELSON: We are required to recommend what is called the National Environmental Development Plan, or NED Plan, as we call it. That's the one that represents the least first cost that meets all of the project parameters, and that's, right now, the Nutley outlet plan.

ASSEMBLYMAN DUCH: Okay, but if in fact, Congress or the Senate has already introduced this amendment, if in fact, Congress follows suit and says this should go to Newark Bay, the Corps would be in a position to complete the design of the extension of this tunnel to the Newark Bay?

COLONEL DANIELSON: Yes.

MR. PIETROWSKY: Ultimately, it's not our choice. We're a consulting engineer for the Congress and the State of New Jersey. As long as the sponsor, the State of New Jersey, supports that plan and the Congress authorizes it, we would then be directed to design and implement that plan.

ASSEMBLYMAN DUCH: Okay, for those members of the public who joined us later on. I would like to explain to you that this is an informational hearing. There was a prior hearing held in the Borough of Rutherford at which public input was taken.

The purpose of this meeting is an informational meeting for the members of this Committee to gather information from the Army Corps of Engineers and to have questions that they may have and to have concerns that they may have addressed.

In that vein, Senator Joseph Bubba has joined us today, and I will acknowledge Senator Bubba and request that he will speak at this time. What I would like you to do Senator, is to come up here where there is a microphone so that you will be recorded for purposes of the transcript.

We will take questions from all Committee members. I'm just recognizing the Senator so that he can go on to Senate business from here. Senator?

**S E N A T O R   J O S E P H   L.   B U B B A:** Thank you very much, Mr. Chairman. I appreciate your kindness. As you know, there are other Committee meetings today, and I'm on two Committees that will be meeting, and some of my bills are up in other Committees, so I appreciate this time.

I come here out of real frustration. If I can put a handle on this thing, I believe that the Army Corps of Engineers started to talk about alternatives, rather let's say, alternatives to correct the flood problem that we have in northern New Jersey. One of those alternatives was the tunnel.

Now, those discussions started almost ten years ago. So, there's been a plan that has been talked about now for almost ten years. And the problem in the Passaic River Basin, as I said, is not a new one that's been as a result of new development.

You know, an easy way to explain away floods is to say, "Well, gee whiz, if you would stop building then the flooding would stop." This thing has been going on since 1850.

I believe the Passaic River has been studied on four or five occasions, 1939, '48, '62, '69, '72, and '73. Each time some sort of recommendation was made but at no time did any recommendation reach the stage that it's reached here.

In 1984, two elderly women in Wayne died as a result of the flood, and one fire fighter who was assisting in the evacuation of some people died in the flood waters.

From time to time you are going to hear some concerns, some of them valid, and some of them self-serving. I hope that this Committee separates the two, and then judiciously positions the legislation for a vote on the tunnel for action.

There are some -- and I think this is a valid concern and a concern that was addressed by the Congress and the U.S. Senate -- that feel as though the tunnel dumps on them. Well, the Army Corps of Engineers, while they assure us that that kind of situation will not occur. That it will not have a detrimental effect on where this tunnel exits in the Nutley/Clifton area, I think it's a valid concern.

If the Congress is willing to move the tunnel down to the Newark Bay, I certainly would not fight that. I think it's a viable alternative.

We have reached the point that is mind-boggling. We're at a point where the State of New Jersey, during the Kean administration, one of the few things that I can point to with pride in the Kean administration, where the Kean administration took over the local authority, so therefore we moved significantly towards correcting the flooding problem.

I might add for the record that for the first time to my knowledge, in the history of the State of New Jersey, there are legislators who feel that the flooding problem is a statewide problem, much the way we in North Jersey feel that beach erosion is a statewide problem. And we have assisted, or have attempted to assist, in the correction of the beach erosion.

There are State legislators, one being Bill Gormley, who in his Natural Resources Act has earmarked funds for the flood areas in North Jersey. I think that's a great step forward, that there are legislators who recognize that this is a statewide problem.

And there are those, some of which in private groups, who have approached the various legislators and said, "Gee,

there's a simple reason, there's a simple way to solve this problem. Just buy out."

Well, I think the Army Corps of Engineers stopped counting at about \$3 billion. I mean, you saw a slide of the City of Paterson. Would you like to buy out the City of Paterson? It's just not a viable alternative.

I believe if we try to take a rational look at this thing, that we will see that we are affecting in New Jersey alone, as you heard, 116 municipalities. Whatever those hang-ups are, whatever those problems are, to any individual legislator, to any individual district, let's compromise. Let's do what's right for those districts, and at the same time do what's right for northern New Jersey.

I appreciate the courtesy that you have extended me in being able to address this problem. I would hope that you would see this problem as being as critical in your minds collectively as I see it in my mind. Thank you.

ASSEMBLYMAN DUCH: Thank you very much, Senator Bubba. Any questions for the Senator?

Senator, thank you for being with us. I see Senator Rice in the room. Senator Rice do you wish to be heard on this subject at this time?

S E N A T O R R O N A L D L. R I C E: (speaks from audience) No. I didn't know that it was coming up. I would just like to go on record as saying that as it stands presently I know the City of Newark and others oppose it. But, I came to get my colleague for another Committee.

I would like to go on record. I didn't know it was up. Our Mayor is not here, and our Director of Engineering is not here, and we perceive some problems as to what's going to happen in our district if in fact this is approved. There has got to be some compromises.

So, I just wanted to say that, but I had to come and get my colleague.

ASSEMBLYMAN DUCH: Thank you, Senator.

You know, when you went through the project-- We will now do various questions from various Committee members. When you went through the project in your slide presentation, you talked a little bit about the inlet and the spillway and how that works, etc. Could you run that by me again?

We talked about a 70 foot in diameter spillway with some kind of a tube in the middle where the water will fall into the tunnel 125 feet. Can you elaborate on that a little?

MR. PIETROWSKY: The Pompton inlet would have a flow restrictor which would consist of a gated structure across the Pompton River. Normally, the gates would be open so water would flow downstream just as it is today. It's only when flooding is imminent, that would get into developed areas, flooding beyond the banks full capacity of the stream, the gates in the flow restrictor would close down further, although it would always allow, at least, what's known as the average daily flow, to continue downstream, at about 500 cubic feet per second.

By closing the gates further, water would start to pond behind the flow restrictor and would then enter through a concrete spillway into a basin that's about eight-feet deep, eight-feet deep, 70 feet in diameter -- I'm sorry, 400 feet in diameter. It would fill up the basin and then drop into the morning glory inlet which is raised up in the middle of the basin. The morning glory inlet is 70 feet in diameter.

The water would flow into the morning glory inlet and would flow down into the tunnel, which at that point is about 125 feet under the surface in solid rock under the ground.

ASSEMBLYMAN DUCH: What is the capacity of this morning glory inlet? How much water will it take?

MR. PIETROWSKY: The Pompton inlet is about 28,000 cubic feet per second. That's the ultimate design. It's like a 100-year flood expected on a long-term average, once every 100 years.

ASSEMBLYMAN DUCH: Okay. In your presentation you had said that this would handle flooding -- I thought you had said from 100 years, almost up to a 500-year spectrum.

MR. PIETROWSKY: It depends on the location, because the topography of the central basin is not a constant flat area. There are some areas that are higher in the central basin that would get protection that aren't flooded as much now, that would get higher protection than the 100 year. Minimum would be the 100-year flood protection in the central basin.

ASSEMBLYMAN DUCH: What is the capacity of the other inlet, the second inlet?

MR. PIETROWSKY: The second inlet is designed at a design capacity of, I think, about 12,000 cubic feet per second. The flood peak coming down the main stem Passaic River through the wetlands complex is much less. It's attenuated quite a bit because of all the wetlands, open areas, in that area. In fact, that's the reason behind the importance of the acquisition, the preservation of those wetlands -- the 5350 acres. We don't want to have those acres in any way developed to move up or speed up that flood peak, or increase it; to lower the design integrity of the project in the future.

ASSEMBLYMAN DUCH: At one point in your presentation you also indicated that we would lose about 785 acres of wetlands, but then we are going to add some wetlands, because you showed one slide that showed some areas of wetlands, and then another slide that showed enhanced wetlands.

MR. PIETROWSKY: Yeah. You may even have heard or seen the number bantered around, 906 acres or so. That was the original number in terms of the wetlands impacted by the project. When the report was down in Washington, during its review, there were some changes and the current number is now 785 acres of wetlands.

With those acres, the agreement is to mitigate fully for those wetlands, value for value, mainly through creating new wetlands in conjunction with the levee construction. It also would involve the enhancement of existing wetlands, including some of those that are purchased as part of the preservation of natural storage.

The agreement with the Fish and Wildlife Service is such that a comprehensive wetlands management plan for the entire central Passaic basin would be developed in order to increase the biologic productivity of that whole area, that whole network of wetlands.

ASSEMBLYMAN DUCH: Could you give me a bottom line figure on the number of acres that would be added to wetland protection that are not included now?

MR. PIETROWSKY: The 785 acres is a mitigation, so there is no net increase because of that.

ASSEMBLYMAN DUCH: Right.

MR. PIETROWSKY: The 5350 acres is purchasing what's there now. That's not an increase.

ASSEMBLYMAN DUCH: But it's already protected.

MR. PIETROWSKY: It's already there.

ASSEMBLYMAN DUCH: It's already protected.

MR. PIETROWSKY: Those are lands that are not at this time in public ownership. They are in private ownership. So, ostensibly, in the future, those would be the most vulnerable to development in the future.

ASSEMBLYMAN DUCH: Is there anything on any of those lands at the present time?

MR. PIETROWSKY: I think the estimate by our biologist is that about 10% of those wetlands do have some problems in terms of productivity, previous abuses, human abuses, and things of that nature. But, no, they're generally open space wetlands at this point.

ASSEMBLYMAN DUCH: Okay. I need you to explain something to me, and this is from an engineering standpoint. The water is going to drop into the tunnel and travel 13 miles or 20 miles, whichever plan you would propose. How does it come up? Is it pumped up; does it come up naturally from the force of the water?

MR. PIETROWSKY: It's the head difference between the inlets and the outlets. The outlet is at sea level and we're talking about an elevation of 170-plus feet mean sea level in the Wayne area, where the inlet is. So, it's an inverted siphon design, so it will just come up naturally.

ASSEMBLYMAN DUCH: So that the tunnel--

MR. PIETROWSKY: No pumps are needed.

ASSEMBLYMAN DUCH: At the Clifton/Nutley border, the tunnel will be coming out at ground level?

MR. PIETROWSKY: It will be coming from underneath the ground, up to the level right next to the McCarter Highway, the way it's proposed now.

ASSEMBLYMAN DUCH: How far is it going to come from underneath the ground?

MR. PIETROWSKY: I think it's about 135 feet at that location.

ASSEMBLYMAN DUCH: But it is going to drop, go down the tunnel, and then come up?

MR. PIETROWSKY: That's correct. That's correct.

ASSEMBLYMAN DUCH: Okay.

MR. PIETROWSKY: The pumps provided for the project are for pumping out the water from the tunnel after flood events, to get the tunnel dry so it can be inspected, and also for maintenance purposes. So there are pumps, but the pumps are not needed for the operation of the tunnel. It's the head differential between the inlets and the outlet that enable the tunnel to function.

ASSEMBLYMAN DUCH: In order to construct the tunnel, let's say you start boring. Will the material all be removed from the end where you start, or will there be shafts sunk and the material taken out of shafts every mile, or--

MR. PIETROWSKY: No, the way it's proposed now there'd be two headings for the current tunnel -- the 13-and-a-half mile tunnel -- initially two headings with the tunnel boring machines. One heading at the lower end where the material will be removed on the Passaic River, probably by barge. The other heading, resulting material being evacuated by the quarry we showed -- the slide, up near Montclair State College.

So, there would be two locations initially where the material would be evacuated, and the transportation to remove that material is very important to minimize disruption to those areas.

That's why the location of all those large quarries in the Montclair area are very important, because material can be stockpiled very easily without any disruption to any local neighborhoods.

ASSEMBLYMAN DUCH: Okay. For the 13-and-a-half mile project, I'm assuming that you computed how much material will be taken out, and you've also computed how much you can put where?

MR. PIETROWSKY: Yes.

ASSEMBLYMAN DUCH: And you feel that you have a capacity to dispose of all this material?

MR. PIETROWSKY: There's no question about that. In fact, a contingency in the estimate is that there has been no decrease in the cost as to the salvage value of the material.

When the report was down in Washington the engineers reviewing it noted that potentially \$50 million to \$65 million of savings could be realized because of the value of that material.

Most of the quarries in this area have been played out. In fact, believe it or not, material is sometimes imported from overseas, from as far as Scotland for projects in this area.

So this material could easily be stored in those quarries up in that area, and in fact, it could be quite valuable, potentially reducing the cost of the project, and this is, in fact, the basis for discussions we've had previously with DEP and with the previous Governor's administration in terms of that potentiality.

ASSEMBLYMAN DUCH: Let's say I own a home in Clifton, and you're going to put the tunnel under my home. Am I going to be notified, and will you be required to purchase an easement, or is it just an automatic-- Are you just allowed to do this, or what is the proposal and how do we deal with that?

MR. PIETROWSKY: Well, the way the project would work is that the State of New Jersey as the sponsor would be providing all lands, easements, and rights of way. That would include a right of way, an easement -- subsurface easement -- under people's properties for the tunnel. So, you're talking about negotiating an easement for about 125 feet or so under the ground at certain locations, yes.

ASSEMBLYMAN DUCH: Now, your figures for the cost of completing the tunnel, that takes into account the cost to the State of New Jersey in negotiating those easements?

MR. PIETROWSKY: Yes.

ASSEMBLYMAN DUCH: It does?

MR. PIETROWSKY: We have a lot of experience-- I showed you a picture of the Park River Tunnel in Hartford. The Corps is currently constructing the San Antonio Flood Control Project down in San Antonio, Texas. We've looked at other tunnels across the country, and we have reasonable estimates in terms of the amount of work that it takes and how much it costs.

ASSEMBLYMAN DUCH: Let's say the tunnel is built. What is the cost sharing formula, or who will be responsible for paying the costs of maintaining the tunnel, under your proposal?

MR. PIETROWSKY: Well, the way the Federal cost sharing rules work for this kind of project, the nonfederal sponsor would be-- The project, upon completion -- construction completion -- the project would be turned over to the State of New Jersey, the nonfederal sponsor. The State would be operating the project at that point.

ASSEMBLYMAN DUCH: Let me tell you what my concern is. Let's say, for example, I live in the City of Garfield -- okay? -- and the City of Garfield gets no direct benefit from the construction of the tunnel in either way. There's really no benefit to it.

MR. PIETROWSKY: Well, there is flood protection provided to Garfield, but I recognize the severity of Garfield's flood problem is not the same as Wayne's or Lincoln Park's.

ASSEMBLYMAN DUCH: But, in the plan you showed us, you talked about the levees going up to Wallington, not up to Garfield.

MR. PIETROWSKY: No, but the tunnel diversion, the tunneling diverting the water from going around through Paterson down to Garfield, does protect Garfield as one of the municipalities.

ASSEMBLYMAN DUCH: But, in your 1984 flood, which is one of your major floods that you are talking about, I was the Mayor of Garfield. I had water on River Road, so I put sandbags on River Road. I mean, that was the extent of my flooding problem in 1984. Maybe I was lucky, but that was the extent of my flooding problem. So my question is, do I or do the people in the City of Garfield -- a town where the benefits are questionable -- are those people going to be forced to share in the cost of maintaining the tunnel, as an example?

MR. PIETROWSKY: That's a decision the State of New Jersey will have to make. That's not--

ASSEMBLYMAN DUCH: You have nothing to do with to do with that? You have no recommendations regarding that?

MR. PIETROWSKY: No. We have an agreement at this time, with the previous administration; an endorsement by the Governor. We have a sponsor of the project. The mechanism by which the State decides to allocate the nonfederal share of the cost is up to the State to decide. That's within the control of the State of New Jersey.

ASSEMBLYMAN DUCH: Okay.

MR. PIETROWSKY: I would presume it's a regional project with regional benefits involving many communities. The previous communications that we've had with the State, they've done some studies. They were leaning towards some kind of authority or entity of a regional nature, not burdening each of the municipalities, but I think that's something that has to be taken up with the DEP and within the State itself.

ASSEMBLYMAN DUCH: Yeah. I'm a little concerned about authorities. Our history in the State of New Jersey with authorities has not been very good.

Let's go back to the outlet, all right? There is a potential to have 40,000 cubic feet of water per second coming out of the outlet, correct?

MR. PIETROWSKY: About 28,000 cubic feet per second from the outlet, but of course, there's other water coming down the Passaic River, too, so when you combine it all you're up around 40,000.

ASSEMBLYMAN DUCH: No. The reason I combine it and tell me if I'm wrong: I'm combining it because the Pompton River, I'm going to get 28,000 falling in there, potentially--

MR. PIETROWSKY: Right.

ASSEMBLYMAN DUCH: --and from the Passaic River I'm going to have 12,000.

MR. PIETROWSKY: That's correct.

ASSEMBLYMAN DUCH: That gives me 40,000 cubic feet of water per second coming out of the tunnel. Possible or not?

MR. PIETROWSKY: Not really possible. The 12,000 coming from the Passaic comes into the tunnel at a different time. The advantage of the tunnel is that the water coming into the Pompton inlet results from the relatively rapid peaking of the mountainous areas of the highland area. That peak occurs about 30 hours after a storm.

The peak on the Passaic River, which is greatly attenuated and reduced, occurs two or three days later to 12,000 CFS. So that, by the time the water, the 12,000 CFS is coming into the tunnel in the Passaic River, you're not getting 28,000 -- anywhere near the 28,000 on the Pompton.

The total will always be about 28,000.

ASSEMBLYMAN DUCH: About 28,000 cubic feet of water per second?

MR. PIETROWSKY: Right.

ASSEMBLYMAN DUCH: All right. Let's take that as the figure. And this water is going to come out, and you explained how it's going to be dispersed in a way that the velocity of the water will be lessened by virtue of this movement of water from the ground to the surface.

MR. PIETROWSKY: And you have a concrete energy dissipating structure, like the one I showed you up in Park River, that's correct.

ASSEMBLYMAN DUCH: Okay. Now, the water comes into this area of the river, which is rather narrow. Okay, I do represent one side of the river, Senator Bubba represents the other side, but the river is rather narrow. So therefore, because of the quantity of water, you propose a levee system not only that goes downstream, but upstream as well?

MR. PIETROWSKY: Yes. That's correct.

ASSEMBLYMAN DUCH: Okay. And you mentioned something about four feet, approximately four feet of water? Now, my question is, if it would raise the river four feet above flood stage -- or four feet above whatever, average flow-- That's one question: Is it flood stage, or average flow?

The next question would obviously be, if it's flood stage, then I have a concern that if it's four feet above flood stage, then I'm probably going to need to build some walls in Garfield?

Now, I'd like you to address both of those issues.

MR. PIETROWSKY: Well, at the location of the outlet itself, now you're talking only for the design flood, the 100-year flood. That's where you're talking about the four foot increase at the outlet itself. Of course, for a ten-year flood or smaller flood it's much less. For a 50-year flood it's less, but the maximum increase is four feet for the 100-year design flood at the outlet.

That's a localized effect, and it diminishes as you go both upstream and downstream. It diminishes as you go upstream because it's tail water, it's backwater upstream, and downstream you have increasing channel capacity as the river flows to Newark Bay. So, by the time you get to the border of Wallington and Garfield, the increase is zero. So, that's where you get the average foot-and-a-half over that six-mile reach between the upper end of Wallington all the way down to North Arlington.

ASSEMBLYMAN DUCH: So you don't feel there would be any impact from Wallington and Garfield and that area, up to the Dundee Dam?

MR. PIETROWSKY: No. From the area from the beginning of Garfield up to the Dundee Dam you start to be getting some flood reduction because, certainly, the area upstream of the Dundee Dam you start to get much more significant flood

reduction because the tunnel itself is diverting water away from that bend, through Paterson, down past Fair Lawn and Elmwood Park, down to Garfield.

ASSEMBLYMAN DUCH: What is the impact of the backup of the water on those storm drainage systems that might drain into the river?

MR. PIETROWSKY: The storm drains would have to be incorporated, modified as part of the levee design, with pumping stations exclusively in that area. We tend to design levees within the ponding areas which would store the storm runoff from local streets or pumping stations. Because of the urban nature of that area there, we've called for pumping stations exclusively in that area. So the runoff, running off within the towns would be used in conjunction with pumping stations that would pump the water through the dikes, through the levees on the banks of the river.

In a sense, you would no longer have water backing up from the river into the storm drains. You would have a pump to force the water out from the town into the river.

ASSEMBLYMAN DUCH: So, the storm drains then would no longer flow-- They'd have to flow to a pump station, and then be pumped in?

MR. PIETROWSKY: They would flow through improved pipes with a pump station to get them into the river, that's correct.

ASSEMBLYMAN DUCH: How many pieces of property would have to be taken from Wallington down to the Newark Bay on the easterly side of the river in order for you to build this levee system? If you have an estimate, that's fine, but I'm just curious as to what kind of property taking are we talking about?

MR. PIETROWSKY: Gee, I don't have a number offhand. We could submit that for the record for you. It's basically a levee structure. It has one on two-and-a-half side slopes. So, for an eight-foot high levee, you're talking an eight-foot

width on top and then another 20 feet on either side in terms of banks, so you're talking potentially 48 to 50 feet in width.

ASSEMBLYMAN ROONEY: Well, you've wiped out River Road in Garfield then.

MR. PIETROWSKY: So, you're talking about a 50-foot wide earthen, grass structure, with a macadam top, where there's room. Where there's no room for that, then floodwalls would be proposed, and floodwalls would take two or three feet. It's nowhere near the same width.

But, aesthetically, certainly the levees are preferred, from the aesthetic standpoint.

ASSEMBLYMAN DUCH: My concern is, for example, Rutherford, the Borough of Rutherford. There are condominium developments along the river, some that have nice walking paths, etc. There are homes along the river. In fact, there is one home where the gentleman has a plane, a seaplane on the Passaic River.

MR. PIETROWSKY: Yes, yes.

ASSEMBLYMAN DUCH: I would look at that and say obviously, based on this plan, all of those homes would have to be taken. I would like to know what the total taking would be on the easterly side of the river, and what kind of compensation are we talking about for the towns?

For example, if we're saying, okay, we don't want to take the land in the upper Passaic River Basin, because we don't want to move anybody and we don't want to relocate anybody, we don't want to force anybody out of their house, yet we're going to do that in the lower Passaic River Basin, so my--

MR. PIETROWSKY: No homes are taken. Even in Rutherford, I'm not going to minimize the impact of the recommended plan in Rutherford--

ASSEMBLYMAN DUCH: There's no homes taken?

MR. PIETROWSKY: No homes are taken--

ASSEMBLYMAN DUCH: None?

MR. PIETROWSKY: --but there are floodwalls proposed with bulkheading in the backyards of those homes. Floodwalls are only about two feet thick, so there's room for the floodwalls.

It certainly would be a change in the aesthetic nature of those people's properties. There would, of course, be openings -- gated openings -- to provide access to those homeowners who still wanted access to the river, like the individual you indicated. But, of course, maintenance is associated with those gated openings. They would have to then be maintained by the State to make sure they would be closed during flood events.

ASSEMBLYMAN DUCH: Sure. Okay, so you're going--

MR. PIETROWSKY: There are no homes taken, but there is property taken. We can get the acreage for you in terms of the--

ASSEMBLYMAN DUCH: It's property, but all those homes, all those condominiums, right down to Newark Bay, you're telling me that no one's home property -- well, not property -- home or business, will be taken?

MR. PIETROWSKY: Not in total. It would just be property taken from those individuals. In some places I notice-- There's a junkyard in Garfield, where some of the junk--

ASSEMBLYMAN DUCH: You could take that.

MR. PIETROWSKY: --not in Garfield, in North Arlington, right up to the edge of the stream. There would have to be some impact on the business, at that point, to get the property for the floodwall, but we're not taking enough property to justify taking the entire business.

ASSEMBLYMAN DUCH: How long do you anticipate this project to take? Let's say all approvals were in place.

Funding was in place. From that point on, how long would it take to build the 13-and-a-half mile, and then of course, to build the 20-mile?

MR. PIETROWSKY: Well, you have to recognize that we're at a point now where we don't have an authorized project yet. So, at this point, Congress is just providing us funds to continue the design. The design would go on if the project is authorized, for another four or five years.

The earliest construction would begin is 1996. So, in that sense we're in a position where we have a lot of hurdles, including the ultimately signing of the local cooperation agreement with the State of New Jersey. At that point, five or six years from now, the State would then have to start making moneys available for the lands, easements, and rights of way.

The construction period is estimated for the recommended plan to be between 1996 and the year 2004. It's an eight-year construction period. So, we're talking about another five or six years of design and eight years of construction.

Of course, the construction would be phased. Pieces of the project could come on-line and start producing benefits well before the overall project is completed. But, on the other hand, the commitment for the State of New Jersey in terms of financial outlays would be spread over that eight-year period, also. It would not commence until 1996 and it would not be due all in one lump sum. It would be gradual over that construction period.

ASSEMBLYMAN DUCH: How many people are involved in your section, the Passaic Tunnel Section of the U.S. Army Corps-- What is the proper title, and how many people are involved in this project at this time?

MR. PIETROWSKY: We're the Passaic River Office, the Passaic River Division of the New York District, Corps of Engineers. We have about 15 people right now working on the project.

ASSEMBLYMAN DUCH: And you would work with who in the State of New Jersey, if the tunnel project were approved?

MR. PIETROWSKY: We have worked historically with the New Jersey Department of Environmental Protection.

ASSEMBLYMAN DUCH: Has there been any expression that there would be a need to create a division within the Department to deal with all of these-- You know, you have said a number of times that the State of New Jersey would be responsible for this and responsible for that. Do you have any idea or projection of how many people we would need to commit from the State of New Jersey to this project?

MR. PIETROWSKY: We have coordinated with the State about what the requirements would be from the Federal perspective for the design. And I understand that the staff of DEP has also proposed a small organization -- I think they're talking about four or five people -- to handle the State's end of the work, the DEP's end. Plus, I think the State had, I think, four people working during our planning phase on the project, also.

That's the major State commitment over the next five or six years in the sense that there's a lot of work the State can do up front to minimize their ultimate financial outlays on the project, by working with the Federal government, and certainly working with their Congressional delegation. That will be taking staff time of DEP to do that.

ASSEMBLYMAN DUCH: All right. Colonel, you addressed a question before, the issue of the cost to benefit ratio. My question is, isn't the cost to benefit ratio of the Newark Bay alternative-- I have down that it's estimated to be 1.1, and that by statute the Corps is required to only execute projects that will produce at least a 1.5 cost to benefit ratio.

MR. PIETROWSKY: That's not true. By statute, 1.1 is the requirement.

ASSEMBLYMAN DUCH: All right, and this--

MR. PIETROWSKY: The reason we recommended the plan we did was twofold. The State selected it, number one, and it also had the highest B/C ratio, 1.5.

The Newark Bay alternative does not have as high a B/C ratio, but it is justified economically, and therefore meets the requirements for both the administration and the Congress to consider authorizing it.

ASSEMBLYMAN DUCH: Okay. For the record, again. The ratio for the Clifton/Nutley outfall tunnel would be what?

MR. PIETROWSKY: One point five.

ASSEMBLYMAN DUCH: Okay. And for the Newark Bay alternative?

MR. PIETROWSKY: One point one.

ASSEMBLYMAN DUCH: Okay. Does the tunnel in any way fit into the State Master Plan, or has it been discussed and made a part of, or considered at all? Any impact on the State Master Plan?

MR. PIETROWSKY: To the extent to which we've coordinated with DEP on the future land use, the population projections for all of the municipalities in the Passaic Basin, State Master Plan assumptions have been incorporated into that model of the future. It is compatible.

ASSEMBLYMAN DUCH: All right. At this time, Assemblyman John Rooney has been waiting patiently, so Assemblyman, we're going to recognize you.

ASSEMBLYMAN ROONEY: Thank you very much. Just going back to the basic question: I know the tunnel's been explored through many, many hearings and whatever, but has the Corps looked at the possibility of containing the water from where it originates, rather than use the tunnel: by the buy out process; by forming reservoirs and retention basins up in that area? Has that been studied by the Corps? Can we get copies of whatever the findings were?

MR. PIETROWSKY: Yes, you can. Our reports thoroughly document all of the alternatives that we've looked at, including flood detention and buy outs. A buy out to provide a comparable level of protection to the tunnel, 100-year design flood, would cost upwards of \$4 billion. I think Senator Bubba mentioned we stopped counting at \$3 billion. We actually went to \$4 billion before we stopped counting.

ASSEMBLYMAN ROONEY: Well, I'm not interested in buying out the City of Paterson, and yet the City of Paterson has survived the floods for years. I don't think there's been that much damage. You talk about the 100-year flood. The last one which occurred in 1903 is the one that you are basing some of the information on.

The thing is, I was thinking a huge disruption-- And Assemblyman Duch, who was right on point, asked many of the questions that I had. When you start establishing floodwalls, all of a sudden you're going to wall off portions of our population, in Bergen County particularly, along River Road in Garfield. If you ever put a berm up, I think we would be inside the Cameo, which is one of our favorite places there.

Four to one is what we usually see, on a foundation versus height type ratio. Berms are not going to happen. I think we've all agreed on that in the southern end of the county; northern, yes. In Passaic County you'll see some berms because there are fewer homes up there, particularly because of the flooding.

But we're going to see walls in Bergen County. Personally, I think the floodwalls are going to be very objectionable.

The other question I have is, has there been any alternative to push the water north, up into the Wanaque system? We've got a pipeline that goes over into the Hackensack system to provide more drinking water, because we

always have that problem. We had to put in a pipeline about ten years ago to protect us against droughts.

There is an existing pipeline from Wanaque over to the Hackensack system. Is there any way to move the water north, up there, because I know there's a whole system of reservoirs and basins, and just water retention areas in that area. It might alleviate the problem. Let's look north instead of looking south. Have you looked at that possibility?

MR. PIETROWSKY: I think the existing pipelines are much too small. I think we're talking in the order of magnitude of several hundred cubic feet per second, as opposed to the 28,000 cubic feet per second we're talking about for the tunnel.

ASSEMBLYMAN ROONEY: Well, into the Wanaque system though, and also the Monk's Reservoir right now. If you're looking at building pipes south, why not look at building them north, or north and I guess east to go into that Monk system and also the Wanaque system? Has that possibility been explored?

You have a total reservoir system up there, that we could use the water.

MR. PIETROWSKY: Unfortunately, those reservoirs are not flood control reservoirs. They are water supply reservoirs which are-- The purpose is to keep them as full as possible for the water supplies for northern New Jersey.

The way flood control would work, those reservoirs would have to be empty and remain empty to be available for the threat of flooding, so that the water could then fill the reservoirs if there was a flood. In that sense, the flood control purpose is counter to the water supply purpose, not really compatible.

ASSEMBLYMAN ROONEY: But what bothers me is the fact that we had water problems in northern New Jersey, particularly in my area up in Hackensack system. Couldn't we create new

reservoirs up in that end of the county that is less populated, rather than try to build a tunnel through the most populated area of our State?

Try moving north. Put in another reservoir system. Push the water up there so we have a little bit better system.

MR. PIETROWSKY: We haven't been able to work with the State of New Jersey to identify any areas that remain that would sustain a new development of a reservoir at this point. I think Monkskill was the last remaining site that is available. That's the problem.

ASSEMBLYMAN ROONEY: I'd like to see the figures on the buy outs and--

MR. PIETROWSKY: Sure.

ASSEMBLYMAN ROONEY: --not based on a 100-year flood, because--

MR. PIETROWSKY: We looked at floods ranging from the 100 down to the 50, to the 10-year, and then only the most severe structures in the 10-year. The problem is when you start getting to buy outs affecting only a few homes, you are affecting such a small number of the homes and businesses, order of magnitude of 2% or 3%, that the flood threat is not really being measurably reduced, and the potential for catastrophe and loss of life still remains. That's the problem.

ASSEMBLYMAN DUCH: Just as a follow-up to Assemblyman Rooney's request, any figures you have regarding the buy out options of a 10-year, 15-year, 25-year--

MR. PIETROWSKY: Sure.

ASSEMBLYMAN DUCH: --whatever figures you have, we would appreciate your submitting them to the Committee for our review.

MR. PIETROWSKY: Which is not to say that there is not a place for a buy out. I have commended the State, and the Federal Emergency Management Agency have implemented buy outs.

The people who are suffering the most, the chronic flooding areas, it makes sense to get those people out of there as soon as you can because we're talking about a long-term comprehensive solution to solve the flood problem once and for all.

Meanwhile, there are other options that are compatible with the short-term, with that solution. And certainly, the State's buy out has been one of those.

ASSEMBLYMAN DUCH: Okay. Assemblywoman Ogden?

ASSEMBLYWOMAN OGDEN: Thank you. You stated previously that this is going to take, I think probably, 15 years, if everything goes well. When will the flood victims begin to be protected?

MR. PIETROWSKY: That's a hard question to answer, because it depends on what victims, but gradually-- If construction is initiated in 1996, parts of the project would come on-line in terms of the levee construction, 1997, 1998, and certainly the lower leg of the tunnel -- the piece of the tunnel that terminates at either Nutley/Clifton or at Newark Bay with the spur inlet at the Passaic River could be operational within about three-and-a-half years, the year 2000, to provide comprehensive protection to the lower half of the basin.

ASSEMBLYWOMAN OGDEN: And that doesn't deal with the people who are getting the worst flooding now, then? Pequannock, Fairfield, Wayne people. They'll have to wait--

MR. PIETROWSKY: The Pompton Valley, which is the worst area, would need the upper leg of the tunnel constructed, although some areas in Morris County could have levee construction before that to start bringing relief to them.

ASSEMBLYWOMAN OGDEN: Well, we're basically saying that the people who are currently the victims today in 1990 are going to wait for 10 years, possibly 15 years--

MR. PIETROWSKY: That's correct.

ASSEMBLYWOMAN OGDEN: --before they have any protection.

What is currently happening in these communities in terms of land use now? Has all development ceased in the flood prone areas of these towns that are the principal beneficiaries?

MR. PIETROWSKY: That's a tough question for us to answer as Federal officials. We're not really in the land use business.

ASSEMBLYWOMAN OGDEN: Well, you know, we're talking about spending a least a billion dollars, and to currently have the problem exacerbated by improper land use measures and for all of us to eventually -- if this goes through -- have to pay for these people, for them to continue to create the problem.

MR. PIETROWSKY: All I can tell you is that one key element of the plan that the State of New Jersey and the municipalities have agreed to is that with the implementation of the project, and the 100-year flood plain shrinking, local governments it was perceived initially would have the option of then increasing development. What was agreed to was that a local cooperation item was inserted into the project bylaws that would require the existing floodways that exist today, to remain.

So that even with the project, those communities would not be building in the floodways that exist today. So that would minimize the amount--

ASSEMBLYWOMAN OGDEN: But they will be able to develop more, is that what you said?

MR. PIETROWSKY: They would be able to develop less. They would not be able to develop more, even with the project. That measure would preserve about, I think, 6700 acres of wetlands and open space in those communities.

ASSEMBLYWOMAN OGDEN: In terms of the wetlands, I believe you said you were going to buy, what was it, roughly 5000--

MR. PIETROWSKY: Five-thousand-three-hundred-fifty acres of open space, of which about 5200 acres are wetlands.

ASSEMBLYWOMAN OGDEN: And why, when we have a State law to prevent development in the wetlands, is it needed?

MR. PIETROWSKY: If in the future the State of New Jersey wants to take responsibility for preserving those lands either through the existing Fresh Water Wetlands Act or through additional acts, to save the money from buying those lands. That's a possibility.

At this time, our coordination with the State indicates that due to some of the grandfathering and the way the law is structured, it's not certain that those lands will not be developed. Since the integrity of the project and the desire to not worsen the flood problem in the future hinges on those lands, they have remained as a project feature.

ASSEMBLYWOMAN OGDEN: Is that including just the wetlands, or is that including extensive buffers?

MR. PIETROWSKY: It includes some buffer space, too. That's why the total acreage is greater than the wetland acreage.

ASSEMBLYWOMAN OGDEN: In terms of the parklands that have been purchased with Green Acres that I guess are now going to have levees, is this part of your overall budget -- how those are going to be replaced?

MR. PIETROWSKY: They have to be mitigated, that's correct.

ASSEMBLYWOMAN OGDEN: So the people who live in these towns are going to lose the open space, and where is there going to be additional open space, some other towns, or the same ones?

MR. PIETROWSKY: Normally the recreational features thus far have been incorporated into the levee design themselves. So that the open space would be changed, modified, rather than totally eliminated.

ASSEMBLYWOMAN OGDEN: How high are the levees going to be?

MR. PIETROWSKY: They vary. They average about eight feet in height, with gradual side slopes.

ASSEMBLYWOMAN OGDEN: Two feet thick?

MR. PIETROWSKY: That's a floodwall. A floodwall would be about two feet thick. But floodwalls can have cantilevered paths put on them also, so there's ways to have continuous linkage of pocket parks and recreational features. We've included provisions for boat launching ramps, both for recreation and for emergency vehicles. The attempt is there for the recreation to be fully mitigated.

ASSEMBLYWOMAN OGDEN: I don't think it is going to be possible to mitigate the scenic views that residents have of rivers and--

MR. PIETROWSKY: Scenic views will be changed. You'd have to be on top of the levee to see the river, as opposed to being in the park. That's correct.

ASSEMBLYWOMAN OGDEN: In terms of the 117 towns that are going to have to assume the annual maintenance, do you have a list of what those towns are? I know you said earlier that it will be the final decision of the State, but I am assuming you are going to recommend to the State which ones they should be.

MR. PIETROWSKY: We will not recommend to the State how to-- We will provide information to the State, any information they require in terms of, let's say, beneficiaries, or things of that nature in terms of how they decide to allocate the cost, but that's the State's call.

We can certainly provide a list of the 117 towns in the basin.

ASSEMBLYWOMAN OGDEN: And what did you say the annual maintenance was going to be once it was constructed?

MR. PIETROWSKY: \$2.1 million, annually. That, of course, would vary slightly from year to year depending on maintenance of the tunnel and whether or not there is a flood event that year that would require inspection.

ASSEMBLYWOMAN OGDEN: So that's the bottom-- That's a minimum?

MR. PIETROWSKY: That's the average. Some years it would be less, some years slightly more.

ASSEMBLYWOMAN OGDEN: In terms of your discarding the purchase of the structures in the floodway, saying that would cost about \$3 billion, what would it cost -- because there are others who have made estimates that vary with yours -- to buy those that are, for instance, the most flood prone?

MR. PIETROWSKY: Well, there are a variety of plans that we have. We have one plan that includes structures that are in the 10-year floodplain. Again, a comprehensive plan in the 10-year floodplain, not just focusing on five towns, I believe is still over \$1 billion in terms of the number of homes.

The plans that I have seen put forth--

ASSEMBLYWOMAN OGDEN: And what about the 100-year flood?

MR. PIETROWSKY: The 100-year?

ASSEMBLYWOMAN OGDEN: Yes.

MR. PIETROWSKY: You're talking well over \$2 billion, just for the residential properties. You're talking a lot of homes at that point.

ASSEMBLYWOMAN OGDEN: And 50?

MR. PIETROWSKY: We can provide those figures for you.

ASSEMBLYWOMAN OGDEN: The last question I have deals with the whole issue of water supply. You know, this is an area that currently has a deficit -- this general area in terms of groundwater supply -- and hundreds of thousands of people depend upon it. How have you projected that this major change

in land use will not adversely impact on the recharging of our underground aquifers? And what cost benefit ratio have you come up with to provide for an alternate source of water supply, if indeed, we find that the well runs dry?

MR. PIETROWSKY: Now, let me clarify-- Excuse me, what major change in land use are you referring to?

ASSEMBLYWOMAN OGDEN: I'm talking about the levees and the channelization and the fact that water isn't going to spread out the way it has been.

MR. PIETROWSKY: The levees that are proposed in the central basin, I should have mentioned, are not river bank levees. They are not levees along the banks of the river. They are what's known as setback levees. They are not along the stream. They're set back at the fringe of development, adjacent to the residential areas.

So, the only areas that will be prevented of water getting into, will be the areas that are paved now, and are sewered now, with the leveed floodwall structures.

ASSEMBLYWOMAN OGDEN: But how high are these levees going to be? Are these the five foot ones?

MR. PIETROWSKY: Each system varies. They range from five feet to eight feet in that area. So, with the levees being set back from the stream, you're minimizing the impacts on the wetlands, and you're allowing the floodwaters to spread out, and by the State agreeing to not change the floodways, there really isn't any development induced in those areas.

ASSEMBLYWOMAN OGDEN: So you have not taken into account in your cost benefit ratio the possible replacement of our current water supply system?

MR. PIETROWSKY: We don't foresee any-- There's no impact on the existing water supply. The tunnel does not go through the sole source of water supply area, and the operating rules of the tunnel were set in conjunction with the natural resource agencies so that there would be no impact on recharge.

ASSEMBLYMAN DUCH: Thank you, Assemblywoman.  
Assemblyman Jacobson?

ASSEMBLYMAN JACOBSON: Thank you very much, Mr. Chairman. I just have a brief question, but first I just want to commend you again for another hearing. I'm sorry I couldn't get up to the Rutherford one. Chairman Duch, I was just sworn in in January and I'm from Monmouth County, so I'm not as familiar with this project as other legislators and the Chairman has been a steady source of information ever since I got down here, having kept me posted about everything and expressing his interest and concern.

Most of my concerns and questions have been addressed to those matters. However, I just have a brief question about the economic analysis of the cost of the project. I'm sure there is a built-in inflation adjustment for that cost. I'm just curious as to how that worked?

MR. PIETROWSKY: The cost I showed you today, the \$913 million is the cost at today's dollars.

ASSEMBLYMAN JACOBSON: Okay.

MR. PIETROWSKY: So when we talk about cost and benefits, that 1.5 cost benefit ratio, that's based on today's dollars.

I did mention that we have been furnishing information through the President's Office of Management and Budget, with future inflation built in. For that project, the future costs with inflation would be about \$1.2 billion.

ASSEMBLYMAN JACOBSON: Does the Army Corps give an adjustment, or are any studies based on its history of cost overruns for its projects? Is there ever anything like that, because obviously, a lot of times we know of a project that has cost more than expected. Are there any type of studies that have been done that way, or is there any type of adjustment that you can make for that?

COLONEL DANIELSON: Yes. There are studies, numerous studies to try to address that, and the cost estimate for this project is going to be based on the latest estimating techniques that are available.

If fact, this will be the first of the large civil projects to be done on a new cost estimating system that the Corps and the industry has adopted. It has contingency accounts built into it and as the design progresses into the outer years and construction progresses, those contingency accounts should diminish and keep at a level cap on the cost of the project, except for the inflationary indexes that are added every year.

ASSEMBLYMAN JACOBSON: So you are saying that this project, the estimates of the value in terms of unforeseen circumstances in cost is a little different than you have done in past projects?

COLONEL DANIELSON: That's correct.

ASSEMBLYMAN JACOBSON: Okay. Because any information that you have on that, I'd be interested in seeing; anything that is written down. Because I assume, obviously, the cost you are giving us is the one you expect it to be, and it should be accurate. I'm just curious about that component -- how you figure it to account for overruns. I'd appreciate if you would forward me any information on that.

Thank you, Mr. Chairman.

ASSEMBLYMAN DUCH: Thank you, Mr. Jacobson.

At this time, I have a number of concluding questions. However, I recognize Assemblyman Martin has appeared in the audience. Assemblyman, if you would like to step forward, if you have some comments-- We do have a statement which was delivered by your legislative aide. Do you have any comments that you would like to add?

What I would like you to do, is to take a seat here so that you will be appropriately recorded.

**A S S E M B L Y M A N R O B E R T J. M A R T I N:** Thank you, Mr. Chairman. Thank you, members of the Committee.

This is an issue that has been very perplexing. It's not been an easy one. I recognize that most of the Committee members, I think, have a philosophical view, even though there may be information provided through these hearings. I know that, and I do appreciate the fact, that you've attempted to further glean specific information from the Army Corps, which I think is important for all of us, and I'm glad that it's being recorded so that we can use that information.

The dollars are significant. It is, to a large extent, an economic issue but more importantly, it's really a question of what to do with a very troublesome problem. Ideally, under the best of all worlds, if we were here 50 years earlier, I would strongly support the concept of no tunnel; that we should use the land in a much more appropriate basis and be able to channel that water in some way that would make it available for drinking water.

The problem for the 26th District -- and unfortunately, I think this has become almost a battle among districts, a battle among municipalities -- is I have been to the area during the '84 flood. I have walked through the areas of Wayne, through the areas of Pequannock. I have been there. I've gone to people's houses where you can see the dirt and the mud stains going up through the living rooms. Houses ruined, neighborhoods destroyed.

I don't know, right now, how you can deal with that without taking that water and removing it and moving it to somewhere which would be safe? I'm concerned about, and I know the people in Nutley, and I know the people in the other communities have a concern, that we would be dumping our problem down into their backyards.

I agree philosophically with Assemblywoman Maureen Ogden that we should hold people accountable for building in

the flood lands. It's stupidity that caused that in the first instance. Nevertheless, what we have are whole communities built in an area which floods. It floods every so many years, so the only way that I can see -- and I haven't seen anything else to show me otherwise to deal with the problem -- is to have a tunnel.

I strongly support, as Congressman Gallo does, taking the tunnel and moving it down to Newark Bay as opposed to having it come up further upstream. I know that's disruptive. I know it's not the most environmentally pristine thing to do. On the other hand, right now, I think it's the best thing to do under the circumstances.

I think it can be done in a safe manner. I think if it's taken to Newark Bay it will resolve many of the fears of the levees and the dikes of the communities upstream. I do believe that's the approach to handle.

I just recall very vividly talking to people who have had to live their lives around rowboats in the middle of the night, taking out children, taking out family members -- living in fear every time it rains in April or May, as it even did this weekend. When it rains for more than a couple of days, there is an inherent danger in that area.

The 100-year flood, God forbid, would flood an area much greater than any kind of buy out that this State is capable of doing.

I don't see any other solution. I don't think the Army Corps, in struggling to-- And I've read the reports that go back to the 1890s dealing with this. I don't see any real alternative of handling the problem once and for all than through some form of a tunnel; ultimately a tunnel that I would like to see be taken to the Newark Bay.

Thank you.

ASSEMBLYMAN DUCH: Thank you, Assemblyman Martin.

Just a couple more questions. We had talked about a \$2 million annual maintenance cost. And that's based on what dollars, when? Because we talked about the extension cost being \$300 million more in October 1989 dollars, \$2.1 million--

MR. PIETROWSKY: October 1989.

ASSEMBLYMAN DUCH: --as of October 1989. What maintenance is involved with the tunnel?

E. R A Y M O N D B O C: Maintenance of the tunnel basically involves periodically pumping out the lower segment of the tunnel to open it up so that you can walk through it and inspect to see the condition of the tunnel. This would occur five years after the implementation of the project or after any major flood, then every ten years thereafter.

It would also mean periodic operation of the inlet structure gates to assure that they are in operational order, mowing the grounds around these areas, normal housekeeping chores. Also inspection of gates -- closure structure gates -- to make sure they are operational, periodically. I guess that's about it.

ASSEMBLYMAN DUCH: All right. You just talked about the pumping out of the tunnel. My impression was that after each storm, the tunnel would be completely pumped out.

MR. PIETROWSKY: That's correct.

MR. BOC: I'm sorry. That's the option. That's the way it's to be operated now. We're pumping it out after each event, and it will be maintained in the dry state.

ASSEMBLYMAN DUCH: Okay. Do you have any estimate as to any kind of a silt build-up or a material build-up in the tunnel, or is this engineered in such a way that there's going to be very little build-up? Let's say a typical -- take a 50-year storm. What would happen?

MR. PIETROWSKY: Generally the way the tunnel is designed, the water coming into the tunnel, at the Pompton inlet, let's say, is arriving through the modified channels of

the Pequannock, Wanaque, and Ramapo Rivers, which would be stabilized through those reaches, and the river would not be picking up a lot of silt and debris at that point.

The modification of the channels go upstream virtually to Pompton Lakes Dam, Pompton Lake, and Wanaque Reservoir. By and large, those structures already act as sediment traps, and in conjunction with a sediment trap constructed in conjunction with the outlet inlet itself, it's not expected that sedimentation is going to be a big problem. In fact, the water should be very clean in the tunnel; much more clean than the water spilling out of the banks and picking all sorts of debris during flood events now.

We have worked with experts across the nation in terms of looking at the maintenance of the tunnel in terms of the sediment that does get into the tunnel and keeping the tunnel vital in terms of making sure the sediments are moved after each flood event.

That's what Ray alluded to in terms of including into the estimate of the cost of the tunnel.

ASSEMBLYMAN DUCH: How would you get into the tunnel to maintain it? For example, let's say there was a sediment problem, and we have to bring a truck or a bulldozer or something into the tunnel to remove this sediment. Is there an elevator system, or--

MR. BOC: Okay. We have mentioned some work shafts, Montclair, and also at the outlet area. Once the tunnel is evacuated, you would have a crane that would drop whatever was needed, a small truck or whatever, to the tunnel invert, and that truck could move into the tunnel, after, of course, checking to make sure that everything was okay by other means. With a small backhoe or whatever, remove whatever materials would be necessary, put in a truck, bring it back to the crane and then lift this material out of the tunnel and put it on another truck, and cart it away.

So, there are certain work shafts that would be maintained permanently, and this would take up probably less than an acre of land in those areas.

ASSEMBLYMAN DUCH: Okay. I want to go back to the portion of the river between the Dundee Dam and the Newark Bay, which is an intertidal, or tidal zone of the river. What is the impact on the ecosystem of that intertidal area of the construction of this tunnel?

MR. PIETROWSKY: Well, I think the greatest impact identified in the environmental impact statement in coordination with the natural resource agencies is at the outlet site itself as proposed, in Nutley and Clifton. The actual construction of that structure which would impact on some anadromous fish habitat.

What's been proposed is to create additional anadromous fish habitat actually further upstream. Downstream of Dundee Dam there is sort of a rapids area, to extend that, because that's preferred by the anadromous fish for spawning, and to expand that area. In fact, I think it's more than acre for acre. I think we're going to two to one, I think, for the creation of that habitat. That's been developed in conjunction with the U.S. Fish and Wildlife Service.

So that the actual construction of the outlet is-- The biggest impact would be on the aquatic habitat at that location.

ASSEMBLYMAN DUCH: When the tunnel will be in use, will there ever be a time when the bridges in the lower Passaic River Basin would have to be closed?

MR. PIETROWSKY: Well, I'll let Ray expand upon that. But I've seen concerns about that and one thing you have to remember is that we talked about the four-foot increase at the outlet and the one-and-a-half foot increase through that six-mile reach. That's for the maximum flood event -- the 100-year flood event. The other more frequent flood events are

much smaller. It would take a flood event exceeding a 20-year event in that area to have to start closing any of those bridges. So that means once in 20 years you might have to close a gate, that a bridge might be closed.

In those instances, when you start to get flooding that significant, the approach roads to the bridges which are generally lower than the bridge, start to flood anyway.

You're a little more familiar about what bridges, specifically?

MR. BOC: Specifically, the Harrison Bridge has a low approach and would flood under such conditions from tidal flooding, but with the levee structures in place the bridge would not have to be closed because the levee would cut off the water from coming around to the intersection on the Harrison side. In effect, that bridge would be closed less frequently because of flooding, because of the presence of the levee system.

But as Bob pointed out, most of the other bridge systems further upstream, particularly in the reach between the Second River and Wallington, the frequency is 20 to 25 years for one bridge, and then the rest are in the 40- to 50-year flood range, with some only closed for freeboard purposes, which is the factor of safety on top of the design flood.

So, they would very infrequent--

MR. PIETROWSKY: To answer your question, they would close under those circumstances. We can, if you want, give you a list of each bridge.

ASSEMBLYMAN DUCH: Do you have a projection as to when that--

MR. PIETROWSKY: Yeah, and at what elevation it would have to close. If that would be helpful to you, we can provide that for you.

ASSEMBLYMAN DUCH: I would appreciate that.

The way this process works, if I understand it right, is that the State of New Jersey asked you, in effect, to undertake this study and to come up with these alternatives. If the State of New Jersey were to reject the tunnel plan, what happens?

MR. PIETROWSKY: We would go on to build other projects across the nation. The State of New Jersey is our client in a sense, so--

ASSEMBLYMAN DUCH: Okay.

MR. PIETROWSKY: The State of New Jersey is facing, through the Governor's administration and through the Congressional delegation representing the people, the decision about what kind of flood control, if any, they want, in the Passaic Basin.

ASSEMBLYMAN DUCH: All right. Are you involved in any way with the Saddle River Channelization Project?

MR. PIETROWSKY: Yes, we are. That's another-- That's a related project that was in the Passaic Basin that was actually already authorized for implementation in the Water Resources Act of 1986.

ASSEMBLYMAN DUCH: What impact does that project have on this project? Because if the Saddle River is channelized and water is going to flow through the Saddle River quicker, obviously it will arrive in the Passaic River Basin quicker, and it would impact on -- if that's going to be rushing down from the north-- And the other water will be coming out further south, correct?

MR. PIETROWSKY: Yeah. The Saddle River, I believe, enters from the Bergen County side between Wallington and Garfield.

ASSEMBLYMAN DUCH: Correct.

MR. PIETROWSKY: That project is aimed at primarily protecting flood areas upstream from Garfield and Wallington; Lodi, Saddle Brook, up to Paramus.

That project is a \$45 million project that was authorized in the Water Resources Act of 1986 and is independent from the main stem project. It can be implemented separate from the tunnel project. It wouldn't need the tunnel project for it to function. It's, basically, increasing the channel capacity of the Saddle River, up through those areas, up through Lodi and Saddle Brook.

ASSEMBLYMAN DUCH: My question is though, wouldn't it cause the water from the Saddle River to rush into the Passaic River quicker, and would there be any backlash into the Garfield and Wallington area, Clifton, Passaic?

MR. PIETROWSKY: No. The timing of the floods in the Saddle River and the Passaic River are such that the Saddle River peaks much earlier. It's a much more urban area. Certainly within 12 hours or so.

We're talking about days for the Passaic River to peak, so there's no harm or impact on Garfield or Wallington due to that project.

ASSEMBLYMAN DUCH: Is there any analysis or conclusion in your studies that show that?

MR. PIETROWSKY: Yeah. We have separate reports that we can furnish you.

ASSEMBLYMAN DUCH: I would appreciate those reports.

MR. PIETROWSKY: Sure.

ASSEMBLYMAN DUCH: Members of the Committee, any other questions?

ASSEMBLYWOMAN OGDEN: Just one question here, Mr. Chairman. In terms of the cost benefit ratio, I think you said it went to 1.1 with the addition of the Newark Bay extension. Have you factored into account in your total benefit ratio, the interest and the inflation? We're talking about going out over at least 15 years at this point.

MR. PIETROWSKY: Yes. That's correct.

ASSEMBLYWOMAN OGDEN: That still places you at or above one? It doesn't put you below one?

COLONEL DANIELSON: That's correct. When you add inflation, you add the factors to the benefit and to the cost side.

ASSEMBLYWOMAN OGDEN: And what about interest?

MR. PIETROWSKY: Yeah. There's something called interest during construction. From the period of now and during the next 15 years there's also included in both project costs. That's included.

ASSEMBLYWOMAN OGDEN: And what interest rate and what inflation rate are you projecting?

MR. PIETROWSKY: We used the interest rate prescribed by the Federal government and the Office of Management and Budget. I think it's eight-and-seven-eighths, right now. It's the long-term bond rate to the government

ASSEMBLYWOMAN OGDEN: So it's geared to like a 30-year treasury bond?

MR. PIETROWSKY: Exactly.

ASSEMBLYWOMAN OGDEN: And inflation?

MR. PIETROWSKY: Inflation, the same thing. The OMB rates, I think is 4% right now, but remember, the numbers that we showed you today, the 913, doesn't include the inflation. When you add the inflation, that's when you get to about \$1.2 billion for the recommended plan. That's not a cost I showed you today on the slides. We were talking October 1989 dollars initially.

So there are two separate things in terms of the inflation versus the interest.

ASSEMBLYWOMAN OGDEN: Because 4% inflation, in recent years, is really quite low. In 1980 we had double digit.

MR. PIETROWSKY: I can only assume the administration has its reasons for selecting that rate, at this point.

ASSEMBLYWOMAN OGDEN: Well, that's because it's the current one.

ASSEMBLYMAN ROONEY: That's only private industry. That doesn't apply to public funding.

ASSEMBLYMAN DUCH: Any other questions from members of the Committee? (no response)

All right. At this time I would have just a couple of comments, and they are as follows:

I appreciate the fact that the Army Corps of Engineers came down today to address the concerns of the members of this Committee regarding this particular project. This is a project that has most of us in the Legislature concerned. We are obviously concerned about flooding, but we are also concerned about the protection of our people and the best method of protecting our people.

We have requested certain information today, and I would ask that the Army Corps of Engineers arrange to provide that information to us within the next couple of weeks. I would like to see it within 14 days or so.

MR. PIETROWSKY: Sure.

ASSEMBLYMAN DUCH: Any difficulties with that?

MR. PIETROWSKY: No.

ASSEMBLYMAN DUCH: Okay. I would ask that enough copies be made available so that each member of the Committee can have them. There are five Committee members, I would say eight to ten copies would be appropriate.

The members of this Committee will, at some future date, take up consideration of over 29 bills that have been filed concerning the Passaic River Tunnel Project. Some are buy out bills. Some are bills for the creation of a tunnel authority, and some are bills, obviously, for the funding of the construction of the tunnel. So there are numerous issues that the members of this Committee will be forced to face.

We have requested information regarding your buy out figures. That information is important to some of us. Some of us feel that a buy out, perhaps, is the way to go. Obviously, there are other people in the Legislature who feel that a buy out is not the way to go, and that this construction should take place, so, the information you provide us, will certainly help us in making a better and more informed decision.

I want to thank you for taking the time to come, and I would like to thank the members of the public who have shown up today to express their interest, both pro and con. I see the "Yes" stickers, and I also see the "Stop the Flood Tunnel" stickers, and certainly, your presence here is welcome. I'm sure that it has been a learning experience for you as well.

Again, there will be a future meeting of this Committee at which members of the public will be given an opportunity to speak and address the issues again. Many of those bills will be up for consideration at that time.

Thank you very much everyone, and have a good day. The hearing is adjourned.

COLONEL DANIELSON: Mr. Chairman, I'd like to thank you and the members of the Committee for giving us the opportunity to present the project to you today. Thank you very much.

ASSEMBLYMAN DUCH: Thank you, Colonel.

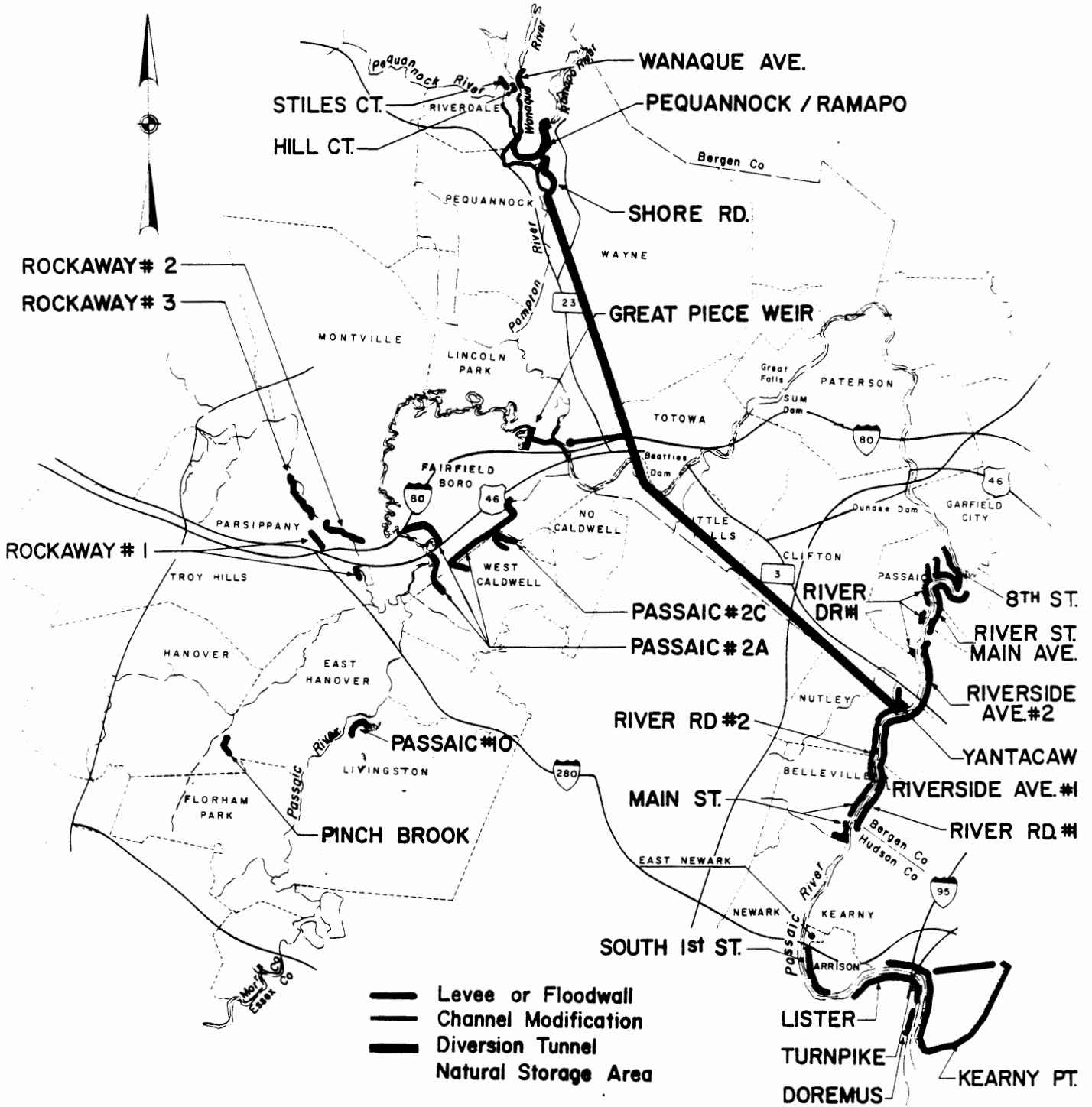
**(MEETING CONCLUDED)**

**APPENDIX**



# RECOMMENDED PLAN

POMPTON RIVER/PASSAIC RIVER  
DUAL INLET TUNNEL



1x

## PASSAIC RIVER FLOOD PROTECTION PROJECT

The U.S. Army Corps of Engineers recommends the Passaic River Flood Protection Project to control flooding in the Passaic River Basin, a 935 square mile area that has been subjected to serious flooding since Colonial times. Portions of eight New Jersey counties -- Bergen, Essex, Hudson, Morris, Passaic, Somerset, Sussex, and Union -- and parts of Rockland and Orange counties in New York are in the basin. There are 117 New Jersey municipalities and 15 New York municipalities.

The Passaic River Basin's severe flooding problem results from its location in the East Coast storm belt and the heavy residential and industrial development in a terrain studded with lakes and rivers -- principally the Pompton, Pequannock, Wanaque, Ramapo, Mahwah, Saddle, Whippany, and Rockaway rivers.

The basin's critical flood problem areas hold about 30,000 structures, which sustain about \$100 million in damage a year. If the 1903 flood (the flood of record) were to occur in this area under current development conditions, an estimated \$1.9 billion (in October 1989 dollars) in flood damages would result.

Parts of the Passaic River Basin have been declared disaster areas in 1968, 1971, 1972, 1973, twice in 1975, and in 1984. Severe localized flooding occurred in November 1977, January 1979, and March-April 1983. The storm of April 5, 1984, caused severe flooding in northern New Jersey, claiming three lives and \$390 million in damages (in October 1989 dollars).

The U.S. Army Corps of Engineers developed flood damage reduction plans for the Passaic Basin in 1939, 1948, 1962, 1969, 1972, and 1973. None were implemented because the public opposed them on economic, environmental, and social grounds.

The Corps then developed the plan for the project, as authorized in the Water Resources Development Act of 1976. On June 28, 1984, the State of New Jersey endorsed the Passaic River Flood Protection Project and in a letter of May 8, 1987, formally announced its intention to act as the project's non-Federal sponsor.

The central feature of the project is a 13.5-mile-long, 39-foot-diameter main tunnel, which will carry flood waters from an inlet at the upper end of the Pompton River down to an outlet on the Passaic River just above its confluence with the Third River. A 1.2-mile-long, 22-foot diameter spur tunnel will convey Central Basin area flood waters from an inlet just below Two Bridges on the Passaic River to an underground connection with the main diversion tunnel.

Some 5.9 miles of channel modifications will be required to direct flows into the inlets, and the diversion tunnels will be augmented by some 37.3 miles of levees and flood walls.

2x

In addition, the project calls for the acquisition of 5,350 acres of natural water storage areas, 5,200 of which are wetlands. Without the project, these lands could conceivably be developed, worsening existing flood problems.

In an agreement with the Corps, the State of New Jersey has promised to continue to protect 6,300 acres that are annually inundated by the river, thus avoiding any secondary development. About 9,500 acres of the Central Basin are already protected as designated parkland. That brings the total of natural storage areas that the Corps is credited with permanently preserving to 21,000 acres.

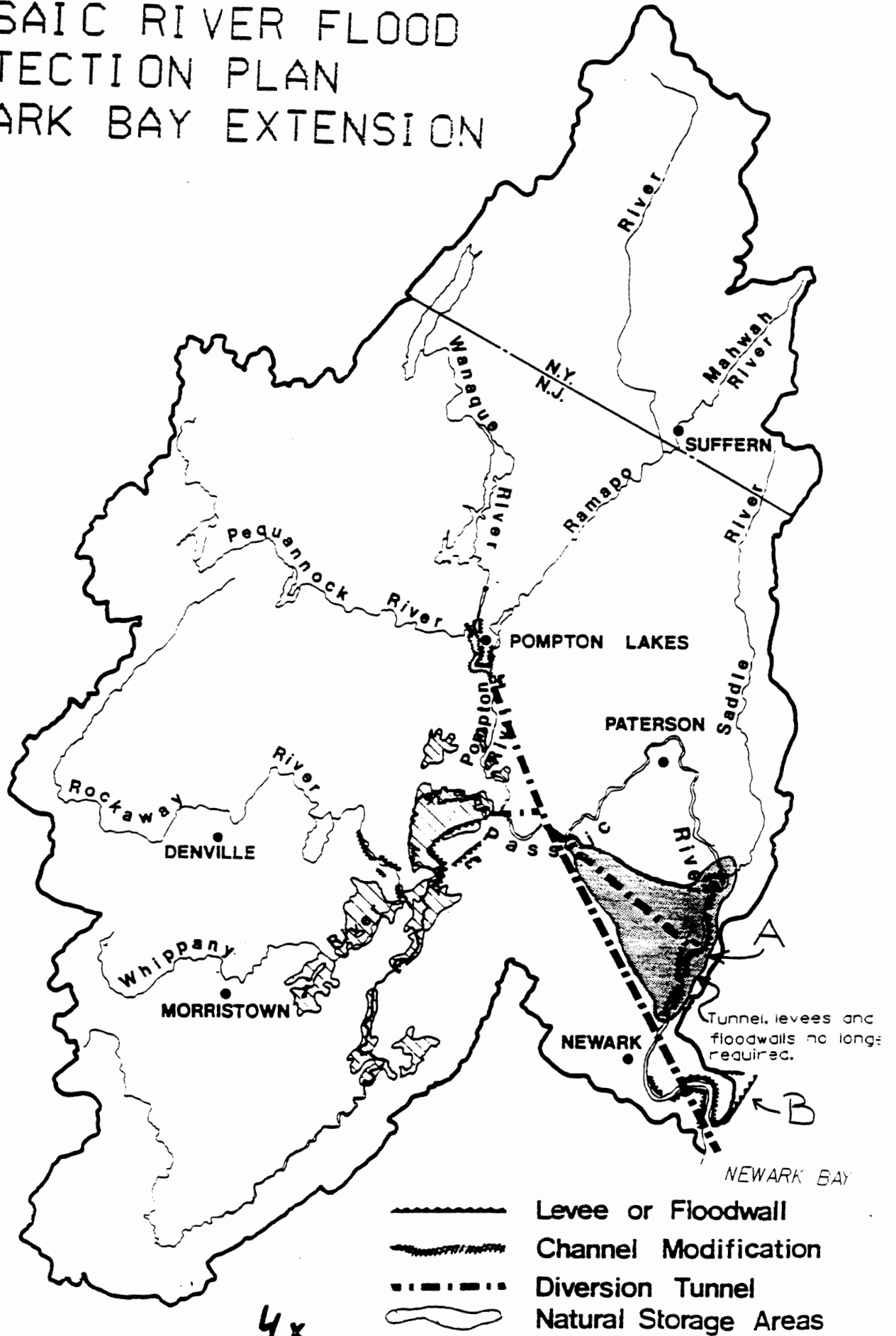
The project will cost \$1.19 billion to build and has a benefit-to-cost ratio of 1.5 to 1. It will provide protection against a 100-year flood, a statistical description describing a very big flood that will occur on average once a century. Specific levee/flood-wall systems would protect against floods up to the 500-year level.

Altogether, the Flood Protection Project includes preservation measures for fish and wildlife and provision for wetlands mitigation. It will provide more greenways and expand the opportunities for recreation along the river. These efforts will be directed and assisted by the U.S. Environmental Protection Agency and the U.S. Fish and Wildlife Service in cooperation with the U.S. Army Corps of Engineers, the State of New Jersey, and local authorities.

CONTACT: Mr. Robert A. Pietrowsky, Chief, Passaic River Division,  
U.S. Army Corps of Engineers  
Telephone: (212) 264-3567.

3x

# PASSAIC RIVER FLOOD PROTECTION PLAN NEWARK BAY EXTENSION



4x

## NEWARK BAY EXTENSION

This map is annotated to highlight changes in the Passaic River flood protection plan should the tunnel be extended to Newark Bay.

The flood protection plan originally selected by the State of New Jersey and recommended by the U.S. Army Corps of Engineers locates the tunnel outlet on the lower Passaic River at the Nutley-Clifton border, and includes nine levee systems along the banks of the lower Passaic River in South Bergen and East Essex counties. These levees, which are shown as area A on the attached map, total 13.5 miles in length and would provide both riverine and hurricane protection, and would also safely contain flows exiting from the tunnel outlet.

If the tunnel is extended to Newark Bay, these levees in area A are no longer included in the plan. (Note that without them, the tunnel would still provide some protection to areas in South Bergen and East Essex counties, but these areas would not receive protection from hurricanes and tidal storm surges.)

Both the recommended plan and the Newark Bay outlet alternative include five levee systems in the Newark-Hudson County area (area B) that provide flood protection from hurricanes and tidal storm surges, and are not related to the tunnel.

For the Newark Bay outlet alternative, the tunnel would be approximately six miles longer, and would discharge into a significantly larger body of water with no increases in water surface elevations in Newark Bay or upstream on the Passaic or Hackensack rivers. Therefore, if the tunnel is extended to Newark Bay, the Newark-Hudson area and the hurricane levee systems would not be affected.

5x



## State of New Jersey

### NEW JERSEY GENERAL ASSEMBLY LEGISLATIVE OFFICES

101 GIBRALTAR DRIVE  
SUITE 2-D  
PARSIPPANY-TROY HILLS  
MORRIS PLAINS, NEW JERSEY 07950  
201-984-0922  
201-984-8094 FAX

ROBERT J. MARTIN  
MINORITY WHIP  
ASSEMBLYMAN—26TH DISTRICT

ALEX DECROCE  
ASSEMBLYMAN—26TH DISTRICT

### New Jersey Assembly Conservation and Natural Resources Committee May 14, 1990

My name is Laurie Briggs. I am here today representing Assemblymen Robert J. Martin and Alex DeCroce of the 26th Legislative District (Morris/Passaic Counties). The Assemblymen would like to express their continued support of the Passaic River Dual Inlet Tunnel Diversion Project.

The Passaic River Basin has been recognized as being one of the most serious flood areas on the East Coast. The Basin encompasses some of the most densely developed metropolitan area in the country. The development of its floodplain, due to heavy residential and industrial growth, and its location in the East Coast stormbelt has led to a history of severe hardship during flooding.

The Passaic River Tunnel Project, which includes the acquisition for preservation of 5,350 acres of wetland and 5.9 miles of channel modifications, incorporates the construction of a 13.5 mile underground water diversion tunnel and a 1.2 mile spur tunnel. These tunnels would take waters from the high waters in the Basin and immovable surface barriers that have previously prevented the safe flow of flood waters and allow the water to empty into the Newark Bay. Also the retirement and preservation of more than 5,000 acres of wetlands would replenish the underground aquifer and provide for the necessary natural storage areas for water within the Central Passaic Basin.

Both Assemblyman Martin and Assemblyman DeCroce are in favor of the tunnel continuing to Newark Bay to ensure a safe outlet location for high river waters. After much consideration and consultation with the Army Corps of Engineers and Congressmen Gallo, Roe and Torricelli, the Assemblymen believe that the Passaic River Tunnel Project is the best long term solution for the critical issue of flooding which faces the people of Northern New Jersey.

Thank you Mr. Chairman and Committee Members for your time. Both Assemblymen appreciate your consideration.

6x



## TUNNEL FACTS

- The State chapter of the League of Women Voters and the New Jersey Alliance for Action have been involved in searching for a solution to flooding in the Passaic River Basin for the past 15 years.
- In 1988, Governor Thomas Kean agreed that the State of New Jersey would serve as the non-federal sponsor for the Tunnel Plan. Also, each of the last three Commissioners of the New Jersey DEP has supported the Tunnel Plan.
- Damages from a most severe storm will cause damages in excess of \$1.12 billion to the Passaic River Basin. At a cost of \$879 million, the Tunnel will pay for itself at the time of the next 100-year flood event (the "flood of record" occurred in 1903).
- In fact, the State of New Jersey, as the non-federal sponsor, will pay only 25% of the cost of the Tunnel, \$250 million, while eliminating \$1.12 billion in damages.
- Annual damages due to flooding in the Passaic River Basin average \$100 million, while annual maintenance of the Tunnel will cost approximately \$2.1 million and eliminate all damages.
- The purchase of residential and commercial properties necessary to provide the same level of protection as the Tunnel Plan would cost at least four times as much, and severe flooding would still occur!
- The Tunnel Plan will permanently preserve 5,350 acres of natural flood plain storage areas, 5,200 acres of which are wetlands, precluding any and all future development.
- The Supervising Hydrogeologist for the State of New Jersey's Division of Water Resources conducted a technical review of the Tunnel Plan and concluded that the Tunnel would have no measurable impact on either the quantity or quality of groundwater in the Bedrock or Buried Valley aquifers of the Basin.
- Over 100 plans, both structural and non-structural, were considered by the United States Army Corps of Engineers before the selection of the Tunnel Plan by the New Jersey Department of Environmental Protection.

7x

PROTECT is a committee of the New Jersey Alliance for Action

## TUNNEL PLAN ENDORSEMENTS

The Pompton/Passaic Dual Inlet Tunnel Plan has received numerous endorsements, including:

The Honorable Dean Gallo, United States House of Representatives  
The Honorable Robert Roe, United States House of Representatives  
The Honorable Leanna Brown, New Jersey State Senate, 26th District  
The Honorable Joseph Bubba, New Jersey State Senate, 34th District  
The Honorable Alex DeCroce, New Jersey State General Assembly, 26th District  
The Honorable Robert J. Martin, New Jersey State General Assembly, 26th District  
New Jersey Department of Environmental Protection  
Interstate Sanitation Commission  
New Jersey Society of Professional Engineers  
American Society of Mechanical Engineers-NJ  
Consulting Engineers Council-NJ  
New Jersey Society of Municipal Engineers  
American Society of Civil Engineers-NJ Section  
Morris County Board of Chosen Freeholders  
Passaic County Board of Chosen Freeholders  
Borough of Butler  
Borough of Fair Lawn  
Borough of Florham Park  
Borough of Lincoln Park  
Borough of Pompton Lakes  
Borough of West Paterson  
City of Paterson  
East Hanover Township  
Fairfield Township  
Pequannock Township  
Township of Little Falls  
Township of Montville  
Wayne Township  
Mayor's Flood Advisory Committee of Pompton Lakes  
Morris & Sussex Counties Building Trades Council  
Regional Water Management Board  
Bergen County Building Trades Association  
Natural Resources Citizen Advisory Committee  
Heavy & General Construction Laborers Local #472  
Building Contractors Association-NJ  
Flood Residents Coalition  
Iron Workers Local Union #483  
National Electrical Contractors Association  
New Jersey Asphalt Pavement Association  
Association for Bridge Construction and Design  
Construction & General Laborers Local Union #172  
New Jersey Builders Association  
Associated General Contractors Association-NJ  
Utility and Transportation Contractors Association-NJ  
New Jersey Industrial Development Association  
Electricians Local Union #102 I.B.E.W.  
Passaic County Building Trades Council  
Operating Engineers Local Union #825  
New Jersey Alliance for Action

8x



**FLOOD PROTECTION IN THE PASSAIC RIVER BASIN  
 A COMPARATIVE ANALYSIS**

	<u>U.S. Army Corps of Engineers Tunnel Plan</u>	<u>Passaic River Coalition Proposal</u> <sup>1</sup>
Purchase of certain flood prone properties?	No <sup>2</sup>	Yes
After proposed plan is carried out:		
--Remaining residences which will be flooded when a 100-year storm event occurs?	none	13,563 houses
--Commercial/industrial properties which will be flooded when a 100-year storm event occurs?	none	2,218 businesses
--Damages which will result from 100-year storm?	none	\$943 million
Wetlands to be acquired and permanently protected by public ownership (net increase after completion of plan)?	5,200 acres	not specified
Federal contribution which can be anticipated to offset project costs (1986 dollars):	\$622.5 million	none
Selected and endorsed by Commissioner of NJ Department of Environmental Protection?	Yes	No
Selected and endorsed by Governor of New Jersey?	Yes	No

<sup>1</sup> Based upon publicly released information from the Passaic River Coalition, Ella Filipone, Ph.D., Executive Administrator.

<sup>2</sup> Construction of the Great Piece Weir requires the removal of 33 structures. It is projected that these structures will be acquired by other agencies prior to construction of the Tunnel.

9x

NUMBER OF STRUCTURES  
PASSAIC RIVER MAIN STEM PROTECTION

PASSIC COUNTY	6,800	MORRIS COUNTY	4,800
CLIFTON	80	EAST HANOVER	200
LITTLE FALLS	600	LINCOLN PARK	6
PASSAIC CITY	170	MONTVILLE	1,000
PATERSON	3,000	PARSIPPANY-TROY HILLS	500
POMPTON LAKES	1,000	PEQUANNOCK	2,500
TOTOWA	250	RIVERDALE	150
WAYNE	1,500		
WEST PATERSON	170		
ESSEX COUNTY	2,200	BERGEN COUNTY	2,700
BELLEVILLE	220	EAST RUTHERFORD	260
FAIRFIELD	1,530	ELMWOOD PARK	90
LIVINGSTON	40	FAIR LAWN	600
NEWARK	330	GARFIELD	470
NORTH CALDWELL	3	LYNDHURST	230
NUTLEY	3	NORTH ARLINGTON	70
ROSELAND	2	RUTHERFORD	100
WEST CALDWELL	100	WALLINGTON	900
		HUDSON	350
		EAST NEWARK	20
		HARRISON	160
		KEARNY	170
TOTAL	16,850		

DATA REFLECTS THE NUMBER OF STRUCTURES, THE ACTUAL NUMBER OF HOMES AND PLACES OF BUSINESS WOULD BE SIGNIFICANTLY HIGHER

## BUSINESS FORUM

# The time is now for flood project

By ELLIS S. VIESER

The New Jersey Alliance for Action is a statewide, nonprofit coalition comprised of approximately 500 business, governmental, academic and professional organizations. The Alliance for Action advances those causes which have an impact on the quality of life and the economy for all New Jersey residents.

Flooding throughout the Passaic River Basin is among the most serious flood problems on the East Coast. The Basin includes portions of the most densely developed metropolitan area in the country and contains nearly 2.5 million residents, or approximately 1,500 people per square mile. The average annual flood damages in the Basin total nearly \$100 million.

The greatest engineering organization in the world, the U.S. Army Corps of Engineers, was requested by the State of New Jersey and New Jersey's congressional delegation to study ways to relieve the flooding in the Basin.

Over 150 alternatives were studied and after careful consideration by federal and state officials, and with input from the public, the State of New Jersey selected and endorsed the Passaic River Flood Control Plan.

The flood of April 1984, which caused \$390 million in damages and claimed 3 lives, was a 25-year flood (which means a flood of this magnitude occurs once every 25 years). During this flood, 9,400 people had to be evacuated from their homes. Today, if a 100 year flood occurred, as it did in 1903, an estimated \$1.9 billion in damages would result and this figure does not take into account the potential loss of life. Also, area businesses and industries would be flooded out. If the Flood Control Project is implemented, the Basin would not sustain any damage during such a severe storm and most importantly, lives and property would be protected.

This project recently received the approval of the President's Office of Management and Budget. The project has the approval of U.S. Fish and Wildlife, U.S. Environmental Protection Agency, the U.S. Department of Interior and the Interstate Sanitation Commission. In addition, the project has been endorsed by the last three New Jersey Department of Environmental Protection commissioners. Sens. Bill Bradley and Frank Lautenberg recently endorsed the project with an extension to Newark Bay. Congressmen Robert Roe, Dean Gallo and Robert Torricelli are all in favor the project with the extension to Newark Bay. Also, The Star-Ledger has editorially endorsed the project.

New Jersey gets back only 67 cents from each dollar we send to Washington, D.C. This project will be 75 percent federally funded, which will give New Jersey the chance to alleviate this imbalance. In 1968, the State of New Jersey officially became the non-federal sponsor of the project.

---

*Ellis S. Vieser is president  
of New Jersey  
Alliance for Action*

---

In the midst of New Jersey's current budget crisis it is important for Gov. Jim Florio to know that the state's 25 percent share does not have to be provided until the beginning of construction, which will be 1996 or later. It does not have to be provided in one lump sum (it can be spread out as construction progresses) and only 5 percent has to be in cash. The rest may be in the form of credits, in kind services and lands that are already in state ownership. As for the extension to Newark Bay, it is possible that this cost will be 100 percent federally funded.

A complete buy-out of flood prone properties has already been studied by the Corps of Engineers and has been found not to be economically feasible. Therefore, it was rejected by the State of New Jersey. An effective buy-out would cost over \$4 billion, which would have to be paid entirely by the state. It would also require the eviction and relocation of over 15,000 residences and businesses.

The Passaic River Flood Control project is the most environmentally sensitive of all structural alternatives. The project calls for the preservation of open space through the acquisition of 5,350 acres of natural storage areas, of which 5,200 are wetlands. The Corps of Engineers is prohibited by law from destroying wetlands without replacing them by the "no net loss provision" form the Wetlands Act.

The Passaic River Flood Control Project is New Jersey's last chance to bring an end to the flooding and personal suffering in the Basin. It is ridiculous to argue that the homes and businesses in the Basin should not have been built. They are there, so let's take care of the problem now before we miss the opportunity or another major flood occurs.

11x

PASSAIC RIVER FLOOD CONTROL PROJECT

COMMON MISCONCEPTIONS AND CORRESPONDING ACTUAL FACTS  
ABOUT THE RECOMMENDED PLAN

MISCONCEPTION:

The Corps plan is "cast in concrete", it cannot be altered and must be built as proposed.

FACT:

The plan recommended by the Corps is the plan, after full analysis, which meets the Federal water planning criteria for Corps plan formulation. However Congress can modify the plan as it deems necessary.

MISCONCEPTION:

Cost of annual operation and maintenance (O&M) has been quoted at \$5 million per year.

FACT:

Actual O&M will cost \$2.1 million annually. (Ref. p. 19 of BERH report dated July 1988.)

MISCONCEPTION:

The tunnel would transfer the flood problem from the Central Basin to the Lower Valley.

FACT:

Levees and floodwalls would be provided in the Lower Valley to safely contain tunnel discharges as well as protect against fluvial and tidal flooding. (EIS, p. 58).

MISCONCEPTION:

The plan will drain and deplete groundwater supplies contained in the Passaic Central Basin The source Buried Valley Aquifer.

FACT:

Central Basin groundwater aquifers will not be adversely affected. Flooding conditions in the primary recharge areas are unaffected by the tunnel plan for all but rare flood events (100, 500 year). Much groundwater recharge occurs outside of the flood plain and is unaffected by the project. Project operating rules designed to minimize environmental impacts also assure normal recharge. The Corps has coordinated with the New Jersey State Geologist in this matter to confirm the impact assessment. (EIS, p. 175-180).

MISCONCEPTION:

The tunnel will dry up the river and worsen water quality problems during low flow periods.

FACT:

The operating rules for the plan explicitly state that no water is to be diverted into the tunnel unless the flow exceeds the one year flood flow. Therefore, under normal conditions the river flow is unchanged by the plan. (EIS. p. 58)

MISCONCEPTION:

The project would divert water from reservoirs.

FACT:

This cannot happen. All the water supply reservoirs are upstream from the project's tunnel inlets. Therefore, it is physically impossible for the project to directly divert water away from water supply storage reservoirs.

MISCONCEPTION:

Nonstructural plans, especially buy outs, were ignored.

FACT:

An array of nonstructural plans, including buy outs, were fully investigated. It was determined that for comparable levels of protection, buyouts would be

4 to 5 times more costly than the recommended plan and therefore were not economically justifiable. (EIS, pp. 30-31 Appendix C, pp. 155-169).

MISCONCEPTION:

The project will destroy the 5,350 Acres of Wetlands required for the preservation of natural floodplain storage in the Central Basin.

FACT:

The 5,350 acres (which includes 5,200 acres of wetlands) required by the preservation of natural floodplain storage part of the plan will remain as they are today. No construction to modify any of these lands is necessary or desired. These lands will be purchased by the government to foreclose on development and they will be managed by a government agency as wildlife habitat areas. (EIS, p. 186,187, 191).

MISCONCEPTION:

The plan will lead to more development (secondary development in the floodplain/wetlands areas) after project completion.

FACT:

The Corps recognized this possibility and has reached agreement with NJDEP to preserve floodway delineations in areas contiguous to preservation of natural floodplain storage areas, thus eliminating this potential impact. (EIS, p. 13 and NJDEP letter dated 5/8/87).

MISCONCEPTION:

The 39 Foot diameter tunnel will cause a 39 foot high wall of water in the Lower Valley at the outlet.

FACT:

The Tunnel discharge would begin to dissipate immediately due to the much larger width and depth of the river versus the tunnel size at the outlet. For the 100 year design flood, the river stage will increase an average of 1.5 feet. (EIS, Table 31)

14X

**MISCONCEPTION:**

The building of levees and flood walls will block the scenic beauty of the river, thereby limiting its cultural and recreational utility.

**FACT:**

Levees and flood walls can actually enhance the recreational benefits and utility of the general landscapers in a community. While the surface configuration of the riverside edges would be altered by the levees, this does not mean that the land would be lost to recreation. Ample recreational opportunities would be provided along the levees top, e.g. walking/bike trails, benches, lighting, comfort facilities, drinking fountains and the proper landscaping for picnicking, sunbathing, or sledding activities. Even fishing would be possible from the riverside slope.

In addition, linking of pocket parks along the river that are now separated by long stretches of private lands would afford more park space and inturn provide a riverside trail through much of the Lower Valley. The System of riverside levees would eliminate forcing pedestrians to return to busy streets, enabling pedestrians and bicyclists to get closer to the river through longer reaches. The added elevation will afford views, both along the walkways and at the overlooks. Access to the river for recreation and boating will be provided, including access to marinas and emergency vehicles. Also, refinements of levee designs can be included if desired by local interests.

**NOTE:**

EIS and page numbers, etc., in parentheses are references to the Final Environmental Impact Statement issued on December 16, 1988 on the Flood Protection Feasibility Study on the Main Stem Passaic River (Dec. 1987). By referring to these pages, the reader will find further explanation and support for information in the FACT column.

If you have questions about statements that you have heard or would like further information concerning this document, contact Robert A. Pietrowsky or Raymond Boc at (212) 264-3567 or write to:

Passaic River and Special Studies Branch  
U.S. Army Corps of Engineers, New York  
26 Federal Plaza  
New York, NY 10278-0090

15x

# PROTECT



Passaic River Organizations To Encourage Construction of the Tunnel

P.O. Box 6438 • Rampan Plaza II • Rampan Center • Edison NJ 08818 • 201-225-1180 • FAX 201-225-4674

## PASSAIC RIVER BASIN: DAMAGES - 100 YEAR FLOOD

COUNTY	WITHOUT TUNNEL PLAN	WITH TUNNEL PLAN <sup>1</sup>
PASSAIC	\$485,700,000	0
Clifton	\$11,300,000	0
Little Falls	\$11,500,000	0
Passaic City	\$41,600,000	0
Paterson	\$110,500,000	0
Pompton Lakes	\$38,000,000	0
Totowa	\$7,600,000	0
Wayne	\$201,00,000	0
W. Paterson	\$64,200,000	0
ESSEX	\$285,600,000	0
Belleville	\$8,300,000	0
Fairfield	\$179,800,000	0
Livingston	\$5,000,000	0
Newark	\$62,900,000	0
N. Cladwell	\$100,000	0
Nutley	\$71,000	0
Roseland	\$100,000	0
W. Caldwell	\$28,800,000	0
MORRIS	\$256,100,000	0
E. Hanover	\$13,800,000	0
Florham Pk.	\$4,200,000	0
Hanover	\$3,900,000	0
Lincoln Park	\$83,000,000	0
Montville	\$8,300,000	0
Par-Troy Hills	\$13,900,000	0
Pequannock	\$127,700,000	0
Riverdale	\$1,300,000	0
BERGEN	\$96,200,000	0
E. Rutherford	\$9,500,000	0
Elmwood Pk.	\$4,300,000	0
Fairlawn	\$20,300,000	0
Garfield	\$26,800,000	0
Lyndhurst	\$5,500,000	0
N. Arlington	\$1,500,000	0
Rutherford	\$3,200,000	0
Wallington	\$25,100,000	0
HUDSON	\$48,000,000	0
E. Newark	\$800,000	0
Harrison	\$5,900,000	0
Kearny	\$41,300,000	0
TOTAL	\$1,171,600,000	0

SOURCE: United States Army Corps of Engineers, October 1989  
Price Levels

<sup>1</sup> Minor residual damage will occur in some areas.

16x

PASSAIC RIVER BASIN: DAMAGES - 100 YEAR FLOOD

	Legislative Representatives	Damages without Passaic River Flood Control Plan	Damages With Passaic River Flood Control Plan*
PASSAIC COUNTY		\$485,700,000.00	0
Clifton District 34	Senator Joseph Bubba (R) Assemblyman Joseph Mecca (D) Assemblyman Gerald Zecker (R)	\$11,300,000.00	0
Little Falls District 34	Senator Joseph Bubba (R) Assemblyman Joseph Mecca (D) Assemblyman Gerald Zecker (R)	\$11,500,000.00	0
Passaic City District 36	Senator Gabriel Ambrosio (D) Assemblyman Thomas Duch (D) Assemblyman Louis Gill (D)	\$41,600,000.00	0
Paterson District 35	Assemblyman John Giregenti (D) Assemblyman William Pascrell, Jr. (D)	\$110,500,000.00	0
Pompton Lakes District 40	Senator Henry McNamara (R) Assemblyman Nicholas Felice (R) Assemblyman David Russo (R)	\$38,000,000.00	0
Totowa District 34	Senator Joseph Bubba (R) Assemblyman Joseph Mecca (D) Assemblyman Gerald Zecker (R)	\$7,600,000.00	0
Wayne District 34	Senator Joseph Bubba (R) Assemblyman Joseph Mecca (D) Assemblyman Gerald Zecker (R)	\$201,000,000.00	0
West Paterson District 34	Senator Joseph Bubba (R) Assemblyman Joseph Mecca (D) Assemblyman Gerald Zecker (R)	\$64,200,000.00	0

17X

ESSEX COUNTY		\$280,600,000.00	0
Belleville District 30	Senator Carmen Drechio (D) Assemblywoman Marion Crecco (R) Assemblyman John Kelly (R)	\$8,300,000.00	0
Fairfield District 34	Senator Joseph Bubba (R) Assemblyman Joseph Mecca (D) Assemblyman Gerald Zecker (R)	\$179,800,000.00	0
Livingston District 22	Senator Donald DiFrancesco (R) Assemblyman Robert Franks (R) Assemblywoman Maureen Ujden (R)	\$5,000,000.00	0
Newark District 27	Senator Richard Codey (D) Assemblywoman Stephanie Bush (D) Assemblyman Harry McEnroe (D)	\$62,900,000.00	0
District 28	Senator Ronald Rice (D) Assemblyman Michael Adubato (D) Assemblyman Jimmy Zangari (D)		
District 29	Senator Wynona Lipman (D) Assemblyman Willie Brown (D) Assemblyman Jackie Mattison (D)		
North Caldwell District 34	Senator Joseph Bubba (R) Assemblyman Joseph Mecca (D) Assemblyman Gerald Zecker (R)	\$100,000.00	0
Nutley District 30	Senator Carmen Drechio (D) Assemblywoman Marion Crecco (R) Assemblyman John Kelly (R)	\$700,000.00	0
Roseland District 33	Senator Donald DiFrancesco (R) Assemblyman Robert Franks (R) Assemblywoman Maureen Ujden (R)	\$100,000.00	0
West Caldwell District 34	Senator Joseph Bubba (R) Assemblyman Joseph Mecca (D) Assemblyman Gerald Zecker (R)	\$38,800,000.00	0

18X

19x

MORRIS COUNTY		\$256,100,000.00	0
East Hanover District 26	Senator Leanna Brown (R) Assemblyman Alex DeCroce (R) Assemblyman Robert Martin (R)	\$13,800,000.00	0
Florham Park District 26	Senator Leanna Brown (R) Assemblyman Alex DeCroce (R) Assemblyman Robert Martin (R)	\$4,200,000.00	0
Hanover District 25	Senator John Dorsey (R) Assemblyman Arthur Albohn (R) Assemblyman Rodney Frelinghuysen (R)	\$3,900,000.00	0
Lincoln Park District 26	Senator Leanna Brown (R) Assemblyman Alex DeCroce (R) Assemblyman Robert Martin (R)	\$83,000,000.00	0
Montville District 26	Senator Leanna Brown (R) Assemblyman Alex DeCroce (R) Assemblyman Robert Martin (R)	\$8,300,000.00	0
Par-Troy Hills District 26	Senator Leanna Brown (R) Assemblyman Alex DeCroce (R) Assemblyman Robert Martin (R)	\$13,900,000.00	0
Pequannock District 26	Senator Leanna Brown (R) Assemblyman Alex DeCroce (R) Assemblyman Robert Martin (R)	\$127,700,000.00	0
Riverdale District 26	Senator Leanna Brown (R) Assemblyman Alex DeCroce (R) Assemblyman Robert Martin (R)	\$1,300,000.00	0
BERGEN COUNTY		\$96,200,000.00	0
East Rutherford District 36	Senator Gabriel Ambrosio (D) Assemblyman Thomas Duch (D) Assemblyman Louis Gill (D)	\$9,500,000.00	0
Elmwood Park District 35	Assemblyman John Girgenti (D) Assemblyman William Pascrell, Jr. (D)	\$4,300,000.00	0

20x

74205  
151

Fair Lawn District 40	Senator Henry McNamara (R) Assemblyman Nicholas Felice (R) Assemblyman David Russo (R)	\$20,300,000.00	0
Garfield District 36	Senator Gabriel Ambrosio (D) Assemblyman Thomas Duch (D) Assemblyman Louis Gill (D)	\$26,800,000.00	0
Lyndhurst District 36	Senator Gabriel Ambrosio (D) Assemblyman Thomas Duch (D) Assemblyman Louis Gill (D)	\$5,500,000.00	0
North Arlington District 36	Senator Gabriel Ambrosio (D) Assemblyman Thomas Duch (D) Assemblyman Louis Gill (D)	\$1,500,000.00	0
Rutherford District 36	Senator Gabriel Ambrosio (D) Assemblyman Thomas Duch (D) Assemblyman Louis Gill (D)	\$3,200,000.00	0
Wallington District 36	Senator Gabriel Ambrosio (D) Assemblyman Thomas Duch (D) Assemblyman Louis Gill (D)	\$25,100,000.00	0
HUDSON COUNTY		\$48,000,000.00	0
East Newark District 32	Senator Thomas Cowan (D) Assemblyman Anthony Impeveduto (D) Assemblyman David Kronick (D)	\$800,000.00	0
Harrison District 32	Senator Thomas Cowan (D) Assemblyman Anthony Impeveduto (D) Assemblyman David Kronick (D)	\$5,900,000.00	0
Kearny District 32	Senator Thomas Cowan (D) Assemblyman Anthony Impeveduto (D) Assemblyman David Kronick (D)	\$41,300,000.00	0
TOTAL DAMAGES		\$1,171,600,000.00	0

Source: U.S. Army Corps of Engineers, October 1989 price levels

\*Minor residual damage will occur in some areas with the Passaic River Flood Control Plan.